

Vehicle Rescue in the New Millennium

VOLUME 09-1 Approx. length: 44:49

Lesson 1 Approx. length: 12:31

New Car Technology

 What Works and What Doesn't: Cutting Tool Usage

 Plan A – Plan B – Plan C

Collision Forces – Laws of Physics

 Newton's Laws of Motion

 The Effects of Rebounding and the related movement of objects

Lesson 2 Approx. length: 10:44

New Vehicle Design

 Substandard Imports

Design Evolution:

 the 80s

 the 90s

 the 2000s

Vehicle Crashworthiness Comparisons noting changes in vehicle constructions and air bag design

 2003 Honda Accord vs. 1995 Chevrolet Cavalier

 2000 Subaru Legacy vs. 1995 Mitsubishi Galant

 1999 Mitsubishi Galant vs. 1995 Mitsubishi Galant

 1996 Toyota Previa vs. 1998 Toyota Sienna LE

 1997 Pontiac Trans Sport vs. 1998 Toyota Sienna LE

 2002 Honda CR-V

 2001 Hyundai Santa Fe vs. 1998 Isuzu Amigo

 2001 Toyota Tundra vs. 2001 Ford F-150

 Toyota Camry vs. Toyota Yaris

 Mercedes Smart Car

 Mercedes Smart Car vs. a small truck

Impact of Automobile Manufacturers on Government Crashworthiness Standards

Lesson 3 Approx. length: 8:26

Evolution of Federal Motor Vehicle Safety Standards (FMVSS):

 1991 – 2010

Structural Design Changes:

 Roof Rollover

 Reinforcement of the A and B Posts: stronger but more difficult

 Side Impact

 No side collapse zones

 Unibody Construction

Body-over-Frame (Unibody) Construction

- Impact Crush Zones
- Round Reinforcement Construction
- High-Strength Steel and New Structural Component Construction
- Review of Cutting Tool Design
 - How structural design changes affect cutting tools
 - Implications for tool usage and performance

Lesson 4 Approx. length: 13:08

- Construction Materials of Heavy Vehicles
 - School Buses
 - Motor Homes
- Generational Review of Steel Strengths

Kramer vs. Kramer Approx. Length: 2:10

- Vehicle construction/materials

VOLUME 09-2 Approx. length: 44:43

Lesson 1 Approx. length: 12:55

- Vehicle Construction Materials
 - Steel
 - Aluminium
 - Magnesium
 - Composite
 - Carbon fiber
 - Carbon fiber/Kevlar
 - Foam
 - Acoustic
 - Structural
 - Toxic components
 - Glass
 - Laminated
 - Tempered
 - Breaking glass techniques
 - Polycarbonate
 - Bullet-Proof

Lesson 2 Approx. length: 11:29

- Hazards Facing Responders
 - Airbags/Restraints
 - Smart air bags
 - Back seat/console air bags

- Rear headrest air bags
- Under-hood/frontal air bags
- Motorcycle air bags
- Dual-Stage air bags
- Air Bag misconceptions and myths

Lesson 3 Approx. length: 8:00
Hazards Facing Responders (cont.)

- High Voltage
- Hybrids
 - Micro
 - Mild
 - Full
 - Series/Range Extender
 - Dual Mode
 - Plug In
 - Full Electric

Lesson 4 Approx. length: 12:19
Hazards Facing Responders (cont.)

- High Voltage (cont.)
 - Batteries
 - Nickel Metal Hydride (NiMH)
 - Lithium Ion
 - Smart Keys
 - High Voltage Systems
 - Power in windshields
 - Electrocution discussion

Kramer vs. Kramer Approx. length: 2:07
Air Bag Hazards

VOLUME 09-3 Approx. length: 54:11

Lesson 1 Approx. length: 12:09
Hazards Facing Responders (cont.)

- High Voltage System (cont.)
 - Capacitors
 - Safety/Service Disconnects
 - Vehicle (Mis)identification
 - Shutdown/Disable Procedures
- High Pressure
 - Air bag inflator canisters

- Alternative fuel vehicle venting (CNG, LNG, Hydrogen)
- Compressed gas cylinders (shocks for hoods, trunks, bumpers)
- Flammable/Combustibles
 - Gas
 - Diesel
 - Ethanol
 - Compressed Natural Gas (CNG)
 - Liquified Natural Gas (LNG)
 - Hydrogen
- Fluids
- Hazardous Materials
 - Importance of PPV and SCBA
 - Importance of cleaning PPV and SCBA
 - Dangers of Benzene

Lesson 2 Approx. length: 13:09

Responder Awareness

Response

- Dangers to volunteer responders traveling to or leaving scenes
- Dangers to career and volunteer responders from fireground operations
- Emergency vehicle driving awareness and avoiding distractions
- High-visibility vests and classes of safety garments
- Driver inattention causing crashes at emergency scenes.

Lesson 3 Approx. length: 13:51

Responder Awareness (cont.)

Scene Management

- Mutually understood lane designations
- Lane Numbering
- Inside/Outside
- Left/Right
- Upstream/Downstream from incident

Accident zone set-up

- Proper emergency vehicle positioning and lane usage
- Conflicting emergency apparatus signals
- Flagger qualifications, hand signals, flagging operations
- Directing Traffic
- Close Calls

Command Management

- Communications
- Cooperation
- Coordination

Lesson 4 Approx. length: 15:10

Responder Awareness (cont.)

General Hazards

Leaks and Spills

Environmental clean-up resources

Electrical

Contacting the power company

Overhead wires (include in 3-dimensional size-up)

Vehicle Data Recording

New Safety Technologies

Identifying car designs as related to hazards encountered in response

Universal shut-down procedures

Kramer vs. Kramer Approx. length: 2:16

Highway Rescue Scene Management

Topics covered in 09-4, 09-5, and 09-6

VOLUME 09-4 Approx. length: 53:53

Lesson 1 Approx. length: 19:17

Invisible Injuries

Incident Management: Who's in charge?

Lesson 2 Approx. length: 9:19

Operations

Size-up

Dispatch, Approach, Arrival, On-Scene, Individual Vehicle

Stabilization

Lesson 3 Approx. length: 9:13

Operations (cont.)

Stabilization (cont.)

Lifting Air Bags

Basic Extrication

Stabilization

Lesson 4 Approx. length: 10:00

Basic Extrication (cont.)

Stabilization (cont.)

Lock-out/Tag-out

Electrical Shutdown

Batteries

Alternative Fuels

Natural gas (CNG, LNG)
Propane (LPG)

Kramer vs. Kramer Approx. Length: 2:04
Who's in Charge?

VOLUME 09-5 Approx. length: 50:46

Lesson 1 Approx. length : 10:10

Alternative Fuels (cont.)

 Ethanol (FFE, E-85)

 Electric

 Hydrogen

 Vehicle Fires: gasoline vs. hydrogen

 Biodiesel

Lesson 2 Approx. length: 11:31

 Patient Protection

 Extrication

 Plan A - Plan B - Plan C

 Vehicle Access

 Front

 Side

 Top

 Rear

 Floor

 Hood

 Breaking Glass

 Windshield

 Vehicle Air Bags Covers

Lesson 3 Approx. length: 14:16

 Extrication (cont.)

 Lifting the steering column

 Brake Pedal Tricks

 Door Tricks

 Tool use vs. task at hand

Lesson 4 Approx. length: 8:37

 Extrication (cont.)

 Door Hinges

 Hood Removal Trick

 B Post

 Alternative Door Designs

 Sidewall Removal

Both doors/one unit
"Noah's Ark"
3rd Door

Kramer vs. Kramer: Approx. length: 2:12
Dealing with Alternative Fuels

VOLUME 09-6 Approx. length: 46:08

Lesson 1 Approx. length: 10:00

Extrication (cont.)

Roof

Flapping the roof

Cutting the roof

Roof Cylinders

Cutting blade suggestion

Patient removal suggestions

Hydroform cutting tricks

Rear

Trunk opening tricks

Trunk Tunneling

Floor

Lesson 2 Approx. length: 10:16

Extrication (cont.)

Dash: lift it or roll it?

Releasing trapped feet

Proper use of hydraulic tools

Lesson 3 Approx. length: 12:21

Extrication (cont.)

Special Hazards

Increased cutting forces

Broken Blades

Uncuttable steel

Hidden injuries

Scene Safety

PPE requirements

Toxic bunker gear

Wear protective vests

Mayday signal

Golden Hour/Platinum 10 minutes

Arriving safely on-scene

Large vehicles

Truck classification

Heavy vehicles and machinery
Trailer/Van construction & weights
Bus propulsion designations
Motor Homes/Trailers

Lesson 4 Approx. length: 7:24
Heavy vehicles and machinery (cont.)

Hazards

Fuels

Gasoline

Diesel

Natural Gas

Propane

Hydrogen

Pneumatic

Air Brakes

Hydraulic

Braking/Acceleration

Electric

High Voltage Components

Safe Scene

Safe work zone

Assessment: 360

Victim: reassure, establish communications

Safety Factors

Traffic

Haz-Mat Response

Emergency Response Guide

Haz-Mat Control

Kramer vs. Kramer: Approx. length: 2:16
Turnout Gear Cleanliness

VOLUME 09-7 Approx. length: 1:09:13

Lesson 1 Approx. length: 10:57

Large Vehicle Response

Large Vehicle Fires

Tanker Fires

Large Vehicles – Vehicle Extrication

Techniques

Heavy Wreckers

Wrecker Recovery Equipment

Rigging Solutions

Lesson 2 Approx. length: 8:43

Large Vehicle Response (cont.)

- Lifting Air Bags
- Multiple Wreckers
- Stabilizing
- Seat Belts
- Weight Shift

Scene Cleanup

- Containing the Contaminants
- Cargo & Personal Items
- Open Roadway

Lesson 3 Approx. length: 10:22

Magnesium Fires

- Purpose
- Preparation
- Agents to be Tested
- Testing Evolutions
- Baseline Characteristics
- Result

Lesson 4 Approx. length: 12:01

Magnesium Fires (cont.)

- Testing Evolutions (cont.)
- Evolution:
 - Class ABC: Monoammonium Phosphate
- Result
- Evolution:
 - Class BC Powder: Sodium Bicarbonate
- Result
- Evolution:
 - Class BC: Carbon Dioxide (CO₂)
- Result
- Evolution:
 - Class A (with water) BC: Halon
(Bromotrifluoromethane)
- Result

Lesson 5 Approx. length: 12:35

Magnesium Fires (cont.)

- Testing Evolutions (cont.)

Evolution:

Class BC Powder: Potassium Bicarbonate (“Purple K”)

Result

Evolution:

Class B: A-FFF (Aqueous Film-Forming Foam)

6% concentration

Result

Evolution:

Sand, wet

Result

Evolution:

Sand, dry

Result

Evolution:

Earth/Dirt

Result

Evolution:

Class D Powder: Sodium Chloride (“Met-L-X”)

Result

Evolution:

Sodium Chloride/Table Salt

Result

Lesson 6 Approx. length: 11:35

Magnesium Fires (cont.)

Testing Evolutions (cont.)

Evolution:

Water, small quantity

Result

Evolution:

Water, large quantity

Result

Recap & Analysis

Failures

Successes

Resources

Preplanning

VOLUME 09-8 Approx. length: 1:08:14

Lesson 1 Approx. length: 2:17

Evaluation of Vehicle Construction

Lesson 2 Approx. length: 2:21

Flammable Liquid Spill Response

Lesson 3 Approx. length: 2:24
Quick Vehicle Access

Lesson 4 Approx. length: 3:18
Trunk Entry Through Taillight

Lesson 5 Approx. length: 3:11
Trunk Tunneling

Lesson 6 Approx. length: 1:55
Flapping the Roof

Lesson 7 Approx. length: :29
Brake Pedal Maneuver

Lesson 8 Approx. length: 3:28
Side Wall Removal with Vertical Crush

Lesson 9 Approx. length: 6:59
Lifting or Rolling the Dash

Lesson 10 Approx. length: 3:46
Lifting the Dash without Cuts

Lesson 11 Approx. length: 3:50
Lifting the Steering Column
& Dash Lift Without Cuts

Lesson 12 Approx. length: 8:10
Mini-van Access

Lesson 13 Approx. length: 7:53
Mini-van Access:
Dash Lift from the Outside

Lesson 14 Approx. length: 6:32
Cutting Through the Floor

Lesson 15 Approx. length: 7:13
Bend Vehicle in Half

Lesson 16 Approx. length: 1:28
Summary