REPORT OF THE
DEPARTMENT OF FIRE PROGRAMS AND
STATE POLICE ON

A Plan for the Inspection of Fire Fighting Vehicles of all Volunteer Fire Departments and Companies

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 13

COMMONWEALTH OF VIRGINIA
RICHMOND
1992

COMMONWEALTH of VIRGINIA

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December 4, 1991

TO: The Honorable L. Douglas Wilder, Governor of Virginia, and Members of the General Assembly

Pursuant to the mandates of House Bill 2000 enacted as Section 46.2-1157 of the Code of Virginia, enclosed is a Plan for the Inspection of Fire Fighting Vehicles of All Volunteer Fire Departments and Companies. This plan is the result of a cooperative effort between the Department of Fire Programs and the Department of State Police.

Sincerely,

W. F. Corvello

Superintendent,
Department of State Police

K R Shrop

Executive Director,
Department of Fire Programs

TABLE OF CONTENTS

EXECUTIVE SUMMARY

REPORT OF THE
DEPARTMENTS OF FIRE PROGRAMS AND STATE POLICE
ON A PLAN FOR THE INSPECTION OF FIRE FIGHTING VEHICLES
OF ALL VOLUNTEER FIRE DEPARTMENTS AND COMPANIES
TO

THE GOVERNOR AND GENERAL ASSEMBLY OF VIRGINIA
RICHMOND, VIRGINIA
DECEMBER, 1991

This report is in response to the mandate contained in Section 46.2-1157 of the Code of Virginia as enacted by the 1991 General Assembly. The Department of Fire Programs and the Superintendent of State Police were directed to develop a plan for the inspection of and payment for the inspection of fire fighting vehicles owned or operated by all volunteer fire departments or companies. Such plan is to be presented to the General Assembly by January 1, 1992.

A review was made of the inspection rules and regulations by the Superintendent of State Police to determine their applicability to fire fighting vehicles. A determination was made that three exemptions and one addition should be made to the regulations for these vehicles. The exemptions were:

1. Emergency warning lights should not be inspected on fire fighting vehicles manufactured prior to January 1, 1992.

2. Fire fighting vehicles should be allowed to be equipped with interior map lights that exceed 15 candlepower.

3. Gutter lights on tiller steered vehicles should not be inspected.

It was also determined that windshield wipers on the forward facing windshields of tiller steered vehicles should be subject to the same inspection requirements as other windshield wiper systems.

The Departments of Fire Programs and State Police caused an Ad-Hoc Committee to be appointed to study the inspection of these vehicles. The Ad-Hoc Committee was made up of representatives of paid and volunteer fire departments and companies and a representative of the Department of State Police.

The Committee reviewed current inspection rules and regulations, a report of the National Transportation Safety Board concerning accidents involving fire fighting vehicles, and the mandate of the General Assembly. They scheduled public hearings at eight locations throughout the State and prepared an information packet to be distributed during the public hearings.

Public hearings were held at the selected locations beginning on August 26, 1991 in Norton, Virginia and concluding on October 17, 1991 in Fairfax, Virginia.

Public hearings were attended by 172 persons. All of those attending were members of paid or volunteer fire departments or companies. No opposition was voiced during any of the public hearings to the requirements that fire fighting vehicles be subject to safety inspection.

Comments were made concerning cost to rural volunteer organizations to update their vehicles to inspection standards.

Without exception, all agreed that volunteer and paid departments should be treated the same in regards to the requirement that their vehicles be safety inspected.

The Ad-Hoc Committee, after careful consideration of their study and comments made during the public hearings, recommended to the Department of Fire Programs and the Superintendent of State Police that fire fighting vehicles owned and operated by members of all volunteer fire departments and companies be subject to the same inspection requirements as paid fire departments.

This plan as submitted by the Department of Fire Programs and the Superintendent of State Police recommends the following plan:

> Fire fighting vehicles owned or operated by fire departments or companies made up exclusively of all volunteers shall, effective July 1, 1992, be submitted to an official inspection station for inspection of their safety components and any such defects found shall be corrected before such vehicles shall be operated upon the highways of the Commonwealth.
>
> Fire fighting vehicles shall be inspected in accordance with the rules and regulations as promulgated by the Superintendent except as listed in this report.
>
> Volunteer fire departments or companies may enter into written agreements with governmental entities for the inspection of their fire fighting vehicles.

The Department of Fire Programs and the Fire Services Board will provide training in the development and operation of preventive maintenance programs to those fire departments or companies that do not have such programs in place.

Fire departments and companies made up exclusively of all volunteers, and those that do not receive financial support from the local governmental entity in which they are located, may utilize funds provided by the Department of Fire Programs for the payment of inspection fees provided by statute.

The General Assembly is encouraged to establish an emergency fund to be administered by the Department of Fire Programs for emergency repair of volunteer fire departments' or companies' vehicles deemed defective or inadequate by inspection criteria.

ORIGIN OF THE PLAN

House Bill 2000 enacted into law as Section 46.2-1157 of the Code of Virginia by the 1991 General Assembly directed the Department of Fire Programs and the Superintendent of State Police to develop a plan for presentation to the 1992 General Assembly for completing the inspection of fire fighting vehicles of all volunteer fire departments or companies. This plan is to include provisions for the payment for inspection of such vehicles.

House Bill 2000 was introduced into the 1991 General Assembly by Delegate George W. Grayson of Williamsburg. The bill proposed to amend and reenact Section 46.2-1157 of the Code of Virginia relating to motor vehicle safety inspections.

As introduced, the changes would have required all vehicles used for fire fighting to become subject to annual inspections. Fire fighting vehicles have not been required to be submitted for such inspections in the past. The Department of Fire Programs and the Superintendent of State Police saw certain problems associated with the inspection of fire fighting vehicles and expressed their concerns during hearings on this bill. Fire fighting vehicles are very large special built vehicles which will not fit into many of the inspection station facilities in many localities. Also, many of these vehicles require persons possessing certain levels of expertise to perform checks and repairs. There were concerns raised that some localities may be without fire suppression equipment where it was necessary to drive long distances to inspection stations and, should defects be identified, new parts availability could delay repairs in many rural areas. There were also questions raised concerning what would happen if the only available fire fighting vehicle in a given community had been rejected during the inspection process and a fire occurred.

Due to concerns raised during hearings in the House Roads and Internal Navigation Committee and the Senate Transportation Committee, the bill was amended twice. The House Roads and Internal Navigation Committee added wording charging the Superintendent to promulgate inspection regulations taking into consideration the special purposes of fire fighting vehicles. The Senate Transportation Committee added language to exempt vehicles owned or used exclusively by volunteer fire departments or companies until July 1, 1992, and directed the Department of Fire Programs and the Superintendent of State Police to develop a plan for inspecting these vehicles by January 1, 1992. The plan, including provisions for payment of the inspection fees, could be considered by the 1992 General Assembly to determine if vehicles owned or used by fire departments or companies made up exclusively of volunteers should be exempted from the requirements of Section 46.2-1157.

INTRODUCTION

Virginia's Motor Vehicle Safety Inspection Program originated on July 1, 1932 as the result of legislative action by the Virginia General Assembly.

This program was developed in response to a disproportionate number of motor vehicle crashes resulting from failure of motor vehicle safety components.

The law from 1932 through 1940 required all Virginia registered vehicles be submitted for inspection of their safety components. In 1941, James H. Price, Governor of Virginia, issued a proclamation directing the owner or operator of every motor vehicle within the confines of the Commonwealth to submit their motor vehicles to inspection at an official inspection station and mandated the correction of any defects found before further operation of such vehicle on the highway. Successive proclamations, issued by Governors from 1942 through 1956, mandated all Virginia registered vehicles be submitted to inspection at an official inspection station and to have corrected all defects found to exist.

A proclamation issued by Governor Thomas B. Stanley in April, 1957, exempted fire fighting equipment used exclusively as fire fighting apparatus from the requirement to be submitted for inspection. Proclamations issued by successive Governors since that date have also excluded fire fighting equipment used exclusively as fire fighting apparatus from the requirement to be inspected.

Due to the conditions under which emergency vehicles operate, motor vehicle crashes occur. Over the years, most of the crashes involving fire fighting vehicles have been attributed to driver error, either on the part of the fire fighting vehicle operator or the operator of the other vehicle when another vehicle was involved. When a crash occurred and it was determined that a mechanical failure was the causative factor, it was dismissed as an isolated incident.

Several severe crashes involving fire fighting vehicles that have occurred over the past few years have caused concern over the safe operating condition of these vehicles. As the result of the investigation of a crash in May, 1990 in Waterbury, Connecticut, that took the life of two fire fighters and injured three other fire fighters, the National Transportation Safety Board decided to undertake a special investigation concerning emergency fire apparatus safety. During the ensuing investigation, the Safety Board examined 8 separate fire apparatus accidents and conducted an informal survey of the 50 States and the District of Columbia to determine their requirements for inspecting fire apparatus.

Investigative results revealed serious deficiencies in the maintenance of fire fighting vehicles. The National Transportation Safety Board recommended to the Governors and legislative bodies of those States without fire apparatus inspection programs:

> Develop and implement a fire apparatus inspection program that requires periodic inspections performed by commercial vehicle inspectors in accordance with the Federal Highway Administration Motor Carrier Assistance Program vehicle (mechanical) inspection criterion.

Prior to the release of the NTSB findings, Virginia fire fighters expressed concerns over their personal safety, and the safety of other motorists while operating on the highways of this Commonwealth, due to perceived problems associated with the safe operating condition of some fire fighting vehicles. These concerns prompted the Professional Fire Fighters Association to raise this issue with Delegate Grayson.

Fire fighters realize that, by the very nature of their occupation, certain hazards exist that cannot be mitigated except by training and their own efforts to protect themselves. However, they believe that dangers associated with failure to properly maintain and inspect the very equipment that they are so dependent on should not be allowed to exist. Rules and regulations of the Federal Occupational Health and Safety Administration mandate employers provide a safe working environment for employees. It further mandates steps be taken to correct any deficiencies in equipment that might pose a hazard to those required to operate or use such equipment. While volunteer fire fighters are not employees of a volunteer fire department or company, they are individuals volunteering to put their life on the line to protect the citizens of the Commonwealth. They are providing an essential public service that falls within the domain of government's responsibility. Our very own safety and well being can rest solely on their willingness and ability to provide such service.

In response to the mandate of the General Assembly to the Department of Fire Programs and the Superintendent of State Police, an Ad-Hoc Committee was formed to study and develop rules and regulations for the inspection of fire apparatus. This committee was made up of representatives from paid and volunteer fire departments throughout the State and a representative from the Department of State Police.

After preliminary review of the requirements of Virginia's Annual Motor Vehicle Safety Inspection Program and review of the National Transportation Safety Board's Special Investigative Report on Emergency Fire Apparatus, public hearings were scheduled at 8 locations throughout the State. (A schedule of the public hearings and a summary of the minutes of those hearings is included in Appendix A.)

At each public hearing, Mr. Kenneth R. Sharp, Executive Director, Department of Fire Programs, reviewed House Bill 2000, explained the charge of the committee, provided each attendee with copies of the bill and copies of the preliminary work of the committee. The attendees were advised that the committee was interested in any comments they had concerning the inspection of fire apparatus.

Captain J. P. Henries, Safety Officer, Department of State Police, addressed the present State Inspection Program and explained the proposed inspection program for fire apparatus. Again, attendees were encouraged to make any comments they wished and to express any concerns they had concerning the proposal.

Captain Murrey Loflin, Virginia Beach Fire Department and Chairman of the Ad-Hoc Committee discussed concerns over the weight of fire apparatus.

Those present at each public hearing were polled as to whether they were in favor of or opposed to mandatory inspection of fire apparatus. Without exception, all were in favor of such inspections. Concerns expressed were over cost to repair old fire vehicles in mostly rural communities where funds for operation are limited. It was brought out that there are still a number of 1950 vintage model fire vehicles in operation in some communities. Parts for these vehicles are sometimes not readily available which could result in the vehicle being placed out of service.

During the public hearings, no concerns were expressed over the $10.00 inspection fee payable when each vehicle is inspected. General comments were that this is an insignificant factor and would not in itself pose any hardship on the fire departments and companies.

The report and plan that follows addresses the need for periodic inspection of fire fighting vehicles and the concerns raised by the General Assembly and those in the fire fighting community.

DEVELOPMENT OF THE PLAN

Inspection rules and regulations as contained in the Official Inspection Manual of the Department of State Police were promulgated by the Superintendent in accordance with the requirements of Section 46.2-1165 of the Code of Virginia. The rules and regulations, as promulgated by the Superintendent, are designed to address inspection of safety components of motor vehicles to ensure that these components meet minimum standards at the time of inspection.

Inspection rules and regulations are based on requirements of State and federal statutes, standards and specifications of the Society of Automotive Engineers, and standards and specifications of the American National Standards Institute Incorporated, as they pertain to motor vehicle safety components. The only items inspected that are not safety related are pollution control systems and components. These items are inspected to ensure compliance with federal and State emissions requirements.

After careful review by the Superintendent, it was determined that fire fighting vehicles could and should be inspected in accordance with the rules and regulations as contained in the Official Inspection Manual, with three exceptions and one addition. Those exceptions pertained to the inspection of emergency warning lights for operation and approved type, presence of interior map lights that exceed 15 candlepower, and gutter lights on tiller steered vehicles. The one addition requires inspection of windshield wipers on the rear windshield of tiller steered vehicles. Even when considering the special purpose of fire fighting vehicles, it was determined that they have the same basic components of every other vehicle operating on the highways, and that these components are as critical to the safe operation of fire fighting vehicles as to any other vehicle.

The Ad-Hoc Committee, consisting of fire fighters representing paid and volunteer fire departments, carefully reviewed the rules and regulations of the inspection program as contained in the Official Inspection Manual. The Committee recommended that fire fighting vehicles be inspected in accordance with these rules and regulations with the exception of emergency warning lights, interior map lights exceeding 15 candlepower and gutter lights on tiller steered vehicles. The recommendation for exclusion of gutter lights was based on their special purpose peculiar to tiller steered vehicles. Interior map lights exceed the maximum candlepower for lights permitted inside of motor vehicles and are necessary to enable fire fighters to read maps while responding to fire calls.

One area of concern expressed during the legislative process concerned the extreme weight of fire fighting vehicles and the effect such weight had on the vehicles safety. Recommendations were made that these vehicles be required to comply with weight limitations established in Title 46.2 of the Code of Virginia. After thorough study by the Ad-Hoc Committee, it was their belief that the General Assembly had already considered vehicle weights as they pertained to fire fighting vehicles and responded with the provisions contained in Section 46.2-1102. The Ad-Hoc Committee did recommend that gross vehicle and axle weight ratings as established by the manufacturer, not be exceeded. It was the belief of this committee that if these ratings were adhered to, safe operation of these vehicle would not be compromised.

The Committee also studied the effect that payment of the $10.00 inspection fee would have on fire departments and companies that would be dependent on public inspection stations for the inspection of fire fighting vehicles. It was the belief of the Committee members that the fee would not be an obstacle for volunteer fire companies and the overall cost to them would be insignificant.

Members of the Committee representing volunteer fire companies did express concern over cost associated with repairing defects on fire fighting vehicles found during the inspection process. It was pointed out that a number of volunteer fire companies still operate 1950 vintage model vehicles that may not meet inspection criteria. Some replacement parts for such vehicles are not readily available and could prove to be costly.

The Committee believes that it is government's responsibility to provide essential public safety services to its citizens. Such services include adequate fire protection. Many communities in Virginia receive these services from volunteer fire departments or companies. In many instances, these volunteer organizations are funded almost exclusively through contributions made by the citizens that they serve. Whenever new equipment is needed or repairs to old equipment are necessary, the volunteer organization must resort to fund raising for financing. In some communities, funds necessary to meet expenses are not realized, resulting in inadequate or unsafe equipment being operated.

Fire fighters, whether paid or volunteer, are essential to every community in the Commonwealth. Their safety and well being is dependent on the equipment that they must use to provide such services to their communities. Periodic safety inspection of fire fighting vehicles is necessary to ensure the integrity of the safety components of their vehicles.

It was the consensus of the Committee that fire departments and companies should take steps to ensure that their vehicles are properly maintained and in safe operating condition at all times. It was determined that many fire departments and volunteer fire companies have excellent preventive maintenance programs currently in effect. It is the belief of the Committee that if all fire departments and companies had preventive maintenance programs, the mandatory safety inspection of their vehicles would serve as an independent verification of the safe operating condition of their vehicles. This would preclude the probability of a fire fighting vehicle being rejected for a major safety defect during the inspection process.

The Committee recommended to the Department of Fire Programs that a preventive maintenance course be developed and made available to fire departments and companies. This recommendation was approved and the Department of Fire Programs and the Fire Service Board is in the process of developing the program to be made available to all interested departments and companies prior to July 1, 1992.

Public hearings held in eight locations throughout the State revealed strong support for the inspection of fire fighting vehicles. The consensus of those attending these public hearings was that fire fighting vehicles should be inspected, and the criteria for paid and volunteer vehicles should be the same. Not one person attending the public hearings was opposed to such inspections. The only concerns expressed during the hearings dealt with the cost associated with repairs necessitated by inspection of certain fire fighting vehicles.

It is the belief of this committee that all fire fighting vehicles must be properly maintained in a safe operating condition at all times. This is not only necessary for the safety of those fire fighters using the vehicles, but for the safety of other users of the highways. Governmental resources must be made available to those localities where fire protection services are provided by volunteer organizations. Such resources could be the appropriation of monies to a special fund administered through the Department of Fire Programs and the Fire Services Board for maintenance of these vehicles. Expenditure of these funds would be subject to approval of a committee appointed by the Department of Fire Programs and the Fire Services Board based on identifiable emergency needs of the requesting organization.

The following plan contains recommendations of the Department of Fire Programs and the Superintendent of State Police, based on the mandate of the General Assembly and a careful review of current inspection rules and regulations and the work of the Ad-Hoc Committee.

THE PLAN

Fire fighting vehicles owned or operated by fire departments or companies made up exclusively of all volunteers shall, effective July 1, 1992, be submitted to an official inspection station for inspection of their safety components, and any defects found shall be corrected before such vehicle shall be operated upon the highways of the Commonwealth.

Fire fighting vehicles shall be inspected in accordance with the rules and regulations as promulgated by the Superintendent and contained in the Official Inspection Manual except for the following:

1. Emergency warning lights shall not be inspected on fire fighting vehicles manufactured prior to January 1, 1992.

2. Fire fighting vehicles may be equipped with interior map lights that exceed 15 candlepower.

3. Gutter lights on tiller steered vehicles shall not be inspected.

4. Windshield wipers on rear forward facing windshields of tiller steered vehicles shall be inspected and shall meet the same operational requirements as for other windshield wiper systems.

Volunteer fire departments or companies may enter into written agreements with governmental entities within their service areas that hold private appointments as official inspection stations for the service and inspection of such vehicles. Such agreement shall be subject to approval by the Superintendent of State Police.

The Department of Fire Programs and the Fire Services Board will provide training in the development and operation of preventive maintenance programs prior to July 1, 1992 to those fire departments and companies that do not have such programs in place. This program will enable these departments and companies to constantly assess the safe operating condition of their vehicles. Such programs, when properly established and carried out, will cause the annual safety inspection of their vehicles to become an independent verification of the quality of their program. Maintenance cost to the individual departments and companies will also be reduced as a result of cost savings realized when components are replaced before they fail and damage other components.

Fire departments and companies made up exclusively of all volunteers, and those volunteer fire departments and companies that do not receive financial support from the county, city or town in which they are located and serve, may utilize funds provided by the Department of Fire Programs for the payment of the inspection fee as set forth in Section 46.2-1167 of the Code Of Virginia. Such funds shall not be used for other than payment of the inspection fees prescribed by law.

The General Assembly of Virginia is encouraged to establish an emergency fund to be administered by the Department of Fire Programs for use in making repairs to safety components of fire fighting vehicles that are deemed defective or inadequate by inspection criteria. Such funds would be payable only upon application to a committee as appointed by the Department of Fire Programs and the Fire Services Board, based on identifiable emergency needs of the volunteer fire department or company making the request.

APPENDIX A

HOUSE BILL 2000

REPORT OF PUBLIC HEARINGS

House Bill 2000 was introduced in the 1991 General Assembly by Delegate George W. Grayson of Williamsburg. The bill proposed to amend and reenact 46.2-1157 of the Code of Virginia relating to motor vehicle safety inspections.

As introduced, the changes would have required all vehicles used for fire fighting to become subject to annual inspection. Many fire fighting vehicles have not been required to pass such inspections in the past.

The Department of Fire Programs and the Superintendent of State Police saw certain problems with implementation of these inspections. Fire apparatus previously exempted are very large, special built trucks which will not readily fit into most inspection station facilities and may require specially trained inspection personnel. Some localities would be without effective fire suppression equipment where it was necessary to drive long distances to inspection stations and, should defects be identified, new parts availability could delay repairs in many rural areas. Also, there are numerous questions regarding cases where fire occurs and apparatus, sometimes the only one available, has been rejected.

These concerns were voiced by both Fire Programs and State Police at the House Roads and Internal Navigation Committee and Senate Transportation Committee. The bill was amended twice. The House Roads and Internal Navigation Committee added wording which charged the Superintendent of State Police to promulgate inspection regulations taking into consideration the special purpose of fire fighting vehicles. The Senate Transportation Committee added words to exempt vehicles owned or used exclusively by volunteer fire fighting units and required the Department of Fire Programs and the Superintendent of State Police to develop a plan for inspecting these vehicles by January 1, 1992. The plan, including provisions for payment of the inspection fees, could be considered by the 1992 General Assembly and the exemption to volunteers' apparatus repealed.

As a result, the Department of Fire Programs and the Department of State Police organized an Ad-Hoc Committee to study and develop rules and regulations for the inspection of fire apparatus.

The following people were selected for the Ad-Hoc Committee:

Wesley Dolezal	Chesterfield County Fire Department
Paul Poling	Amissville Volunteer Fire Department
Ben Byrd, Jr.	Wachapreague Volunteer Fire Dept.
Bobbie Slayton	Roanoke City Fire Department
Sam Bird	Department of Fire Programs
Murrey Loflin	Virginia Beach Fire Department
Jerry Smith	Fairfax County Fire and Rescue
Gary Pope	Fairfax County Fire and Rescue
Captain J. P. Henries	Department of State Police

As the preliminary work, the committee set the following dates and locations for public hearings:

August 26	Norton
August 28	Salem
August 29	Harrisonburg
September 23	Danville
September 25	Portsmouth
September 26	Melfa (Eastern Shore)
October 3	Ashland
October 17	Fairfax

At each public hearing, Mr. Kenneth R. Sharp reviewed House Bill 2000, explained the charge of the committee, provided each attendee with copies of the bill and copies of preliminary work of the committee. Mr. Sharp stated that written comments would be received through 5 p.m., November 1, 1991 by anyone wishing to make such written comments. He then turned the hearing over to Captain Henries.

Captain Henries addressed the present State Inspection Program and explained the proposed inspection program for fire apparatus. Due to the fact that there are very few emergency warning lights approved by the State Police, Captain Henries explained that they would not be inspected at this time. (See attached exception list).

Captain Henries recommended to those in attendance that fire apparatus specifications include only lights that have been approved by the Department of State Police.

The hearing was then turned over to Captain Murrey Loflin. Captain Loflin discussed problems associated with the weight of fire apparatus. He pointed out the need for fire departments and companies to be aware of the manufacturers gross vehicle weight rating for each vehicle they own and operate and the rating of each axle under those vehicles. He recommended all fire vehicles be weighed, and that the limitations set by the manufacturer of each vehicle and axle be strictly observed.

Captain Loflin informed the attendees that the Department of Fire Programs and the Department of State Police are developing a 16 hour Preventive Maintenance Course which, hopefully, will be available after January 1, 1992. Classes for this course will be held in each of the four training areas, Wise, Roanoke, Orange and Richmond, as soon as possible after January 1, 1992.

The floor was then opened for questions from those in attendance at the hearings. The following are questions received and answers provided during the public hearings:

QUESTIONS:

What is the approximate cost per vehicle for paid departments?

Captain Henries explained that he could not estimate the costs for inspecting vehicles; however, the inspection fee is the same as for automobiles. Also, if the apparatus is city or county owned, the costs should be absorbed by the locality.

Will there be a different sticker for fire apparatus or the same as for automobiles?

The sticker will be the same as on personal vehicles.

Has the State looked at additional money that might be available for rural departments?

Mr. Sharp explained that at this time, no legislation is planned to give additional money. He stated that it is his opinion that the minimum charge for the inspection ($10.00) can come from the Fire Programs Fund.

Will a letter be sent to the Board of Supervisors that this inspection will be mandatory after July 1, 1992?

Yes, this information with the rules and regulations will be forwarded to all localities after it is approved by the General Assembly this year.

Will the standards for paid and volunteer departments be the same?

Yes.

Can the inspections be done at regular inspection stations?

Only if that station can accommodate the larger vehicles.

Are the exceptions for inspections going to be listed?

Yes, a list is included in the package given tonight.

If the vehicle is rejected,is the driver liable while going back to his station?

The operator is always responsible for the vehicle. Also, if the steering and brakes are defective, the vehicle should not be driven. If the driver knows that the vehicle is defective, he does not need to go to an inspection station to find it out. He is liable for the vehicle the same as any driver of any other vehicle.

How long is the rejection sticker valid?

15 days.

What happens to the older equipment found in volunteer stations that are on the borderline and the inspector "nitpicks?" What if the rejection is not a safety item? Could there be an exception on these items?

Virginia law prohibits the operation of a vehicle with certain defects. Most are those that could cause or contribute to a crash. Certain safety defects, as defined in inspection rules and regulations, do not constitute a violation of Virginia Motor Vehicle laws when the vehicle is operated on the highways. These defects, while not having a direct bearing on the vehicle's ability to safely traverse the highways, are designated as those that have a direct impact on driver and vehicle occupant safety and other highway users' safety. Inspection regulations are required to be followed by the safety inspectors when conducting inspections. If the inspector passes a vehicle that does not meet inspection requirements, he is in violation of inspection rules and regulations and, possibly, in violation of the law.

Can maintenance of the apparatus be covered through the Fire Programs Fund?

No.

Can State Troopers come to the departments and inspect the apparatus?

No.

Is there anyway there could be a couple of years for the volunteers to phase in their equipment to comply with the law?

No, it will be effective October 1, 1991 for paid departments and July 1, 1992 for volunteers if approved by the 1992 General Assembly. Additionally, operation of fire vehicles with defects currently defined as such in Virginia law violates the law every time they are operated on the highways.

Will there be any date that all emergency lights must be legal on fire apparatus?

This has not been addressed.

What if the person doing the inspection is not reliable?

This should be reported to the Department of State Police for action.

Will the preventive maintenance class be open to people other than fire fighters?

Yes.

Where is the exhaust line to be?

Must discharge to the rear of the passenger carrying compartment.

Could the Department of State Police and the Department of Fire Programs work jointly to do courtesy type inspections throughout the State at regional schools?

This will be a part of the program that is being developed.

Will the Preventive Maintenance Program have a Virginia State Inspector to help develop the program?

Yes.

Does a paid person mean a person that is paid in that department only? Example: If a volunteer is also a paid fire fighter, how is he classified?

A volunteer who works in a paid department is classified as a volunteer in his volunteer station and a paid person in his paid station.

How can the departments handle the inspection of all their trucks at the same time?

This may present a problem at first; however, it is suggested that trucks be inspected in a series instead of all the trucks being inspected in July. Inspect some in May, some in June, some in July, etc. until they are all inspected and then they will fall due the following year in different months.

Can all inspection stations handle trucks over 10,000 lbs?

No. Check with the station to make sure they can inspect the apparatus inside. Inspections cannot be done on the outside of the inspection station. (A listing of all large exemption and unlimited inspection stations is available for those needing this information before you leave this meeting).

Can industry such as Perdue inspect vehicles for volunteer departments?

No. The only way they can do that is to change their inspection status. Then they must enter into a contract with the fire organization.

Are federal vehicles exempt?

They are exempt from inspection requirements; however, they are not exempt from statutory requirements as to the condition of their safety components.

What happens if a station has one truck and no mutual aid?

Stations need to do preventive maintenance so they will be ready for the inspection and not be surprised with defective equipment.

If you do not have a facility in your area that can handle large vehicles, can you bring the inspector into your station?

No.

What do you mean by approved lights?

Approved lights are lights that have been submitted to the Department of State Police for verification that they meet minimum standards as required by Virginia law and issued approval for sale and use in Virginia by the Superintendent of State Police. Many lights in use by fire organizations on their vehicles have not been

approved as required. It is suggested that those responsible for ordering new fire apparatus include in their specifications that all lighting devices must have been approved for use in Virginia. Only then will the companies that sell these lighting devices follow the approval procedure.

Is the 16-hour preventive maintenance course mandatory?

No. It will be offered so the stations can be aware of what is needed for their trucks to pass inspection and to enable them to properly maintain their equipment in safe operating condition.

If you have one or two paid personnel in a county, are you considered paid and must you have your equipment inspected by October 1, 1991?

Yes. One paid person makes the department a combination paid/volunteer company and this makes the effective date October 1, 1991.

Is this a yearly or semi-yearly inspection?

It is a yearly inspection; however, some departments are doing it more often.

What is the procedure to cover payment for repairs to vehicles if the department does not have the money available?

It is the localities responsibility to provide service to their community. Therefore, they should be responsible for the repairs and maintenance of equipment.

It was suggested and recommended by attendees at the public hearings that the standards set forth in the rules and regulations for House Bill 2000 be the same for volunteer and paid departments.

Concern was expressed about the exhaust systems. Concern that some are too loud.

Suggested that inspections be done at certain times during the year because of weather. It was felt that apparatus should not be left out in the winter months because of the danger of freezing.

It was suggested that fire departments work through their county purchasing agents to buy parts, etc. for their equipment. This should save money.

It was suggested that someone with expertise in the field of inspections and maintenance attend association meetings to explain what was discussed at the public hearings.

SUPPORT:

The Ad-Hoc Committee held eight public hearings starting in Norton, Virginia, and holding the final one in Fairfax, Virginia. Not one person spoke in opposition to House Bill 2000, but instead, expressed that it was a safety issue and they supported it 100 percent.

APPENDIX B

EXCEPTIONS

Inspection Requirements for Passenger Vehicles and Vehicles up to 10,000 lbs.

Section 16,	paragraph 5	(Emergency warning lights will not be inspected.)
	paragraph 10	(Emergency warning lights will not be inspected.)
Section 20,	paragraph 18	(Firefighting vehicles may be equipped with interior map lights that exceed 15 candlepower.)

Inspection Requirements for Vehicles over 10,000 lbs.

Section 53,	paragraph 4	(Emergency warning lights will not be inspected.)
	paragraph 9	(Emergency warning lights will not be inspected.)
Section 57,	paragraph 1F	(Firefighting vehicles may be equipped with interior map lights that exceed 15 candlepower.)

Note: Gutter lights on firefighting vehicles with tiller steering (rear steering on ladder trucks) shall not be inspected.

Section 60, paragraphs 1 through 5 shall apply to windshield wipers on windshields on tiller steered vehicles.

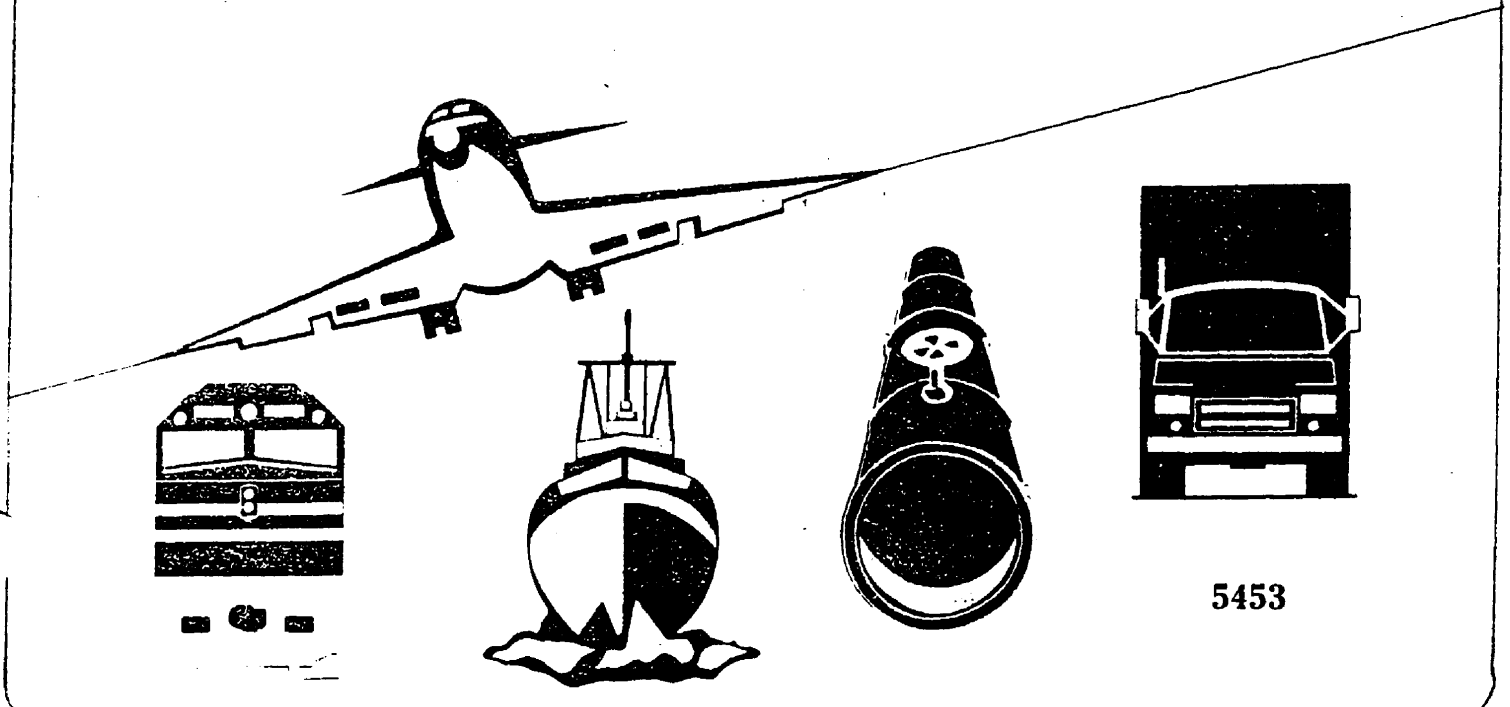
PB91-917001
NTSB/SIR-91/01

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

SPECIAL INVESTIGATION REPORT

EMERGENCY FIRE APPARATUS



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NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

SPECIAL INVESTIGATION REPORT

EMERGENCY FIRE APPARATUS

ADOPTED: MARCH 19, 1991
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Abstract: For this report, the Safety Board examined 8 separate fire apparatus accidents and conducted an informal survey of the 50 States and the District of Columbia to determine their requirements for inspecting fire apparatus. The safety issues discussed in the report are fire department vehicle maintenance programs and State inspection programs, fire department operating procedures concerning manual brake limiting valves and engine retarders, and fire apparatus occupant seatbelt use. Recommendations concerning these issues were made to the U.S. Fire Administration of the Federal Emergency Management Agency, the International Association of Fire Chiefs, the National Fire Protection Association, and those States which do not have existing programs in place to periodically inspect fire apparatus.

CONTENTS

EXECUTIVE SUMMARY

On May 10, 1990, a 1974 Hahn custom pumper fire engine responding to an emergency call in Waterbury, Connecticut, ran off the road and hit a large tree when the driver lost control on a steep downgrade. The fire engine carried five paid firefighters; two firefighters were fatally injured, one sustained moderate injuries, and the driver and remaining firefighter sustained only minor injuries. Because the Safety Board had several other fire truck (apparatus) accidents under investigation at the time of the Waterbury, Connecticut, accident, it was decided to undertake a special investigation concerning emergency fire apparatus safety.

The primary safety issues raised by these accidents are the adequacy of fire department vehicle maintenance programs and State inspection programs, fire department operating procedures concerning manual brake limiting valves and engine retarders, and fire apparatus occupant seatbelt use.

Safety recommendations addressing these issues were made to the U.S. Fire Administration of the Federal Emergency Management Agency, the International Association of Fire Chiefs, the National Fire Protection Association, and those States which do not have existing programs in place to periodically inspect fire apparatus.

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

SPECIAL INVESTIGATION REPORT

EMERGENCY FIRE APPARATUS

INTRODUCTION

On May 10, 1990, a 1974 Hahn custom pumper fire engine operated by the Waterbury Fire Department (WFD), while responding to an emergency call in Waterbury, Connecticut, ran off the road and hit a large tree when the driver lost control on a steep downgrade. The fire engine carried five paid firefighters and 500 gallons of water. Two firefighters were fatally injured, one firefighter sustained moderate injuries, and the driver and remaining firefighter sustained only minor injuries. The pavement was wet from previous rain.

This accident and several others involving emergency fire apparatus[1] responding to alarms prompted the Safety Board to conduct a special investigation to determine the adequacy of fire apparatus maintenance and inspection, fire department operating procedures, and occupant seatbelt use. National Fire Protection Association (NFPA)[2] data indicate that between 1980 and 1989, 15 percent[3] of all firefighters who died in the line of duty died as a result of accidents involving fire apparatus that were en route to alarms.[4] As part of this special investigation, the Safety Board examined 8 separate fire apparatus accidents and conducted an informal survey of the 50 States and the District of Columbia to determine their requirements for inspecting fire apparatus.

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[1]For the purposes of this report, "fire apparatus" refers to the heavy fire vehicles, such as pumpers/engines, ladder trucks, heavy squad units, 10,000 pounds and over, that transport people, and specialized equipment, such as foam/crash units used at airports.

[2]The National Fire Protection Association (NFPA), organized in 1896, is an independent, voluntary membership, nonprofit organization that develops voluntary standards and codes which serve as guidelines for the fire services in all phases of operations.

[3]One hundred and seventy-nine firefighters.

[4]See appendix A for further information concerning NFPA accident data.

MAINTENANCE AND INSPECTION

Accident Information

Waterbury, Connecticut.--On May 10, 1990, at 11:19 a.m. eastern standard time, a 1974 Hahn custom pumper, Model HCP12-24, with two jumpseats[5] was dispatched from the WFD Highland Avenue fire house to an alarm on Thomaston Avenue in Waterbury, Connecticut. (See figure 1.) The driver stated that after the alarm sounded, he started the vehicle and observed that the brake system air pressure was 120 psi (within normal operating limits).

According to the driver, the apparatus was functioning normally while heading north on Highland Avenue. As the driver approached Chase Parkway, he slowed the vehicle by downshifting the automatic transmission from drive to drive 2, applied the brakes, and came to a stop at the intersection. Highland Avenue at this location is straight and level. The driver stated that the brakes worked "okay" and that he had no trouble stopping. The driver then crossed Highland Avenue, successfully negotiated a sharp turn (with a radius of 355 feet), and proceeded down the 10-to 13-percent grade to the intersection of West Main Street. The driver stated that he slowed through the sharp turn by downshifting.

On the steep grade, he downshifted again and applied the brakes but "did not feel any braking." He then downshifted to drive 1 and applied the brakes and parking brake (spring brake), but the parking brake button kept "popping" back.[6] He stated that the only deceleration he could detect was from the transmission. When he reached the intersection of Highland Avenue and West Main Street, he made a right turn into the westbound lane of West Main Street. He saw traffic backed up from the light at a nearby intersection and attempted an immediate left turn into an apartment complex parking lot. The fire engine ran over a 7-inch curb, and the driver stated that he saw a tree and tried to steer away from it. The fire engine traveled about 38 feet on the grass and collided with a tree that had two trunks. (See figure 2.)

As a result of the collision with the tree, the driver and firefighter who had been seated in the left jumpseat received minor injuries. The firefighter seated in the right front seat received moderate injuries. All of these firefighters were restrained by lap belts. The firefighter in the right jumpseat was fatally injured, (the Safety Board could not determine whether this firefighter was restrained by the available lap belt). The firefighter standing behind the right jumpseat, who was unrestrained, was fatally injured. None of the occupants were ejected. The right front of the cab sustained most of the damage.

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[5]This fire apparatus was a spare vehicle that was in use because the first-line fire apparatus was being serviced.

[6]The parking brake for this fire apparatus was controlled by a push/pull control valve located on the apparatus instrument panel. The Hahn operating manual states: "To set the parking brake on the rear axle chambers, pull out the parking brake control. To release the parking brake, push control in."

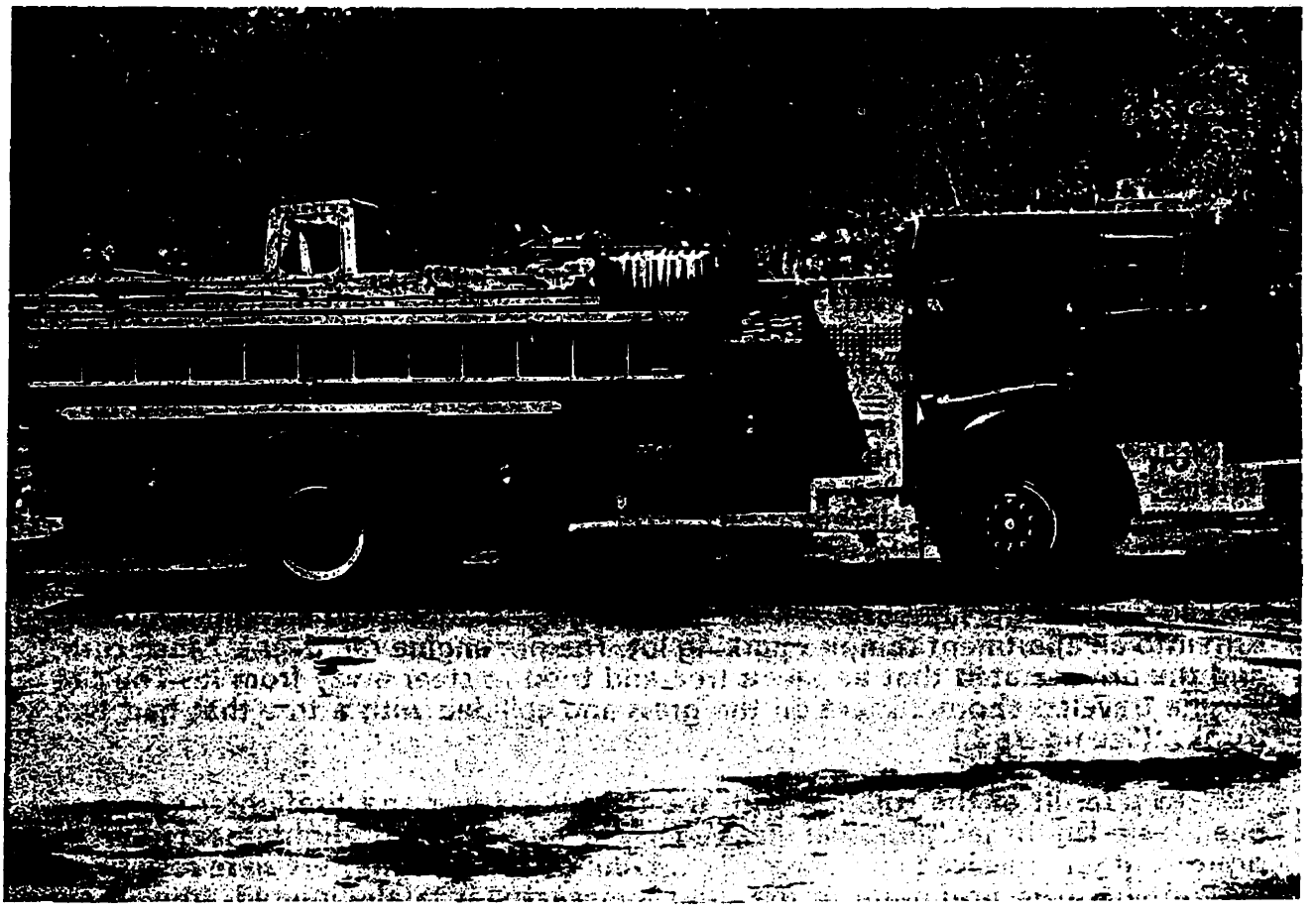

Figure 1.--Hahn custom pumper, Model HCP-15.
(similar to the accident vehicle.)

Tarrant County, Texas.--About 2:34 p.m., on October 24, 1990, a Spillway Volunteer Fire Department (SVFD) firefighter was dispatched in a tanker truck to transport 1,000 gallons of water to other firefighters at the scene of a house fire in rural Tarrant County, Texas. Before departing on the fire call, she had been babysitting the fire chief's 2-year-old daughter. She was unable to find another babysitter and took the infant with her. The 1963 International Loadstar 1600 firetruck was not equipped with seatbelts, and the infant was not restrained in a child safety seat.

Figure 2.--Accident vehicle at its final rest position.
(Waterbury *Republican American* newspaper photograph; Don Cousey, staff photographer; Tom Kabelka, photo lab.)

The firetruck was eastbound on Farm-to-Market Road 1886 at a witness-estimated speed of 45 mph when the driver began negotiating a shallow left curve on a 6-percent downgrade. The right side tires of the firetruck dropped 5 inches off the right pavement edge, and the driver steered to the left and lost control of the vehicle. The firetruck eventually travelled off the pavement on the south side of the road, dropped 10 feet, and crashed head-on into a dirt embankment. The firetruck exploded into flames at impact, and both occupants were killed.

Fire Apparatus Maintenance

WFD vehicle maintenance was performed by the WFD Bureau of Auto Repairs (BAR) located in the Waterbury Public Works service yard. The four employees at the BAR maintained all fire apparatus, firefighting equipment, fire station power generators, lawn mowers, nonemergency vehicles, and automobiles. The WFD had 42 motorized vehicles including 21 fire apparatus. The WFD mechanics were required to pass a civil service mechanics test. They received on-the-job training and brief training seminars from truck dealers and distributors.

Generally, spare fire apparatus are used only when the first-line apparatus are out of service for maintenance or repair. In January 1990, the WFD purchased new equipment, and the accident fire apparatus was taken out of first-line service as engine 9 at the Northside fire house on January 27, 1990. The accident fire apparatus eventually became the first-line spare at the fire house on Highland Avenue. At the time of the accident, the WFD had three ladder trucks and five engines in spare service. They were under the same maintenance schedule as the regular first-line apparatus.

All the WFD fire apparatus had hour meters that recorded engine running time and were used to determine when vehicle service was needed. Under the WFD preventive maintenance program, a vehicle was to be serviced after 150 hours of operation. The 150-hour service check included changing the engine oil and filter, lubricating the chassis, checking all fluids, and inspecting all belts, hoses, batteries, tires, exhaust system, fuel system, steering, suspension, and brakes. The service manual for the 1974 Hahn pumper, which was the accident vehicle, recommends service every 50 hours.

The master mechanic stated that the BAR also performs an annual service check on each vehicle that includes the items on the 150-hour service check, changing the fuel, automatic transmission, water, and air filters, and changing the pump transfer gear case and rear axle carrier case oil. Any rebuilding of components (brakes, transmission, etc.) is normally performed at this time. A service reminder (a 4-inch by 8-inch index card) is posted in the cab of the apparatus and states the hour meter reading for the next 150-hour service check and the date of the next annual service check. It is the responsibility of the personnel where the apparatus is stationed to notify the BAR when a vehicle is due for maintenance. Additionally, the WFD accident driver stated that shift duty drivers normally inspect their vehicles (pre-trip) at the beginning of a 3-day duty shift; this inspection includes a check of all fluids and an examination of the tires for damage, low air pressure, and tread wear, but no road tests are performed.

Of the 12 request-for-repair forms filed on the accident vehicle between November 7, 1988, and May 3, 1990, 7 were requests to fix the brakes. Most of the forms had notes indicating that the brakes had been checked or adjusted. A request for repair dated May 3, 1990, stated that "the maxi brake doesn't hold on hills and the regular [brakes] have a hard time stopping the engine on emergency runs." No records or available information indicated that the brakes had been repaired. Earlier in the morning on the day of the accident, the crew took the accident vehicle to the BAR to exchange the 24-foot extension ladder. While there, the driver talked to the master mechanic about the brakes. The driver indicated that the master mechanic checked the air pressure and made several brake applications. He told the driver there were no mechanics in the shop at that time and that if the driver brought the engine back after lunch, someone would adjust the brakes. Shortly after the engine company returned to the fire station, it responded to the call that resulted in the accident.

The fire engine was equipped with an automatic transmission and air-mechanical service brakes. A mechanical examination of the vehicle following the accident indicated that the front axle brakes had no defects and that the push-rod adjustments were within operating limits. An accumulation of rust was observed in both the left and right rear axle brakes. Three of the four rear axle brakeshoes were not making contact with the drum upon application. The lower left and both the upper and lower right brakeshoes were frozen at the anchor pins.

The rear axle brake chamber push-rod adjustments were within operating limits on the right side and at the maximum operating limit on the left side. The air chambers were misaligned, and the push rods had severe wear markings on the sides.[7]

If only one brakeshoe out of four makes contact with one of the two drums, the rear axle receives only 25 percent of the brake retarding force that it should. According to Safety Board calculations, which took into account the size of the air chamber (24 square inches on the front axle and 30 square inches on the rear axle) and which assumed an air pressure application of 100 psi, the rear axle brakes were in such poor condition that the apparatus had only 58 percent of its original braking capability. The driver indicated that the wet/dry switch[8] was in the wet position, thus providing only 50 percent of the braking capability of the front axle. (See "Fire Department Operating Procedures.") The condition of the rear axle brakes, coupled with the use of the wet/dry switch in the wet position, reduced the original braking capability of the vehicle to about 36 percent.

The accumulated rust around the anchor pins of the WFD apparatus rear axle brakes indicated that they were in need of lubrication. According to the manufacturer's service manual, the brakeshoe pins should be cleaned and lubricated after every 500 hours of use. Based on the hour-meter recorded measurements, the accident vehicle's brakeshoe pins should have been serviced in November 1989. The rust and the frozen condition of the pins indicate that the service was not performed. The Safety Board concludes that the BAR did not adequately maintain the accident vehicle's brakes and did not follow the manufacturer's recommended service guidelines.

The WFD BAR policy was that fire apparatus should receive preventive maintenance after every 150 hours of operation, as measured by the engine hour-meters. A review of the service records for the accident vehicle shows that in September 1988 it received a 150-hour service check although it had been in service for 267 hours since its last check. In November 1989, 468 hours of service later, it received its next check. The Safety Board concludes that the BAR did not adhere to its own policy of servicing a vehicle after every 150 hours of service. The manufacturer's service intervals are intended to insure that a vehicle performs as designed. Service intervals of 50 hours were recommended by the manufacturer's maintenance manual for the WFD accident vehicle. Most vehicle manufacturers recommend service based on either the amount of use or elapsed time, whichever comes first, because a vehicle can deteriorate even while it is idle. Lubricants can dry out, and rust and corrosion can develop, especially in the case of spare vehicles that may be used infrequently.

The Tarrant County, Texas, SVFD had 6 vehicles (a tanker, two engines, a rescue vehicle, and two grass trucks). The SVFD did not have a formal maintenance program or record system. It did change the oil in its vehicles every 3 or 4 months and did take the vehicles to an outside shop for repair when they were not functioning properly.

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[7]See appendix B for further information concerning the condition of the brake.

[8]Many vehicles use a manual limiting valve (commonly called a dry road/slippery road valve or wet/dry switch) that is controlled by a pneumatic switch in the cab. In the "dry road" position, the valve is a 1:1 valve. In the "slippery road" position, it reduces front brake pressure to 50 percent of control line pressure at all control line pressure levels.

The postcrash examination of the firetruck disclosed numerous deficiencies: The left front tire was underinflated; its rated inflation pressure was 95 psi; however, it was only inflated to 50 psi. The right rear dual tires were inflated to 45/44 psi; their rated inflation pressure was 85 psi. Further, the firetruck's steering components were excessively worn. The splined shaft attaching the pitman arm to the steering gear box was worn, and the ball socket joint where the steering arm attached to the drag link was excessively worn.

The firetruck's hydraulic brakes also had several deficiencies. SVFD personnel indicated that before the accident the firetruck would pull to the left during brake applications. An examination of the brakes revealed that the right front drum was rusted and the bottom shoe did not make contact with the drum.

As illustrated by the Waterbury, Connecticut, accident, some fire department maintenance programs do not ensure that fire apparatus are properly maintained. Further, as illustrated by the Tarrant County, Texas, accident some fire departments have no maintenance program. Because fire apparatus often stop suddenly, because they are frequently operated at higher speeds than are conventional vehicles, and because they are operated under hazardous conditions, it is essential that they be properly maintained. Therefore, the Safety Board believes that the U.S. Fire Administration (USFA)[9] of the Federal Emergency Management Agency and the International Association of Fire Chiefs (IAFC) should urge fire departments to establish vehicle maintenance programs that follow all of the manufacturers service requirements and schedules.

Fire Apparatus Inspection

Connecticut State Inspection.--Following the Waterbury accident, a mechanical inspection of the WFD fire apparatus was conducted by the Connecticut Department of Motor Vehicle (CDMV) Commercial Vehicle Safety Unit. The CDMV indicated that because of the condition of the brakes, the vehicle failed the safety criteria used in the commercial vehicle roadside inspection program developed by the Commercial Motor Carrier Safety Assistance Program (MCSAP) of the Federal Highway Administration (FHWA).[10] After the accident, the Waterbury City Maintenance Department examined the brakes of the WFD first-line fleet of 9 engines and 5 ladder trucks; 9 of the 14 (64 percent) were withdrawn from service to be repaired.

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[9]The United States Fire Administration maintains offices and conducts programs in the following areas: fire policy and coordination, firefighter health and safety, fire data and analysis, and fire prevention and control. The Administration works closely with the Nation's fire service, with fire service organizations, with Federal, State, and local governments, and with the private sector in developing and implementing programs aimed at lowering the level of loss of life and property.

[10]North American Uniform Service Criteria, Commercial Vehicle Safety Alliance, February, 1990, Out-of-Service Condition: When any motor vehicle(s) by reason of its mechanical condition or loading, is determined to be so imminently hazardous as to likely cause an accident or breakdown, or when such condition(s) would likely contribute to loss of control of the vehicle(s) by the driver, said vehicle(s) shall be placed out of service. No motor carrier shall require nor shall any person operate any motor vehicle declared and marked "out-of-service" until all required repairs have been satisfactorily completed.

At the time of the Waterbury accident, the State did not require the inspection of emergency vehicles. After the accident, the CDMV initiated a voluntary non-fee inspection program for fire service vehicles. From July 1, 1990, to January 3, 1991, the CDMV inspected 559 fire apparatus from 64 cities and towns. During this period, 193, or 35 percent, of the fire apparatus failed the CDMV roadside inspection. Fifty percent of the deficiencies involved brakes, 18 percent involved steering systems, and the remaining deficiencies involved tires, suspension systems, and fuel leaks.

Texas State Inspection.--The postaccident examination of the Tarrant County, Texas, fire apparatus disclosed numerous mechanical deficiencies, including under-inflated tires, worn steering components, worn brake drums, and a rusted brake drum, all of which indicate inadequate maintenance. The apparatus had been inspected at an inspection station designated by the Texas Department of Public Safety (DPS) and had received an Annual Vehicle Inspection Certificate dated October 5, 1990, which was 19 days before the accident.[11] The requirements of the Texas inspection for this apparatus consisted of 22 elements that included emissions testing; examinations of the lights, horn, windshield wipers, and tires, and a brake test that required the vehicle to stop within 20 feet at a speed of 10 mph. This inspection did not include a visual or mechanical examination of the brakes.

State Vehicle Inspection Programs.--The Safety Board conducted a limited survey of the 50 States and the District of Columbia to determine whether the States require vehicle inspections for fire emergency vehicles. Currently, 19 States require fire apparatus to be inspected periodically by the State or by designated fleet inspection stations.[12]

Table 1--States Requiring Periodic State Fire Apparatus Inspections

Arkansas	New York
California	North Carolina
Connecticut[13]	Oklahoma
District of Columbia	Pennsylvania
Hawaii	Rhode Island
Louisiana	South Carolina
Maine	Texas
Massachusetts	Utah
Mississippi	Vermont
New Hampshire	Washington[14]
New Mexico[15]	

[11]In July 1990, the DPS Motor Vehicle Inspection Unit cited the designated inspection station that had issued the certificate for issuing certificates of inspection without completing the required safety inspections.

[12]See appendix C for further information concerning State motor vehicle and commercial vehicle inspection programs.

[13]Voluntary program.

[14]Voluntary program.

[15]Fire apparatus inspection is required by the State Fire Marshall's Office.

Among the 18 highway safety program standards issued by the Department of Transportation were the periodic motor vehicle inspection (PMVI) standards. The Highway Safety Act of 1966 gave the Secretary of Transportation the authority to withhold highway construction funds if highway safety program standards were not met. By 1975, 31 States and the District of Columbia had periodic inspection programs. However, according to a report[1] by the U.S. General Accounting Office (GAO), the Highway Safety Act of 1976 removed the Secretary's authority to withhold highway construction funds and provided that State safety programs could be approved without meeting all of the 18 program standards. Ten States repealed the program as a result of the 1976 Act.[2]

The GAO report states that a 1989 National Highway Traffic Safety Administration (NHTSA) study[3] and other data show that periodic vehicle inspection programs reduce accident rates. The NHTSA study concluded that periodic inspection programs reduce the number of poorly maintained vehicles on the highways, but that available data do not conclusively demonstrate that inspection programs significantly reduce accident rates. The GAO took exception to this conclusion and reexamined the eight studies quoted in the NHTSA study. The GAO found that:

> Taken together, the studies discussed in NHTSA's report as well as several other studies identified by GAO indicated that inspection programs reduce accident rates. These studies included estimates of accident reduction ranging from less than 1 percent to as high as 27 percent. The actual magnitude of the reduction is unknown. GAO agrees with NHTSA that all of the studies had limitations either of scope, age, or methodological completeness. Thus, while the large majority of studies point to a safety benefit from inspection programs, they do not provide a reliable basis for judging how much effect the programs have on accident rates.[4]

As a result of the 1990 report, the GAO recommended that:

> ...the Secretary of Transportation direct NHTSA to support state periodic motor vehicle inspection programs through such actions as (1) sponsoring research, (2) assisting inspection states to share their experiences and adapt to changing automotive technology, and (3) promoting public awareness of the need to properly maintain the safety-critical components of vehicles.

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[1]Motor Vehicle Safety, "NHTSA [National Highway Traffic Safety Administration] Should Resume Its Support of State Periodic Inspection Programs," Report to the Chairman, Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, United States General Accounting Office, (GAO/RCED-90-175), July 1990.

[2]Those States that repealed PMVI programs after the 1976 legislation are listed with the dates of start and repeal: Colorado (1937-1981), New Mexico (1953-1977), Georgia (1965-1982), Wyoming (1967-1977), Florida (1968-1981), Idaho (1968-1976), Kentucky (1968-1978), South Dakota (1968-1979), Indiana (1969-1980), Nebraska (1969-1982)

[3]"Study of the Effectiveness of State Motor Vehicle Inspection Programs," NHTSA, (Washington, D.C., August 1989).

[4]GAO, executive summary, p.5.

After the implementation of a MCSAP random roadside inspection program in Connecticut in 1986, the percentage of vehicles that had to be removed from service because of out-of-service violations declined,[20] indicating an improvement in the general condition of the commercial vehicles on the road. Fire apparatus are equipped with many of the same mechanical features as other heavy trucks and can do fully as much damage in the event of an accident. However, most States do not have an oversight program for these vehicles that is comparable to the MCSAP inspections for heavy trucks. For example, although the Tarrant County, Texas, fire apparatus was inspected shortly before the accident, the vehicle was not taken out of service even though the apparatus was in poor condition. The Texas inspection did not provide the level of scrutiny that an inspection under MCSAP (mechanical) criteria would have provided. Additionally, the voluntary inspections of fire apparatus in Connecticut indicate that many of these vehicles are not maintained properly.

Currently, MCSAP programs do not include fire apparatus, and because of the random nature of MCSAP inspections, the Safety Board believes that it would be inappropriate to include them in MCSAP. However, the Safety Board believes that an improvement in the condition of fire apparatus could be expected if these vehicles were subjected to the level of inspections that commercial vehicles receive through MCSAP. Therefore, the Safety Board believes that States should require the inspection of fire apparatus and that these inspections should be performed by commercial vehicle inspectors in accordance with MCSAP (mechanical) criterion to ensure continuity in the depth and level of the inspections.

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[20]In 1986 70 percent of the heavy commercial vehicles inspected during CDMV MCSAP random roadside inspections failed or were put out of service because of safety violations; in 1990, 40 percent failed.

FIRE DEPARTMENT OPERATING PROCEDURES

Accident Information

About 6:50 p.m., on June 9, 1990, engine 381, a 1979 Oren pumper-tanker of the Long Green Volunteer Fire Company (LGVFC) in Baltimore County, Maryland, was traveling north on Manor Road responding to an emergency call when the driver lost control of the vehicle while turning at an intersection. The fire apparatus rotated 180 degrees and overturned in a ditch. The driver and four firefighters received minor to no injuries. All of the firefighters were restrained by seatbelts. The pavement was wet from a previous rain. The driver stated that as he entered the curve, he was traveling 25 to 30 miles per hour. He took his foot off the gas to slow the truck, and he "counted on the engaged engine retarder[21] to slow him down." He also stated that "the rear end went very fast, slipped around 180 degrees till I hit a ditch and flopped over." He indicated that the engine retarder was always left on and that none of the drivers turned it off.

The driver indicated that he had been driving fire apparatus for 26 years. He had participated in obstacle course driver training sponsored by the Baltimore County Fire Department. The LGVFC Chief indicated that the company periodically received driver training from the Baltimore County Fire Department in which participants were taught to leave engine retarders on all the time. It was the LGVFC practice to have engine retarders on at all times. Additionally, the training officer of the Baltimore County Fire Department indicated that its drivers were taught to leave engine retarders on all the time.

Engine Retarders

The Jacobs Manufacturing Company, one of several manufacturers of engine retarders, warns drivers in its "Professional Driver Techniques and Owner's Manual" about the dangers of using retarders when they are driving on slippery or wet roads. The manual states that the driver should not use the retarder until he is sure that his truck is maintaining traction without its use. Then he can use the lower power settings on the retarder. Progressively higher power settings should not be used until it is established that the vehicle is maintaining traction in the lower settings. "If the tractor drive wheels lock or if there is a fishtail motion, immediately turn off the master switch and don't turn the Jake Brake [engine retarder] on until road conditions improve."

In the NHTSA booklet entitled "A Professional Truck Driver's Guide on the Use of Retarders,"[22] truck drivers are warned to turn engine retarders off when they are driving empty trucks or pulling empty trailers on wet pavement or when they are driving tractors without trailers.

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[21]An engine retarder uses the engine itself to aid in slowing and controlling the vehicle. When activated, the engine retarder alters the operation of the engine's exhaust so that the engine works as a power-absorbing air compressor; however, this provides a retarding action only to the drive axle.

[22]DOT HS 806 675, January 1985.

The "Model Driver's Manual for Commercial Vehicle Driver Licensing"[23] also addresses engine retarders and states:

> Some vehicles have "retarders." Retarders help slow a vehicle, reducing the need for using your brakes. They reduce brake wear and give you another way to slow down. There are many types of retarders (exhaust, engine, hydraulic, electric). All retarders can be turned on or off by the driver. On some the retarding power can be adjusted. When turned "on" retarders apply their braking power (to the drive wheels only) whenever you let up on the accelerator pedal all the way.
>
> Caution: When your drive wheels have poor traction, the retarder may cause them to skid. Therefore you should turn the retarder off whenever the road is wet, icy or snow covered.

In 1982 and 1983, the NHTSA sponsored research that was done by the Transportation Research Institute of the University of Michigan.[24] The research explored the influence of retarder torque on directional control on slippery pavements. In summary, the study indicates that drivers of retarder-equipped vehicles should be informed that they may avoid potential control problems by turning off their retarders when they are operating either empty or lightly loaded vehicles on roads that are either icy or slippery. The experimental portion of the research was performed by a test driver who had experience in heavy-truck braking experiments on slippery surfaces. In the experiment, this driver could not recover from the rapid jackknifes that occurred on slippery surfaces when he was turning an empty vehicle while decelerating with the engine retarder.

In 1985 and 1986, the Safety Board investigated accidents in Texas and Colorado[25] in which heavy trucks lost directional control due to the misuse of engine retarders. The drivers of the trucks did not have manufacturers' operating manuals, and the motor carriers had not established operating procedures that were consistent with the manufacturers' warnings about the proper use of engine retarders.

As a result of these investigations, the Safety Board recommended that the National Highway Traffic Safety Administration (NHTSA):

> H-89-38
>
> Require the installation of a permanently affixed placard in the interior of new truck tractors equipped with an engine retarder to warn against using the retarder on slippery/wet surfaces when the

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[23]U.S. DOT, Federal Highway Administration Publication No. FHWA-MC-89-051, dated January 31, 1989.

[24]"Retarders for Heavy Vehicles: Phase III Experimentation and Analysis; Performance, Brake Savings, and Vehicle Stability" (DOT HS 8006 672).

[25]Highway Field Report--"1981 GMC Astro Jackknife and Loss of Control, near Decatur, Texas," August 13, 1985 (NTSB-FTW-85-H-TR38), and Highway Field Report--"1981 Freightliner Jackknife and Overturn, near Mineral Wells, Texas," April 3, 1986 (NTSB-FTW-86-H-TR09).

> vehicle is empty or lightly loaded. The placard should also warn against using the engine retarder to shift gears in these conditions.

The NHTSA responded that the warnings in the booklet "A Professional Truck Driver's Guide on the Use of Retarders" and in the commercial drivers license (CDL) "Model Driver's Manual" should reach the truck driving population and eliminate the need for placarding. The NHTSA was concerned about "driver-compartment clutter and information overload from an excessive number of lights, buzzers, and warnings." The NHTSA is investigating the "driver overload issue." Safety Recommendation (H-89-38) has been classified as "Open--Acceptable Action."

Also as a result of the Texas and Colorado accidents, the Safety Board issued recommendations to the Professional Truck Drivers Institute of America, Inc., the International Brotherhood of Teamsters, the American Trucking Associations, Inc., the manufacturers of engine retarders, and the Federal Highway Administration, recommending that they inform their members of the potential hazards of misusing engine retarders and develop training on the proper use of engine retarders. (See appendix D.) However, no recommendations were issued to the fire service community.

Some of the newer fire apparatus are equipped with engine retarders and these vehicles have operating characteristics that are similar to those of heavy commercial trucks. The use of engine retarders on wet pavement can lead to loss of control. As the Baltimore County, Maryland, accident shows, some fire departments have policies that directly conflict with the written warnings issued by the manufacturers of engine retarders. Therefore, the Safety Board believes that the USFA and the IAFC should inform fire departments nationwide of the potential hazards of misusing engine retarders and encourage fire departments to establish operating procedures that are consistent with manufacturers warnings about the proper use of engine retarders.

Limiting Valves

Following the Waterbury, Connecticut, accident, the front axle limiting valve was found in the "wet or "slippery-road" position. The driver stated that it had been raining on and off on the morning of the accident and that the streets were wet. He had set the valve to the "wet" position earlier that morning before driving the apparatus. It was WFD practice that when the roads were wet, the brake limiting valve was to be switched to the slippery road position.

Hahn "Maintenance-Operating Manual" states that "Putting the lever in the 'slippery road' position reduces pressure on the front brakes to half of that on the rear brakes. The front wheels will have less tendency to slide and steering control is maintained. Keep the lever in the 'dry road' position under all normal operating conditions." The "Model Driver's Manual for Commercial Vehicle Driver Licensing" states:

> Some older vehicles (made before 1975) have a front brake limiting valve and control in the cab. The control is usually marked "normal" and "slippery." When you put the control in the "slippery" position, the limiting valve cuts "normal" air pressure to the front brakes by half. Limiting valves were used to reduce the chance of the front wheels skidding on slippery surfaces. However, they actually reduce the stopping power of the vehicle. Front wheel

OCCUPANT SEATBELT USE

Accident Information

Catlett, Virginia.--About 7:38 p.m. on September 28, 1989, wagon 7 of the Catlett Volunteer Fire Company was struck on its left side by a southbound National Railroad Passenger Corporation (AMTRAK) train. The accident occurred at a private-driveway grade crossing off Virginia Route 28 about 1 mile south of Catlett, Virginia.[27] The cab and chassis of the apparatus rotated counterclockwise 450 degrees during the collision and came to rest facing north about 80 feet southeast of the crossing. Most of the apparatus was destroyed; however, the passenger compartment of the canopy cab remained intact. The unrestrained driver and the other firefighter seated in the cab were ejected and fatally injured, and two unrestrained firefighters riding in the rear-facing canopied jumpseat behind the cab were ejected and sustained moderate to severe injuries. A fifth firefighter riding in the rear-facing jumpseat remained within the apparatus following the collision. He received serious injuries.

Eugene, Oregon.--About 6:09 a.m., on January 30, 1990, a Crow Valley Fire Protection District 1989 Pierce pumper fire engine responding to a house fire overturned while traversing a residential driveway which collapsed. The engine-pumper overturned 1.5 times down a 20-foot incline and came to rest on its roof. The apparatus was occupied by three firefighters, who were restrained by seatbelts. All of the firefighters remained within the apparatus during the overturn. Following the accident all of the firefighters were treated for minor injuries and released from the hospital.

Los Angeles, California.--On March 1, 1990, engine 91, a Seagrave firetruck of the Los Angeles City Fire Department, left the station house on a nonemergency run (no lights or siren) and was struck broadside at the intersection of Borden Avenue and Polk Street in the Sylmar section of Los Angeles by an automobile that failed to stop for a red light.

The fire apparatus was hit on the right side behind the rear axle. The police estimated that the automobile's speed was "well in excess of 55 mph." As a result of the collision, the apparatus rotated approximately 90 degrees and overturned onto its roof. The driver and an officer were seated in the forward cab section, and the two firefighters were seated facing rearward in the jumpseat in the enclosed rear cab section. The firetruck cab remained intact during the crash, and all of the firefighters were wearing their seatbelts. The firefighters received only minor injuries. The driver of the automobile was fatally injured.

Gallitzin Township, Pennsylvania.--About 2:45 p.m., on May 17, 1990, the Cresson Volunteer Fire Company responded to an emergency call about a motor vehicle accident. As the 1968 Chevrolet firetruck was traveling northbound downhill on State Route 53, the driver lost control of the vehicle. The rear of the vehicle struck and rode up on a guardrail, and the vehicle overturned more than 360 degrees. The vehicle then struck a bridge abutment, traveled over the side of the bridge, and came to rest on its left side in a creek bed. Both occupants were ejected onto the roadway and were fatally injured.

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[27]See docket HY-514-89 for further information concerning this accident.

The police report indicated that the occupants were not wearing seatbelts. Following the crash, the State Police Motor Carrier Inspection Division officer inspected the accident vehicle. The only problem noted was that the "female ends of both seatbelts were found tucked under the seat, rendering them unusable." The cab was intact after the accident.

Dallas, Texas.--About 1:54 p.m., on August 5, 1990, Dallas Fire Department engine 9, a 1990 Quality firetruck with four occupants, was responding to a medical emergency and was traveling south on South Beltline Road. The driver released the accelerator while he was traveling down a hill that curved to the left; the rear of the apparatus began to skid to the right. The apparatus skidded sideways down the road until the right front tires hit the soft dirt shoulder on the left side of the road and the apparatus rolled over and came to rest 30 feet from the road facing north. (See figure 3.) It was drizzling rain, and the pavement was wet. The driver and officer in the cab and the two firefighters in the jumpseat were wearing their seatbelts. Although the damage to the apparatus was extensive, there were no injuries.

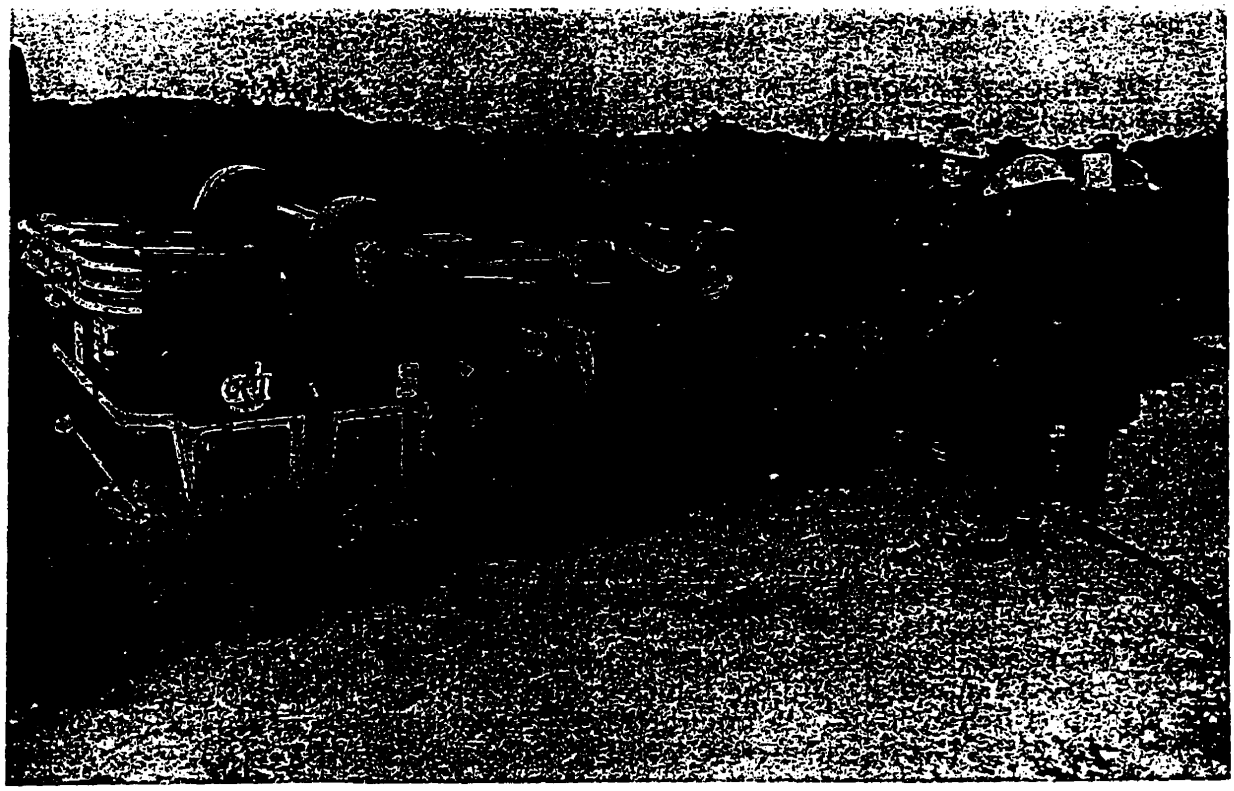

Figure 3.--Dallas, Texas, Fire Department engine 9.
(photograph courtesy of Dallas Fire Department.)

National Fire Protection Association Standards

The NFPA is an independent, voluntary-membership, nonprofit organization. More than 200 NFPA committees develop voluntary standards and codes that serve as guidelines for the fire services in all phases of operations. These standards are updated every 3 to 5 years; however, they are not mandatory.

The 1987 NFPA Standard 1500, "Fire Department Occupational Safety and Health Program," Chapter 4, "Vehicles and Equipment," Section 3," Persons Riding on Fire Apparatus," states:

> 4-3.1 All persons riding on fire apparatus shall be seated and secured to the vehicle by seat belts or safety harnesses at any time the vehicle is in motion. Riding on tailsteps or in any other exposed positions shall be specifically prohibited. Standing while riding shall be specifically prohibited.

Fire Apparatus Occupant Seatbelt Use

In the Catlett, Virginia, accident four unrestrained firefighters were ejected from the apparatus, and two of these firefighters were fatally injured. Even though the fire apparatus was heavily damaged, the cab section remained intact. In the Gallitzin Township, Pennsylvania, accident, both unrestrained occupants were ejected. However, the apparatus passenger compartment remained intact. The NHTSA Fatal Accident Reporting System (FARS) 1988 data concerning fatal accidents indicate that 17.4 percent of the unrestrained passenger-car occupants were ejected from the vehicle; of those ejected, 73.5 percent were fatally injured. Although there is no similar data concerning occupant ejection as a result of accidents involving fire apparatus, it is clear that ejection from a vehicle during a collision is likely to cause a serious or fatal injury.

In contrast, several accidents in which fire apparatus overturned and the restrained occupants remained within the apparatus and were not injured illustrate the benefits of using seatbelts. In the Los Angeles, California, accident and in the Eugene, Oregon, accident, the vehicles overturned, yet the firefighters, who had used their seatbelts, received only minor injuries. In the Dallas, Texas, accident the fire apparatus rolled over and came to rest 30 feet from the road; however, the four firefighters were uninjured. Accordingly, it is likely that had the occupants of the Catlett, Virginia, and Gallitzin Township, Pennsylvania, accident vehicles been restrained, they might not have been ejected and might have been less severely injured.

NFPA voluntary standard 1500 clearly states that all persons shall be seated and restrained while riding on fire apparatus, and most departments have policies requiring the use of seatbelts. Yet, firefighters continue to be injured and killed because they are not restrained. Fire apparatus are frequently operated at higher speeds than conventional vehicles are and, therefore, are prone to overturn and high-speed accidents. It is essential for firefighters to wear available seatbelts to prevent ejection and injury. Although there are voluntary standards that encourage seatbelt use, there is no nationwide program to educate the firefighting community concerning the benefits of seatbelts. Thus, the Safety Board believes that the USFA, in cooperation with the IAFC and the NFPA, should encourage fire departments to establish and enforce mandatory seatbelt policies and to develop programs that promote the use of seatbelts in fire apparatus.

CONCLUSIONS

1. The condition of the rear axle brakes coupled with the use of the wet/dry switch in the wet position reduced the original braking capability of the Waterbury, Connecticut, accident vehicle to about 36 percent.

2. The Waterbury Fire Department Bureau of Auto Repairs did not maintain the accident vehicle's brakes adequately and did not follow the manufacturer's recommended service guidelines.

3. The Waterbury Fire Department Bureau of Auto Repairs did not adhere to its own policy of servicing a vehicle after 150 hours of service.

4. The condition of fire apparatus can be improved if these vehicles are subjected to the level of inspections that commercial vehicles receive through MCSAP.

5. The use of manual brake limiting valves can diminish fire apparatus stopping capability.

6. The use of engine retarders on wet pavement can lead to loss of control.

7. Firefighters are more likely to avoid ejection and injury if they are restrained.

RECOMMENDATIONS

As a result of this special Investigation, the National Transportation Safety Board made the following recommendations:

--to the U.S. Fire Administration of the Federal Emergency Management Agency:

Urge fire departments to establish vehicle maintenance programs that follow all of the manufacturers service requirements and schedules. (Class II, Priority Action) (H-91-3)

Inform fire departments nationwide of the potential hazards of misusing engine retarders, and encourage fire departments to establish operating procedures that are consistent with manufacturers warnings about the proper use of engine retarders. (Class II, Priority Action) (H-91-4)

Notify fire departments of the hazards of using fire apparatus manual brake limiting valves, and urge them to discontinue the use of these devices. (Class II, Priority Action) (H-91-5)

In cooperation with the National Fire Protection Association and the International Association of Fire Chiefs, encourage fire departments to establish and enforce mandatory seatbelt policies and to develop programs that promote the use of seatbelts in fire apparatus. (Class II, Priority Action) (H-91-6)

--to the International Association of Fire Chiefs:

Urge fire departments to establish vehicle maintenance programs that follow all of the manufacturers service requirements and schedules. (Class II, Priority Action) (H-91-7)

Inform fire departments nationwide of the potential hazards of misusing engine retarders, and encourage fire departments to establish operating procedures that are consistent with manufacturers warnings about the proper use of engine retarders. (Class II, Priority Action) (H-91-8)

Notify fire departments of the hazards of using fire apparatus manual brake limiting valves, and urge them to discontinue the use of these devices. (Class II, Priority Action) (H-91-9)

Cooperate with the U.S. Fire Administration and the National Fire Protection Association to encourage fire departments to establish and enforce mandatory seatbelt policies and to develop programs that promote the use of seatbelts in fire apparatus. (Class II, Priority Action) (H-91-10)

--to the National Fire Protection Association:

Cooperate with the U.S. Fire Administration and the International Association of Fire Chiefs to encourage fire departments to establish and enforce mandatory seatbelt policies and to develop programs that promote the use of seatbelts in fire apparatus. (Class II, Priority Action) (H-91-11)

--to the Governors and legislative bodies of those States without fire apparatus inspection programs:

Develop and implement a fire-apparatus inspection program that requires periodic inspections performed by commercial vehicle inspectors in accordance with the Federal Highway Administration Motor Carrier Assistance Program vehicle (mechanical) inspection criterion. (Class II, Priority Action) (H-91-12)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ James L. Kolstad
Chairman

/s/ Susan M. Coughlin
Vice Chairman

/s/ Jim Burnett
Member

/s/ John K. Lauber
Member

/s/ Christopher A. Hart
Member

March 19, 1991

APPENDIXES

APPENDIX A

ACCIDENT DATA

The Safety Board examined published NFPA accident data from 1980 through 1989 (summarized in the table below). In this 10-year period there were 1,191 firefighter fatalities; 262 fatalities, or 22 percent, occurred in apparatus or motor vehicle accidents. Of the 262, 179 (15 percent of the 1,191 fatalities) occurred in fire department vehicles, and 59 (5 percent of the 1,191 fatalities) occurred in personal vehicles.

National Fire Protection Association
Accident Data
1980-1989

Year	Total fire-fighter fatalities	Career/ volunteer	Apparatus or motor vehicle accident	Fire department vehicle	Personal vehicle
1980	134	67/67	21 (21%)	19	6
1981	123	64/59	20 (16%)	11	4
1982	117	49/68	23 (19%)	16	2
1983	106	58/48	21 (20%)	15	6
1984	116	47/69	32 (27%)	25	5
1985	119	57/62	23 (19%)	17	5
1986	113	60/53	27 (23%)	24	7
1987	124	52/72	33 (27%)	20	10
1988	129	48/81	33 (26%)	17	9
1989	110	46/64	21 (19%)	10	5
Total	1,191		262 (22%)	179 (15%)	59 (5%)

APPENDIX B

WATERBURY, CONNECTICUT, ACCIDENT APPARATUS BRAKE CONDITION

Air chamber size	Slack adjuster	Measured push rod stroke (inches)	Recommended maximum stroke before readjustment (inches)
Front axle	Manual	1 1/8	1 3/4
Left 24	Manual	1	1 3/4
Right 24			
Rear axle			
Left 30/30	Manual	2	2
Right 30/30	Manual	1 3/4	2

APPENDIX C

INSPECTION REQUIREMENTS FOR FIRE APPARATUS

State	PMVI[a]	Commercial PMVI	Fire Apparatus
Alabama	-	-[b]	-
Alaska	-	-	-
Arizona	-	-	-
Arkansas	X	X	X
California	-	-[c]	-
Colorado	-	-	-
Connecticut	-	-	-[d]
Delaware	X	-	-
District of Columbia	X	X	X
Florida	-	X	-
Georgia	-	X	-
Hawaii	X	X	X
Idaho	-	-	-
Illinois	-	X	-[e]
Indiana	-	-	-
Iowa	-	-	-
Kansas	-	X	-
Kentucky	-	-	-
Louisiana	X	X	X
Maine	X	X	X
Maryland	-	X	X
Massachusetts	X	X	X
Michigan	-	X	-
Minnesota	-	X[f]	-
Mississippi	X	-	X
Missouri	X	-	X
Montana	-	-	-
Nebraska	-	-	-
Nevada	-	-	-
New Hampshire	X	X	X
New Jersey	X	X	X
New Mexico	-	-	X[g]
New York	X	X	X
North Carolina	X	-	X
North Dakota	-	-	-
Ohio	-	-	-

[a]Periodic motor vehicle inspection.

[b] PMVI for commercial vehicles is currently limited to liquid propane gas (LPG) carriers.

[c]Since 1989 California has required all commercial carriers to be inspected every 90 days.

[d]Voluntary program.

[e]Ambulances are required to be inspected. Fire apparatus are not.

[f]Minnesota started a PWI program for commercial vehicles in April 1991.

[g]Fire apparatus inspection is required by the State Fire Marshall's Office.

APPENDIX C

Oklahoma	X	X	X
Oregon	-	-	-
Pennsylvania	X	X	X
Rhode Island	X	X	X
South Carolina	X	-	X
South Dakota	-	-	-
Tennessee	-	-	-
Texas	X	X	X
Utah	X	X	X
Virginia	X	X	X
Washington	-	X	-d
West Virginia	X	X	-e
Wisconsin	-	-	-
Wyoming	-	-	-

APPENDIX D

STATUS OF PREVIOUS RECOMMENDATIONS ABOUT ENGINE RETARDERS

As a result of the Texas and Colorado directional control accidents,[a] the Safety Board issued the following safety recommendations:

--to the Professional Truck Drivers Institute of America, Inc.:

H-89-39

Inform your members of the potential hazards of misusing the engine retarder and urge your accreditation committee to require member schools to include training on the proper use of the engine retarder in their curricula. (Closed --Acceptable Action)

--to the International Brotherhood of Teamsters:

H-89-40

Inform your members of the potential hazards of misusing the engine retarder and ensure that drivers are adequately trained in the proper use of the engine and other types of retarders. (Open--Acceptable Action)

H-89-41

Urge your members to comply with the advisory placards provided by the engine retarder manufacturers that warn against using the engine retarder on slippery/wet surfaces when the vehicle is empty or lightly loaded or that warn against using the engine retarder to shift gears in these conditions. (Open--Acceptable Action)

--to the American Trucking Associations, Incs.:

H-89-42

Inform your members of the potential hazards of misusing the engine retarder and urge them to formulate written policies for the operation of engine retarders and to ensure drivers are trained in their use. (Closed--Acceptable Action)

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[a]Highway Field Report--"1981 GMC Astro Jackknife and Loss of Control, near Decatur, Texas," August 13, 1985 (NTSB-FTW-85-H-TR38), and Highway Field Report--"1981 Freightliner Jackknife and Overturn, near Mineral Wells, Texas," April 3, 1986 (NTSB-FTW-86-H-TR09).

H-89-43

Urge your members to install the advisory placards provided by the engine retarder manufacturers that warn against using the retarder on slippery/wet surfaces when the vehicle is empty or lightly loaded or that warn against using the engine retarder to shift gears in these conditions. (Closed--Acceptable Action)

--to the manufacturers of engine retarders:

H-89-44

Revise existing owner's manuals and placards to warn against the use of the engine retarder on slippery/wet surfaces when the vehicle is empty or lightly loaded, and call special attention to this warning in the owner's manuals for drivers operating a single-driver axle tractor. (Closed-- Acceptable Action)

--to the Federal Highway Administration:

H-89-45

Include in the commercial driver's license testing procedures questions regarding the proper operation of engine retarder systems. (Closed--Reconsidered)

* U.S. G.P.O.:1991-281-626-20038