On-scene Investigation / Vehicle to Vehicle
Dynamic Science, Inc. / Case Number: DS99020
1997 Ford Taurus
Arizona
July 1999

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The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the National Highway Traffic Safety Administration.

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 case was initiated in response to a report of an air bag deployment related passenger fatality. This low speed crash took place in the state of Arizona in June, 1999. Vehicle 1, a 1997 Ford Taurus GL four-door (green) driven by a 28-year-old male, was traveling eastbound on a two-lane undivided roadway. The front right bucket seat was occupied by a 3-year-old female (104 cm/41 in., 21.8 kg/48 lbs.) seated in a forward-facing, overhead shield-equipped Cosco Touriva (Model # 02-014) child safety seat[1]. The seat had been placed in the forward facing toddler position with the shoulder harness threaded through the upper slots–though the harness on the right was twisted. According to post-crash witnesses, the child seat was attached to the vehicle using the lap and shoulder belts. This seating position is equipped with a switchable retractor that is activated by fully unwinding the restraints until the ratchets catch. There are no indications that the retractor had been switched, which would cause the child seat to not be firmly held in place. Vehicle 2, a 1997 Ford Taurus GL four-door (silver) driven by a 77-year-old male, was traveling in front of Vehicle 1. The driver had made a wrong turn and wanted to reverse his path of travel. Vehicle 2 steered onto the right hand shoulder and into a vacant lot. The driver then steered back into the roadway so that as he entered the roadway his path of travel was 90 degrees from his initial path. The driver was wearing dark glasses which he indicated may have contributed to him not seeing Vehicle 1. As Vehicle 2 entered the roadway, the driver of Vehicle 1 began braking–depositing approximately 6 m (20 ft) of locked wheel skids–and steering to the left. The front of Vehicle 1 (12FDEW1) struck the left side of Vehicle 2 (09LPEW2). Vehicle 1 sustained a total delta v of 13.5 km/h (8.4 mph), a longitudinal delta v of -13.4 km/h (-8.4 mph), and a lateral delta v of -1.4 km/h (-0.9 mph). Both air bags in Vehicle 1 deployed at this point. Vehicle 2 sustained a total delta v of 13.5 km/h (8.4 mph), a longitudinal delta v of -1.2 km/h (-0.7 mph), and a lateral delta v of 13.4 km/h (8.3 mph). The front right occupant sustained a complete separation of the occipital bone and the 1st cervical vertebra, laceration of the brain stem at the pons and medullary junction, moderate cerebral edema, subarachnoid hemorrhage around the brain stem and on the right and left parietal lobes, subgaleal hemorrhage over the right frontal bone, two subgaleal hemorrhages over the left occipital bone, and a contusion involving the right lung. Externally, this occupant sustained abrasions and contusions to the face, neck, and frenulum/crotch. Upon arrival of the police, the child was not breathing and there was no pulse. She was transported to a local medical center where she was pronounced dead.

17. Key Words	18. Distribution Statement
Air bag, deployment, injury, accident, fatality, passenger.	

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[1]The case occupant exceeded the seat weight limit of 19.5 kg (43 lbs.) by 2.2 kg (5 lbs.).

Dynamic Science, Inc.
Accident Investigation
Case Number: DS99020

TABLE OF CONTENTS

BACKGROUND:

Description:	This case was initiated in response to a report of an air bag deployment related passenger fatality. The case was conducted as an on-scene investigation. NHTSA was notified by local fire department. DSI was notified on July 1, 1999. Field work was completed on July 7, 1999. DSI was accompanied during the vehicle and scene inspections by the investigating police officer.
Investigation Type:	On-scene
Crash Location:	Arizona
Crash Date:	June 1999
Notification Date:	July 1, 1999
Field Work Completed:	July 7, 1999

SUMMARY:

This low speed crash took place in the state of Arizona in June, 1999. Vehicle 1, a 1997 Ford Taurus GL four-door (green) driven by a 28-year-old male, was traveling eastbound on a two-lane undivided roadway. The front right bucket seat was occupied by a 3-year-old female (104 cm/41 in., 21.8 kg/48 lbs.) seated in a forward-facing, overhead shield-equipped Cosco Touriva (Model # 02-014, manufacture date 3/25/96) child safety seat[2]. The seat had been placed in the forward facing toddler position with the shoulder harness threaded through the upper slots–though the harness on the right was twisted. According to post-crash witnesses, the child seat was attached to the vehicle using the lap and shoulder belts. This seating position is equipped with a switchable retractor that is activated by fully unwinding the restraints until the ratchets catch. There are no indications that the retractor had been switched, which would cause the child seat to not be firmly held in place.

Figure 1. Travel path for Vehicle 1. Arrow shows path Vehicle 2 used to initially exit roadway.

[2]The case occupant exceeded the seat weight limit of 19.5 kg (43 lbs.) by 2.2 kg (5 lbs.).

Vehicle 2, a 1997 Ford Taurus GL four-door (silver) driven by a 77-year-old male, was traveling in front of Vehicle 1. The driver had made a wrong turn and wanted to reverse his path of travel. Vehicle 2 steered onto the right hand shoulder and into a vacant lot. The driver then steered back into the roadway so that as he entered the roadway his path of travel was 90 degrees from his initial path. The driver was wearing dark glasses which he indicated may have contributed to his not seeing Vehicle 1.

Figure 3. Exterior, Vehicle 1

As Vehicle 2 entered the roadway, the driver of Vehicle 1 began braking–depositing approximately 6 m (20 ft) of locked wheel skids–and steering to the left. The front of Vehicle 1 (12FDEW1) struck the left side of Vehicle 2 (09LPEW2). Vehicle 1 sustained a total delta v of 13.5 km/h (8.4 mph), a longitudinal delta v of -13.4 km/h (-8.4 mph), and a lateral delta v of -1.4 km/h (-0.9 mph). Both air bags in Vehicle 1 deployed at this point.

Figure 2. Child safety seat, front view

Vehicle 2 sustained a total delta v of 13.5 km/h (8.4 mph), a longitudinal delta v of -1.2 km/h (-0.7 mph), and a lateral delta v of 13.4 km/h (8.3 mph).

The front right occupant sustained a complete separation of the occipital bone and the 1st cervical vertebra, laceration of the brain stem at the pons and medullary junction, moderate cerebral edema, subarachnoid hemorrhage around the brain stem and on the right and left parietal lobes, an 8.0 x 5.0 cm (3 x 2 in.) subgaleal hemorrhage over the right frontal bone, two subgaleal hemorrhages over the left occipital bone measuring 4.0 x 4.0 cm (1.6 x 1.6 in.), and a contusion involving the right lung. Externally, this occupant sustained abrasions and contusions to the face, neck, and frenulum/crotch.

It appears that as the driver of Vehicle 1 saw Vehicle 2 he applied the brakes and began steering to the left. As a result of the braking, the child seat slid forward taking up any slack in the lap and shoulder belt.

At impact, both air bags deployed. The tethered passenger side air bag module cover contacted the right arm of the child seat–separating it at the child seat back. The deploying air bag then struck the child fully in the face and wrapped/engaged the neck, causing the facial abrasion and the neck injury.

The child's head was lifted upwards by the deploying air bag causing the separation of the occipital bone and the 1st cervical vertebra. This latter movement loaded the shoulder harnesses causing the abrasions/contusions to the right upper shoulder. The frenulum/crotch injury is likely related to child's upward movement against the crotch strap.

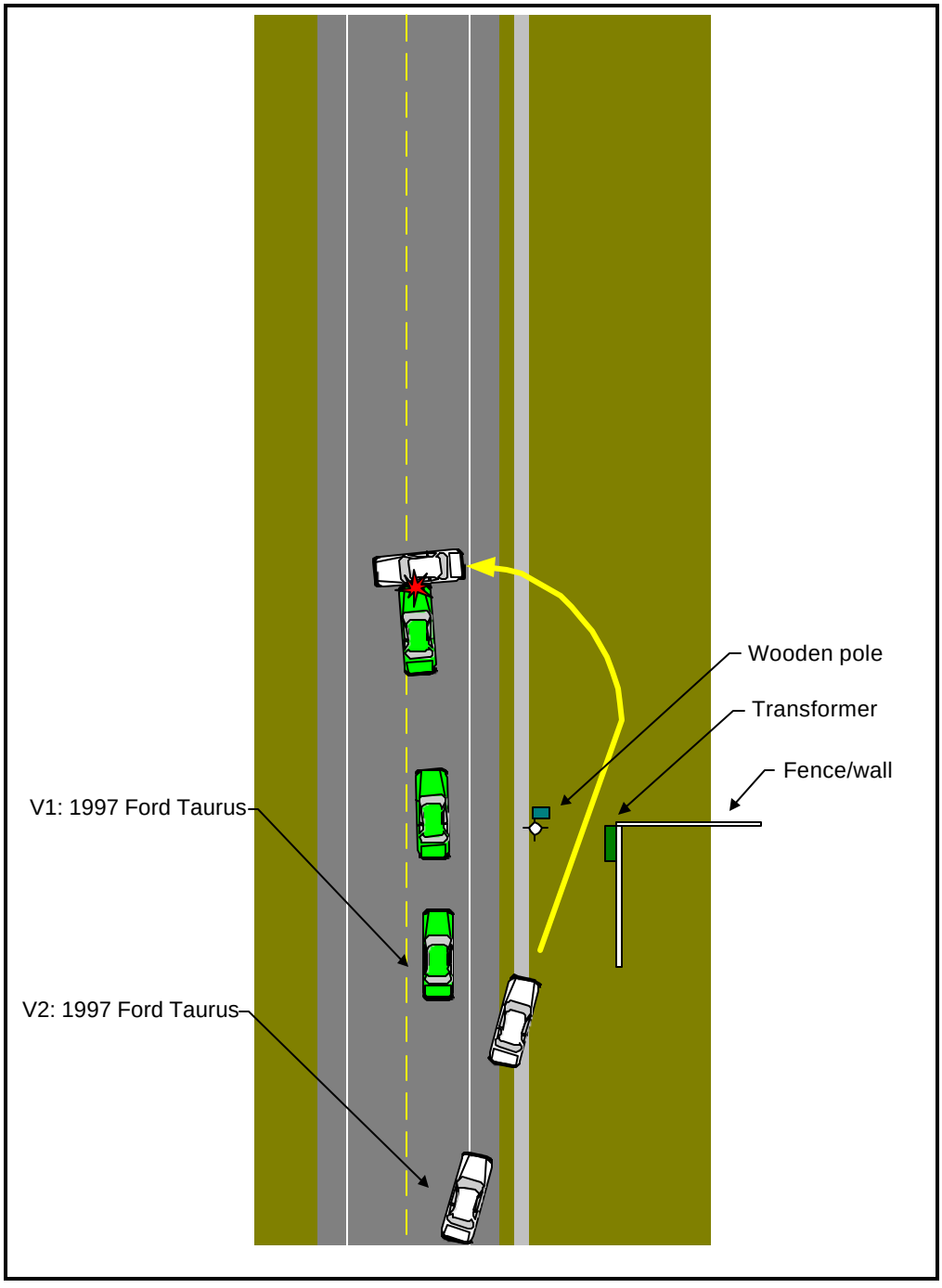
Immediately after the impact, the driver of Vehicle 1 exited the vehicle on the left side and opened the passenger side door. Witnesses indicated that he was struggling to get the child out of the seat. Upon arrival of the police, the child was not breathing and there was no pulse. She was transported to a local medical center where she was pronounced dead at 1558 hours.

The driver of Vehicle 1 was transported to a local hospital where he was treated and released.

The driver of Vehicle 2 has had hip replacement surgery; the crash caused some type of dislocation. He was transported to a local hospital where he was treated and released.

Both vehicles were towed from the scene.

Scene Diagram



DETAILED INFORMATION

Vehicles

Vehicle 1

Description:	1997 Ford Taurus GL four-door sedan (green)	
VIN:	1FALP52U3VGXXXXXX	
Odometer:	Unknown	
Engine:	3.0L EFI V6	
Reported Defects:	None	
Cargo:	None	
Damage Description:	Minor rearward crush to front bumper, hood displaced, fractures to passenger side of windshield.	
CDC:	12FDEW1	
Delta V:	Total	13.5 km/h (8.4 mph)
	Longitudinal	-13.4 km/h (-8.3 mph)
	Latitudinal	-1.2 km/h (-0.7 mph)
	Energy	8,117 joules (5,988 ft-lbs.)

The interior of Vehicle 1 sustained minor damage from occupant contact. There were no areas of intrusion into the passenger compartment. There was occupant contact evidence to the passenger air bag, the right instrument panel, and the passenger air bag module cover.

This vehicle was equipped with bucket seats in the front left and front right seating positions. The front left seat was adjusted between the middle and rear most track positions. The front right seat was also adjusted between the middle and rear most track position. Both front seats were

Figure 5. Exterior, Vehicle 1

equipped with adjustable head restraints which were not damaged.

The front left air bag was housed in the steering wheel hub and was concealed by asymmetrical H-configuration cover flaps. The circular air bag was equipped with one tether and no vent ports. The bag was not damaged.

The front right air bag was located in the top-instrument panel position. The single air bag module cover flap was an irregularly shaped rectangular configuration. The 53 x 61 cm (21 x 24 in.) rectangular air bag was equipped with one tether but no vent ports. The air bag had a post-crash excursion of 53 cm (20.8 in.). There was no damage to the air bag, but there were skin transfers found on the left face of the air bag. The module cover engaged the arm of the child safety seat. The module cover was dented and the right arm of the child seat was dislodged.

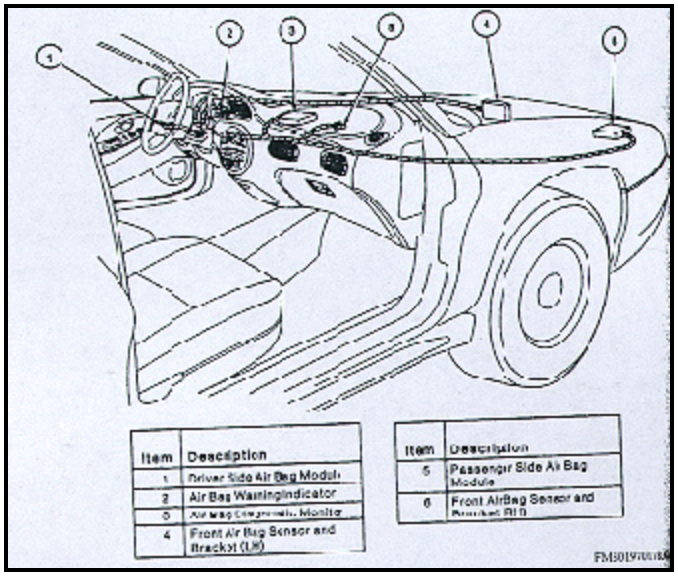


Figure 6. Passenger side air bag

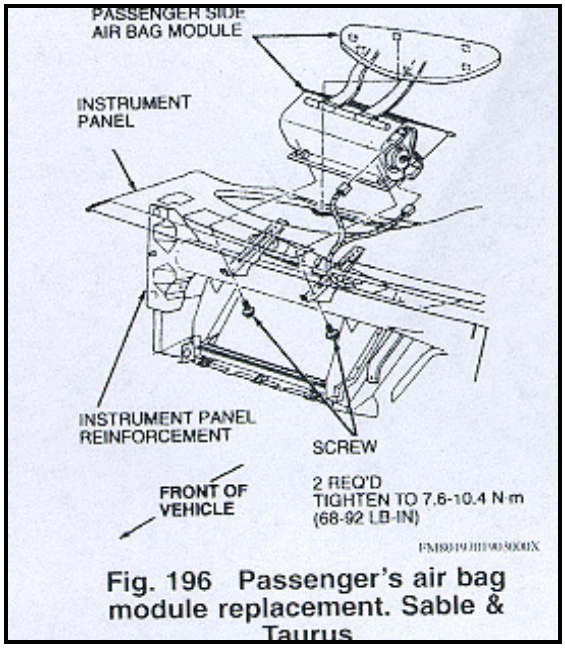


Figure 7. Passenger side air bag

Vehicle 2

Description:	1997 Ford Taurus GL four-door sedan (silver)	
VIN:	1FALP52U7VAXXXXXX	
Odometer:	31,581 miles	
Engine:	3.0L EFI V6	
Reported Defects:	None	
Cargo:	None	
Damage Description:	Moderate lateral crush to left front door area and left rear door area. Minor intrusion on left side.	
CDC:	09LPEW2	
Delta V:	Total	13.5 km/h (8.4 mph)
	Longitudinal	-1.2 km/h (-0.7 mph)
	Latitudinal	13.4 km/h (8.3 mph)
	Energy	14,116 joules (10,420 ft-lbs.)

Figure 8. Exterior, Vehicle 2

Occupants

Vehicle 1	Occupant 1	Occupant 2
Age/Sex:	28/Male	3/Female
Seated Position:	Front left	Front right
Seat Type:	Bucket seat-fabric covered	Bucket seat-fabric covered
Height:	Unknown	104cm/41 in.
Weight:	Unknown	21.8 kg/48 lbs
Occupation:	Unknown	NA
Pre-existing Medical Condition:	None noted	None
Alcohol/Drug Involvement:	None	NA
Driving Experience:	Est. > 10 years	NA
Body Posture:	Normal, upright.	Normal, upright
Hand Position:	Unknown	Unknown
Foot Position:	Right on brake, left on floor	Unknown
Restraint Usage:	None used	Lap and shoulder belt used in conjunction with forward facing child safety seat
Air bag:	Deployed	Deployed

Vehicle 2

Age/Sex:	77/Male
Seated Position:	Front left
Seat Type:	Bucket-fabric covered
Height:	Unknown
Weight:	Unknown
Occupation:	Retired
Pre-existing Medical Condition:	Hip replacement surgery
Alcohol/Drug Involvement:	None
Driving Experience:	Unknown
Body Posture:	Unknown
Hand Position:	Unknown
Foot Position:	Right on accelerator, left presumed to be on floor
Restraint Usage:	Lap and shoulder belt used

Injuries and Injury Mechanisms

Vehicle 1

	INJURY	OIC CODE	ICD-9	SOURCE
Driver:	No reported injuries			
FR Occupant:	Atlanto-occipital dislocation with laceration of the brain involving the pons medullary junction	140212.6,8 650208.2,6	851.6	Air bag
	Subarachnoid hemorrhage, right and left parietal lobes	Not codeable–see General NASS injury coding rule #25, item 3.	852.0	Air bag
	Subarachnoid hemorrhage, brain stem	Not codeable–see General NASS injury coding rule #25, item 3.	852.0	Air bag
	Subgaleal hemorrhage, right frontal bone, 8.0 x 5.0 cm	190402.1,7	920.0	Air bag
	Subgaleal hemorrhages (2), left occipital bone, 4.0 x 4.0 cm	190402.1,2	920.0	Air bag
	Contusion, middle lobe, right lung	441402.3,1	861.21	Child seat - tray
	Moderate cerebral edema	140668.3,9	348.5	Air bag
	Laceration over right eye	290600.1,1	910.8	Air bag
	Contusion/abrasion, right eyelid	297402.1,1 297202.1,1	921.0 918.0	Air bag
	Chin abrasion, 11.0 x 3.5	290202.1,8	910.0	Air bag
	Abrasion, anterior/right/left neck, 18.0 x 5.0 cm	390202.1,0	910.0	Air bag
	Abrasions (2), upper chest, 10.0 x 3.0 cm	490202.1,9	911.0 911.0	Child seat tray
	Contusion/abrasion, left side of face	290202.1,2 290402.1,2	910.0 920.0	Air bag
	Abrasion, left ear lobe, 1.0 x 0.4 cm	290202.1,2	910.0	Air bag
	Abrasion, top of right shoulder, 10.0 x 9.0 cm	790202.1,1	912.0	Child seat harness
	Contusion, top of right shoulder, 6.0 x 2.0 cm	790402.1,1	923.00	Child seat harness
	Contusion, frenulum/crotch	545410.1,8	922.4	Child seat harness, crotch belt

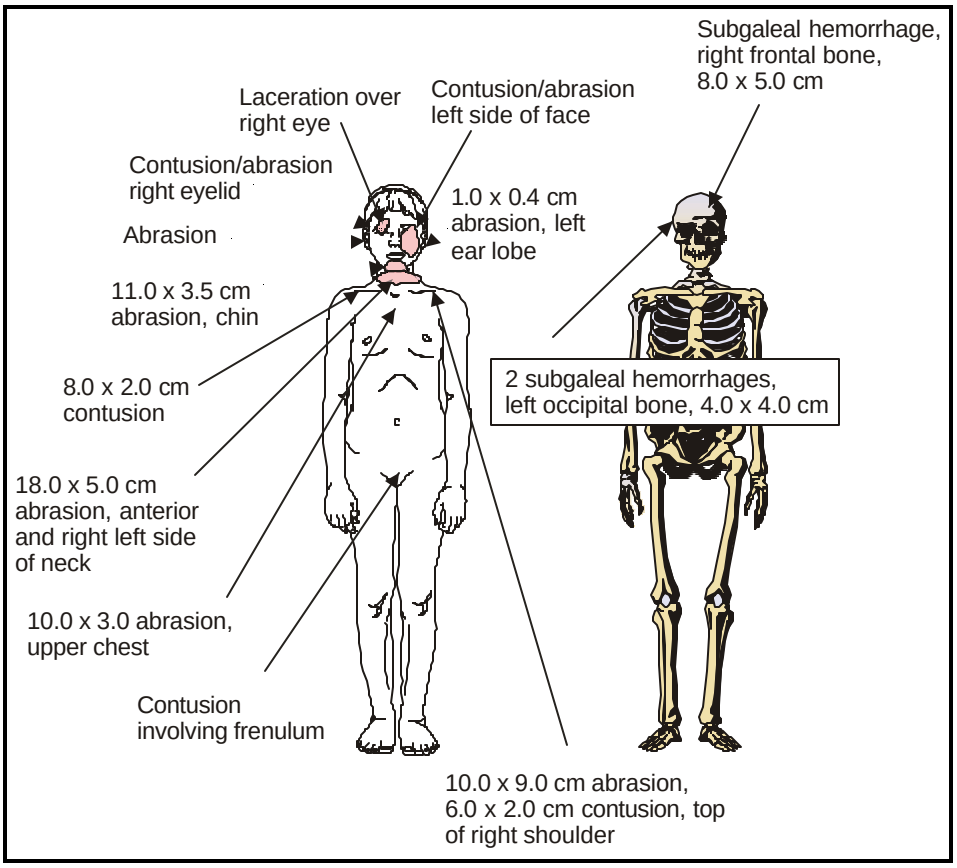


Figure 9. External Injuries

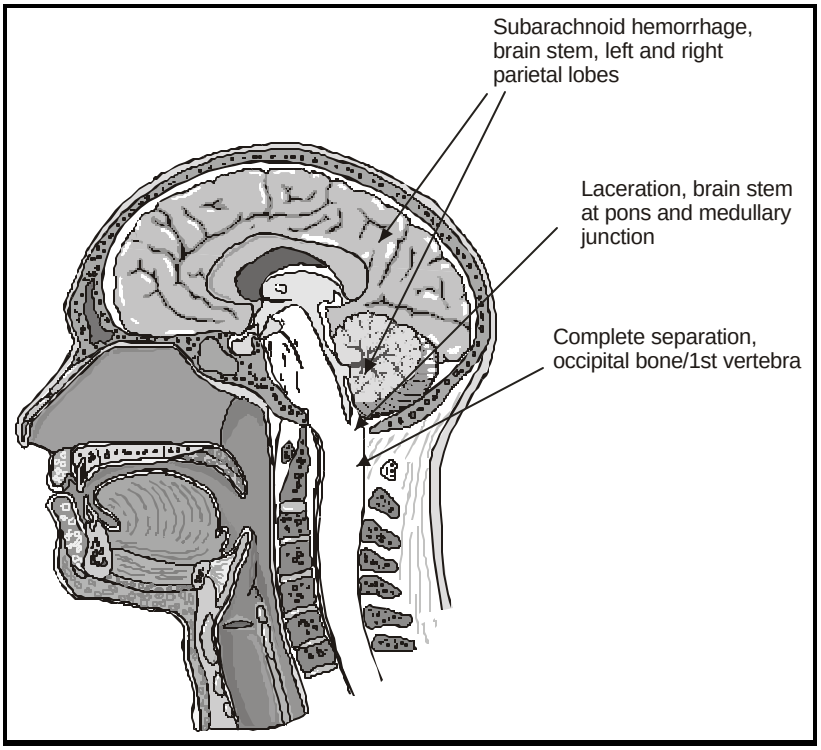


Figure 10. Internal Injuries

Vehicle 2

	INJURY	OIC CODE	ICD-9	SOURCE
Driver:	**No reported injuries**			

Occupant Kinematics

The front right bucket seat was occupied by a 3-year-old female (104 cm/41 in., 21.8 kg/48 lbs.) seated in a forward-facing, overhead shield-equipped Cosco Touriva (Model # 02-014) child safety seat. The case occupant exceeded the seat weight limit of 19.5 kg (43 lbs.) by 2.2 kg (5 lbs.). The child seat had been placed in the forward facing toddler position with the shoulder harness threaded through the upper slots–though the harness on the right was twisted. The front right fabric-covered bucket seat was adjusted between the middle and rear most track position. According to post-crash witnesses, the child seat was attached to the vehicle using the lap and shoulder belts. This seating position is equipped with a switchable retractor that is activated by fully unwinding the restraints until the ratchets catch. There are no indications that the retractor had been switched, which would cause the child seat to not be firmly held in place. The chest clip was being used, but appears to have been used in a position which would have been too low on the child.

Figure 11. Child safety seat, front view

Figure 12. Child safety seat–chest clip and twisted harness

It appears that as the driver of Vehicle 1 saw Vehicle 2, he applied the brakes and began steering to the left. As a result of the braking, the child seat slid forward taking up any slack in the lap and shoulder belt. One of the child's feet likely contacted the face of the instrument panel (see Figure 15). The child seat is 44 cm (17 in.) long from the back to the front. The post-deployment excursion of the air bag is 53 cm (20.8 in.). The distance from the seat back to the base of the air bag was 78 cm (30.7 in..). Even if the child seat had been properly installed, there still would have been an overlap between the seat and the deploying air bag of approximately 19 cm (7.5 in.).

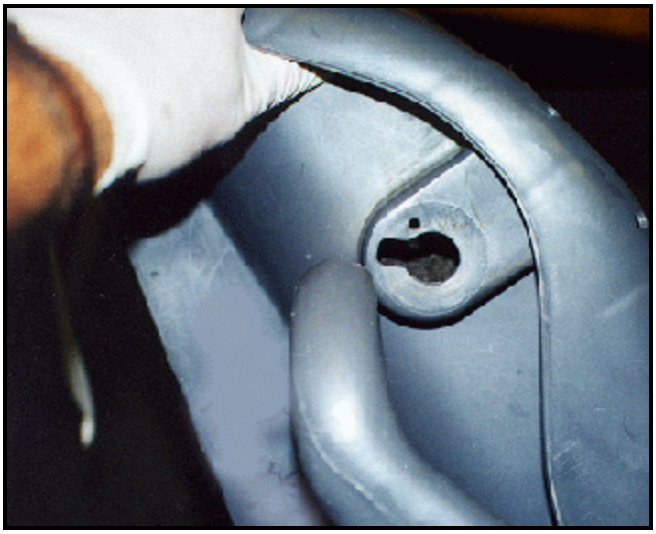


Figure 13. Dislodged shield arm

The front right occupant sustained a complete separation of the occipital bone and the 1st cervical vertebra, laceration of the brain stem at the pons and medullary junction, moderate cerebral edema, subarachnoid hemorrhage around the brain stem and on the right and left parietal lobes, an 8.0 x 5.0 cm (3 x 2 in.) subgaleal hemorrhage over

the right frontal bone, two subgaleal hemorrhages over the left occipital bone measuring 4.0 x 4.0 cm (1.6 x 1.6 in.), and a contusion involving the right lung. Externally, this occupant sustained abrasions and contusions to the face, neck, and frenulum/crotch.

Figure 14. Front right seat with scaled image of child seat superimposed onto seat image.

At impact, both air bags deployed. The tethered passenger side air bag module cover contacted the right arm of the child seat–separating it at the child seat back and forcing it rearward where it likely struck the child's upper chest causing the upper chest abrasions. The deploying air bag then struck the child fully in the face and wrapped the neck, causing the facial abrasions/contusions/laceration and the neck injury. The child was lifted upwards by the deploying air bag causing the separation of the occipital bone and the 1st cervical vertebra. This latter movement loaded the shoulder harnesses causing the abrasions/contusions to the right upper shoulder. The frenulum/crotch injury is likely related to child's movement against the crotch strap.

Figure 15. Contact to face of right instrument panel

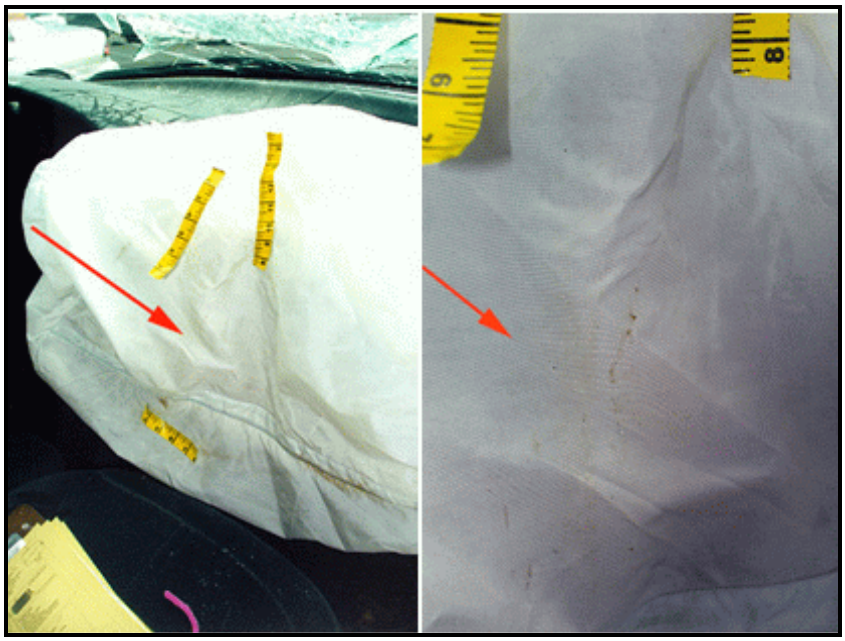


Figure 16. Passenger side air bag–skin transfers

Figure 17. Fiber transfers, passenger side module cover

Attachment 1. Child safety seat instructions

TOURIVA

Overhead Shield and LXO/Luxury Overhead Shield COSCO

Models 02-014, 02-045, 02-055, 02-065, 02-265, 02-054, 02-034, 02-044, 02-025, 02-344, 02-064, 02-275, 02-244, 02-245

READ AND SAVE THESE INSTRUCTIONS

IMPORTANT!
You must follow the instructions for this child restraint exactly or you will increase your child's risk of injury or death.

- Refer to your vehicle owner's manual for additional instructions regarding proper use of this child restraint with your vehicle.
- If you have any questions, call Cosco's Consumer Relations Department, 1-800-544-1108.
- Before you use this child restraint, you must read the entire booklet so you understand how to use it correctly. To help you recognize those instructions which are most critical for your child's safety, we use the following symbol:

WARNING—URGENT SAFETY INFORMATION

Failure to follow these instructions creates a dangerous situation that is likely to result in serious injury or death for your child in the event of a crash or sudden stop.

No one can predict if use of a child restraint will prevent injury or death in a particular crash. However, combined with careful driving, proper use of a child restraint can reduce a child's risk of injury or death in most crashes. Your child is worth the time it will take to read and follow these instructions. If after reading these instructions you still have questions, please contact Cosco's Consumer Relations Department, 1-800-544-1108.

General Information

This child restraint is designed for use by children weighing up to 43 pounds (19.5 kg) whose height is 42 inches (107 cm) or less. This child restraint has been dynamically "crash tested" and conforms to all applicable Federal Motor Vehicle Safety Standards (FMVSS 213) in effect on the date of manufacture.

Editor's Notes Touriva Overhead shield: One piece shell with no tubular frame on back or sides of seat; red push button adjusts recline stand from reclined to upright position; red button to release shield says "Press"; seat belt for rear-facing position threads under pad of seat beneath child's legs.

Recall information

Child restraints could be recalled for safety reasons. You must register this restraint to be reached in a recall. Send your name, address and the restraint's model number and manufacturing date to Cosco Inc., 2525 State Street, Columbus, IN 47201 Attn: Consumer Relations or call 1-800-468-0174. For recall information, call the U.S. Government's Auto Safety Hotline at 1-800-424-9393 (202-366-0123 in the D.C. area.) For Cosco car seat parts and service, call 1-800-544-1108.

GENERAL WARNINGS

1. This child restraint is for children who weigh less than 43 pounds (19.5 kg) whose height is 42 inches (107 cm) or less.
2. According to Federal government safety standards, for maximum protection, the center rear seating position is the safest position in most vehicles for installing a child restraint. If there is no lap belt in the center rear seat, the use of either of the other rear seating positions is recommended.
3. Use the child restraint only on forward facing vehicle seats.
4. Do not use on any vehicle seat that pivots or has a back that folds forward unless the seat has a lock. (See vehicle owner's manual.)
5. Check your vehicle seat belts before each use. Use only if the vehicle lap belt can be tightened properly and securely.
6. This child restraint should be securely belted in the vehicle even when not in use. In a crash or sudden stop, an unsecured child restraint could injure other occupants.
7. Do not use a child restraint with damage or missing parts. Cut, frayed, or damaged belts must never be used. Do not lubricate buckles and fasteners. Do not substitute parts or try to modify the child restraint in any way on your own.
8. This child restraint must face the rear of the vehicle when used for infants under 20 pounds (9 kg). Do not use rear-facing in any seat with an air bag; move the child restraint to another seating location where it can be correctly used rear facing.
9. Never take your child out of the child restraint or try to tend to your child's needs while the vehicle is moving.
10. Do not use a child restraint that has been in a crash. It must be replaced.
11. Cosco does not recommend the use of any child restraint accessories except Cosco accessories.
12. Check instructions for other warnings.

Parents are a child's first teachers and examples. If you always buckle your seat belt, your child will think it is the natural thing to do. Make it a firm rule that the vehicle does not go until everyone is buckled up. Make no exceptions.

Getting ready to use your Touriva™

Cosco recommends that you make the adjustments on this page before you put your child in the restraint and install it in the vehicle.

To Use Recline Stand:

4-A
Reclined Position
1. Press in on red button on side of seat.
2. Pull recline stand under.

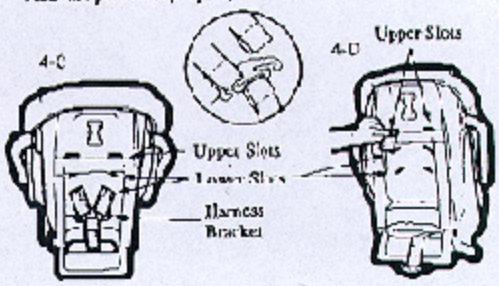
The restraint must be reclined for infants. It may also be reclined for toddlers.

4-B
Upright Position
Pull recline stand down and back until it locks in place.
The upright position is for toddlers only.

To Change Harness Location

The harness must be threaded through one of the two sets of lower slots for rear-facing infant use (under 20 pounds or 9 kg). For forward-facing toddler use (20-43 pounds or 9-19.5 kilograms), the harness MUST be threaded through the upper slots.

In the rear-facing infant position, the correct slots are whichever is closest the two lower slots is closer to your baby's shoulders. In the forward-facing toddler position, you MUST thread the harness through the top set of slots so that it goes over the reinforcement built into the shell. You must make these changes properly so the harness fits snugly around your child and the child restraint performs properly.

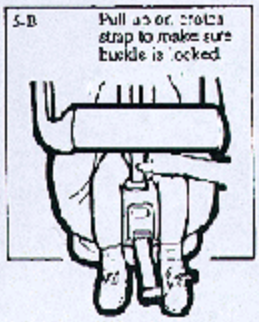


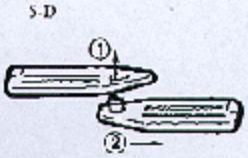
1. Remove both harness straps from the harness bracket (Figure 4-C and inset) and pull both straps through the slots from the front of the child restraint.
2. The slots you select must have plastic harness guides to allow the harness to be properly adjusted. From the back of the child restraint, squeeze the edges of the guides together and pop them out the front. Squeeze into the selected slots from the front.
3. Thread the harness straps through the selected slots from the front. (Figure 4-D). Make sure the harness is not twisted.
4. Refasten the harness straps to the harness bracket (see inset) so they look the same as in Fig. 4-C.

IF YOU DO NOT FOLLOW THESE INSTRUCTIONS COMPLETELY, YOUR CHILD MAY COME OUT OF THE RESTRAINT IN A CRASH, RESULTING IN SERIOUS INJURY OR DEATH.

Putting Your Child in the Restraint

1. Loosen harness by lifting up and holding release lever (Fig. 5-A) while pulling out on shoulder harness. Disconnect the harness retainer by pushing both sections together (see Fig. 5-D). Press red button on buckle to disconnect latch plate. (Fig. 5-A) Lift barrier and place harness straps over the top of the restraint.
2. Place the child in the restraint. Lower barrier while placing harness straps over the child's shoulders. (See picture on cover.) Be sure child's back and bottom are flat against the seat for more comfort and to allow the harness system to be tightened securely. Do not dress an infant in a sack sleeper or wrap an infant in a blanket before securing the harness system, or the harness may not hold the infant securely.
3. Lock latch plate into buckle (Fig. 5-B) until you hear a "click." Pull up on the crotch strap to make sure buckle is locked (Fig. 5-B).
4. To tighten harness, pull on end of harness in front of release lever (Fig. 5-C). The harness should be snug enough so that you can just slip one finger between the harness and the child.
5. To make sure harness is locked, pull out on shoulder harness. If you cannot get the harness to remain tight, do not use the child restraint.
6. Properly locate the harness retainer in a mid-chest position away from the child's neck. Fasten the two sides of the harness retainer together as shown in Fig. 5-D.





Connect sides and pull apart to secure. Reverse process to remove.

Shiel

FAILURE TO ADJUST AND FASTEN THE HARNESS SYSTEM CORRECTLY MAY ALLOW THE CHILD TO BE THROWN FROM THE RESTRAINT IN A CRASH, RESULTING IN SERIOUS INJURY OR DEATH.

Do you need a locking clip?

Before you put your child restraint in the vehicle, buckle the lap/shoulder belt. Pull on the lap belt portion. If it loosens or slips, you must either use a locking clip (Fig. 8-A) to hold the seat belt tight or move the child restraint to another seating location. NOTE: A locking clip will not fix ELR lap-only belts, automatic/passive belts, manual belts or belts that come out the door/side panel or middle of the seat cushion. See pages 6 & 7 for information. A locking clip is located on the top back of the child restraint.

To attach locking clip:
See pages 9 and 10 for complete installation instructions.

1. Thread both vehicle lap and shoulder belts through the proper openings on the child restraint and buckle. Pull up on the shoulder belt until all slack is out and the lap belt is tight. (See Fig. 8-B)
2. Grasp both vehicle belts together just behind the latch plate and unbuckle. (See Fig. 8-B) Note: If the latch plate ends up behind the car seat, grasp the belts to the outside of the car seat, as close to the latch plate as possible.
3. Thread both portions of the vehicle belt onto the locking clip. (See Fig. 8-C)
4. Rebuckle the belt. (See Fig. 8-D) The lap belt portion should be tight and hold the child restraint securely. If not, remove the locking clip and repeat all steps.

Failure to use a locking clip when needed will allow the child restraint to move out of position. If you cannot secure the child restraint tightly, move it to another seating location in the vehicle.

Order additional locking clips by sending a check or money order for $2.50 to Cosco Inc., 2525 State Street, Columbus, Indiana 47201 (in the U.S.). They may also be available from your local automotive dealer.

Fig. 8-A

Locking Clip

Latch plate

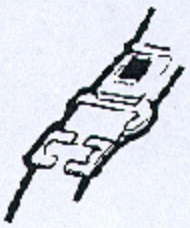
Fig. 8-B

1. Grasp belts here.

2. Pull up to tighten.

Fig. 8-C

Fig. 8-D



Special Features (some models)

The infant support insert is designed to help keep small infants more upright and comfortable. It fits behind your infant and can be removed for older infants and toddlers.

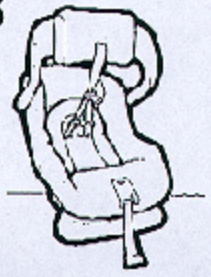
There are two kinds of inserts that come with different models of Cosco child restraints. To use insert, place it in the car seat as shown in Figures 3-A and 3-B. For the insert shown in 3-A, one with goes on each side of the infant with the U-shaped back support section facing up as shown. Do not use insert with U-shape facing down; the performance of the child restraint could be compromised.

Install insert 3-B as shown, making sure that the top end of insert is above the infant's head. Do not allow the infant's head to come over the top inside of the insert; if this happens, your infant is too large for the insert and you should discontinue its use. Make sure insert does not cover your infant's face in any way. When rethreading the harness, it must go through the slots in the insert as shown.

Remove insert for older children and store for future use. Inserts may be machine washed and dried.

3-A

3-B



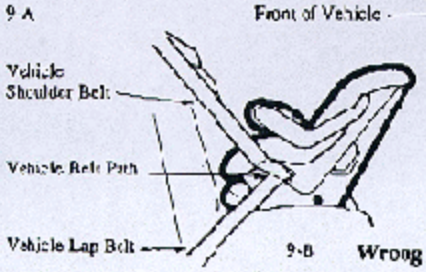
3-C

Some models have an Accu-Just™ shield that automatically pivots to fit your child (Fig. 3-C).

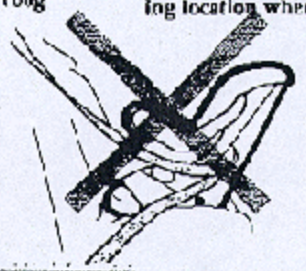
Infant Installation up to 20 pounds (9 kg)

This child restraint must always face the rear of the vehicle when used in the infant position. This allows the infant's stronger back to absorb any crash forces. Read general warnings on page 2 and seat belt compatibility information on pages 6-8 before installing this child restraint.

9 A



9-B **Wrong**



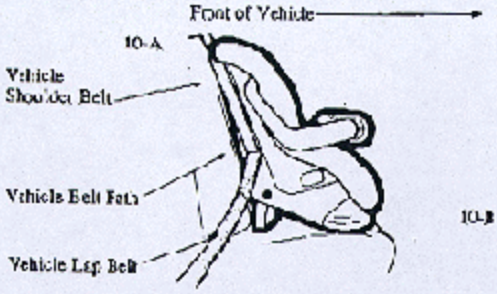
To Install:

1. Infants under 20 pounds (9 kg) must ride in the reclined position facing the rear of the vehicle (Fig 9-A.)
2. You must thread the shoulder harness properly through the correct set of lower slots. (See "To Change Harness Location", page 4).
3. Thread the vehicle lap belt through the front belt path, (Fig. 9-A.), either over or under the upholstery. If the vehicle lap and shoulder belts are attached, thread both through the belt path. Do not place vehicle belt over child's legs.
4. Buckle the vehicle belt and adjust as tightly as possible. Push down firmly on the child restraint while pulling up on the shoulder belt until the lap belt is tight.

Do not use the child restraint in any vehicle seat where the lap belt cannot be tightened securely and properly or where it can be loosened by pulling on it. (See Page 2 and 6-8). Do not use in the rear-facing position in any seating location with an air bag; move the child restraint to a seating location where it can be used rear-facing.

Toddler installation 20 to 43 pounds (9 to 19.5 kg)

In the forward-facing toddler position, the shoulder harness must be threaded through the upper slots. You must change the harness location before installing the seat in the vehicle. See "To Change Harness Location" on Page 4. Read general warnings on page 2 and seat belt compatibility information on pages 6-8 before installing this child restraint.



10-B

To Install:

1. Toddlers who weigh 20-43 pounds (9-19.5 kg) and are less than 42 inches (107 cm) tall ride facing the front of the vehicle (Fig 10-A.) in either the upright or the reclined position. To change positions, see Page 4.
2. Thread the vehicle lap belt through the rear belt path as shown in Fig. 10-A. If the lap and shoulder belts are attached, pass both through the belt path.
3. Buckle the vehicle belt and adjust as tightly as possible. Push down firmly on the child restraint while pulling up on the shoulder belt until the lap belt is tight.
4. Place your infant in the child restraint. Adjust and secure the harness system as described in "Putting Your Child in the Restraint" on page 7.

Do not use the child restraint in any vehicle seat where the lap belt cannot be tightened securely and properly or where it can be loosened by pulling on it. (See Pages 2 and 6-8).

WRONG