SENATE TRANSPORTATION COMMITTEE

MINUTES OF MEETING

Wednesday, April 2, 1975

A joint hearing of the Senate and the Assembly Transportation Committees was held on Wednesday, April 2, 1975, for the purpose of hearing testimony and observing a demonstration on SB 121, which Requires Vehicle Safety Inspections. The demonstration was put on by the Department of Transportation regarding Periodic Motor Vehicle Inspection. The meeting was called to order at 12:15 p.m.

Senator Helen Herr was in the Chair:

PRESENT WERE:
Senator Helen Herr, Chairman
Senator Warren Monroe
Senator William Raggio
Senator Richard Blakemore
Senator Joe Neal
Senator Mary Gojack
Senator Jack Schofield

Assemblyman Alan Glover, Chairman of the Assembly Transportation Committee

ALSO PRESENT:
Joe Zemaitis, DOT, NHTSA, Region IX
Brad Crittenden, NHTSA, Region IX
John Ryan, NHTSA, Region IX
Frank Greiner, DOT, Washington D.C.
Roz Parry, Office of Highway Safety
D. Tatum, Office of Highway Safety
Richard King, Office of Highway Safety
Wayne Tetrault, Office of Highway Safety
David Lawson, Office of Highway Safety
John Borda, Office of Highway Safety
V. L. Fletcher, DMV
James Lambert, DMV - Highway Patrol
John Ciardelli, DMV
Howard Hill, DMV
Freddie Little, DMV
Grant Bastian, Hwy. Dept.
Barnie Smith, AAA
Virgil Anderson, AAA
Judy Matteucci, Budget Office
Darryl Capurro, Nevada Motor Transport Assn.

Mr. John Borda of the Nevada Highway Safety Office introduced to the Committee, Mr. Brad Crittenden, of the National Highway Traffic Safety Association, Region IX; and, Mr. Frank Greiner of the Department of Transportation in Washington D. C. Mr. Greiner then gave testimony and gave a demonstration on the need for Periodical Motor Vehicle Inspection. (SEE ATTACHMENT A.)

At 1:15 p.m. the joint hearing was recessed and the Senate Transportatic Committee was called to order for a general meeting.

ACTION WAS THEN TAKEN ON THE FOLLOWING BILLS:

SB 121 — REQUIRES VEHICLE SAFETY INSPECTIONS.

The Committee consensus was that we hold this bill until a later date.

SB 174 — EXEMPTS MOTOR-ASSISTED BICYLES FROM MOTOR VEHICLE REGISTRATION AND DRIVER'S LICENSE PROVISIONS AND PROVIDES FOR APPLICATION OF TRAFFIC LAWS AND CERTAIN EQUIPMENT PROVISIONS TO MOTOR-ASSISTED BICYCLES.

Senator Monroe restated the purpose of the bill and submitted necessary amendments which would exempt Mopeds from Motor Vehicle Registration but would not exempt them from Driver's License Provisions. He felt the bill was necessary as there had been much information provided the Committee and testimony received in prior meetings that this type vehicle was becoming extremely popular and we would have to deal with them in the very near future. (See Attachment B)

Senator Monroe then moved "DO PASS WITH AMENDMENTS"
Senator Blakemore seconded the motion.
Motion carried with all voting aye except Senator Neal who registered a no vote.

SB 191 — MAKES VARIOUS CHANGES IN REGULATIONS FOR OPERATION OF TAXICABS IN CERTAIN COUNTIES.

Chairman Herr presented the Committee with the proposed new amendments to this bill and asked if the Committee wanted to take any action this date.

Senator Monroe moved "DO PASS WITH AMENDMENTS"
Senator Blakemore seconded the motion.
Motion carried with all voting aye except Senator Neal who registered a no vote.

(SEE ATTACHMENT C.)

SB 384 — DESIGNATES STATE ROUTE 17 AS COMSTOCK HIGHWAY.

The purpose of this bill was to rename Route 17 which is the main highway to Virginia City, to Comstock Highway. (See Attachment D.)

Senator Monroe moved "DO PASS."
Senator Blakemore seconded the motion.
Motion passed unanimously.

AB 153 — CHANGES PROVISIONS CONCERNING WINDSHIELD WIPERS ON VEHICLES.

James Lambert gave testimony as to the purpose of this measure which was necessary to conform to National Safety Standards. (See Attachment E.)

Senator Schofield moved "DO PASS."
Senator Raggio seconded the motion.
Motion carried unanimously.

AB 121 — PRESCRIBES WARNING DEVICE FOR SLOW MOVING VEHICLES

John Borda of the Office of Highway Safety gave testimony as to the purpose of the bill. (See Attachment F.)

Senator Monroe moved "DO PASS."
Senator Schofield seconded the motion.
Motion carried unanimously.

AB 301 — PROVIDES FOR A MOBILE HOME TRIP PERMIT IN LIEU OF REGISTRATION AND LICENSING REQUIREMENTS.

John Ciardella of the Department of Motor Vehicles gave testimony as to the purpose of this bill. He also said that this bill came from the Tax Commission. He said that instead of registration plates being issued to these mobile homes, the Assessor would issue a permit, $1.00 which would be sent to the Registration Division of the Department of Motor Vehicles.

There were needed amendments. (See Attachment G.) So that the Committee could give this bill and the amendments full consideration:

Senator Monroe moved AMEND AND REREFER TO COMMITTEE.
Senator Schofield seconded the motion.
Motion carried unanimously.

There being no further business the meeting was adjourned until 1:00 p.m. on Monday, April 6, 1975 in Room 345.

Respectfully submitted,

APPROVED:

Helen Herr

Senator Helen Herr,
Chairman

Molly M. Torvik

Molly M. Torvik, Secretary

UNITED STATES GOVERNMENT

Memorandum

U.S. DEPARTMENT OF TRANSPORTAT
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRAT

Attachment A
147

SUBJECT: Motor Vehicle Inspection and Vehicle-In-Use Standards Implementation Procedures

DATE: FEB 20 1975

In reply refer to:
N42-32

FROM : Associate Administrator
Traffic Safety Programs

TO : Regional Administrators
Regions I through X

This memorandum cancels the memorandum of May 7, 1974, Subject: Vehicle-In-Use Standards Implementation Schedule.

The purpose of this memorandum is to provide information and guidance to the States on minimum requirements for implementing a motor vehicle inspection program. The guidelines are based on a favorable mix of cost of inspection and detection of critical vehicle safety defects.

After careful examination and review of all available data it has been determined that a minimum inspection offering maximum safety benefits should be directed at the vehicle's braking system and tires. The minimum criteria for braking systems and tires have been selected for the emphasis inspection (see Attachment A) because these two systems have been established by research as being involved in approximately two-thirds of all accidents caused by mechanical defects.

All States must include provisions for implementing the emphasis inspection criteria in their revised comprehensive program plan and FY 1976 annual work program. All States must have an approved motor vehicle inspection program by June 30, 1975. The States that select a pilot, experimental or demonstration program must include at least the emphasis inspection and should start operation no later than January 1, 1976.

This emphasis inspection will remain in effect until June 30, 1978. We will continue to collect data concerning parts of the VIU standards other than those being emphasized. Subsequently, we will emphasize the most cost effective implementation schedule based on research data and State experience.

We recognize other vehicle safety systems contribute to accidents. It is not the intent of this memorandum to discourage the States from the inspection of these other safety related systems -- in fact such inspections are encouraged.

I have now had the opportunity to review in some detail the most current data concerning the motor vehicle inspection program. It is clear to me that in the case of the special emphasis items we are on absolutely sound ground and our actions are based on supportable facts. The staff of the Office of State Vehicle Programs is available to assist you in working with the States to implement this program.

Fred W. Vetter, Jr.

Attachment

EMPHASIS INSPECTION

Service Brake System

Unless otherwise noted, the force to be applied during inspection procedures to power-assisted and full-power brake systems is 25 lb, and to all other systems, 50 lb. Inspector judgment for measuring the 25- and 50-pound force is acceptable.

(a) Failure indicator - The brake system failure indicator lamp, if part of a vehicle's original equipment, shall be operable. (This lamp is required by Federal Motor Vehicle Safety Standard No. 105, 49 CFR 571.105, on every new passenger car manufactured on or after January 1, 1968, and on other types of motor vehicles manufactured on or after September 1, 1975.)

Inspection procedure - Apply the parking brake and turn the ignition to start, or verify lamp operation by other means indicated by the vehicle manufacturer that the brake system failure indicator lamp is operable.

(b) Brake system integrity - The brake system shall demonstrate integrity as indicated by no perceptible decrease in pedal height under a 125-pound force applied to the brake pedal or by no illumination of the brake system failure indicator lamp. The brake system shall withstand the application of force to the pedal without failure of any line or other part.

Inspection procedure - With the engine running on vehicles equipped with power brake systems, and the ignition turned to "on" in other vehicles, apply a force of 125 pounds to the brake pedal and hold for 10 seconds. Note any decrease in pedal height, and whether the lamp illuminates. Inspector judgment for measuring the 125-pound force is acceptable.

(c) Brake hoses and assemblies - Brake hoses shall not be mounted so as to contact the vehicle body or chassis. Hoses shall not be cracked, chafed, or flattened. Protective devices, such as "rub rings," shall not be considered part of the hose or tubing.

Inspection procedure - Examine visually, inspecting front brake hoses through all wheel positions from full left to full right for conditions indicated.

Note - To inspect for (d), (e), and (f) below, remove a minimum one front wheel.

(d) Disc and drum condition - If the drum is embossed with a maximum safe diameter dimension or the rotor is embossed with a minimum safety thickness dimension, the drum or disc shall be within the appropriate specifications. These dimensions will be found on motor vehicles manufactured since January 1, 1971, and may be found on vehicles manufactured for several years prior to that time. If the drums and discs are not embossed, the drums and discs shall be within the manufacturer's specifications.

Inspection procedure - Examine visually for condition indicated, measuring as necessary.

(e) Friction materials - On each brake the thickness of the lining or pad shall not be less than one thirty-second of an inch over the rivet heads, or the brake shoe on the bonded linings or pads. Brake linings and pads shall not have cracks or breaks that extend to rivet holes except minor cracks that do not impair attachment. Drum brake linings shall be securely attached to brake shoes. Disc brake pads shall be securely attached to shoe plates.

Inspection procedure - Examine visually for conditions indicated, and measure height of rubbing surface of lining over rivet heads. Measure bonded lining thickness over shoe surface at the thinnest point on the lining or pad.

(f) Structural and mechanical parts - Backing plates and caliber assemblies shall not be deformed or cracked. System parts shall not be broken, misaligned, missing, binding, or show evidence of severe wear. Automatic adjusters and other parts shall be assembled and installed correctly.

Inspection procedure - Examine visually for conditions indicated.

Brake Power Unit

Vacuum hoses shall not be collapsed, abraded, broken, improperly mounted, or audibly leaking. With residual vacuum exhausted and a constant 25-pound force on the brake pedal, the pedal shall fall slightly when the engine is started, demonstrating integrity of the power assist system. This test is not applicable to vehicles equipped with full power brake system as the service brake performance test shall be considered adequate test of system performance.

Inspection procedure - With engine running, examine hoses visually and aurally for conditions indicated. Stop engine and apply service brakes several times to destroy vacuum in system. Depress brake pedal with 25 pounds of force and while maintaining that force, start the engine. If brake pedal does not fall slightly under force when the engine starts, there is a malfunction in the power assist system.

Tires

(a) Tread depth - The tread on each tire shall be not less than two thirty-seconds of an inch deep.

Inspection procedure - Passenger car tires have tread depth indicators that become exposed when tread depth is less than two thirty-seconds of an inch. Inspect for indicators in any two adjacent major grooves at three locations spaced approximately equally around the outside of the tire. For vehicles

other than passenger cars, it may be necessary to measure tread depth with a tread gauge.

(b) Type - Vehicle shall be equipped with tires on the same axle that are matched in tire size designation, construction, and profile.

Inspection procedures - Examine visually. A major mismatch in tire size designation, construction, and profile between tires on the same axle, or a major deviation from the size as recommended by the manufacturer (e.g., as indicated on the glove box placard on 1968 and later passenger cars) are causes for rejection.

(c) General condition - Tires shall be free from chunking, bumps, knots, or bulges evidencing cord, ply, or tread separation from the casing or other adjacent materials.

Inspection procedure - Examine visually for conditions indicated.

(d) Damage - Tire cords or belting materials shall not be exposed, either to the naked eye or when cuts or abrasions on the tire are probed.

Inspection procedures - Examine visually for conditions indicated, using a blunt instrument if necessary to probe cuts or abrasions.

Issued June 27, 1967

Highway Safety Program Standard 1

PERIODIC MOTOR VEHICLE INSPECTION

Purpose

To increase, through periodic vehicle inspection, the likelihood that every vehicle operated on the public highways is properly equipped and is being maintained in reasonably safe working order.

Standard

Each State shall have a program for periodic inspection of all registered vehicles or other experimental, pilot, or demonstration program approved by the Secretary, to reduce the number of vehicles with existing or potential conditions which cause or contribute to accidents or increase the severity of accidents which do occur, and shall require the owner to correct such conditions.

I. The program shall provide, as a minimum, that:

A. Every vehicle registered in the State is inspected either at the time of initial registration and at least annually thereafter, or at such other time as may be designated under an experimental, pilot, or demonstration program approved by the Secretary.

B. The inspection is performed by competent personnel specifically trained to perform their duties and certified by the State.

C. The inspection covers systems, subsystems, and components having substantial relation to safe vehicle performance.

D. The inspection procedures equal or exceed criteria issued or endorsed by the National Highway Traffic Safety Administration.

E. Each inspection station maintains records in a form specified by the State, which include at least the following information:

1. Class of vehicle.
2. Date of inspection.
3. Make of vehicle.
4. Model year.
5. Vehicle identification number.
6. Defects by category.
7. Identification of inspector.
8. Mileage or odometer reading.

F. The State publishes summaries of records of all inspection stations at least annually, including tabulations by make and model of vehicle.

II. The program shall be periodically evaluated by the State and the National Highway Traffic Safety Administration shall be provided with an evaluation summary.

Issued August 29, 1973
(Effective date: September 28, 1973)

PART 570 — VEHICLE IN USE INSPECTION STANDARD

Title 49—Transportation

CHAPTER V—NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

[Docket No. 73-9; Notice 2]

PART 570—VEHICLE IN USE INSPECTION STANDARDS

This notice adds Part 570, Vehicle In Use Inspection Standards, to Chapter V, Title 49, Code of Federal Regulations.

Part 570 does not in itself impose requirements on any person. It is intended to be implemented by the States through the highway safety program standards issued under the Highway Safety Act (23 U.S.C. 402) with respect to inspection of motor vehicles with a gross vehicle weight rating of 10,000 pounds or less, except motorcycles and trailers. General provisions regarding vehicle inspection are set forth in NHTSA Highway Safety Program Manual Vol. 1, Periodic Motor Vehicle Inspection. Standards and procedures are adopted for hydraulic service brake systems, steering and suspension systems, tire and wheel assemblies.

Interested persons have been afforded an opportunity to participate in the making of these amendments by a notice of proposed rulemaking published in the FEDERAL REGISTER on April 2, 1973 (38 FR 8451), and due consideration has been given to all comments received in response to the notice, insofar as they relate to matters within the scope of the notice. Except for editorial changes, and except as specifically discussed herein, these amendments and the reasons therefore are the same as those contained in the notice.

Policy considerations.—A total of 120 comments were received in response to the notice. These comments were submitted by State motor vehicle agencies, national safety organizations, motor vehicle associations, vehicle and equipment manufacturers, antique car clubs and owners, public interest groups, and individual citizens. The commenters were predominantly in favor of periodic motor vehicle inspection (PMVI) and the establishment of uniform motor vehicle in use safety standards throughout the United States.

As the NHTSA stated in the prior notice, cost-benefit factors were the primary policy consideration in developing the inspection standards and procedures. The primary concern of the States was the socioeconomic impact on the motoring public as well as the impact on the State itself. The general consensus was that the proposed inspection requirements would require a significant increase in facilities, operating personnel, and equipment. Though cost effectiveness was a predominant concern the States nevertheless felt that inspections should include vehicles over 10,000 pounds gross vehicle weight and be extended to include other vehicle systems. Several States expressed concern for the cost of implementing the proposed standards, estimating it at from $10 to $14 per car. Even though these States favored PMVI and now have PMVI or random inspection they felt that implementation costs would have a decided economic impact.

NHTSA has responded to these comments allowing an optional road test as a check of service brake system performance, adopting neither of the proposed parking brake procedures, and simplifying test procedures where possible so that tests may be conducted with a minimum added expenditure for equipment, personnel, and facilities. These matters will be discussed subsequently.

The establishment of the proposed standards as "minimum requirements" was questioned by several States as leading to a "watering down" of current requirements in those States which currently meet or exceed them. The NHTSA repeats its intent that the standards are not intended to supplant State standards that establish a higher performance or to discourage them from establishing or maintaining standards for other vehicle systems not covered by NHTSA.

A number of comments were received from antique car clubs and individual owners who believe that antique, special interest, and vintage cars should be exempt from the proposed standards. These comments should be directed to the States. Each State has its own definitions and registration requirements for vehicles of this nature, and the NHTSA intends the States to implement Part 570 to the extent that it is compatible with its current requirements for these special vehicles.

Several respondents commented that the proposed standard should be expanded to include lighting, glazing, exhaust, wipers, horns, controls, and instrumentation systems. The consensus was that the cost-benefit ratio would materially increase if these systems were included in the proposed standard since inspection of these systems does not require time-consuming procedures or special tools, and corrective measures are less costly to the owner. Some considered it contradictory that safety systems covered by the Federal standards must meet safety performance requirements at the time of manufacture and not during the service life of the vehicle. As the NHTSA stated in the prior notice, the initial Federal effort is intended to cover those vehicles and vehicle systems whose maintenance in good order has proven critical to the prevention of traffic accidents. Requirements for motorcycles and trailers, and for less critical systems are under study, and the NHTSA intends to take such rulemaking action in the future as may be appropriate to cover them.

Applicability.—A frequent comment was that the standards and procedures should be extended to cover vehicles whose GVWR exceeds 10,000 pounds. Because braking and steering and suspension systems on these vehicles differ materially from those on lighter vehicles, different criteria must be established and the proposed standards simply cannot be extended to cover them. The NHTSA, however, is developing appropriate inspection standards and procedures for heavy vehicles and will propose them in a notice to be issued by mid-October 1973.

Brake systems.—Several comments were received questioning the procedure for determining operability of the brake failure indicator lamp. In some vehicles the parking brake indicator and service brake system failure indicator use the same lamp and the methods of simulating failure vary.

It is realized that the procedure specified by the standard is general in nature and cannot cover all possible systems. In those vehicles where a lamp test cannot be executed in the normal manner the test will have to be conducted in accordance with the manufacturer's specifications, as determined by the vehicle inspector.

The brake system integrity test for fluid leakage has been modified on the basis of comments that it was not stringent enough. It was proposed that decrease in pedal height under 125 pounds force for 10 seconds should not exceed one-quarter of an inch. The requirement adopted is that there be no perceptible decrease in pedal height when 125 pounds of force is applied to the brake pedal and held for 30 seconds.

The brake pedal reserve test has been adopted substantially as proposed, and specifies that the engine be operating at the time of the test. Vehicles with full power (central hydraulic) brake systems are exempted from this test as the service brake performance test will be adequate to test such systems.

The service brake performance test offers the option of a road test, or testing upon a drive-on platform or roller-type brake analyzer (originally proposed under the title "Brake equalization"). States that conduct random inspections, and those that designate agents to perform vehicle inspections, objected strenuously to a test requiring the use of roller-type or drive-on test equipment. Consequently, an alternate test has been adopted which requires vehicles to stop from 20 mph in 25 feet or less without leaving a 12-foot wide lane. It is intended that this option be used only by States where it is current practice, and it is hoped that such States where practicable will change to the drive-on brake platform or roller-type brake analyzer tests. The terms "crimped" and "damaged" have been eliminated as causes for rejection of brake hoses, as redundant. If brake discs and drums are not embossed with safety tolerances, the requirement has been added that they be within the manufacturer's recommended specifications.

The primary concern regarding power assist units was that the brake pedal will

rise instead of falling on a full-power brake system when tested according to the procedure proposed. In view of the basic design of a full-power brake system this test would not be a proper check of system operation, and will not be required. As noted earlier, the service brake performance test will be used as the primary test of the full-power brake performance. To accord with the terminology of Standard No. 105a this section has been renamed "Brake power units."

The parking brake system inspection proposal proved controversial. The NHTSA proposed two objective, alternate tests, the first requiring the system to hold the vehicle on a 17 percent grade, and the second requiring the system to stop the vehicle from 20 mph within 54 feet. The first was objected to principally on the ground that each inspection station would have to construct a 17 percent grade. This would present problems for both in-line and bay-type inspection facilities. The stopping distance test, on the other hand, was opposed as a dynamic test more appropriate for service brake evaluation. In view of these objections, the parking brake inspection requirements were not adopted.

Steering and suspension systems.—The primary objections to the steering wheel test for free play concerned the test condition with the engine off on vehicles equipped with power steering, the linear measure of system free play (instead of angular measure to eliminate the variance due to steering wheel diameters), and the 2 inch free play limit for rack and pinion type steering gear.

The tolerance proposed and adopted for steering wheel free play is 2 inches for wheels of 16 inches diameter or less, since few passenger car steering wheels exceed this diameter. However, a table of free play values for older vehicles with steering wheels over 16 inches in diameter has been added to the standard. The requirement to have the engine running is being added to the procedure since steering wheel play can be greater with the engine off than with the engine on for cars equipped with power steering. Steering play on cars equipped with rack and pinion type steering will require further review to determine if the 2 inch tolerance should be changed.

Some comments argued that wheel alignment tolerances were considered too restrictive in the toe-in condition, and too lenient in toe-out. Some comments recommended visual inspection of tire wear as criteria to determine alignment. However, visual inspection of tire wear is not considered a valid method of checking alignment, and therefore was not adopted as an alternate method. No consensus of alternative values could be derived from the comments, and the proposed tolerances of 30 feet per mile have been adopted.

The requirements for the condition of shock absorber mountings, shackles, and U-bolts have been changed from "tight" to "securely attached" as a clarification.

Tire and wheel assembly standards and inspection procedures.—Several comments were received suggesting that rim deformation in excess of one-sixteenth of an inch be permitted, as the proposed tolerance would result in rejection of otherwise safe vehicles. The primary concern of the requirement is air retention, and since vehicles with wheel deformation of one-sixteenth of an inch apparently perform satisfactorily in service without hazard the deformation tolerance has been increased to three thirty-seconds of an inch runout for both lateral and radial bead seat areas.

Effectivity.—Several commenters questioned the proposed effective date, 30 days after publication of the final rule. The NHTSA considers it in the public interest that minimum Federal standards for motor vehicles in use become effective without further delay. Implementation by the States will take place within the context of their highway safety programs, and the plans approved by the NHTSA under the Highway Safety Act, 23 U.S.C. 402.

In consideration of the foregoing, Title 49, Code of Federal Regulations is amended by adding Part 570 to read as set forth below.

Effective date.—September 28, 1973. Since this part does not in itself impose requirements on any person it is determined for good cause shown that an effective date earlier than 180 days after publication of the final rule is in the public interest.

(Secs. 103, 108, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1397, 1407, delegation of authority at 49 CFR 1.51.)

Issued on August 29, 1973.

JAMES B. GREGORY,
Administrator.

AUTHORITY: Secs. 103, 108, 119, Public Law 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1397, 1407; delegation of authority at 49 CFR 1.51.

§ 570.1 Scope.

This part specifies standards and procedures for inspection of hydraulic service brake systems, steering and suspension systems, and tire and wheel assemblies of motor vehicles in use.

§ 570.2 Purpose.

The purpose of this part is to establish criteria for the inspection of motor vehicles by State inspection systems, in order to reduce death and injuries attributable to failure or inadequate performance of motor vehicle systems.

§ 570.3 Applicability.

This part does not in itself impose requirements on any person. It is intended to be implemented by States through the highway safety program standards issued under the Highway Safety Act (23 U.S.C. 402) with respect to inspection of motor vehicles with gross vehicle weight rating of 10,000 pounds or less, except motorcycles or trailers.

§ 570.4 Definitions.

Unless otherwise indicated, all terms used in this part that are defined in 49 CFR Part 571, Motor Vehicle Safety Standards, are used as defined in that part.

§ 570.5 Service brake system.

(a) *Failure indicator.*—The brake system failure indicator lamp, if part of a vehicle's original equipment, shall be operable. (This lamp is required by Federal Motor Vehicle Safety Standard No. 105, 49 CFR 571.105, on every new passenger car manufactured on or after January 1, 1968, and on other types of motor vehicles manufactured on or after September 1, 1975.)

(1) *Inspection procedure.*—Apply the parking brake and turn the ignition to start. verify lamp operation by other means indicated by the vehicle manufacturer that the brake system failure indicator lamp is operable.

(b) *Brake system integrity.*—The brake system shall demonstrate integrity as indicated by no perceptible decrease in pedal height under a 125 pound force applied to the brake pedal or by no illumination of the brake system failure indicator lamp. The brake system shall withstand the application of force to the pedal without failure of any line or other part.

(1) *Inspection procedure.*—With the engine running on vehicles equipped with power brake systems, and the ignition turned to "on" in other vehicles, apply a force of 125 pounds to the brake pedal and hold for 30 seconds. Note any decrease in pedal height, and whether the lamp illuminates.

(c) *Brake pedal reserve.*—When the brake pedal is fully depressed, the distance that the pedal has traveled from its free position shall be not greater than 80 percent of the total distance from its free position to the floorboard or other object that restricts pedal travel.

Inspection procedure.—Measure the distance (A) from the free pedal position to the floorboard or other object that restricts brake pedal travel. Depress the brake pedal, and with the force applied measure the distance (B) from the depressed pedal position to the floorboard or other object that restricts pedal travel. Determine the percentage as

$$\frac{A-B}{A} \times 100.$$

The engine must be operating when power-assisted brakes are checked. The pedal reserve check is not required for vehicles equipped with full-power (central hydraulic) brake systems, or to vehicles with brake systems designed to operate with greater than 80 percent pedal travel.

(d) *Service brake performance.*—Compliance with one of the following performance criteria will satisfy the requirements of this section. Verify that tire inflation pressure is within the limits recommended by vehicle manufacturer before conducting either of the following tests.

(1) *Roller-type or drive-on platform tests.*—The force applied by the brake on a front wheel or a rear wheel shall not differ by more than 20 percent from the force applied by the brake on the other front wheel or the other rear wheel respectively.

(i) *Inspection procedure.*—The vehicle shall be tested on a drive-on platform, or a roller-type brake analyzer with the capability of measuring equalization. The test shall be conducted in accordance with the test equipment manufacturer's

specifications. Note the left to right brake force variance.

(2) *Road test.*—The service brake system shall stop the vehicle in a distance of 25 feet or less from a speed of 20 miles per hour without leaving a 12-foot-wide lane.

(i) *Inspection procedure.*—The road test shall be conducted on a level (not to exceed plus or minus one percent grade) dry, smooth, hard-surfaced road that is free from loose material, oil, or grease. The service brakes shall be applied at a vehicle speed of 20 miles per hour and the vehicle shall be brought to a stop as specified. Measure the distance required to stop.

(e) *Brake hoses and assemblies.*—Brake hoses shall not be mounted so as to contact the vehicle body or chassis. Hoses shall not be cracked, chafed, or flattened.

(i) *Inspection procedure.*—Examine visually, inspecting front brake hoses through all wheel positions from full left to full right for conditions indicated.

NOTE.—To inspect for (f), (g), and (h) below, remove at a minimum one front wheel and one rear wheel.

(f) *Disc and drum condition.*—If the drum is embossed with a maximum safe diameter dimension or the rotor is embossed with a minimum safety thickness dimension, the drum or disc shall be within the appropriate specifications. These dimensions will be found on motor vehicles manufactured since January 1, 1971, and may be found on vehicles manufactured for several years prior to that time. If the drums and discs are not embossed, the drums and discs shall be within the manufacturer's specifications.

(i) *Inspection procedure.*—Examine visually for condition indicated, measuring as necessary.

(g) *Friction materials.*—On each brake the thickness of the lining or pad shall not be less than one thirty-second of an inch over the rivet heads, or the brake shoe on bonded linings or pads. Brake linings and pads shall not have cracks or breaks that extend to rivet holes except minor cracks that do not impair attachment. Drum brake linings shall be securely attached to brake shoes. Disc brake pads shall be securely attached to shoe plates.

(i) *Inspection procedure.*—Examine visually for conditions indicated, and measure height of rubbing surface of lining over rivet heads. Measure bonded lining thickness over shoe surface at the thinnest point on the lining or pad.

(h) *Structural and mechanical parts.*—Backing plates and caliper assemblies shall not be deformed or cracked. System parts shall not be broken, misaligned, missing, binding, or show evidence of severe wear. Automatic adjusters and other parts shall be assembled and installed correctly.

(i) *Inspection procedure.*—Examine visually for conditions indicated.

§ 570.6 Brake power unit.

Vacuum hoses shall not be collapsed, abraded, broken, improperly mounted, or audibly leaking. With residual vacuum exhausted and a constant 25 pound force on the brake pedal, the pedal shall fall slightly when the engine is started, demonstrating integrity of the power assist system. This test is not applicable to vehicles equipped with full power brake system as the service brake performance test shall be considered adequate test of system performance

(i) *Inspection procedure.*—With engine running, examine hoses visually and aurally for conditions indicated. Stop engine and apply service brakes several times to destroy vacuum in system. Depress brake pedal with 25 pounds of force and while maintaining that force, start the engine. If brake pedal does not fall slightly under force when the engine starts, there is a malfunction in the power assist system.

§ 570.7 Steering systems.

(a) *System play.*—Lash or free play in the steering system shall not exceed values shown in Table 1.

(i) *Inspection procedure.*—With the engine on and the wheels in the straight ahead position, turn the steering wheel in one direction until there is a perceptible movement of a front wheel. If a point on the steering wheel rim moves more than the value shown in Table 1 before perceptible return movement of the wheel under observation, there is excessive lash or free play in the steering system.

TABLE 1.—STEERING SYSTEM FREE PLAY VALUES

Steering wheel diameter (inches):	Lash (inches)
16 or less	2
18	2¼
20	2½
22	2¾

(b) *Linkage play.*—Free play in the steering linkage shall not exceed one-quarter of an inch.

(i) *Inspection procedure.*—Elevate the front end of the vehicle to load the ball joints. Insure that wheel bearings are correctly adjusted. Grasp the front and rear of a tire and attempt to turn the tire and wheel assembly left and right. If the free movement at the front or rear tread of the tire exceeds one-quarter inch there is excessive steering linkage play.

(c) *Free turning.*—Steering wheels shall turn freely through the limit of travel in both directions.

(i) *Inspection procedure.*—Turn the steering wheel through the limit of travel in both directions. Feel for binding or jamming in the steering gear mechanism.

(d) *Alignment.*—Toe-in and toe-out shall not exceed 30 feet per mile, as recorded on a scuff gauge, or equivalent measuring device.

(i) *Inspection procedure.*—Use instructions of measuring device manufacturer.

(e) *Power steering system.*—The power steering system shall not have cracked or slipping belts, or insufficient fluid in the reservoir.

(i) *Inspection procedure.*—Examine fluid reservoir and pump belts for conditions indicated.

§ 570.8 Suspension system.

(a) *Suspension condition.*—Ball joint seals shall not be cut or cracked. Structural parts shall not be bent or damaged. Stabilizer bars shall be connected. Springs shall not be broken, or extended by spacers. Shock absorber mountings, shackles, and U-bolts shall be securely attached. Rubber bushings shall not be cracked, extruded out from or missing from suspension joints. Radius rods shall not be missing or damaged.

(i) *Inspection procedure.*—Examine front and rear end suspension parts for conditions indicated.

(b) *Shock absorber condition.*—There shall be no oil on the shock absorber housing attributable to leakage by the seal, and the vehicle shall not continue free rocking motion for more than two cycles.

(i) *Inspection procedure.*—Examine shock absorbers for oil leaking from within, then with vehicle on a level surface, push down on one end of vehicle and release. Note number of cycles of free rocking motion. Repeat procedure at other end of vehicle.

§ 570.9 Tires.

(a) *Tread depth.*—The tread on each tire shall be not less than two thirty-seconds of an inch deep.

(i) *Inspection procedure.*—Passenger car tires have tread depth indicators that become exposed when tread depth is less than two thirty-seconds of an inch. Inspect for indicators in any two adjacent major grooves at three locations spaced approximately equally around the outside of the tire. For vehicles other than passenger cars, it may be necessary to measure tread depth with a tread gauge.

(b) *Type.*—Vehicles should be equipped with tires on the same axle that are matched in nominal size, construction, and profile.

(i) *Inspection procedure.*—Examine visually. A major mismatch in nominal size, construction, and profile between tires on the same axle, or a major deviation from the size as recommended by the manufacturer (e.g. as indicated on the glove box placard on 1968 and later passenger cars) are causes for rejection.

(c) *General condition.*—Tires shall be free from chunking, bumps, knots, or bulges evidencing cord, ply, or tread separation from the casing or other adjacent materials.

(i) *Inspection procedure.*—Examine visually for conditions indicated.

(d) *Damage.*—Tire cords or belting materials shall not be exposed, either to the naked eye or when cuts or abrasions on the tire are probed.

(i) *Inspection procedure.*—Examine visually for conditions indicated, using an awl if necessary to probe cuts or abrasions.

§ 570.10 Wheel assemblies.

(a) *Wheel integrity.*—A tire rim, wheel disc, or spider shall have no visible cracks, elongated bolt holes, or indication of repair by welding.

(i) *Inspection procedure.*—Examine visually for conditions indicated.

(b) *Deformation.*—The lateral and radial runout of each rim bead area shall not exceed three thirty-seconds of an inch total indicated runout.

(i) *Inspection procedure.*—Using a runout indicator gauge, and a suitable stand, measure lateral and radial runout of rim bead through one full wheel revolution and note runout in excess of three thirty-seconds of an inch.

(c) *Mounting.*—All wheel nuts and bolts shall be in place and tight.

(i) *Inspection procedure.*—Check wheel retention for conditions indicated.

15 WVS13

DATE 01/28/75

STATE CONFORMANCE WITH VEHICLE IN USE INSPECTION STANDARDS

PARA	REGION 1						REGION 2			REGION 3						REGION 4							REGION 5						REGION 6			REGION 7			REGION 8						REGION 9			REGION 10		
STATE CODE	C T	M E	M A	N H	R I	V T	N J	N Y	P R	D E	D C	M D	P A	V A	W V	A L	F L	G A	K Y	M S	N C	S N	T L	I N	I N	V I	M N	O H	W I	A F	L A	N C	O T	I K	V E	N S	C O	M T	S U	U D	W T	A Z	C A	H I	N V	A K	I D	D R	W A
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D1	N	N	N	N	N	N	Y	N	N	Y	Y	N	Y	N	Y	N	Y	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
D2	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
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D	N	Y	N	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	N	N	N	Y	Y	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	N	N	N	Y	N	Y	N	N
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REFERENCE KEY

570.05 SERVICE BRAKE SYSTEM
- A. FAILURE INDICATOR
- B. BRAKE SYSTEM INTEGRITY
- C. BRAKE PEDAL RESERVE
- D. SERVICE BRAKE PERFORMANCE
  - 1. ROLLER-TYPE/PLATFORM TESTS
  - 2. ROAD TEST
- E. BRAKE HOSES AND ASSEMBLIES
- F. DISC AND DRUM CONDITION
- G. FRICTION MATERIALS
- H. STRUCTURAL AND MECHANICAL PARTS

570.06 BRAKE POWER UNIT

570.07 STEERING SYSTEMS
- A. SYSTEM PLAY
- B. LINKAGE PLAY
- C. FREE TURNING
- D. ALIGNMENT
- E. POWER STEERING SYSTEM

570.08 SUSPENSION SYSTEMS
- A. SUSPENSION CONDITION
- B. SHOCK ABSORBER CONDITION

570.09 TIRES
- A. TREAD DEPTH
- B. TYPE
- C. GENERAL CONDITION
- D. DAMAGE

570.10 WHEEL ASSEMBLIES
- A. WHEEL INTEGRITY
- B. DEFORMATION
- C. MOUNTING

It is surprising to discover the number of motorists who believe that their cars, much like their bodies, are destined never to wear out regardless of abuse or lack of care. At the risk of being repetitive, I should like to say that "until we discover how to achieve perpetual motion, the best engineered machine we can build is goint to wear out."

Lets compare the automotive brake system to our body. Comparing the automobile brake system to the human body would replace the brake system with the heart. The driver replaces the brain.

Fig. I It becomes obvious that a defect in the brake system could be fatal. A hydraulic leak, a frayed hose, cracked or worn off lining, could be equivalent to a coronary. The severity of the coronary is proportional to the extent of the defect. The criticality of the braking system is of the highest magnitude.

Fig. II & III Thus, thin or inadequate brake linings are equated to high blood pressure causing excessive strain to the heart. When emergency situations such as a panic stop, or sustained heavy braking is required, the overworked brake systems cannot perform adequately. The result could be a collision, which is equivalent to a coronary. If the collision or coronary is too severe, death will result.

With present automobile brake designs and current inspection technology, it becomes obvious that to inspect the brake linings for thickness and cracks, to inspect brake slave cylinders, to inspect calipher assemblies, wheels must be pulled.

Fig. IV The well-known Indiana study of accident causes concluded that brake system factors were a certain cause in 4 percent of the accidents investigated, and were a definite or probable factor in six percent of the cases studied.

Fig. V Other studies such as Contract No. HS-354-3-716 showed a 34 percent vehicle rejection rate because of brakes. Well over half (approximately 65 percent) were defects which were exposed when the wheels were removed. This study was conducted in our D.C. inspection lanes and included the inspection of 936 passenger vehicles.

Fig. VI An additional 119 passenger vehicles were inspected at the D.C. inspection lanes. Fifty-seven cars were rejected from mechanical defects exposed when wheel removals were executed.

Fig. VII Ultrasystems, Inc., under Contract No. FH-11-7525 recorded from 2,476 inspected vehicles the following:

Fig. VIII TRW under Contract No. FH-11-6964 recorded from 20,909 vehicles the following brake defects.

Figures V, VI, VII and VIII show brake defects which are detected from wheel pulling. For practical reasons, the current design of brake systems, coupled with the available diagnostic techniques leaves no other method of inspecting these components other than visual.

In a study completed by TRW entitled "Component Degradation, Braking Systems Performance" (Contrace No. DOT-FH-11-6964) December 30, 1969, it was recorded that those vehicles that have worn through the brake lining and have metal to metal surfaces, the stopping distance from 60 to 0 mph increased an average of 20%.

The Bendix Corporation ran dynamometer tests in which shoes for both the front disc and rear drum brakes were tested with no friction material on them. The test was adjusted so that only the 35 reburnish stops and the effectiveness stops were to be run. The brakes seized-up due to friction welding during the fifth burnish stop. During this stop, the front torque went from approximately 10,000 in-lb to greater than 22,500 in-lb where the stud bolts sheared off causing a lost of front torque. Also, the rear torque increased from 7,500 in-lb to over 20,000 in-lb where the shoes bent and the stud holes in the drum back were severly deformed. The instantaneous torque may have been very much higher since the response of the instrumentation recording system is limited to approximately 10 Hz. The result of such torque imbalance is an uncontrolled

Movie 11 min

vehicle.

The foremost objection to removing the wheels for brake inspection has been the cost. Figures have been quoted as high as $15.00 for pulling wheels.

Fig. IX

Figure IX shows an estimated cost under $1 for pulling two wheels. The assumption is based on a time factor of 10 minutes for the two wheels and inspector salaries of 8 to 10 thousand dollars per year. Not considering overhead, vacation and insurance, the 8 to 10 thousand per salary equates into $3.85 and $4.81/hr. respectively.

Fig. X

Figure X is a breakdown of the wheel pulling functions. The elapsed time (shown as Δt) is derived from our own experience in the D.C. lane, an Alaska study, and from an AVCO contract DOT-HS-5-0137 shown in Figures XI, XII and XIII.

Fig. XI XII XIII

According to the 1974 edition of "Accident Facts" there were 41,020 non-pedestrian, non-motorcycle rider fatalities, 21,362,400 property damage involvements. Using the data from the NHTSA 1972 edition of "Societal Costs of Motor Vehicle Accidents" we observe the following information:

Fig. XIV

Loss per fatality	-	$200,000
Loss per injury	-	7,200
Property damage only	-	300 per involvement

It should be reasonable to complete the emphasis standards with other safety checks in 15 to 20 minutes. This includes two wheel pulls and requires no interpretations during the inspection. The additional five to ten minutes are for inspecting the tires, brake light, other brake components, and additional safety systems other than the required brakes and tires.

Using a $6/per hr. labor rate, 20 minutes will cost the inspection facility $2. Because our new cost effective inspection procedures have eliminated the cost of capital equipment, the high cost of amortization is no longer a factor.

Raising the garage door, driving the car into the bay, scraping off the sticker, writing the report, vacations, insurance, overhead, and let's not forget our honest profit, can double the $2 cost.

We can now understand why and how States such as Pennsylvania and New Hampshire charge $4 to $4.50 for removing two wheels. In Virginia, which charges $3 for one wheel removal, try and remove an inspection station's certificate!

By the way, the average charge in the State of Virginia charged during 1973 to repair cars to comply with inspection at the inspection station was $1.35. This is not to say that the vehicle did not have a brake repair done elsewhere, in fact, more than likely did. I emphasize this point to

illustrate that under State supervision "Rip-offs" can be minimized.

Justifications for motor vehicle inspections have been known for many years, and various opinion polls (e.g., in Belgium, France and Germany) have shown that the public supports this need. Most experts also accept this, but based on heuristic judgments rather than hard, quantitative data. Indeed, few concrete conclusions can be drawn from the available accident data. Thus, estimates as to the number of accidents in which vehicle defects can be listed as a causative factor, range from 6 to 18 percent. Almost no data are available on the number of accidents that were averted because some defect identified in an inspection was corrected.

The difficulty is readily seen in numerically described the positive results of motor vehicle inspections or, for that matter, any other accident avoidance or primary safety action. While one can readily count the accidents that occur, it is virtually impossible to count the accidents that were averted. The motorist might know that because recently repaired brakes he was saved from having an accident, but this fact never appears in any official statistical summary.

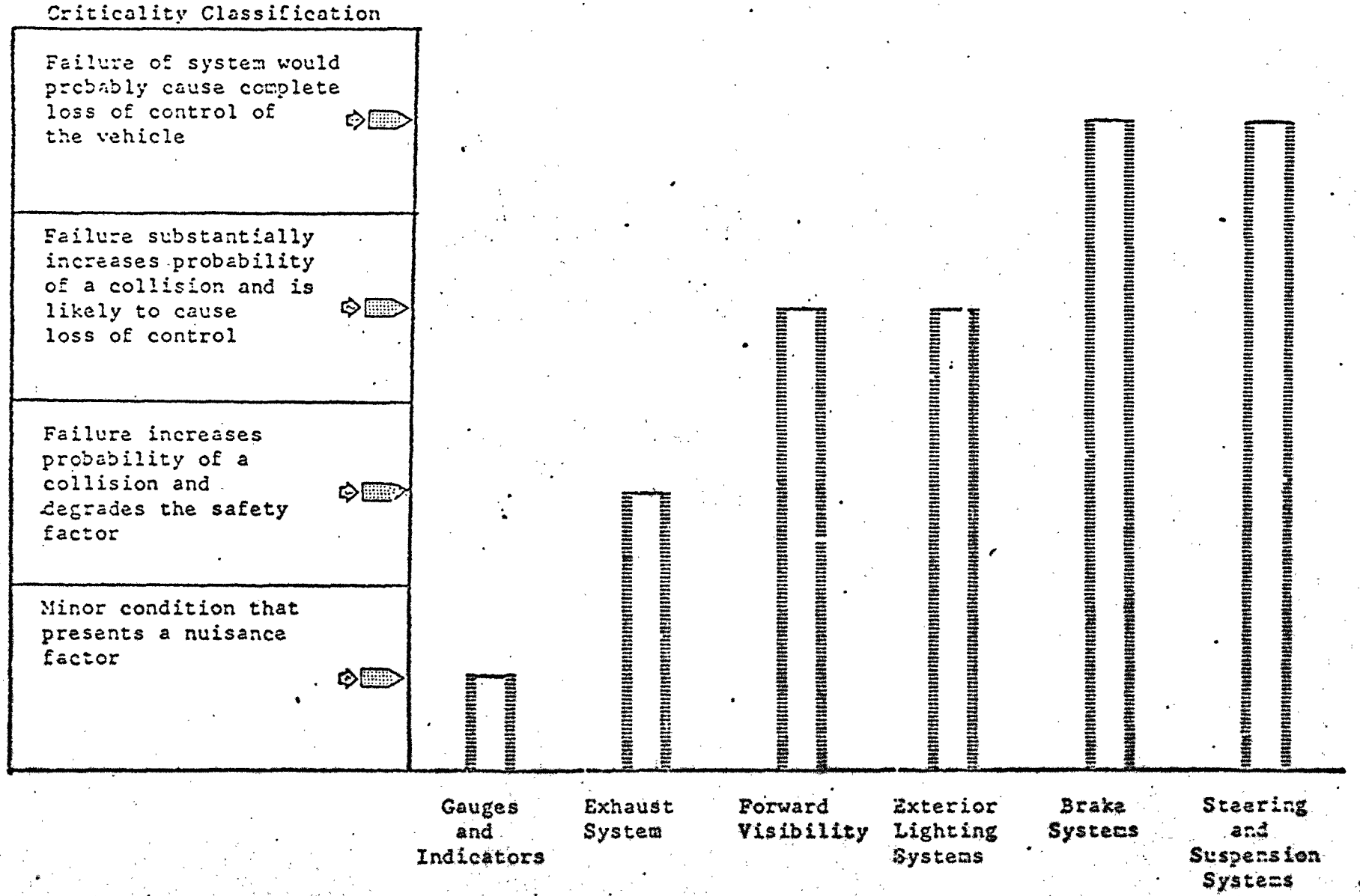
Notwithstanding seemingly indisputable logic in its support, motor vehicle inspection is subject to much questioning and controversy regarding both its technology and its benefits. Both are closely interrelated; better inspection

techniques should result in lives saved by better identifying needed repairs before they cause accidents. Better inspection techniques should reduce the likelihood that owners will be required to spend money on unnecessary repairs. Modern technology can guard against "under inspection" which requires owners to complete unnecessary repairs.

There is a continuing need in upgrading various aspects of motor vehicle inspections. This upgrading is primarily in the inspection procedures and techniques involved in the safety inspection of the brake systems.

Because of the high criticality and at the same time to the highest known vehicle cause of motor vehicle accidents it becomes obvious that improvements and upgrading of motor vehicle inspections can be implemented most efficiently in the brake and tire systems. The results of such a program will be to improve vehicle inspection programs that otherwise permit unsafe vehicles to be operated on public thoroughfares. It will guard against subjective and overly strict inspections which cause owners to pay for unnecessary repairs.

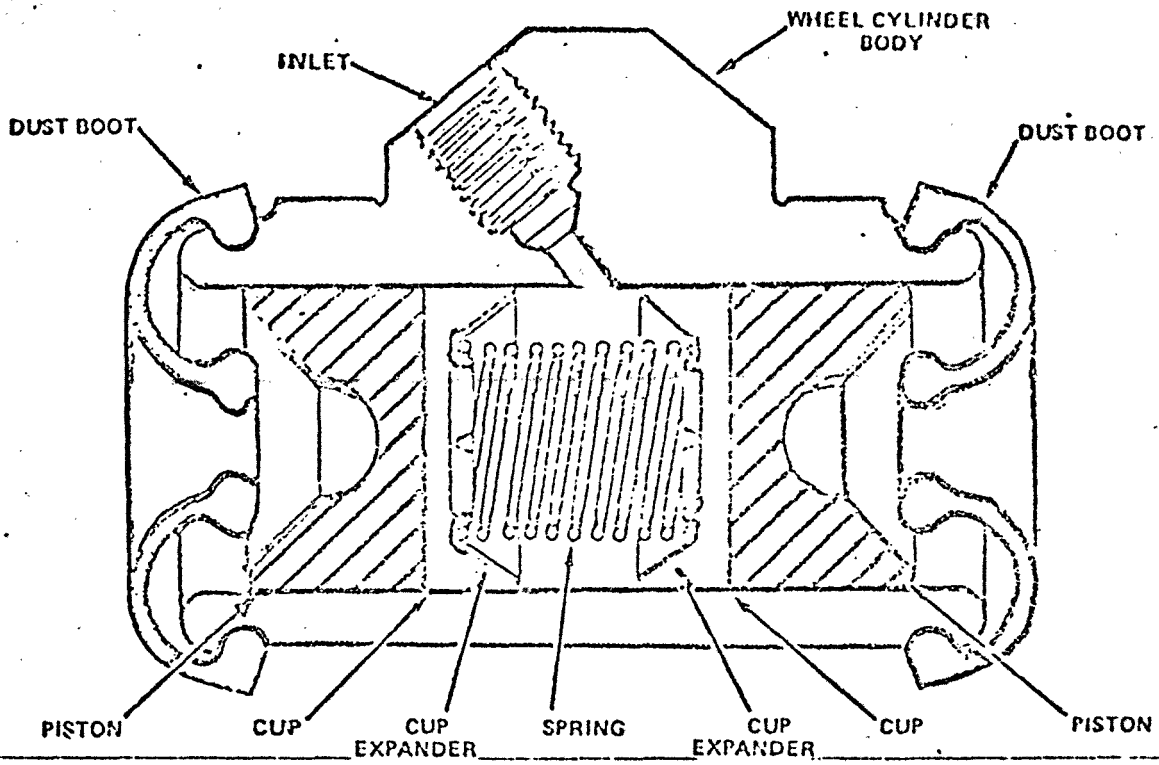
M. V. SAFETY SYSTEMS CRITICALITY CLASSIFICATION



* Contract FH-11-6522 (Operations Research, Inc.) National Highway Safety Bureau

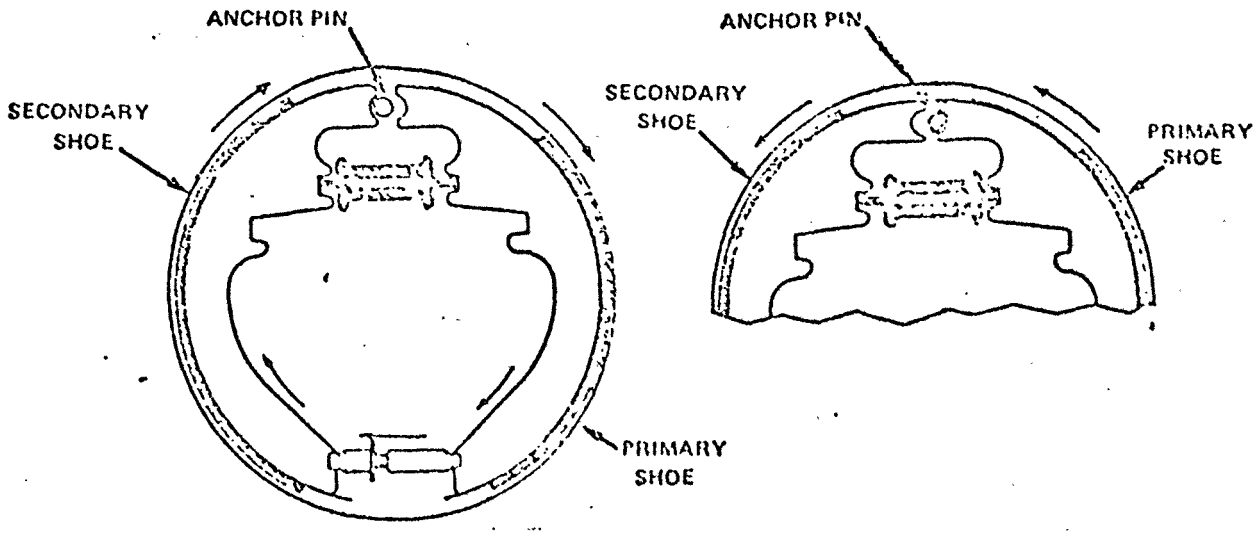
FIGURE 1

DRUM BRAKE



P-24607-15

CROSS SECTION TYPICAL WHEEL CYLINDER



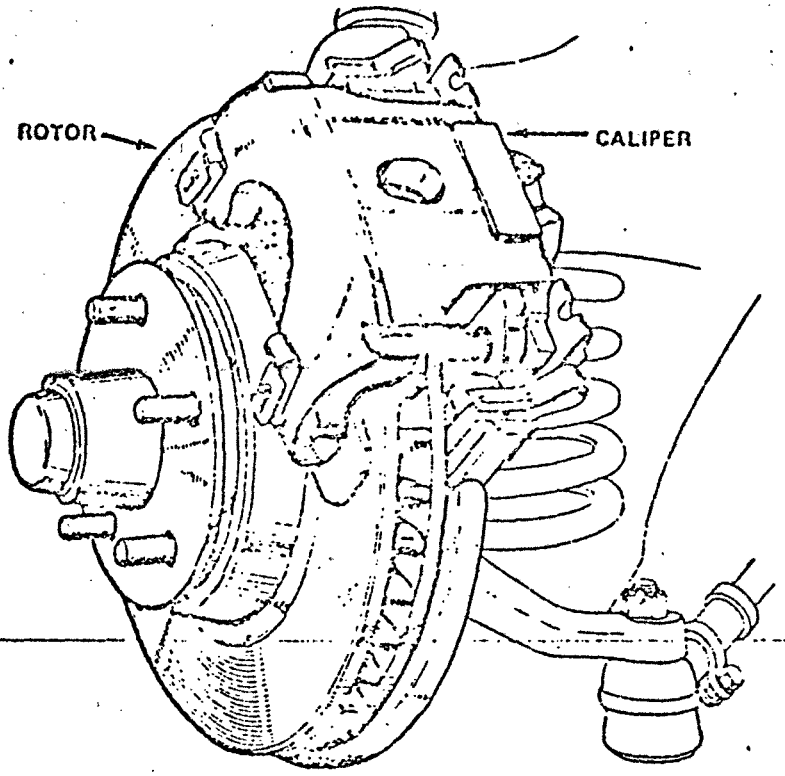
FORWARD BRAKING

REVERSE BRAKING

P-24607-20

BRAKING ACTION

DISK BRAKE



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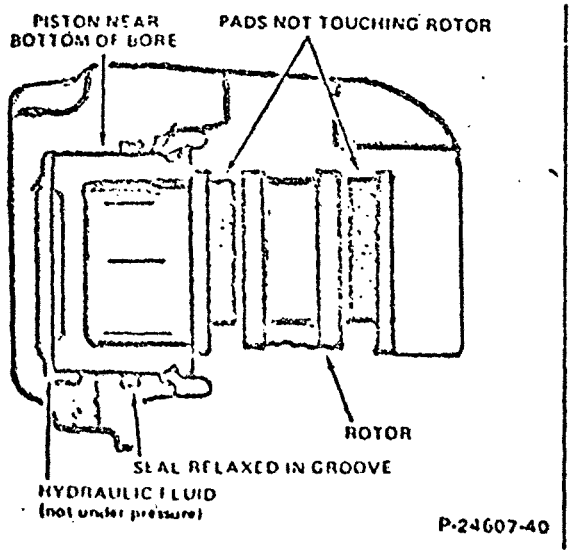
DISK AND ROTOR ASSEMBLY



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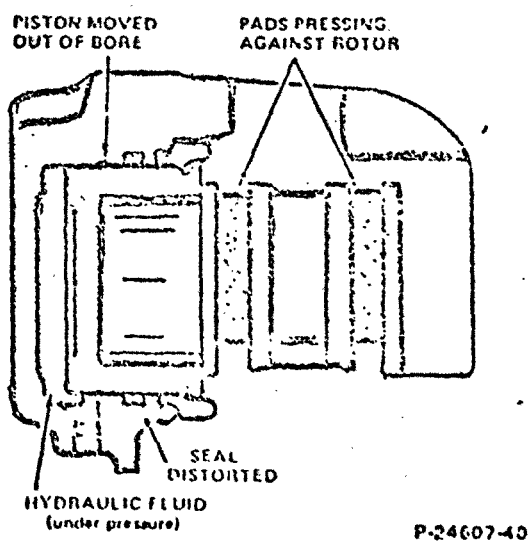
CROSS SECTION CALIPER - RELEASED



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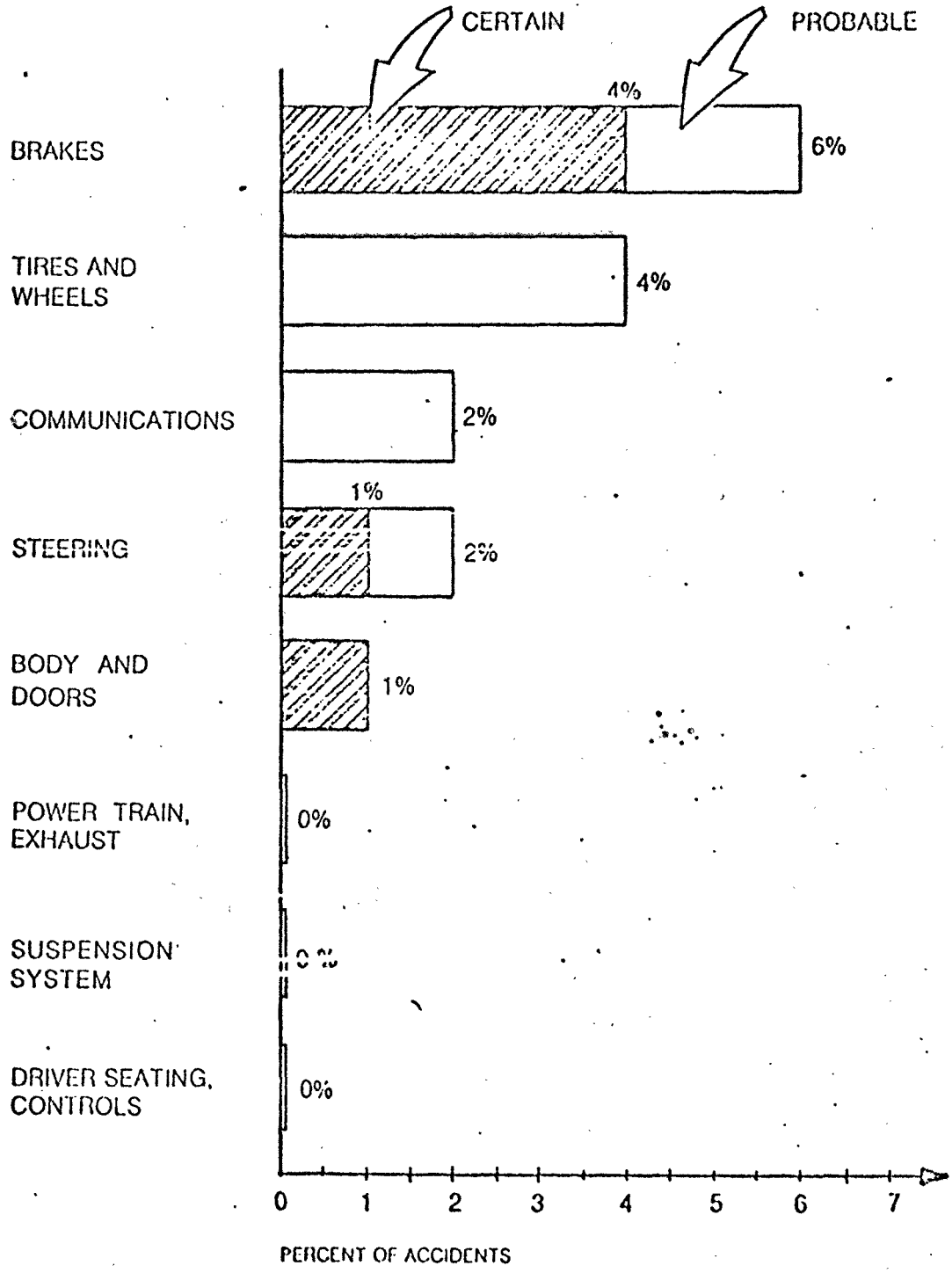
CROSS SECTION CALIPER - APPLIED

Fig. 17

Figure

Brake Systems, Tires and Wheels Were the Most Frequent Vehicular Accident Causes



Based on Phase II, Level C Causal Data

(a) D.C. report of 9/16/74 - Roy Dennison

Re: DOT HS-354-3-716 - of 936 vehicles inspected from March 28, 1974 through August 1974, 317 or 34% were rejected for brakes. From pulling wheels the following data was recorded:

	Advise	Reject
Brake lining thickness	93	108
Wheel cylinders	56	64
Brake drums and rotors	107	21
Brake lining pattern & condition	77	45

Of the 34% brake defective rejected vehicles, approximately 65% of those defects were detected from wheel removal.

Fig. V

(b) D.C. report of 10/19/74 - Paul Honke

"Brake Inspection Methods Study Phase III" - of 119 passenger vehicles inspected between May 29, 1973 and November 27, 1973, 57 or 48% were rejected from wheel pulling inspections. The following data was recorded:

Number of Vehicles	Percentages	Outage
21	18%	Wheel cylinder leakage
19	16%	Thin lining (0-1/32)
19	16%	Scored drum or rotor
16	13%	Grease seal Leakage
9	8%	Poor shoe contact
9	8%	Oversize drum or thin rotor
8	7%	Contaminated lining
3	2%	Stuck wheel cylinder

Fig. VI

(c) In a study entitled "Vehicle-In-Use Safety Standards Study" performed by Ultrasystems, Inc., under Contract No. FH-11-7525, and reported in their final report dated August 1971, vehicle condition data was recorded from 2,476 vehicles in four states. The following list of brake component outages (requiring wheel removal for inspection) versus percent was obtained:

Component	% Outage
Front lining condition	11
Front lining thickness	10
Front drum or disc	11
Rear lining condition	9
Rear lining thickness	6
Rear drum condition	7
Front wheel cylinder	9
Rear wheel cylinder	6

Fig. VII

(d) The following visual inspection defect data were gathered from (1964-1968 models) automobiles inspected at diagnostic centers located in various parts of the country and reported by TRW in their report "Component Degradation: Braking Systems Performance", dated December 30, 1969, under Contract No. FH-11-6964. Up to 20,909 vehicles were involved under each defect type.

Defect Type	% Vehicles Defective
Lining/pad thickness	14.6
Wheel cylinders	7.1
Drum/disc condition	5.3
Lining/pad condition	4.4
Return Springs	3.3

Defect rates shown are not additive as more than one defect could be present at the same time.

Fig. VIII

INSPECTION COSTS FOR WHEEL PULL

INSPECTION TIME: UNDER 10 MINUTES FOR PULLING TWO WHEELS.

(DATA FROM ALASKA AND D.C. STUDIES)

INSPECTION COST: UNDER $1.00

(INSPECTOR SALARIES $8-10K; MARYLAND STUDY)

ACTUAL AVERAGE STATE INSPECTION FEES INCLUDING:

- TWO WHEELS PULLED - $4.50 (2 STATES)
- ONE WHEEL PULLED - $2.50 (8 STATES)

Fig. IX

WHEEL REMOVAL

Estimated Time Study and Cost

Item	Time - Min.*	$ Cost/Wheel @ $6/Hr.
Lift up	.75	.075
Wheel removal	1.5	.15
Inspection	1.25	.125
Wheel mount	1.25	.125
Lift down	.25	.025
Total	5.00	.50

*Experienced Inspector

Fig. X

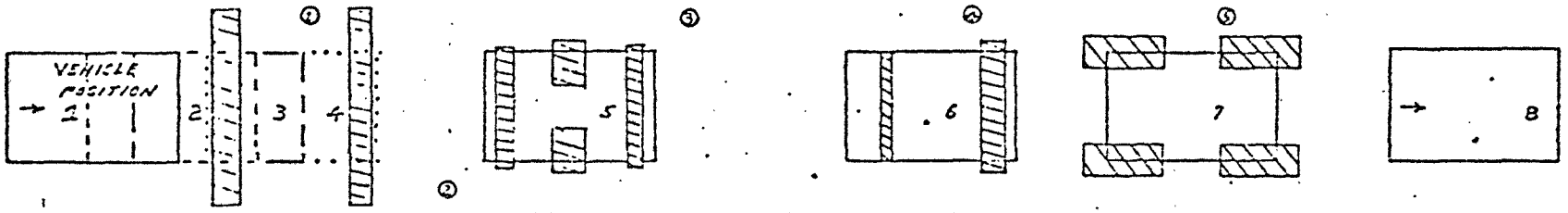
VUGRAPH

TIME AND MOTION RESEARCH LANE

DESCRIPTION	MANPOWER	Ave Δ t (min)	Std. Dev. (min)	Min Δ t (min)	Max Δ t (min)
Vehicle ID	1	1.8	0.5	1.2	2.8
Fenders	1	0.1*			
Vehicle Structure	1	0.3*			
Vehicle Accessories (interior)	1	0.4*			
Glazing	1	0.2*			
Tire Pressure	2	1.0	0.4	0.5	2.5
Internal & Doors (ignition & shift, window reg., doors & hinges, door latch & lock)	1	0.4*			
Underhood and harness on	2	3.0	0.9	1.0	5.0
Hunter Station (alignment, etc.) (includes pendant time)	1	2.8	0.6	1.9	4.6
Headlamps	2	0.2	-0-	0.2	0.2
Front and Rear Lamps	2	0.3	-0-	0.3	0.3
Roller Brakes (fr)	1	1.3	0.5	0.8	2.6
Car Move and Park Brakes	1	0.3*			
Roller Brakes (rr)	1	1.2	0.3	0.7	1.7
Scuff (during move-to-lift)	1	0.2*			
Lift up	1	1.0	0.3	0.4	1.3
Underbody	1	1.0	0.5	0.4	2.2
Wheel Pull	2	1.0	0.4	0.5	1.8
Wheel/Brake Assembly	2	0.8	0.5	0.2	1.8
Wheel Mount	2	1.2	0.4	0.4	2.3
Lift Down	1	1.1	0.3	0.7	1.9
Enter Data in Pendant (lift station)	1	0.5*			
Platform Brakes	1	0.9	0.3	0.5	1.9
Emissions and Speedometer	2	2.2	0.5	0.9	3.2
Engine Analysis	2	2.8	1.1	1.3	6.1
Counsel (includes 1.5 minutes for printout)	1	3.4	1.6	1.8	8.0

Fig. 32

ENTRANCE & STATION 1	STATION 2	STATION 3	STATION 4 & COUNSEL
EQUIPMENT: CRT & KEYBOARD; EMISSIONS ANALYZER; AIR GAUGE; BRAKE ANALYZER; ENGINE ANALYZER; DYNAMOMETER; HEADLAMP TESTER; PCV VALVE TESTER; HARNESS	SCUFF GAUGE; LIFT	FRONT END ANALYZER; SCUFF GAUGE (NOT USED)	PRINTER & KEYBOARD
READIT (1)	READIT (2) READIT (3)	READIT (4)	READIT (5)

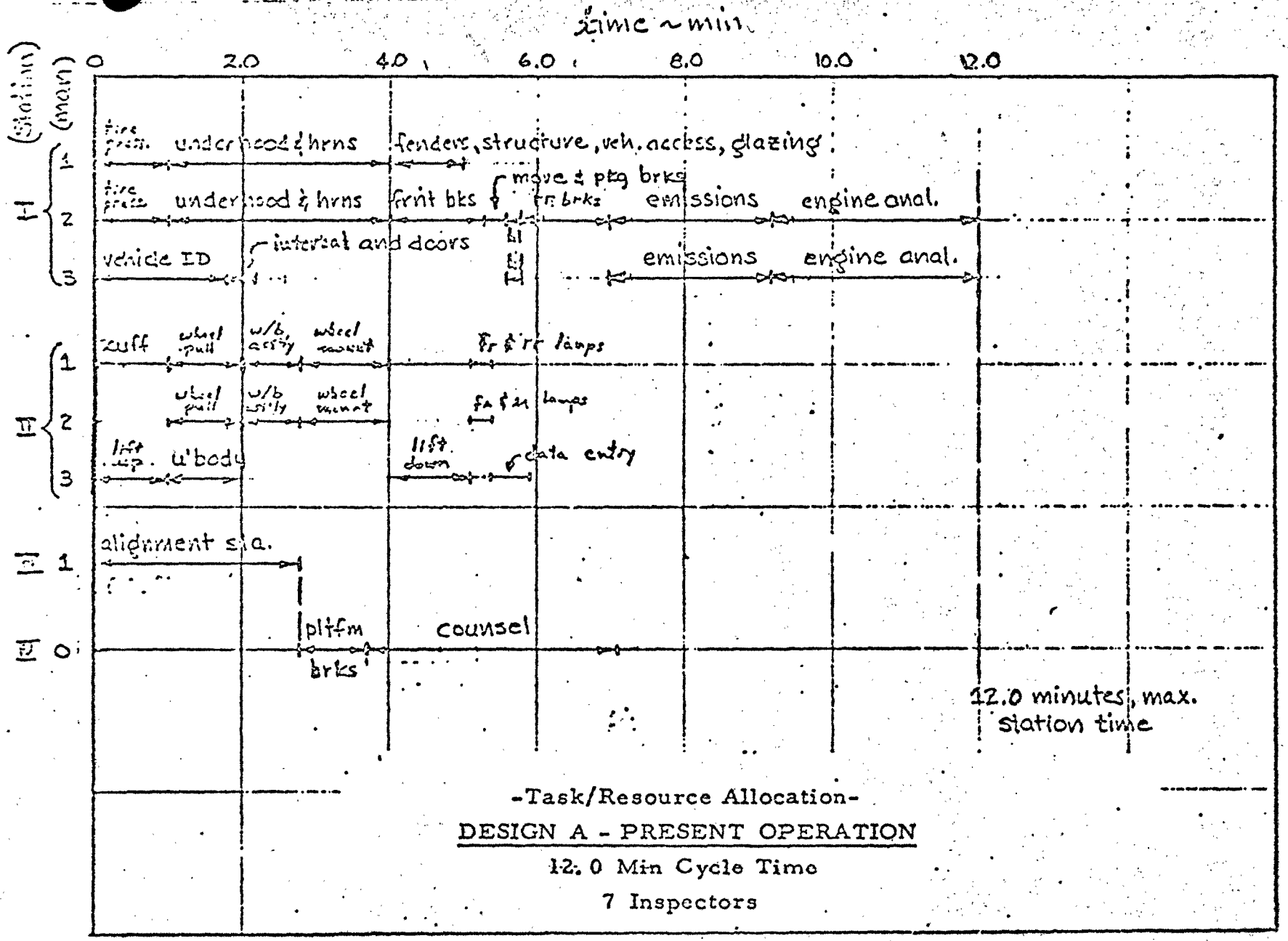


TEST ID'S	LOG IN *	LIFT UP	SCUFF *	ALIGNMENT *	PLATFORM BRAKES SHOCKS & MOTION	LOG OUT *
POSITION 1	VEHICLE STRUCTURE	FLUID LEAKS	BRAKE ASSY			
	VEHICLE ACCESSORIES	BRAKE ASSY.	LININGS/PADS			
	BRAKE SYSTEM INT.	LININGS/PADS	WHEELS & TIRES			
	DOORS & HINGES	WHEELS & TIRES	WHEEL BEARINGS			
	DOOR LATCH & LOCK	TIRE CONST.	STEERING			
	WINDOW REGULATOR	F. SP/SHOCK/SHR.	BALL JOINTS			
	FENDERS	R. FRAME & SUMP.				
	GLAZING	EXHAUST SYS.	R. SP/SHOCK/SHR.			
	IGNITION & SHIFT LEV.	R. LAMPS & REFLECTORS	F. FRAME & SUMP.			
	ENGINE ACCESSORIES	HAZARD WARN.	MOTOR MOUNT & DRIVE SHAFT			
	EMISSION CONT DEV.	FRONT LAMPS & ASSEMBLY	FLUID LINES & CONNECTORS			
	ELECTRICAL	SIDE MARKERS	LAT DOWN.			
	FLUID RESERVOIRS.					
	HOOD LATCH					
	TIRE PRESSURE					
POSITION 2	ROLLER BRAKES (FR) *					
POSITION 3	HEADLAMPS					
	FOG/DRIVING LAMPS					
	PARKING BRAKE					
POSITION 4	ROLLER BRAKES (LR) *					
	EMISSIONS (SPEED) *					
	ENGINE ANALYSIS 1.					
MANPOWER	3	3		1		

* DIRECT COMPUTER INTERFACE

DESIGN A - PRESENT OPERATION (LAYOUT)

VUGRAPH XII



-Task/Resource Allocation-

DESIGN A - PRESENT OPERATION

12.0 Min Cycle Time

7 Inspectors

VUGRAPH XXI

17 I 75

Loss Per Fatality	-	$200,000
Loss Per Injury	-	7,200
Property Damage Only	-	300 per involvement

Ref: Societal Costs of Motor Vehicle Accidents

NHTSA - 1972

Fig. XIV

Percent of Accidents Caused by Vehicle Defects

Degree of Certainty	Causal (%)	Societal Cost ($ billion)
Certain (95% confidence)	6.0	1.6
Probable (80% confidence)	15.9	4.3
Possible*	25.8	7.0

*Confidence level not estimated.

Fig. XV

ATTACHMENT C

ASSEMBLY ACTION	SENATE ACTION	ASSEMBLY / SENATE AMENDMENT BLANK 180
Adopted ☐	Adopted ☐	Amendments to Assembly / Senate
Lost ☐	Lost ☐	Bill / Joint Resolution No. 191 (SJR 58-162)
Date:	Date:	Proposed by Committee on Transportation
Initial:	Initial:	
Concurred in ☐	Concurred in ☐	
Not concurred in ☐	Not concurred in ☐	
Date:	Date:	
Initial:	Initial:	

Amendment No. 5810

Amend sec. 2, page 1, line 10, by deleting "For" and inserting: "[For".

Amend sec. 2, page 1, by deleting lines 13 through 16 and inserting: "at his pleasure.] On and after [January 1, 1972,] July 1, 1975, a taxicab authority shall consist of [three] five members appointed by the governor. One of such members shall be an accountant and one shall have experience as a taxicab driver. Members shall be appointed for terms of 3 years each, except that [Of the first taxicab authority appointed, one member

shall be appointed for a term of 1 year, one member for 2 years, and one member for 3 years.] of the two additional members appointed in 1975, one shall be appointed for a term of 2 years. Vacancies occur-".

Amend sec. 3, page 2, by deleting lines 30 and 31 and inserting:

"(b) Field investigators and inspectors; and".

Amend sec. 13, page 7, line 7, by deleting "shall [:" and inserting: "shall:".

Amend sec. 13, page 7, line 8, by deleting "1." and inserting: "[1.] (a)".

Amend sec. 13, page 7, line 9, by deleting "2." and inserting: "[2.] (b)".

Amend sec. 13, page 7, line 10, by deleting "3." and inserting: "[3.] (c)".

Amend sec. 13, page 7, line 12, by deleting "4." and inserting: "[4.] (d)".

Amend sec. 13, page 7, line 14, by deleting "5." and inserting: "[5.] (e)".

Amend sec. 13, page 7, line 16, by deleting "6." and inserting: "[6.] (f)".

Amend sec. 13, page 7, line 17, by deleting "7." and inserting: "[7.] (g)".

Amend sec. 13, page 7, line 19, by deleting "8." and inserting: "[8.] (h)".

Amend sec. 13, page 7, line 22, by deleting "9." and inserting: "[9.] (i)".

Amend sec. 13, page 7, line 25, by deleting "10." and inserting: "[10.] (j)".

Amend sec. 13, page 7, by deleting line 28 and inserting:

"[11.] (k) Operate his taxicab in accordance with all applicable".

Amend sec. 14, page 8, between lines 12 and 13, by inserting:

"(i) Not operate a taxicab with an expired driver's permit.

(j) Not operate a taxicab without a driver's permit issued pursuant to NRS 706.8841 in his possession.

Amendment No. 5310 to Senate Bill No. 191 (BDR 53-152) Page 3

(k) Not work longer than 10 hours continuously.".

Amend sec. 14, page 8, line 13, by deleting "[If" and inserting: "If".

Amend sec. 14, page 8, by deleting lines 18 through 20 and inserting:

"(c) Third offense: Revocation of a driver's permit.".

Amend sec. 15, page 8, by deleting lines 35 through 39.

Amend sec. 15, page 8, line 40, by deleting "5." and inserting: "3.".

Amend sec. 15, page 8, line 43, by deleting "6." and inserting: "4.".

Amend the bill as a whole by deleting section 16.

Amend the title of the bill, by deleting lines 5 6 and 7 and inserting:

"penalties; and providing other matters properly relating thereto.".

E

A.B. 153 - PURPOSE

TO CLEAR UP PROBLEMS WITH THE PRESENT STATUTE AND ALLOW FOR FUTURE CHANGES IN MANUFACTURERS' WIPER SPECIFICATIONS. PROBLEMS WITH THE PRESENT STATUTE ARE:

1. DOES NOT SPECIFICALLY REQUIRE THAT WIPERS BE SELF-OPERATING.
2. MAKES THE OPERATION OF SOME TRUCKS, MOBILE EQUIPMENT, AND IMPLEMENTS OF HUSBANDRY UNLAWFUL, I.E., MANUFACTURED AFTER 1969, WITH ONLY ONE WIPER.
3. REQUIRES A WINDSHIELD WIPER BUT DOES NOT HAVE PROVISION THAT IT MUST BE OPERATED DURING INCLEMENT WEATHER.
4. DOES NOT ALLOW A FUTURE WIPER DESIGN TO BE OPERATED WITH ONLY ONE WIPER.

SLOW MOVING VEHICLE EMBLEM

I. Effectiveness of Law.

A. 20 or more states presently have a SMV emblem law.

1. Indicate drastic reduction of rear-end collision into farm equipment.

2. Motor Vehicle - SMV collisions occur mostly on open highways, during daylight, nice weather and without motorists view being obstructed.

3. Positive recognition of the SMV by the motorist at a safe distance will reduce # of accidents.

II. Cost Factor.

A. Minimal - _____

B. Easily attainable at farm implement stores.

III. Conclusion.

A. Many persons throughout state presently use SMV sign.

B. Legislators from most rural areas have indicated approval of the measure.

C. I believe the situation now existing whereas some SMV's display the sign is a dangerous situation. It causes many drivers to expect that all slow moving vehicles will be denoted by the sign and they may find themselves in a difficult situation.

ASSEMBLY ACTION	SENATE ACTION	ASSEMBLY / SENATE AMENDMENT BLANK
Adopted ☐	Adopted ☐	Amendments to Assembly / Senate
Lost ☐	Lost ☐	Bill / Joint Resolution No. 301 (BDR 43-100
Date:	Date:	Proposed by Committee on Transportation
Initial:	Initial:	
Concurred in ☐	Concurred in ☐	
Not concurred in ☐	Not concurred in ☐	
Date:	Date:	
Initial:	Initial:	

Amendment No. 7529

Resolves conflict with A.B. 128

Amend section 14, page 4, line 22, delete "4, every passenger car" and insert:

"[4,] 3, every passenger car, travel trailer".

Amend section 14, page 4, delete line 28 and insert:

"2. [Every mobile home shall be registered for a ".

Amend section 14, page 4, line 31 insert a closed bracket after "3.".

AS Form 1a (Amendment Blank) 3044A

Drafted 3-28-75 By JW

To Journal (3) CFB

Amendment No. 7529 to Assembly Bill No. 301 (BDR 43-100) Page 2

Amend section 14, page 4, line 32 delete "4." and insert "[4.] 3.".

Amend section 14, page 4, after line 34, insert:

"[5.] 4. When the registration of any of the vehicles referred to in subsection 1 is transferred pursuant to NRS 482.3667 or 482.399, the expiration date of a regular license plate or plates, special license plate or plates or substitute decal shall, at the time of transfer of registration, be updated for a period of 12 consecutive months beginning the first day of the month after the transfer, and a credit on the portion of the registration fee and privilege tax attributable to the remainder of the current registration period shall be allowed according to the applicable provisions of NRS 482.3667 and 482.399.".

Amend the bill as a whole, insert new sections to be designated as sections 15 and 16, following section 14, to read:

"Sec. 15. NRS 482.260 is hereby amended to read as follows:

482.260 1. The department and its agents in registering a vehicle shall:
(a) Collect the license plate fees and registration fees as provided for in this chapter.
(b) Collect the privilege tax on the vehicle, as agent for the county where the applicant intends to base the vehicle for the registration period, unless the vehicle is deemed to have no base.
(c) Issue a certificate of registration, together with the regular license plate or plates.
2. Upon proof of ownership satisfactory to the director, he shall cause to be issued a certificate of ownership as provided in this chapter.

3. Every vehicle referred to in subsection 1 of NRS 482.206 being registered for the first time in Nevada shall be taxed for privilege tax purposes for a 12-month period. Every vehicle referred to in subsection [3] 2 of NRS 482.206 being registered for the first time in Nevada shall be taxed for privilege tax purposes pro rata on a monthly basis upon the amount of time remaining in the current calendar year.

Sec. 16. NRS 482.280 is hereby amended to read as follows:

482.280 1. The registration of every vehicle referred to in subsection 1 of NRS 482.206 shall expire at midnight on the last day of the last month of the registration period. The registration of every vehicle referred to in subsection [3] 2 of NRS 482.206 shall expire at midnight on December 31. The department shall mail to each holder of a valid registration certificate an application form for renewal registration for the following registration period. Such forms shall be mailed by the department in sufficient time to allow all applicants to mail the applications to the department and to receive new registration certificates and license plates, stickers, tabs or other suitable devices by mail prior to expiration of subsisting registrations. An applicant may, if he chooses, present the application to any agent or office of the department.

(more)

Amendment No. 7529 to Assembly Bill No. 301 (BDR 43-100) Page 4

2. The department shall insert in each application form mailed as required by subsection 1 of this section the amount of privilege tax to be collected for the county under the provisions of NRS 482.260.

3. An owner who has made proper application for renewal of registration previous to the expiration of the current registration but who has not received the number plate or plates or registration card for the ensuing registration period is entitled to operate or permit the operation of such vehicle upon the highways upon displaying thereon the number plate or plates issued for the preceding registration period for such time as may be prescribed by the department as it may find necessary for issuance of such new plate or plates or registration card.

4. The registration fees for a motortruck and truck tractor, and for any trailer or semitrailer having an unladened weight of 3,501 pounds or more shall be reduced by one-twelfth for each calendar month which has elapsed from the beginning of each calendar year, the fee so obtained, rounded to the nearest one-half dollar, but in no event to be less than $5.50. ".

Amend the bill as a whole by renumbering sections 15 through 18 as sections 17 through 20 respectively.

Amend the bill as a whole, insert a new section to be designated as section 21, following section 18, to read:

"Sec. 21. Sections 14, 15 and 16 of this act shall become effective at 12:01 a.m. on July 1, 1975.".

(REPRINTED WITH ADOPTED AMENDMENTS)
FIRST REPRINT

S. B. 174

SENATE BILL NO. 174—SENATOR MONROE

FEBRUARY 10, 1975

Referred to Committee on Transportation

SUMMARY—Exempts motor-assisted bicycles from motor vehicle registration and driver's license provisions and provides for application of traffic laws and certain equipment provisions to motor-assisted bicycles. Fiscal Note: No. (BDR 43-401)

EXPLANATION—Matter in *italics* is new; matter in brackets [ ] is material to be omitted.

AN ACT relating to motor vehicles; exempting battery-powered moped powercycles from registration and driver's license requirements; providing for the application of traffic laws and certain equipment provisions to battery-powered moped powercycles; and providing other matters properly relating thereto.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. Chapter 482 of NRS is hereby amended by adding thereto a new section which shall read as follows:

"Battery-powered moped powercycle" means every motor vehicle which:

1. Travels on only two wheels in contact with the ground;

2. Is propelled by human power or a battery-operated motor or both; and

3. Is capable of a maximum speed of not more than 30 miles per hour on a flat surface with not more than 1 percent grade in any direction when the motor is engaged.

SEC. 2. NRS 482.010 is hereby amended to read as follows:

482.010 When used in this chapter, the words and terms in NRS 482.013 to 482.135, inclusive, *and section 1 of this act* shall for the purposes of this chapter, have the meanings ascribed to them in [NRS 482.013 to 482.135, inclusive,] *such sections,* except in those instances where the context clearly indicates a different meaning.

SEC. 3. NRS 482.070 is hereby amended to read as follows:

482.070 "Motorcycle" means every motor vehicle designed to travel on not more than three wheels in contact with the ground, except any such vehicle as may be included within the term "tractor" *or "battery-powered moped powercycle"* as defined in this chapter.

S. B. 191

SENATE BILL NO. 191—SENATOR HERR

FEBRUARY 13, 1975

Referred to Committee on Transportation

SUMMARY—Makes various changes in regulations for operation of taxicabs in certain counties. Fiscal Note: No. (BDR 58-362)

EXPLANATION—Matter in *italics* is new; matter in brackets [ ] is material to be omitted.

AN ACT relating to the taxicab authority; creating the taxicab authority fund; establishing the undercover investigator's revolving fund; providing for a fee and a hearing when an application for a certificate of public convenience and necessity is submitted; establishing criteria for a taxicab driver's permit; revising provisions for physician's certificates; adding new prohibited acts; providing penalties; giving certain employees of the taxicab authority peace officer status; and providing other matters properly relating thereto.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. NRS 706.8813 is hereby amended to read as follows:

706.8813 "Certificate holder" means a person who has obtained and who holds a certificate of public convenience and necessity which was issued for the operation of a taxicab business within the county by:

1. The public service commission of Nevada prior to July 1, 1969, and which has not been *transferred,* revoked or suspended by the taxicab authority; or

2. The taxicab authority.

SEC. 2. NRS 706.8818 is hereby amended to read as follows:

706.8818 1. For each county of this state to which NRS 706.881 to 706.885, inclusive, apply, the governor shall, until December 31, 1971, appoint a taxicab authority consisting of three persons, who shall serve at his pleasure. On and after January 1, 1972, a taxicab authority shall consist of three members appointed by the governor. Of the first taxicab authority appointed, one member shall be appointed for a term of 1 year, one member for 2 years, and one member for 3 years. Vacancies occurring as a result of the expiration of such terms shall be filled by appointment for terms of 3 years. No member may serve for more than 6 years. No more than two of such persons may be members of the same political party, and no elected officer of the state or any political subdivision is eligible for appointment.

S. B. 384

SENATE BILL NO. 384—SENATOR DODGE

MARCH 25, 1975

Referred to Committee on Transportation

SUMMARY—Designates State Route 17 as Comstock Highway.
Fiscal Note: Yes. (BDR 35-1361)

EXPLANATION—Matter in *italics* is new; matter in brackets [ ] is material to be omitted.

AN ACT designating State Highway 17 as the Comstock Highway; directing the state highway engineer to place suitable markers along such state highway; and providing other matters properly relating thereto.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. Chapter 408 of NRS is hereby amended by adding thereto a new section which shall read as follows:

1. Route 17 as described in NRS 408.465 shall be known and designated as the Comstock Highway.

2. The engineer is directed to place suitable markers along the highway at such points as he deems appropriate.

SEC. 2. This act shall become effective upon passage and approval.

(REPRINTED WITH ADOPTED AMENDMENTS)
FIRST REPRINT

A. B. 153

ASSEMBLY BILL NO. 153—COMMITTEE ON TRANSPORTATION

JANUARY 30, 1975

Referred to Committee on Transportation

SUMMARY—Changes provisions concerning windshield wipers on vehicles. Fiscal Note: No. (BDR 43-325)

EXPLANATION—Matter in *italics* is new; matter in brackets [ ] is material to be omitted.

AN ACT relating to equipment on vehicles; changing provisions concerning types of windshield wipers permitted; and providing other matters properly relating thereto.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. NRS 484.621 is hereby amended to read as follows:

484.621 1. Every motor vehicle, except motorcycles, equipped with a windshield shall be equipped with a *self-operating* windshield wiper [, which shall be kept in good operating condition and] *system* which shall be so constructed as to be controlled [or operated] by the driver.

2. [When any such motor vehicle was originally equipped with two windshield wipers such wipers shall be kept] *The windshield wiper system with which the vehicle is equipped shall be maintained* in good operating condition [.

3. Every such motor vehicle manufactured after July 1, 1969, which is equipped with a windshield shall be equipped with two windshield wipers, one mounted on the right half and one on the left half of the windshield.

4. This section shall] *and capable of effectively clearing the windshield so as to provide clear vision through the windshield for the driver under all ordinary conditions of rain, snow or other moisture.*

3. The wiper system shall be operated while the vehicle is being driven during conditions of rain, snow or other moisture which obstruct or reduce the driver's clear view through the windshield.

4. Subsection 1 does not apply to [snow removal equipment] *highway maintenance vehicles, special mobile equipment, implements of husbandry, or vehicles manufactured before July 1, 1935,* with adequate manually operated windshield wipers.

(REPRINTED WITH ADOPTED AMENDMENTS)
FIRST REPRINT

A. B. 121

ASSEMBLY BILL NO. 121—COMMITTEE ON TRANSPORTATION

JANUARY 29, 1975

Referred to Committee on Transportation

SUMMARY—Prescribes warning device for slow moving vehicles.
Fiscal Note: No. (BDR 43-396)

EXPLANATION—Matter in *italics* is new; matter in brackets [ ] is material to be omitted.

AN ACT relating to traffic safety; prescribing a special warning device for display on slow moving vehicles except under certain conditions; providing a penalty; and providing other matters properly relating thereto.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. Chapter 484 of NRS is hereby amended by adding thereto a new section which shall read as follows:

1. After September 15, 1975, when any vehicle or combination of vehicles designed for and is operated at speeds of 25 miles per hour or less is moved on a highway, whether pulled, towed or self-propelled and whether in daytime or nighttime, the vehicle or combination shall have displayed a slow moving vehicle emblem, except as provided in subsection 3.

2. Use of the slow moving vehicle emblem is restricted to the type of vehicle or combination specified in subsection 1, and the use of the emblem on any other type of vehicle or any stationary object on or beside a highway is unlawful.

3. A vehicle or combination of vehicles of the type specified in subsection 1 is not required to have displayed a slow moving vehicle emblem if the vehicle or combination is moved only on a highway not open to public use or is guarded by flagmen or flares.

4. The requirement for a slow moving vehicle emblem is in addition to any lights or warning flags required by this chapter.

5. The department of motor vehicles shall adopt standards for the slow moving vehicle emblem which conform to standards adopted by the American Society of Agricultural Engineers.

6. The emblem shall be mounted, with a point up, on a plane perpendicular to the direction of travel, and located on the rear of the vehicle.