

Nevada BLM Fire & Aviation-Driver Training



*Developed February 2007
Updated April 2007*

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Nevada State Office
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Reno, Nevada 89520-0006
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In Reply refer To:
9210 (NV-913)

April 5, 2007

To: Fire Management Officers
From: Chief, Office of Fire and Aviation
Subject: 2007 Fire Equipment Driver Training

This memo confirms the 2007 Fire Equipment Driver training class will be required for all regular drivers of specialty equipment.

Definitions:

Specialty Fire equipment includes fire engines, water tenders, helicopter support vehicles, and crew carriers.

Regular Driver: A driver whose duties include driving fire equipment on a regular basis. This may include highway, off-road, city, mobile attack and extreme terrain driving.

Training Class:

The training class for 2007 was developed by a Nevada Group of AFMO/FOS/EML, is 16 hours in length, and includes both classroom and actual on-road and off-road driving. Your Field Office will soon be contacted to provide logistical support for this class (classroom, area to drive vehicles, etc...). Course instruction will occur from 0800-1700 each day.

Training Dates:

Carson City	April 23-24, 2007
Winnemucca	April 25-26, 2007
Battle Mountain	April 27-28, 2007
Elko	April 29-30, 2007
Ely	May 1-2, 2007
Las Vegas	May TBD, 2007

A Nevada Cadre will travel around the state providing the training for each Field Office. Instructor packages will be left at each Field Office so that employees that missed the sessions may complete the training. We encourage the local office to have as many regular drivers as possible attend during the listed training dates. If an office has employees that will miss the scheduled date at their Field Office, please feel free to coordinate instruction with an adjoining office.

Please document completion of this training and record in all training folders. All Field Offices have been issued “**STOP**” safety stickers for your fire equipment and the definitions of these stickers will be reviewed during the classroom portion of the driver training. Please ensure **all of your fire vehicles** have at least one of these stickers mounted in a highly visible location prior to fire season.

Time Frames:

The National Office will conduct a preparedness review for Nevada, June 11 through June 22, 2007. During this preparedness review, the team has been requested to spot check compliance of this driver training requirement.

For Field offices that need to bring in employees on their day off to attend this training, the Nevada State Office will, upon request, provide a charge code to the Field Office.

If you have any questions concerning this Driver Training requirement or the training sessions, please contact Bob Knutson, Deputy State Fire Management Officer/Operations at (775) 861-6507.

Signed by:
Rex McKnight, Chief
Office of Fire and Aviation

Authenticated by:
Cindy Savoie,
Program Analyst

Preface

This Driver Training Course is a 16-hour course designed to ensure the student possesses the prerequisite knowledge and skills necessary to perform the task of vehicle operator for pickups, sports utility vehicles, and specialized equipment such as engines, water tenders, and crew carriers.

The course is divided into 3 separate modules; Module 1 (4 hrs) covers BLM driving policy, attitudes and perceptions, and case studies utilizing select accident investigation reports from past seasons; Module 2 (4 hrs) includes training on completing periodic, pre-use, and post-use maintenance checks, utilization of the Fire Engine Maintenance and Procedure Record (FEMPR), and basic vehicle control exercises (cone course driving exercises); Module 3 (8 hrs) includes off road and on road driving exercises during which drivers will be evaluated by cadre.

Over half of the course time is devoted to actual hands on driving exercises for the students. The students and local supervisors are encouraged to use these exercises on a periodic basis throughout the season to ensure currency, and build proficiency in the skills associated with the operation of motor vehicles in support of fire operations.

While many of the objectives and material for this training course were taken from the NWCG approved S-216 (Driving for the Fire Service) and PMS 419 (Engine Operator Training), the total required time and objectives of this Driver Training Course do not satisfy the requirements for either S-216 or PMS 419. This course should not be considered as a substitute for either S-216 or PMS 419 and home units should still consider providing this suggested NWCG training.

In addition, it is Bureau policy that all drivers receive the National Safety Council Defensive Driver Training within 3 months of entering on duty, with refresher training every 3 years after the initial training. Home units are still required to provide this training to their employees within the established time frames.

This course was originally developed by the Nevada State Office Bureau of Land Management to meet agency training needs and requirements for vehicle operators. It is the responsibility of the home unit to update changes in Bureau policy, or if home unit policy is more stringent, to amend the training to include this.

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MODULE 1

Unit 1- Introduction and Training Requirements

OBJECTIVES:

1. Introduce the training cadre.
2. Introduce the students.
3. Identify and explain any administrative concerns.
4. Explain course process, expectations, and requirements.
5. Introduce the course to the students.

I. INSTRUCTOR PREREQUISITES

A. The cadre must be experienced vehicle operators to ensure proper demonstration of driving techniques. The recommended ratio of students to instructors is 5 to 1. The recommended ratio of students to vehicles is 3 to 1. It is recommended that the maximum class size not exceed 25 students.

II. TRAINING REQUIREMENTS

A. Operators of Wildland Fire Engines, Water Tenders, and Crew Carriers (hereafter referred to as specialized fire equipment)

1. Module 1 (4 hrs), Module 2 (4 hrs), and Module 3 (8 hrs) are required

B. The initial year this training is implemented (2007) all operators of specialized fire equipment will be required to complete the full 16 hour training. After meeting initial training requirements, an annual refresher will be required.

1. After initial implementation in 2007, successful completion of S-216 (Driving for the Fire Service) or PMS-419 (Engine Operator Training) will satisfy training and refresher training requirements for the Driver Training Course.

a. For example, in 2008, if an employee has successfully completed S-216 or ENOP training, they are not required to take the Driver Training Course.

Or

b. After initially receiving the Driver Training Course in 2007, if an employee successfully completes either S-216 or Engine Operator Academy in 2008 they have satisfied training requirements.

3. Alternative courses such as National Safety Council sanctioned Emergency Vehicle Operator Course (EVOC) or other courses home units wish to utilize as driver refresher training must be approved by the Nevada State Office Deputy Fire Management Officer on a case by case basis.

a. Defensive Driver Training remains a required training course for all BLM employees who operate any motor vehicle.

III. STUDENT PREREQUISITES

A. The students must possess a current motor vehicle license, and possess the appropriate agency specific licensing for participation in the Module 3 driving exercises (ie. only students with Class B Commercial Driver's Licenses or Instruction Permits will be allowed to drive vehicles with GVWR of 26,000 lbs or greater) .

B. Home units should also have a current DI-131 (Application for U.S. Government Motor Vehicle Operator's Identification Card) and form OF-345 (Physical Fitness Inquiry for Motor Vehicle Operators - Appendix A) on file for all students prior to participation in training. Similar forms are acceptable.

IV. COURSE OBJECTIVES

A. Performance Objectives

Course objectives are stated in broad terms that define what the student will be able to do after completing the course.

The student will be able to:

1. Safely and efficiently operate a fire vehicle in the fire environment by applying the appropriate driving skills and techniques for the specific situation.
2. Apply basic maintenance procedures to ensure vehicle readiness.
3. Act in a professional manner when operating a vehicle, includes adhering to all Bureau policy related to motor vehicle operation.

B. Unit Objectives

Unit 1 - Introduction

1. Introduce the instructors and the course coordinator.
2. Introduce the students.
3. Introduce the course to the students.
4. Explain the course process and expectations.

Unit 2 – BLM Driving Policy

1. Identify the 3 main publications that detail BLM and incident driving policy.
2. Discuss driving duty limitations and requirements of vehicle operators.
3. Engage in a discussion about Bureau policies and regulations.

Unit 3 – Case Studies of 2006 Accident Reports

1. Reference and apply BLM policies related to vehicle operations.
2. Apply lessons learned from accident investigation reports and develop recommendations to prevent similar incidents.

Unit 4 - Attitudes and Situational Awareness – STOP Sticker

1. Describe the attributes of a professional vehicle operator in the wildland fire service.
2. Define situational awareness as it applies to driving.
3. List five distractions that affect your ability to safely operate the vehicle. Describe how to mitigate the effects of the distractions.
4. Identify 3 physical factors and explain how they may affect your ability to do the job.
5. Introduce the STOP sticker and discuss how it is to be used.

Unit 5 - Understanding and Checking Your Vehicle

1. Explain why it is important to perform a vehicle inspection.
2. Explain why it is important to document any actions taken concerning the vehicle such as inspections, repairs, maintenance, or performance tests in the Fire Engine Maintenance Procedure and Record (FEMPR).
3. Perform a vehicle inspection. Determine your vehicle's readiness for daily operations in the field.

Unit 6 - Basic Vehicle Control

1. Describe and demonstrate vehicle start-up procedures.
2. Demonstrate the proper use of the spotter's hand signals.
3. On an established course, demonstrate the proper driving skills, an understanding of vehicle handling and maneuvering capabilities, and the application of appropriate cautions.

Unit 7 - Vehicle Control Tasks (Urban, Suburban and Rural)

1. Demonstrate the acceptable operation of a vehicle through a predetermined route or course representative of expected driving surfaces which incorporates the following maneuvers:

- Enter and exit a limited access highway and execute lane changes.
- On a rural road, drive through two kinds of curves.

The student's performance will be evaluated in accordance with a performance checklist.

2. Explain the relationship of momentum and inertia to vehicle size and speed.
3. Explain how to mitigate centrifugal forces when negotiating curves.
4. Explain the purpose of the two second rule for determining following distance.

Unit 8 - Off Road Driving

1. List seven of the ten hazards encountered while driving off-road.
2. Develop a Go/No-Go checklist for off-road driving.
3. Demonstrate the proper driving techniques while negotiating selected poor traction conditions listed in this unit and explain precautions the operator needs to take.

V. TIME ELEMENT

A. Presentation Time

1. Modules 1-3 (Full Course) require 16 hours to complete.

VI. COURSE COORDINATION AND ADMINISTRATION REQUIREMENTS

A. Materials

1. The following publications will be provided by the course coordinator:
 - Driver Training Work Book
 - Driver Training Power Point Presentation
 - A master copy of the Driver Training Workbook and CD-ROM with Driver Training Power Point Presentation will be provided to home units upon completion of initial training so that home units can provide training to students not able to initially participate.
2. The home unit will provide the following:
 - Vehicle / equipment that the student will be expected to operate
 - Ratio of vehicles to students will be 1 to 3 (1 vehicle : 3 students)
 - Classroom facilities for Module 1 Training
 - Location for cone driving exercise (large open parking lot / dirt lot)

- Location scouted for off-road driving exercise to include:
 - Incline - The student will be instructed to drive up an incline and at midslope, stop the vehicle completely, apply the parking brake, and turn the engine off. The student will then restart the engine and proceed to the top of the incline. After reaching the top, the student will back the engine down the incline.
 - Side Hill - The student will drive the engine along an incline at mid-slope, judging slope steepness and the capability of the engine, to safely maneuver on the slope.
 - Rocks / Brush - The student will maneuver the engine through rocks and / or heavy brush using their best judgment to determine the safest route.
 - Sand/Soft Dirt - The student demonstrates driving through sand or soft dirt without getting stuck.
 - Gulley / Steam Crossing – The student demonstrates driving through a gulley or stream crossing without getting stuck.

3. Additional material and equipment needed:

- Projection system and computer capable of projecting the PowerPoint presentation.
- Approximately 50 traffic cones for the cone courses.
- Measuring tape to lay out courses, chalk to mark locations of cones, spray paint if marking on non-paved surface.

B. Evaluations

1. Group exercises and discussions will be utilized to check the individual's progress toward meeting the instructional objectives for each unit.

2. The field exercises will be evaluated by the use of a Driver's Performance Evaluation Booklet (See Appendix B). The Performance Evaluation Booklet contains forms for evaluating each phase of the hands on driving exercises. The sum of these forms will form an overall assessment of the individual's ability to perform the driving tasks. As training is an ongoing process, it is hoped that this information will help guide the local supervisor in identifying and planning additional opportunities to allow individuals to continue the development of their driving skills.

VII. Course Agenda

Day One

0800-0830	Unit 1 - Introduction and Course Overview
0830-0915	Unit 2 – BLM Driving Policy
0915-0930	BREAK
0930-1130	Unit 3 – Case Study of 2006 Accident Reports
1130-1200	Unit 4 – Attitudes and Situational Awareness – STOP
1200-1300	LUNCH
1300-1330	Unit 5 – Understanding and Checking Your Vehicle
1330-1500	Unit 5 Exercise – Vehicle Check and Documentation
1500-1700	Unit 6 Exercise – Basic Vehicle Control

Day Two

0800-1600	Unit 7 / Unit 8 Exercises – Vehicle Control Tasks (Urban, Suburban, Rural) and Off-Road Driving Exercises
1600-1700	Close Out and Review

Unit 2- BLM Driving Policy

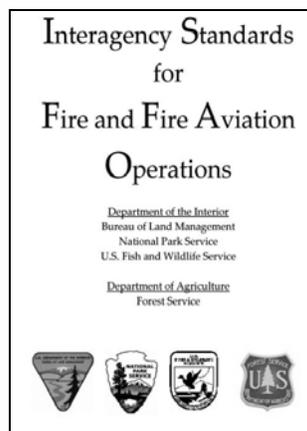
OBJECTIVES:

1. Identify the 3 main publications that detail BLM emergency and non-emergency driving policy.
2. Discuss driving duty limitations and requirements of vehicle operators.
3. Engage in a discussion about Bureau policies and regulations.

INTRODUCTION:

The purpose of this unit is to review all BLM driving and equipment operation policy. All employees are required to follow this policy while operating BLM vehicles or equipment. It is important to understand that driving duty day limitations change depending on whether or not you are working in support of an emergency incident or non-emergency incident.

I. Interagency Standards for Fire and Fire Aviation Operations – “2007 Red Book”



Chapter 7 (Safety), Page 07-5 (Deleted Non-BLM Policy Reference)

Driving Standard

All employees driving motor vehicles are responsible for the proper care, operation, maintenance and protection of the vehicle. The use of government owned, rented, or leased motor vehicles is for official business only. Unauthorized use is prohibited.

General Driving Policy

- Employees must have a valid state driver's license in their possession for the appropriate vehicle class before operating the vehicle. Operating a government-owned or rental vehicle without a valid state driver's license could result in disciplinary action.

- All drivers whose job duties require the use of a motor vehicle will receive initial defensive driver training within three months of entering on duty and refresher driver training every three years thereafter.
 - The operator and all passengers are required to wear seat belts and obey all federal and state laws.
 - All traffic violations or parking tickets will be the operator's responsibility.
 - All driving requiring a CDL will be performed in accordance with applicable Department of Transportation regulations.
-
- BLM - All employees operating a Government motor vehicle will be required to submit Form DI-131 (Application for U.S. Government Motor Vehicle Operator's Identification Card) and OF-345 (Physical Fitness Inquiry for Motor Vehicle Operators). When the supervisor signs the DI-131, the employee is authorized to operate Government-owned or leased vehicles, or privately-owned vehicles on official business. Individual office forms equivalent to the OF-345 and DI-131 are acceptable.
-
- BLM - Employees operating any motor vehicle with a GVWR of 26,000 pounds or more, towing a vehicle 10,000 pounds GVWR or more, hauling hazardous material requiring the vehicle to be placarded, or transporting, 16 or more persons, including the driver, must possess a valid Commercial Drivers License (CDL) with all applicable endorsements.
-
- BLM - Seat belts must be available and used in Bureau motor vehicles. Without exception, seat belts must be worn at all times by motor vehicle operators and passengers, regardless of the distance to be traveled or the time involved. If any employee fails to fasten their seat belt while riding in a vehicle on official business they are subject to disciplinary action as determined by local management.
-
- BLM/FWS/NPS - The DOI has granted wildland fire agencies a waiver to allow employees between the ages of 18 and 21 to operate agency commercial fire vehicles using a state issued CDL under the specific conditions as stated below:
 - Drivers with a CDL may only drive within the state that has issued the CDL and must comply with the state's special requirements and endorsements.
 - These drivers must only drive vehicles that are equipped with visible and audible signals, and are easily recognized as fire fighting equipment. This excludes, but is not limited to, school buses used for crew transport and "low-boy" tractor trailers used for construction equipment transport.
 - Supervisors must annually establish and document that these drivers have a valid license (i.e. that the license has not been suspended, revoked, canceled, or that the employee has not been otherwise unqualified from holding a license - 485 DM 16.3.B (1), ensure that the employee has the ability to operate the vehicle(s) safely in the operational environment assigned (485 DM 16.3.B (2), and review and validate the employee's driving record (485 DM 16.3.B(4)).

- Wildland fire driving safety statistics from the Safety Management Information System (SMIS) will be reviewed at the end of the 2007 fire season to determine if there is any reason why the waiver should not become permanent policy.

Incident Operations Driving

This policy addresses driving by personnel actively engaged in wildland fire suppression or all-risk activities; including driving while assigned to a specific incident (check-in to check-out) or during initial attack fire response (includes time required to control the fire and travel to a rest location).

- Agency resources assigned to an incident or engaged in initial attack fire response will adhere to the current agency work/rest policy for determining length of duty day.
- No driver will drive more than 10 hours (behind the wheel) within any duty-day.
- Multiple drivers in a single vehicle may drive up to the duty-day limitation provided no driver exceeds the individual driving (behind the wheel) time limitation of 10 hours.
- A driver shall drive only if they 1 have had at least 8 consecutive hours off duty before beginning a shift. Exception to the minimum off-duty hour requirement is allowed when essential to:
 - Accomplish immediate and critical suppression objectives.
 - Address immediate and critical firefighter or public safety issues.
- As stated in the current agency work/rest policy, documentation of mitigation measures used to reduce fatigue is required for drivers who exceed 16 hour work shifts. This is required regardless of whether the driver was still compliant with the 10 hour individual (behind the wheel) driving time limitations.

Fire Vehicle Operation Standards

Operators of all vehicles must abide by state traffic regulations. Operation of all vehicles will be conducted within the limits specified by the manufacturer. Limitations based on tire maximum speed ratings and Gross Vehicle Weight restrictions must be followed. It is the vehicle operator's responsibility to ensure vehicles abide by these and any other limitations specified by agency or state regulations.

Headlights and taillights will be illuminated at all times while the vehicle is in motion. Emergency lighting will not be used except when performing suppression or prescribed fire operations, or to mitigate serious safety hazards. Overhead lighting and other emergency lighting must meet state code requirements, and will be illuminated whenever the visibility is reduced to less than 300 feet. Blue lights are not acceptable for wildland fire operations.

**Chapter 15 (Firefighting Equipment), Page 15-5
(Deleted Non-BLM Policy Reference)**

Engine Water Reserve

Engine Operators will maintain at least 10 percent of the pumpable capacity of the water tank for emergency engine protection and drafting.

Chocks

At least one chock will be carried on each engine and will be properly utilized whenever the engine is parked or left unattended. This includes engine operation in a stationary mode without a driver “in place.”

Fire Extinguisher

All engines will have at least one 5 lb. ABC-rated (minimum) fire extinguisher, either in full view or in a clearly marked compartment.

Nonskid Surfaces

All surfaces will comply with National Fire Protection Association (*NFPA*) 1906 *Standards for Wildland Fire Apparatus* (6.4.3.) guidelines.

First Aid Kit

Each engine shall carry, in a clearly marked compartment, a fully equipped 10-person first aid kit.

Gross Vehicle Weight (GVW)

Supervisors must ensure that the maximum allowable weight of the vehicle is not exceeded.

Speed Limits

Posted speed limits will not be exceeded.

Lighting

All new orders for fire engine apparatus will include an overhead lighting package in accordance with statewide standards. It is recommended that the lighting package meet NFPA 1906 standards. Engines currently in service may be equipped with overhead lighting packages.

Colors

Lighting packages containing blue lights are not allowed and must be replaced. Blue lights have been reserved for law enforcement and must not be used on fire vehicles. A red, white, and amber combination is the accepted color scheme for fire.

Light Use

While off-road and/or during suppression, prescribed fire or other emergency activities, headlights and taillights shall remain illuminated at all times while the vehicle is in operation. Overhead lighting (or other appropriate emergency lights) shall be illuminated whenever visibility is reduced to less than 300 feet.

On-Board Flammable Liquid Storage

Occupational Safety and Health Administration (OSHA) regulations state, “*only approved metal containers, of not more than 5 gallons capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure, be used for storing or transporting flammable liquids*” (29 CFR 1910.106).

To comply with OSHA requirements and agency directives, only OSHA approved, type II metal safety cans should be used. Approved are the 2-in-1 polyethylene containers (Dolmars) used to fill chainsaws and steel Jerry cans that are used as a fuel tank for Mark III pumps. Cans must be clearly marked as to their content (e.g., gasoline, diesel, drip torch fuel). Dolmars must also be marked with the fuel oil ratio and the date of the saw gas mix so its suitability for use can be easily determined.

- **BLM - Drip Torch Fuel Transportation and Dispensing**

Reference Instruction Memorandum FA IM. 2005-030. This IM provides direction for drip torch fuel transportation and dispensing to bring BLM equipment and practices into compliance with applicable regulations and nationally recognized standards. It also provides direction on procurement of new equipment.

Fire Engine Maintenance Procedure and Record

Apparatus safety and operational inspections will be accomplished either on a post-fire or daily basis. Offices are required to document these inspections. Periodic maintenance (as required by the manufacturer) shall be performed at the intervals recommended and properly documented. All annual inspections will include a pump gallon per minute (GPM) test to ensure the pump/plumbing system is operating at desired specifications.

Engine Inventories

An inventory of supplies and equipment carried on each vehicle is required to maintain accountability and to obtain replacement items lost or damaged on incidents. The standard inventory for engines is found in Appendix R

II. NWCG CDL Duty Day Limit Clarification Memo



NATIONAL WILDFIRE COORDINATING GROUP

National Interagency Fire Center
3833 South Development Avenue
Boise, Idaho 83705

February 6, 2004

Memorandum

To: NWCG Members; Chairs- Working Teams and Advisory Groups
From: Chair, NWCG /s/ J L Stires
Subject: National Incident Operations Driving Standards

This memo revises the 02/26/03 NWCG interagency standards concerning emergency hours of driving, hereinafter referred to as “incident operations driving”.

Further in-depth research and legal consultation has resulted in a determination that state and federal fire agencies are exempted from several requirements under Department of Transportation 49 CFR (CDL requirements). These include hours of service (duty day hours) and record of duty status (log book). These exemptions intentionally provide fire agencies the latitude for more flexibility within incident operations driving than we originally interpreted and subsequently reflected in the 02/26/03 standards.

These revised driving standards set forth limitations consistent with the new 02/06/04 NWCG work/rest standards, while allowing significantly improved operational functionality over the earlier standards. Notably, this revised standard eliminates earlier duty day hour differences between CDL and non-CDL engine operators, which resulted in serious operational difficulties for the field. These incident operations driving standards have already been adopted as policy through the “Standards for Fire and Fire Aviation Operations 2004” Handbook by federal signatory agencies.

These new driving standards will provide improved incident operations within the interagency wildland fire community. Please insure that this information is made available to your fire management personnel.

Cc: Chairs, Geographic Area Coordinating Groups
Attachment

Incident Operations Driving

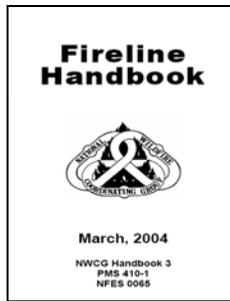
These standards address driving by personnel actively engaged in wildland fire or all risk response activities, including driving while assigned to a specific incident or during initial attack fire response (includes time required to control the fire and travel to a rest location). In the absence of more restrictive agency policy, these guidelines will be followed during mobilization and demobilization as well. Individual agency driving policies shall be consulted for all other non-incident driving.

1. Agency resources assigned to an incident or engaged in initial attack fire response will adhere to the current agency work/rest policy for determining length of duty day.
2. No driver will drive more than 10 hours (behind the wheel) within any duty-day.
3. Multiple drivers in a single vehicle may drive up to the duty-day limitation provided no driver exceeds the individual driving (behind the wheel) time limitation of 10 hours.
4. A driver shall drive only if they have had at least 8 consecutive hours off duty before beginning a shift.

Exception: Exception to the minimum off-duty hour requirement is allowed when **essential** to:

- a) Accomplish **immediate** and **critical** suppression objectives, or
 - b) Address **immediate** and **critical** firefighter or public safety issues.
5. As stated in the current agency work/rest policy, documentation of mitigation measures used to reduce fatigue is required for drivers who exceed 16-hour work shifts. This is required regardless of whether the driver was still compliant with the 10-hour individual (behind the wheel) driving time limitations.

III. Fireline Handbook



Chapter 1 – Firefighting Safety

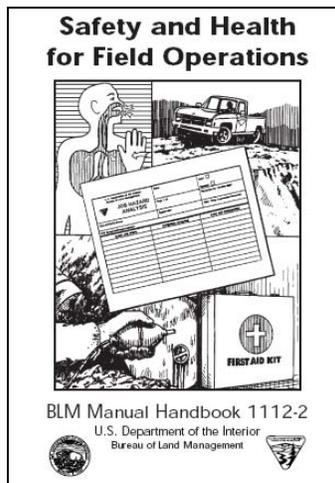
Personnel Transportation Page 53

- Overhead should have a driver whenever possible.
- All passengers in vehicles shall be seated and seat-belted with arms and legs inside vehicle.
- Personnel and unsecured tools will not be transported together.
- Driver must be qualified for the vehicle and operating conditions. If not, remove them from driving duties.
- When traveling to a fire, observe all traffic signals, safe speed limits, and safety rules.
- Driver should walk around vehicle to make sure all is clear before departure.
- Driver is responsible for arrangements to ensure that if chock blocks are provided, they are in place before loading, unloading, or when parked.
- When transporting personnel, the driver shall not leave his/her seat until the vehicle is securely chocked. NEVER load or unload personnel from an UNCHOCKED VEHICLE.
- Driver shall conduct a daily mechanical check of vehicle before driving. Unsafe equipment should be removed from service and reported to the Ground Support Unit for repair.
- Driver should use spotter outside of vehicle when backing or turning around.
- Recommend that vehicles be operated with headlights on at all times.

Engine Operations Page 60

- All vehicles going to fires should stop for traffic lights and stop signs, even when using emergency warning lights, siren, and air horns. Watch for oncoming traffic.
- Mark vehicles parked on highway at fires by flags or warning lights in front and back to warn motorists of presence of equipment and personnel.
- An engine operator, a hose puller, and a nozzle operator are desirable for effective use of engines in performing fire suppression operations.
- Park engines on the side of road away from oncoming fire to reduce heat exposure on equipment and to allow other vehicles to pass. **DO NOT BLOCK ROAD WITH YOUR ENGINE.**
- Engine will be positioned for a quick getaway.
- Engines should be attended at all times.
- Nozzle operators should wear eye protection.
- When fires make hot runs upslope, it is safer to draw back to the flanks and let the fire cross the road than to attempt a frontal assault.
- Adequate supervision and good communications, including hand signals, are necessary for safe, effective engine work.

IV. BLM Manual Handbook 1112-2 Topic 4 Motor Vehicle and Equipment Safety Page 37



4.2 Procedures

When an employee's duties require operation of a motor vehicle for official business, whether BLM-owned, GSA Fleet, commercially leased, or privately owned, the employee will be required to submit a Form DI-131 (Application for U.S. Government Motor Vehicle Operators Identification Card) and Form OF-345 (Physical Fitness Inquiry for Motor Vehicle Operators) or equivalent form, to obtain driving authorization. The employee must hold a valid state driver's license in order to obtain and retain the authorization. Authorization to drive on official business must be renewed at the time the state driver's license is renewed or a minimum of every 4 years.

A. Driving Limitations

- 1. Maximum Driving Time Restriction.** Employees will not exceed 8 hours of driving time (behind the wheel) during a 16-hour duty period. Breaks of 15 minutes are recommended every 2 hours when driving continuously.
- 2. Rest Requirement.** At least 8 consecutive hours of rest, without duty, are required prior to each duty period requiring driving.
- 3. Other Limitations.** Management/employees may place further limitations on the above hours of duty and/or driving time due to safety factors, i.e., fatigue, weather, illness. Supervisor should be notified of changes and delays.
- 4. Fire Emergency Driving.** Refer to BLM Manual 9210.5.

B. Types of Operators

1. **Operators of Sedans and Light Trucks.** The 5 CFR 930 requires the employee to have a valid state drivers License in his or her possession at all times while driving on official business. An incidental operator is any employee who is required to operate a motor vehicle in order to properly carry out his/her assigned duties but whose principal duties are not operating a motor vehicle and his/her position is not classified as a motor vehicle operator.

2. **Full-Time Operators.** Employees operating any motor vehicle with a GVWR of 26,000 pounds or more (BLM policy also includes fire pumpers of 15,000 GVWR), towing a vehicle 10,000 pounds GVWR or more, hauling hazardous material requiring the vehicle to be placarded, or transporting 16 or more persons, including the driver, must possess a valid Commercial Drivers License (CDL) with all applicable endorsements. Employee shall be at least 21 years of age and will comply with the necessary health monitoring requirements for a CDL. Authorization must be noted in the personnel file on Form DI-131 or equivalent.

3. **Operators of Specialized Equipment.** Authorization to operate specialized equipment, e.g., 4x4 vehicles, dump trucks, front-end loaders, dozers, forklifts, backhoes, tracksters, skid-steer equipment, snowmobiles, all terrain vehicles (ATV), boats, etc., must be noted in the personnel file or maintained following local record keeping procedures.

C. Supervisory Responsibility. Supervisors are responsible for ensuring that employees can satisfactorily operate the vehicle/equipment for which they are authorized. Supervisors have the authority to restrict or terminate authorizations of poor or unsafe drivers. Supervisors are responsible for educating the employee regarding BLM/Government policy on:

1. Mandatory seat belt use.
2. Alcohol/drugs prohibition.
3. Vehicle misuse.
4. Official passengers.
5. Accident reports.

D. Poor Drivers/Unsafe Drivers. A driver whose known deficiencies make his/her driving unsafe will not drive on official business until deficiencies are remedied, or his/her driving must be restricted to compensate for limiting factors. Any driver who has a poor accident record, is careless, uses poor judgment at the wheel, or has numerous driving violations may have their driving privileges suspended or revoked even though they possess a valid state drivers license.

E. Drivers Training. All drivers whose job duties require the use of a motor vehicle will receive initial defensive driver training within 3 months of entering on duty and refresher driver training every 3 years thereafter.

4.3 Equipment

Government-owned or Government-leased vehicles will be maintained in good mechanical condition.

A. Defective Vehicle. Vehicle defects identified by the operator or during safety inspections shall be immediately reported to the supervisor and fleet manager. Defective vehicles shall be removed from service until repaired.

B. Disabled Vehicle. Only authorized emergency repairs may be made to a government vehicle by the operator. If necessary, have it towed. (Refer to the vehicle book).

C. Vehicle Inspections. Monthly vehicle inspections shall be performed and documented by the vehicle operator or designated person. The inspection shall include checking vehicle lights (brake, tail, backup), mirrors, wipers, washers, defroster, gauges, brakes, fluids, and belts. Operators will ensure emergency equipment (first aid kit, reflectors, jack/lug wrench) is in the vehicle.

D. Seat Belts. Seat belts must be available and used in Bureau motor vehicles. (Reference Executive Order 13043, April 16, 1997).

1. Without exception, seat belts must be worn at all times by motor vehicle operators and passengers, regardless of the distance to be traveled or the time involved. If any employee fails to fasten his/her seat belt while riding in a vehicle on official business, he/she is subject to disciplinary action as determined by local management. (Reference 370 DM Appendix A).

2. All heavy, self-propelled equipment fitted with rollover protective structures must have a seat belt for the operator. Seat belt use by the operator is mandatory.

E. Safety/Survival Equipment. Every field vehicle shall be equipped with warning flags or reflectors, a tool kit, and a first aid kit. Additional emergency equipment may be carried in each vehicle as determined by local need.

F. Fire Extinguishers. Approved fire extinguishers are required in buses, ambulances, fire engines, fire trucks, heavy motorized mobile equipment, special use vehicles, and as required by Department of Transportation (e.g., hauling of hazardous materials, such as gasoline, explosives, chemicals, etc.)(49 CFR 393.95). Fire extinguishers (ABC type) are not required in other vehicles, except by order of the State Director. If installed, they must always be properly maintained and inspected annually.

G. Accident Reporting Kit. All Bureau-owned or operated motor vehicles including off-road vehicles and special use equipment will carry a packet containing all accident report forms and other information needed by the driver in case of an accident or other emergency. These packets will be General Services Administration (GSA) or BLM Motor Vehicle Accident Reporting Kits.

1. SF-91 Operator's Report of Motor Vehicle Accident
2. SF-94 Statement of Witness
3. DI-134 Report of Accident/Incident, or similar
4. CA-1 Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation

4.4 Vehicle Servicing and Repairs

Maintain and operate vehicles as recommended by the manufacturer. Comply with GSA and BLM requirements on use, care, maintenance, and inspections contained in the looseleaf vehicle book in each vehicle. In case of accident, be familiar with *WHAT TO DO IN CASE OF ACCIDENT* material. Additionally all drivers should:

- A. Maintain records of all repairs and inspections.
- B. When the tread depth of any tire on the front steering wheels of any vehicle exceeding 10,000 GVWR falls below 4/32 inch, the tire will be replaced.
- C. Keep interior and exterior of vehicle clean at all times and free of trash and loose items.
- D. Have maintenance done by a qualified mechanic. Always check items repaired before driving vehicle away from repair shop.
- E. Comply with local laws on studded tire use.
- F. Emergency equipment and tools carried inside of vehicles shall be secured.
- G. Securely anchor weight ballasts in pickup trucks, if needed. Do not use rocks or boulders.
- H. If vehicles or equipment to be used or transported are equipped with hydraulic lifts, ensure that they are secured in place with safety locks or other devices to prevent accidental lowering.
- I. Before adjusting the chassis of a dump truck with the dump box in an elevated position, secure body with props to prevent accidental lowering.
- J. Use only approved-type safety cans for storage and transportation of gasoline and other flammable liquids. Approved metal cans carried in a pickup bed with a plastic liner can become highly charged with static electricity. Grounding is to be done by placing the safety can on the ground or by using grounding devices.

4.5 Trailers Less Than 10,000 lbs GVW. All drivers towing trailers must be properly qualified and authorized.

- A. Vehicles towing trailers must comply with local, State, and Interstate Commerce Commission (ICC) regulations concerning size and weight of towing vehicle. Towing vehicles must have sufficient heavy brakes, and be heavy enough to ensure complete braking control in stopping and holding trailer.

- B. All trailers shall be equipped with suitable warning devices (i.e., reflective triangles) for use in emergency situations.
- C. All trailers shall be equipped with standard workable trailer lights and stoplights.
- D. All horse and similar trailers shall be equipped with trailer jacks or loading gear.
- E. Use of a safety chain is mandatory.
- F. Trailers, having 1,500 pounds gross trailer weight and over must be equipped with brakes adequate to stop and hold the trailer.
- G. Electric breakaway switch to automatically apply trailer brakes is required.

V. Discussion Questions

- 1) What are the three main documents where BLM driving policy (emergency and non-emergency) can be found?**

- 2) How many hours is one driver allowed to drive in support of fire operations per day?**

- 3) How many hours in a single driver allowed to drive in a non-emergency situation per day?**

- 4) What is the length of a duty day, is there a difference for CDL and non-CDL licensed engine drivers?**

- 5) In relation to driving standards and training, what are supervisors responsible for ensuring and / or enforcing?**

Unit 3- Case Studies of 2006 Vehicle Accident Reports

OBJECTIVES:

1. Reference and apply BLM policies related to vehicle operations.
2. Apply lessons learned from accident investigation reports and develop recommendations to prevent similar incidents.

INTRODUCTION:

The main emphasis of this unit is the use of investigation reports to reinforce course lessons and policies dealing with the operation of vehicles and specialized equipment. The accident reports represented in this unit should be updated annually to be used as Driver Refresher Training.

The topics covered in the accident reports should naturally lead to discussion and participation by the students. It is important that the discussion focuses on the vehicle operator's role in the events. It is not the intent of these case studies to find fault or place blame on the individuals involved, but to introduce the students to "real" situations that they could find themselves in. Emphasis should be on what they would do if given the same situation, not what these individuals did wrong.

The investigation reports will be presented by first allowing the student to read through the entire report. After finishing with the reading, students should individually answer the discussion questions. The instructor will then walk through the timeline, photographs, and findings of each report using with a Power Point presentation. As a group, the class will discuss each of the reports and develop lessons learned from these incidents and recommendations for how to prevent similar incidents.

Fact Finding Report –Gilmer (C30S) Fire Engine 1949 Rollover, BLM Elko Field Office, NV

Executive Summary:

On August 14, at approximately 19:15 hours, an accident involving BLM Type 4 Fire Engine 1949 occurred on the Gilmer Fire, Elko Field Office, BLM, Nevada. The accident occurred approximately 40 miles northwest of Wells, NV. While traveling from the Dixon Fire to the Gilmer (Initial Attack) Fire, the engine rolled over three quarters of a turn to the left coming to rest on the passenger side after failing to successfully negotiate a right hand curve on a gravel road.

Five fire fighters were in the engine. All were wearing seatbelts at the time of the accident. All five firefighters were transported to Northeastern Nevada Regional Medical Center in Elko, NV. The four passengers were treated for minor injuries and released. The driver underwent treatment for a broken left arm and was also released.

Causal factors were determined to be poor road conditions, shifting center of gravity due to a partial load of water, and driving too fast for conditions.

Narrative:

8/14/06 18:45 - Engine 1949 departs Dixon Fire in route to the Gilmer Fire with approximately half a load of water on board.

8/14/06 19:15 - Engine 1949 Operator Brock Uhlig fails to negotiate an approximately 45 degree curve to the right on the O'Neill Basin Access Road. Engine 1949 rolled over $\frac{3}{4}$ of a turn to the left coming to rest on the passenger side.

- Crew members on board were James Jund, front passenger seat; Chad Holbert, right rear seat; Justin Temoke, center rear seat; and Jeremiah Braun, left rear seat. Everyone was wearing their respective seat belt. The front passenger window was closed. All of the other windows in the engine were open.
- Brock Uhlig stated that he had slowed to between 35 and 40 mph when he lost control of the vehicle.
- After the Engine came to rest on the passenger side, the four passengers were able to unlatch their seatbelts and exit the engine through the left rear (driver's side) window.
- The driver, Brock Uhlig, had trouble unlatching his safety belt because he was stuck between the driver's seat and the steering wheel. Uhlig also sustained a broken upper left arm which further hampered his ability to release his seat belt. Jeremiah Braun helped Uhlig by releasing the air control in the driver's seat. Braun also shut off the master power switch which killed all electrical power to the vehicle. Once Uhlig released his seat belt he was still unable to exit the

vehicle through a side window due to his broken arm.

- James Jund then climbed an adjacent hill and made radio contact with Dixon Fire IC, Ryan Romero. Romero arrived at the scene of the accident at approximately 20:04.

8/14/06 20:01 – An ambulance and the Jaws of Life were ordered.

8/14/06 20:44 –Wells Ambulance arrived on scene. The Jaw of Life was used to remove Engine 1949's roof so that Uhlig could safely exit the vehicle.

8/14/06 22:12 – Wells Ambulance in route to Northeastern Nevada Regional Medical Center with Uhlig, Braun, and Jund on board. Temoke and Holbert transported in Engine 1903 by Fire Operations Supervisor Mike Pope. The Wells Ambulance and Engine 1903 were met about halfway to Elko by the Elko Ambulance. All five Engine 1949 Crewmembers transferred to the Elko Ambulance and were taken the rest of the way to the Northeastern Nevada Regional Medical Center.

8/16/06 – The driver and four crew members were individually interviewed by the Fact Finding Team between 15:00 and 18:00 hours.

Investigative Process:

A three person Fact Finding Team (Team) appointed by the BLM State Fire Management Officer (see page 7) and assisted by an Elko BLM Law Enforcement Ranger conducted the investigation. In addition, an Accident Reconstruction Specialist was consulted to review the Team's estimate of the vehicle speed at the time of the accident. The investigation included an analysis of human, material, and environmental factors. The process included interviews, a visit to the accident site, analysis of physical factors at the accident site, examination of Engine 1949, and a review of the timelines established by the Team. The Team consisted of the following individuals:

- Everell "Butch" Hayes (Team Lead), BLM Nevada State Office Fire and Aviation, Deputy State Fire Management Officer
- David Griggs, BLM Nevada State Office Division of Support Services, Safety and Occupational Health Specialist
- Billy Britt, BLM Carson City Field Office, Fire Operations Supervisor
- Carrie Pope (assisting), BLM Elko Field Office, Law Enforcement Ranger
- David G. Lord (consultant), Accident Reconstruction Specialist, Salt Lake City, UT

Findings:

1. BLM work/rest and incident operations driving duty day policies were adhered to.
 - Discussion: The crew had worked a shift of approximately nine hours prior to the accident. The crew had taken a day off on Saturday, 8/5/06, nine days before the accident. The crew had worked an average of ten hour shifts since the day off. The crew was within policy guidelines.
2. All crew members were current with required training.
3. All crew members were wearing their seat belts at the time of the incident.
4. Engine 1949 had a half tank of water. The center of gravity was a factor in this accident. Shifting water can change the center of gravity, affecting stability and the way the engine handles.
 - Approximately half the water in the engine tank (approximately 400 gallons) was used on the Dixon Fire prior to departing for the Gilmer Fire.
5. Road conditions:
 - There were active thunderstorms present and the accident scene had received some light spotty rain showers but not enough precipitation to affect the road surface.
 - There was a cattle guard approximately 175 feet before the curve. The driver did not recall the cattle guard during the interview until he saw the photographs of the accident scene.
 - Discussion: The cattle guard was fairly level with the grade of the road. The Team drove over the cattle guard a number of times at different speeds. When crossing the cattle guard it could be felt but it did not affect the handling of the vehicle. (Ford Expedition).
 - The surface of the gravel road prior to and at the curve where the rollover occurred was loose. The road has some light washboard going into the curve.
 - The type of curve where the rollover occurred is referred to as a diminishing radius curve; i.e. the curve starts out relatively gradual and gets more severe as you continue around the curve.
 - The bank of the road going into the curve was slightly positive. Near the area where loss of control took place the bank of the road changed to slightly negative.
6. The operator of Engine 1949 said he thought he was driving between 35 and 40 miles per hour as the Engine entered the right-hand curve. All crew members were asked how fast they thought they were traveling. Their responses were: 25 to 30; 30 to 35; 20 to 25; and 25 to 30.
7. An estimate of speed was calculated by the Team using Accident Reconstruction Analysis Techniques. Distance of skid and coefficient of friction estimated the speed to be between 42 and 44 miles per hour. This calculation was corroborated by a professional Accident Reconstruction Specialist.
 - Discussion: Distance of skid was measured at between 153 and 163 feet with a coefficient of friction of .40 used – loose gravel (See diagram on Page 6).

Overall recommendation:

Nevada Fire and Aviation should continue to stress the need for situational awareness as it relates to unusual vehicle and/or driving conditions. In addition, refresher training on engine operation should be developed and provided to all existing Engine Operators.

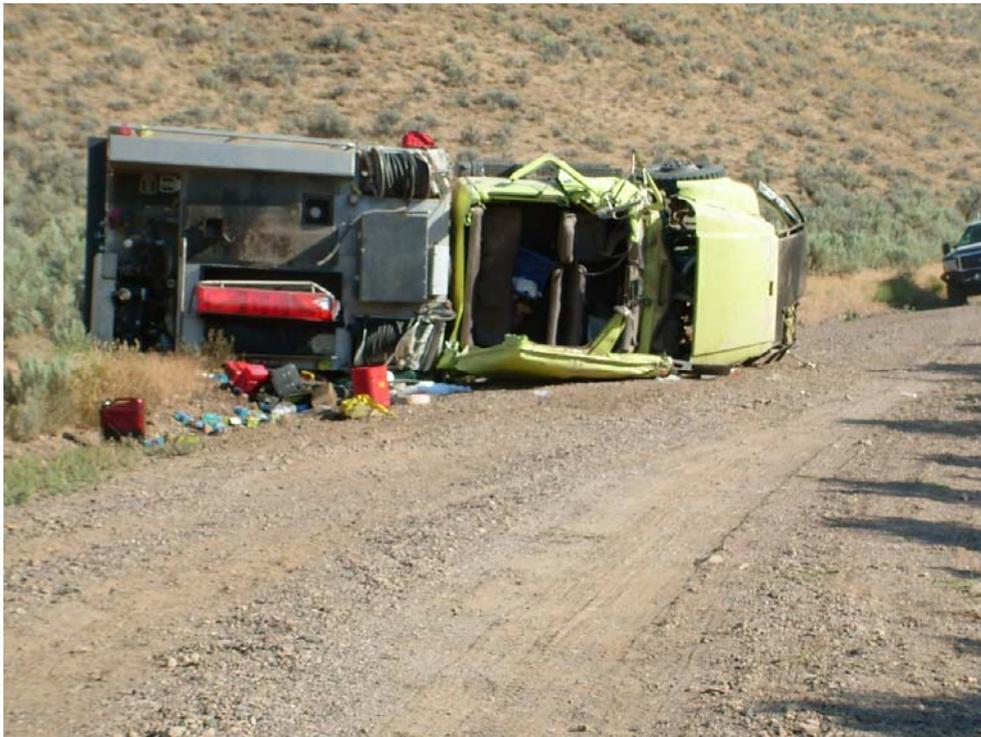
Conclusions and Observations:

It is the conclusion of the Team that Engine 1949 experienced a rollover due to a combination of the following factors:

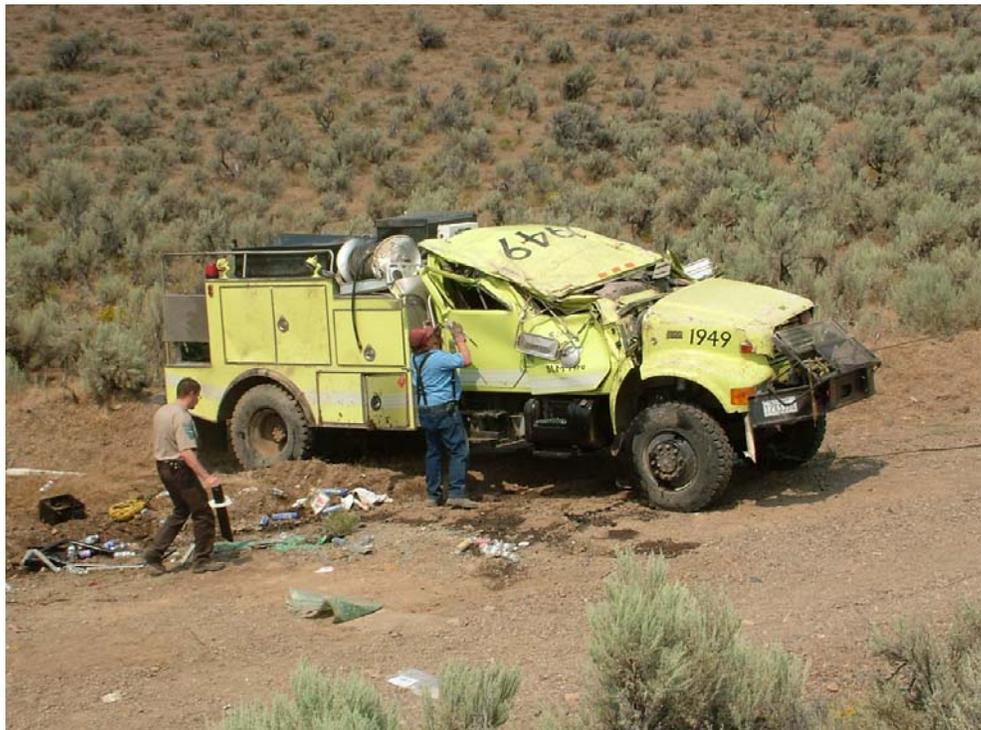
- * Poor road conditions (loose gravel and light wash board).
- * Diminishing radius curve.
- * Slight negative banking.
- * Shifting weight of half a load of water (approximately 400 gallons).
- * Driving too fast for conditions.



Accident scene – Engine 1949 Rollover. Direction of travel was to left (NNE). Note cattle guard on road.

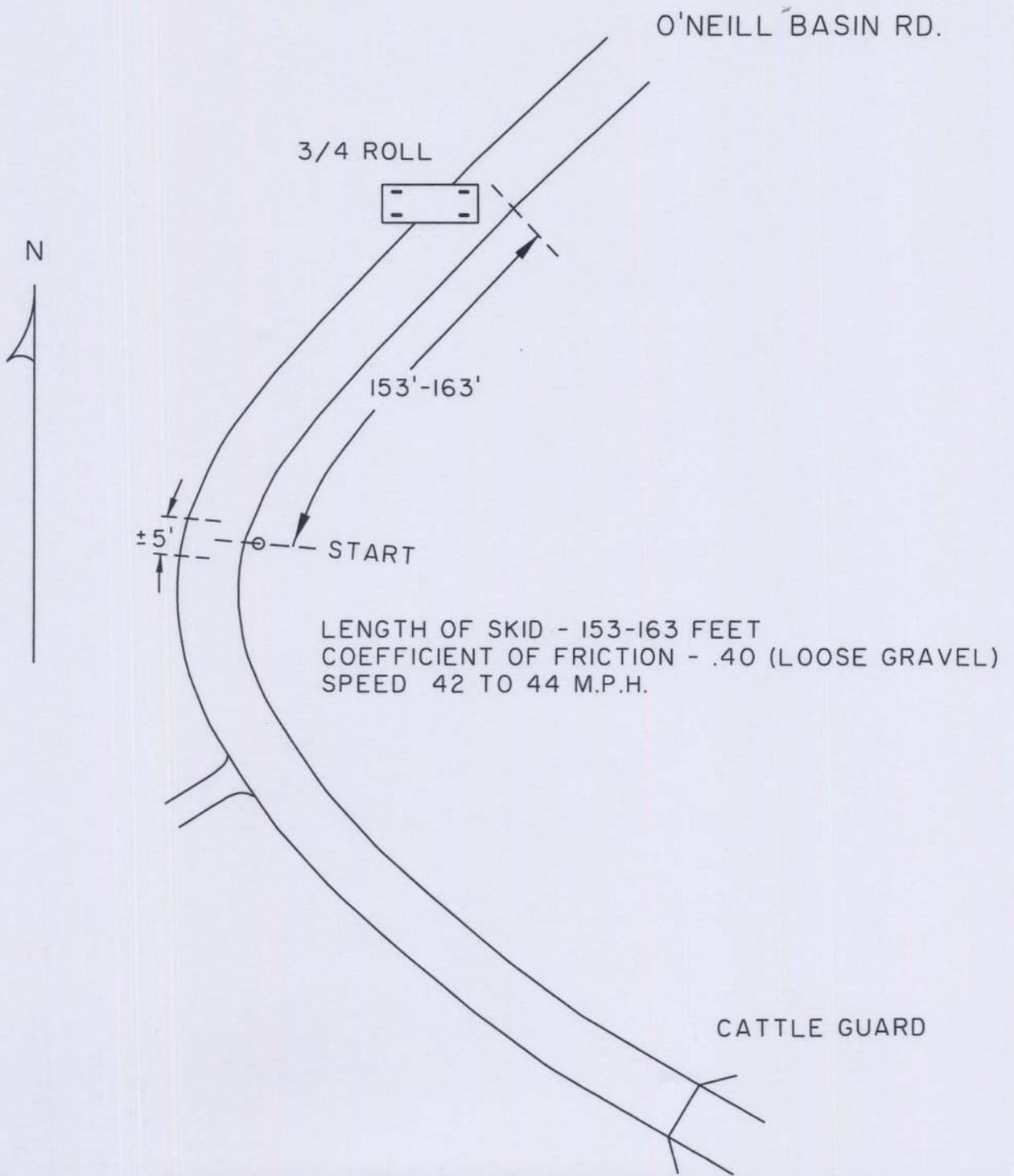


Engine 1949 after rollover – Passenger compartment roof was removed in order to extricate engine operator.



Engine 1949 at rollover scene after being righted August 15, 2006

ENGINE 1949 ROLLOVER 8/14/06 1915 HRS



Discussion Questions

1) Were there any violations of BLM driving policy, if so list them?

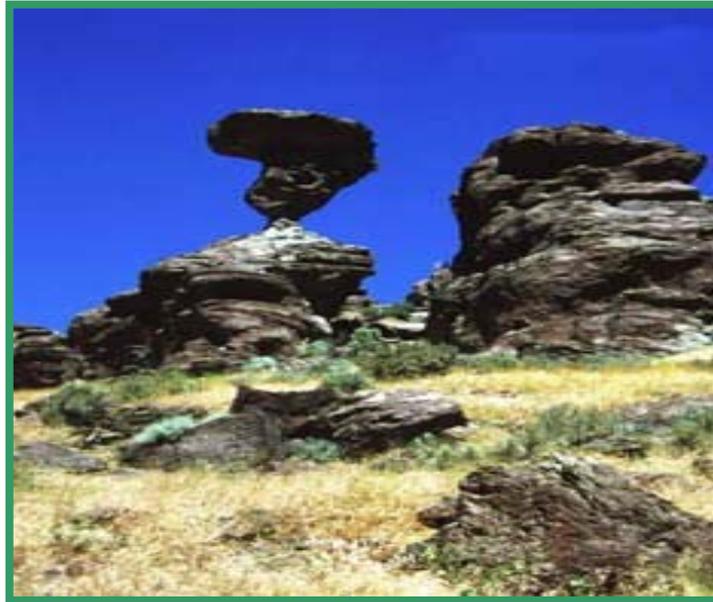
2) What were the direct and indirect causes of the accident?

3) What are the lessons learned from this accident?

4) List any recommendations to prevent similar accidents?

Balance Rock Accident Investigation Team

Accident Investigation Factual Report Balance Rock Rollover Engine E2421



Bureau of Land Management
Twin Falls District, Idaho



August 21, 2006

I. INTRODUCTION

A. BLM Heavy Fire Engine, with a crew of three was returning from a routine re-supply run in Twin Falls, Idaho to the Juniper Butte guard station when the driver lost control of the vehicle, resulting in a roll-over accident.

II. SUMMARY

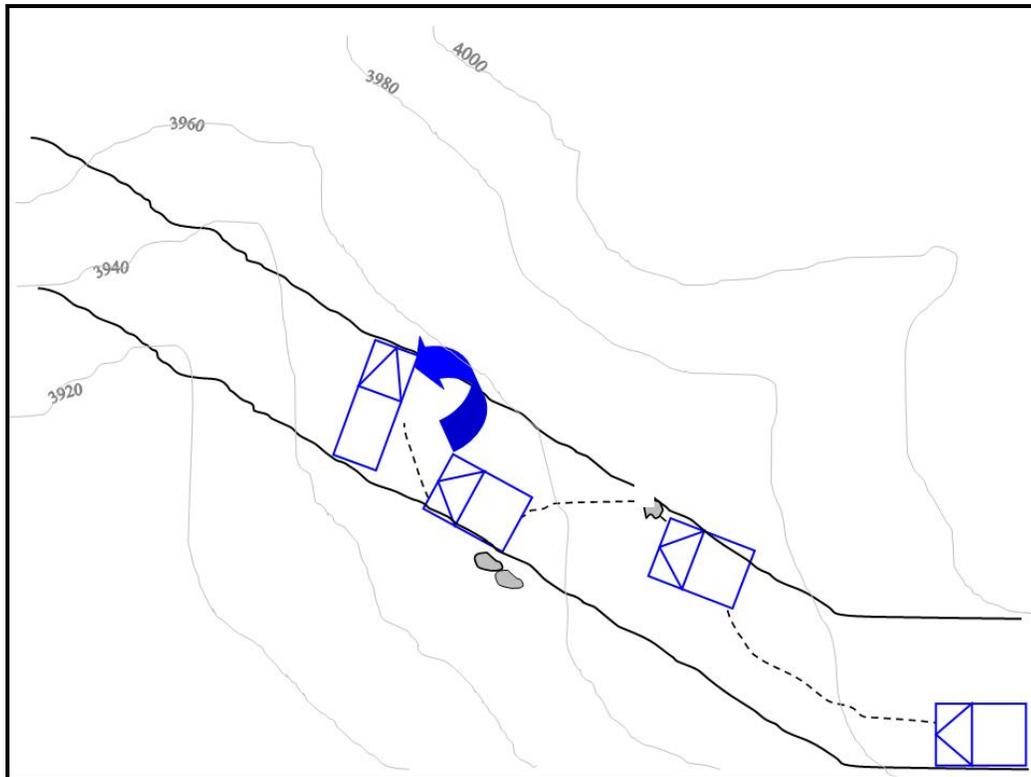
On August 14, 2006, at approximately 1830 hours an accident occurred resulting in injuries to three fire fighters. The front seat crew passenger was transported by air- evacuation to a local hospital in Twin Falls, Id. This individual was further evaluated, and then air-evacuated to a hospital in Boise, Id., with non-life threatening injuries to the back and pelvis. The driver and third crew member were transported by ground ambulance to a local hospital in near by Twin Falls, Id., where they were treated and released.

III. Narrative

Fire Engine E2421 was returning from Twin Falls to the Juniper Butte Guard Station, west bound on Balanced Rock Road, traveling approximately 35-40 mph.

Approximately 11 miles west of Castleford the engine came over a rise and the road turned slightly to the right. Crew members reported that the vehicles rear-end started to slide to the outside of the curve. The operator then attempted to correct the “fish tail” by slightly turning the steering wheel to the right. The operator then over-corrected the vehicle causing the engine to head to the right side of the road; again the operator attempted to regain control of the engine, over-corrected and temporarily departed the road bed.

In an attempt to avoid impacting the rocks along the left side of the road, the operator then applied the brakes, and steered to the right, back towards the road. After impacting one large rock with the driver side rear tire, the engine began to lean to the driver side and then made a three-quarter roll. The engine then came to rest on the passenger side lying perpendicular in the road (See Sketch and Photo 1 below).



**Photo taken by County Sheriff of E-2421, after accident.
Note a portion of the Cab has been cut open to extricate trapped occupants**



Photo 1

E2420 and the Engine Module Leader's (EML) chase vehicle were following E2421 on the gravel road, and arrived on the scene within minutes of the accident. The EML then took charge of the situation by: assessing the scene, determining injuries, and contacting the South Central Idaho Dispatch center for emergency assistance from the Twin Falls Sheriff's Department, as well as the ambulance and Life Flight Air Service.

At approximately 1900 hours, the fire department, ambulance and Life Flight arrived on scene. The driver of E2421 had already exited the vehicle and was being treated along side the road by the emergency medical service (EMS) team. The local fire department used the "Jaws of Life," to extract the two remaining crew members from the wreckage. All three crew members were stabilized at the scene. Two crew members were transported to the local hospital where they were treated and released with minor injuries. The other one was air- lifted to the local hospital, further evaluated, and then transported to St. Alphonsus Hospital in Boise, Id. for surgery.

IV. Witness Statements/Interviews

Initial Witness Statements were taken and interviews were conducted on site by BLM Law Enforcement and the County Sheriff, August 14th, 2006. This interview process continued over the next three days, with the last interviews being completed by the Investigation Team at the Shoshone Field Office on the afternoon of August 17, 2006.

A Twin Falls County Sheriff's Deputy conducted the initial accident investigation upon arrival at the scene. Two BLM Rangers took additional statements from the Engine Module crewmembers at the Twin Falls District Office, after their release from the hospital. An Idaho Special Agent interviewed the most seriously injured occupant of E2421, the Engine Boss, at St. Alphonsus Regional Medical Center in Boise, Id. on the afternoon of August 16, 2006 (See Attachment B).

V. Site Investigation

Latitude: 42° 36. 2.16"

Longitude: 115° 25. 25.67"



Balanced Rock Rollover Site Map

The accident occurred on Balance Rock/Crows Nest Road, approximately 11 miles West of Castleford. This is a BLM owned gravel road, which is maintained by cooperative agreement by Owyhee County, Idaho (see Attachment F).

For the area of the road where the accident occurred, the road conditions are characterized as moderately rough, with a slight decline and “wash board” type bumps and ruts. Two and three foot diameter rocks are present on both sides of the road.

Investigation of the accident site confirmed that the wheel tracks from E2421 are consistent with the engine operator’s statement on when the engine began to “fish tail,” and eventually left the road (see Photo 2 below).

**Photo is looking west along the Balance Rock road;
note the “fish tail” tracks on the right side of the road left by E2421.**



Photo 2

As the Engine “fish tailed” to the right the Operator overcorrected, and as Photo 3 shows, the engine then departed the road bed on the left side of the road.

“Fish tail” tracks from E-2421, where the Engine begins to leave the roadbed near to where the investigator is walking.



Photo 3

When the Engine left the road bed, the operator attempted to regain control of the engine and avoid a group of rocks. Unable to avoid the largest, the rear of the engine impacted that rock, causing damage to the rear driver side tire rim. This impact also dislodged the rock from its location and caused it to roll approximately 20 feet away (see Photos 4 and 5 below).

**Photo of the hole made when rock was hit and moved.
The large rock is in the center of the photo, just to the left of the investigator.**



Photo 4

Photo of rear tire rim that impacted the rock.



Photo 5

VI. Work Rest History

According to crew time reports on file at the Shoshone Fire Office both the Engine Module leader and the entire crew of engine E2421 were within the 2:1 work/rest ratio guidelines set forth in the *Interagency Standards for Fire and Fire Aviation Operations*.

VII. Qualifications

The following personnel qualifications have been verified with documentation:

Engine Boss

- Fully Qualified Engine Boss and Engine Operator
- Fully Qualified Firefighter Type 1 (FFT1)
- Fully Qualified Firefighter Type 2 (FFT2)
- Fully Qualified Commander Type 4
- Current valid Idaho Commercial Drivers License (CDL)
- Has attended a Defensive Driving Training course within the last 3 years

Engine Crew Member 1 (Operator at the time of the accident)

- Fully Qualified Firefighter Type 2 (FFT2)
- Trainee Firefighter Type 1 (FFT1)
- Current valid Idaho Driver's License
- Has attended a Defensive Driving Training course within the last year

Engine Crew Member 2

- Fully Qualified Firefighter Type 2
- Current valid Idaho Driver's License
- Has attended a Defensive Driving Training course within the last year

VIII. Findings

Direct Causes

E2421 was traveling too fast for the conditions of the road.

- In the initial accident report from the Twin Falls Deputy Sheriff, the official finding was that the vehicle was operating too fast for the road conditions. (See Attachment C).
- In the findings of the Investigation Team, it was also determined that the road conditions and speed were a direct cause of the accident, based on the sheriff's report, site inspection, and interviews conducted.

Indirect Cause

Driver's inexperience on handling the engine on this type of roadway was an indirect cause of the accident.

- During the interview with the Investigation Team, the driver stated that she had turned the wheel of the vehicle towards the road (to keep the vehicle on the road), when she should have turned the vehicle into the direction of the fish tail to stabilize the vehicle.
- The Driver stated to the Investigation Team, they were traveling in Drive (5th gear). Engine compression to slow the vehicle would not be sufficient once the fuel pedal was released considering the loose gravel, topography, wash board and rutted conditions on the road. The engine was not able to make the turn and maintain position on the road.

Other Findings:

BLM/State/CDL requirements and vehicle mechanical readiness:

- According to the Statement given from the Engine Boss after the accident, the decision to allow the operator to drive at the time of the accident was based on his belief that the operator “does not need a Commercial Drivers License (CDL) to drive a heavy engine on a gravel road.” He also stated that the driver was “in training to become an engine operator.”
- The Balance Rock Road is a BLM owned gravel road, maintained by Owyhee County by agreement. The Investigation Team found no policy or waiver that exempts BLM from CDL requirements based on road jurisdiction or type of road. In order to be compliant with Idaho State Law, at minimum, the Operator “in training” needed to have a Class B restricted permit to drive E2421.
- It is the finding of the Investigation Team that the mechanical condition of E2421 did not contribute to the accident. Maintenance records were current, indicating no issues with drive train or chassis and repairs to deficiencies were performed. According to interviews and statements, E2421 was one of their best engines and drove very well. It was also found that the engine was full of water at the time of the accident. General appearance of the other engines, both heavy and light within the fleet, is good to excellent. Vehicles are clean, organized and a spot check showed that pumps start readily.

IX. Recommendations

The Balanced Rock Accident Investigation Team recommends the following:

- All drivers are required to follow *BLM Manual Handbook 1112-2, Safety and Health for Field Operations and Interagency Standards for Fire and Fire Aviation Operations (The Red Book)*, as stated in the citation page below.
- All fire personnel who will be operating any fire vehicles need to successfully complete *S216 Driving for Fire Service*.
- All fire personnel required to drive engines and 4x4 vehicles, need to complete the Agency’s 4x4 operation training course, as stated in the *BLM Manual Handbook 1112-1, Safety and Health Management* requirements as stated in the citation page below.
- Fire Management for Twin Falls District should ensure that all Idaho CDL requirements are followed for any BLM vehicle exceeding 26,000 lbs. gross vehicle weight (GVW).
- Fire leadership at all levels should provide appropriate oversight and accountability to ensure that safety protocols are adhered to, such as, but not limited to the use of seatbelts.

Discussion Questions

1) Were there any violations of BLM driving policy, if so list them?

2) What were the direct and indirect causes of the accident?

3) What are the lessons learned from this accident?

4) List any recommendations to prevent similar accidents?

Inskip Fire Engine Rollover Review

July 23, 2006

Executive Summary

At approximately 22:20 on July 20, 2006, an engine rollover accident occurred in the BLM Winnemucca Field Office, Nevada. While returning home from the Inskip Fire, Engine 2946 (Winnemucca District engine) attempted to miss a black cow on State Highway 400, skidded for 196 feet, departed the roadway and rolled over onto its side. The three crewmembers, Joshua Henry (ENGB), Lindsey Swensen and Brady Charles were given first aid on scene by the crew of Engine 2943 which was following Engine 2946 at the time. All crewmembers were then transported to Humboldt General Hospital, treated and released with minor injuries.

Narrative

7/20/06 22:03- Engine 2946 departs Inskip Fire returning Winnemucca.

7/20/06 22:24- 2902 (Mike Feticc) reports an engine accident, no injuries, requests accident investigator and tow truck. Will transport crew to hospital for check up.

7/20/06 22:39- 2902 states 2946 crew is being transporting to Humboldt General Hospital.

7/20/06 23:03- Nevada Highway Patrol and A-1 Towing in route to accident scene.

7/21/06 00:58- Engine 2946 crew released from Hospital, everyone is OK.

Investigative Process

A three person BLM Investigation Team conducted the investigation. The investigation included an analysis of human, material and environmental factors. The process included interviews, verification of documentation, visit to the accident site, skid mark analysis, examination of Engine 2946 and timeline review. The investigation team consisted of the following individuals:

Tom Romanello (Team Lead), BLM Office of Fire and Aviation, Fire Management Specialist

Jeff Birrell, BLM Elko District Office, Fire Operations Supervisor

Nate Gogna, BLM Silver State Hotshots, Crew Supervisor and Acting AFMO Carson City District.

Findings

Finding #1: BLM work/rest and incident operations driving duty day policies were adhered to.

Discussion: The crew had worked a shift of approximately 14 hours when they were released from the incident and the drive home was about 1 hour. The crew had taken a day off 5 days prior to the accident and been working an average of 10 hour days since the day off. This is within policy limitations.

Finding #2: The State Trooper who investigated the accident stated he felt that Engine 2946 was traveling at speeds that were excessive for the conditions.

Discussion: Conditions at the time of the accident were very dark. The area adjacent to the accident scene is open range for free roaming cattle. The crew and driver had worked a long shift of over 14 hours. The crew had received a radio warning, from the lead vehicle in the convoy, concerning cows on the roadway. Based on evidence at the scene and interviews with personnel the investigation team was unable to conclude that excessive speed was a contributing factor. The team felt that the speed at the time of the accident was likely between 55-60mph. The posted speed limit is 70mph.

Recommendation: FMO's should ensure that all fire vehicle operators meet BLM drivers training requirements and that additional tailgate and 6-minute for safety training sessions are conducted regularly. These sessions should include identification of incident driving hazards and determination of safe driving speeds for commonly encountered road conditions. Safe driving speeds are sometimes significantly less than posted speed limits.

Finding #3: None of the crewmembers on Engine 2946 were wearing seatbelts at the time of the accident.

Discussion: The State Trooper who investigated the accident stated he would have issued citations for lack of seatbelt use except for a Nevada law that does not require seatbelt use for occupants of vehicles in excess of 10,000 lbs. gross vehicle weight.

Recommendation: All fire vehicle operators should ensure that every passenger in their vehicle is wearing a seatbelt at all times per the *Interagency Standards for Fire and Fire Aviation Operations* page 06-5 and the *Safety and Health for Field Operations Manual Handbook 1112-2* page 39. State and Field Office FMO's and Field Office Managers should ensure that all employees are educated regarding BLM/Government policy on mandatory seatbelt use.

Conclusions and Observations

The crew of Engine 2946 was returning home from a routine Initial Attack fire and was within policy requirements for work/rest and driving duty day limitations. They unexpectedly encountered a black cow on the roadway in open range country at night. They were extremely fortunate that the engine did not depart the roadway sooner than it did or at a higher rate of speed. Due to the fact that none of the crew were wearing seatbelts the potential for severe injury or death would have been high. Driving, and especially night driving, remains one of the highest risk activities firefighters undertake in the accomplishment of their jobs. This incident should serve as an important lesson learned to all personnel engaged in driving activities.

Discussion Questions

1) Were there any violations of BLM driving policy, if so list them?

2) What were the direct and indirect causes of the accident?

3) What are the lessons learned from this accident?

4) List any recommendations to prevent similar accidents?

Raft River Accident Investigation

Factual Report

August 8, 2006

Executive Summary

At approximately 21:00 on August 4, 2006, an accident occurred on the Raft River fire on the Twin Falls District (BLM-ID), approximately 30 miles east of Burley, Idaho. During initial attack of the fire, a firefighter was injured when a Type 6 fire engine backed into him while repositioning during mop-up operations. The engine struck a firefighter, pushing her into the injured firefighter, knocking him to the ground, and continued to roll over the firefighter until the Engine Operator was able to stop and move the engine forward to free the firefighter. A medical emergency was declared on the radio, and a Life Flight helicopter was immediately requested. The injured firefighter was stabilized and transported to Magic Valley Regional Medical Center in Twin Falls, Idaho. The fire engine was left in place and the Engine Operator and remaining engine crewmembers were released from the fire and transported to Twin Falls.

Narrative

08/04/06 15:57- Engine 2692 responds to incident.

08/04/06 17:42- Engine 2692 arrives on scene at the Raft River fire and receives a briefing and assignment from IC Battalion 1 (Brian Bishop, ID-STF).

08/04/06 20:56- Engine Module Leader Sonner arrives near the accident location, and has a conversation regarding moving Engine 2692 to refill the water tank. Engine 2692 Operator Cameron confirms that the engine will move to refill.

08/04/06 approximately 21:00- Firefighter Burk is injured. After hearing the radio conversation regarding moving the engine to refill, firefighter Shaw and firefighter Burk walk around the rear of the engine from the driver's side toward the passenger's side. As they reach a point directly behind and a few feet from Engine 2692, both firefighters are distracted by a lizard. The Engine Operator begins to move the engine in reverse. Firefighter Shaw notices the engine moving toward them, and both firefighters attempt to avoid the engine. The engine continues to move in reverse, striking firefighter Shaw and pushing her into firefighter Burk. Firefighter Burk falls to the ground facing up with his feet toward the engine. Both firefighters attempt to move out of the path of the engine- only firefighter Shaw was successful when she moved toward the driver's side of the engine out of its path. As the engine continues to back up, firefighter Burk's feet become entangled in the undercarriage, pushing his knees toward his chest, resulting in injuries to his back and spine. Firefighter Shaw screams at Engine Operator Cameron to stop the engine. Engine Operator Cameron does so, and then moves the engine forward to free firefighter Burk. Engine Module Leader Sonners and Engine Module Leader Houser run to the site, and Houser begins first aid and stabilization.

08/04/06 21:02- Tony Davis (incoming ICT3) contacts SCIIDC and notifies them of a medical emergency and requests Life Flight respond immediately to the fire.

08/04/06 21:02-21:50- personnel on scene provided first aid to firefighter Burk, stabilized his condition, and prepared a landing site for the Life Flight helicopter.

08/04/06 21:50- Life Flight helicopter lands near accident site.

08/04/06 22:16- Life Flight helicopter leaves accident site with firefighter Burk, en route

MVRMC.

08/04/06 22:31- Remaining crewmembers of Engine 2692 leave the fire en route to Twin Falls, ID.

Investigative Process

A three-person Interagency Investigation Team conducted the investigation. The investigation included an analysis of human, material and environmental factors. The process included interviews and written statements, verification of documentation, visit to the accident site, examination of Engine 2692 and timeline review. The investigation team consisted of the following individuals:

Jeff Arnberger (Team Lead), Assistant Fire Management Officer, Bureau of Land Management, Elko Field Office, Elko, Nevada.

Elden Alexander, Assistant Zone Fire Management Officer, Region 4, Uinta National Forest

Rich Zimmerlee, BLM Boise Smokejumpers, Prescribed Fire Manager

Material and environmental factors did not contribute to the accident. Human factors did contribute to the accident. None of the 10 Standard Firefighting Orders were compromised.

Findings

Finding #1: BLM work/rest and incident operations driving duty day policies were adhered to. In addition, all training and qualification records for the involved crew were in order and all individuals were current.

Discussion: The crew had been positioned at Juniper Butte Guard Station and Rogerson Guard Station on the morning of the accident and had responded to a small fire while en route from Rogerson to Shoshone. The crew then responded to the Raft River fire that afternoon. The crew worked a 12-hour shift on August 3, and had a full day off on July 19, and were on workday #16 on the day of the accident. This is within policy limitations. The crew also was current with regards to Annual Fireline Safety Refresher training, Defensive Driving training, and first aid/CPR training. Taskbook histories and qualification records were complete.

Finding #2: Emergency response procedures were in place and were followed. All personnel involved performed well under duress.

Discussion: When the accident occurred, personnel at the scene immediately reacted and notified SCIIDC of the need for medivac. Personnel at the scene performed basic life support and prepared for the incoming helicopter. Numerous personnel at the scene displayed effective leadership to control the situation and preserve the scene for investigation. Employees at SCIIDC followed the emergency medical response plan, and provided the necessary support to the incident as well as make all required notifications.

Finding #3: The Engine Operator of Engine 2692 lacked situational awareness regarding the location of his assigned crewmembers prior to moving the engine and had failed to communicate his intentions to them. Crewmembers failed to maintain situational awareness when they proceeded to the rear of the engine. A spotter was not used when backing the engine, and the Engine Operator did not walk around the engine prior to moving to ensure hazards or personnel were not present.

Discussion: Statements indicate that firefighters Wade and Burk overheard the plan to move the engine to refill the water tank on the handheld radio, and they were moving from the driver side of the engine around the back of the engine with the intent of entering the vehicle on the passenger side. However, the Engine Operator did not confirm this information verbally with the firefighters. The Engine Operator's statement also indicates that prior to moving the vehicle, he looked in both side mirrors and saw only one firefighter (Wade) in the driver's side mirror. The Engine Operator then proceeded to place the transmission in reverse and back the engine from its parked position. Statements obtained from firefighters Wade and Burk both indicate that when they were in the area immediately behind the engine, they were distracted from their mission by a lizard. Both firefighters also indicated they did not remember hearing the backup alarm or notice the engine moving in reverse (the review team confirmed that the backup alarm and backup lights were functional). The firefighters only became aware that the engine was moving in reverse when firefighter Wade was bumped by the engine and then looked at the engine and saw that it was in motion. The PMS 410-1 *Fireline Handbook* states that a vehicle driver should "walk around the vehicle to make sure all is clear before departure" (Chapter 1, page 53), and the driver "should use spotter outside of vehicle when backing or turning around" (Chapter 1, page 54). Neither of these safety practices were used.

Recommendation: All fire vehicle operators should ensure all personnel are accounted for and in a safe position prior to moving any vehicle. State and Field Office FMO's and Field Office Managers should ensure that all employees are familiar with and adhere to Bureau safe driving policies and safe procedures when working around vehicles or equipment.

Finding #4: Engine 2692 was not staffed with the appropriate supervision as per 2006 *Interagency Standards for Fire and Fire Aviation Operations* (Red Book).

Discussion: the Red Book states that a Type 6 engine will have a minimum staffing level of two individuals, including a Single Resource Boss for each engine (Page 15-1). The Red Book also states that "if configured with more than one engine module for local assignments, engines may be staffed with one Engine Operator (ENOP) and one Engine Module Member, provided an Engine Module Leader is assigned to the group for operational supervision" (Page 15-1). It is the opinion of this review team that this District intended to meet the Red Book policy; however, the assigned Engine Module Leader was physically removed from the location of Engine 2692 and was busy briefing other incoming resources, and Engine 2692 was operating as a single resource at the time of the accident. Furthermore, the Engine Module Leader was supervising at least two engines and 10 people at the time of the accident as per District procedure, and the engines were geographically separated. It is the opinion of this review team that the Engine Module Leader was actually performing the duties of Task Force Leader once the engines were separated, creating span of control and supervision issues that may have contributed to this accident.

Recommendation: The BLM National Office of Fire Aviation issued FA-IM-2006-035 (Subject: BLM Engine Staffing Levels) on the same day the accident occurred. This Instruction Memorandum establishes minimum and target staffing levels for BLM fire engines. The Memorandum sets the minimum staffing level for Type 6 engines as one Single Resource Boss (ENGB) and one Firefighter Type 2 (FFT2). State and Field Office FMO's and Field Office Managers should ensure immediate compliance with this Instruction Memorandum.

Finding #5: Initial witness statements, a roster of involved personnel, and other documentation were not gathered in a timely fashion.

Discussion: Upon the arrival of this team, no witness statements had been solicited, and the team was unable to gather a complete list of involved personnel until almost 36 hours after the accident. Upon formulation of this list, the team was finally able to solicit statements from involved personnel and begin interviews. The *2006 Interagency Standards for Fire and Fire Aviation Operations* (Red Book) states that a roster of involved personnel should be developed and the involved personnel should be available for interviews by the investigation team (page 19-7). The Red Book also states that statements from involved individuals should be gathered prior to a Critical Incident Stress Management session. This presented a challenge to the team, as some involved individuals were on days off or on fire assignment immediately prior to the CISM session.

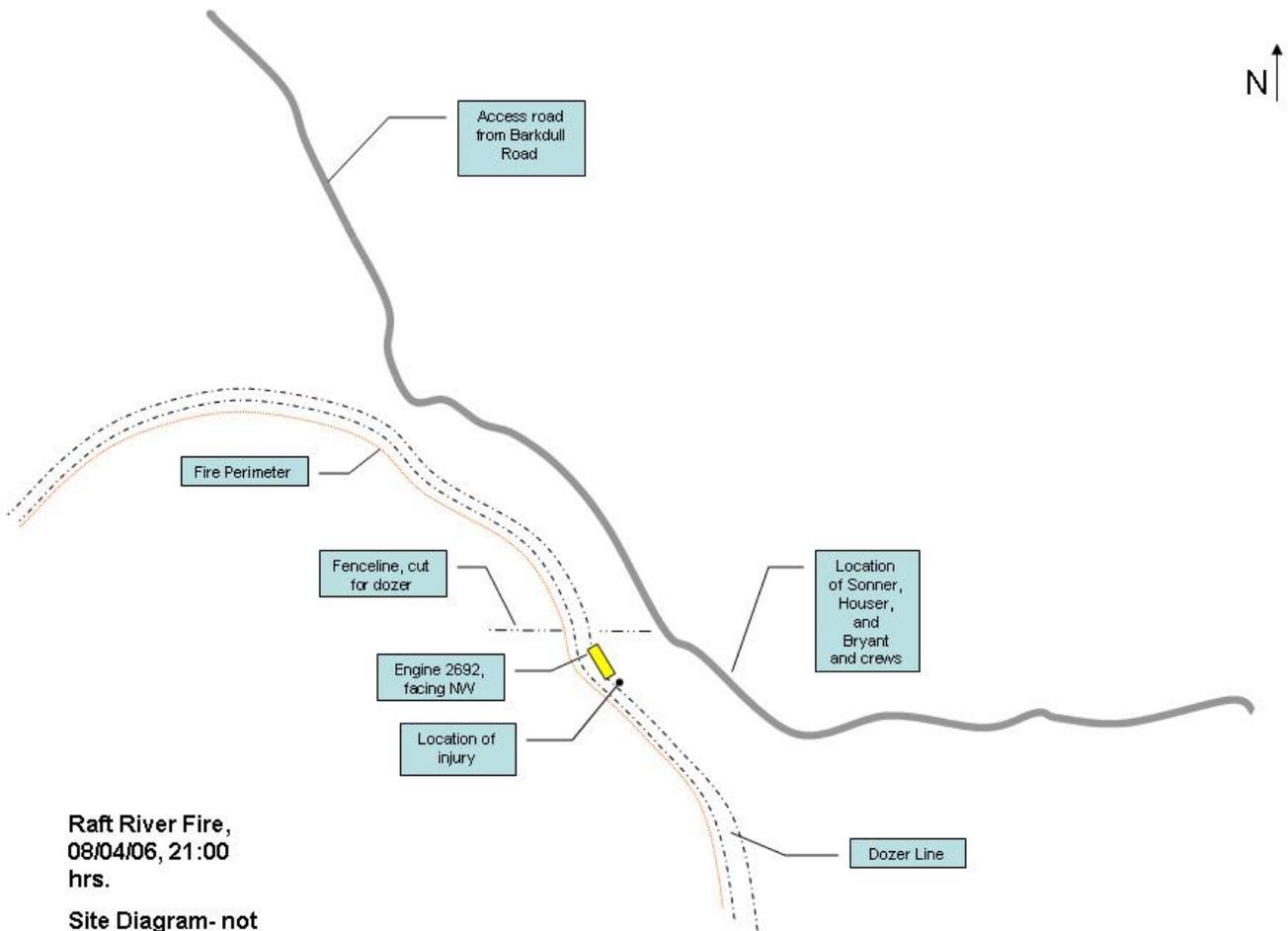
Recommendation: Implement a procedure to dispatch a Field Office Safety Officer or other available Safety Officer immediately to the scene to gather statements, secure the scene and any critical degradable evidence, and to ensure that the safety and well-being of all involved personnel is handled appropriately.

Conclusions and Observations

The crew of Engine 2692 responded to a routine Initial Attack fire and was within policy requirements for work/rest and driving duty day limitations. The engine crew was performing routine mop-up operations when the incident occurred. It is the opinion of this review team that the major causal factors of this accident were lack of situational awareness on the part of all crewmembers and lack of communication amongst the crew prior to moving the engine. In addition, span of control and adequate supervision were stretched thin, and may have contributed to the accident. The review team recommends that all employees engaged in any activities around vehicles and equipment need to follow guidelines and policies already in place to ensure the safety of employees and to reinforce the importance of situational awareness and communication between an operator and ground forces. The review team also recommends that the District ensures that all engines are staffed in compliance with national policy. Additionally, the review team feels that the National Office of Fire and Aviation should evaluate the content of the Engine Operator (ENOP) Position Taskbook for the purpose of ensuring that Engine Operators, upon completing the taskbook, are adequately trained and prepared to safely operate fire engines in an actual fire environment.

This incident should serve as an important lesson learned to all personnel engaged in driving activities.

Raft River Accident Investigation Factual Report
Attachment 1- Site Map and Photos



**Raft River Fire,
08/04/06, 21:00
hrs.
Site Diagram- not
to scale**



Photo 1- Showing location of Engine 2692 on dozer line, taken from Sonner's approximate location on two-track road.



Photo 2- Showing rear of engine where accident occurred.



Photo 3- Showing location of Engine 2692. Location of Sonner, Houser, and Bryant and crews from this angle was on the two-track at bottom of draw behind and below the engine.



Photo 4- Showing brush and berm in front of Engine 2692, and dozer line berm under the engine.

Discussion Questions

1) Were there any violations of BLM driving policy, if so list them?

2) What were the direct and indirect causes of the accident?

3) What are the lessons learned from this accident?

4) List any recommendations to prevent similar accidents?

Charleston (C4CU) Contract Engine Rollover

BLM Elko Field Office, Nevada

August 18, 2006

Executive Summary:

At approximately 21:00 on August 16, 2006 a contract Type VI Engine (AAA Forestry – call sign “AAA”) was returning to ICP from their assignment on the Charleston Fire. The route of travel was through the Heguy Ranch Headquarters and along the entrance road to the ranch heading towards a County Road parallel to Mason Creek. The engine drifted to the right side of the entrance road and then off an embankment into an irrigation ditch immediately adjacent to the road on the right side. The vehicle came to rest on its right (passenger) side. Occupants were the operator, Patrick Thiel, and crewmembers Jim Hart and Ramon Soto. There were no injuries. All occupants were employees of AAA Forestry (Outpost of Enterprise, Inc. 208/550-1785). All occupants of the vehicle were wearing seatbelts. The occupants exited the vehicle after the accident and were able to push it to the left (drivers) side until it came to rest against the side of the irrigation ditch at an approximate angle of 45 degrees. The vehicle remained in this position until the Fact Finding Team arrived at approximately 12:15 on August 17, 2006.

Narrative:

8/15/06 07:00 – Engine AAA went on shift in Klamath Falls, OR.

8/15/06 – Later that morning (exact time unknown) Engine AAA dispatched to the Charleston Fire, Elko Field Office, NV

8/16/06 0:100 – Pulled into Button Point Rest Area between Winnemucca, NV and Battle Mountain, NV on I-80 to sleep.

8/16/06 – Approximately 04:30 left Rest Area and proceeded to Elko Interagency Dispatch.

8/16/06 – Approximately 06:00 arrived Elko Interagency Dispatch.

8/16/06 – Approximately 11:00 received assignment and proceeded to Charleston ICP.

8/16/06 – Approximately 20:45 left Charleston Fire to return to ICP in order to meet work/rest guidelines.

8/16/06 – Approximately 21:00 Engine AAA went off road into an irrigation ditch.

8/17/06 – Approximately 12:15 Fact Finding Team arrived at ICP to investigate

8/18/06 – Approximately 09:30 Fact Finding Team verified that Engine AAA had been retrieved and towed to the Elko BLM Fire Yard by Lostra Bros. Towing, Elko, NV.

Investigative Process:

A three person Fact Finding Team (Team) appointed by the BLM State Fire Management Officer and assisted by an Elko BLM Law Enforcement Ranger conducted the investigation. The investigation included an analysis of human, material, and environmental factors. The process included interviews, a visit to the accident site, analysis of physical factors at the accident site, examination of Engine AAA, and a review of the timelines established by the Team. The fact finding team consisted of the following individuals:

Everell “Butch” Hayes (Team Lead), BLM Nevada State Office Fire and Aviation,
Deputy State Fire Management Officer

David Griggs, BLM Nevada State Office Division of Support Services, Safety and
Occupational Health Specialist

Billy Britt, BLM Carson City Field Office, Fire Operations Supervisor

Carrie Pope (assisting), BLM Elko Field Office, Law Enforcement Ranger

Findings:

Finding #1: From interviews conducted work/rest guidelines were exceeded by both the Engine Operator and crew of Engine AAA based on the timeline established during interviews with Engine Operator.

Discussion: Engine AAA entered duty at 07:00 on August 15, 2006 and continued on duty until approximately 01:00 on August 16, 2006. Following a rest period of approximately three and one-half hours Engine AAA continued to be on duty until approximately 21:00 on August 16, 2006. This is not in accordance with established work/rest guidelines.

Recommendation: (1) It must be made clear to contracted suppression resources that contracted resources are subject to the same work/rest guidelines as Agency personnel. (2) Expanded Dispatch or any other entity performing the role of Check In should continue to verify hours of work/rest before assigning contract resources to an incident.

Finding #2: The road being traveled at the time of the accident was narrow with a soft shoulder/embankment.

Discussion: While the condition and width of the entrance road to the Heguy Ranch Headquarters did not meet County standards it could be safely traveled with appropriate care and attention.

Recommendation: When traveling on unimproved and/or private roads, an especially high degree of attention and situational awareness must be maintained at all times, especially during darkness.

Finding #3: Driver inattention contributed to this accident.

Discussion: As stated by the Engine Operator (Operator), immediately prior to the accident a spotlight became dislodged in the passenger compartment and landed in the area of the Operator’s feet. While trying to retrieve the spotlight the vehicle drifted too close to the edge of the road. When the Operator realized what was happening it was too late to correct the vehicle’s travel direction and avoid running off the road.

Recommendations: (1) All items in the passenger compartment should be secured to prevent movement during vehicle operation and (2) If an item becomes dislodged during

vehicle operation, the operator should either stop the vehicle and secure the item or instruct a passenger to secure the loose item and not divert his/her attention from the primary duty (driving).

Finding #4: Driver fatigue may have contributed to this accident due to the number of hours the vehicle operator had been driving.

Discussion: Driving duty day limitations during any 16 hour duty day are 10 hours (whether consecutive or not) behind the wheel. There is an additional requirement that at least an 8 hour period of rest occur before a new duty day begins. Exigent circumstances allowing for a deviation from this requirement did not exist in this case.

Recommendation: It must be made clear to contracted suppression resources that those resources are subject to the same driving duty day limitations as Agency personnel.

Conclusions and Observations

Contract Engine AAA was returning from a line assignment on the Charleston Fire to ICP when the Engine left a dirt roadway and slid into an irrigation ditch. There were no injuries and minor, if any, damage to the Engine. The driver and crew had exceeded work/rest requirements and the driver had also exceeded driving duty day limitations. Causal factors in this accident were found to be driver inattention and possible fatigue.

A claim for damages is neither justified nor anticipated. Consultation with the towing company indicated the retrieval was successful and the only minor damage was that the bead broke loose on the right front tire as it drug across the ditch bank. The tire was successfully aired up on scene and the vehicle towed back to the Elko Fire Yard for re-inspection before being allowed to return to the Fire.



Engine AAA Resting Against Irrigation Ditch Bank – Front View



Engine AAA Resting Against Irrigation Ditch Bank – Rear View Engine



AAA Resting Against Irrigation Ditch Bank – Driver Side View



Engine AAA Resting Against Irrigation Ditch Bank –Passenger Side View

Discussion Questions

1) Were there any violations of BLM driving policy, if so list them?

2) What were the direct and indirect causes of the accident?

3) What are the lessons learned from this accident?

4) List any recommendations to prevent similar accidents?

Unit 4 - Attitudes and Situational Awareness – STOP Sticker

Objectives:

1. Describe the attributes of a professional vehicle operator in the wildland fire service.
2. Define situational awareness as it applies to driving.
3. List five distractions that affect your ability to safely operate the vehicle. Describe how to mitigate the effects of the distractions.
4. Identify 3 physical factors and explain how they may affect your ability to do the job.
5. Introduce the STOP sticker and discuss how it is to be used.

Introduction:

The purpose of this unit is to generate a discussion about the attributes of a professional driver and how that driver approaches the task of driving. This includes gathering situational awareness (SA) before the vehicle starts and while driving, filtering out distractions that can influence their SA, and controlling the physical factors that influence their SA. The STOP sticker is also introduced and explained in this unit. While the distractions of driving continue to increase, it is imperative the drivers focus on the task at hand and filter out all other distractions while driving.

I. Attributes of a Professional Driver

A. Safety First Attitude

- As a public employee you have greater driving responsibility than the motoring public.
- Use SOPs to ensure proper procedures.
- Exercise restraint and good judgment to ensure the safe and efficient operation of your vehicle.
- Check passengers and cargo.
- Check vehicle readiness.
- Inspect vehicle.
- Safety circle (a quick walk around inspection).

B. Technically proficient in their job

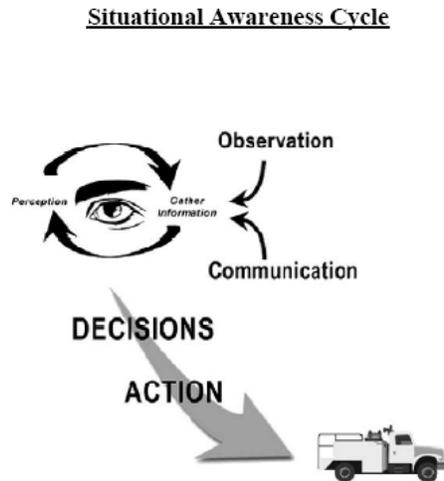
- Familiar with vehicle to be driven.
- Responsibility to obtain needed training to maintain and improve skill level.
- Who is responsible?
 - Agency
 - Individual

C. Professionalism

- Pride in self
- Pride in equipment
 - Clean and well maintained

II. Situational Awareness

A. Situational Awareness in driving is your perception of the driving environment. Regardless of your perception, reality may be different. The quality of your situational awareness (i.e., a closer match to reality) will result in better decision making.



B. Drivers have a responsibility to be aware of their situation. They must do this to protect their crew and equipment. This is accomplished by input from observation and communication of all things around them.

1. Some examples might include:
 - a. Vehicle performance
 - b. Vehicle capabilities
 - c. Road conditions and type
 - d. Radio traffic
 - e. Past experience in area
 - f. Observations from passengers
 - g. Communications with supervisor, crew, adjoining forces
 - h. Information concerning the current status of the incident, weather, terrain, etc.

C. Filtering to improve situational awareness

1. Sometimes information concerning the fire environment and the driving environment may become overwhelming which in turn will make it difficult to process all the information needed to maintain good SA. In these cases you must decide what information is most important to attend to. This process is called filtering.



D. External Factors That Cause Distractions

1. Distractions shift focus from critical elements to something that is not as important.

- a. Radio
- b. Cellular phone
- c. Sirens
- d. Personal problems
- e. Beginning and end of assignment/going home
- f. Work loads
- g. Mission focused (tunnel vision)

2. How can these distractions be mitigated?

III. Physical Factors that Affect Driving

A. The wildland firefighter's physical and mental standards that are needed to accomplish the tasks required on an incident are extreme. Many different aspects of life are to be considered. It is the driver of a wildland fire vehicle that has the responsibility to make sure that they are in top mental and physical shape and are able to perform the duties required to be an operator.

1. Work and Non-Work Related Stress

- a. List Possible Causes

2. Physical fitness

- a. List Benefits of Good Physical Fitness

4. Mental Alertness

- a. List Factors Affecting Mental Alertness

5. Effects of Drugs and Alcohol

- a. List Effects of Drugs and Alcohol Use on Driving Performance

IV. STOP Sticker



The STOP Sticker is a red octagonal sign with a white border. Inside the octagon, there is a white hand icon with the index finger pointing up. The text "Before You Operate this Vehicle:" is written in black, bold, sans-serif font across the hand icon.

Seat belts on?

Tools and equipment stowed?

Operator and Crew have Situational Awareness?

Personnel accounted for?

A. Seat Belts On



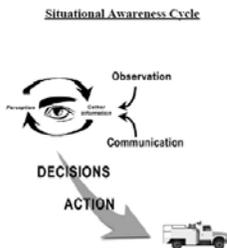
1. The use of seat belts is mandatory and all operators are required to ensure that passengers are buckled in prior to moving the vehicle.
2. Even during suppression operations, operators should ensure that seatbelts are worn by all passengers. Seatbelts should be equipped with locks that will prevent seat belts from cinching down during off road driving.
3. Seat belts save lives and prevent injuries, **BUCKLE UP!**

B. Tools and Equipment Stowed



1. Complete this while doing your “Safety Circle”:
Get into a routine of doing this the same every time.
 - a. Look under vehicle for problems
 - b. Cabinets / Equipment Secure
 - Fuel cans
 - Boxes
 - Drip Torches
 - Hoses
 - Nozzles in Holders
 - No Loose Items
 - c. Tires-look at tread and air pressure, check duals.
 - d. Check vehicle body for damage.
 - e. Windows and mirrors are clean and clear.

C. Operator and Crew Have Situational Awareness



1. Account for all personnel
2. Vehicle clear of hazards
3. Spotters being utilized
4. Crew communicates hazards / conditions to operator

D. Personnel Accounted For

1. Account for all assigned personnel and others in the area.
2. Never back without checking behind the vehicle (Safety Circle).
3. Use spotters.
4. Communicate intentions before moving vehicle.

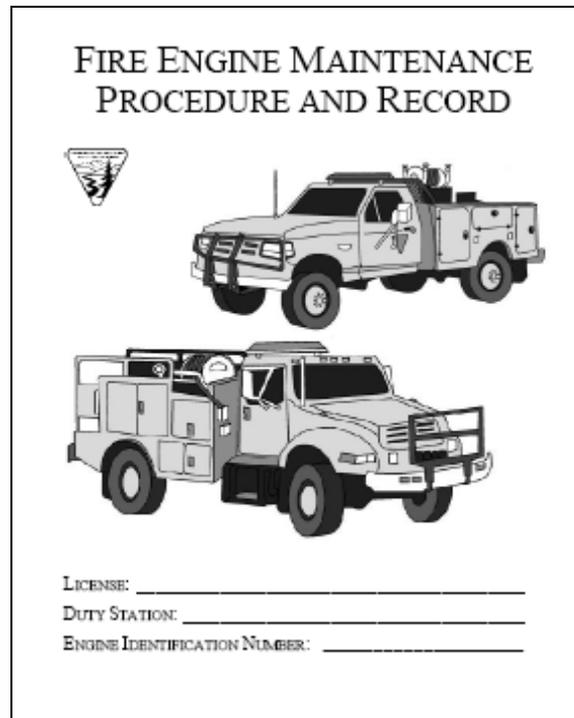
E. Stickers should be placed on dash of vehicles and used as a checklist everytime you get behind the wheel. **Complete each step of the STOP Checklist before you start the vehicle.**

MODULE 2

Unit 5 - Understanding and Checking Your Vehicle

Objectives:

1. Explain why it is important to perform a vehicle inspection.
2. Explain why it is important to document any actions taken concerning the vehicle such as inspections, repairs, maintenance, or performance tests in the Fire Engine Maintenance Procedure and Record (FEMPR).
3. Perform a vehicle inspection. Determine your vehicle's readiness for daily operations in the field.



I. Fire Engine Maintenance Procedure and Record

A. This book was developed for you to use as a guide to perform routine maintenance on a BLM fire engine. Duties described as “daily,” or “as needed” are recommendations by the development group. However, local protocol may dictate that some tasks are done more often, or less, then local standards should be followed.

B. This document is to be used for both the “Heavy” and “Light” engines; some instructions are specific to each type individually. Skip the task if it does not pertain to the engine you are using.

C. Although it was designed for engine use, it can be utilized for other vehicles or crew carriers by skipping sections specific to engines.

D. As an operator, you are required to ensure that the vehicle you are operating is safe to operate; this is done by completing and documenting pre-trip inspections.

II. Reasons for Documenting

A. Keep records of maintenance performed on incidents and those using 9310 money. Records will help to evaluate our equipment and make changes as needed.

B. Reasons for having records

1. Liability reasons in case of a mechanical mishap that can cause damage or injury.
2. To discover mechanical trends with vehicles, that can help with the future design of other fire engines.
3. As a reminder when certain mechanical service was performed or needs to be performed.
4. Information sharing
 - a. Good record keeping is a great way to start newsletters, e-mail, face-to-face talk on the fireline, etc.
 - b. Information sharing lets others know of safety problems found so that they can be corrected.
 - c. Helps in the development of new and safer equipment.

III. Field Exercise – Performing Daily Check

A. Each student will be required to perform and properly document a daily vehicle check. The evaluation form used for this check is located in Appendix B. At a minimum, the following items should be checked on all types of vehicles and equipment.

1. Oil - Check fluid levels and add if needed.
2. Coolant - Check fluid levels and add if needed.
3. Power Steering - Check fluid levels and add if needed.
4. Automatic Transmission Fluid - Check transmission fluid according to manufacturer's guidelines.
5. Fan Belts - Check belts for wear, frays, tension, or cracks.

6. Air Cleaners - Carefully inspect mounting brackets, inlet hose connections, and fittings. Inspect gasket and sealing surface areas. Replace service element, if needed.
7. Hoses - Check for signs of wear, cracks or leaks. Check clamps.
8. Leaks - Check for signs of dripping fluids around major components of the engine.
9. Batteries - Check that battery (s) is secure, connections are tight, and cell caps are present. Battery connections should not be excessively corroded. Battery box and cover must be secure.
10. Fuel Tank - Make sure it is full and securely mounted.
11. Hydraulic Oil (if applicable) - Check level of fluid; add if needed.
12. Air Tanks - Check for moisture and bleed if necessary. Inspect mounting brackets.
13. Slack Adjusters - Inspect for excessive play in the brake assembly (adjust to manufacturer's specifications). Check for broken, loose or missing parts.
14. Parking Brake - Check for proper operation; ensure vehicle doesn't move when brake is set.
15. Air Brake Check - Performed in accordance with D.O.T. (CDL) standards.
16. Tires - Check tread depth and wear, sidewall damage, and tire pressure. Ensure that tires are matched. Check spare. Check condition of mud flaps.
17. Hubs and Lug Nuts - Check for leaks and proper operation of manual hubs. Inspect rims for damage and proper mounting. Ensure lug nuts are present and tight.
18. Undercarriage - Check for loose bolts, hanging wires, exhaust system, leaks, broken parts, steering components, drive train, shock absorber, free of debris, springs and spring shackles, body mounts, cross members, etc.
19. Cabinet Locks - Check for operation.
20. General Condition - Clean and orderly appearance (both internal and external). Agency emblems, decals, equipment numbers and license plates present and in good condition.
21. Start Engine - Leave engine running for electrical checks.

22. Lights/Signals - Check headlights, brake lights, running lights, emergency lights, turn signals, back-up lights, work lights, panel lights, cabinet lights, dome and dash lights, etc. and replace bulbs as necessary.
23. Mirrors/Glass - Check for cleanliness, cracks, chips, and damaged brackets or mounts. Ensure proper adjustment.
24. Back-up Alarm - Operational.
25. Gauges - All gauges should be operational. Any non-functioning gauges should be reported.
26. 2-Way Radio/P.A. - Perform a radio check to see if radio receives and transmits. Check to see if it is securely mounted and speakers are functional.
27. Wipers/Washers - Check condition, reservoir level, and operation.
28. Horn - Check operation, mounting brackets, and air horn.
29. Seat Belts - Clean, secure, accessible, and operational.
30. Heater & AC - Check fan, defroster, vents, and controls.
31. Log Book - Current, neat and available. Check for credit card, receipts and proper charge codes.
32. Accident Forms - Contained within the DI-135: DI-134, SF-91, SF-94, CA-1, OF-26 and the S-43. Ensure all forms are in the DI-135.
33. Fire Extinguisher - Securely mounted, pins in place, inspection current, tagged, reflective marker on the extinguisher, and charged.
34. First Aid Kit(s) - Maintained, updated, and clearly marked.
35. Reflector Set - Available and operational.
36. Wheel Chocks - In place and accessible.
37. Jack/Lug Wrench - Compatible with vehicle and proper sized jack.
38. N.U.S - Check for missing or damaged items, replace if necessary.

Unit 6 - Basic Vehicle Control

Objectives:

1. Describe and demonstrate vehicle start-up procedures.
2. Demonstrate the proper use of the spotter's hand signals.
3. On an established course, demonstrate the proper driving skills, an understanding of vehicle handling and maneuvering capabilities, and the application of appropriate cautions.

INTRODUCTION:

The following exercises will be conducted using the cone driving course. The cadre will be evaluating drivers using the evaluation forms found in Appendix B. Other evaluation criteria include:

- A. Driver's foot will be off the accelerator and on the foot brake when shifting out of neutral/park.
- B. Vehicle will be completely stopped before shifting in or out of reverse.
- C. Transmission lever will be set back to the neutral/park position with parking brake set before driver leaves the seat.
- D. On steering wheel, place hands at the 9 and 3 o'clock position and thumbs on outside of wheel.

CONE COURSE EXERCISE

Talk to each driver and orally critique each driver's performance. Give the students ways to improve driving through the cones.

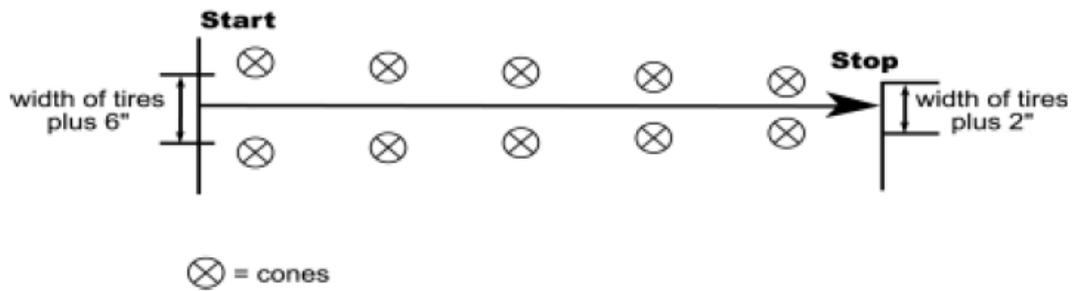
There will be 4 cone exercises which consist of the following:

1. Diminishing Clearance
2. Straight Line
3. Serpentine
4. Curve Backing; left and right

The cone exercises are set up for a Type 6 engine (helitack and crew carriers) and a Type 4 engine (regular cab and six-pack). The diagrams for all the cone exercises are on the following pages. These represent the most common vehicle types. If you have other vehicle types you may have to spend some time in layout. Use the diagrams as a template and adjust to fit the needs of your vehicles. It is beneficial to have the instructors/evaluators run through the courses to make sure they are set up correctly. The instructor will need to make sure all cones (approximately 50) are in place. These cones are readily available from power companies, gas companies, construction companies, state highway departments; or other resources you may have in your community. Cone locations can be pre-marked with chalk or paint. By using the chalk or paint as a reference point, cones that are knocked over can be placed in their exact location. If there is more than one type of vehicle used in the course, two sets of markings can be used at each station. For the backing portion of these courses you should encourage the use of spotters. This serves two purposes; to provide practice for the spotters and increase the communication between spotter and driver. At times it may be acceptable to allow backing without spotters to illustrate how much more difficult the task is without them.

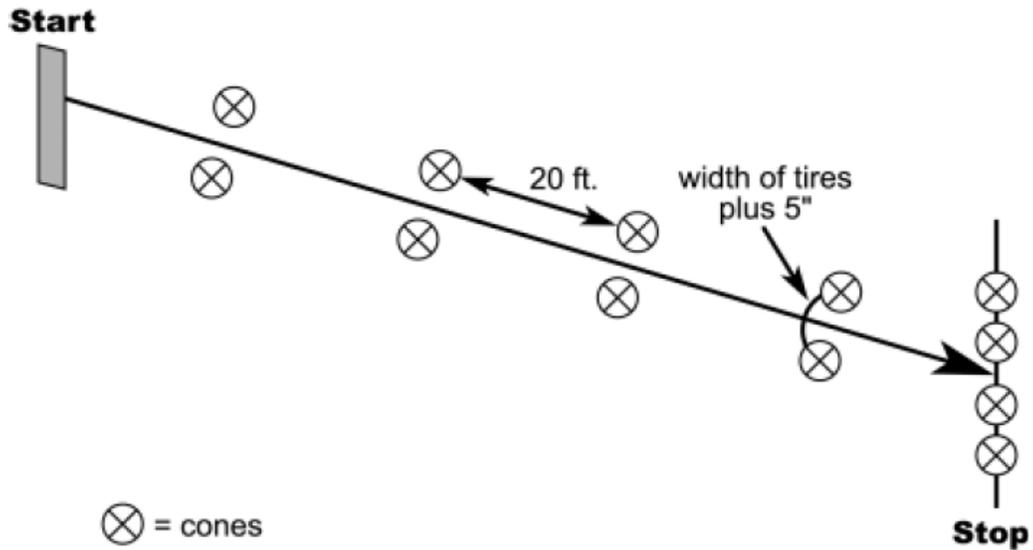
DIMINISHING CLEARANCE COURSE

The driver must move truck through this 75 foot lane without touching the cones. Fifty feet beyond the last cone the driver must stop with the front bumper on the stop line.



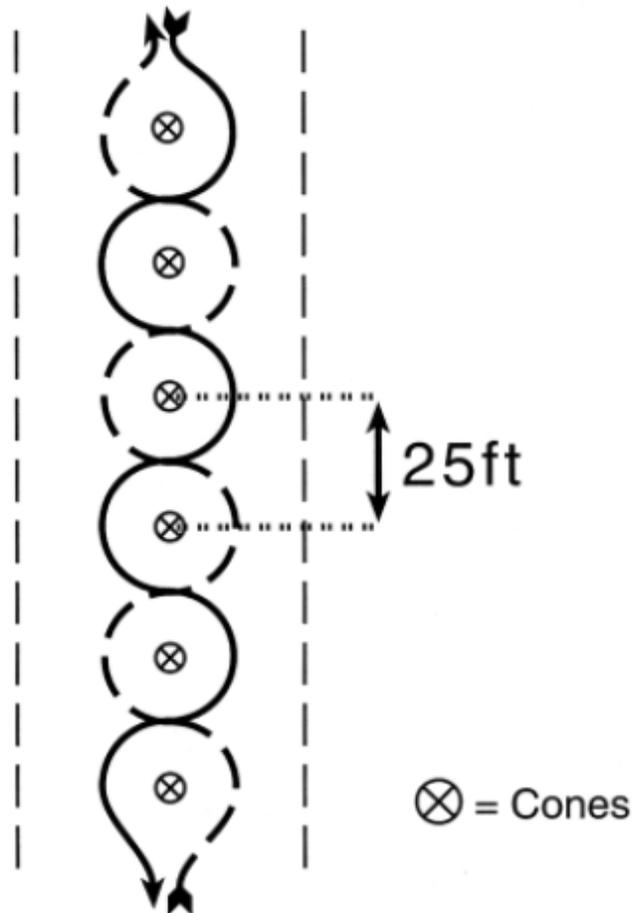
STRAIGHT LINE DRIVING COURSE

Driver must steer truck between two rows of cones spaced every 20-feet. The direction of the run will be slanted so the driver must judge his distances and direction by the cones as guides. A minimum of 100-feet will be used and the driver must accelerate and shift through the gears without stopping. At the end of course driver must stop vehicle without hitting stop line cones.



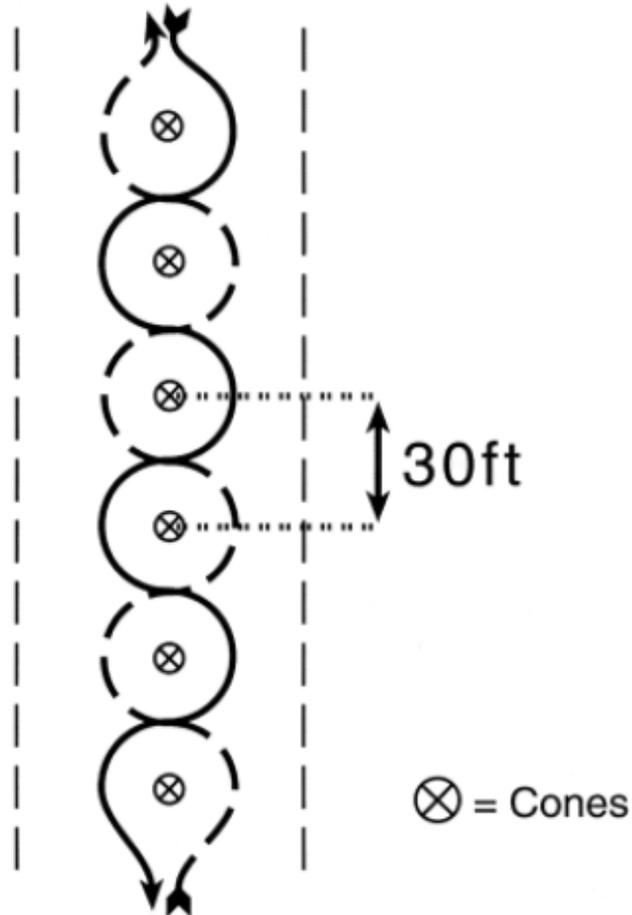
SERPENTINE
Type 6 Engine

The student will begin at the start point that the evaluators have set up. They will proceed up the right side of the row of cones. At the first cone while driving forward the student will alternate passing to the left of the first cone, then right of the second cone and so forth past the last cone. The student will then align the engine and reverse through the course, backing to the right of the first cone, left of the second cone, etc. The student is allowed to stop and align the engine only at the stop/start points. The student should not run over any cones.



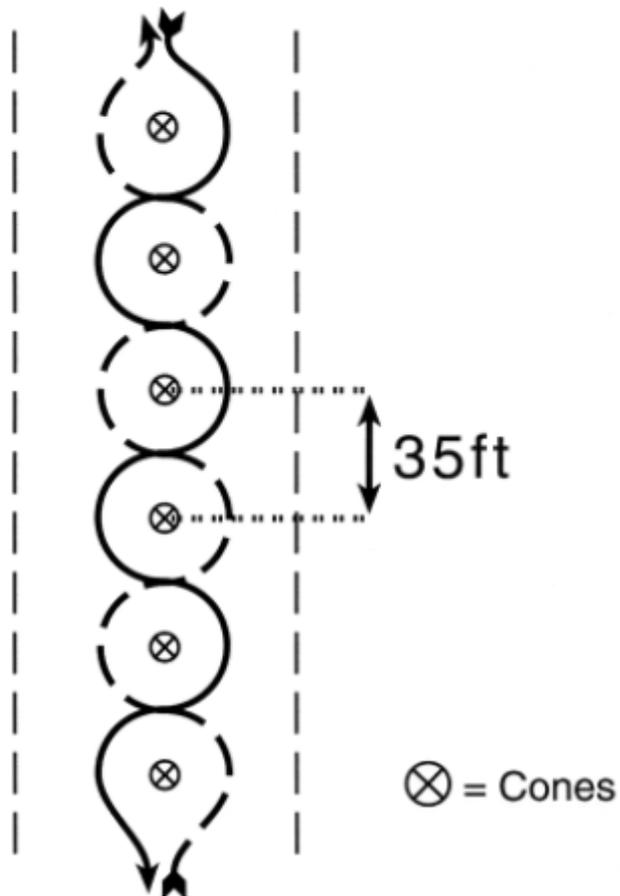
SERPENTINE
Type 4 Engine

The student will begin at the start point that the evaluators have set up. They will proceed up the right side of the row of cones. At the first cone while driving forward the student will alternate passing to the left of the first cone, then right of the second cone and so forth past the last cone. The student will then align the engine and reverse through the course, backing to the right of the first cone, left of the second cone, etc. The student is allowed to stop and align the engine only at the stop/start points. The student should not run over any cones.



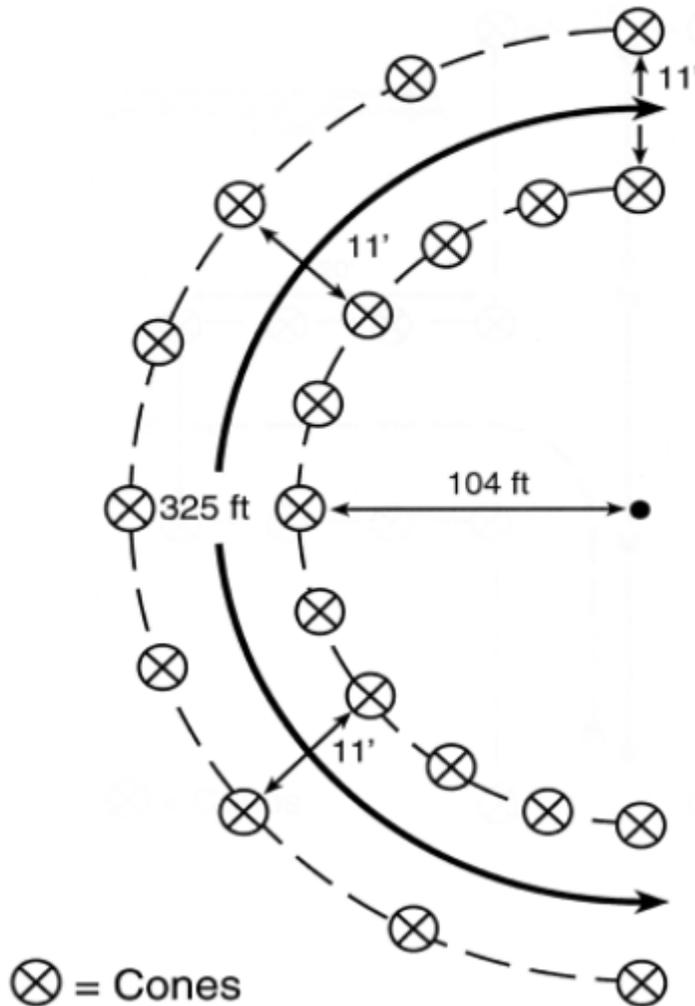
SERPENTINE
Type 4 Engine - Six Pack

The student will begin at the start point that the evaluators have set up. They will proceed up the right side of the row of cones. At the first cone while driving forward the student will alternate passing to the left of the first cone, then right of the second cone and so forth past the last cone. The student will then align the engine and reverse through the course, backing to the right of the first cone, left of the second cone, etc. The student is allowed to stop and align the engine only at the stop/start points. The student should not run over any cones.



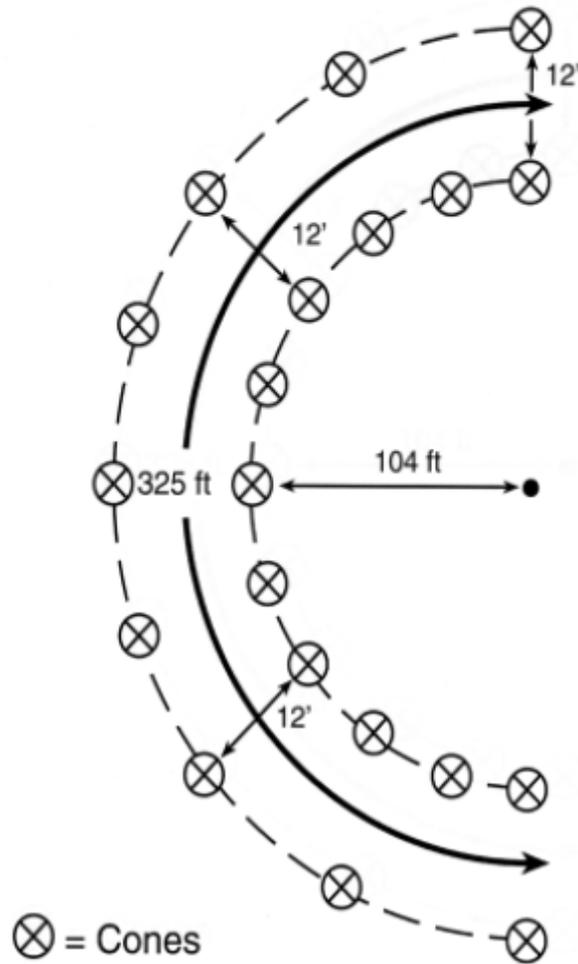
CURVE BACKING LEFT AND RIGHT
Type 6 Engine

For this exercise, the student will back the engine to the left through the curve. The student will then turn the engine around and back through the curve to the right. The curve should be 325 feet long. Eleven cones should be used on the inside of the curve. The radius dimension to the inside curve is 104 feet.



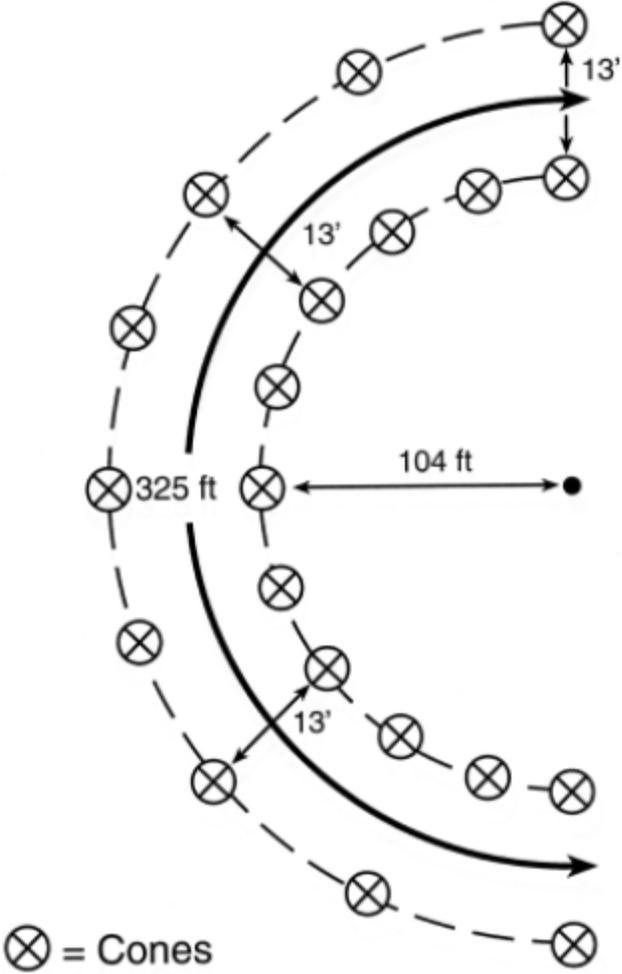
CURVE BACKING LEFT AND RIGHT Type 4 Engine

For this exercise, the student will back the engine to the left through the curve. The student will then turn the engine around and back through the curve to the right. The curve should be 325 feet long. Eleven cones should be used on the inside of the curve. The radius dimension to the inside curve is 104 feet.



CURVE BACKING LEFT AND RIGHT
Type 4 Engine - Six Pack

For this exercise, the student will back the engine to the left through the curve. The student will then turn the engine around and back through the curve to the right. The curve should be 325 feet long. Eleven cones should be used on the inside of the curve. The radius dimension to the inside curve is 104 feet.



MODULE 3

Unit 7

Vehicle Control Tasks (Urban, Suburban, or Rural)

Unit 8

Off Road Driving Tasks

OBJECTIVES:

Unit 7

1. Demonstrate the acceptable operation of a vehicle through a predetermined route or course representative of expected driving surfaces which incorporates the following maneuvers:

- Enter and exit a limited access highway and execute lane changes.
 - On a rural road, drive through two kinds of curves.
 - The student's performance will be evaluated in accordance with a performance checklist.
2. Explain the relationship of momentum and inertia to vehicle size and speed.
3. Explain how to mitigate centrifugal forces when negotiating curves.
4. Explain the purpose of the two second rule for determining following distance.

Unit 8

1. List seven of the ten hazards encountered while driving off-road.
2. Develop a Go/No-Go checklist for off-road driving.
3. Demonstrate the proper driving techniques while negotiating selected poor traction conditions listed in this unit and explain precautions the operator needs to take.

PERFORMANCE OBJECTIVES:

Demonstrate the acceptable operation of a vehicle through a predetermined route or course representative of expected driving surfaces, which incorporates the following maneuvers. Enter and exit a limited access highway and execute lane changes. On a rural road, drive through two kinds of curves.

Demonstrate the proper driving techniques while negotiating selected poor traction conditions listed in this chapter and explain precautions the operator needs to take.

The student's performance will be evaluated in accordance with a performance checklist.

INTRODUCTION:

The following units will be presented entirely as field exercises. While students are expected to know and understand the evaluation tasks and criteria as stated in this unit, it will not be presented in a formal classroom setting. Students are expected to explain how different forces affect their vehicle handling capabilities while driving through the predetermined courses and routes. The evaluation forms used for these field exercises are found in Appendix B. Students will be evaluated while driving and any deficiencies will be noted on evaluation forms. It is the responsibility of the home unit to review evaluation forms and ensure that drivers needing additional training receive it.

VEHICLE CONTROL TASKS / EVALUATION CRITERIA

It is important that you understand the forces you are dealing with that will make control of your vehicle a challenge. As an operator of a fire vehicle it is likely that your vehicle will not respond in the same way as normal vehicle.

Your vehicle will likely be larger, take longer to stop, have a higher center of gravity, or be hauling heavy loads of water, and demand more skill to control.

I. MOMENTUM AND INERTIA

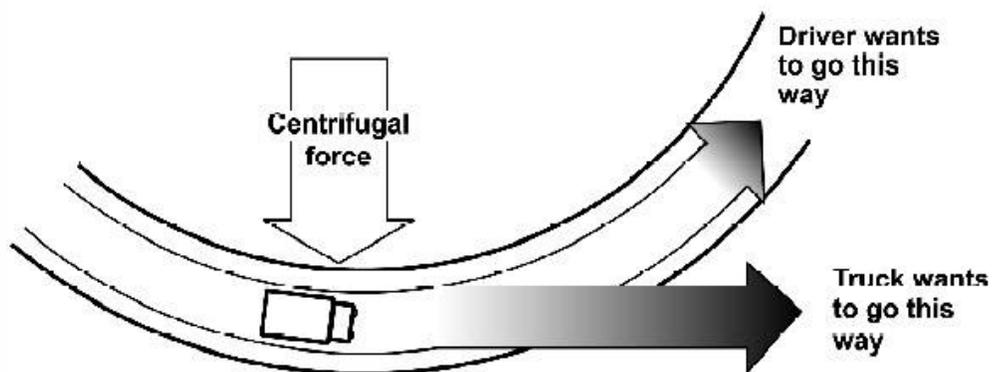
A. Momentum is defined as the product of a vehicle's mass, or weight times its velocity or speed.

B. Inertia is defined as the force that makes a moving truck tend to stay in motion in the same direction.

C. Momentum and inertia both increase as the size of the vehicle gets larger and heavier.

II. CENTRIFUGAL FORCE

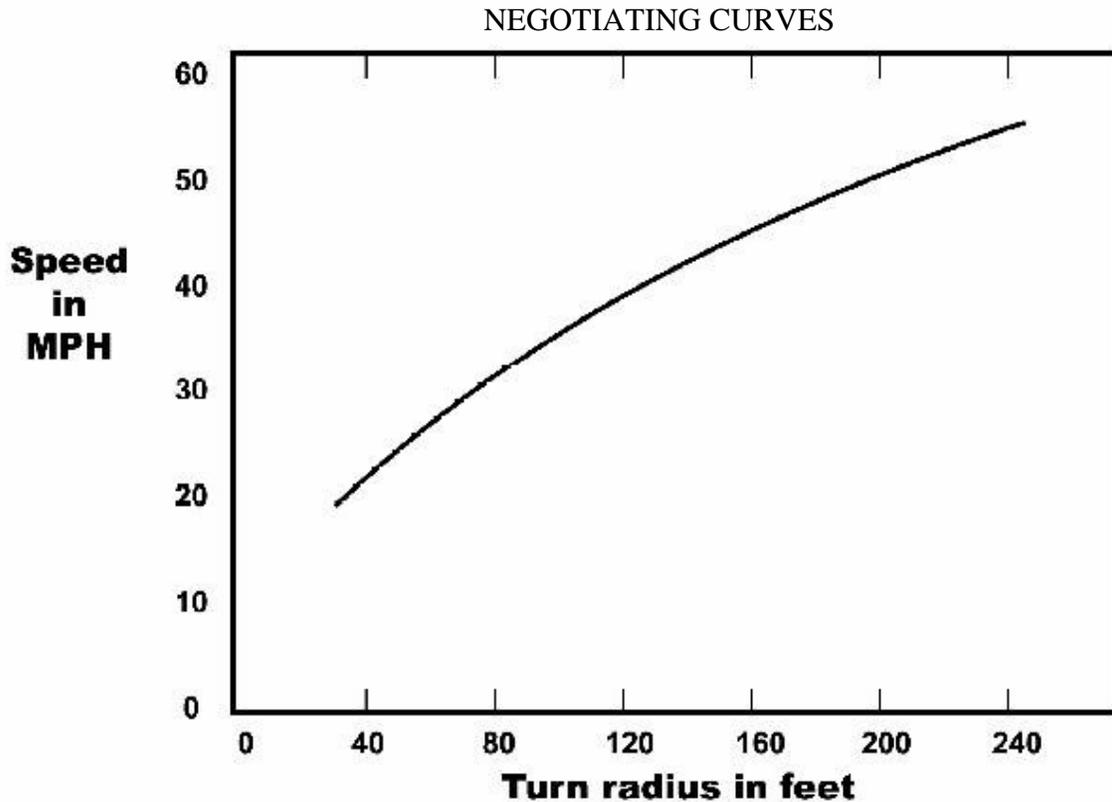
A. Centrifugal force is defined as the force that tends to push a vehicle traveling around a curve away from the center of the turning circle.



B. Centrifugal force is influenced by two things; speed and the radius of the curve.

1. The faster the vehicle is moving, the greater the centrifugal force on the truck.
2. The tighter the curve or smaller the radius, the greater also are the effects of centrifugal force.

3. Entering a tight curve without preparing by slowing down could cause the vehicle to leave the road.



III. FOLLOWING DISTANCES

A. What is a safe following distance?

An operator of a fire vehicle is following at a safe distance if they can:

1. Stop without mishap if the vehicle in front comes to a sudden stop.
2. Take evasive action (steer around) to avoid a mishap if the vehicle in front comes to a sudden stop.
3. Determining a safe following distance:
 - An appropriate following distance will allow enough time to come to a complete stop if the lead vehicle panic stops (stops as fast as possible by braking). Therefore, safe following distance is greater than the distance required for reaction time, but less than the total stopping distance.
 - $\text{Speed (MPH)} \times 2 = \text{Minimum Following Distance (ft)}$

4. The Two Second rule

- a. A rule of thumb that works at different speeds and allows two seconds of separation between the vehicle ahead and the fire vehicle.
- b. Three seconds is a lot safer.
- c. Begin counting when the vehicle ahead passes a marker on or beside the road. Stop counting when your vehicle passes the same marker.
- d. Increase following distance by one second if:
 - The vehicle ahead is unusual.
 - Driving a large engine with water.
 - Condition of your vehicle is suspect, e.g., tires worn.
- e. Double following distance if:
 - Road surface is loose or slippery (wet dirt or gravel).
 - Vision is obscured (rain, fog, dust, smoke).
 - Driver is not fully alert, tired.
- f. Triple the following distance if road surface is packed with snow or icy.

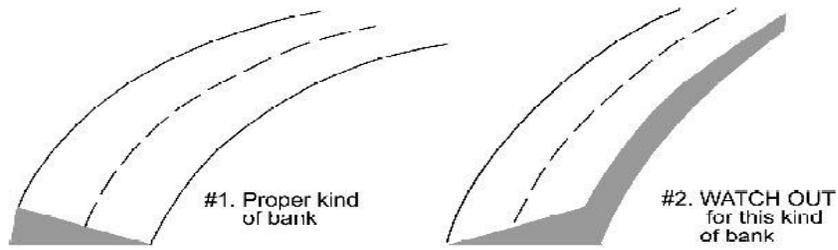
IV. NEGOTIATING CURVES

Centrifugal force increases by a factor of four when your speed doubles. If you enter a curve too fast the effects of centrifugal force could make your vehicle tip over or you could choose to give up on making the curve and drive off the road or into the on coming lane.

A. The tighter the curve the slower you're going to have to drive the vehicle.

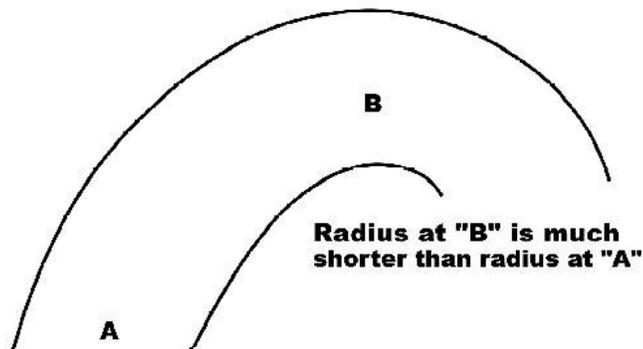
B. Curves banked to the outside (out sloped roads)

1. Exaggerates your weight transfer.
2. Greatly increases centrifugal force.
3. Dangerous

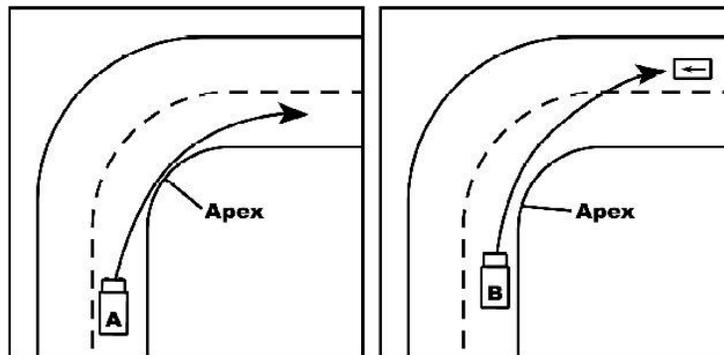


C. Decreasing radius curve

1. A curve that has a decreasing radius the further you get into it.
2. Your speed may be adjusted fine for the beginning of the curve only to find that you are going too fast to negotiate the end of the curve.



3. Commonly found in rural and forest road settings.
4. Operator must think about the entire curve when adjusting speed and setting up apex.



D. Establishing an Apex

The Apex is defined as the pointed end of something. For a curve it is the middle point, or pointed end and serves as a reference point for the driver to prepare for the turn.

1. Select correct speed.
2. Avoid braking in curve.
3. Enter curve as far to the outside radius (your turning arc) as possible.
4. Begin to turn as early as possible.
5. Establish an apex that matches the curve's apex when beginning the turn at the last part of the inside road edge or center point that can be seen from the entry point.
6. If your speed is correct your vehicle should feel good, solid, and stable through the curve. Slight acceleration halfway through the curve will help counteract centrifugal force.

V. DRIVING LIMITED ACCESS HIGHWAYS.

- A. Enter On-Ramp at posted speed.
- B. Do not enter highway at sharp angle.
- C. Move into acceleration lane using outside mirrors and left turn signal. Wait for clearing in traffic (200 to 300 feet depending upon conditions).
- D. Move into right lane and travel down straightway.
- E. Maintain safe following distance.
- F. Pass other vehicles using left lane, mirrors, turn signal at each point then move back to right lane. Visually check blind spot before initiating lane change.
- G. Reduce speed when approaching merging areas then accelerate.
- H. Use mirrors.

OFF-ROAD DRIVING TASKS / EVALUATION CRITERIA

I. BASICS OF FOUR WHEEL DRIVE

A. Four Wheel Drive (4WD) offers better traction when in adverse road surface conditions.

B. Engage 4WD only on road surface that will allow some slippage of wheels. Severe damage may result to your vehicle if you engage and operate your vehicle in 4WD on hard surface roadways.

C. Check the operators manual for your vehicle prior to using your 4WD system.

D. Generally 4WD is not that all 4 wheels are spinning to give traction. Usually only one wheel per axle will be pulling.

The tire that is the easiest to turn will get the power from the engine/drive train.

E. Manual Hubs versus Automatic Hubs

1. Manual hubs

a. You must physically turn the mechanism to lock in the hubs before 4WD can be engaged.

2. Shift out of 4WD prior to unlocking the hubs.

a. You may have to rock the vehicle to lock-in and unlock hubs.
b. Never use anything other than your hands to turn hubs.

3. Automatic hubs

a. Auto hubs only require you to shift into 4WD. Once you start moving the hubs will engage by themselves.

b. They engage by vacuum, cam lever, gear mechanism, or springs. Check your vehicle operator's manual.

c. Auto hubs may require you to back up several yards after you shift out of 4WD to disengage the hubs. Read your vehicle operators manual.

d. The gear mechanism inside the hubs can be made of plastic, Teflon or metal. These are small parts and can break easily. Limit rocking motion of vehicle if you get in a sticky situation.

4. Transfer Case (2WD, 4WD Low and 4WD High)

- a. The transfer case causes the power to flow from the engine and transmission, which normally goes to the rear axle but also can go to the front axle (4WD).
- b. In normal road operation the vehicle will be in 2WD. This allows for normal driving on roads and highways.
- c. 4WD High, which is the same gear ratio of 2WD, allows for higher speeds and vehicle control on dirt roads, slippery, snowy or roads that need a bit more traction.
- d. 4WD Low gives a much lower gear ratio for more control on difficult terrain. Most off road driving should be done in low range.

II. OFF-ROAD DRIVING PROCEDURE

A. Use spotters where appropriate.

1. Always use spotter if another person is available.
2. Where vision is obstructed or route is uncertain.
3. When backing up.
4. Make sure vehicle operator can see spotter at all times.
5. Operator and spotter need to be able to communicate either orally or by hand signal.

B. Go/No-Go Checklist

1. Operator needs to go through a personal Go/No-Go checklist prior to attempting to cross any poor traction or hazardous situations.
2. Items considered should include:
 - Can you safely cross this hazard?
 - If you cross the hazard once can you return on same path?
 - Is there another route you can use that is safer and easier on the environment?
 - Do you need to cross at this location?
 - If you get stuck or breakdown will you be able to get out of this location without any other assistance?
 - Have you scouted the path you are going to take?
 - Do you know what is on the other side of the hazard?

- If you decide not to continue what effect will it have on completion of your assignment?
- Does anybody know where you are? Do you have radio or cellular telephone communication?

III. TOOLS NEEDED WHEN OFF ROAD DRIVING.

A. Operator should ensure that the following minimum equipment / tools are in vehicle prior to driving off road:

- Shovel
- Chain w/hooks
- Jumper cables
- Recovery strap (3" X 30')
- Tool kit
- Axe or Pulaski
- Winch is operational if equipped
- Jack with board to stabilize

B. The above items are just the basics. Additional items should be considered such as:

- Emergency reflectors
- Tire chains
- Heavy duty gloves
- Radio or cellular phone
- Maps
- Blanket
- Pulley block
- Matches
- 2 or 3 "D" shackles
- Fusees
- Compass
- Winch accessory kit
- Food and water
- Extra fuel

IV. DRIVING THROUGH POOR TRACTION CONDITIONS.

A. Engage 4WD as soon as leaving established roadway.

B. Some vehicles do not engage as soon as shifted into 4WD. It may take 10 to 30 seconds for the 4WD to engage. If you are waiting until you come to a poor traction condition prior to engaging 4WD you may become stuck before your 4WD engages.

C. Less impact on environment.

D. Mud



1. Go/No-Go
2. Proceed slowly but steadily through mud.
3. Be aware of deep mud holes.
4. Walk and scout difficult section of road to make sure you can get through.
5. Probe mud holes for deep pockets, rocks, roots and other debris.
6. Clean mud hole of debris prior to entering.
7. Expect to slip and slide, do not oversteer.
8. You may want to put on tire chains prior to entering mud hole.
9. Back out before you really get stuck, if possible.
10. Remember to clean undercarriage and inspect drive train.
11. If forward progress is slowed try turning wheels back and forth quickly to transfer torque from one tire to another.

E. Sand

1. Go/No-Go
2. Proceed steadily forward, do not spin tires.
3. You may want to reduce tire pressure, possibly down to 10 psi. If you drop tire pressure, make sure to air back up prior to getting on hard surface. Slow speeds, less than 25 m.p.h., for short distances of two to four miles are okay to get to an air source.
4. Stop on a level or down hill area while in sandy soils.
5. Make wide, sweeping turns.
6. Do not spin tires and dig down to frame.

F. Gravel

1. Go/No-Go
2. Slow speeds
3. Poor traction
4. Dust/low visibility
5. Moguls/bumps may cause loss of control
6. Rough terrain
7. Allow suspension to move up and down with terrain by placing tires on level spots and avoiding moguls.
8. If vehicle is empty try softening the tires by letting a few pounds of air out. This gives good traction and better ride.
9. Expect rocks to tumble, logs to roll and soft ground to cause you to slip and slide.
10. Tire placement is very important when driving in rough terrain.
11. Look over hood down road. Do not drive with head out of window, trying to look down at wheels.
12. Keep picture of road in your mind, feel the road as the terrain goes by.

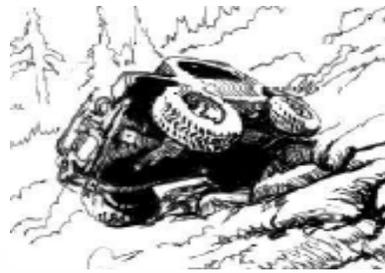
13. Know your undercarriage clearance. Know approach and departure angles.
14. Do not straddle rocks. Place tires on rocks or stumps.
15. Speed on rough terrain 5 to 10 m.p.h.
16. Keep vehicle as level and even as possible.
17. Use spotter.

G. Gullies/ditches/logs/windfall and culverts

1. Go/No-Go
2. Scout route first if uncertain.
3. Cross at a diagonal when possible.
4. This increases clearance and traction.
5. Proceed slowly.
6. Use spotter.
7. Ease in and power out.
8. Allow one tire at a time to cross obstacle while the other three help push and pull the other over.
9. Small gullies can be approached at less than 2 M.P.H. in first gear, 4-wheel drive, at right angle using foot brake to ease front wheels into and over the gully.
10. Whenever possible move logs, cut with axe or chainsaw or drag away.
11. If necessary, fill in with rocks, brush, dirt and wet down to solidify the aggregate before starting over.
12. Watch for branches, broken pieces, etc. kicking up and causing damage to the body parts or getting caught in drive train.
13. When traveling a road with gullies straddle .V. groove. If groove gets too wide you will have to drive down into gully. Keep vehicle as level as possible and centered over gully.



H. Side Hills



1. Go/No-Go
2. Avoid whenever possible
3. Beware of vehicle with high center of gravity (engines), center of gravity will change as water shifts in tank.
4. Watch for downhill holes, or uphill rocks and stumps that could exceed tilt degree.
5. Scout route
6. Use spotter
7. Avoid stumps and rocks on uphill side.
8. Less traction/control of vehicle
9. Do not overreact. Vehicles tend to slide before they roll. If vehicle slides, stop--then figure out easiest and quickest way to level surface.
10. Keep tires straight, do not turn uphill unless to follow tracks.
11. Stay on established roadways.
12. Do not turn around on side hill. Back vehicle down to level surface.
13. Do not attempt to side hill with high profile vehicle.
14. Steep terrain

I. Climbing hills

1. Go/No-Go
2. Scout route for hazards
3. Deep ruts
4. Hidden objects
5. Turn around spot on top of hill
6. Surface conditions
7. Estimate slope
8. Drive straight uphill
9. Low range 4WD
10. Start out in low gear
11. Slow and steady
12. Don't spin tire
13. Just enough power to get up hill



J. Descending Hills

1. Go/No-Go
2. Scout route for hazards
3. Deep ruts
4. Hidden objects
5. Dead end at bottom, nowhere to go
6. Turn around spot
7. Estimate slope
8. Go straight down hill
9. Low range 4WD, do not shift gears
10. Easy on brakes, just enough to maintain desired speed and RPM range.

K. Negotiate Water Hazards

1. Go/No-Go
2. Scout route
3. Spotter
4. Water depth
5. Cross where others have crossed
6. Stream bed is:
 - a. Rock and gravel
 - b. Boulders
 - c. Mud or sand
7. The possibility of vehicle engine swallowing water exists. Note where air intake is during inspection.
8. If possible do not go into water or mud over top of tires.
9. Make sure you can get out of other side and current is not too swift.
10. Once out, remember brakes are wet and give them time to dry out. You may apply light pressure to brakes to help them dry out faster.
11. If vehicle stalls in water and possibly swallows water do not restart engine as this could damage it. Remove vehicle from water using recovery methods, winching, pulling or pushing.
12. Take care to minimize damage and disturbance to stream bank and bed.



L. Negotiate brush, trees, sagebrush, etc., w/o damaging vehicles.

1. Go/No-Go
2. Use spotters
3. Proceed slowly
4. Scout route
5. Engage 4WD
6. Special hazards
7. Animals - Alive or dead
8. Cultural sites

M. Protecting the Environment

1. Tread Lightly Policy

- Travel only on existing rights of way.
- Respect the rights of other land users.
- Educate yourself by knowing where you are going, and complying with signs and barriers.
- Avoid stream banks, lake shores, meadows, wildlife. Ford streams at designated crossings.
- Drive and travel responsibly to protect the environment and conserve wildlife.

V. POST TRIP INSPECTION

A. After returning to hard surface check vehicle.

1. Disengage 4WD
2. Rocks between dual tires
3. Damage to body
4. Damage to undercarriage
5. Leaking fluids
6. Tire damage
7. Debris in undercarriage
8. Hanging wires

STUDENT REFERENCE

Stopping and Restarting on a Steep Incline

Standard Transmission

1. Use emergency brake to hold vehicle.
2. Put vehicle in lowest gear (4 low should be used).
3. Lift clutch until it tries to engage using idle of motor only. Do not lift all the way (like riding the clutch). This will feel like the vehicle wants to move forward. Hold the clutch in this position.
4. Take foot off the brake pedal.
5. As the clutch engages, and starts to move the vehicle forward, release the emergency brake and lift clutch slowly.
6. The vehicle will move in idle.
7. Then increase RPMs. SLOWLY...

Automatic Transmission

1. Use emergency brake to hold vehicle.
2. Put vehicle in lowest gear (4 low should be used).
3. Press the accelerator until the transmission tries to engage (without using the brake pedal). This will feel like the vehicle wants to move forward.
4. As the transmission engages and starts to move the vehicle forward, release the brake.
5. As the vehicle moves increase the engine RPM.
6. This procedure will put less stress on running gears and drive train.

Appendix A

PHYSICAL FITNESS INQUIRY FOR MOTOR VEHICLE OPERATORS

1. Name (Last, First, Middle)	2. Date of Birth (Month/Day/Year)	3. Title of Position
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4. Home Address (Number, Street or RFD, City, State & Zip)	5. Employing Agency
--	---------------------

6. Have you ever had or have you now (Place a check at left of each item)

Yes No	Yes No
<input type="checkbox"/> <input type="checkbox"/> Poor vision in one or both eyes	<input type="checkbox"/> <input type="checkbox"/> Arthritis, rheumatism, swollen or painful joints
<input type="checkbox"/> <input type="checkbox"/> Eye Disease	<input type="checkbox"/> <input type="checkbox"/> Loss of hand, arm, foot, or leg
<input type="checkbox"/> <input type="checkbox"/> Poor hearing in one or both ears	<input type="checkbox"/> <input type="checkbox"/> Deformity of hand, arm, foot, or leg
<input type="checkbox"/> <input type="checkbox"/> Diabetes	<input type="checkbox"/> <input type="checkbox"/> Nervous or mental trouble of any kind
<input type="checkbox"/> <input type="checkbox"/> Palpitation, chest pain, or shortness of breath	<input type="checkbox"/> <input type="checkbox"/> Blackouts or epilepsy
<input type="checkbox"/> <input type="checkbox"/> Dizziness or fainting spells	<input type="checkbox"/> <input type="checkbox"/> Sugar or albumin in urine
<input type="checkbox"/> <input type="checkbox"/> Frequent or severe headaches	<input type="checkbox"/> <input type="checkbox"/> Excessive Drinking habit (Alcohol)
<input type="checkbox"/> <input type="checkbox"/> High or low blood pressure	<input type="checkbox"/> <input type="checkbox"/> Other serious defects or diseases
<input type="checkbox"/> <input type="checkbox"/> Drug or narcotic habit	

7. If you answer is "Yes" to one or more of the above questions, explain fully in this space, indicating date of original condition and current status:

8. (A) Do you wear glasses (or contact lenses) while driving?..... Yes No

(B) Do you wear a hearing aid?..... Yes No

PRIVACY ACT STATEMENT

Solicitation of this information is authorized by 40 U.S.C. 491 and 5 CFR Part 930 Subpart A, which require OPM to regulate Federal employees use of Government-owned or -leased motor vehicles. It is used to ascertain the physical fitness of Federal employees, whose jobs require authorization to drive Government-owned or -leased vehicles. It is also used in the renewal of authorizations for all such employees. Based on the information provided, employees may be referred for a medical examination before being granted an initial authorization for a medical examination before being granted an initial authorization or a renewal. The disclosure of this information is mandatory when an employee's job requires driving a Federal motor vehicle and is voluntary otherwise. However, failure to complete when requested may result in you not being permitted to operate a Government vehicle.

Certification: I certify that my answers to the above are full and true and I understand that a willfully false statement or dishonest answer may be grounds for cancellation of my eligibility or my dismissal from the service and is punishable by law.	9. Signature	10. Date Signed (Month, Day, Year)
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REVIEW AND CERTIFICATION BY DESIGNATED OFFICIAL

I certify that I have reviewed this physical fitness inquiry form and other available information regarding the physical condition of the applicant, and I have made the following determination:

- 1. There is no information on this form or otherwise available to indicate that the applicant should be referred for physical examination.
- 2. On the basis of items checked on this form or other information, this applicant must be referred for physical examination before authorized to operate a Government-owned or -leased motor vehicle or current authorization is renewed.
- 3. Items checked on this form or otherwise available do not warrant referral for medical examination because of the following facts:

Signature of Designated Official	Date Signed (Month, Day, Year)
----------------------------------	-----------------------------------

**US Department of the Interior
Bureau of Land Management
Motor Vehicle/Special Equipment Authorization**

Applicant's Name:

Title:

Office Code:

Sex: Date of Birth: Hair Color: Eye Color: Height: Weight: Social Security Number:

Current Driver's License:

State: _____ Number: _____ Issue Date: _____

Expiration Date: _____ Class of License and Endorsements: _____

Is your License valid in the state you are domiciled? Yes _____ No _____

Applicant- Please Read

Severe penalties are provided for unofficial use of government-owned or leased vehicles by 31 U.S.C. 638 A(c)(2) as follows: "....Any officer or employee of the government who willfully uses or authorizes use of any government-owned motor vehicle or aircraft, for other than official purposes or otherwise violates the provisions of this paragraph shall be suspended from duty by the head of the department concerned, without compensation, for not less than one month, and shall be suspended for a longer period or summarily removed from office if circumstances warrant."

The term "official purposes" does not include the transportation of officers and employees between their domiciles and places of employment except in the cases of officers and employees engaged in field work the character of whose duties makes such transportation necessary and such transportation has been approved by officials authorized to do so.

Affidavit

I certify that my answers above are full and true, and I understand that a willfully false statement or dishonest answer to any question may be grounds for cancellation of my eligibility or my dismissal from the service and is punishable by law. I also certify that I will comply with the rules and regulations governing the use of government-owned and leased motor vehicles and equipment. I will inform my supervisor if my state driver's license is suspended or revoked.

Signature of Applicant

Date

To Be Completed by Supervisor

Types of Vehicles/Special equipment authorized to use (Supervisor initial):

Passenger Vehicle:	15 passenger and under:	*over 15 passenger
Truck:	2X4:	4X4:
Trailer Towing:	Under 26,000 GVWR:	*over 26,000 GVWR:
Haz Mat Endorsement:	*Motorcycle:	**ATV:
Backhoe:	**Forklift:	Snowmobile:
Motorboat:	Bulldozer:	Other (specify):

* Must conform with applicable state laws for licensing; no checklist is required.

**Must have BLM-specific training prior to certification.

Restrictions (non off-road use of 4X4, etc.)

The applicant is authorized to operate a government-owned or leased vehicle or special equipment while in the performance of his/her official duties, provided he/she has a valid state driver's license in possession at all times while driving.

I certify that I have reviewed available fitness information regarding the physical fitness condition of the applicant and that I have determined there is no information on this or any form to indicate that the applicant should be referred for physical examination.

I certify that I have received information from an examiner as to the abilities of the applicant to operate the vehicles/special equipment above if I requested an examiner to evaluate the applicant's ability to operate the vehicles or equipment.

Signature of Supervisor:

Title:

Date:

Appendix B - Performance Evaluation

This booklet serves as a guide for the observed performance of the student during the field exercise portion of the Driver Training Course. The intent of this booklet is to ensure that the student has an opportunity to practice driving techniques that will enhance the safety and efficiency of the operator when operating under field conditions. Much of the learning will take place when interacting with the qualified instructor/coach during the field exercises. As training is an ongoing process, it is up to the supervisor at home to read through this document and discuss any recommendations offered by the instructor(s)/coach(s) and where appropriate offer additional opportunities for the student to continue to build proficiency in driving.

Student's Name _____

Vehicle Model _____

Supervisor's Name _____

Evaluator _____

Unit 5 Field Evaluation

Performance Checklist

Standards

Evaluator's Remarks Pass, Needs More Practice

1. Student rates vehicle general condition as in service, out of service, or in service with minor service needed. Makes proper notation on Fire Engine Maintenance and Procedure record or similar inspection form.

2. Student checks all fluids under the hood on vehicle and services items as needed to ensure vehicle is serviceable. Determines, through inspection, problems with fluids that will take vehicle out of service.

3. Exterior lights, tires (tread, sidewalls, pressure) wheel rims and doors will be rated as either OK or FIX on the inspection form

4. All under the hood hoses and belts will be checked for wear, frays, tension, or cracks and rated as either OK or FIX on the inspection form.

5. Cab's interior cleanliness, seat belts, gauges, turn signals, windshield wipers and washers, radios, mirrors, siren and interior lights will be rated as either OK or FIX on the inspection form.

6. All equipment required per unit/agency regulations inspected and rated as OK or FIX on the inspection form.

Evaluator _____

Vehicle type _____

Unit 6 Field Evaluation

Performance Checklist

Standards

Evaluator's Remarks Pass, Needs More Practice

1. Completes safety circle inspections prior to starting vehicle. Checks for leaks, secures cabinets/equipment, visually checks tires, windows, mirrors and removes chocks. Inside cab adjusts seat, mirrors, seat belts, starts vehicle and checks gauges.

2. Drive a fire vehicle in a straight line in both forward And reverse without hitting the stop-line cones.

3. Drive a fire vehicle through a diminishing clearance course without hitting the boundary cones.

4. Drive a fire vehicle through a serpentine course in both forward and reverse without hitting the boundary cones.

5. Drive a fire vehicle into a dock in reverse without hitting the boundary indicators.

6. Drive a fire vehicle through an offset alley course without hitting the boundary indicators.

7. Drive a fire vehicle through a continuous curve course in both forward and reverse without hitting the boundary indicators.

Evaluator _____

Vehicle type _____

Unit 7 Field Evaluation Highway Exercise

Performance Checklist

Standards

Evaluator's Remarks Pass, Needs More Practice

1. Driver enters ramp at posted speed.

2. Does not enter highway at sharp angle.

3. Moves into acceleration lane using outside mirrors and left turn signal.

4. Waits for clearing in traffic.

5. Maintains safe following distance.

6. Passes other vehicles using left lane, mirrors, turn signal at each point then moves back into right lane.

7. Slows down when approaching merging areas.

8. Uses mirrors and right turn signal when approaching deceleration lane then decelerates in lane.

9. Does not make last minute turnoff.

10. Follows posted safe speed for off-ramp.

Other Remarks

Evaluator _____

Vehicle type _____

Unit 7 Field Evaluation Rural Road Exercise

Performance Checklist

Standards

Evaluator's Remarks Pass, Needs More Practice

1. Maintains safe following distance.
(Driver explains process used to establish distance).

2. Drives through a medium radius curve. *(Driver explains to observer braking and shifting method, speed used and feeling of truck while in curve and exiting actions.)*

3. Enters, drives through and exits a tight radius curve. *(Driver explains to evaluator braking and shifting methods, speed used, use of the apex, feeling of vehicle while in curve.)*

4. Enters, drives through and exits a decreasing radius curve. *(Driver explains to evaluator braking and shifting methods, speed used, feeling of vehicle while in curve and exiting actions.)*

Other Remarks

Evaluator _____

Vehicle type _____

Unit 8 Field Evaluation Uphill, Sidehill, Downhill

Performance Checklist

Standards

Evaluator's Remarks

Pass, Needs More Practice

1. The path of the truck will be walked over by the driver before starting to determine location of rocks, brush, soil condition and steepness of slope. (Driver will make Go/No Go decision.)

2. The vehicle will be started at all times in 4-wheel drive low range on the transfer case.

3. Coordinate release of manual brake when vehicle has power to the wheels. (If manual transmission, brake and clutch release will be coordinated to avoid snapping or slipping of transmission.)

4. Transmission will be kept in first gear until level ground is reached.

5. Vehicle will not be allowed to coast downhill out-of-gear.

6. Vehicle will not be driven on a sidehill with a slope exceeding the safe operating capacity of the vehicle.

7. Chock blocks will always be placed behind downhill tires with manual brake set when driver leaves seat.

Evaluator _____

Vehicle type _____

Unit 8 Field Evaluation Driving Across Hazards

Performance Checklist

Standards

Evaluator's Remarks

Pass, Needs More Practice

1. Driver assesses hazard by scouting and making GO/NO GO decision.

2. Established trails through woods and over sandy, rocky terrain will be followed with smaller saplings centered on front bumper and with outside spotter/guide.

3. Gullies will be scouted with outside guide/spotter and, if necessary, filled in with rocks, brush, dirt and wet down to solidify the aggregate before starting over the hazard.

4. Small gullies will be approached at less than 2 m.p.h. in first gear, 4-wheel drive, at right angle using foot brake to ease front wheels into and over the gully.

5. Small streams/riders will be forded with outside guide in front of vehicle, in first gear and 4-wheel drive at no more than 2 m.p.h. Brakes will be dried after crossing.

6. Post inspection will be completed on vehicle before leaving off road area inspecting for sticks in undercarriage, rocks in duals, grass debris on catalytic converter.

Evaluator _____

Vehicle type _____