CRASH DATA RESEARCH CENTER

Calspan Corporation Buffalo, NY 14225

NOT-IN-TRAFFIC SURVEILLANCE

CALSPAN REMOTE HYPERTHERMIA DEATH INVESTIGATION SCI CASE NO: CA09045

VEHICLE: 1995 ISUZU RODEO

LOCATION: KENTUCKY

INCIDENT DATE: JUNE 2009

Contract No. DTNH22-07-C-00043

Prepared for:

U.S. Department of Transportation National Highway Traffic Safety Administration Washington, D.C. 20590

DISCLAIMER

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no responsibility for the contents or use thereof.

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 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.

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. CA09045	2. Government Accession No.	3. Recipient's Cata	log No.	
4. Title and Subtitle Not-In-Traffic Surveillance Calspan Remote Hyperthern	5. Report Date: February 2010			
Vehicle: 1995 Isuzu Rodeo Location: Kentucky		6. Performing Orgo	6. Performing Organization Code	
7. <i>Author(s)</i> Crash Data Research Center		8. Performing Organization Report No.		
9. Performing Organization Na Crash Data Research Center	me and Address	10. Work Unit No.		
Calspan Corporation P.O. Box 400 Buffalo, New York 14225	11. Contract or Grant No. DTNH22-07-C-00043			
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration		13. Type of Report and Period Covered Technical Report Incident Date: June 2009		
Washington, D.C. 20590		14. Sponsoring Age	14. Sponsoring Agency Code	
15. Supplementary Note This remote investigation focused on the circumstances surrounding the death of a 2-year-old female who was left unattended in a 1995 Isuzu Rodeo.				
16. Abstract This remote investigation focused on the circumstances surrounding the death of a 2-year-old female who was left unattended in a 1995 Isuzu Rodeo. The child was restrained within an unknown-type Child Restraint System (CRS) in the second row of the vehicle over a two-hour time period during the afternoon in June, 2009. The child was found inside the vehicle by a family member and was unresponsive at that time. She was transported by ground ambulance to a pediatric trauma center and pronounced deceased due to hyperthermia/heat exposure.				
17. Key Words		18. Distribution Sta	atement	
Not-In-Traffic Surveillance	Hyperthermia Death	General Public	22 Duine	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 14	22. Price	

TABLE OF CONTENTS

BACKGROUND	.1
SUMMARY	.1
VEHICLE DATA	.1
CHILD OCCUPANT DATA	. 2
INCIDENT SITE	. 2
INCIDENT SEQUENCE	. 2
PRF-INCIDENT	2
Incident	3
Post-Incident	3
INCIDENT SITE SCHEMATIC	. J
ATTACHMENT A. NITS Forms	+
	•••

NOT-IN-TRAFFIC SURVEILLANCE CALSPAN REMOTE HYPERTHERMIA INVESTIGATION SCI CASE NO: CA09045

VEHICLE: 1995 ISUZU RODEO LOCATION: KENTUCKY INCIDENT DATE: JUNE, 2009

BACKGROUND

This remote investigation focused on the circumstances surrounding the death of a 2-yearold female who was left unattended in a 1995 Isuzu Rodeo. **Figure 1** is an image of an exemplar Isuzu Rodeo. The child was restrained within an unknown-type Child Restraint System (CRS) in the second row of the vehicle over a two-hour time period during the afternoon hours in June, 2009. The child was found inside the vehicle by a family member and was unresponsive at that time. She was transported by ground ambulance to a pediatric trauma



Figure 1: Left side view of an exemplar 1995 Isuzu Rodeo.

center and pronounced deceased due to hyperthermia/heat exposure.

This hyperthermia-related fatality was identified by the Crash Investigation Division (CID) of the National Highway Traffic Safety Administration (NHTSA) through an internet news search and the notification was forwarded to the Calspan Special Crash Investigations (SCI) team on June 22, 2009. Calspan SCI initiated follow-up activities and established cooperation with the investigating police agency on July 2, 2009. The CID subsequently assigned a remote level investigation of the incident to the Calspan SCI team on the same day due to the agency's interest in Not-In-Traffic fatalities. The remote investigation involved two telephone interviews with the police investigator. Limited details regarding the incident were available due to the on-going criminal proceedings. SCI's request for a copy of the police report and supporting images was declined by the investigator.

SUMMARY

Vehicle Data

The 1995 Isuzu Rodeo 4-door sport utility vehicle was manufactured on a 276 cm (108.7 in) wheelbase and was equipped with the LS trim package. The Vehicle Identification Number (VIN) was 4S2CK58V0S4 (production sequence deleted). The Isuzu Rodeo was designed as a 5-passenger vehicle with front bucket seats and a rear bench seat. Tinted window glazing was standard equipment. The Isuzu was not owned by the driver, but had been in his possession for approximately 1 year. The vehicle was owned by another family member and had been loaned to the driver.

Child Occupant Data

The deceased child was a 2-year-old female with a reported height and weight of 91 cm (36 in) and 13 kg (29 lb). She was dressed in a multi-color, long sleeve pullover that went to the knees. Upon arrival in the Emergency Department, her internal temperature measured rectally was 42.2 degrees Celsius (107.7 degrees Fahrenheit). No external injuries were noted after examination. The cause of death was ruled Hyperthermia/Heat Exposure.

Incident Site

This incident occurred during the afternoon hours of June, 2009. On the day of incident, the weather almanac reported that the sky was clear and the afternoon temperature ranged from 29 degrees Celsius (84 degrees Fahrenheit) at 1200 hours to a high temperature of 31 degrees Celsius (89 degrees Fahrenheit) at 1654 hours. The average wind speed was 16 km (10 mph) from the northwest.

Research conducted by General Motors and other independent sources indicated that the interior temperature of a parked vehicle generally rises approximately 4 degrees Celsius (40 degrees Fahrenheit) above the ambient temperature over a two hour period. During testing, this temperature differential was observed to occur regardless of the ambient test temperature. Based on the average temperature of the incident day, the interior temperature of the vehicle likely rose to an estimated 51 degrees Celsius (125 degrees Fahrenheit).

The incident occurred on a one-way, two-lane street outside the residence of the driver. The residence was located mid-block in an urban/residence setting. The street was oriented in a northeast/southwest direction. The one-way traffic flow was southwest in direction. Single family homes were located on the south roadside. The Isuzu rodeo was parked along the left curb outside the family's home. **Figure 2** is an aerial view of the incident site.



Figure 2: Aerial view of the incident site.

Incident Sequence

Pre-Incident

On the day of the incident, the 2-year-old female child and seven additional children were under the care of the grandparents. The police investigator indicated that the grandparents and children had just returned from a family outing at a local park. During the 10 minute trip from the park to the residence, the Isuzu was occupied by two adults in the front row, four children, inclusive of the 2-year-old child, in row 2 and four children in the cargo area. The 2-year-old child was restrained within a CRS in the row 2 center position. It was believed that the child was placed in the CRS by one of the older children or climbed into the seat herself. The grandparents did not place the child in the CRS. The driver/grandfather drove the Isuzu from the park to the family's home to and parked the Isuzu outside the residence on the road side. The vehicle was parked in full sun on the left side of a two-lane, one-way road. The driver/grandfather reported that he typically parked the vehicle in the driveway.

Incident

Upon their return from the outing, the adults exited the vehicle and entered the dwelling with one of the older children to attend to a personal problem. The adults were under the impression that one of the other children would assist the 2-year-old child from the vehicle. Reportedly, the other children exited the vehicle to play leaving the 2-year-old child unattended.

A short time after the family's return from the park, another adult relative arrived at the residence. The grandparents of the child (the driver and front right passenger of the Isuzu) left the property in another vehicle in order run some errands. When the grandparents returned to the residence, they discovered that the 2-year-old child was missing.

Post-Incident

Approximately 2-1/2 hours had elapsed from the time the family had initially returned from the park until her discovery within the Isuzu. She was still restrained within the CSS and was unresponsive. The police were alerted of the incident via the 9-1-1 emergency system. The police arrived on scene within 4 minutes of the call and initiated Cardio-Pulmonary Resuscitation (CPR) until the arrival of Emergency Medical Services (EMS). The child was transported by ground ambulance to a pediatric trauma center and pronounced deceased 31 minutes after the 9-1-1 call. The cause of death was listed as hyperthermia/heat exposure. The child internal rectal temperature was 42.2 degrees Celsius (107.7 degrees Fahrenheit). An interior temperature measurement of the vehicle was not recorded, as the vehicle had vented with open doors for an unknown period of time.



Figure 3: Incident Site Schematic.

ATTACHMENT A:

NITS Forms

Not Applicable	
U.S. Department of Transportation National Highway Traffic Safety Administration SCENE	FORM Special Crash Investigations Not In Traffic Surveillance
1. Case NumberA09045_	 SCENE INFORMATION 7. Type of area in which crash occurred (Select all that apply) Single family residential Bay beyong they be
IDENTIFICATION 2. Date of Crash 0 6 / X X 0 9	Multi family housing Commercial Industrial Rural Unknown
3. Time of Crash 9 9 9 9 Code reported military time of crash.	8. Driver exterior sightline obstructions (Select all that apply)
NOTE: Midnight = 2400 Unknown = 9999	None Utility poles Other vehicles Signs Building Glare Trees Unknown
AMBIENT CONDITIONS 4. Light Conditions	Shrubbery •No driver present Other (specify) 9. Crash location
 Daylight Dark Dark but lighted Dawn Dusk Unknown 	Driveway Road / street Parking Lot Sidewalk Other (specify) Alley Intersection of driveway and sidewalk
5. Atmospheric Conditions (Select all that apply)	10. Non motorist sightline obstructions (Select all that apply)
 Clear-No adverse conditions Cloudy Rain Snow Fog, Smog, Smoke Sleet, Hail (freezing rain or drizzle) Blowing Snow Severe Crosswinds Blowing Sand, Soil, Dirt Other (specify): Unknown 	 None Other vehicles Building Trees Shrubbery Utility poles Signs Glare Other (specify) No driver present Unknown + / - 11. Grade at parked position 9 9 9 9 %
6. Temperature	12. Estimated distance from parked position to impact
 Below 0 degrees Celsius (Below 32 F) 1-10 degrees Celsius (33-50 F) >10-24 degrees Celsius (51-75 F) Over 24 degrees Celsius (Over 75 F) Unknown 	<u>0</u> 0 0 0 m 13. Estimated speed at impact <u>0</u> 0 kmph +/- 14. Grade at impact <u>9</u> 9 9 % 15. Estimated distance from impact to vehicle final rest <u>0</u> 0 0 m
	Unknown = 999 Reference items 11,12, 13, 14, 15

1. Case Number _____ ____ ____

VEHICLE IDENTIFICATION

- 3. Model Year ____ ___ ___
- 4. Vehicle Make (specify):
- 5. Vehicle Model (specify):

GLAZING						
Location	Presence (check)	Status (select)	Clarity (select)	Tint (check)	Glazing Obstructions (specify if present)	
Windshield		Fixed / Closed / Open / Partially Open / Unknown	Clear / Hazy / Very Dirty / Unknown			
LF		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty			
RF		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty			
2 nd Left		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty			
2 nd Right		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty			
3 rd Left		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty			
3 rd Right		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty			
Backlight		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty			
Left Backlight		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty			
Right Backlight		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty			
Roof		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty			
Other (specify)		Fixed / Closed / Open / Partially Open	Clear / Hazy / Very Dirty			
TIRE DATA						
6. Vehicle Manufacturer Recommended Tire Size						
7. LF Tire	7. LF Tire Size 9. RF Tire Size					
8. LR Tire Size 10. RR Tire Size						

Special Crash Investigations – Not In Traffic Surveillance: Vehicle Form Page						
	Seats / Head Restraint Data					
Seat Position	Seat Type (Select from below)	Head Restraint (Check if available)	Head Restraint Adjustment (select)	NOTES:		
Front Left	1		Full Down / Mid / Full Up	Vehicle was not inspected; Vehicle images were not		
Front Middle	0		Full Down / Mid / Full Up	available. Head restraint data was		
Front Right	1		Full Down / Mid / Full Up	unknown.		
2 nd Left	4		Full Down / Mid / Full Up			
2 nd Middle	4		Full Down / Mid / Full Up			
2 nd Right	4		Full Down / Mid / Full Up			

Seat Type codes:

2nd Right

3rd Left

3rd Middle

3rd Right

- 0 = No seat or seat folded down
- 1 = Bucket
- 2 = Bucket w/ folding back
- 3 = Bench
- 4 = Bench with folding back cushions
 5 = Bench w/ folding back

4

0

0

0

- 6 = Split bench w/ separate back cushions
- 7 = Split bench w/ separate folding back

VEHICLE MEASUREMENTS

Clearance Heights		Measurements (all from ground, and in centimeters	NOTES
Beltlin	e	n/a	
Top o	f trunk/tailgate	n/a	
Bottor	n of bumper	n/a	
Traile	hitch (if applicable)	n/a	
Under	carriage		
	Sway bar	n/a	
	Axle	n/a	
	Differential	n/a	
	Other (specify):	n/a	
Senso	or Height (if equipped)	n/a	
Came	ra Height (if equipped)	n/a	

8 = Pedestal (i.e. column supported)

- 9 = Box mounted (i.e. van type)
- 10= Other seat type (specify)

Full Down / Mid / Full Up

Full Down / Mid / Full Up

Full Down / Mid / Full Up

99= Unknown seat type

Not Applicable	
National Highway Traffic Safety Administration Back Up / F	Parking Aid Form Special Crash Investigations Not In Traffic Surveillance
1. Case Number	 Video image quality under scene lighting conditions
PARKING AID PRESENCE	└─INone present └─IGood
2. Type of backing/parking aid present	Average Poor (specify): Unknown
☐OEM camera ☐OEM ultrasonic/radar sensor ☐OEM combination camera-ultrasonic/radar	8. Was the camera functioning properly
sensor OEM Fresnel lens OEM interior mirrors Aftermarket camera Aftermarket ultrasonic/radar sensor Aftermarket combination camera-ultrasonic radar sensor Aftermarket Fresnel lens Aftermarket interior mirrors Other (specify):	 None present Yes No, poor image quality due to glare No, poor image quality due to atmospheric conditions No, camera turned off No, camera inoperable Unknown ULTRASONIC/RADAR SENSOR Specify object detection range on diagram
CAMERA INFORMATION	
Specify field of view measurements on diagram	9. System make/model
3. System make/model 4. ride conforty: Capital Appr Dome present LCD (color) CRT (black & white) Unknown	10. Auditory warning illumination No senser present Description (Select all that apply)
 5. Video display size cm (<i>Diagonal</i>) 6. Camera location 	No sensor present Left bumper Center bumper Right bumper
 None present Bumper License plate Tailgate/Hatch/Trunk Other (specify):	 Argint bumper License plate area Tailgate/Hatch/Trunk 13. Was warning system functioning properly
	 No sensor present Yes, system alerted driver No, system did not alert driver No, system turned off No, system inoperable Unknown

Special Crash Investigations – Not In Traffic Surveill	lance: Back Up / Parking Aid Form Page 2
14. Did driver react to warning	
 No sensor present Yes No Unknown Sensor present, did not sound 	
15. Did driver report common false warnings	
☐ No sensor present ☐ Yes ☐ No ☐ Unknown	
Not App	blicable

No Driver Present	
Undo Not Applicable	
U.S. Department of Transportation DRIVER I National Highway Traffic Safety Administration	FORM Special Crash Investigations Not In Traffic Surveillance
1. Case Number	10. Driver entry interruption (Select all that apply)
DRIVER PROFILE 2. Driver's Age	 Direct trip from building to vehicle Loaded items into vehicle Spoke with family Spoke with neighbors Spoke with contacted nonmotorist Return trip (backing into driveway/lot) Other (specify): N/A Unknown 11. Purpose of backing
999 = Unknown kg 5. Driver's Weight kg 999 = Unknown	Leaving parking space in parking lot Backing onto roadway from driveway Entering parking space in parking lot Backing into driveway from roadway
6. Driver eyewear worn (Select all that apply) None Eyeglasses Sunglasses Contacts Unknown	Other (specify): N/A Unknown 12. Where was driver going Description:
7. Driver vision deficiency condition (Select all that apply) Nore Nea sighted Fan lighted St m lism Our (Lecific) Unknown	13. Friver in a hurry DEPECTION OF THE CONTROL OF T
 8. Non motorist's relationship to driver No relationship Child Grandchild Sibling Neighbor Friend Other (specify):	after vehicle entry (Select all that apply) Did not look Checked mirrors Turned right and looked back Turned left and looked back Viewed Camera Listened for auditory/visual warning from system
 9. Driver approach to vehicle for entry From left front From left From left rear From right rear From right front 	 15. Estimated time between vehicle entry and start of backing
Return trip (backing into driveway/lot) Other (specify): N/A Unknown	 □ 0-10 Seconds □ 11-30 Seconds □ 31-60 Seconds □ Unknown

Special Crash Investigations – Not In Traffic Surveillance: Driver Form 19. Did driver see struck non motorist prior to impact 16. What direction was the driver looking during (Select all that apply) backing maneuver (Select all that apply) No. never saw non motorist Straight ahead Saw non motorist prior to entering vehicle Saw non motorist after entering vehicle Right Other (specify): Left Unknown ٦N/A Rearward At object inside the car 20. Est time between start of backing and impact At mirrors Other (specify): \square <2 or = 1 second N/A 2-5 seconds Unknown 6-10 seconds 17. Was the driver distracted during back up $\square > 10$ seconds maneuver 🗆 N/A Unknown (Select all that apply) 21. Driver interior sightline obstructions No non-driving activities (Select all that apply) External Looking at other vehicles Other occupant Pillar Looking at other non motorist Other (specify) 7 Headrest Looking at intended turn destination Unknown Cargo External focus, not specified □ None Other external focus (specify): 22. Recent experience driving this vehicle Internal Looking at other occupant More than 10 times the last three months Talking to passenger 7 6-10 times the last three months 7 2-5 times the last three months Dialing phone Less than 2 times the last three ronths Taking on phone d sti g rac p/c player Lishning avba First tip ve stl. g clip ate controls Ind Using a conce/controls integral auencv (specify): 1 Daily Reading/adjusting navigation system 1 Weekly Eating or drinking Several times a month Smoking related Monthly Retrieving fallen object 7 Rarely (specify): First time in lot/driveway Internal focus, not specified Unknown N/A Focused on other internal object (specify): 24. Driver Impairment]N/A (Select all that apply) Unknown 18. Driver avoidance actions prior to impact No drugs or alcohol present (Select all that apply) Alcohol present (specify BAC):] Drugs present (specify): None None Unknown] Braking **7** Steering left 25. Source of alcohol/drug results Steering right Accelerating Police reported Other (specify): ☐ Medical record 🗖 N/A Other (specify)

> Not Tested Unknown if tested

Unknown

Page 2

Not Applicable Non Mo	otorist
National Highway Traffic Safety Administration For	M Special Crash Investigations Not In Traffic Surveillance
Not Applicable Non Mo National Highway Traffic Safety Administration Form 1. Case Number	m Special Crash Investigations Not In Traffic Surveillance 11. Non-motorist motion Not moving Walking slowly Walking rapidly Running or jogging Skipping/Hopping/Jumping Falling/Stumbling/Rising On skates/skateboard On bike/scooter Other (specify): in a CRS Unknown Unknown 12. Non-motorist approach relative to rear of vehicle Stationary From left From left From left From left From left From left Prom left Torm deved pace Ran away (along vehicle path) Jumped Turned away from vehicle Other (specify): N/A
Image: Constant of the sted sector of the sted sector of the sted sector of the sted sector of the stead sector of the stead sector of the stead sector of the stead sector of the s	 Alone One adult present One other child present Multiple adults present Multiple children present Unknown

Sp	becial Crash Inve	stigations – Not In Traffic	C Surveillance: Non-N	lotorist Form	Page 2		
	NON MOTORIST CLOTHING						
N	 NOTES: Specify Color, Fabric and Texture/Weight for outermost layer only Indicate "NONE" if applicable Available codes: 						
	<u>Color</u> Black Lt gray/silver Gold/tan Dark blue Dark green Maroon Orange White Pink	Charcoal gray Brown Purple Light blue Light green Red Yellow Other (specify)	<u>Fabrics</u> Natural Synthetic Blend	<u>Textures</u> Soft Slick Coarse	<u>Weights</u> Heavy Medium Light		
	Clothing	Color	Fabric	Texture	Weight		
н	Hat	Unknown					
E A	Helmet	Unknown					
D W	Hood	Unknown					
EA	Other (specify):	Unknown					
R	Unknown						
U	Short Sleeve	Unknown					
P P	Long Sleeve	Other: Multi-color					
E R	Light Jacket	Unknown			Å.		
в	Heavy Jacket	Unknown					
	Other (Specify):	Unknown					
T	Unknown						
L O	Shorts	Unknown					
W E	Pants	Unknown		-			
R	Shoes	Unknown					
BOD	Other (specify):	Unknown					
Y	Unknown						

. .

- -