

INTERLOCAL AGREEMENT BETWEEN THE CITY OF LAS VEGAS AND THE
LAS VEGAS METROPOLITAN POLICE DEPARTMENT REGARDING THE USE
OF SURPLUS VEHICLES BY THE LAS VEGAS FIRE DEPARTMENT FOR
DRIVER TRAINING

This Agreement is made by and between the City of Las Vegas ("City"), a political subdivision of the State of Nevada and the Las Vegas Metropolitan Police Department ("Metro"), a police department organized in accordance with the provisions of NRS 280 on this ____ day of _____, 2010. The City and Metro may be hereinafter each be referred to individually as a Party or collectively as the Parties.

RECITALS

1. Las Vegas Fire and Rescue ("LVFR"), a department of the City, conducts an Advanced Driver Training ("ADT") program for its firefighter employees, but needs vehicles to conduct such training. Attached hereto at Exhibit 1 is a copy of the ADT program guidelines.
2. Metro regularly decommissions its vehicles, and sells such surplus vehicles at public auction.
3. Fire requested from Metro the use of such surplus vehicles prior to sale at auction for the ADT program, and Metro has agreed to provide such vehicles for driver training purposes only.
4. Nevada Revised Statutes 277.180 provide that two or more public agencies may enter into an interlocal agreement for the joint use of resources for the promotion of the safety, welfare and property for those governed by and protected by the Parties.

NOW, THEREFORE, in consideration of the mutual terms, conditions and covenants hereinafter set forth, the Parties agree as follows:

AGREEMENT

I. Metro to Provide Surplus Vehicles to LVFR.

To assist with proper firefighter driver training, Metro agrees to provide surplus vehicles to LVFR pursuant to the terms of this Agreement. LVFR acknowledges and agrees that any vehicles provided by Metro are for use in the ADT program only, and such vehicles shall not be used for any other purpose. LVFR use of a Metro vehicle for any purpose other than the ADT program is a breach of this Agreement.

II. Surplus Vehicles.

- A. A surplus vehicle is a vehicle for which Fleet Operations has received a replacement vehicle and the vehicle is scheduled to be sold at the next scheduled auction. Upon written request by LVFR, Metro shall furnish one or more surplus vehicles for the LVFR ADT program for a duration not to exceed the next scheduled vehicle auction.
- B. Metro's Director of Fleet Operations shall warrant in writing that it is not aware of any known current operational or safety issues concerning the mechanical, electrical, or hydraulic systems of any surplus vehicles furnished to LVFR, and that any vehicle furnished to LVFR has been maintained in accordance with the manufacturer's recommended maintenance schedule.
- C. Metro and LVFR personnel shall each inspect the tires on any vehicle to be furnished to LVFR for this program prior to using the vehicle in the ADT program. Such employees shall certify that each of the four tires have at least a consistent 4/32 of an inch of tread across the width of each tire. If a tire or tires do not meet these criteria, such tires must be replaced by LVFR or the vehicle must not be used in the ADT program.
- D. The Parties shall draft a standard form, to document in writing, the requirements of this section for each vehicle furnished to LVFR by Metro. This form shall include documentation of any damage to the vehicle prior to providing the vehicle to LVFR, and Metro shall take pictures of all four sides of the car and these pictures shall accompany such form. Such completed standard form shall accompany each vehicle when delivered to LVFR.
- E. Prior to using any vehicle in the ADT program, an LVFR employee shall review its standard form to verify that all above requirements for use are satisfied, and note any damage to the vehicle not otherwise documented by Metro. If all safety and maintenance requirements are not satisfied, LVFR shall not use such vehicle in the ADT program.
- F. LVFR agrees to return the vehicle in the same aesthetic condition upon which it received the vehicle from Metro. If the vehicle's paint or body was damaged by LVFR in any material fashion, the Parties shall discuss the extent of the necessary repairs and the City shall perform such repairs at its sole expense.
- G. LVFR agrees to return the vehicle in the same operational condition upon which it received the vehicle from Metro. If the vehicle's mechanical, electrical or hydraulic systems were damaged by LVFR in any **material** fashion, the Parties shall discuss the extent of the necessary repairs and the City shall perform such repairs at its sole expense prior to returning the vehicle to Metro.

If the vehicle is driven more than three thousand (3,000) miles during its use by LVFD, LVFD shall ensure that no additional regular maintenance as required by the manufacturer is necessary. If so, then LVFD shall perform such manufacturer-required regular maintenance at the City's sole expense prior to returning the vehicle to Metro.

- H. Metro is not required to incur any costs, whether in parts or labor, to make its surplus vehicles acceptable for LVFD ADT use if the available surplus vehicles do not meet the operational, safety or tire standards set forth herein.

III. Miscellaneous

- A. Term; Termination. Unless otherwise terminated upon thirty (30) days written notice by either Party, this Agreement will expire as of June 30, 2015. If terminated, LVFD shall immediately return any vehicles in its possession to Metro. If any of the vehicles are in need of maintenance or repair pursuant to the terms of this Agreement, the repairs shall be completed as soon as possible and returned to Metro.

- B. Indemnification of Metro.

Subject to the limitation provided by NRS Chapter 41, the City shall hold Metro harmless, and agrees to fully indemnify, pay any and all costs to defend and hold Metro, its officers and employees harmless from and against any and all claims, damages, losses, expenses, suits, actions, decrees, judgments, awards, attorneys' fees and court costs for any claims against Metro by any party based upon damages, loss or injuries sustained due to any vehicle furnished to the City by Metro for use in the ADT program while under the primary control of LVFR.

Notwithstanding the foregoing, the City shall be under no obligation to defend, indemnify or otherwise hold Metro harmless or pay Metro's costs of defense if any such claim, suit or action is a result, in whole or in part, of Metro's willful misconduct or its own negligence.

This indemnification shall survive any termination of this Agreement.

- C. Modification of this Agreement.

This Agreement may not be modified or amended except by written agreement, duly approved by the Governing Bodies of the Parties. Modification or amendment in any other form shall have no force or effect, and may not be relied upon by any person.

D. Notices.

Any notice, invoice, payment or delivery required under this Agreement must be submitted in writing and sent by U.S. Mail, or by hand delivery, and directed to the appropriate party as follows:

Metro: Director, Fleet Operations
4480 West Oquendo Road
Las Vegas, Nevada 89118

City of Las Vegas: Fire Chief – Las Vegas Fire & Rescue
500 N. Casino Center Blvd.
Las Vegas, NV 89101

E. Entire Agreement.

This Agreement constitutes the entire Agreement and understanding of the parties hereto and supersedes all other oral and written negotiations, agreements and understandings of every kind.

F. Breach/Dispute Resolution.

1. General Default Events: Opportunity to Cure. In the event of any noncompliance with any provision of this Agreement, the Party alleging noncompliance shall deliver to the other by certified mail a five (5) business day notice of default and opportunity to cure. The time of notice shall be measured from the date of certified mailing. The notice of default shall specify the nature of the alleged default and the manner in which it may be satisfactorily corrected, during which five (5) business day period the Party alleged to be in default shall not be considered in default for the purposes of the remedies for default as provided herein. If the default is corrected, then no default shall exist and the Party alleging the non-compliance party shall take no further action.
2. Default; Remedies. If a default exists pursuant to (F)(1), above, the non-complaint Party is in default, the Party alleging non-compliance may declare the breaching party in default and upon a declaration of default, the Parties must engage in dispute resolution as provided herein.
3. Dispute Resolution. Any dispute under this Agreement shall be resolved in the following manner. A Party may provide a written description of the disputed issue or breach of this agreement to the Deputy Fire Chief responsible for fleet operations and the Director responsible for fleet operations. The Deputy Fire Chief and Director shall meet in person

within seven (7) days of the submission of the writing to resolve the dispute between the Parties. If resolution of the issue does not occur, a Party may then send the same written description of the disputed issue to the Fire Chief and the Clark County Sheriff. The Fire Chief and the Clark County Sheriff shall meet in person within seven (7) days of the submission of the writing to resolve the dispute between the Parties. If the Parties cannot resolve the issue, the dispute must be brought before the Las Vegas City Council at their next available meeting and the Fiscal Affairs Committee for the Metropolitan Police Department for resolution. To the extent applicable, actual contract damages for any breach shall be limited by NRS 354.626.

G. Further Action

The parties hereto shall execute and deliver all documents, provide all information and take or forbear from all such action as may be necessary or appropriate to achieve the purpose of this Agreement

H. Applicable Law

This Agreement shall be governed by the laws of the State of Nevada.

I. Authority

This execution, delivery and performance of this Agreement have been duly authorized and approved by the required governing bodies or personnel of LVFD and Metro to bind the entities to this Agreement; and this Agreement constitutes a valid and binding agreement in accordance with its terms.

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IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the dates
set forth below:

LAS VEGAS METROPOLITAN
POLICE DEPARTMENT

By: _____
DOUGLAS C. GILLESPIE
SHERIFF

Date: _____

CITY OF LAS VEGAS

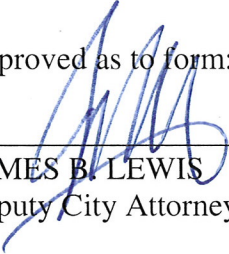
OSCAR B. GOODMAN

Date: _____

Attest:

BEVERLY K. BRIDGES, MMC
City Clerk

Approved as to form:



JAMES B. LEWIS
Deputy City Attorney

LAS VEGAS METROPOLITAN POLICE DEPARTMENT VEHICLE CONDITION REPORT

OFFICER(S)		P#	MILEAGE		FUEL (GAL)	OIL (QTS)	OK
			OFF				
			ON				
			TOTAL				

EVENT#: _____
 DATE: _____
 VEHICLE #: _____
 DISTRICT: _____

REDLINED

VEHICLE

- | | | |
|-----|----------------------|--|
| 1. | Interior | |
| 2. | Body | |
| 3. | Glass | |
| 4. | Mirrors | |
| 5. | Headlights | |
| 6. | Taillights | |
| 7. | Brake Lights | |
| 8. | Turn Signals | |
| 9. | Interior/Dash Lights | |
| 10. | Engine | |
| 11. | Transmission | |
| 12. | Brakes | |
| 13. | Suspension | |
| 14. | AC/Heater | |
| 15. | Steering | |
| 16. | Tires | |
| 17. | Drivetrain | |

EMERGENCY EQUIPMENT

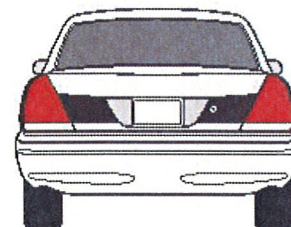
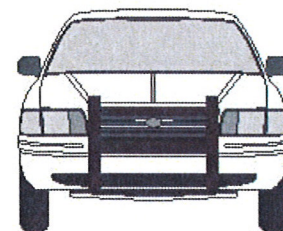
- | | |
|----------------|--|
| 18. Light Bar | |
| 19. Radio | |
| 20. Siren | |
| 21. Spotlights | |
| 22. Tracker | |
| Display _____ | |
| Receiver _____ | |

EQUIPMENT

- | | | |
|-------|--------------------|--|
| 23. | MCT | |
| 24. | Fire Extinguisher | |
| 25. | First Aid Kit | |
| 26. | Keys (2 sets) | |
| 27. | Flares | |
| 28. | Blankets | |
| 29. | Gas Card | |
| 30. | Traffic Cones | |
| 31. | Comm. Disease | |
| 32. | Teddy Bear # | |
| 33. | Shotgun | |
| <hr/> | | |
| 34. | Low Lethal Shotgun | |
| <hr/> | | |
| 35. | Roll-A-Tape # | |
| <hr/> | | |
| 36. | Stop Stick Kit | |
| 37. | Trauma Kit | |

SERVICE & SAFETY INSPECTION SCHEDULE

Last Inspection	Next Inspection
Date:	Date:
Mileage:	Mileage:



COMMENTS

LEGEND:

A • DIRTY B • WORN C • MISSING D • DAMAGED E • INOPERATIVE F • MALFUNCTION G • NOISY H • OTHER

	SUPERVISOR'S INITIALS
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EXHIBIT

1

Las Vegas Fire & Rescue
ADVANCE DRIVER TRAINING
PROGRAM
Lesson Plan

Rescue Operation

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Class Description

To provide a detailed and comprehensive driver training program for all fire department members with emphasis on safety and driving skills under all driving conditions, and to teach all vehicle operators to respond as quickly and correctly as possible in an emergency situation.

All exercises meet or exceed the standards set forth in NFPA 1002 Standard for Driver Apparatus and the Nevada Commercial Drivers License Program, and Advanced Driver Training programs.

All instructors for the course are certified through as Advanced Driver Training Instructors.

This thereby becomes the Standard for the Las Vegas Fire & Rescue (LVFR).

Learning Competencies

Vehicle and apparatus drivers must possess both driving skill and proper attitude in order to drive safely and professionally. Many drivers believe that years of experience will see them through every situation. However, experience alone is not enough. It must be supplemented by continuing education, classroom work, and "hands-on" driving.

Fire apparatus are not designed for high speed handling. A sports car will stop easier, sway less while turning, and handle better because it has less inertia to overcome due to it's lighter weight and low center of gravity. In learning to drive top-heavy apparatus, the driver must learn to compensate for the added inertia. This is accomplished by decreased speed, practice, increased awareness, as well as anticipation of traffic signals and the actions of others. Couple defensive driving skills with repetitive training in Advanced Driver Training techniques for collision avoidance and the driver will learn to avoid a critical situation by taking the proper action without conscious thought.

All of these exercises/maneuvers can and are used everyday by drivers of emergency vehicles. Below is a definitive reason for the use of each exercise and the learning competencies gained by each driver successfully passing the Driver Training Program through Las Vegas Fire & Rescue.

Serpentine - The serpentine exercise helps acquaint the driver with the vehicle's turning capabilities. The controls stressed in the exercise are basic to all driving situations. The purpose is to develop a sense of unity and control with the vehicle and learn proper timing of steering inputs (the relationship of a fixed object to that of a moving object). 9-3 hand positions,

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smoothness, timing, and throttle controls stressed in this exercise are the basics of Advanced Driver Training techniques.

Reverse Serpentine - Backing a vehicle through the reverse serpentine helps to acquaint the driver(s) to spatial references. In doing so, the driver learns smoothness, timing, rhythm and the use of outside and inside rear view mirrors.

Evasive maneuver - This is designed to teach an alternative to panic braking in an emergency situation. This exercise teaches that less distance is needed to steer a vehicle around an object than is used when panic stopping before striking it. This shows the maneuvering capability and stability of the vehicle while teaching the driver his or her own capabilities and limitations in making the maneuver.

Controlled braking - This helps the driver to develop the ability to achieve maximum braking while still being able to control the direction of the vehicle. During wheel lock up, inability to maneuver/steer the vehicle is experienced. This trains the driver to regain directional control of the vehicle as soon as possible after a skid/lock-up has occurred, return the vehicle back into the original lane, and stop before the vehicle enters a simulated intersection.

Hammerhead - Improving awareness of vehicle size, maneuverability in confined spaces, increase awareness of the vehicle turning radius, and the use of mirrors are all part of what the driver learns in the Hammerhead. This teaches the relationship of the vehicle with stationary objects. For Rescue drivers, this exercise represents the placement of vehicles in driveways, parking spaces, or alleyways necessary for patient transportation needs.

Offset Alley - The 12 foot alley from which the driver must enter/exit is arranged 12 feet out of line to the opposite 12 foot alley into which the vehicle must be driven. The purpose of the exercise is to test the driver's ability to maneuver the vehicle within a confined space. The driver must accurately judge the distance between the vehicle and the barriers and learn the position of the front and rear bumpers. After proceeding forward through the exercise, the driver will back through the offset alleys. The driver should be proficient enough at backing as to not hit any cones or have to reposition the vehicle.

Alley Dock - This teaches the driver to correctly position, back, and turn around a rescue. When driving a rescue, the driver must know the correct position of both the front and rear bumpers so as to be able to correctly place that vehicle into position when spotters are not available. The latter is not advisable; however there are times when it becomes necessary to do so and the driver must be able to demonstrate this without challenge.

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Zig-Zag – The zig-zag is a modified serpentine exercise that incorporates the use of additional cones and barrier piping to represent obstructions. In this exercise, the driver learns of the position and clearance of all parts of the vehicle. All barrier piping simulates apparatus door widths and vehicle heights. Wooden flags represent overhangs and obstructions at outside rear view mirror heights and above. The driver gains knowledge and understanding of apparatus turning radius while learning to use outside rear view mirrors. Steering inputs forward are different than that of reverse, because the steering components are in front as opposed to the rear. Compensations in turning radius must be made by the driver due to the differences.

Over-the-Road - In compliance with Nevada Commercial Motor Vehicle testing, drivers are evaluated on the skills they possess and are properly instructed in defensive driving. Defensive driving skills are to be used at all times so that the driver does not have to react to an incident using a collision avoidance maneuver. Drivers will be shown proper lane changes, stop points on roadway intersections, freeway, residential, and city traffic driving, proper use of mirrors and signaling, as well as spacing between vehicles during both code 1 and code 3 responses. The use and appropriate application of secondary braking systems and the Las Vegas Fire & Rescue Code 3 driving rules and regulations are discussed at this time. The driver must demonstrate the ability to back into alleyways, parking spaces, apartment complexes, and driveways as required by the instructor. The Over-the-road testing period is a pass/fail evaluation. The use of defensive driving skills during all facets of the evaluation period are mandatory by the driver and failure to exhibit any of these skills will mean loss of driving privileges on the Las Vegas Fire & Rescue.

Off-road Recovery - The purpose is to give the driver an understanding of the problems involved with, and to develop the driver's skills in making an off-road recovery over a curb or back onto the driving portion of the roadway at operating speeds. Too much steering input may cause the vehicle to cross over its lane into the adjacent one and possibly off the road on the other side before the driver can regain control of the vehicle. Not enough steering input will leave the vehicle on the shoulder possibly facing a parked car, bridge abutment or worse. This exercise teaches the driver to make a quick return to the roadway necessary to avoid a collision.

Wet Application Skid Control

- Non ABS and ABS or Anti-lock braking
- Incipient skid stopping
- Lane Change
- Split Coefficient stopping
- Alternate braking devices (Telma, Jake Brake, etc.)

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Responses of Emergency Vehicles are not always performed in ideal situations. Inclement weather conditions will always present an extreme hazard for drivers of large apparatus. Wet Application Skid Control teaches the driver the limitations of the apparatus he/she may be driving when faced with this situation.

As in the Controlled Braking, the driver develops the ability to achieve maximum braking while still being able to control the vehicle. Combine this with wet/slick surfaces and the attempt becomes almost senseless. Wheel lock up occurs almost immediately, therefore the driver must learn the reactions the apparatus will display when faced with the above scenarios. The driver will learn the proper action to take under these conditions and will react accordingly. Proficiency and competency of skills will be required. Speeds to start are random but progressive according to the skill level of each driver.

Resources Needed

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180	12" Cones
110	18" Cones
40	36" Cones
40	1"x 4' PVC pipe with couplings (tee and 90° elbow)
8	4"x 12" Wooden flags with adjustable clamps for pipe
16	18" Cones with wooden bases and support pegs for pipe
8	2 Channel radios
EA.	Closed course evaluation forms for each student
EA.	Over the road forms for each student
1	Student completion form for that day's training (To be used by the safety officer)

*15-20 acre driving pad consisting of 8" asphalt over an 8" lime stabilized base. Pad to have all exercises outlined for easy set up and removal.

*Pick/up - for safety officer to address the safety of the operation and for transportation of the equipment.

*Rescue - 1 for the over-the-road exercise.

*Rescue - 1 for each 2 students in ½ of the training class

*ABS equipped sedan - 1 for each 2 students in ½ of the training class

*Certified ADT Instructors – 1 for each 2 students

*Safety officer

Closed Course Outline

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Required Time Frame	Topic Outline	Teaching Aids and References
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Closed Course – Day 1

10 Min.	Driver Preparation	GM Training Manual
55 Min.	Serpentine Exercise (progressively 45', 55' and 60' starting with 45')	Course Drawings/Set-up, Course Validation, GM Training Manual
5 Min.	Break	
55 Min.	Evasive exercise (using progressive speeds of 2 mph starting at 25 mph)	Course Drawings/Set-up, Course Validation, GM Training Manual
5 Min.	Break	
55 Min.	Controlled Braking – using progressive speeds of 2 mph starting at 25mph	Course Drawings/Set-up, Course Validation, GM Training Manual
5 Min.	Break	
55 Min.	Offset Alley exercise (first forward than reverse)	Course Drawings/Set-up, Course Validation
5 Min.	Break	
55 Min.	Hammerhead exercise	Course Drawings/Set-up, Course Validation

Closed Course Outline

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Required Time Frame	Topic Outline	Teaching Aids and References
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Closed Course – Day 2

55 Min.	Zig-Zag exercise	Course Drawings/Set-up, Course Validation
5 Min.	Break	
20 Min.	Alley Dock exercise	Course Drawings/Set-up, Course Validation
5 Min.	Break	
35 Min.	Off-road Recovery (using Progressive speeds of 2 mph Starting at 30 mph)	Course Drawings/Set-up, Course Validation, GM Training Manual, NV CDL Manual

Over the road evaluations is only performed following the successful passing of the prior day's training and evaluations.

60 Min. (minimum)	Over the Road	Course Validation, NV CDL Manual
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Closed Course Outline

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Classroom – Day 3 – Wet Application Skid Control

20 Min. for each exercise	Non ABS and ABS or Anti-lock Braking using the following Exercises: - Evasive - Controlled Braking - Split Coefficient - Lane Change - Incipient Skid Stopping - Secondary Braking System (i.e. Telma, Jake, Allison retarder)	Course Drawings/Set-up, Course Validation, GM Training Manual
20 Min.	Circular Skid (radius turn maneuver) - begin at 25 mph progressing 2 mph until loss of control is reached through normal travel	Course Drawings/Set-up, Course Validation, GM Training Manual
60 Min.	Over the road evaluation	NDOT CDL Manual, LVFR Drivers Manual

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * The instructor will demonstrate all exercises before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

NARRATIVE

Driver Preparedness

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In vehicle set up:

- * Adjust seat for maximum freedom
- * Arms should be away while slightly bent
- * Hand placement @ "9-3"
 - Flat steering wheel-- "9-3" with a hand drop technique & hand over hand
- * Sit upright in the back of the seat
- * Adjust mirrors accordingly
- * #1 priority ----- SEAT BELTS
- * Heel of foot should be positioned so that the ball of the foot is used to depress the throttle or brake without lifting. Preferably beneath the right side of the brake pedal
- * Familiarize yourself with instrument panel

9-3" Hand Placement:

- * Provides greater maneuverability
 - Full 180-degree turn without moving hands
 - 85% of incidents can be corrected this way
- * Eliminates the frequent use of hand over hand steering
 - This leads to over-steering
- * Eliminates body lean or sway
 - Keeps driver upright
- * Placement of hands/fingers/arms
 - Hold with thumbs only - release fingers naturally when executing a maneuver
 - Stiff handling (arms) slows the steering effort

Exercise execution

Serpentine

1. I.D. the course (explain cone position and spacing)
2. Run parallel to the course
3. Set speed -- +/- 2 mph
4. NO BRAKING
5. Align with 1st cone -- 3-4 ft. out

6. Make a 90° (when driver feels he/she has cleared the cone)
 - * watch for correct 90°

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7. Full 180° turn using the hand drop technique and hand over hand
8. Space evenly on each cone
9. Will have to apply slight throttle pressure to keep speed up - due to cornering forces

Instructor Tips:

- The vehicle approaches the cones parallel to them and goes around the first cone as though it was in the middle of the course.
- Hand position remains at 9-3 using hand drop or hand over hand steering throughout the course, if physically possible.
- Steering movements are smooth, continuous and even in both directions.
- Speed is lost at each cone due to cornering. Throttle pressure must be increased to maintain a constant speed.
- Stay close to the cones. The student may have to knock some down in order to learn how to position the vehicle relative to them.
- Staying close to the cones keeps the vehicle in a straight a line as possible. This minimizes steering movement, which reduces the need to increase throttle pressure.
- Speed: For the first time student, 15 mph is fast enough. Maximum speed will depend on the space available and safety considerations. However, it is not necessary to exceed 25 mph to accomplish the goals of this exercise.
- As speed is increased, it will be necessary to steer sooner as the vehicle approaches the cones.
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong and show or tell the student how to make corrections
- Correct the student's errors as they happen. It may be necessary to talk them through the exercise.
- Operational Checklist:
 - ☞ Entry speed
 - ☞ Hand position
 - ☞ Position of vehicle at beginning of course
 - ☞ Closeness of vehicle to cones
 - ☞ Smoothness of steering
 - ☞ Use of throttle
 - ☞ Exit Speed

Common Errors:

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- Enters the course too fast
- Attacks the first cone at an angle rather than in a line parallel with the course
- Fails to maintain speed and/or changes speed abruptly
- Passes too far from the cones
- Steering errors:
 - ☞ Does not steer enough to avoid cones with the front of the vehicle
 - ☞ Steers too soon, striking the adjacent cones with the rear of the vehicle
 - ☞ Does not steer continuously and strikes the next cone with front of the vehicle

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * The instructor will demonstrate all exercises before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills is realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Reverse Serpentine

1. Begin at the left side of the first cone, parallel with the course, and begin backing.
2. Speed should remain comfortable and consistent.
3. As rescue begins to pass the first cone, the driver should make a safe and easy turn in the direction the rescue needs to go.
4. As the rescue passes the cone, the driver slowly corrects steering to return to straight
5. The driver should look to the opposite rear view mirror and note the position of the next cone.
6. Approaching the cone, the driver begins to turn the steering wheel in the direction needing the rescue to go.
7. As the rescue passes the cone, the driver slowly corrects steering to return to straight position.
8. When that cone leaves the view of the driver's mirror, the driver should then look to the opposite mirror or other side of the rescue and watch for the cone to come into view.
9. Repeat steps 3-8 until completion of the exercise.

Instructor Tips:

- The vehicle approaches the cones parallel to the exercise.
- Steering movements are smooth, continuous and even in both directions.

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- Stay close to the cones at approximately 3-4 feet. The student may have to knock some down in order to learn how to position the vehicle relative to them.
- Staying close to the cones keeps the vehicle in a straight a line as possible. This minimizes steering effort.
- Speed: What the student feels comfortable with, but at all times continuous
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong and show or tell the student how to make corrections.
- Correct the student's errors as they happen. It may be necessary to talk them through the exercise in the beginning.
- Operational Checklist:
 - ☞ Entry speed
 - ☞ Hand position
 - ☞ Position of vehicle at beginning of course
 - ☞ Closeness of vehicle to cones
 - ☞ Smoothness of steering
 - ☞ Exit speed

Common Errors:

- Enters the course too fast
- Attacks the first cone at an angle rather than in a line parallel with the course
- Fails to maintain speed and/or changes speed abruptly
- Passes too far from the cones
- Steering errors:
 - ☞ Does not steer enough to avoid cones with the rear of the trailer
 - ☞ Steers too soon, striking the adjacent cones with the rear of the trailer
 - ☞ Does not steer continuously and strikes the next cone with rear of the trailer.
 - ☞ Returns to straight to soon and strikes the original cone with the front of the rescue.
 - ☞ Provides too much steering.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques
- * The instructor will demonstrate all exercises before the student's practice and skills evaluations

- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate

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satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Evasive

1. I.D. the course (barrier cones)
2. Center vehicle in the 12' lane
3. On a cue of "Left" or "Right",
 - a. Release throttle
 - b. NO BRAKING
 - c. APPROX. 180° turn using the hand drop technique
 - d. Steer back APPROX. 180° using hand drop and hand over hand
 - * Quick snap of the steering wheel will correct any fish tail
 - e. Once committed - don't change mind
 - f. Use what steering is required to accomplish the task

Instructor Tips:

- The student may tend to guess the direction the instructor will call. It is more important to make the maneuver without striking cones than to go the called direction. If guessing is a problem to the extent that the student is not learning, it may be necessary to alter the procedures to meet the needs of the student.
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong and show or tell the student how to make corrections.
- Approaching the cue point, the student may tip off an unconscious intention toward one exit lane. Watch for shifting, leaning, or movement of the steering wheel, all in the intended direction. These cues can be used to make the exercise easier or more difficult, according to the needs of the students.
- Have the student obtain the desired speed as quickly as possible and then hold the throttle steady. This will allow them to concentrate on the driving tasks.
- Speed: 25 mph to start. Increase speed on approximately 2-3 mph increments as student goes through course without striking cones. Increase the speed until the limit of capability of the student is reached and/or the limitations of the vehicle.
- If a student strikes cones on two or three consecutive passes at the same speed, increase the distance of the cue until successful, then build up again.
- Slight variations from the desired speed can be compensated for by adjusting the timing of the cue.
- Operational Checklist:
 - ☞ Hand position
 - ☞ Speed
 - ☞ Location of cue cone
 - ☞ Student's movements: Hands, body, and feet

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- ☞ Timing of steering
- ☞ Cones struck
- ☞ Release of throttle
- To help keep the student from guessing the direction, it may help to have them concentrate on a fixed point some distance beyond the barrier rather than on the barrier itself.
- Correct the student's errors as they happen. It may be necessary to talk them through the exercise.

Common Errors:

- Steer in the wrong direction
- Starts to steer in the wrong direction and then tries to recover.
- Steering movements are too slow.
- Does not release the throttle or applies more throttle.
- Improper hand position - hand(s) moves to different position on steering wheel or does not complete a hand drop technique.
- Uses the brakes

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Controlled Braking

1. I.D. the course (barrier cones)
2. Set speed -- start at 25 mph
3. Decide ahead of time on the lane choice
4. Cue on a command of "NOW"

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5. Maintain foot position at all times before the "cue" command
6. On cue -- apply constant/even pressure on the brake pedal
 - a. The ball of the foot is the sensitivity point
 - b. If lock-up occurs - release slightly - DO NOT PUMP
 - * Locked wheels make controlled steering impossible
 - c. Brake and steer simultaneously - hand drop technique initially
 - * Hand over hand steering after passing the barrier
 - * Driver should be focusing on the stopping point
7. I.D. on-coming lane cones and return hand over hand to original lane
8. Stop with the entire rescue parallel with the course and the driver's shoulders equal with the exit cones before exiting

Instructor Tips:

- Controlled braking can be either accomplished with the right or left foot.
- Watch for foot and hand movements that are made before the cue is given.
- Speed: Range for effective teaching is 25-45 mph.
- Do not permit a left foot braker to cover the brake pedal with their left foot when that is not their normal highway driving habit.
- The cue distance can be shortened if the vehicle has not attained the desired speed at the normal cue point.
- Have the student attain the desired speed as quickly as possible and then hold the throttle steady.
- Watch the student throughout the maneuver. Inform the student of what they are doing right and wrong, and show or tell the student how to make corrections.
- It is important to reset the cones in the first barrier each time they are struck.
- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.
- Point out that, in making quick stops in a real situation, the driver needs to be aware of traffic behind them and not to block traffic unnecessarily by their braking action.
- Operational Checklist:
 - ☞ Speed
 - ☞ Hand position
 - ☞ Location of cue cone
 - ☞ Early foot movement

 - ☞ Early steering
 - ☞ Timing of steering and braking
 - ☞ Control of steering movement
 - ☞ Foot control while braking
 - ☞ Response of vehicle to steering and braking inputs

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☞ Cones struck

Common Errors:

- Locks the wheels and does not ease off the brake pedal to let the wheels roll again or releases the brake pedal completely.
- Does not brake soon enough.
- Anticipates the cue by moving a foot toward the brake pedal and/or by steering slightly.
- Forgets to brake, usually after having just completed the evasive exercise.
- Does not steer far enough to the left to miss barrier.
- Does not coordinate braking and steering.
- Does not release the throttle.
- Loses control of the steering wheel.
- Leaves vehicle partially in left lane when stopped

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Hammerhead

1. I.D. the course (barrier cones and poles/flags)
2. After entering, make a left turn
3. Proceed to the corner of the exercise and prepare to back into the simulated driveway
4. After completed, drive to the opposite end, and make the same maneuver. This time backing into the simulated alley

5. Proceed to the original driveway and pull into this forward
6. Reverse out and proceed to the other end making the same maneuver into the simulated alley
7. After which the student exits the exercise
 - * Speed is relative to the exercise and determined by the driver

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Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Offset Alley

1. I.D. the course
2. Enter first from the end opposite the "J"
3. Proceed through course and stopping within 18" of the end cone
4. Reverse through course and stopping within 18" of the beginning cone
 - * Speed is relative to the exercise and determined by the driver

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished.

Alley Dock

1. I.D. the course
2. Prepare to enter alley so that a backing maneuver is initially made to the driver's side. Once completed satisfactorily, back to the right, blind side
3. Back the vehicle into the simulated alley using mirrors.

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- If the driver's head is out of the window, then proper use of the passenger side mirror can not be used. This is permissible as long as the driver watches both mirrors and does not leave the driver's seat.
4. Speed is relative to the course and is set by the driver.

Instructor Tips:

- Driver should watch the corner cones of the dock until both come into view in the mirror
- To assist in backing, the driver should visualize a barrier cone approximately three feet out from the corner of the dock. This will help to position the rescue so that a straighter approach is possible and allows the driver to see the entire dock.
- As the driver backs slowly; steering inputs should be slow.
- As the driver backs quickly, faster steering inputs may be necessary.
- Instructor should stand adjacent to the driver's door to facilitate instructions to the driver and to watch for obstacles in or around the course.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Zig-Zag

1. I.D. the course
2. Enter through either end of the course
3. Proceed to the left and enter the first simulated apparatus door
 - it is beneficial to enter the gate so that the right, rear tire(s) are approximately 8" from the base of the cone and the vehicle is parallel to the course. This puts the vehicle in the proper position to enter the next gate.
4. Proceeding through to the right, the driver enters the next gate.
5. Proceed in a zig-zag fashion until exiting out the other end of the exercise.
6. The driver then stops and reverses through the exercise using the same zig-zag fashion.
7. The driver stops after exiting through the original starting position.

Note:

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- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises are demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Off-road Recovery

1. I.D. the course
2. The student approaches the course at the speed identified by the instructor
3. The student drops one side of the vehicle off of the road edge and positions the vehicle so that the off-road wheels have room to turn without scrubbing the curb.
4. Turn the wheel ¼ turn toward the road.
5. When the student hears or feels the front tire hit the curb, straightens the vehicle so that it stays in its lane.
6. Make a U-turn and approach the course from the opposite direction
7. Perform the same maneuver
8. Make a U-turn and approach the course from the opposite direction
9. Drive the entire vehicle off the roadway and positions the vehicle so that the off-road wheels have room to turn without scrubbing the curb.
10. Turn the wheel ¼ turn toward the road
11. When the student hears or feels the last rear tire hit the curb, straightens the vehicle so that it stays in its lane .
12. Make a U-turn and approach the course from the opposite direction
13. Drive the entire vehicle off the roadway and positions the vehicle so that the off-road wheels have room to turn without scrubbing the curb.
14. Turn the wheel ¼ turn toward the road
15. When the student hears or feels the last rear tire hit the curb, straightens the vehicle so that it stays in its lane.

Instructor Tips:

- Be sure to watch the student's steering motions closely to determine the amount and timing of their steering inputs. Inform the student of what they are doing right and wrong, and show or tell the student how to make corrections.
- Until the student is familiar with the exercise, they should be cued when to make the

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recovery. After that the student can initiate the maneuver at his/her own discretion.

- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.
- It is not necessary to center the vehicle over the road edge in order to give the tire enough space to turn. The shoulder may not be wide enough to do that. Just enough space is needed between the curb and the off-road tire for the tread, rather than the sidewall, to contact the curb when the recovery is made.
- 45 – 90 degree of steering input is all that is needed to make a recovery.
- The greater the curb height and/or the closer the tire is to the curb, the greater the amount of steering and the quicker the steering wheel needs to be turned in order to recover the roadway.
- If the student turns the steering wheel to maintain lane position before the front tire strikes the curb, there is the possibility that the front tire will climb the curb and the rear tire will not. The rear tire can then scrub, causing a problem.
- The maneuver can be accomplished easily with the 9-3 hand position.
- Speed: Start at 30 mph. Increase in 5 mph steps as the student progresses until the limit of capability of the student or course is reached.
- Operational Checklist:
 - ☞ Hand Position
 - ☞ Timing of steering to maintain lane
 - ☞ Speed
 - ☞ Releases accelerator
 - ☞ Position of vehicle to curb
 - ☞ Amount of steering to recover road

Common Errors:

- Does not allow sufficient space between the curb and the tire for the tire to assume the angle needed to come up over the curb without scrubbing.
- Applies the brakes
- Does not release throttle or accelerates.
- Steer too slowly. This can cause the tire to scrub resulting in an improper recovery.
- Steers more than necessary to make the vehicle recover the roadway

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in

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the demonstration or as required by the specific exercise

- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Split Coefficient

1. I.D. the course
2. The student enters onto the skid pad at a predetermined speed with ½ of the vehicle on the pad and ½ on dry surface
3. The student attempts to stop the vehicle without wheel lock-up or using the ABS brakes
4. The student releases the throttle, steers to keep the front of the vehicle pointed straight, and controls any skid.
5. This is done from both ends of the skid pad

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Lane Change

1. I.D. the course
2. The student enter the skid pad at a predetermined speed
3. After the entire vehicle is on the skid pad, the student makes a lane change
4. The student releases the throttle, steers to keep the front of the vehicle pointed straight into the chosen lane of travel, and controls any skid.
5. Lane changes are made both to the left and right.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in

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the demonstration or as required by the specific exercise

- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Incipient skid stopping

1. I.D. the course
2. The student enter the skid pad at a predetermined speed
3. After the entire vehicle is on the skid pad, the student makes a stop without locking up the wheels
4. The student releases the throttle, steers to keep the front of the vehicle pointed straight, and controls any skid.
5. Speeds are gradual and progressive

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Secondary braking systems: (i.e. engine, exhaust, driveline, and transmission retarders)

1. The secondary braking system on the vehicle is demonstrated by the instructor after the entire vehicle is on the skid pad. No brakes are used.
2. The student then demonstrates the same system with progressive speeds until loss of control.
3. This helps the student realize to what point the vehicle is stable using that particular braking

system under inclement weather conditions.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations

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- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Circular Skid: (radius turn maneuver)

1. I.D. the course
2. Begin at 25-mph progressing 2 mph until loss of control is reached through normal travel
3. Turns are made after the entire vehicle is on the skid pad
4. Turns are made both left and right.

Instructor Tips:

- It is necessary to very closely observe the student's hand movements as they correct the skid. Inform the student what they are doing right and wrong, and show or tell the student how to make corrections.
- Listen to the sound of the engine to determine if the student has released the throttle or has accelerated.
- Give the student simple, single skids to start.
- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.
- Make sure the student starts with the 9-3 hand position, but changes to the hand-drop or hand-over-hand method if necessary.
- Vary the exercise so that the student does not develop a conditioned response to the skid.
- Watch for foot movement to determine if the student has a tendency to use the brakes.
- Several factors determine how severe the student's skid will be: Speed, the angle of entry of the vehicle onto the skid surface (the greater the angle, the more severe the skid), and the length of time the instructor keeps the wheel(s) locked.
- Speed: On a slick surface, skid control can be taught from 25 mph. Start at the lower speed and work up gradually as the skill of the student would indicate.
- Operational Checklist:
 - ☞ Speed
 - ☞ Hand position
 - ☞ Amount of steering used to drive curved path
 - ☞ Angle of the path of the vehicle on the skid surface
 - ☞ Hand movement in correcting skid
 - ☞ Response time of the student
 - ☞ Timing of counter steering

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☞ Returns to 9-3 hand position

Common errors:

- Responds slowly to the first skid, allowing the vehicle to go beyond the point of control.
- Does not steer enough to control the skid
- Over-responds to the skid by turning the steering wheel too much, possibly causing a second skid.
- Starts the counter steer too late after the initial correction.
- Does not use hand-over-hand steering if more than 180 degree of steering is achieved and then momentarily stops steering. This causes the student to be very slow in applying additional steering and may result in the vehicle skidding out of control.
- Takes both hands off the steering wheel at the same time or shuffle steers.
- Does not ease up on the accelerator.
- Tries to control the skid by using the accelerator or accelerates unknowingly.
- Applies the brakes possibly locking the wheels, unless vehicle has ABS.
- Cannot distinguish which direction the vehicle is skidding and does nothing.
- Steers with one hand only.
- Steers in the wrong direction.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Air Brake Test:

1. Check Air Compressor Governor Cut-in and Cut-out Pressures
 - a. With engine on and air tank full, reduce air pressure by pumping service brake pedal. At idle, the air governor should cut-in at about 100 psi. and cut-out the air compressor at about 120-125 psi.

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2. Air tanks full, batteries/ignition on, engine off, wheels chocked or on flat ground.
3. Release the parking brake and time the air pressure drop
 - a. loss rate should be less than 2 psi in 1 minute for single vehicles and less than 3 psi in 1 minute for combination vehicles
4. Apply foot pressure of 90 psi or more to the service brake pedal
 - a. after the initial drop, pressure should not drop more than 3 psi in 1 minute for single vehicles or more than 4 psi for combination vehicles
5. Test Low Pressure Warning Signal
 - a. Continue reducing air tank by pumping brake pedal
 - b. low pressure warning signal must come on before reaching less than 60 psi (or tank with the lowest air pressure in dual systems)
6. Check That the Spring Brakes Come on Automatically
 - a. Continue reducing air tank by pumping brake pedal
 - b. "Parking Brake" knob should pop out when the air pressure falls to within 20-40 psi
7. Check Rate of Air Pressure Buildup
 - a. Engine on and at operating Rpm's
 - b. Pressure should build from 85-100 psi within 45 seconds in dual air systems
 - c. Pre-1975, typical requirements are from 50-90 psi within 3 minutes at idle speed
8. Test Parking Brake
 - a. With parking brake on, gently pull forward or backward (based on location of wheel chocks) to see if parking brake will hold. Only mild throttle pressure is needed.

** Too much throttle pressure can damage driveline.
9. Test Service Brakes
 - a. Release parking brake, slowly move forward or backward (based on location of wheel chocks) and apply service brakes.
10. Check Manual Slack Adjusters on S-Cam Brakes
 - a. Park on level ground, wheels chocked, keys in pocket
 - b. Push in parking brake
 - c. Pull on each slack adjuster
 - > should not move more than 1 inch where the push rod attaches
 - > since parking brakes only affect the rear brakes, the front slack adjusters can be

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checked at any time during the pre-trip inspection.

Hydraulic Brake Test

Test Brake Cylinder Leakage Rate

With engine off:

1. Pump the brake pedal three times, and then hold it down for five seconds. The brake pedal should not move during the five seconds.

Test Parking Brake

1. Parking brake on, gently pull forward to test if parking brake will hold

Test Service Brakes

1. Release parking brake, slowly move forward and apply brake pedal

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ENGINE (PUMPER) OPERATIONS

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Class Description

To provide a detailed and comprehensive driver training program for all pumper operators with emphasis on safety and driving skills under most all driving conditions. In addition, after completing the Advanced Driver Training (ADT) program, to teach all vehicle operators to respond as quickly and correctly as possible in an emergency situation.

Las Vegas Fire & Rescue (LVFR) uses standards set forth by National Fire Protection Association, 1002 Standard for Driver Apparatus, Commercial Drivers License (CDL), Nevada Department of Transportation, General Motors Advanced Driver Training, National Highway Traffic and Safety Administration, and the Occupational Health and Safety Administration programs.

All driving instructors are certified through General Motors Desert Proving Grounds, Advanced Driver Training program.

This thereby becomes the Standard for Las Vegas Fire & Rescue (LVFR).

Learning Competencies

Vehicle and apparatus drivers must possess both driving skill and proper attitude in order to drive safely and professionally. Many drivers believe that years of experience will see them through every situation. However, experience alone is not enough. Continuing education, classroom work, and “hands-on” driving must supplement it.

Fire apparatus are not designed for high-speed handling. A sports car will stop easier, sway less while turning, and handle better because it has less inertia to overcome due to it's lighter weight and low center of gravity. In learning to drive top-heavy apparatus, drivers must learn to compensate for the added inertia. Decreased speed, practice, increased awareness, as well as anticipation of traffic signals and the actions of others accomplish this. Couple defensive driving skills with repetitive training in Advanced Driver Training (ADT) techniques for collision avoidance and the driver will learn to avoid a critical situation by taking the proper action without conscious thought.

All of the exercises/maneuvers listed below can and are sometimes used everyday by drivers of commercial vehicles. Below is a definitive reason for the use of each exercise and the learning competencies gained by each driver successfully passing the Advanced Driver Training Program through the Las Vegas Fire & Rescue.

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Serpentine - The serpentine exercise helps acquaint the driver with the vehicle's turning capabilities. The controls stressed in the exercise are basic to all driving situations. The purpose is to develop a sense of unity and control with the vehicle, learn proper timing of steering inputs and throttle controls, and spatial references (the relationship of a fixed object to that of a moving object). 9-3 hand position on the steering wheel, smoothness, timing, and rhythm are stressed in this exercise along with hand-drop steering are the basics of Advanced Driver Training techniques.

Reverse Serpentine - Backing a vehicle through the reverse serpentine helps to acquaint the driver to spatial references. In doing so, the driver learns the use of outside and inside rear view mirrors.

Evasive maneuver - This is designed to teach an alternative to panic braking in an emergency situation. This exercise teaches that less distance is needed to steer a vehicle around an object than is used when panic stopping before striking it. This demonstrates the maneuvering capability and stability of the vehicle while teaching the driver his/her own capabilities and limitations in making the maneuver.

Controlled braking - This helps the driver to develop the ability to achieve maximum braking while still being able to control the direction of the vehicle. During wheel lock-up, inability to maneuver/steer the vehicle is experienced. The driver is trained to regain directional control of the vehicle as soon as possible after a skid/lock-up has occurred, return the vehicle back into the original lane, and stop before the vehicle enters the simulated intersection.

Alley Dock - This teaches the driver to correctly position, back, and turn around a pumper. When driving a pumper, the driver must know the correct position of both the front and rear bumpers so as to be able to correctly place that vehicle into position when spotters are not available. The latter is not advisable; however there are times when it becomes necessary to do so and the driver must be able to demonstrate this without challenge.

Zig-Zag - The Zig-Zag is a modified serpentine exercise that incorporates the use of additional cones and barrier piping to represent obstructions. In this exercise, the driver learns of the position and clearance of all parts of the vehicle. All barrier piping simulates apparatus door widths and vehicle heights. Wooden flags represent overhangs and obstructions at outside rear view mirror heights and above. The driver gains knowledge and understanding of apparatus turning radius while learning to use outside rear view mirrors. Steering inputs forward are different than that of reverse, because the steering components are in front as opposed to the rear. Compensations in turning radius must be made by the driver due to the differences.

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180 Degree Turn – In this exercise, all drivers learn where the location is of the corners of the vehicles front and rear bumpers. Drivers tend to over/under compensate for bumper placements due to lack of awareness.

Over the road - In compliance with Nevada Commercial Motor Vehicle testing, drivers are evaluated on the skills they possess and are properly instructed in defensive driving. Defensive driving skills are to be used at all times so that the driver does not have to react to an incident using a collision avoidance maneuver. Among other things, drivers will be shown proper lane changes, stop points on roadway intersections, freeway, residential, and city traffic driving, proper use of mirrors and signaling, spacing between vehicles, and the use and appropriate application of secondary braking systems. Standard Operating Procedures and driving rules and regulations are discussed at this time. The driver must demonstrate the ability to back into alleyways, parking spaces, apartment complexes, and driveways as required by the instructor. The Over-the-road testing period is a pass/fail evaluation. The use of defensive driving skills during all facets of the evaluation period is mandatory by the driver and failure to exhibit any of these skills will mean failure of the over the road section and may also lose certification from Las Vegas Fire & Rescue.

Off-road Recovery - The purpose is to give the driver an understanding of the problems involved with, and to develop the driver's skills in making an off-road recovery over a curb or back onto the driving portion of the roadway at operating speeds. Too much steering input may cause the vehicle to cross over its lane into the adjacent one and possibly off the road on the other side before the driver can regain control of the vehicle. Not enough steering input will leave the vehicle on the shoulder possibly facing a parked car, bridge abutment or worse. This exercise teaches the driver to make a safe return to the roadway when necessary and to avoid a collision.

Wet Application Skid Control

- Non ABS and ABS or Anti-lock braking
- Incipient skid stopping
- Lane Change
- Split Coefficient stopping
- Secondary braking systems (engine, exhaust, driveline, transmission)

Driving pumpers are not always performed in ideal situations. Inclement weather conditions will always present an extreme hazard for drivers of a large apparatus. Wet Application Skid Control teaches the driver the limitations of the apparatus he/she may be driving when faced with this situation.

As in the Controlled Braking, the driver develops the ability to achieve maximum braking while still being able to control the vehicle. Combine this with wet/slick surfaces and the attempt

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becomes almost senseless. Wheel lock up occurs almost immediately; therefore the driver must learn the reactions the apparatus will display when faced with the above scenarios. The driver will learn the proper action to take under these conditions and will react accordingly. Proficiency and competency of skills will be required. Speeds to start are random but progressive according to the skill level of each driver.

Resources Needed

180	12" Cones
110	18" Cones
40	36" Cones
40	1"x 4' PVC pipe with couplings (tee and 90° elbow)
8	4"x 12" Wooden flags with adjustable clamps for pipe
16	18" Cones with wooden bases and support pegs for pipe
8	2 Channel radios
EA.	Closed course evaluation forms for each student
EA.	Over the road forms for each student
1	Student completion form for that day's training (to be used by the safety officer)

*15-20 acre driving pad consisting of 8" thick $\frac{3}{4}$ " asphalt over an 8" lime stabilized base. Pad to have all exercises outlined for easy set up and removal.

*Vehicle for safety officer to address the safety of the operation and for transportation of the equipment and instructors.

*Pumper - One for the over-the-road exercise.

*Pumper - One for each two students in one-half of the training class, at least one should be equipped with ABS.

*ABS equipped sedan - One for each two students in one-half of the training class

*Certified Advanced Driver Training Instructor - One for each two students

*Safety Officer

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Classroom Outline

Required Time Frame	Topic Outline	Teaching Aids and References
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Classroom - Day 1

15 Min.	Legal issues	Handouts, Video
60 Min.	Pre-trip inspection - lecture and hands-on application practice, air brake test	Quantum Pumper, Nevada Commercial Drivers License Manual
5 MIN.	Break	
20 Min.	Code 3 Driving rules and regulations	Standard Operating Procedures, LVFR Driver/Operator Manual
55 Min.	Secondary braking systems, Anti-lock brakes	ABS video, handouts
5 Min.	Break	
30 Min.	Overview of Closed Course and Over the Road evaluations	Forms, overheads, drawings, lecture, NV CDL Manual

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Closed Course Outline

Required Time Frame	Topic Outline	Teaching Aids and References
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Closed Course - Day 1 (continued)

10 Min.	Driver Preparation	General Motors Advanced Driver Training Course Training Manual
55 min.	Serpentine exercise (progressively 55', 60', and 65' starting with the 55') Forward then Reverse	Course Drawings/Set-up, Course Validation, GM Training Manual
5 Min.	Break	Drivers switch vehicles
55 Min.	Evasive exercise (using progressive speeds of 2 mph starting at 25 mph)	Course Drawings/Set-up, Course validation, GM Training Manual
5 Min.	Break	Drivers switch vehicles
55 Min.	Controlled Braking - using progressive speeds of 2 mph starting at 25 mph) - Student demonstrates proper use of ABS brakes following non-ABS evaluations	Course Drawings/set-up, Course validation, GM Training Manual
5 Min.	Break	Drivers switch vehicles
55 Min.	Zig-Zag exercise	Course Drawings/Set-up, Course Validation
5 Min.	Break	Drivers switch vehicles
55 Min.	Alley Dock exercise	Course Drawings/Set-up Course Validation

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Closed Course Outline

Required Time Frame	Topic Outline	Teaching Aids and References
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Closed Course - Day 2

35 Min.	180° turn exercise	Course Drawings/Set-up, Course Validation, LVFR Drivers/Ops Manual
55 Min.	Off-road Recovery (using progressive speeds of 2 mph starting at 30 mph)	Course Drawings/Set-up, Course Validation, GM Training Manual
60 Min.	Over the road evaluations	NDOT CDL Manual, LVFR Driver/Ops Manual

Closed Course – Day 3 – Wet Application/Skid control

Required Time Frame	Topic Outline	Teaching Aids and References
Application/Skid control 20 Min. for each exercise	Non-ABS and ABS or Anti-lock braking using the following exercises: - Evasive - Controlled Braking - Split Coefficient - Lane Change - Incipient skid stopping - Secondary braking systems (i.e. driveline, engine brake, output retarders)	Course Drawings/Set-up, Course Validation, GM Training Manual
20 Min.	Circular Skid (radius turn maneuver) - begin at 25-mph progressing 2 mph	Course Drawings/Set up, Course Validation, GM Training Manual

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Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * The instructor will demonstrate all exercises before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills is realized
- * During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

NARRATIVE

Driver Preparedness

In vehicle set up:

- * Adjust seat for maximum freedom
- * Arms should be away while slightly bent
- * Hand placement @ "9-3"
 - Flat steering wheel-- "9-3" with a hand drop technique & hand over hand
- * Sit upright in the back of the seat
- * Adjust mirrors accordingly
- * #1 priority ----- SEAT BELTS
- * Heel of foot should be positioned so that the ball of the foot is used to depress the throttle or brake without lifting. Preferably beneath the right side of the brake pedal
- * Familiarize yourself with instrument panel

9-3" Hand Placement:

- * Provides greater maneuverability
 - Full 180-degree turn without moving hands
 - 85% of incidents can be corrected this way
- * Eliminates the frequent use of hand over hand steering
 - This leads to over-steering
- * Eliminates body lean or sway
 - Keeps driver upright
- * Placement of hands/fingers/arms
 - Hold with thumbs only - release fingers naturally when executing a maneuver
 - Stiff handling (arms) slows the steering effort

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Exercise execution

Serpentine

1. I.D. the course (explain cone position and spacing)
2. Run parallel to the course
3. Set speed -- +/- 2 mph
4. NO BRAKING
5. Align with 1st cone -- 3-4 ft. out
6. Make a 90° (when driver feels he/she has cleared the cone)
 * watch for correct 90°
7. Full 180° turn using the hand drop technique and hand over hand
8. Space evenly on each cone
9. Will have to apply slight throttle pressure to keep speed up - due to cornering forces

Instructor Tips:

- The vehicle approaches the cones parallel to them and goes around the first cone as though it was in the middle of the course.
- Hand position remains at 9-3 using hand drop or hand over hand steering throughout the course, if physically possible.
- Steering movements are smooth, continuous and even in both directions.
- Speed is lost at each cone due to cornering. Throttle pressure must be increased to maintain a constant speed.
- Stay close to the cones. The student may have to knock some down in order to learn how to position the vehicle relative to them.
- Staying close to the cones keeps the vehicle in a straight a line as possible. This minimizes steering movement, which reduces the need to increase throttle pressure.
- Speed: For the first time student, 15 mph is fast enough. Maximum speed will depend on the space available and safety considerations. However, it is not necessary to exceed 25 mph to accomplish the goals of this exercise.
- As speed is increased, it will be necessary to steer sooner as the vehicle approaches the cones.
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong and show or tell the student how to make corrections.
- Correct the student's errors as they happen. It may be necessary to talk them through the exercise.
- Operational Checklist:
 - ☞ Entry speed
 - ☞ Hand position
 - ☞ Position of vehicle at beginning of course
 - ☞ Closeness of vehicle to cones
 - ☞ Smoothness of steering

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- ☞ Use of throttle
- ☞ Exit speed

Common Errors:

- Enters the course too fast
- Attacks the first cone at an angle rather than in a line parallel with the course
- Fails to maintain speed and/or changes speed abruptly
- Passes too far from the cones
- Steering errors:
 - ☞ Does not steer enough to avoid cones with the front of the vehicle
 - ☞ Steers too soon, striking the adjacent cones with the rear of the vehicle
 - ☞ Does not steer continuously and strikes the next cone with front of the vehicle

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * The instructor will demonstrate all exercises before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills is realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Reverse Serpentine

1. Begin at the left side of the first cone, parallel with the course, and begin backing.
2. Speed should remain comfortable and consistent.
3. As pumper begins to pass the first cone, the driver should make a safe and easy turn.
4. The driver should look to the rear view mirror and note the position of the next cone.
5. When that cone leaves the view of the drivers' mirror, the driver should then look to the opposite mirror or other side of the pumper and watch for the cone to come into view.
6. As the second cone comes into view, the driver should put the rear wheels of the pumper 3-4' from the cone
7. The front wheels are then straightened and the pumper reversed until the second cone is far enough down to make a safe and easy turn.s
8. Repeat steps 3-7 until completion of the exercise.

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Instructor Tips:

- The vehicle approaches the cones parallel to the exercise and goes around the first cone as though it was in the middle of the course.
- Steering movements are smooth, continuous and even in both directions.
- Stay close to the cones at approximately 3-4 feet. The student may have to knock some down in order to learn how to position the vehicle relative to them.
- Staying close to the cones keeps the vehicle in a straight a line as possible. This minimizes steering effort.
- Speed: What the student feels comfortable with, but at all times continuous
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong and show or tell the student how to make corrections.
- Correct the student's errors as they happen. It may be necessary to talk them through the exercise in the beginning.
- Operational Checklist:
 - ☞ Entry speed
 - ☞ Hand position
 - ☞ Position of vehicle at beginning of course
 - ☞ Closeness of vehicle to cones
 - ☞ Smoothness of steering
 - ☞ Exit speed

Common Errors:

- Enters the course too fast
- Attacks the first cone at an angle rather than in a line parallel with the course
- Fails to maintain speed and/or changes speed abruptly
- Passes too far from the cones
- Steering errors:
 - ☞ Does not steer enough to avoid cones with the rear of the pumper
 - ☞ Steers too soon, striking the adjacent cones with the rear of the pumper
 - ☞ Does not steer continuously and strikes the next cone with rear of the pumper.
 - ☞ Returns to straight too soon and strikes the original cone with the front of the pumper.
 - ☞ Provides too much steering.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * The instructor will demonstrate all exercises before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized

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- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Evasive

1. I.D. the course (barrier cones)
2. Center vehicle in the 12' lane
3. On a cue of "Left" or "Right",
 - a. Release throttle
 - b. NO BRAKING
 - c. APPROX. 180° turn using the hand drop technique
 - d. Steer back APPROX. 180° using hand drop and hand over hand
 - * Quick snap of the steering wheel will correct any fish tail
 - e. Once committed - don't change mind
 - f. Use what steering is required to accomplish the task

Instructor Tips:

- The student may tend to guess the direction the instructor will call. It is more important to make the maneuver without striking cones than to go the called direction. If guessing is a problem to the extent that the student is not learning, it may be necessary to alter the procedures to meet the needs of the student.
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong and show or tell the student how to make corrections.
- Approaching the cue point, the student may tip off an unconscious intention toward one exit lane. Watch for shifting, leaning, or movement of the steering wheel, all in the intended direction. These cues can be used to make the exercise easier or more difficult, according to the needs of the students.
- Have the student obtain the desired speed as quickly as possible and then hold the throttle steady. This will allow them to concentrate on the driving tasks.
- Speed: 25 mph to start. Increase speed on approximately 2-3 mph increments as student goes through course without striking cones. Increase the speed until the limit of capability of the student is reached and/or the limitations of the vehicle.
- If a student strikes cones on two or three consecutive passes at the same speed, increase the distance of the cue until successful, then build up again.
- Slight variations from the desired speed can be compensated for by adjusting the timing of the cue.
- Operational Checklist:
 - ☞ Hand position
 - ☞ Speed
 - ☞ Location of cue cone
 - ☞ Student's movements: Hands, body, and feet

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- ☞ Timing of steering
- ☞ Cones struck
- ☞ Release of throttle
- To help keep the student from guessing the direction, it may help to have them concentrate on a fixed point some distance beyond the barrier rather than on the barrier itself.
- Correct the student's errors as they happen. It may be necessary to talk them through the exercise.

Common Errors:

- Steer in the wrong direction
- Starts to steer in the wrong direction and then tries to recover.
- Steering movements are too slow.
- Does not release the throttle or applies more throttle.
- Improper hand position - hand(s) moves to different position on steering wheel or does not complete a hand drop technique.
- Uses the brakes

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Controlled Braking

1. I.D. the course (barrier cones)
2. Set speed -- start at 25 mph
3. Decide ahead of time on the lane choice
4. Cue on a command of "NOW"
5. Maintain foot position at all times before the "cue" command
6. On cue -- apply constant/even pressure on the brake pedal
 - a. The ball of the foot is the sensitivity point
 - b. If lock-up occurs - release slightly - DO NOT PUMP
 - * Locked wheels make controlled steering impossible
 - c. Brake and steer simultaneously - hand drop technique initially
 - * Hand over hand steering after passing the barrier

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* Driver should be focusing on the stopping point

7. I.D. on-coming lane cones and return hand over hand to original lane
8. Stop with the entire pumper parallel with the course and the driver's shoulders equal with the exit cones before exiting

Instructor Tips:

- Controlled braking can be either accomplished with the right or left foot.
- Watch for foot and hand movements that are made before the cue is given.
- Speed: Range for effective teaching is 25-35 mph.
- Do not permit a left foot braker to cover the brake pedal with their left foot when that is not their normal highway driving habit.
- The cue distance can be shortened if the vehicle has not attained the desired speed at the normal cue point.
- Have the student attain the desired speed as quickly as possible and then hold the throttle steady.
- Watch the student throughout the maneuver. Inform the student of what they are doing right and wrong, and show or tell the student how to make corrections.
- It is important to reset the cones in the first barrier each time they are struck.
- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.
- Point out that, in making quick stops in a real situation, the driver needs to be aware of traffic behind them and not to block traffic unnecessarily by their braking action.
- Operational Checklist:
 - ☞ Speed
 - ☞ Hand position
 - ☞ Location of cue cone
 - ☞ Early foot movement
 - ☞ Early steering
 - ☞ Timing of steering and braking
 - ☞ Control of steering movement
 - ☞ Foot control while braking
 - ☞ Response of vehicle to steering and braking inputs
 - ☞ Cones struck

Common Errors:

- Locks the wheels and does not ease off the brake pedal to let the wheels roll again or releases the brake pedal completely.
- Does not brake soon enough.
- Anticipates the cue by moving a foot toward the brake pedal and/or by steering slightly.
- Forgets to brake, usually after having just completed the evasive exercise.

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- Does not steer far enough to the left to miss the barrier
- Does not coordinate braking and steering.
- Does not release the throttle.
- Loses control of the steering wheel.
- Leaves vehicle partially in left lane when stopped.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Alley Dock

1. I.D. the course
2. Prepare to enter alley so that a backing maneuver is initially made to the driver's side (once completed satisfactorily, back to the right, blind side)
3. Back the vehicle into the simulated alley using mirrors.
 - If the driver's head is out of the window, then proper use of the passenger side mirror can not be used. This is permissible as long as the driver watches both mirrors and does not leave the driver's seat. When backing to the passenger side, although not advisable during normal driving situations, mirrors will be required.
4. Speed is relative to the course and is set by the driver.
5. The driver should make a safe and easy turn in the direction the pumper needs to go.
6. The driver should park the pumper within 18" from the rear dock.

Instructor Tips:

- Driver should watch the corner cones of the dock until both come into view in the mirror
- To assist in backing, the driver should visualize a barrier cone approximately three feet out from the corner of the dock. This will help to position the pumper so that a straighter approach is possible and allows the driver to see the entire dock.
- As the driver backs slowly; steering inputs should be slow.
- As the driver backs quickly, faster steering inputs may be necessary.
- Instructor should stand adjacent to the driver's door to facilitate instructions to the driver and to watch for obstacles in or around the course.

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Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Zig-Zag (Forward)

1. I.D. the course
2. Begin with hands at the 9-3 position.
3. Enter the lane driving forward. As the pumper clears the last lane cone with its bumper, turn slightly to the left and come as center to the lane as possible.
4. As the rear dual tire is approximately 6-10 inches from the inside cone(s), make a turn of the wheel using the amount of steering necessary to turn past the cone(s).
5. Continue steering toward the next set of cones bring pumper as perpendicular as possible to the exercise.
6. Enter the next set of cones until the rear dual tires are 6-10 inches from the inside cones.
 - If the driver's head is out of the window, then proper use of the passenger side mirror can not be used. This is permissible as long as the driver watches both mirrors and does not leave the driver's seat.
7. Speed is relative to the course and is set by the driver.
8. Repeat steps 2-5 until reaching the end of the exercise.

Instructor Tips:

- Driver should watch the inside cones of each gate and place the rear tire approximately 6-10 inches from the cone and the pumper as perpendicular to the course as possible. This will help to position the pumper so that a straighter approach is possible and allows the driver to see the entire exercise.
- If the driver proceeds slowly; steering inputs should be slow.
- If the driver proceeds quickly, faster steering inputs may be necessary.
- It is not necessary for the instructor to ride during the forward portion unless direction is needed.

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Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises are demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized

Zig-Zag (Reverse)

1. Upon completion of the forward Zig-Zag, the backing maneuver is initially made to the blind side.
2. Exit the lane backing veering to the right. As the pumper clears the last lane cone with its bumper, turn slightly to the right and come as center to the lane next gate as possible.
3. As the rear dual tire is approximately 6-10 inches from the inside cone(s) and parallel to the course, make a turn of the wheel using the amount of steering necessary to turn past the cone(s).
4. Continue steering toward the next set of cones bring pumper as perpendicular as possible to the exercise.
5. Enter the next set of cones until the rear dual tires are 6-10 inches from the inside cones.
 - If the driver's head is out of the window, then proper use of the passenger side mirror can not be used. This is permissible as long as the driver watches both mirrors and does not leave the driver's seat.
6. Speed is relative to the course and is set by the driver.
7. Repeat steps 2-5 until reaching the end of the exercise.
8. Back the vehicle into the simulated alley using mirrors.
 - If the driver's head is out of the window, then proper use of the passenger side mirror can not be used. This is permissible as long as the driver watches both mirrors and does not leave the driver's seat.

Instructor Tips:

- As the driver begins to back, watch for a slight turn of the wheel to begin the backing effort. This allows for proper setup to enter the next gate. This will help to position the pumper so that a straighter approach through the gate is possible and allows the driver to see the entire exercise.
- Best practice demonstrates the pumper's position to be perpendicular with the gate with the rear tire 6-10 inches from the inside cone. If the pumper is not perpendicular until it comes past the gate, the driver should come more perpendicular to the gate prior to entering.
- The driver should continue in the turn after entering the gate. This will help to position the pumper so a more perpendicular approach through the next gate is possible and allows the driver to see the entire exercise.

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- If the driver backs slowly; steering inputs should be slow.
- If the driver backs quickly, faster steering inputs may be necessary.
- Instructor should stand adjacent to the driver's door to facilitate instructions to the driver and to watch for obstacles in or around the course.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized

180° Turn

1. I.D. the course
2. The student approaches the course at the speed identified by the instructor
3. No brakes or stopping are allowed
4. Turn right on the first pass, then left. Alternating on each successive pass.

Instructor Tips:

- If driver is unaware of the location of the front bumper to start, assistance can be asked of the instructor. Successful passing without the assistance of the instructor must be made.
- Driver can look out the side window, but cannot leave the seat.
- Speed should be consistent and set by the driver.
- Operational Checklist:
 - ☞ Hand position
 - ☞ Speed
 - ☞ Checking both mirrors

Common Errors:

- Speed inconsistent or uses brakes
- Leaves drivers seat to see cones
- Does not watch both mirrors
- Tractor/trailer to straight when entering

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations

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- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Off-road Recovery

1. I.D. the course
2. The student approaches the course at the speed identified by the instructor
3. The student drops one side of the vehicle off the road edge and positions the vehicle so that the off-road wheels have room to turn without scrubbing the curb.
4. The driver eases off the throttle, doesn't brake, and stabilizes the vehicle
5. Turn the wheel ¼ turn toward the road.
6. When the student hears or feels the front tire hit the curb, straightens the vehicle so that it stays in its lane.
7. Make a U-turn and approach the course from the opposite direction
8. Perform the same maneuver
9. Make a U-turn and approach the course from the opposite direction
10. Drive the entire vehicle off the roadway and positions the vehicle so that the off-road wheels have room to turn without scrubbing the curb.
11. The driver eases off the throttle, doesn't brake, and stabilizes the vehicle
12. Turn the wheel ¼ turn toward the road
13. When the student hears or feels the last rear tire hit the curb, straightens the vehicle so that it stays in its lane.
14. Make a U-turn and approach the course from the opposite direction
15. Perform the same maneuver
16. Make a U-turn and approach the course from the opposite direction
17. Student drops one side of the vehicle off the road edge and positions the vehicle so that the off-road wheels scrub the curb with the inside of the off-road tires.
18. Turns the wheel gradually toward the road until the vehicle begins to enter the roadway
19. When the student feels the front tire grab and enter the roadway, counter steers to return to parallel with the lane. A slight snap of the wheel may be necessary to correct any limited handling situation that may present itself.
20. Make a U-turn and approach the course from the opposite direction
21. Perform the same maneuver
22. Repeated runs are made until satisfaction of skills are realized

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Instructor Tips:

- Be sure to watch the student's steering motions closely to determine the amount and timing of their steering inputs. Inform the student of what they are doing right and wrong, and show or tell the student how to make corrections.
- At no time should the wheel be jerked back in an attempt to return the vehicle to the roadway.
- Until the student is familiar with the exercise, they should be cued when to make the recovery. After that, the student can initiate the maneuver at his/her own discretion.
- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.
- It is not necessary to center the vehicle over the road edge in order to give the tire enough space to turn. The shoulder may not be wide enough to do that. Just enough space is needed between the curb and the off-road tire for the tread, rather than the sidewall, to contact the curb when the recovery is made.
- 45° - 90° of steering input is all that is needed to make a recovery.
- The greater the curb height and/or the closer the tire is to the curb, the greater the amount of steering and the quicker the steering wheel needs to be turned in order to recover the roadway.
- If the student turns the steering wheel to maintain lane position before the front tire strikes the curb, there is the possibility that the front tire will climb the curb and the rear tire will not. The rear tire can then scrub, causing the rear of the vehicle to remain in the off-road position.
- The maneuver can be accomplished easily with the 9-3 hand position (hand drop for larger units)
- Speed: Start at 30 mph. Increase in 2-3 mph steps as the student progresses until the limit of capability of the student or course is reached or the limitations of the vehicle.
- Operational Checklist:
 - ☞ Hand position
 - ☞ Timing of steering to maintain lane
 - ☞ Speed
 - ☞ Releases accelerator
 - ☞ Position of vehicle to curb
 - ☞ Amount of steering to recover road

Common Errors:

- Does not allow sufficient space between the curb and the tire for the tire to assume the angle needed to come up over the curb without scrubbing.
- Applies the brakes
- Does not release throttle or accelerates.

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- Steer too slowly during a non-scrub run; this can cause the tire to scrub resulting in an improper recovery.
- Steers more than necessary to make the vehicle recover the roadway.
- Jerks the wheel in the direction of the roadway in an attempt to recover.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Wet Application Exercises

Split Coefficient

1. I.D. the course
2. The student enters onto the skid pad at a predetermined speed with ½ of the vehicle on the pad and ½ on dry surface
3. The student attempts to stop the vehicle without wheel lock-up or using the ABS brakes
4. The student releases the throttle, steers to keep the front of the vehicle pointed straight, and controls any skid.
5. This is done from both ends of the skid pad

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

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Lane Change:

1. I.D. the course
2. The student enter the skid pad at a predetermined speed
3. After the entire vehicle is on the skid pad, the student makes a lane change
4. The student releases the throttle, steers to keep the front of the vehicle pointed straight into the chosen lane of travel, and controls any skid.
5. Lane changes are made both to the left and right.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Incipient skid stopping

1. I.D. the course
2. The student enter the skid pad at a predetermined speed
3. After the entire vehicle is on the skid pad, the student makes a stop without locking up the wheels
4. The student releases the throttle, steers to keep the front of the vehicle pointed straight, and controls any skid.
5. Speeds are gradual and progressive

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

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Secondary braking systems: (i.e. engine, Jake Brakes, driveline, and transmission retarders)

1. The secondary braking system on the vehicle is demonstrated by the instructor after the entire vehicle is on the skid pad. No brakes are used.
2. The student then demonstrates the same system with progressive speeds until loss of control.
3. This helps the student realize to what point the vehicle is stable using that particular braking system under inclement weather conditions.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Circular Skid: (radius turn maneuver)

1. I.D. the course
2. Begin at 25-mph progressing 2 mph until loss of control is reached through normal travel
3. Turns are made after the entire vehicle is on the skid pad
4. Turns are made both left and right.

Instructor Tips:

- It is necessary to very closely observe the student's hand movements as they correct the skid. Inform the student what they are doing right and wrong, and show or tell the student how to make corrections.
- Listen to the sound of the engine to determine if the student has released the throttle or has accelerated.
- Give the student simple, single skids to start.
- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.
- Make sure the student starts with the 9-3 hand position, but changes to the hand-drop or hand-over-hand method if necessary.
- Vary the exercise so that the student does not develop a conditioned response to the skid.
- Watch for foot movement to determine if the student has a tendency to use the brakes.
- Several factors determine how severe the student's skid will be: Speed, the angle of entry of the vehicle onto the skid surface (the greater the angle, the more severe the skid), and the

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length of time the instructor keeps the wheel(s) locked.

- Speed: On a slick surface, skid control can be taught from 25 mph. Start at the lower speed and work up gradually as the skill of the student would indicate.
- Operational Checklist:
 - ☞ Speed
 - ☞ Hand position
 - ☞ Amount of steering used to drive curved path
 - ☞ Angle of the path of the vehicle on the skid surface
 - ☞ Hand movement in correcting skid
 - ☞ Response time of the student
 - ☞ Timing of counter steering
 - ☞ Returns to 9-3 hand position

Common errors:

- Responds slowly to the first skid, allowing the vehicle to go beyond the point of control.
- Does not steer enough to control the skid
- Over-responds to the skid by turning the steering wheel too much, possibly causing a second skid.
- Starts the counter steer too late after the initial correction.
- Does not use hand-over-hand steering if more than 180° of steering is achieved and then momentarily stops steering. This causes the student to be very slow in applying additional steering and may result in the vehicle skidding out of control.
- Takes both hands off the steering wheel at the same time or shuffle steers.
- Does not ease up on the accelerator.
- Tries to control the skid by using the accelerator or accelerates unknowingly.
- Applies the brakes possibly locking the wheels, unless vehicle has ABS.
- Cannot distinguish which direction the vehicle is skidding and does nothing.
- Steers with one hand only.
- Steers in the wrong direction.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

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Air Brake Test:

1. Check Air Compressor Governor Cut-in and Cut-out Pressures
 - a. With engine on and air tank full, reduce air pressure by pumping service brake pedal. At idle, the air governor should cut-in at about 100 psi. and cut-out the air compressor at about 120-125 psi.
2. Air tanks full, batteries/ignition on, engine off, wheels chocked.
3. Release the parking brake and time the air pressure drop
 - a. loss rate should be less than 2 psi in 1 minute for single vehicles and less than 3 psi in 1 minute for combination vehicles
4. Apply foot pressure of 90 psi or more to the service brake pedal
 - a. after the initial drop, pressure should not drop more than 3 psi in 1 minute for single vehicles or more than 4 psi for combination vehicles
5. Test Low Pressure Warning Signal
 - a. Continue reducing air tank by pumping brake pedal
 - b. low pressure warning signal must come on before reaching less than 60 psi (or tank with the lowest air pressure in dual systems)
6. Check That the Spring Brakes Come on Automatically
 - a. Continue reducing air tank by pumping brake pedal
 - b. "Parking Brake" knob should pop out when the air pressure falls to within 20-40 psi
7. Check Rate of Air Pressure Buildup
 - a. Engine on and at operating Rpm's
 - b. Pressure should build from 85-100 psi within 45 seconds in dual air systems
 - c. Pre-1975, typical requirements are from 50-90 psi within 3 minutes at idle speed
8. Test Parking Brake
 - a. With parking brake on, gently pull forward or backward (based on location of wheel chocks) to see if parking brake will hold. Only mild throttle pressure is needed.

** Too much throttle pressure can damage driveline.
9. Test Service Brakes
 - a. Release parking brake, slowly move forward or backward (based on location of wheel chocks) and apply service brakes.

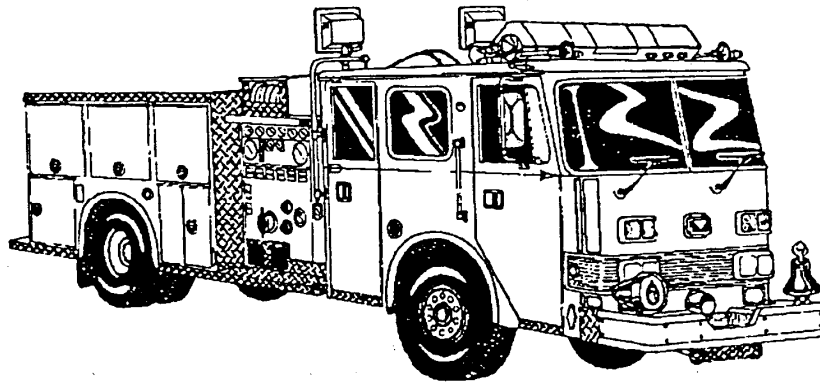
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10. Check Manual Slack Adjusters on S-Cam Brakes
 - a. Park on level ground, wheels chocked, keys in pocket
 - b. Push in parking brake
 - c. Pull on each slack adjuster
 - > should not move more than 1 inch where the push rod attaches
 - > since parking brakes only affect the rear brakes, the front slack adjusters can be checked at any time during the pre-trip inspection.

PRETRIP VEHICLE INSPECTION GUIDE



DAILY CHECK

Engine Compartment

1. ☐ Leaks
- ☐ Oil level
- ☐ Water level
- ☐ Power steering fluid
- ☐ Water pump
- ☐ Air compressor
- ☐ Alternator
- ☐ Fuel line leaks

Outside Cab/around truck

3. ☐ Emergency lighting
- ☐ Headlights
- ☐ Door, mirrors
- ☐ Rear lights, reflectors
- ☐ Brake/signal lights
- ☐ Emergency equipment

Inside Cab

2. ☐ Air Brake Test
- ☐ Emergency light switch
- ☐ Steering wheel play
- ☐ Parking brake
- ☐ Dash lights
- ☐ Horn
- ☐ Oil pressure
- ☐ Ammeter/volt meter
- ☐ Fuel tank gauge
- ☐ Mirrors, windshield
- ☐ Wipers
- ☐ Heater/defroster

Chassis Inspection

5. ☐ Springs
- ☐ Spring mounts
- ☐ Shock absorbers,
- ☐ Brake hose
- ☐ Brake chamber
- ☐ Brake drum
- ☐ Rims
- ☐ Axle seals
- ☐ Tires tread (4/32 (F), 2/32 (R))
- ☐ Lug nuts
- ☐ Steering box
- ☐ Steering linkage
- ☐ Exhaust system
- ☐ Drive shaft
- ☐ Frame
- ☐ Fuel tank
- ☐ Hydraulic fluid
- ☐ Jack plates
- ☐ hydraulic lines
- ☐ Hoisting cylinders

APPENDICES

Glossary of Terms

ABS	Anti-lock braking system
Gate	Simulating a door opening or obstruction representing mid-height of the truck. This is also to represent height limitations for each particular apparatus/vehicle and the limitations of outside rear view mirrors.
I.D.	Identify the course as to the location and purpose of each cone, barrier, barrier piping, and course outline. Instructors dialogue, comments on the purpose of each exercise and validation. A demonstration of each exercise is then completed by the instructor where appropriate.
Secondary Braking Systems	Those systems using either engine or exhaust braking, and/or electro-magnetic or transmission output retarders to restrict the forward movement of a vehicle and in turn slow the vehicle down.

MANUALS

1. Nevada Department of Transportation. Nevada Commercial Driver's License Manual. Current issue
2. General Motors Desert Proving Grounds. Advanced Driver Training Course Manual. 1990 edition.
3. Las Vegas Fire & Rescue Driver Operator Manual 2001/2002

EVALUATION FORMS

1. Closed Course
2. Over-the-Road
3. Air Brake test
4. Pretrip inspection
5. Student Evaluation

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Class Description

To provide a detailed and comprehensive driver training program for all fire department members with emphasis on safety and driving skills under all driving conditions, and to teach all vehicle operators to respond as quickly and correctly as possible in an emergency situation.

All exercises meet or exceed the standards set forth in NFPA 1002 Standard for Driver Apparatus and the Nevada Commercial Drivers License Program.

All instructors for the course are certified as Advanced Driver Training Instructors.

This thereby becomes the Standard for the Las Vegas Fire & Rescue (LVFR).

Learning Competencies

Vehicle and apparatus drivers must possess both driving skill and proper attitude in order to drive safely and professionally. Many drivers believe that years of experience will see them through every situation. However, experience alone is not enough. It must be supplemented by continuing education, classroom work, and "hands-on" driving.

Fire apparatus are not designed for high speed handling. A sports car will stop easier, sway less while turning, and handle better because it has less inertia to overcome due to it's lighter weight and low center of gravity. In learning to drive top-heavy apparatus, the driver must learn to compensate for the added inertia. This is accomplished by decreased speed, practice, increased awareness, as well as anticipation of traffic signals and the actions of others. Couple defensive driving skills with repetitive training in Advanced Driver Training techniques for collision avoidance and the driver will learn to avoid a critical situation by taking the proper action without conscious thought.

All of these exercises/maneuvers can and are used everyday by drivers of emergency vehicles. Below is a definitive reason for the use of each exercise and the learning competencies gained by each driver successfully passing the Driver Training Program.

Serpentine - The serpentine exercise helps acquaint the driver with the vehicle's turning capabilities. The controls stressed in the exercise are basic to all driving situations. The purpose is to develop a sense of unity and control with the vehicle and learn proper timing of steering inputs (the relationship of a fixed object to that of a moving object). 9-3 hand positions, smoothness, timing, and throttle controls stressed in this exercise are the basics of Advanced Driver Training techniques.

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Reverse Serpentine - Backing a vehicle through the reverse serpentine helps to acquaint the driver(s) to spatial references. In doing so, the driver learns smoothness, timing, rhythm and the use of outside and inside rear view mirrors. During ladder operations, correct placement of the rear tiller driver allows the front driver to follow. The front driver must understand how to compensate for an early or late turn by the rear tiller driver by pushing or delaying the front of the trailer.

Evasive maneuver - This is designed to teach an alternative to panic braking in an emergency situation. This exercise teaches that less distance is needed to steer a vehicle around an object than is used when panic stopping before striking it. This demonstrates the maneuvering capability and stability of the vehicle while teaching the driver his/her own capabilities and limitations in making the maneuver.

Controlled braking - This helps the driver to develop the ability to achieve maximum braking while still being able to control the direction of the vehicle. During wheel lock-up, inability to maneuver/steer the vehicle is experienced. The driver is trained to regain directional control of the vehicle as soon as possible after a skid/lock-up has occurred, return the vehicle back into the original lane, and stop before the vehicle enters the simulated intersection.

Alley Dock - This teaches the driver to correctly position, back up, and turn around a pumper, single chassis or tiller ladder. The driver learns the correct position of both the front and rear bumpers so as to be able to correctly place that vehicle into position when spotters are not available. The latter is not advisable; however there are times when it becomes necessary to do so and the driver must be able to demonstrate this without challenge.

180° turn - In this exercise, all drivers learn where the location is of the corners of the vehicles front and rear bumpers. Drivers tend to over/under compensate for bumper placements due to this lack of awareness. During ladder operations, the tiller driver learns to steer only when needed to and that in most cases, no steering input is required. Over-steering leads to improper placement of the tiller's steering tires.

90° turn - Drivers learn the maximum turning radius of the ladder trucks when both drivers use a coordinated effort. This information becomes beneficial in the use of set-up and operations at incidents with limited access and clearances.

Over-the-road - In compliance with Nevada Commercial Motor Vehicle testing, drivers are evaluated on the skills they possess and are properly instructed in defensive driving. Defensive driving skills are to be used at all times so that the driver does not have to react to an incident using a collision avoidance maneuver. Drivers will be shown proper lane changes, stop points on roadway intersections, freeway, residential, and city traffic driving, proper use of mirrors and signaling, as well as spacing between vehicles during both code 1 and code 3 responses. The use and appropriate application of secondary braking systems and the Las Vegas Fire & Rescue

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Code 3 driving rules and regulations are discussed at this time. The driver must demonstrate the ability to back into alleyways, parking spaces, apartment complexes, and driveways as required by the instructor. The Over-the-road testing period is a pass/fail evaluation. The use of defensive driving skills during all facets of the evaluation period are mandatory by the driver and failure to exhibit any of these skills will mean loss of driving privileges on the Las Vegas Fire & Rescue.

Off-road Recovery - The purpose is to give the driver an understanding of the problems involved with, and to develop the driver's skills in making an off-road recovery over a curb or back onto the driving portion of the roadway at operating speeds. Too much steering input may cause the vehicle to cross over it's lane into the adjacent one and possibly off the road on the other side before the driver can regain control of the vehicle. Not enough steering input will leave the vehicle on the shoulder possibly facing a parked car, bridge abutment or worse. This exercise teaches the driver to make a quick return to the roadway necessary to avoid a collision.

Wet Application Skid Control

Non ABS and ABS or Anti-lock braking

Incipient skid stopping

Lane Change

Split Coefficient stopping

Alternate braking devices (Telma, Jake Brake, etc.)

Responses of Emergency Vehicles are not always performed in ideal situations. Inclement weather conditions will always present an extreme hazard for drivers of large apparatus. Wet Application Skid Control teaches the driver the limitations of the apparatus he/she may be driving when faced with this situation.

As in the Controlled Braking, the driver develops the ability to achieve maximum braking while still being able to control the vehicle. Combine this with wet/slick surfaces and the attempt becomes almost senseless. Wheel lock up occurs almost immediately, therefore the driver must learn the reactions the apparatus will display when faced with the above scenarios. The driver will learn the proper action to take under these conditions and will react accordingly. Proficiency and competency of skills will be required. Speeds to start are random but progressive according to the skill level of each driver.

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Resources Needed

180	12" Cones
110	18" Cones
40	36" Cones
40	1"x 4' PVC pipe with couplings (tee and 90° elbow)
8	4"x 12" Wooden flags with adjustable clamps for pipe
16	18" Cones with wooden bases and support pegs for pipe
8	2 Channel radios
EA.	Closed course evaluation forms for each student
EA.	Over the road forms for each student
1	Student completion form for that day's training (To be used by the safety officer)

*15-20 acre driving pad consisting of 8" asphalt over an 8" lime stabilized base. Pad to have all exercises outlined for easy set up and removal.

*Pick/up - for safety officer to address the safety of the operation and for transportation of the equipment.

*Tiller Ladder - 1 for the over-the-road exercise.

*Heavy Duty Ladder and Tiller Ladder - 1 for each 3 students in ½ of the training class

*ABS equipped sedan - 1 for each 2 students in ½ of the training class

*Advanced Driver Training Instructor - 1 for each 2 students

*Certified ADT Instructors - 2 for over the road evaluation in tiller ladder for each 10 students

*Safety officer

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Classroom Outline

Required Time Frame	Topic Outline	Teaching Aids and References
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Classroom - Day 1

15 Min.	Personnel Department Letter PD #96	Handouts, Video
15 Min.	After the Accident	Video
55 Min.	Pre-trip inspection - lecture and hands-on application practice, air brake test	Heavy duty and tiller ladders, Nevada CDL Manual, Driver Training Series video
5 Min.	Break	
20 Min.	Code 3 driving rules and regulations	LVFR Driver Op Manual
20 Min.	Apparatus parking	Video
30 Min.	Aerial setup procedures	Aerial Errors video, slides, lecture
5 Min.	Break	
55 Min.	Secondary braking systems, Anti-lock brakes	“Telma” video, PFD 1994 Braking Demonstration video, handouts
5 Min.	Break	
30 Min.	Overview of Closed Course and Over the Road evaluations	Forms, overheads, drawings, lecture

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Closed Course Outline

Required Time Frame	Topic Outline	Teaching Aids and References
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Closed Course - Day 1

AM --- 10 Min.	Driver Preparation	GM Training Manual
20 Min.	Apparatus Familiarization	Driving around course wo/exercises both students in both position
55 Min.	Forward Serpentine (progressively)	Course Drawings/Set-up, Course Validation, GM Training Manual
5 min.	Break	Drivers are to switch vehicles and positions at this time
55 Min.	Reverse Serpentine	Course Drawings/Set-up, Course Validation, GM Training Manual

--- Continued this format for the duration
of Closed Course Day 1 training ---

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Closed Course –
Day 2--

55 Min.	Evasive exercise (using progressive speeds of 2 mph starting at 25 mph)	Course Drawings/Set-up Course Validation, GM Training Manual
5 Min.	Break	Drivers are to switch vehicles and positions at this time
55 Min.	Controlled Braking - using progressive speeds of 2 mph starting at 25 mph. Student demonstrates proper use of ABS brakes following any non-ABS evaluations	Course Drawings/Set-up, Course validation, GM Training Manual
5 Min.	Break	Drivers are to switch vehicles and positions at this time
55 Min.	Alley dock exercise (first left then right)	Course Drawings/Set-up, Course validation
5 Min.	Break	Drivers are to switch vehicles at this time
55 Min.	180° turn exercise	Course Drawings/Set-up, Course validation
5 Min.	Break	Drivers are to switch vehicles and positions at this time

--- Continued this format for the duration
of Closed Course Day 2 training ---

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Closed Course Outline

Required Time Frame	Topic Outline	Teaching Aids and References
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Closed Course Day 3 ---

55 Min.	90° turn exercise	Course Drawings/Set-up, Course Validation
5 Min.	Break	Drivers are to switch vehicles at this time
35 Min.	Off-road Recovery (using progressive speeds of 2 mph starting at 30 mph)	GM Training Manual, Course Drawings/Set-up, Course validation, Nevada CDL Manual
60+ Min.	Over the road evaluations	Nevada Commercial Drivers License Manual, GFD Drivers Manual
	*** Finish any exercise training evaluations prior to conducting over the road training.	

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Closed Course Outline

Required Time Frame	Topic Outline	Teaching Aids and References
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Classroom - Day 4 - Wet Application/Skid control

20 Min. for each exercise	Non ABS and ABS or Anti-lock braking using the following exercises: - Evasive - Controlled Braking - Split Coefficient - Lane Change - Incipient skid stopping - Secondary braking systems (i.e. driveline, engine brake, output retarders)	Course Drawings/Set-up, Course Validation, GM Training Manual
20 Min.	Circular Skid (radius turn maneuver) - begin at 25 mph progressing 2 mph until loss of control is reached through normal travel	Course Drawings/Set up, Course Validation, GM Training Manual

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

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Ladder Operations

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NARRATIVE

Driver Preparedness

In vehicle set up

- * Adjust seat for maximum freedom
- * Arms should be away while slightly bent
- * Hand placement @ "9-3"
 - Flat steering wheel-- "9-3" with a hand drop technique & hand over hand
- * Sit upright in the back of the seat
- * Adjust mirrors accordingly
- * #1 priority ----- SEAT BELTS
- * Heel of foot should be positioned so that the ball of the foot is used to depress the throttle or brake without lifting. Preferably beneath the right side of the brake pedal
- * Familiarize yourself with instrument panel

9-3" Hand Placement

- * Provides greater maneuverability
 - Full 180 degree turn without moving hands
 - 85% of incidents can be corrected this way
- * Eliminates the frequent use of hand over hand steering
 - This leads to over-steering
- * Eliminates body lean or sway
 - Keeps driver upright
- * Placement of hands/fingers/arms
 - Hold with thumbs only - release fingers naturally when executing a maneuver
 - Stiff handling (arms) slows the steering effort

Exercise execution

Serpentine

1. I.D. the course (explain cone position and spacing)
2. Run parallel to the course
3. Set speed -- +/- 2 mph
4. NO BRAKING
5. Align with 1st cone -- 3-4 ft. out
6. Make a 90° (when driver feels he/she has cleared the cone with front tire)
 - * watch for correct 90°
7. Full 180° turn or hand over hand (using hand drop technique) on each cone thereafter
8. Space evenly on each cone
9. Will have to apply slight throttle pressure to keep speed up - due to cornering forces
10. Front driver must pass around all cones without the assistance of the tiller driver.

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Instructor Tips:

- The vehicle approaches the cones parallel to them and goes around the first cone as though it was in the middle of the course.
- Hand position remains at 9-3 using hand drop or hand over hand steering throughout the course, if physically possible.
- Steering movements are smooth, continuous and even in both directions.
- Speed is lost at each cone due to cornering. Throttle pressure must be increased to maintain a constant speed.
- Stay close to the cones. The student may have to knock some down in order to learn how to position the vehicle relative to them.
- Staying close to the cones keeps the vehicle in a straight a line as possible. This minimizes steering movement which reduces the need to increase throttle pressure.
- Speed: For the first time student, 15 mph is fast enough. Maximum speed will depend on the space available and safety considerations. However, it is not necessary to exceed 25 mph to accomplish the goals of this exercise.
- As speed is increased, it will be necessary to steer sooner as the vehicle approaches the cones.
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong and show or tell the student how to make corrections.
- Correct the student's errors as they happen. It may be necessary to talk them through the exercise.
- Operational Checklist:
 - ☞ Entry speed
 - ☞ Hand position
 - ☞ Position of vehicle at beginning of course
 - ☞ Closeness of vehicle to cones
 - ☞ Smoothness of steering
 - ☞ Use of throttle
 - ☞ Exit speed

Common Errors:

- Enters the course too fast
- Attacks the first cone at an angle rather than in a line parallel with the course
- Fails to maintain speed and/or changes speed abruptly
- Passes too far from the cones
- Steering errors:
 - ☞ Does not steer enough to avoid cones with the front of the vehicle
 - ☞ Steers too soon, striking the adjacent cones with the rear of the vehicle
 - ☞ Does not steer continuously and strikes the next cone with front of the vehicle

Note:

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- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) during any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Reverse Serpentine

Front Driver ---

1. Begin at the left side of the first cone, parallel with the course, and begin backing
2. Set speed that is comfortable
3. As trailer begins to turn past the first cone, front driver should follow
4. Rear wheels of the tractor should be 3-4' from each cone and in line with the trailer.

Instructor Tips:

- The vehicle approaches the cones parallel to them and goes around the first cone as though it was in the middle of the course.
- If the trailer never turns, then the front driver never turns. The front driver must wait for the rear to turn first
- Front driver: Hands remain at the 9-3 position at all times viewing both outside rear view mirrors.
- Tiller driver: Hands remain at the bottom of the steering wheel with palms up-thumbs out. Shuffle steering by the Tiller driver only is allowed, but only when backing.
- Steering movements are smooth, continuous and even in both directions.
- Stay 3-4' from each cone. The student may have to knock some down in order to learn how to position the vehicle relative to them.
- Staying close to the cones keeps the vehicle in a straight a line as possible. This minimizes steering movement.
- Speed: What the student feels comfortable with, but at all times continuous
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong and show or tell the student how to make corrections.
- Correct the student's errors as they happen. It may be necessary to talk them through the exercise.
- Operational Checklist:
 - ☞ Entry speed
 - ☞ Hand position
 - ☞ Position of vehicle at beginning of course
 - ☞ Closeness of vehicle to cones
 - ☞ Smoothness of steering

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☞ Exit speed

Common Errors:

- Enters the course too fast
- Attacks the first cone at an angle rather than in a line parallel with the course
- Fails to maintain speed and/or changes speed abruptly
- Passes too far from the cones
- Tractor turns prior to the trailer turning first
- Steering errors:
 - ☞ Does not steer enough to avoid cones with the rear of the tractor
 - ☞ Steers too soon, striking the adjacent cones with the rear of the tractor
 - ☞ Driver is not patient with trailer and steers too early causing a jack knife situation

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations.
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise.
- * The student will continue in the exercise until satisfaction of skills is realized.
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished.

Tiller Driver ---

1. Begin at the left side of the first cone, parallel with the course, and begin backing.
2. Speed is set by front driver, but should remain comfortable for both.
3. As trailer begins to pass the first cone, the tiller driver should wait until the cone is far enough down the trailer to make a safe and easy turn.
4. Tiller driver should look either in the rear view mirror or backwards and note the position of the next cone.
5. When that cone leaves the view of the tiller driver, the driver should then look to the opposite mirror or other side of the trailer and watch for the cone to come into view.
6. As the second cone comes into view, the tiller driver should put the rear wheels of the trailer 3-4' from the cone.
7. The tiller wheels are then straightened and the trailer reversed until the second cone is far enough down the trailer to make a safe and easy turn.
8. Repeat steps 3-7 until completion of the exercise.

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Instructor Tips:

- The tiller driver should be aware of the location of the tractor portion to ensure that the tractor does not turn too early. If this happens, the tiller driver should warn the front driver and call for a stop in backing.
- Hands remain at the bottom of the steering wheel, palms up, with thumbs out at all times viewing both outside rear view mirrors and occasionally turning around to view cones.
- Steering movements are smooth, continuous and even in both directions.
- Stay 3-4' from each cone. The student may have to knock some down in order to learn how to position the trailer relative to the cones.
- Staying close to the cones keeps the vehicle in a straight a line as possible. This minimizes steering movement.
- Speed: What the drivers feel comfortable with, but at all times continuous.
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong and show or tell the student how to make corrections.
- Correct the student's errors as they happen. It may be necessary to talk them through the exercise.
- Operational Checklist:
 - ☞ Entry speed
 - ☞ Hand position
 - ☞ Position of vehicle at beginning of course
 - ☞ Closeness of vehicle to cones
 - ☞ Smoothness of steering
 - ☞ Exit speed

Common Errors:

- Enters the course too fast
- Attacks the first cone at an angle rather than in a line parallel with the course
- Passes too far from the cones
- Steering errors:
 - ☞ Does not steer enough to avoid cones with the rear of the trailer
 - ☞ Steers too soon, striking the adjacent cones with the middle or rear of the trailer
 - ☞ Does not watch the tractor and allows for a jack knife situation to exist

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Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations.
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise.
- * The student will continue in the exercise until satisfaction of skills is realized.
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished.

Evasive

1. I.D. the course (barrier cones)
2. Center vehicle in the 12' lane
3. On a cue of "Left" or "Right",
 - a. Release throttle
 - b. NO BRAKING
 - c. Hand drop technique around barrier
 - d. Steer back APPROX. 180° to center tractor/trailer in the lane
 - * Quick snap of the steering wheel will correct any fish tail
 - e. Once committed - don't change mind
 - f. Use what steering is required to accomplish the task
 - g. Front driver must get entire ladder through without tiller driver steering input

Instructor Tips:

- The student may tend to guess the direction the instructor will call. It is more important to make the maneuver without striking cones than to go the called direction. If guessing is a problem to the extent that the student is not learning, it may be necessary to alter the procedures to meet the needs of the student.
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong and show or tell the student how to make corrections.
- Approaching the cue point, the student may tip off an unconscious intention toward one exit lane. Watch for shifting, leaning, or movement of the steering wheel, all in the intended direction. These cues can be used to make the exercise easier or more difficult, according to the needs of the students.
- Have the student obtain the desired speed as quickly as possible and then hold the throttle steady. This will allow them to concentrate on the driving tasks.
- Speed: 20 mph to start. Increase speed with approximately 2 mph increments as student goes through course without striking cones. Increase the speed until the capability limits of the student are realized or the limitation of the apparatus is reached.
- If a student strikes cones on two or three consecutive passes at the same speed, increase the distance of the cue until successful then build up again.

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- Slight variations from the desired speed can be compensated for by adjusting the timing of the cue.
- Operational Checklist:
 - ☞ Hand position
 - ☞ Speed
 - ☞ Location of cue cone
 - ☞ Student's movements: Hands, body, feet
 - ☞ Timing of steering
 - ☞ Cones struck
 - ☞ Release of throttle
 - ☞ Tiller steering input
- To help keep the student from guessing the direction, it may help to have them concentrate on a fixed point some distance beyond the barrier rather than on the barrier itself.
- Correct the student's errors as they happen. It may be necessary to talk them through the exercise.

Common Errors:

- Steer in the wrong direction
- Starts to steer in the wrong direction and then tries to recover.
- Steering movements are too slow.
- Does not release the throttle or applies more throttle.
- Improper hand position - hand(s) moves to different position on steering wheel or does not complete a hand drop technique.
- Uses the brakes

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized

Controlled Braking

Front driver --

1. I.D. the course (barrier cones)
2. Set speed -- start at 20 mph
3. Decide ahead of time on the lane choice
4. Cue on a command of "NOW"
5. Maintain foot position at all times before the "cue" command
6. On cue -- apply constant/even pressure on the brake pedal

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- a. The ball of the foot is the sensitivity point
- b. If lock-up occurs - release slightly - DON'T PUMP
 - * Locked wheels make controlled steering impossible
- c. Brake and steer simultaneously - hand drop technique initially
 - * Hand over hand steering after passing the barrier
 - * Driver should be focusing on the stopping point
7. I.D. on-coming lane cones and return hand over hand to original lane
8. Stop parallel with the course before the tractor duals pass the double cones (intersection).

Instructor Tips:

- Controlled braking can be accomplished with either the right or left foot.
- Watch for foot and hand movements that are made before the cue is given.
- Speed: Range for effective teaching is 20-35 mph.
- Do not permit a left foot braker to cover the brake pedal prior to the cue being given.
- The cue distance can be shortened if the vehicle has not attained the desired speed at the normal cue point.
- Have the student attain the desired speed as quickly as possible and then hold the throttle steady.
- Watch the student throughout the maneuver. Inform the student of what they are doing right and wrong, and show or tell the student how to make corrections.
- It is important to reset the cones each time they are struck.
- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.
- Point out that, in making quick stops in a real situation, the driver needs to be aware of traffic behind them and not to block traffic unnecessarily by their braking action.
- Operational Checklist:
 - ☞ Speed
 - ☞ Hand position
 - ☞ Location of cue cone
 - ☞ Early foot movement
 - ☞ Early steering
 - ☞ Timing of steering and braking
 - ☞ Control of steering movement
 - ☞ Foot control while braking
 - ☞ Response of vehicle to steering and braking inputs
 - ☞ Cones struck

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Common Errors:

- Locks the wheels and does not ease off the brake pedal to let the wheels roll again or releases the brake pedal completely.
- Does not brake soon enough.
- Anticipates the cue by moving a foot toward the brake pedal and/or by steering slightly.
- Forgets to brake, usually after having just completed the evasive exercise.
- Does not apply enough steering effort to miss the barrier cones
- Does not apply hand over hand steering to return to parallel
- Does not coordinate braking and steering.
- Does not release the throttle.
- Loses control of the steering wheel.
- Leaves vehicle partially in left lane or not parallel when stopped.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Tiller driver --

1. I.D. the course (barrier cones)
2. Speed set by front driver -- start at 20 mph
3. As cue to given to the front driver and a brake and evade maneuver is made, steering input is not applied until trailer wheel/bumper is past the barrier cone.
4. I.D. on-coming lane cones and return hand over hand to original lane
 - * Driver should be focusing on the stopping point
5. Stop with the trailer parallel with that of the tractor and with the course before exiting

Instructor Tips:

- Watch the student to ensure that enough initial steering input is not used until passing the barrier cones with the tiller wheels/bumper. This will require more than a hand drop technique. Possibly use a hand-over-hand.
- Watch the student throughout the maneuver. Inform the student of what they are doing right and wrong, and show or tell the student how to make corrections.
- It is important to reset the cones each time they are struck.
- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.

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- Point out that, in making quick stops in a real situation, the driver needs to be aware of traffic behind them and not to block traffic unnecessarily by their braking action.
- Operational Checklist:
 - ☞ Hand position
 - ☞ Location of trailer position at barrier
 - ☞ Timing of steering
 - ☞ Control of steering movement
 - ☞ Response of trailer to steering and braking inputs
 - ☞ Cones struck

Common Errors:

- Anticipates the cue by steering slightly.
- Steers before passing barrier cones
- Does not apply hand over hand steering to return to parallel
- Loses control of the steering wheel.
- Leaves trailer partially in either lane or not parallel when stopped.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Alley Dock

Front Driver --

1. I.D. the course
2. Set speed that is comfortable
3. Prepare to enter alley so that a backing maneuver is initially made to the driver's side (once completed satisfactorily, back to the right, blind side)
4. Begin backing the ladder into the simulated alley using mirrors.
5. As trailer begins to turn, the front driver should follow until the entire ladder is positioned in the alley dock and the rear bumper is within 18" from the rear of the dock.
6. First the front driver makes the rear bumper spot without the help of the tiller driver, then with his assistance

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Instructor Tips:

- If the trailer never turns, then the front driver never turns. The front driver must wait for the rear trailer to turn first.
- Hands remain at the 9-3 position at all times viewing both outside rear view mirrors.
- Steering movements are smooth, continuous and even.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Tiller Driver --

1. After the course is identified, tiller driver gives the ok to begin backing
2. Speed is set by front driver, but should remain comfortable for both
3. Prepare to enter alley so that a backing maneuver is initially made to the driver's side (once completed satisfactorily, back to the right, blind side)
4. As trailer begins to enter the dock, the tiller driver should wait until the cone is far enough down the trailer to make a safe and easy turn
5. Tiller driver should look either in the rear view mirror or backwards and note the position of both entrance cones.
6. As trailer enters the dock, the tiller driver should position the trailer so that it is parallel in the dock and the rear bumper is within 18" from the rear of the dock.
7. First the front driver makes the rear bumper spot without the help of the tiller driver, then asks for his assistance

Instructor Tips:

- Tiller driver should watch the dock's corner cones until both come into view in the mirror
- Turns into the alley dock should be made at an imaginary cone approximately 3' out from the corner cone. This helps to place the ladder in a straighter position for backing and allows the driver to see the entire dock
- As the driver backs slowly, steering inputs should be slow
- As the driver backs quickly, faster steering inputs may be necessary
- Hands remain at the bottom of the steering wheel with palms up, thumbs out. At all times, driver should view both outside rear view mirrors.
- Steering movements are smooth, continuous and even.

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Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

180° Turn

1. I.D. the course
2. The student approaches the course at the speed identified by the instructor
3. No brakes or stopping are allowed
4. Turn right on the first pass, then left
5. Tiller driver does not steer, holds wheel straight

Instructor Tips:

- If driver is unaware of the location of the front bumper to start, assistance can be asked of the instructor. Successful passing without the assistance of the instructor must be made.
- Driver can look out the side window, but cannot leave the seat
- Speed should be consistent and set by the driver
- Operational Checklist:
 - ☞ Hand position
 - ☞ Speed
 - ☞ Checking both mirrors

Common Errors:

- Tiller steers
- Speed inconsistent or uses brakes
- Leaves drivers seat to see cones
- Does not watch both mirrors
- Does not allow enough room for trailer
- Ladder not straight when entering

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Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

90° Turn

1. I.D. the course
2. The student approaches the course at the speed identified by the instructor
3. No stopping, brakes ok
4. (Tiller Driver) should watch rear trailer bumper and put it 4-6" from lane cones

Instructor Tips:

- If driver is unaware of the location of the front bumper to start, assistance can be asked of the instructor. Successful passing without the assistance of the instructor must be made.
- Driver can look out the side window, but cannot leave the seat
- Speed should be consistent and set by the driver
- Operational Checklist:
 - ☞ Hand position
 - ☞ Speed
 - ☞ Checking both mirrors

Common Errors:

- Repositioning caused by late or early steering inputs
- Steers too early and causes middle of trailer to strike inside lane poles (cones).
- Tiller driver provides too much evasive steering and strikes outside lane cones with rear bumper
- Tiller driver does not provide enough evasive steering and strikes inside lane poles with trailer

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise

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- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Off-road Recovery

1. I.D. the course
2. The front driver approaches the course at the speed identified by the instructor
3. The front driver drops one side of the ladder off of the road edge and positions the vehicle so that the off-road wheels have room to turn without scrubbing the curb.
4. Turn the wheel ¼ turn toward the road. Tiller driver provides slight steering effort only if needed. Otherwise, holds wheel straight and follows.
5. When each driver feels his tire hit the curb, straightens the ladder so that it stays in its lane.
6. Make a U-turn and approach the course from the opposite direction
7. Perform the same maneuver
8. Make a U-turn and approach the course from the opposite direction
9. Drive the entire ladder off the roadway and positions the ladder so that the off-road wheels have room to turn without scrubbing the curb.
10. Turn the wheel ¼ turn toward the road. Tiller driver provides slight steering effort only if needed. Otherwise, holds wheel straight and follows.
11. When each driver feels his tire hit the curb, straightens the ladder so that it stays in its lane.
12. Make a U-turn and approach the course from the opposite direction
13. Perform the same maneuver
14. Make a U-turn and approach the course from the opposite direction
15. Student drops one side of the ladder off of the road edge and positions the ladder so that the off-road wheels scrub the curb with the inside of the off-road tires. Tiller steering input is required to address the rear trailer portion.
16. The front driver turns the wheel gradually toward the road until the ladder begins to enter the roadway. Tiller driver provides slight steering effort only if needed. Otherwise, holds wheel straight and follows.
17. When the student feels the front tire grab and enter the roadway, counter steers to return to parallel with the lane. A slight snap of the wheel may be necessary to correct any limited handling situation that may present itself.
18. Make a U-turn and approach the course from the opposite direction
19. Perform the same maneuver
20. Repeated runs are made until satisfaction of skills are realized

Instructor Tips:

- Be sure to watch the student's steering motions closely to determine the amount and timing of their steering inputs. Inform the student of what they are doing right and wrong, and show or tell the student how to make corrections.
- Until the student is familiar with the exercise, they should be cued when to make the recovery. After that, the student can initiate the maneuver at his/her own discretion.

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- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.
- It is not necessary to center the vehicle over the road edge in order to give the tire enough space to turn. The shoulder may not be wide enough to do that. Just enough space is needed between the curb and the off-road tire for the tread, rather than the sidewall, to contact the curb when the recovery is made.
- 45° - 90° of steering input is all that is needed to make a recovery.
- The greater the curb height and/or the closer the tire is to the curb, the greater the amount of steering and the quicker the steering wheel needs to be turned in order to recover the roadway.
- If the student turns the steering wheel to maintain lane position before the front tire strikes the curb, there is the possibility that the front tire will climb the curb and the rear tire will not. The rear tire can then scrub, causing part of or the entire ladder to remain on the shoulder.
- The maneuver can be accomplished easily with the 9-3 hand position (hand drop for larger units)
- Speed: Start at 30 mph. Increase in 2-3 mph steps as the student progresses until the limit of capability of the student is reached or the limitations of the apparatus.
- Operational Checklist:
 - ☞ Hand position
 - ☞ Timing of steering to maintain lane
 - ☞ Speed
 - ☞ Releases accelerator
 - ☞ Position of vehicle to curb
 - ☞ Amount of steering to recover road

Common Errors:

- Does not allow sufficient space between the curb and the tire for the tire to assume the angle needed to come up over the curb without scrubbing.
- Applies the brakes
- Does not release throttle or accelerates.
- Steer too slowly. This can cause the tire to scrub resulting in an improper recovery.
- Jerks the wheel in an attempt to recover the roadway.
- Steers more than necessary to make the vehicle recover the roadway.

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Lesson Plan

Ladder Operations

Revised 10/01/07

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Wet Application Exercises

Split Coefficient

1. I.D. the course
2. The student enters onto the skid pad at a predetermined speed with ½ of the vehicle on the pad and ½ on dry surface
3. The student attempts to stop the vehicle without wheel lock-up or using the ABS brakes
4. The student releases the throttle, steers to keep the front of the vehicle pointed straight, and controls any skid.
5. This is done from both ends of the skid pad

Note:

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- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Lane Change

1. I.D. the course
2. The student enter the skid pad at a predetermined speed
3. After the entire vehicle is on the skid pad, the student makes a lane change
4. The student releases the throttle, steers to keep the front of the vehicle pointed straight into the chosen lane of travel, and controls any skid.
5. Lane changes are made both to the left and right.

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Note:

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- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Incipient skid stopping

1. I.D. the course
2. The student enter the skid pad at a predetermined speed
3. After the entire vehicle is on the skid pad, the student makes a stop without locking up the wheels
4. The student releases the throttle, steers to keep the front of the vehicle pointed straight, and controls any skid.
5. Speeds are gradual and progressive

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Secondary Braking Systems (i.e. Telma, Jacob brake, Allison retarder)

1. The secondary braking system on the vehicle is demonstrated by the instructor after the entire vehicle is on the skid pad. No brakes are used.
2. The student then demonstrates the same system with progressive speeds until loss of control.
3. This helps the student realize to what point the vehicle is stable using that particular braking system under inclement weather conditions.

Note:

- * Secondary braking systems should be demonstrated and practiced on normal driving surfaces after wet.
- * The instructor will explain each exercise to ensure the student knows the basic techniques.

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- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Circular Skid (radius turn maneuver)

1. I.D. the course
2. Begin at 25 mph progressing 2 mph until loss of control is reached through normal travel
3. Turns are made after the entire vehicle is on the skid pad
4. Turns are made both left and right.

Instructor Tips:

- It is necessary to very closely observe the student's hand movements as they correct the skid. Inform the student what they are doing right and wrong, and show or tell the student how to make corrections.
- Listen to the sound of the engine to determine if the student has released the throttle or has accelerated.
- Give the student simple, single skids to start.
- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.
- Make sure the student starts with the 9-3 hand position, but changes to the hand-drop or hand-over-hand method if necessary.
- Vary the exercise so that the student does not develop a conditioned response to the skid.
- Watch for foot movement to determine if the student has a tendency to use the brakes.
- Several factors determine how severe the student's skid will be: Speed, the angle of entry of the vehicle onto the skid surface (the greater the angle, the more severe the skid), and the length of time the instructor keeps the wheel(s) locked.
- Speed: On a slick surface, skid control can be taught from 25 mph. Start at the lower speed and work up gradually as the skill of the student would indicate.
- Operational Checklist:
 - ☞ Speed
 - ☞ Hand position
 - ☞ Amount of steering used to drive curved path
 - ☞ Angle of the path of the vehicle on the skid surface
 - ☞ Hand movement in correcting skid
 - ☞ Response time of the student
 - ☞ Timing of counter steering
 - ☞ Returns to 9-3 hand position

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Common errors:

- Responds slowly to the first skid, allowing the vehicle to go beyond the point of control.
- Does not steer enough to control the skid
- Over-responds to the skid by turning the steering wheel too much, possibly causing a second skid.
- Starts the counter steer too late after the initial correction.
- Does not use hand-over-hand steering if more than 180° of steering is achieved and then momentarily stops steering. This causes the student to be very slow in applying additional steering and may result in the vehicle skidding out of control.
- Takes both hands off the steering wheel at the same time or shuffle steers.
- Does not ease up on the accelerator.
- Tries to control the skid by using the accelerator or accelerates unknowingly.
- Applies the brakes possibly locking the wheels, unless vehicle has ABS.
- Cannot distinguish which direction the vehicle is skidding and does nothing.
- Steers with one hand only.
- Steers in the wrong direction.

Note:

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- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

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Air Brake Test

1. Check Air Compressor Governor Cut-in and Cut-out Pressures
 - a. With engine on and air tank full; reduce air pressure by pumping service brake pedal. At idle, the air governor should cut-in at about 100 psi. and cut-out the air compressor at about 120-125 psi.

Air Leakage Rate test

2. Air tanks full, batteries/ignition on, engine off, wheels chocked or on flat ground.
3. Release the parking brake and time the air pressure drop
 - a. loss rate should be less than 2 psi in 1 minute for single vehicles and less than 3 psi in 1 minute for combination vehicles
4. Apply foot pressure of 90 psi or more to the service brake pedal
 - a. after the initial drop, pressure should not drop more than 3 psi in 1 minute for single vehicles or more than 4 psi for combination vehicles
5. Test Low Pressure Warning Signal
 - a. Continue reducing air tank by pumping brake pedal
 - b. low pressure warning signal must come on before reaching less than 60 psi (or tank with the lowest air pressure in dual systems)
6. Check That the Spring Brakes Come on Automatically
 - a. Continue reducing air tank by pumping brake pedal
 - b. "Parking Brake" knob should pop out when the air pressure falls to within 20-40 psi
7. Check Rate of Air Pressure Buildup
 - a. Engine on and at operating Rpm's
 - b. Pressure should build from 85-100 psi within 45 seconds in dual air systems
 - c. Pre-1975, typical requirements are from 50-90 psi within 3 minutes at idle speed
8. Test Parking Brake
 - a. With parking brake on, gently pull forward or backward (based on location of wheel chocks) to see if parking brake will hold. Only mild throttle pressure is needed.

**** Too much throttle pressure can damage driveline.**

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9. Test Service Brakes

- a. Release parking brake, slowly move forward or backward (based on location of wheel chocks) and apply service brakes.

10. Check Manual Slack Adjusters on S-Cam Brakes

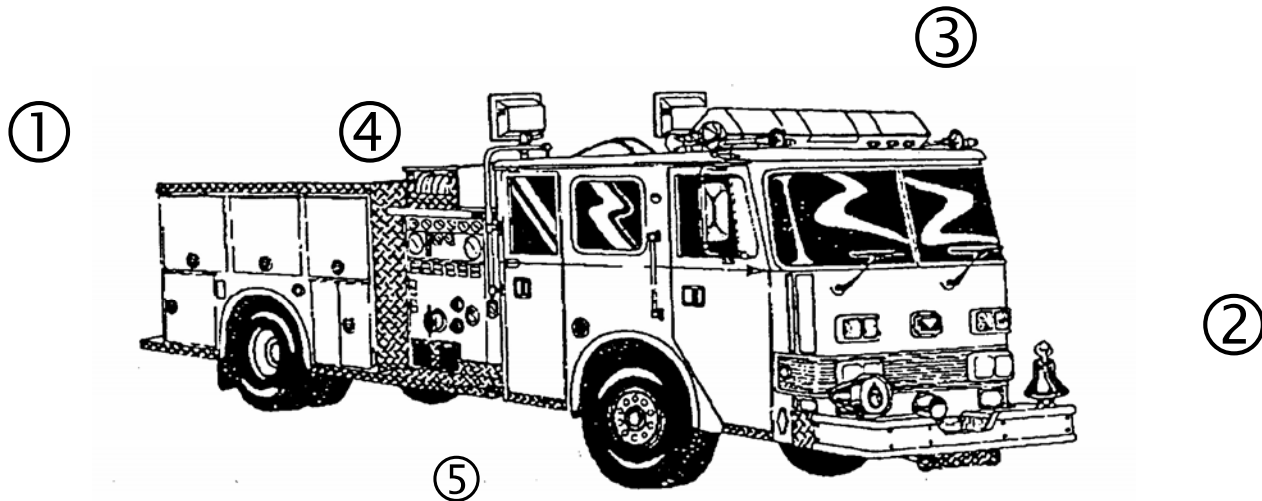
- a. Park on level ground, wheels chocked, keys in pocket
- b. Push in parking brake
- c. Pull on each slack adjuster
 - > should not move more than 1 inch where the push rod attaches
 - > since parking brakes only affect the rear brakes, the front slack adjusters can be checked at any time during the pre-trip inspection

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**LVFR PRE-TRIP VEHICLE
INSPECTION GUIDE**



DAILY CHECK

Engine Compartment

1. ☐ Leaks
- ☐ Oil level
- ☐ Water level
- ☐ Power steering fluid
- ☐ Air compressor

Inside Cab

2. ☐ Emergency lights/siren
- ☐ Steering wheel play
- ☐ Parking brake
- ☐ Dash lights
- ☐ Horn
- ☐ Oil pressure
- ☐ Ammeter/volt meter
- ☐ Fuel tank gauge
- ☐ Air brake buzzer
- ☐ Mirrors, windshield
- ☐ Wipers
- ☐ Heater/defroster

Outside Cab/around apparatus

3. ☐ Emergency lighting
- ☐ Headlights

On top of apparatus

4. ☐ Water tank level
- ☐ Foam tank level
- ☐ Fire fighting/EMS equipment
(deluge gun, hoses, nozzles,
back boards, etc.)

TRUCK DAY

5. ☐ Air brake test
- ☐ Springs
- ☐ Spring mounts
- ☐ Shock absorbers,
- ☐ Brake hose
- ☐ Brake chamber
- ☐ Brake drum
- ☐ Slack adjuster
- ☐ Tires (4/32 front, 2/32 rear)
- ☐ Steering box
- ☐ Steering linkage
- ☐ Water pump
- ☐ Alternator

Ladder trucks

- ☐ Jack plates
- ☐ Bulging/leaking hydraulic lines
- ☐ Hoisting cylinders
- ☐ Hydraulic fluid
- ☐ Trailer mounting bolts
- ☐ Trailer air/electrical connections
- ☐ Trailer frame

Tiller

- ☐ Springs
- ☐ Spring mounts
- ☐ Shock absorbers,
- ☐ Brake hose
- ☐ Brake chamber
- ☐ Brake drum
- ☐ Slack adjuster
- ☐ Steering axle tires (4/32)
- ☐ Steering box
- ☐ Steering linkage
- ☐ Tiller signal button
- ☐ Steering wheel play
- ☐ Mirrors, windshield

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- | | | |
|--|--|--|
| ☐ Door, mirrors | ☐ Fuel tank | ☐ Wipers |
| ☐ Rear lights, reflectors | ☐ Fuel leaks | ☐ Heater/defroster |
| ☐ Brake/signal lights | ☐ Exhaust system | ☐ Tire pressure |
| ☐ Emergency equipment | ☐ Drive shaft | ☐ Tire tread depth and wear |
| ☐ Tire pressure | ☐ Frame | ☐ Rim, hub seal, lug nuts |
| ☐ Tire tread depth and wear | ☐ Hydraulic fluid | ☐ Door, mirrors, windshield |
| ☐ Rim, hub seal, lug nuts | ☐ Mud flaps | ☐ Rear lights, reflectors |

APPENDICES

Glossary of Terms

ABS	Anti-lock braking system
Gate	Simulating an apparatus door opening or obstruction representing pumper intake height. This is also to represent height limitations for each particular apparatus/vehicle and the limitations of outside rear view mirrors.
I.D.	Identify the course as to the location and purpose of each cone, barrier, barrier piping, and course outline. Instructors dialogue, comments on the purpose of each exercise and validation. A demonstration of each exercise is then completed by the instructor.
Secondary Braking Systems	Those systems using either vehicle exhaust, electro-magnetic, or internal transmission components to restrict the forward movement of a vehicle and in turn slow the vehicle down.

MANUALS

1. Nevada Department of Transportation. Nevada Commercial Driver's License Manual. Current issue
2. General Motors Desert Proving Grounds. Advanced Driver Training Course Manual. 1990 edition.
3. Las Vegas Fire & Rescue. Driver's Operator Manual.
4. Las Vegas Fire & Rescue. S.O.P.'s

VIDEOS

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1. Phoenix Fire Department. Aerial Errors.
2. Phoenix Fire Department. After the Accident.
3. Phoenix Fire Department. Apparatus Parking. 1994 edition.
4. Phoenix Fire Department. Driver Training Series 1-4, Driver Training Program
5. Phoenix Fire Department. EP-37 Accident. 1993 edition.

EVALUATION FORMS

1. Closed Course
2. Over the Road
3. Grinder
4. Air Brake Test
5. Student Completion

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Class Description

To provide a detailed and comprehensive driver training program for all vehicle drivers with emphasis on safety and driving skills under most driving conditions, and to teach vehicle operators to respond as quickly and correctly as possible in an emergency situation.

Las Vegas Fire & Rescue (LVFR) uses standards established by National Fire Protection Association, 1002 Standard for Driver Apparatus, Nevada Department of Transportation, Commercial Drivers License (CDL), General Motors Advanced Driver Training, National Highway Traffic and Safety Administration, and the Occupational Health and Safety Administration programs.

All instructors are certified using the Advanced Driver Training program.

This then becomes the Standard for Las Vegas Fire & Rescue (LVFR).

Learning Competencies

Vehicle drivers must possess both driving skill and proper attitude to drive safely and professionally. Many drivers believe that years of experience will see them through every situation. However, experience alone is not enough. Continuing education, classroom work, and “hands-on” driving must supplement it.

High profile vehicles are not designed for high speed handling. A sports car will stop easier, sway less while turning and handle better because it has less inertia to overcome due to its lighter weight and low center of gravity. In learning to drive both passenger vehicles and top-heavy or high profile vans, the driver must learn to compensate for any added inertia. This is accomplished by decreased speed, practice, increased awareness, with anticipation of traffic signals and the actions of others. Couple defensive driving skills with repetitive training in Advanced Driver Training techniques for collision avoidance and the driver will learn to avoid a critical situation by taking the proper action without conscious thought.

All of the exercises/maneuvers listed below can and are sometimes used every day by drivers of passenger vehicles. Below is a definitive reason for each exercise and the learning competencies gained by each driver successfully passing the Advanced Driver Training program through Las Vegas Fire & Rescue.

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Serpentine - The serpentine exercise helps acquaint the driver with the vehicle's turning capabilities. The controls stressed in the exercise are basic to all driving situations. The purpose is to develop a sense of unity and control with the vehicle and learn proper timing of steering inputs (the relationship of a fixed object to that of a moving object). 9-3 hand positions, smoothness, timing, and throttle controls stressed in this exercise are the basics of Advanced Driver Training techniques.

Reverse Serpentine - Backing a vehicle through the reverse serpentine helps to acquaint the driver(s) to spatial references. In doing so, the driver learns smoothness, timing, rhythm and the use of outside and inside rear view mirrors.

Evasive maneuver - This is designed to teach an alternative to panic braking in an emergency situation. This exercise teaches that less distance is needed to steer a vehicle around an object than is used when panic stopping before striking it. This shows the maneuvering capability and stability of the vehicle while teaching the driver his or her own capabilities and limitations in making the maneuver.

Controlled braking - This helps the driver to develop the ability to achieve maximum braking while still being able to control the direction of the vehicle. During wheel lock up, inability to maneuver/steer the vehicle is experienced. This trains the driver to regain directional control of the vehicle as soon as possible after a skid/lock-up has occurred, return the vehicle back into the original lane, and stop before the vehicle enters a simulated intersection.

Hammerhead - Improving awareness of vehicle size, maneuverability in confined spaces, increase awareness of the vehicle turning radius, and the use of mirrors are all part of what the driver learns in the Hammerhead. This teaches the relationship of the vehicle with stationary objects. For passenger van drivers, this exercise represents the placement of vans or vehicles in driveways, parking spaces, or alleyways.

Offset Alley - The 12 foot alley from which the driver must enter/exit is arranged 12 feet out of line to the opposite 12 foot alley into which the vehicle must be driven. The purpose of the exercise is to test the driver's ability to maneuver the vehicle within a confined space. The driver must accurately judge the distance between the vehicle and the barriers and learn the position of the front and rear bumpers. After proceeding forward through the exercise, the driver will back through the offset alleys. The driver should be proficient enough at backing to not hit any cones or to have to reposition the vehicle.

Over-the-road - To meet Nevada Commercial Motor Vehicle testing, we evaluate drivers on the skills they possess and are properly instructed in defensive driving. Defensive driving skills are to be used at all times so that the driver does not have to react to an incident using a collision avoidance maneuver. Drivers will be given direction on proper lane changes, stop points on

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roadway intersections, freeway, residential, and city traffic driving, proper use of mirrors and signaling, plus spacing between vehicles. Defensive driving rules are discussed at this time. The driver must demonstrate the ability to back into alleyways, parking spaces, apartment complexes, and driveways as required by the instructor. The Over-the-road testing period is a pass/fail evaluation. The uses of defensive driving skills during all facets of the evaluation period are mandatory by the driver and failure to exhibit any of these skills will mean failure of the over the road section and may also lose certification from Las Vegas Fire & Rescue.

Off-road Recovery - The purpose is to give the driver an understanding of the problems involved with, and to develop the driver's skills in making an off-road recovery over a curb or back onto the driving portion of the roadway at operating speeds. Too much steering input may cause the vehicle to cross over its lane into the adjacent one and possibly off the road on the other side before the driver can regain control of the vehicle. Not enough steering input will leave the vehicle on the shoulder possibly facing a parked car, bridge abutment or worse. This exercise teaches the driver to make a quick return to the roadway necessary to avoid a collision.

Wet Application Skid Control

- Non ABS and ABS or Anti-lock braking
- Incipient skid stopping
- Lane Change
- Split Coefficient stopping
- Secondary Braking System (i.e. Telma, Jake Brake, Allison retarder)

Driving vehicles is not always done in ideal situations. Inclement weather conditions will always present an extreme hazard for drivers of passenger vehicles. Wet Application Skid Control teaches the driver the limitations of the vehicle he or she may be driving when faced with this situation.

As in the Controlled Braking, the driver develops the ability to achieve maximum braking while still being able to control the vehicle. Combine this with wet/slick surfaces and the attempt becomes almost senseless. Wheel lock up occurs almost immediately. Therefore, the driver must learn the reactions the vehicle will display when faced with the above scenarios. The driver will learn the proper action to take under these conditions and will react accordingly. The driver will demonstrate proficiency and competency of skills in the vehicle to achieve a passing grade. Speeds to start are random but progressive according to the skill level of each driver.

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Resources Needed

180	12" Cones
110	18" Cones
40	36" Cones
40	1"x 4' PVC pipe with couplings (tee and 90° elbow)
8	4"x 12" Wooden flags with adjustable clamps for pipe
16	18" Cones with wooden bases and support pegs for pipe
8	2 Channel radios
EA.	Closed course evaluation forms for each student
EA.	Over the road forms for each student
1	Student completion form for that day's training (to be used by the safety officer)

*15-20 acre driving pad consisting of 8" thick $\frac{3}{4}$ " asphalt over an 8" lime stabilized base. Pad to have all exercises outlined for easy set up and removal.

*Pick/up - for safety officer to address the safety of the operation and for transportation of the equipment.

*Passenger vehicle- 1 for the over-the-road exercise.

*Passenger vehicle - 1 for each 2 students in $\frac{1}{2}$ of the training class

*ABS equipped sedan - 1 for each 2 students in $\frac{1}{2}$ of the training class

*Certified Advanced Driver Training Instructor - 1 for each 2 students

*Safety officer

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Classroom Outline

Required Time Frame	Topic Outline	Teaching Aids and References
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Classroom - Day 1

20 Min.	Driving rules and regulations	NDOT Manual
30 Min.	Overview of Closed Course and Over the Road evaluations	Course validation, forms, drawings, NV CDL Manual
55 Min.	Pre-trip practical on vehicle(s)	Passenger vehicle, handouts
5 Min.	Break	
55 Min.	Secondary Braking Systems	Handouts

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Closed Course Outline

Required Time Frame	Topic Outline	Teaching Aids and References
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Driving - Day 1

10 Min.	Driver Preparation	GM Training Manual
55 min.	Serpentine Exercise (progressively, 45', 55', and 60', starting with the 45') Forward then Reverse	Course Drawings/Set-up, Course Validation, GM Training Manual
5 Min.	Break	
55 Min.	Evasive exercise (using progressive speeds of 2 mph starting at 25 mph)	Course Drawings/set-up, Course Validation, GM Training Manual
5 Min.	Break	
55 Min.	Controlled Braking - using progressive speeds of 2 mph starting at 25 mph) - Student demonstrates proper use of ABS brakes following non-ABS evaluations	Course Drawings/Set-up, Course Validation, GM Training Manual
5 Min.	Break	
55 Min.	Offset Alley exercise (first forward then reverse)	Course Drawings/Set-up, Course Validation
5 Min.	Break	
55 Min.	Hammerhead exercise	Course Drawings/Set-up, Course Validation

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Closed Course Outline

Required Time Frame	Topic Outline	Teaching Aids and References
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Driving - Day 2

35 Min.	Off-road Recovery (using progressive speeds of 2 mph starting at 30 mph)	GM Training Manual Course Drawings/Set-up, Course Validation, Nevada CDL Manual
Wet Application Skid control	Non ABS and ABS or Anti-lock braking using the following exercises:	Course Drawings/Set-up, Course Validation, GM Training Manual
20 Min. for each exercise	- Evasive - Controlled Braking - Split Coefficient - Lane Change - Incipient skid stopping	
20 Min.	Circular Skid (radius turn maneuver) - begin at 25 mph progressing 2 mph until loss of control is reached through normal travel	Course Drawings/Set up procedures Course Validation GM Training Manual

Over the road evaluations is only performed following the successful passing of the prior day's training and evaluations.

60 Min.	Over the Road	NV Commercial Driver's License Manual, Course Validation
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- * During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

NARRATIVE

Driver Preparedness

In vehicle set up

- * Adjust seat for maximum freedom
- * Arms should be away while slightly bent
- * Hand placement @ "9-3"
 - Flat steering wheel-- "9-3" with a hand drop technique & hand over hand
- * Sit upright in the back of the seat
- * Adjust mirrors accordingly
- * #1 priority ----- SEAT BELTS
- * Heel of foot should be positioned so that the ball of the foot is used to depress the throttle or brake without lifting. Preferably beneath the right side of the brake pedal
- * Familiarize yourself with instrument panel

9-3" Hand Placement:

- * Provides greater maneuverability
 - Full 180 degree turn without moving hands
 - 85% of incidents can be corrected this way
- * Eliminates the frequent use of hand over hand steering
 - This leads to over-steering
- * Eliminates body lean or sway
 - Keeps driver upright
- * Placement of hands/fingers/arms
 - Hold with thumbs only - release fingers naturally when executing a maneuver
 - Stiff handling (arms) slows the steering effort

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Exercise execution

Serpentine

1. I.D. the course (explain cone position and spacing)
2. Run parallel to the course
3. Set speed -- +/- 2 mph
4. NO BRAKING
5. Align with 1st cone -- 2-3 ft. out
6. Make a 90° (when driver feels he/she has cleared the cone with front tire)
* watch for correct 90°
7. Full 180° turn on each cone thereafter - feeling forearms touch
8. Space evenly on each cone
9. Will have to apply slight throttle pressure to keep speed up - due to cornering forces

Instructor Tips:

- The vehicle approaches the cones parallel to them and goes around the first cone as though it was in the middle of the course.
- Hand position remains at 9-3 throughout the course, if physically possible.
- Steering movements are smooth, continuous and even in both directions.
- Speed is lost at each cone due to cornering. Throttle pressure must be increased to maintain a constant speed.
- Stay close to the cones. The student may have to knock some down in order to learn how to position the vehicle relative to them.
- Staying close to the cones keeps the vehicle in a straight a line as possible. This minimizes steering movement which reduces the need to increase throttle pressure.
- Speed: For the first time student, 15 mph is fast enough. Maximum speed will depend on the space available and safety considerations. However, it is not necessary to exceed 25 mph to accomplish the goals of this exercise.
- As speed is increased, it will be necessary to steer sooner as the vehicle approaches the cones.
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong and show or tell the student how to make corrections.
- Correct the student's errors as they happen. It may be necessary to talk them through the exercise.
- Operational Checklist:
 - ☞ Entry speed
 - ☞ Hand position
 - ☞ Position of vehicle at beginning of course
 - ☞ Closeness of vehicle to cones
 - ☞ Smoothness of steering
 - ☞ Use of throttle
 - ☞ Exit speed

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Common Errors:

- Enters the course too fast
- Attacks the first cone at an angle rather than in a line parallel with the course
- Fails to maintain speed and/or changes speed abruptly
- Passes too far from the cones
- Steering errors:
 - ☞ Does not steer enough to avoid cones with the front of the vehicle
 - ☞ Steers too soon, striking the adjacent cones with the rear of the vehicle
 - ☞ Does not steer continuously and strikes the next cone with front of the vehicle

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Reverse Serpentine

1. Set speed that is comfortable
2. Left hand at the 12 o'clock position, right arm on the back of passenger seat, looking backwards
3. Begin at the right side of the first cone and begin backing.

Instructor Tips:

- The vehicle approaches the cones parallel to them and goes around the first cone as though it was in the middle of the course.
- Left hand remains at the 12 o'clock position at all times. The right arm is on the back of passenger seat, looking backwards or the student facing forward, viewing both outside rear view mirrors.
- Steering movements are smooth, continuous and even in both directions.
- Stay close to the cones. The student may have to knock some down in order to learn how to position the vehicle relative to them.
- Staying close to the cones keeps the vehicle in a straight a line as possible. This minimizes steering movement.
- Speed: What the student feels comfortable with, but at all times continuous
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong and show or tell the student how to make corrections.

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- Correct the student's errors as they happen. It may be necessary to talk them through the exercise.
- Operational Checklist:
 - ☞ Entry speed
 - ☞ Hand position
 - ☞ Position of vehicle at beginning of course
 - ☞ Closeness of vehicle to cones
 - ☞ Smoothness of steering
 - ☞ Exit speed

Common Errors:

- Enters the course too fast
- Attacks the first cone at an angle rather than in a line parallel with the course
- Fails to maintain speed and/or changes speed abruptly
- Passes too far from the cones
- Steering errors:
 - ☞ Does not steer enough to avoid cones with the rear of the vehicle
 - ☞ Steers too soon, striking the adjacent cones with the front of the vehicle
 - ☞ Does not steer continuously and strikes the next cone with rear of the vehicle

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Evasive

1. I.D. the course (barrier cones)
2. Center vehicle in the 12' lane
3. On a cue of "Left" or "Right",
 - a. Release throttle
 - b. NO BRAKING
 - c. APPROX. 180° turn
 - d. Steer back APPROX. 180°
 - * Quick snap of the steering wheel will correct any fish tail
 - e. Once committed - don't change mind
 - f. Use what steering is required to accomplish the task

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Instructor Tips:

- The student may tend to guess the direction the instructor will call. It is more important to make the maneuver without striking cones than to go the called direction. If guessing is a problem to the extent that the student is not learning, it may be necessary to alter the procedures to meet the needs of the student.
- Watch the student carefully throughout the exercise. Inform the student of what they are doing right and wrong, and show or tell the student how to make corrections.
- Approaching the cue point, the student may tip off an unconscious intention toward one exit lane. Watch for shifting, leaning, or movement of the steering wheel, all in the intended direction. These cues can be used to make the exercise easier or more difficult, according to the needs of the students.
- Have the student obtain the desired speed as quickly as possible and then hold the throttle steady. This will allow them to concentrate on the driving tasks.
- Speed: 25 mph to start. Increase speed on approximately 5 mph increments as student goes through course without striking cones. Increase the speed until the limit of capability of the student or course is reached.
- If a student strikes cones on two or three consecutive passes at the same speed, reduce speed to level at which they can be successful then build up again.
- Slight variations from the desired speed can be compensated for by adjusting the timing of the cue.
- Operational Checklist:
 - ☞ Hand position
 - ☞ Speed
 - ☞ Location of cue cone
 - ☞ Student's movements: Hands, body, feet
 - ☞ Timing of steering
 - ☞ Cones struck
 - ☞ Release of throttle
- To help keep the student from guessing the direction, it may help to have them concentrate on a fixed point some distance beyond the barrier rather than on the barrier itself.
- Correct the student's errors as they happen. It may be necessary to talk them through the exercise.

Common Errors:

- Steer in the wrong direction
- Starts to steer in the wrong direction, and then tries to recover.
- Steering movements are too slow.
- Does not release the throttle or applies more throttle.
- Improper hand position - hand(s) moves to different position on steering wheel or is taken off completely.
- Uses the brakes

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Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Controlled Braking

1. I.D. the course (barrier cones)
2. Set speed -- start at 25 mph
3. Decide ahead of time on the lane choice
4. Cue on a command of "NOW"
5. Maintain foot position at all times before the "cue" command
6. On cue -- pivot and squeeze with the ankle - apply constant/even pressure
 - a. The ball of the foot is the sensitivity point
 - b. If lock-up occurs - release slightly - DON'T PUMP
 - * Locked wheels make controlled steering impossible
 - c. Brake and steer simultaneously - APPROX. 180°
 - * Driver should be focusing on the stopping point
7. I.D. on-coming lane cones and returns APPROX. 180° to original lane
8. Stop with cones on shoulder or before

Instructor Tips:

- Controlled braking can be accomplished with either the right or left foot.
- Watch for foot and hand movements that are made before the cue is given.
- Speed: Range for effective teaching is 25-45 mph.
- Do not permit a left foot braker to cover the brake pedal with their left foot when that is not their normal highway driving habit.
- The cue distance can be shortened if the vehicle has not attained the desired speed at the normal cue point.
- Have the student attain the desired speed as quickly as possible and then hold the throttle steady.
- Watch the student throughout the maneuver. Inform the student of what they are doing right and wrong, and show or tell the student how to make corrections.
- It is important to reset the cones in the first barrier each time they are struck.
- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.

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- Point out that, in making quick stops in a real situation, the driver needs to be aware of traffic behind them and not to block traffic unnecessarily by their braking action.
- Operational Checklist:
 - ☞ Speed
 - ☞ Hand position
 - ☞ Location of cue cone
 - ☞ Early foot movement
 - ☞ Early steering
 - ☞ Timing of steering and braking
 - ☞ Control of steering movement
 - ☞ Foot control while braking
 - ☞ Response of vehicle to steering and braking inputs
 - ☞ Cones struck

Common Errors:

- Locks the wheels and does not ease off the brake pedal to let the wheels roll again or releases the brake pedal completely.
- Does not brake soon enough.
- Anticipates the cue by moving a foot toward the brake pedal and/or by steering slightly.
- Forgets to brake, usually after having just completed the evasive exercise.
- Does not steer far enough to the left to miss the barrier
- Does not coordinate braking and steering.
- Does not release the throttle.
- Loses control of the steering wheel.
- Leaves vehicle partially in left lane when stopped.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Hammerhead

1. I.D. the course (barrier cones and poles/flags)
2. After entering, make a left turn
3. Proceed to the corner of the exercise and prepare to back into the simulated driveway

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4. After completed, drive to the opposite end, and make the same maneuver. This time backing into the simulated alley
 5. Proceed to the original driveway and pull into this forward
 6. Reverse out and proceed to the other end making the same maneuver into the simulated alley
 7. After which the student exits the exercise
- * Speed is relative to the exercise and determined by the driver

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Offset Alley

1. I.D. the course
 2. Enter first from the end opposite the "J"
 3. Proceed through course and stopping within 18" of the end cone
 4. Reverse through course and stopping within 18" of the beginning cone
- * Speed is relative to the exercise and determined by the driver

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Off-road Recovery

1. I.D. the course
2. The student approaches the course at the speed identified by the instructor
3. The student drops one side of the vehicle off of the road edge and positions the vehicle so that the off-road wheels have room to turn without scrubbing the curb.
4. Turn the wheel ¼ turn toward the road.

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5. When the student hears or feels the front tire hit the curb, straightens the vehicle so that it stays in its lane.
6. Make a U-turn and approach the course from the opposite direction
7. Perform the same maneuver
8. Make a U-turn and approach the course from the opposite direction
9. Drive the entire vehicle off the roadway and positions the vehicle so that the off-road wheels have room to turn without scrubbing the curb.
10. Turn the wheel ¼ turn toward the road
11. When the student hears or feels the last rear tire hit the curb, straightens the vehicle so that it stays in its lane.
12. Make a U-turn and approach the course from the opposite direction
13. Drive the entire vehicle off the roadway and positions the vehicle so that the off-road wheels have room to turn without scrubbing the curb.
14. Turn the wheel ¼ turn toward the road
15. When the student hears or feels the last rear tire hit the curb, straightens the vehicle so that it stays in its lane.

Instructor Tips:

- Be sure to watch the student's steering motions closely to determine the amount and timing of their steering inputs. Inform the student of what they are doing right and wrong, and show or tell the student how to make corrections.
- Until the student is familiar with the exercise, they should be cued when to make the recovery. After that the student can initiate the maneuver at his/her own discretion.
- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.
- It is not necessary to center the vehicle over the road edge in order to give the tire enough space to turn. The shoulder may not be wide enough to do that. Just enough space is needed between the curb and the off-road tire for the tread, rather than the sidewall, to contact the curb when the recovery is made.
- 45° - 90° of steering input is all that is needed to make a recovery.
- The greater the curb height and/or the closer the tire is to the curb, the greater the amount of steering and the quicker the steering wheel needs to be turned in order to recover the roadway.
- If the student turns the steering wheel to maintain lane position before the front tire strikes the curb, there is the possibility that the front tire will climb the curb and the rear tire will not. The rear tire can then scrub, causing a problem.
- The maneuver can be accomplished easily with the 9-3 hand position.
- Speed: Start at 30 mph. Increase in 5 mph steps as the student progresses until the limit of capability of the student or course is reached.
- Operational Checklist:
 - ☞ Hand position
 - ☞ Timing of steering to maintain lane
 - ☞ Speed

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- ☞ Releases accelerator
- ☞ Position of vehicle to curb
- ☞ Amount of steering to recover road

Common Errors:

- Does not allow sufficient space between the curb and the tire for the tire to assume the angle needed to come up over the curb without scrubbing.
- Applies the brakes
- Does not release throttle or accelerates.
- Steer too slowly. This can cause the tire to scrub resulting in an improper recovery.
- Steers more than necessary to make the vehicle recover the roadway.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Split Coefficient

1. I.D. the course
2. The student enters onto the skid pad at a predetermined speed with ½ of the vehicle on the pad and ½ on dry surface
3. The student attempts to stop the vehicle without wheel lock-up or using the ABS brakes
4. The student releases the throttle, steers to keep the front of the vehicle pointed straight, and controls any skid.
5. This is done from both ends of the skid pad

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

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Lane Change

1. I.D. the course
2. The student enter the skid pad at a predetermined speed
3. After the entire vehicle is on the skid pad, the student makes a lane change
4. The student releases the throttle, steers to keep the front of the vehicle pointed straight into the chosen lane of travel, and controls any skid.
5. Lane changes are made both to the left and right.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Incipient skid stopping

1. I.D. the course
2. The student enter the skid pad at a predetermined speed
3. After the entire vehicle is on the skid pad, the student makes a stop without locking up the wheels
4. The student releases the throttle, steers to keep the front of the vehicle pointed straight, and controls any skid.
5. Speeds are gradual and progressive

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

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Circular Skid: (radius turn maneuver)

1. I.D. the course
2. Begin at 25 mph progressing 2 mph until loss of control is reached through normal travel
3. Turns are made after the entire vehicle is on the skid pad
4. Turns are made both left and right.

Instructor Tips:

- It is necessary to very closely observe the student's hand movements as they correct the skid. Inform the student what they are doing right and wrong, and show or tell the student how to make corrections.
- Listen to the sound of the engine to determine if the student has released the throttle or has accelerated.
- Give the student simple, single skids to start.
- Correct the student's errors as they happen. It may be necessary to talk students through the exercise.
- Make sure the student starts with the 9-3 hand position, but changes to the hand-drop or hand-over-hand method if necessary.
- Vary the exercise so that the student does not develop a conditioned response to the skid.
- Watch for foot movement to determine if the student has a tendency to use the brakes.
- Several factors determine how severe the student's skid will be: Speed, the angle of entry of the vehicle onto the skid surface (the greater the angle, the more severe the skid), and the length of time the instructor keeps the wheel(s) locked.
- Speed: On a slick surface, skid control can be taught from 25 mph. Start at the lower speed and work up gradually as the skill of the student would indicate.
- Operational Checklist:
 - ☞ Speed
 - ☞ Hand position
 - ☞ Amount of steering used to drive curved path
 - ☞ Angle of the path of the vehicle on the skid surface
 - ☞ Hand movement in correcting skid
 - ☞ Response time of the student
 - ☞ Timing of counter steering
 - ☞ Returns to 9-3 hand position

Common errors:

- Responds slowly to the first skid, allowing the vehicle to go beyond the point of control.
- Does not steer enough to control the skid
- Over-responds to the skid by turning the steering wheel too much, possibly causing a second skid.
- Starts the counter steer too late after the initial correction.
- Does not use hand-over-hand steering if more than 180° of steering is achieved and then momentarily stops steering. This causes the student to be very slow in applying additional steering and may result in the vehicle skidding out of control.

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- Takes both hands off the steering wheel at the same time or shuffle steers.
- Does not ease up on the accelerator.
- Tries to control the skid by using the accelerator or accelerates unknowingly.
- Applies the brakes possibly locking the wheels, unless vehicle has ABS.
- Cannot distinguish which direction the vehicle is skidding and does nothing.
- Steers with one hand only.
- Steers in the wrong direction.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor prior to the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

Secondary braking systems: (i.e. engine, exhaust, driveline, and transmission retarders)

1. The secondary braking system on the vehicle is demonstrated by the instructor after the entire vehicle is on the skid pad. No brakes are used.
2. The student then demonstrates the same system with progressive speeds until loss of control.
3. This helps the student realize to what point the vehicle is stable using that particular braking system under inclement weather conditions.

Note:

- * The instructor will explain each exercise to ensure the student knows the basic techniques.
- * All exercises will be demonstrated by the instructor before the student's practice and skills evaluations
- * Following demonstration by the instructor, the student assumes the driving position, enters the course at the same speed determined by the instructor, and follows the same path used in the demonstration or as required by the specific exercise
- * The student will continue in the exercise until satisfaction of skills are realized
- * (Where applicable) During any of the braking exercises, the student will demonstrate satisfactory skills at using ABS brakes after non-ABS evaluations are finished

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Hydraulic Brake Test

Test Brake Cylinder Leakage Rate

With engine off:

1. Pump the brake pedal three times, and then hold it down for five seconds. The brake pedal should not move during the five seconds.

Test Parking Brake

2. Parking brake on, gently pull forward to test if parking brake will hold

Test Service Brakes

3. Release parking brake, slowly move forward and apply brake pedal

APPENDICES

Glossary of Terms

ABS	Anti-lock braking system
Gate	Simulates an alley dock or obstruction. This is also to represent height limitations for each particular apparatus/vehicle and the limitations of outside rear view mirrors.
I.D.	Identify the course as to the location and purpose of each cone, barrier, barrier piping, and course outline. Instructors dialogue, comments on the purpose of each exercise and validation. A demonstration of each exercise is then completed by the instructor.

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MANUALS

1. General Motors Desert Proving Grounds. Advanced Driver Training Course Manual. 1990 edition.
2. Nevada Department of Transportation. Nevada Commercial Driver's License Manual. Pre-1996 edition.

EVALUATION FORMS

1. Closed Course
2. Over the Road
3. Student Completion