

Authorizing Use of Penetred Tires on
Streets and Highways of Minnesota

WHEREAS, Minnesota Statutes 1971, Section 169.72, as amended by Laws of Minnesota 1973, Chapter 378 provides that "no tire on a vehicle moved on a highway shall have on its periphery any block, stud, flange, cleat or spike or any other protuberances of any material other than rubber which projects beyond the tread of the traction surface of the tire:" except that the Commissioner of Highways shall authorize the use on the streets and highways of the State of Minnesota pneumatic tires that have embedded in them wire or wire coils for improving traction on ice and snow, which tires must meet certain statutory requirements and other test specifications as drawn by the Commissioner of Highways, and

WHEREAS, pursuant to Laws of Minnesota 1973, Chapter 378 the Commissioner of Highways shall prescribe specifications and guidelines for an in-depth study or test of said tires' damaging effects, if any, that may be caused to the public roadways of this state, and

WHEREAS, the Commissioner of Highways shall, prior to authorizing the use of said tires, satisfy himself that all requirements of the statutes and his specifications have been met, and

WHEREAS, the Penetred Corporation with offices at 211 West First Street, Marshfield, Wisconsin, has by their letter of request dated June 15, 1973, petitioned the Commissioner of Highways to certify the use of certain steel wire coils manufactured as a component in the wearing surface of pneumatic tires for motor vehicle use on the streets and highways of the State of Minnesota, and

WHEREAS, the Commissioner of Highways has, in accordance with Chapter 378, Laws of Minnesota of 1973, prescribed certain specifications and guidelines (copy of which is attached as Exhibit A) for the testing of said tire components for determining the damage, if any, that may be caused to the public roadways from the use of pneumatic tires that have embedded in their treads wire or wire coils for improving traction on ice and snow, and

WHEREAS, these specifications and guidelines relate to:

- 1) The allowable percentage of wire or wire coils embedded in a tire and that may be in contact with the roadway surface,
- 2) The maximum hardness of the wire or wire coils embedded in a tire,
- 3) The maximum allowable damage to the roadway that may be tolerated from the wires or coils embedded in the tire, and
- 4) The protrusion of wire or wire coils beyond the rubber surface of the tire, and

WHEREAS, the Penetred Corporation has provided the Commissioner of Highways through their letter of request dated June 15, 1973, documentary evidence on the several factors associated with steel wire coil use as required by his, in the form of a report on tests conducted by American Oil Company of Whiting, Indiana pursuant to contract with Penetred Corporation; which report is on file in the Office of the Commissioner of Highways at St. Paul, Minnesota, and is available for public inspection,

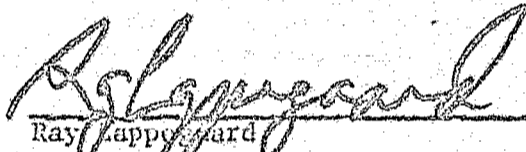
NOW, THEREFORE, based upon the premises given, the Commissioner of Highways hereby orders:

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Pneumatic tires having embedded in their tread steel wire coils produced by Penetrad Corporation, or others equivalent to Penetrad Corporation design (a schematic of which is attached as Exhibit B) and meeting the requirements of the specifications may be used on streets and highways in Minnesota during the entire year without restriction (except that the Commissioner reserves the right to withdraw at any time the license to use said tires if in his sole opinion such use exceeds slight and tolerable damage to the streets and highways of the State of Minnesota, or if other detrimental effects upon the safety and convenience of the public are found by him), provided that:

- 1) Steel wire in the coils has a diameter not exceeding 0.075 inch,
- 2) Under normal use conditions, the percentage of wire or wire coils in contact with the roadway shall not exceed, during the first 1,000 miles of use or operation, 20 percent of the total tire area in contact with the roadway, and after the first 1,000 miles of use or operation of such tires, the percentage of wire or wire coils in contact with the roadway shall not exceed eight percent of the total tire area in contact with the roadway.
- 3) The maximum allowable hardness of the wire or wire coils embedded in a tire shall not exceed 50 on the Rockwell "C" scale, based on Knoop hardness measurements, and the hardness of the wire or wire coils shall be such that they will wear at the same rate as the rubber in the tires.
- 4) The use of pneumatic tires having embedded wire or wire coils in their tread and meeting the other requirements of the test specifications shall not damage the streets and highways or shall only cause slight and tolerable damage.
- 5) When the tire is at rest, the wire coils shall not protrude beyond the rubber surface of the tire, or shall protrude only to such an insignificant amount as to not cause damage to the roadways beyond the tolerable limits.

Dated August 13, 1973


Ray Lappegard
Commissioner of Highways

STATE OF MINNESOTA

COUNTY OF RAMSEY

The undersigned, being a duly appointed agent of the Commissioner for the purpose of certifying copies of orders issued by the Commissioner of Highways, hereby certifies that the above is a true and correct copy of Commissioner's Order No. 53545 in the files of the State of Minnesota, Department of Highways, and that this copy has been compared with the original and is identical.

Dated this 14 day of August 19 73.

RAY LAPPEGAARD, COMMISSIONER OF HIGHWAYS

By Marshall F. Morton

#25638
STATE OF MINNESOTA
DEPARTMENT OF STATE
FILED
AUG 14 1973
Arden J. Edahl
Secretary of State

MINNESOTA DEPARTMENT OF HIGHWAYS COMMISSIONER'S ORDER NO. 53545--Continued

SPECIFICATIONS AND GUIDELINES FOR DETERMINING PAVEMENT
SURFACE WEAR CAUSED BY TIRES HAVING NON-RUBBER
PROTUBERANCES

INTRODUCTION

These specifications and guidelines define the procedures for determining the extent to which tires having protuberances of metal or other materials other than rubber will cause damage to pavement surfaces and whether said tires shall be permitted on the roads and streets in Minnesota. Tires to be evaluated shall be tested on the American Oil Company (AMOCO) Laboratory Traffic Simulator located at Hammond, Indiana, or on a comparable device approved by the Minnesota Highway Department. Materials used in the laboratory test and the testing procedures shall be equivalent to those employed in Test Series 3 of the Test Program for evaluating pavement wear caused by studded tires (described in reference (1)), except as modified hereinafter.

LABORATORY PAVEMENT TEST SPECIMENS

Four laboratory test slabs of asphaltic concrete shall be used, two described as Mix 1, MHD Specification 2351, and two described as Mix 3, MHD Specification 2341 (see Reference (1)). The Minnesota Highway Department will furnish all materials for these mixes and will supervise their construction.

LABORATORY TRAFFIC TESTING

The laboratory pavement test specimens shall first be conditioned by application of a minimum of 100,000 wheel passes of conventional summer tires at 80 degrees F. The wear test shall consist of 1,000,000 wheel passes at 25 degrees F. with the tires that are being evaluated. Surface photographs and wear measurements shall be taken before and after the conditioning passes and at periodic intervals throughout and after the test. The mean depth of wear of the wheel path shall be determined for each set of measurements on each slab. A sample cross section shall be cut from each test mixture for retention by the Minnesota Highway Department.

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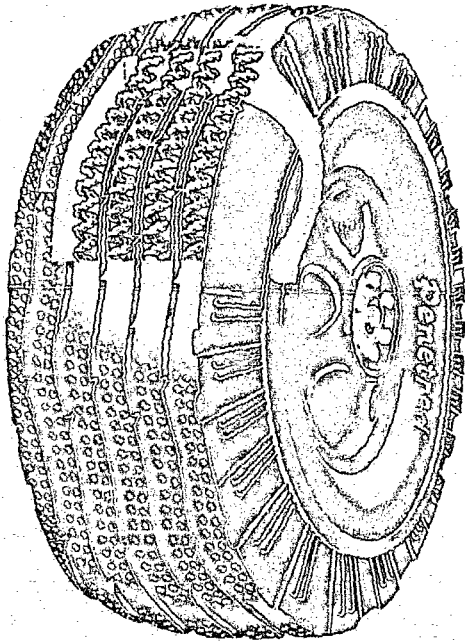
Arden J. Edsall
Secretary of State

Exhibit "B"

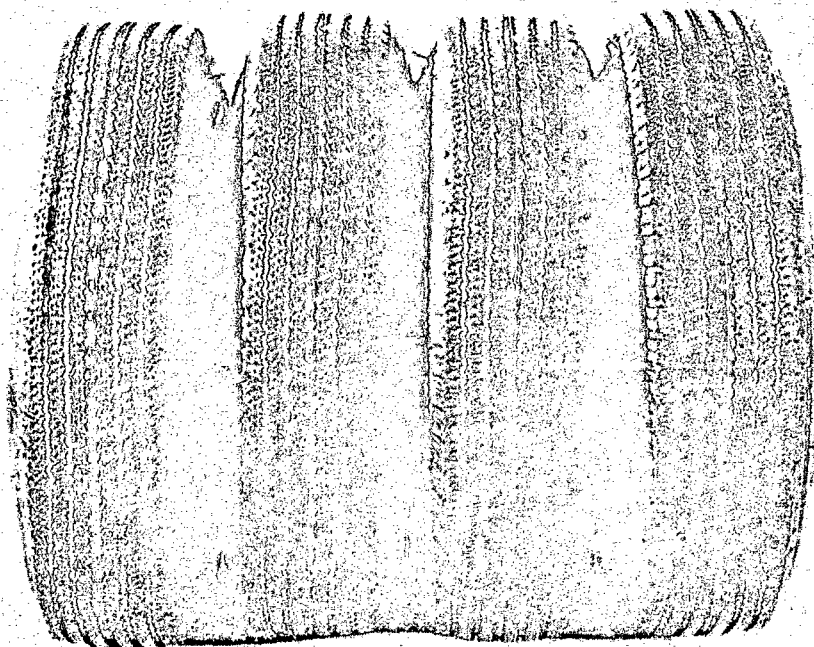
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FIGURE 1

Penetred Snow Tires



A. SCHEMATIC OF TREAD STRUCTURE



B. TIRES USED IN THE TEST

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AUG 14 1973

Arlen J. Ershl
Secretary of State

REFERENCES

1. "Laboratory Evaluation of Pavement Damage Caused by Studded Tires, Salt and Abrasive Sand - Final Report"
May 25, 1971
by T. L. Speer and J. W. Gorman
American Oil Company

2. "Pavement Wear with Penetred Snow Tires"
March 28, 1972
by J. V. Evans and J. W. Gorman
American Oil Company

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DEPARTMENT OF STATE
FILED
AUG 14 1973
Arden J. Erdahl
Secretary of State

MINNESOTA DEPARTMENT OF HIGHWAYS AMENDED COMMISSIONER'S ORDER NO. 54217

Authorized Use of B.F. Goodrich Retread
Tires with Sivon "Hi-trak Tire Tread Wire;"
An Amendment to Minnesota Department of
Highways Commissioner's Order No. 53545.

WHEREAS, Minnesota Statutes 1973 Supplement, Section 169.72 establishes that the Commissioner of Highways shall authorize the use on the streets and highways of the State of Minnesota pneumatic tires that have embedded in them wire or wire coils for improving traction on ice and snow, which tires must meet certain statutory requirements and other test specifications as drawn by the Commissioner of Highways, and

WHEREAS, pursuant to law the Commissioner of Highways has approved specifications for said tires used on the public roadways of this state; which specifications are on file in the Office of the Secretary of State and a part of Minnesota Department of Highways Commissioner's Order No. 53545, and

WHEREAS, the B.F. Goodrich Tire Company (Retread Plant) a Division of the B.F. Goodrich Company which offices at 900 Colorado Avenue South, Minneapolis, Minnesota, has provided documentary evidence on the several factors associated with steel wire produced by the Sivon Manufacturing Company of Painesville, Ohio and thereby, through a letter of request dated November 5, 1973, has petitioned the Commissioner of Highways to certify the use of said wire as a component in the wearing surface of pneumatic tires for motor vehicle use on the streets and highways of the State of Minnesota, and


WHEREAS, said the properties of said wire and the area of tire tread affected have been found by the Commissioner of Highways to fall within the specifications cited in Commissioner's Order No. 53545, and

NOW, THEREFORE, based upon the premises given and after appropriate investigation, the Commissioner of Highways hereby orders:

Pneumatic tires having embedded in the tread Sivon steel wire formed as a component for use in pneumatic tires as produced by the B.F. Goodrich Tire Company, or others equivalent to B.F. Goodrich Tire Company tire component design, may be used on the streets and highways in Minnesota during the entire year without restriction (except that the Commissioner reserves the right to withdraw at any time the license to use said tires if in his sole opinion such use exceeds slight and tolerable damage to the streets and highways of the State of Minnesota, or if other detrimental effects upon the safety and convenience of the public are found by him).

Minnesota Department of Highways Commissioner's Order No. 53545 is hereby amended to conform to the above provisions.

Dated at Saint Paul, Minnesota
this 23rd day of January, 1974.


Ray LaPegard
Commissioner of Highways

STATE OF MINNESOTA

COUNTY OF RAMSEY

The undersigned, being a duly appointed agent of the Commissioner for the purpose of certifying copies of orders issued by the Commissioner of Highways, hereby certifies that the above is a true and correct copy of Commissioner's Minn. Dept. of Hwy. Amend. Comm. Order No. 54217 in the files of the State of Minnesota, Department of Highways, and that this copy has been compared with the original and is identical.

Dated this 24 day of January 19 74

APPEGAARD, COMMISSIONER OF HIGHWAYS

By Marshall J. Morton

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STATE OF MINNESOTA
DEPARTMENT OF STATE
FILED
JAN 25 1974
Arlen J. Edall
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