

BULLETINS
551 - 599

BULLETIN

NO. 599

April 15, 1977

ADDITIONS TO CROSS REFERENCE

This cross reference listing is a supplement to BULLETIN NO. 536 published on July 15, 1975. That 1975 Bulletin combined all brake lining and clutch facing cross reference additions since the original (September 1963) cross reference listing.

This does not include brake shoes, for which the last listing was BULLETIN NO. 540 of July 28, 1975. It must be pointed out that this cross reference data is from original equipment sources, and while some use the same number for service, many do not.

E. W. Drislane
Executive Director

Active Members - List E
Regional Members

ALFA*

<u>Part #</u>	<u>FMSI No.</u>
164-12304	8030

BENDIX

<u>Part #</u>	<u>FMSI No.</u>	<u>Part #</u>	<u>FMSI No.</u>
1,153,201	7054 (I)	2,235,206	7024B (O)
1,153,202	7054 (O)	2,238,490	7024B (I)
1,153,216	7053 (I)	2,238,491	7024B (I)
1,153,217	7053 (I)	2,238,492	7024B (I)
1,153,218	7053 (O)	3,203,525	2135T (s)
2,235,205	7024B (O)	3,203,529	2135T (I)

BORG & BECK*

<u>Part #</u>	<u>FMSI No.</u>	<u>Part #</u>	<u>FMSI No.</u>
165-10096	8025A	165-10435	1005A
165-10173	1037F	165-10436	1006B
165-10262	1092A	165-10532	1005B
165-10263	1025	178-10185	791
165-10301	1275	173-10186	791
165-10347	791		

CHEVROLET

<u>Part #</u>	<u>FMSI No.</u>	<u>Part #</u>	<u>FMSI No.</u>
357,883	2150TT	457,767	7053 (I)
357,884	2150TT	457,768	7053 (I)
361,767	1337	457,769	7053 (O)
367,540	2073T	459,731	1337
367,550	2073T		

CHRYSLER

<u>Part #</u>	<u>FMSI No.</u>
3,880,815	7017A (I)
3,880,816	7017A (O)
3,880,818	7017A (I)
3,880,819	7017A (O)

DAIA*

<u>Part #</u>	<u>FMSI No.</u>
114-C-305	1267

* Clutch Facing

DELCO-REDAINE

<u>Part #</u>	<u>FMSI No.</u>
18,000,210	2117TT (1)
18,002,701	7055
2,633,693	7055
5,474,999	2117TT (s)

EATON

<u>Part No.</u>	<u>FMSI No.</u>	<u>Part #</u>	<u>FMSI No.</u>
43,908	4317G	1,000,239	4527C
44,608	4317G	1,001,041	4317G
53,747	4317G	1,001,042	4317G
53,749	4317G		
57,555	4317G		

FORD

<u>Part #</u>	<u>FMSI No.</u>	<u>Part #</u>	<u>FMSI No.</u>
D-4VA-2285-AA	2081TT (1)	D-50A-2284-CA	2161TT (s)
D-4VA-2285-BA	2081TT (1)	D-60A-2285-AA	2161TT (1)
D-4VA-2285-CA	2081TT (1)	D-60A-2285-BA	2161TT (1)
D-5DA-2284-AA	2135T (s)	D-60A-2285-CA	2161TT (1)
D-5DA-2285-AA	2135T (1)	D-6TA-2019-DA	7054 (1)
D-5SA-2284-AA	2081TT (s)	D-6TA-2018-DA	7054 (0)
D-5SA-2284-BA	2081TT (s)		
D-5SA-2284-CA	2081TT (s)		
D-50A-2284-AA	2161TT (s)		
D-50A-2284-BA	2161TT (s)		

INTERNATIONAL HARVESTER

<u>Part #</u>	<u>FMSI No.</u>
233,007 R91	2085
389,430 C97	10,014*

LONG*

<u>Part #</u>	<u>FMSI No.</u>
C-42-128	1442

ROCKFORD*

<u>Part #</u>	<u>FMSI No.</u>
CL-12391-24	10,014
CL-12391-143	10,014

* Clutch Facing

ROCKWELL

<u>Part #</u>	<u>FMSI No.</u>	<u>Part #</u>	<u>FMSI No.</u>
2240-A-1821	4623	2240-U-2387	17,731A
2240-A-2471	17,741	2240-U-2647	4654
2240-A-2289	4561B	2240-Y-2806	4227E
2240-A-2575	4654	2240-Y-2287	4561B
2240-B-1978	4621	2240-Z-2288	4561B
2240-B-2290	4561B	2240-Z-2574	4654
2240-C-1823	4623	2740-A-1301	4633B
2240-C-1979	4621	2740-A-1691	1297
2240-D-1824	4623	2740-B-1302	4633B
2240-D-1980	4621	2740-B-1692	1297
2240-D-2656	17,741	2740-C-1693	1297
2240-D-2812	4541B	2740-D-1694	1297
2240-E-1931	4621	2740-L-454	1139B
2240-E-2553	4592A	2740-M-455	1139B
2240-F-2632	4541B	2740-N-456	1139B
2240-G-2451	17,731A	2740-N-690	17,742
2240-G-2555	4398B	2740-P-458	1139B
2240-J-2553	4541B	2740-P-692	17,742
2240-J-2584	4398B	2740-Q-459	1139B
2240-K-1987	4623	2740-Q-1473	1297
2240-L-1989	4623	2740-R-1474	1297
2240-M-1989	4623	2740-T-332	17,742
2240-N-1990	4623	2740-U-333	17,742
2240-R-2566	4592A	2740-V-334	17,742
2240-T-2646	4654	2740-W-335	17,742
		2740-X-5146	17,737

STANDARD FORGE & AXLE

<u>Part #</u>	<u>FMSI No.</u>
213,132	4536B
213,133	4536B
213,136	4591A
213,137	4591A

VOLKSWAGEN

<u>Part #</u>	<u>FMSI No.</u>
171-609-537B	1316
171-698-151B	7044
171-698-151C	7044
331-609-537	1355
827-609-537	8129

BULLETIN

NO. 598

April 7, 1977

1977 SUPPLEMENT TO THE 1976 BRAKE SHOE IDENTIFICATION CATALOG

The Printer, Success, Inc., is now shipping copies of the "1977 Supplement to the 1976 Brake Shoe Identification Catalog" to those who placed orders. Member orders were solicited in BULLETIN NO. 590 of January 18, 1977.

This is to advise of a final price reduction for this catalog based on orders received for 40,000 copies (instead of the 30,000 copies budgeted).

Final Price:

Catalogs	\$126.40/M
Punching	3.60/M

For those who ordered with punching, the total price will be \$130.00/M. It may be that you must notify your Purchasing Department of this price change. Those who ordered will be billed at this reduced price regardless of the price on the order.

If there are any questions, please contact me.

EWD/erc
Dist: Active Members-List D
Regional Members
Licensees

E. W. Drislane
Executive Director

BULLETIN

NO. 597

April 6, 1977

HISTORICAL SALES PROGRAM

The historical sales program continues on a quarterly basis. Regional Members using the copyrighted FMSI Numbers for marketing their products in the United States may participate if they wish.

The Institute is requesting details of pieces sold for the first quarter of 1977 (3 months ending March 31, 1977). The rules for the reporting details remain unchanged.

1. Quantities will be reported in pieces (not units). For roll linings, each foot of length will be one piece.
2. Our Accountants will report the names of the members from whom reports are received.
3. Total pieces in each group will be reported.
4. "Clutch Facings" does not include gear tooth discs, automatic transmission discs, or the 8-14" dia., (3/16 to 1/2" thick) asbestos composition discs.

The data as filed will be confidential. Totals for each group will be shown and there is no way of determining quantities by individual members.

You will be receiving from Marshall Granger & Company, Certified Public Accountants, a form for completing this information. Please return it to:

Marshall Granger & Company, C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

If you report, please have your figures in by May 15, 1977. If you do not wish to report these figures, no reply is necessary. Only those reporting figures will receive the industry totals when the data is summarized. A sample form and definitions are attached.

END/erc

Encs.

Distribution: Active Members-List G

Regional Members (paying
Active Members Dues)

E. W. Drislane

Executive Director

EXHIBIT "A"

STATISTICAL PROGRAM OF THE
FRICTION MATERIALS STANDARDS INSTITUTE, INC.

Mail to:

MARSHALL GRANGER & CO., C. P. A.
1600 Harrison Avenue
Manaroneck, New York 10543

* * * * *

See instructions for sales to other members.

Pieces sold to United States distributors, jobbers, private brands,
rebuilders, brake specialists, fleets, mass merchandisers, direct
consumers, government agencies, or other customers for use in the
United States replacement market:

3 MONTHS JANUARY 1 to MARCH 31, 1977

Brake linings less than 3/4" nominal
thickness (See explanation for
roll lining).

Brake blocks, nominal thickness
of 3/4" and over

Disc Brake Linings

Clutch facings

Total Pieces

STATISTICS SUPPLIED BY:

Signature

Company

Telephone Number

SAMPLE
FORM

RECEIVED
FRICTION MATERIALS STANDARDS INSTITUTE
JAN 13 1977

EXHIBIT "B"

DEFINITION FOR HISTORICAL SALES

PIECES

The reports will show pieces of friction material, in groups as shown:

<u>Group</u>	<u>Description</u>	<u>Normal Usage</u>
Brake Lining	Friction materials less than a nominal 3/4" thickness (See note on roll lining)	Normally, <u>one piece</u> to a shoe
Brake Blocks	Friction materials with a nominal thickness of 3/4" and over	Normally, <u>two pieces</u> to a shoe
Disc Brake Linings	Friction materials sold (for disc brakes) to be attached to the shoe, or sold as a unit molded, bonded or riveted to the shoe	Normally, <u>one piece</u> to a shoe
Clutch Facing	Friction materials of annular shape, or segments thereof	Normally, <u>two annular pieces</u> per clutch plate

Note: For roll lining only, consider each foot of length equals one piece.

REPLACEMENT SALES TO UNITED STATES MARKET

This reporting is for sales to the United States replacement market only. Do not include sales to other markets. This includes sales under the friction material manufacturer's own name or brand name used by the customer, to automotive warehouse distributors, jobbers, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies or other customers for use in the United States replacement market.

When a friction materials manufacturer is shipping to a vehicle manufacturer, brake manufacturer, or clutch manufacturer, but has no reasonable way of determining if the pieces are for original equipment or replacement purposes, estimates will not be used - these pieces will not be reported. However, where a friction material manufacturer is shipping to a point known to be used for replacement, or where he stencils or otherwise identifies the pieces as being for replacement purposes, or where the shipments otherwise are obviously known to be for replacement, these pieces will be reported.

The member who sells to the type customer or user indicated above will report those pieces sold, even if purchased from another Active Member or Regional Member.

When you sell your friction materials to another Member (Active or Regional) do not report those sales! Materials sold to Licensee Members of the Institute for the replacement market should be included.

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END/erc

Encs.

Distribution: Active Members-List G
Regional Members (paying
Active Members Dues)

E. W. Drislane

Executive Director

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Clutch facings

Total Pieces

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Signature

Company

Telephone Number

SAMPLE
FORM

USE THIS FORM TO
REPORT TO MEMBERS

EXHIBIT "B"

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B U L L E T I N

N O. 5 9 6 A

March 29, 1977

STATE OF NEW JERSEY--CANCER CONTROL ACT

On March 24, 1977 I sent the membership copies of the "Cancer Control Act" which had been introduced in the New Jersey State Senate on January 24, 1977. In that act, it was proposed that: "No person shall produce, manufacture or use or release onto or into the atmosphere, waters or lands of this State any of the following carcinogens..." Asbestos was included.

The following day, a news article was published advising that the principal sponsor of this legislation Senator John Skevin, was abandoning his effort to ban sixteen carcinogens as proposed in the "Cancer Control Act."

A copy of the news announcement as it appeared in the New York Times of March 25, 1977, is enclosed. The Asbestos Study Committee met on March 28, 1977 and this was discussed briefly. Based on withdrawal of this proposed legislation, the Committee did not recommend any action. This is for your information.

EWD/erc

Enclosure:

Distribution: Active Members

List C

Regional Members

(U.S.Dues)

E. W. Drislane

Executive Director

Skevin Gives Up His Fight to Ban All Manufacturing of Carcinogens

State Senator Attributes Retreat to 'Organized' Opposition and Insufficient Public Support

By WALTER H. WAGGONER

Special to The New York Times

TRENTON, March 24—State Senator John M. Skevin, who has played a leading role in writing legislation designed to arrest New Jersey's cancer mortality rate, the highest in the nation, abandoned today his effort to bar the production and use of 16 known cancer-producing chemicals in the state.

He attributed his retreat to "organized opposition" to the ban and insufficient public support to offset it.

The Oradell Democrat, who is chairman of the special State Senate Commission on the Incidence of Cancer in New Jersey, has sponsored a series of bills attacking the cause of cancer, among them he proposed Cancer Control Act, which would have banned the 16 chemicals identified as carcinogenic.

Mr. Skevin said in a statement that, while pledging his continued support for sections of the cancer control package, he had decided to "eliminate the provision for the ban."

"Let me emphasize this re-evaluation of my position involves great soul-searching and is based on my deeply rooted belief that a public official is elected to office to represent the people and not to do the people's thinking for them," he said.

Mr. Skevin's battle had become virtually a one-man effort, and the final blow, he said in a telephone interview, was the

opposition to the ban voiced in Washington recently by environmental interests who had earlier shown some support in the face of strong attacks by industry and organized labor.

"It is obvious to me that there is considerable opposition to such an outright ban, much of it emanating from industrial sources," Mr. Skevin's statement said. "It is also obvious to me that at least some of the opposition has been 'orchestrated' by the chemical industry and that scare tactics, specifically distortion of facts based on unrealistic estimates of possible wholesale unemployment, have been utilized."

"However, I will not belabor that point right now," the statement continued. "I do intend to pursue this aspect of the problem, the extent to which the American public is being brainwashed into accepting environmental cancer as an inevitable fact of life, at some future date."

The full force of industry's opposition to the proposed legislation emerged initially at a public hearing last Feb. 18 before the Skevin commission.

Joining with the spokesman for several industrial concerns was Charles A. Marciano, president of the New Jersey State A.F.L.-C.I.O., who maintained that the chemical ban would be disastrous to the state's economy.

Support for the measure, with some reservations, came at that time from the New Jersey Conservation Foundation. But even that support dissolved at a Washington conference earlier this week, at which Mr. Skevin served as moderator for a seminar on cancer in New Jersey.

"The opposition by the environmentalists was the final blow," he said today.

He also noted that John J. Horn, Acting State Commissioner of Labor and Industry, had opposed the ban on the chemicals, and that others had also "lined up" behind the argument that the state would suffer severe economic harm, including the flight of industry to other states and resulting unemployment.

In the past, those who supported the Skevin measure argued that the savings in death, illness and medical costs would offset the other economic losses. That group has now apparently shifted to the more moderate position that calls for controls rather than an outright ban on the chemicals.



The New York Times

John M. Skevin

CONFIDENTIAL

100.5000

March 24, 1977

STATE OF NEW JERSEY--CANCER CONTROL ACT

Enclosed for your information is a copy of the "Cancer Control Act" which was introduced in the New Jersey State Senate on January 24, 1977.

You will note that in Paragraph 6, it is proposed that: "No person shall produce, manufacture or use or release onto or into the atmosphere, waters or lands of this State any of the following carcinogens:....asbestos...."

While the meaning of this could be very broad, it would undoubtedly be construed as banning the manufacture of asbestos based friction materials. This proposed law would effect only those in New Jersey, but if it should become law it follows that other jurisdictions would most likely introduce similar legislation. This "Cancer Control Act" will be an added agenda item at a meeting of the Asbestos Study Committee on March 28, 1977.

WED/erc

Enclosure

Distribution: Active Members

List C

Regional Members

(U.S.Dues)

E. W. Brislane

Executive Director

SENATE, No. 3035

STATE OF NEW JERSEY

INTRODUCED JANUARY 24, 1977

By Senators SKEVIN, McGAHN, MARESSA and MARTINDELL

Referred to Committee on Energy and Environment

AN ACT concerning the control of carcinogens and the protection of the public from cancer by the Department of Environmental Protection and by the Department of Health and establishing a Cancer Control Council with certain duties, and making an appropriation.

1 BE IT ENACTED by the Senate and General Assembly of the State
2 of New Jersey:

1 1. This act shall be known and may be cited as the "Cancer
2 Control Act."

1 2. The Legislature finds and determines that New Jersey has one
2 of the highest overall mortality rates for cancer in the Nation;
3 that for a large number of different cancers, the State of New
4 Jersey as a whole and many counties within the State rank signifi-
5 cantly above the National average; that some cancers are trouble-
6 some, painful and treatable while most others are serious and
7 potentially fatal; that the economic costs of cancer are immense,
8 including the cost of hospital care, doctor bills, medication and the
9 loss of production from and salaries of affected workers; and that
10 the social and psychological costs to the victims of cancer and their
11 families are enormous.

12 The Legislature, therefore, declares that the cumulative losses
13 of the State's citizens shall be counteracted by a major research
14 and regulatory program administered by the State Departments
15 of Health and Environmental Protection in conjunction with the
16 Cancer Control Council established herein.

1 3. For the purposes of this act, unless the context clearly requires
2 a different meaning:

3 a. "Cancer" means a malignant tumor characterized by poten-
4 tially unlimited growth with local expansion by invasion and
5 systemically by metastasis.

6 b. "Carcinogen" means a substance or agent producing or
7 inciting cancer and shall include every substance or agent identified
8 as a probable or proven human carcinogen by the National Institute
9 of Occupational Safety and Health pursuant to Public Law 91-596.

1 4. The Commissioner of Environmental Protection, with the
2 approval of the Cancer Control Council, shall formulate, promul-
3 gate, amend or repeal rules and regulations prohibiting, condition-
4 ing and controlling the release of carcinogens onto or into the
5 atmosphere, waters or lands of this State in such quantities which
6 cause or may tend to cause adverse effects on man or the environ-
7 ment and the production, manufacture, sale and labeling of
8 products containing carcinogens which cause or may tend to cause
9 adverse effects on man or the environment.

1 5. The Commissioner of Health, with the approval of the Cancer
2 Control Council, shall formulate, promulgate, amend or repeal rules
3 and regulations prohibiting, conditioning and controlling the use
4 of products containing carcinogens which cause or may tend to
5 cause adverse effects on the health of their users or on any other
6 persons.

1 6. No person shall produce, manufacture or use or release onto
2 or into the atmosphere, waters or lands of this State any of the
3 following carcinogens: 4-nitrobiphenyl, alpha naphthylamine, 4,
4 4-methylene bis (2-chloroaniline), methyl chloromethyl ether, 3,
5 3-dichlorobenzidine, bis-chloromethyl ether, beta naphthylamine,
6 benzidine, 4-aminodiphenyl, ethylenimine, beta propiolactone,
7 2-acetylaminofluorene, 4-dimethylaminoazobenzene, N-nitro-
8 sodimethylamine, asbestos, vinyl chloride.

1 7. a. There is hereby created in the Department of Environ-
2 mental Protection a Cancer Control Council which shall consist of
3 seven members, three of whom shall be the Commissioner of
4 Environmental Protection, the Commissioner of Health, and the
5 Commissioner of Labor and Industry, or their designees, who shall
6 serve ex officio, and four citizens of the State representing the
7 general public to be appointed by the Governor, with the advice
8 and consent of the Senate. The members shall select a chairman
9 and vice chairman of the council from the members representing
10 the general public.

11 b. Of the four members first to be appointed, one shall be ap-
12 pointed for a term of 1 year, one for a term of 2 years, one for
13 a term of 3 years and one for a term of 4 years. Thereafter all
14 appointments shall be made for terms of 4 years. All appointed
15 members shall serve after the expiration of their terms until their

16 respective successor shall be appointed and shall qualify, and any
 17 vacancy occurring in the appointed membership of the council
 18 shall be filled in the same manner as the original appointment for
 19 the unexpired term only, notwithstanding that the previous in-
 20 cumbent may have held over and continued in office as aforesaid.

21 c. Members of the council shall serve without compensation, but
 22 shall be entitled to reimbursement for expenses in attendance at
 23 meetings of the council and in performance of their duties as
 24 members thereof.

1 8. The Cancer Control Council shall be empowered to:

2 a. Approve or disprove of any rule or regulation or any alter-
 3 ation thereof, proposed by the Commissioners of Environmental
 4 Protection or Health pursuant to section 4 or 5 of this act.

5 b. Study the State programs which may relate to the cause or
 6 cure of cancer and to make those recommendations to the concerned
 7 commissioner and to the Legislature which it deems necessary for
 8 the proper conduct and improvement of such cancer related
 9 programs.

10 c. Hold public hearings at least once each year in regard to
 11 existing or proposed cancer control statutes, rules, regulations
 12 and programs and upon the state of the art and technical capabili-
 13 ties and limitations in cancer control and report its recommenda-
 14 tions thereon to the concerned commissioners and Legislature.

15 d. Recommend that the concerned State department grant any
 16 moneys made available to it by future legislation or by the Federal
 17 Government for cancer research projects to the most qualified
 18 applicants and to those applicants proposing to perform the highest
 19 priority research.

1 9. The Departments of Environmental Protection and Health
 2 shall have power, in addition to those granted by any other law, to:

3 a. Conduct and supervise research programs for the purpose of
 4 determining the causes and cures of cancer and the effects and
 5 hazards of the distribution and use of carcinogens on man and his
 6 environment; and in furtherance of this research effort the com-
 7 missioner shall consider, as a primary source of assistance the
 8 American Cancer Society, the College of Medicine and Dentistry
 9 of New Jersey and Rutgers, The State University;

10 b. Conduct and supervise Statewide programs of cancer control
 11 education including the preparation and distribution of information
 12 relating to cancer control;

13 c. Enter and inspect any building or place, except private
 14 residences, for the purpose of investigating an actual or suspected

15 violation of law relating to carcinogens and ascertaining compliance
 16 or noncompliance with any rules, regulations or orders of the
 17 department and for the purpose of investigating suspected health
 18 hazards, documenting exposures, conducting epidemiological
 19 studies to establish a casual relationship between a suspect
 20 carcinogenic substance and cancer and to cooperate with the
 21 National Institute of Occupational Safety and Health and the
 22 Occupational Safety and Health Administration;

23 d. Receive or initiate complaints of violations of applicable laws,
 24 rules, regulations and orders relating to carcinogens and institute
 25 legal proceedings for the prevention of such violations and for
 26 the recovery of penalties, in accordance with law;

27 e. Cooperate with, and receive money from, the Federal Govern-
 28 ment, the State Government, or any county or municipal govern-
 29 ment or from private sources for the study and control of cancer.

1 10. If any person violates any of the provisions of this act or any
 2 rule or regulation promulgated pursuant to the provisions of this
 3 act, the concerned department may institute a civil action in a court
 4 of competent jurisdiction for injunctive relief to prohibit and
 5 prevent such violation or violations and the said court may proceed
 6 in the action in a summary manner.

7 Any person who violates the provisions of this act or any rule,
 8 regulation or order promulgated pursuant to this act shall be liable
 9 to a penalty of not more than \$3,000.00 for each offense, to be
 10 collected in a civil action by a summary proceeding under the
 11 Penalty Enforcement Law (N. J. S. 2A:58-1 et seq.) or in any case
 12 before a court of competent jurisdiction wherein injunctive relief
 13 has been requested. The Superior Court, County Court and county
 14 district court shall have jurisdiction to enforce said Penalty
 15 Enforcement Law. If the violation is of a continuing nature, each
 16 day during which it continues shall constitute an additional,
 17 separate and distinct offense.

18 The concerned department is hereby authorized and empowered
 19 to compromise and settle any claim for a penalty under this section
 20 in such amount in the discretion of the department as may appear
 21 appropriate and equitable under all of the circumstances.

1 11. Whenever an agent of either department finds, or has
 2 probable cause to believe that any carcinogen is being produced,
 3 manufactured, sold, labeled, released or used in violation of any
 4 provision of this act or any rule, regulation or order promulgated
 5 pursuant to this act, he may affix to such substance a tag or other
 6 appropriate marking giving notice that such substance has been

7 detained or embargoed, and warning all persons not to remove,
 8 dispose, or use such substance until permission is given by his
 9 department or a court. It shall be a violation of this act for any
 10 person to remove, dispose, or use any detained or embargoed
 11 carcinogen without such permission.

1 12. The powers, duties and functions vested in the State Depart-
 2 ment of Environmental Protection or the State Department of
 3 Health under the provisions of this act shall not be construed to
 4 limit in any manner the functions, powers and duties vested in
 5 either department under any other provisions of law.

1 13. If any provision of this act or the application thereof to any
 2 person or circumstance is held invalid, the remainder of the act
 3 and the application of such provision to persons or circumstances
 4 other than those to which it is held invalid, shall not be affected
 5 thereby.

1 14. This act shall be liberally construed to effectuate the purpose
 2 and intent thereof.

1 15. There is hereby appropriated for the administration of this
 2 act the sum of \$500,000.00 to the Department of Environmental
 3 Protection and \$500,000.00 to the Department of Health.

1 16. This act shall take effect immediately.

STATEMENT

Mortality and morbidity rates for cancer in New Jersey are among the highest in the Nation. The high incidence of cancer in New Jersey must be reduced to protect the health and welfare of the affected persons and our society as a whole. This bill authorizes the Commissioners of Health and Environmental Protection with the approval of the Cancer Control Council, to regulate the production, manufacture, sale, labeling and use of carcinogens and the release of carcinogens into the environment in order to protect the environment and the health of our people.

B U L L E T I N

N O. 5 9 5

March 18, 1977

ANNUAL MEETING SCHEDULE

I have had several inquiries concerning the Institute's Annual Meeting. The general information on the meeting is as follows:

Location: Marriott's Camelback Inn
Scottsdale, Arizona

Dates: Monday June 20-Thursday June 23.

Actually the Monday arrival is for Officers and Directors, and those who ordinarily report to the Board of Directors on Tuesday. Departure is around noon on Thursday, after the morning membership meeting.

A tentative schedule follows:

Monday 6/20 - evening	- Officers and Board of Directors Reception and Dinner
Tuesday 6/21 - all day	- Officers and Board of Directors Meeting
Wednesday 6/22 - morning	- Golf Tournament
- afternoon	- Membership Meeting
- evening	- Membership Reception and Dinner
Thursday 6/23 - morning	- Membership Meeting

I will have more details on the meeting after April 1 at which time I will request reservations etc. This information is passed along to help you avoid conflicts, and help in scheduling your plans for June.

EWD/erc

Distribution- Active Members
(List A)
Regional Members
(U.S.Dues)

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 9 4

March 17, 1977

FEDERAL REGULATIONS AND SPECIFICATIONS

There were two items published by the Federal Government in December 1976 which could be important to members. One is the NHTSA notice of December 30, 1976 entitled "Defect and Non Compliance Notification Regulation," and the other is the December 20, 1976 (Defense Supply Agency) "Federal Specification HH-L-361E."

Defect and Non-Compliance Notification Regulation

On December 30, 1976, the National Highway Traffic Safety Administration (NHTSA) published a notice amending "Defect Notification" requirements. This amendment, among other things, extended notification requirements to manufacturers of replacement equipment, where earlier requirements applied only to motor vehicle and tire manufacturers.

Because of the concern expressed recently by a member, I am forwarding copies of this to the Membership. The amendment (copy enclosed) is to take effect on June 28, 1977.

A brake lining manufacturer is not as of yet specifically covered for non-compliance with a standard unless he is providing original equipment brake lining for brake systems which must comply with DOT 105 or DOT 121 standards. There is no federal replacement brake lining standard. However, if a brake lining manufacturer sells replacement brake lining that he (or NHTSA) determines (or alleges) has a defect related to motor vehicle safety, he must comply with these requirements. Essentially that would mean any brake lining manufacturer selling his material for on-highway use in the United States.

The question arose as to whether there is a requirement that all such material be "date coded." In my reading of the regulation, I see no specific requirement for "date coding." However, the Administrator might allege that all of a certain product would have to be recalled, if defects were proven in some of a particular product line. If a manufacturer could prove that all defects were from a certain "batch" or "lot" with a certain "date code" or other identification, he might reduce the extent of his recall. Therefore, it would be possible to read into these regulations the desirability of a batch, lot or date identification.

Federal Specification HH-L-361E, Lining, Friction and Lining Material, Friction (Brake) Automotive Material

For many years the Defense Supply Agency has procured brake linings using Federal Specifications HH-L-00361D which among other things required the supplier's products to meet friction and wear requirements based on the SAE J661 friction test machine procedures. While the Defense Supply Agency has been the coordinator for this Federal Specification, the specification itself has been used as a basis for bidding by other governmental agencies.

March 17, 1977

As of December 20, 1976, Federal Specification HH-L-361E is effective. It replaces HH-L-00361D. Federal Specification HH-L-361E incorporates a single ended inertia dynamometer procedure. For civilian type vehicles, the vehicle OE lining performance standards will be the government standards. They say that applicable ordnance drawings will prescribe requirements for each replacement lining.

The dynamometer test is not specifically spelled out. It appears to be patterned after SAE J212, SAE J843d and DOT 105. However, the tables in the rear are filled with errors and inconsistencies. For example, on Page D-2 they have Stops 120-200 under the Torque heading. On Page D-3 they have Major Heading Line Pressure, with Deceleration below. On Page D-4 they have Ft/Sec instead of Ft/Sec². They might better have used forms from J212.

The important point is that HH-L-361E specifies a dynamometer test as a requirement rather than a friction machine test. In Section 3.3 "Replacement lining requirements--Inertia Wheel Dynamometer Test," it states that line pressures, displacement, and wear must fall within limits of the applicable drawing. What the "applicable drawing" is, I do not know.

* * * * *

Copies of these regulations and specifications, for your company, are being sent to:

The foregoing is for your information.

END/lmc

CC: Active Members - List B
Regional Members (US rights)

E. W. Drislane
Executive Director

B U L L E T I N

N O 5 9 3

March 1, 1977

DECLARATION RE PRODUCT CATEGORIES

FOR

FEE FORMULA BASIS

According to our Constitution and By-Laws, the Fee Formula for Active Members must be reviewed annually. Data on categories is accumulated and reported to a Fee Formula Committee and to the Board of Directors who then make recommendations on the fee schedule to the membership.

As a member may be engaged in a category one year and not the following (or the reverse) declarations must be filed annually in order to arrive at a proper fee formula and category assessment.

At the June 1975 meeting, the Board of Directors resolved that category filing information will no longer be confidential. This change was reviewed by Counsel and put into effect for fiscal 1976-77. All categories in which your firm is engaged must be reported. Category filing information will be assembled and reported in summary form to the Membership.

Would you kindly complete and return one copy of the attached form to the Institute Office. We will prepare a summary to assist the Fee Formula Committee and the Board of Directors in establishing the fee formula for the fiscal year starting July 1, 1977.

Filing categories are unchanged from those of recent years. Refer to the "Explanation of Category Filing" attached to the form. If you have questions, please give me a call.

Kindly return your declaration by March 15, 1977. A stamped return envelope is enclosed with the Delegate's copy.

EWD/lmc
Encs.

E. W. Drislane
Executive Director

Active Members - List F

EXPLANATION OF CATEGORY FILING

General - A member must be engaged in at least one of the first three categories, in order to be a member. The number of categories checked is used to determine the fees paid during the next fiscal year. Any member not filing this information correctly will be assessed the full fee for all categories.

Confidentiality - The fee category information is no longer confidential. The data will be reviewed by the Board of Directors to determine its reasonableness. Summary results will be distributed to the Membership.

Your Company is Engaged as follows: - If a member manufactures and sells, purchases and sells, or both purchases and manufactures, and sells the product indicated in the replacement market, he is engaged in that category. In other words, if he sells that product he is engaged in that category. Further, the replacement market includes automotive, industrial, and off road equipment--where Friction Materials Standards Institute, Inc. performs a service, either through cataloguing, assignment of copyrighted FMSI numbers, or the maintaining of prints. If a member sells a certain product type, but only to market where FMSI does not provide services, he does not report that category. Where a member sells a certain product only to a market where there are FMSI services available, but he declines to use these services, he must report that category.

Brake Linings - Under 3/4" Nominal, Including Disc Brake Linings

This includes linings whether loose, attached to shoes, or in roll form, sold to market where the FMSI numbering system is available.

Brake Blocks and Disc Brake Linings - 3/4" Nominal and Over

This includes brake blocks, whether loose or attached to shoes, sold to markets where the FMSI numbering system is available. The 3/4" nominal includes tapered blocks with a maximum thickness of approximately .700", with minimum thickness below .500". This also includes disc brake linings 3/4" and over, measuring lining thickness only at its thickest point. When measuring a lined shoe, to determine lining thickness, measure from the top of the shoe.

Clutch Facings

This includes loose facings or facings attached to plates, sold to markets where the FMSI numbering system is available.

Brake Shoes - New Unlined, Including New Unlined Disc Brake Shoes

This category includes new and unlined shoes (whether drum or disc type) which are sold as new and unlined shoes in the replacement market. If all the new and unlined shoes are sold as lined shoe assemblies, do not report this category.

Friction Materials Standards Institute, Inc.
E-210 Route #4
Paramus, N.J. 07652

Gentlemen:

In response to Bulletin #593 of March 1, 1977 concerning the
declaration of information to be used in determining the
fees, our company is engaged as follows:

<u>Category</u>	<u>We sell to the domestic replacement market:</u>
Brake Linings - Under 3/4" Nominal, Including Disc Brake Linings	☐
Brake Blocks - 3/4" Nominal or over	☐
Clutch Facings	☐
Brake Shoes - New Unlined, Including New Unlined Disc Brake Shoes	☐

Affix an "X" in the square to the right of the category or categories
your company is engaged in.

Signature _____

Company _____

Date _____

Kindly return declaration to the Institute Office by March 15, 1977.

B U L L E T I N

N O. 5 9 2

February 16, 1977

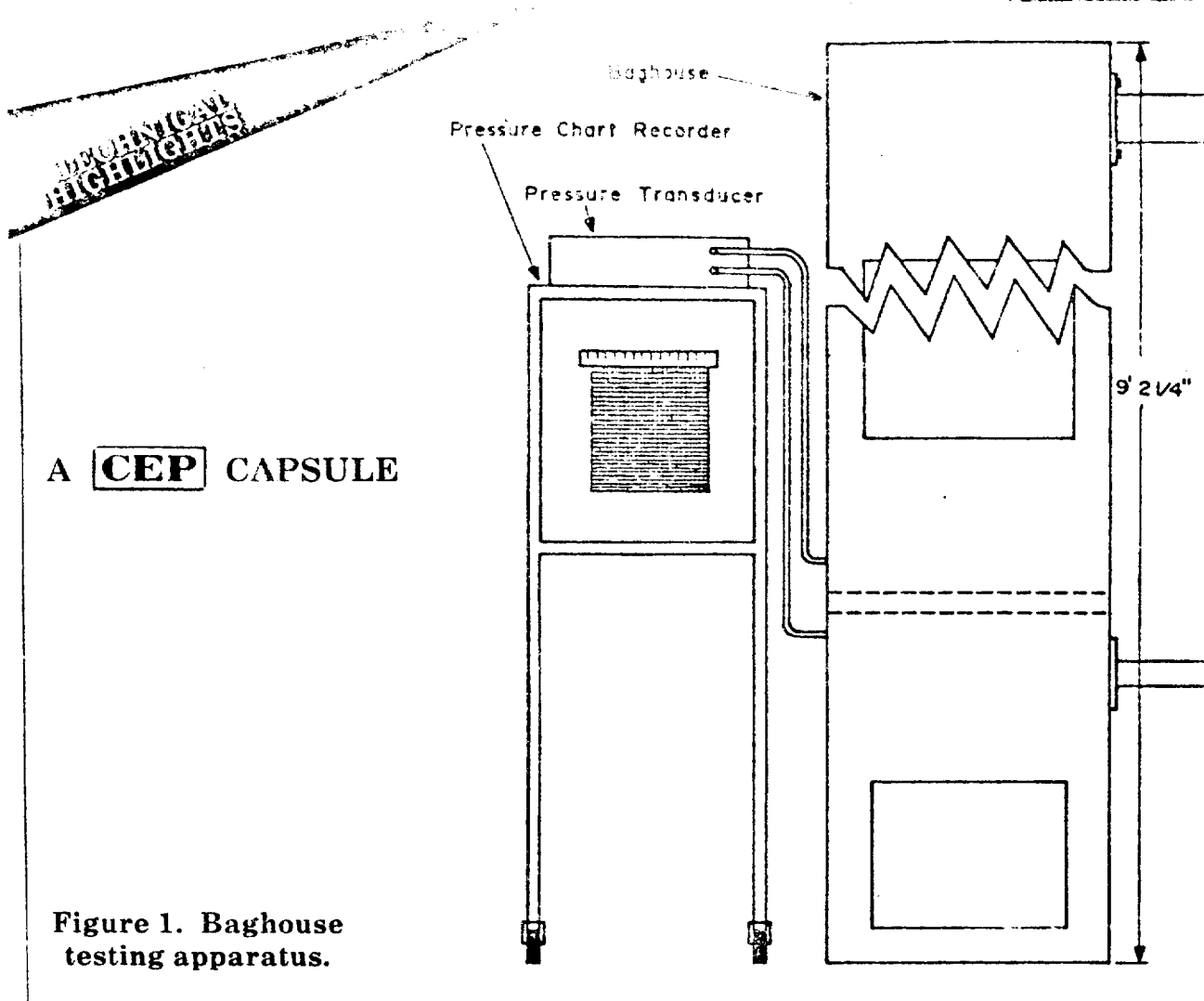
OPTIMIZING BAGHOUSE PERFORMANCE TO CONTROL ASBESTOS EMISSIONS

Enclosed is a copy of an article concerning a research paper prepared by IIT Research Institute under an EPA Contract. It describes various tests and results of the research and appeared in Chemical Engineering of January 1977.

The full paper is available from AIChE Publications, as noted at end of this article. This is for your information.

EWD/erc
Enclosure:
Dist: Active Members - List C
Regional Members (U.S.Dues)

E. W. Drislane
Executive Director



Optimizing Baghouse Performance.

A system of two baghouses in series was found not to be significantly more efficient for reducing emissions than was a single baghouse in a stabilized condition.

C. F. Harwood and P. C. Siebert, IIT Research Institute, Chicago, Ill.
D. K. Oestreich, Environmental Protection Agency, Research Triangle Park, N.C.

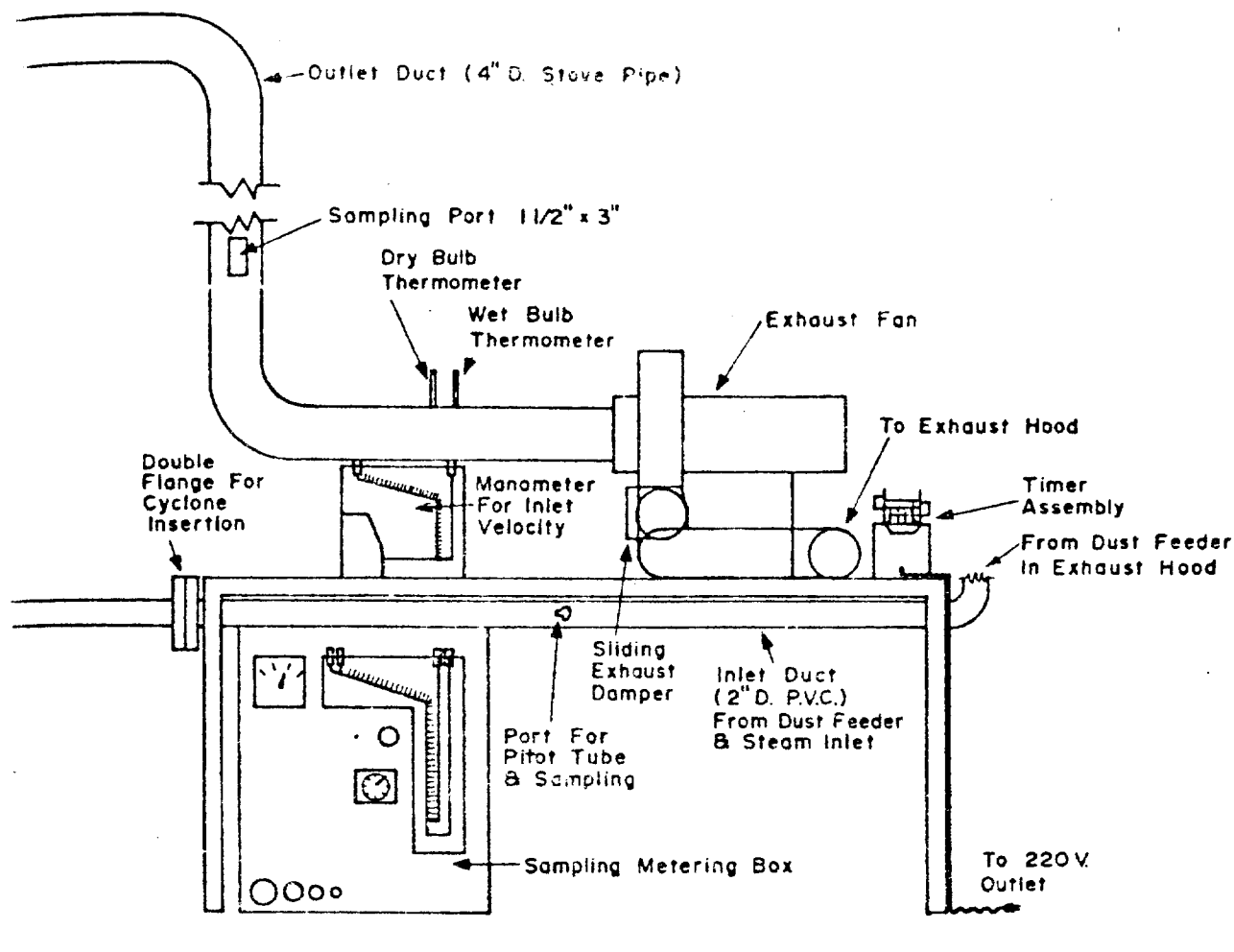
The carcinogenic properties of asbestos have made it imperative that the best available technology, operating at optimal conditions, be used in controlling emissions of these fibers to the atmosphere. This article summarizes the results of laboratory studies undertaken to optimize baghouse performance in this service.

The operating parameters of the baghouses were varied to establish optimum conditions for minimizing the number of fibers in the outlet. These parameters, which were studied in a statistically designed experimental plan, were: 1) filter fabric, 2) air-to-cloth ratio, 3) dust loading, 4) relative humidity, 5) shaking amplitude, 6) frequency, and 7) duration of and time between shaking cycles.

Ranges of the values of the variables were based on those published in the literature, together with a survey of industrial users (1) and consultation with EPA. (2) By statistical design, the levels for each variable was limited to three in order to restrict the tests to a reasonable number.

Experimental apparatus

The baghouse used for this study was a No. 1 model 70-BC Assembled Intermittent Wheelabrator Dustube Dust Collector manufactured by Wheelabrator-Frye Corp. These nominally sized bags are 127 cm. deep and 178 cm.



... To Control Asbestos Emissions

long. For most tests, only two filter bags were used at a time.

The manual shaker mechanism was adapted to automatic operation. A 1/4 h.p., 3,450 rev./min. motor with a variable transmission producing 0 to 675 rev./min. was mounted on the rear of the baghouse and calibrated by a stroboscope. The motor drive of the test apparatus, Figure 1, was then connected to the shaking lever cam with three eccentric positions that produced shaking amplitudes of 0.85, 1.75, and 3.5 cm.

An automatic timing system was constructed that could be set for a specific shaking duration (preceded and followed by 1 min. of settling), and time between shakes. It also controlled the operation of the main blower, an optional auxiliary blower, the dust feeder, sampler, shaker, pressure transducer, and chart recorder.

Filter fabrics chosen for study included three cottons, two Dacrons, and one Nomex. Cotton, the most commonly used fabric in industrial asbestos emission control applications, has been found (3) to be more efficient than Dacron for controlling fly ash emission over a 30 min. cycle.

Three cotton fabrics were chosen: a sateen (the most

commonly used), a napped fabric (more efficient in some applications), and the only commercially available twill. Draemel's work (4) indicated that, for fly ash, a 3 x 1 or 3 x 2 twill with a high thread count would be the most efficient. Dacron fabrics were chosen as they are the second most commonly used fabric in the asbestos industry. Nomex is the most common fabric for high temperature asbestos applications.

A Vibra-Screw, Inc., SCR-20 screw feeder that maintains a constant, linearly-variable, feed rate over the required range of 5 to 60 g./min. was used to feed the test dust. The feeder had a hopper capacity of 56.6 l., which allowed unattended operation at low feed rates for long periods.

An air velocity of 300 m./min. must be maintained in the inlet duct to keep the sifted asbestos cement waste suspended. To accomplish suspension for the lowest air-to-cloth ratio of 0.46 cu. m./min./sq. m. (1.5 cu. ft./min./sq. ft.), an inlet duct of ~5 cm. diameter (2 in. Schedule 40) PVC pipe was used. A 1 h.p., 3,450 rev./min. centrifugal blower, equipped with a sliding damper to control flow, was capable of maintaining the two bag system at an air

to-cloth ratio of 1.22 cu. m./min./sq. m. (4.0 cu. ft./min./sq. ft.) at moderate pressure drops (≤ 7.0 cm. H_2O) across the filter bags. Velocity measurements were made by pitot tube in both the inlet and outlet ducts.

A separate, non-shaking, two-bag baghouse was designed and constructed of 1.9 cm. plywood for the bag series system.

Particulate sampling was conducted by isokinetic sampling onto a filter using a modified EPA Method 5 sampling train. It consisted of a short 38.0 cm. probe and S-type pitot tube with the filter holder connected directly to the sampling meter box. The sampling port was 8.6×4.3 cm. and located in the vertical outlet section at the EPA Method 5 required distances (eight diameters downstream and five diameters upstream) from changes of direction. The filter used was a Millipore filter (MF) of 0.8 μ m pore size.

The fibers emitted were quantified by counting the fibers captured on the membrane filter using optical microscopy for fibers greater than 1.5 μ m in length and transmission electron microscopy for fibers greater than 0.06 μ m in length. A Royco Model 245 particle counter with Module 510 display was used to measure total particles in the overall size range of 0.3 to 5.0 μ m.

Results obtained

For all the fabrics and values of the baghouse operating parameters tested, the mass efficiencies of asbestos collection exceeded 99.99%. However, extremely high numbers of small fibers may still be emitted while attaining such high efficiencies. In terms of number efficiencies, large numbers of fibers were emitted while a high efficiency was being achieved, especially in the case of high inlet loading.

Typical outlet concentrations of asbestos fibers on the order of 10^5 – 10^7 fibers/cu. m. (for fibers ≥ 1.5 m.) and 10^8 – 10^9 fibers/cu. m. (for fibers ≥ 0.06 m.) were found to be emitted.

Operating parameters that were found to be statistically significant in causing reductions in asbestos emissions were: 1) bag fabric, 2) waste type, 3) air-to-cloth ratio, 4) relative humidity, 5) period between shakes and shaking duration, and 6) shaking amplitude. The following findings with regard to the effect of these variables on fiber outlet concentrations were established:

1. Cotton sateen was as efficient as, or more efficient than, all other fabrics tested in reducing emissions in all size ranges.
2. Raw asbestos fibrous waste emits fewer fibers of length ≥ 6.0 μ m than does asbestos cement waste for equal dust loadings by mass in the air stream.
3. For the air-to-cloth ratios studied (0.46 to 1.22 cu. m./min./sq. m. or 1.5–4.0 cu. ft./min./sq. ft.), the optimum ratio was 1.22 cu. m./min./sq. ft. (4.0 cu. ft./min./sq. ft.).
4. There is some evidence to indicate that a decrease in relative humidity may reduce the outlet concentration of fibers ≥ 6.0 μ m.
5. The combination of long period between shakes and short shaking duration produces significantly lower outlet concentrations than does that of short period between shakes and long shaking duration.
6. Higher shaking amplitudes produce lower outlet concentrations.
7. Outlet concentration is not a significant function of stabilization period for periods greater than 24 hr.
8. A system of two baghouses in series is not significantly more efficient than is a single baghouse in a stabilized condition.
9. Recycling the exhaust from a section of stabilizing new bags to a previously stabilized section may drastically reduce the high initial outlet concentrations from a new bag.

The pressure drop across the fabric filter was found to be prohibitively high (≥ 12.7 cm. H_2O) for economic operation in the stable condition in most tests at the low values of shaking amplitude, frequency, and duration of 0.875 cm., 1.0 cycles/sec., and 20 sec., respectively. However, it was found that when the high values of either shaking amplitude (3.5 cm.) or frequency (5 cycles/sec.) were employed, the resulting pressure drops were quite reasonable (≤ 5 cm. H_2O). Thus, the most economical alternatives: cotton sateen bags, high air-to-cloth ratio, and low pressure drop operating conditions, have been shown to be among the most significant in reducing asbestos emissions.

In four phases, the experimental program has established the individual effects of factors that can be manipulated to reduce the outlet concentration of asbestos fibers from enclosed sources. Of the factors, the type of bag, air-to-cloth ratio, shake amplitude, and the shake cycle period and duration (jointly) significantly affect the outlet concentration of asbestos fibers. To reduce the outlet concentration of asbestos fibers, the levels of these variables considered in this study should be set as follows:

Bag type—cotton sateen.

Air-to-cloth ratio—1.22 cu. m./min./sq. m. (4.0 cu. ft./min./sq. ft.)

Amplitude of shake cycle—3.5 cm.

Period and duration of shake cycle—120 min. and 20 sec., respectively

These recommendations are based on the results of the individual effects of the levels of factors considered and degree of precision of the measurement of outlet concentration attained.

Acknowledgment

This article summarizes the work accomplished under EPA Contract 68-02-1353 by the IIT Research Institute. Detailed results are presented in Report No. EPA-600/2-76-065, March 1976 (NTIS Publication No. PB 251-623/AS).

Literature cited

1. Harwood, C. F., P. C. Siebert, and T. P. Balszak, "Assessment of Particle Control Technology for Enclosed Asbestos Sources," Report No. EPA-650/2-74-088 (NTIS No. PB 239-926/AS) (October, 1974).
2. Turner, J. H., EPA, IERL-RTP Private Communication (November, 1974).
3. Dennis, R., "Collection Efficiency as a Function of Particle Size, Shape and Density: Theory and Experience," Proceedings: Symposium on the Use of Fabric Filters for the Control of Submicron Particulates (November, 1974).
4. Draemel, D. C., "Relationship Between Fabric Structure and Filtration Performance in Dust Filtration," Report No. EPA-R2-73-288, NTIS No. PB-222-237, (July, 1973).

The complete manuscript of 28 pages may be obtained for \$6.00 (U.S. prepaid only) by writing AICHE Publications Dept., 345 E. 47 St., New York, N.Y. 10017. Foreign add \$2.50, prepaid only. Request MS No. 8539. Lib. Ref. No. 69A.



Harwood



Siebert



Oestrich

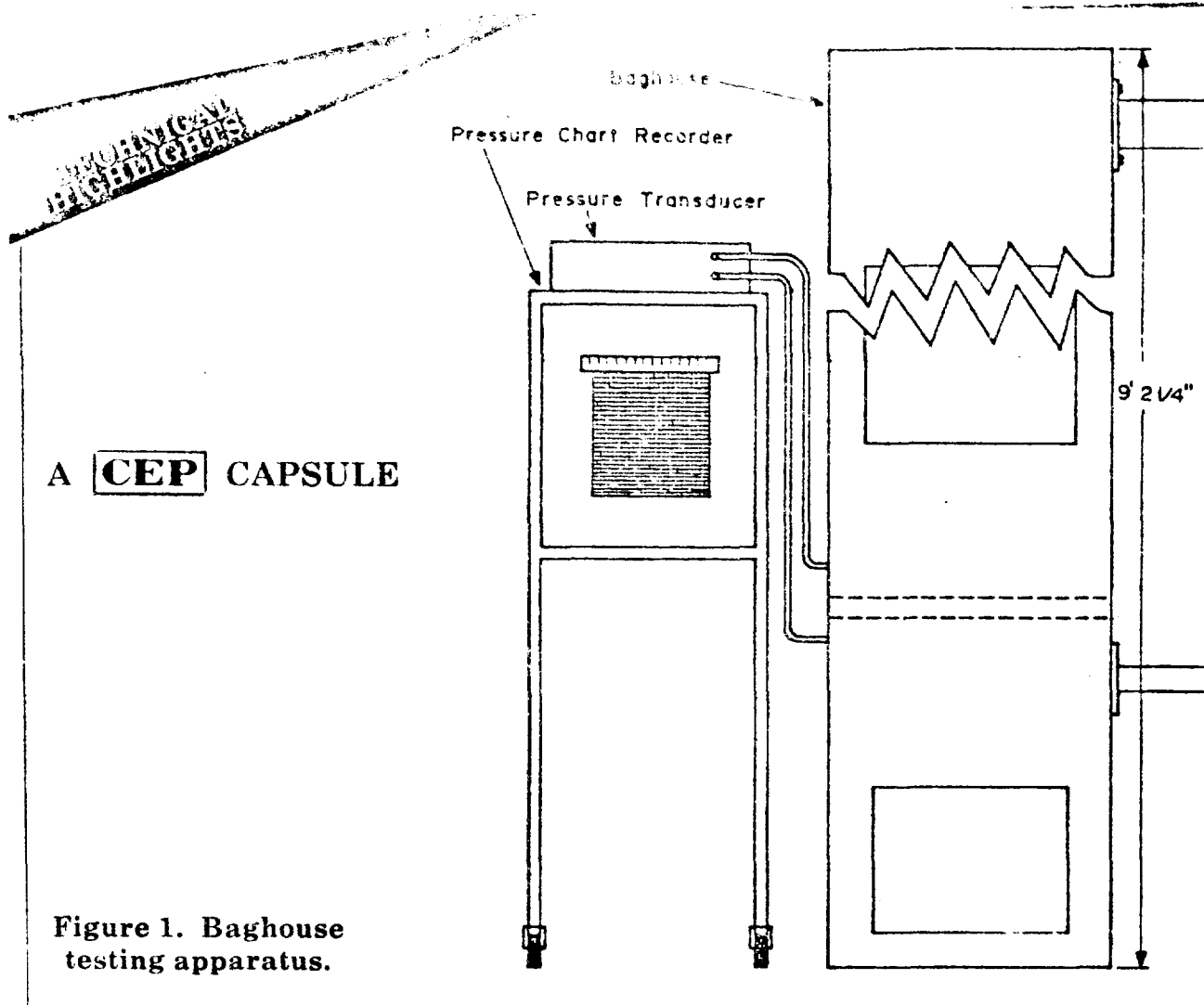


Figure 1. Baghouse testing apparatus.

Optimizing Baghouse Performance.

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C. F. Harwood and P. C. Siebert, IIT Research Institute, Chicago, Ill.
D. K. Oestreich, Environmental Protection Agency, Research Triangle Park, N.C.

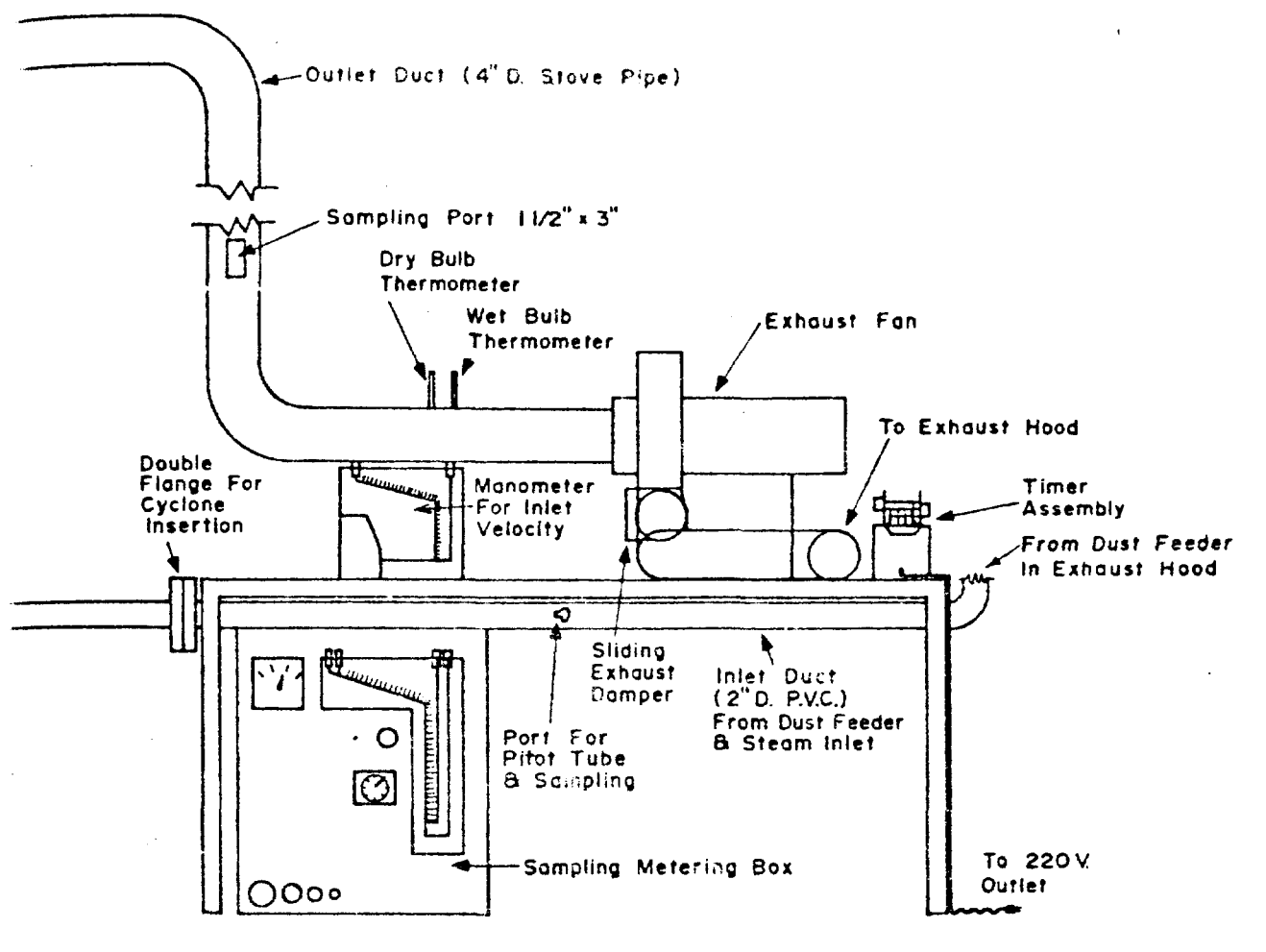
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... To Control Asbestos Emissions

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9. Recycling the exhaust from a section of stabilizing new bags to a previously stabilized section may drastically reduce the high initial outlet concentrations from a new bag.

The pressure drop across the fabric filter was found to be prohibitively high (≥ 12.7 cm. H_2O) for economic operation in the stable condition in most tests at the low values of shaking amplitude, frequency, and duration of 0.875 cm., 1.0 cycles/sec. and 20 sec., respectively. However, it was found that when the high values of either shaking amplitude (3.5 cm.) or frequency (5 cycles/sec.) were employed, the resulting pressure drops were quite reasonable (≤ 5 cm. H_2O). Thus, the most economical alternatives: cotton sateen bags, high air-to-cloth ratio, and low pressure drop operating conditions, have been shown to be among the most significant in reducing asbestos emissions.

In four phases, the experimental program has established the individual effects of factors that can be manipulated to reduce the outlet concentration of asbestos fibers from enclosed sources. Of the factors, the type of bag, air-to-cloth ratio, shake amplitude, and the shake cycle period and duration (jointly) significantly affect the outlet concentration of asbestos fibers. To reduce the outlet concentration of asbestos fibers, the levels of these variables considered in this study should be set as follows:

Bag type—cotton sateen.

Air-to-cloth ratio—1.22 cu. m./min./sq. m. (4.0 cu. ft./min./sq. ft.)

Amplitude of shake cycle—3.5 cm.

Period and duration of shake cycle—120 min. and 20 sec., respectively

These recommendations are based on the results of the individual effects of the levels of factors considered and degree of precision of the measurement of outlet concentration attained.

Acknowledgment

This article summarizes the work accomplished under EPA Contract 68-02-1353 by the IIT Research Institute. Detailed results are presented in Report No. EPA-600/2-76-065, March 1976 (NTIS Publication No. PB 251-623/AS).

Literature cited

1. Harwood, C. F., P. C. Siebert, and T. P. Balszak, "Assessment of Particle Control Technology for Enclosed Asbestos Sources," Report No. EPA-650/2-74-088 (NTIS No. PB 239-926 [AS]) (October, 1974).
2. Turner, J. H., EPA, IERL-RTP Private Communication (November, 1974).
3. Dennis, R., "Collection Efficiency as a Function of Particle Size, Shape and Density: Theory and Experience," Proceedings, Symposium on the Use of Fabric Filters for the Control of Submicron Particulates (November, 1974).
4. Draemel, D. C., "Relationship Between Fabric Structure and Filtration Performance in Dust Filtration," Report No. EPA-R2-73-288, NTIS No. PB 222-237, (July, 1973).

The complete manuscript of 28 pages may be obtained for \$6.00 (U.S. prepaid only) by writing AICHE Publications Dept., 345 E. 47 St., New York, N.Y. 10017. Foreign add \$2.50, prepaid only. Request MS No. 8539. Lib. Ref. No. 69A.



Harwood



Siebert



Oestrich

B U L L E T I N

N O. 5 9 1

February 10, 1977

APPLICATIONS FOR REGIONAL MEMBERSHIP

Industria Colombiana de Asbestos ("Incolbestos")

This is to advise that the application for Regional Membership submitted by Industria Colombiana de Asbestos of Bogota, Colombia has been accepted by the Membership. Background on the new member was given in our General Bulletin No. 585 of December 17, 1976.

Friction Materials Corporation (Dimona, Israel)

This is to advise the Membership that we have received an application for Regional Membership from Friction Materials Corporation, of Dimona, Israel. Their application is now being reviewed by the Membership Committee who will then make recommendations to the Board of Directors. No action is required of the Membership at this time. However, if you have any information that might relate to applicant's eligibility for Regional Membership, it would be appreciated if you would send such information to the Institute Office.

As regards background, Mr. Hugo Schwartz of the Friction Materials Corporation first contacted me about Regional Membership in 1974. At that time he had called from New York while in the States. My reply to his questions concerning membership was sent to his International Corporation, care of the Government of Israel Trade Center at 111 West 40th Street, New York City. Phone calls and correspondence since that time have been with either Mr. Schwartz or Mr. Naidad Rabin who is General Manager of U. S. Operations, of the Friction Materials International Corporation, with address same as the Government of Israel Trade Center (111 West 40th Street).

The Friction Materials Corporation wishes Regional Membership with rights to use the copyrighted FMSI numbers for marketing their products in the United States. They are aware that they must pay the same (higher) dues level of United States Active Members. Their application was received with a deposit of the necessary \$1,300, which--if accepted--would be applied to part of the first year dues. To my knowledge they are not affiliated with any other member and they are not operating under any licensing agreement with other manufacturers.

The foregoing is sent to the Membership as a matter of information.

EWD/erc

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 9 0

January 18, 1977

1977 SUPPLEMENT TO THE 1976 BRAKE SHOE IDENTIFICATION CATALOG

The contract for the printing of the "1977 Supplement to the 1976 Brake Shoe Identification Catalog" has been awarded to:

Success, Inc.
1345 West 16th Street
Indianapolis, Indiana 46202

It is believed that it will contain 24 pages with self-cover.

On an estimate of the total order being 30,000 copies of a 24 page book, the price is:

\$143.30 per M
\$ 3.60 per M additional for five hole punching

If there is a change in the price per thousand due to a change in number of pages or to change in order quantities, or for author's alterations, you will be notified.

Please forward all orders to the Institute Office. Do Not send them to the printer. (British Council and FMSI Canada members send to your respective associations). This is our only means of checking the total quantities ordered and the price charged, as well as whether only members are ordering.

The orders should be made out to Success, Inc. and state punching and shipping instructions. If applicable, please advise any special instructions necessary to ship through your customs.

Kindly forward your orders so that they reach the Institute Office by March 1, 1977.

E. W. Drislane
Executive Director

Distribution: Active Members - List - D
Regional Members
Licensees

B U L L E T I N

N O. 5 8 9

January 18, 1977

ORDERS FOR THE 1977 AUTOMOTIVE DATA BOOK

The contract for the printing of the "1977 Automotive Data Book" has been awarded to:

Tweddle Litho Company
24000 Harper Avenue
St. Clair Shores, Michigan 48080

It is believed that it will contain 112 pages plus cover.

On an estimate of the total order being 80,000 copies of a 112 page book, the preliminary price is:

\$374.40 per M
\$ 12.60 per M additional for five hole punching

If there is a change in the price per thousand due to a change in number of pages or to changes in order quantities, or for author's alterations, you will be notified.

Please forward all orders to the Institute Office. Do not send them to the printer. (British Council and FMSI Canada members send to your respective associations). This is our only means of checking the total quantities ordered and the price charged, as well as whether only members are ordering.

The orders are to be made out to Tweddle Litho Company, and are to state punching and shipping instructions. If you have special instructions such as "no cover," please indicate if you wish "no stitch" and "no trim." If applicable, please advise any special conditions for shipping through your customs.

Please forward your orders so that they reach the Institute Office by March 1, 1977.

E. W. Drislane
Executive Director

Distribution: Active Members - List D
Regional Members

BULLETIN

NO. 508

January 5, 1977

HISTORICAL SALES PROGRAM

The historical sales program continues on a quarterly basis. Regional Members using the copyrighted FMSI Numbers for marketing their products in the United States may participate if they wish.

The Institute is requesting details of pieces sold for the full calendar year 1976 (12 months ending December 31, 1976). The rules for the reporting details remain unchanged.

1. Quantities will be reported in pieces (not units). For roll linings, each foot of length will be one piece.
2. Our Accountants will report the names of the members from whom reports are received, and the names of members reporting in each of the four groups.
3. Total pieces in each group will be reported.
4. "Clutch Facings" does not include gear tooth discs, automatic transmission discs, or the 8-14" dia., (3/16 to 1/2" thick) asbestos composition discs.

While there is no change in your reporting to the Accountants, there will be a change in the form of the report to be rendered by the Accountants. Based on resolutions at the June 1976 membership meeting, for the annual report only, the Accountants will be asked to list the names of the members reporting in each product line. (On the quarterly reports, they have been listing only the members reporting without indicating who reported by product line).

The data as filed will be confidential. Totals for each group will be shown and there is no way of determining quantities by individual members.

You will be receiving from Marshall Granger & Company, Certified Public Accountants, a form for completing this information. Please return it to:

Marshall Granger & Company, C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

If you report, please have your figures in by February 15, 1977. If you do not wish to report these figures, no reply is necessary. Only those reporting figures will receive the industry totals when the data is summarized. A sample form and definitions are attached.

EWD/erc
Encs.

Distribution: Active Members-List G
Regional Members (paying
Active Member Dues)

E. W. Drislane
Executive Director

EXHIBIT "A"

STATISTICAL PROGRAM OF THE
FRICTION MATERIALS STANDARDS INSTITUTE, INC.

Mail to:

MARSHALL GRANGER & CO., C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

* * * * *

See instructions for sales to other members.

Pieces sold to United States distributors, jobbers, private brands, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies, or other customers for use in the United States replacement market:

12 MONTHS JANUARY 1 to DECEMBER 31, 1976

Brake linings less than 3/4"
nominal thickness (See explanation
for roll lining).

Brake blocks, nominal thickness
of 3/4" and over

Disc brake lining

Clutch facings

SAMPLE
FORM

USE REPORTING FORM TO
BE SENT BY ACCOUNTANTS

By: _____

Signature

Company

Date

EXHIBIT "B"

DEFINITION FOR HISTORICAL SALESPIECES

The reports will show pieces of friction material, in groups as shown:

<u>Group</u>	<u>Description</u>	<u>Normal Usage</u>
Brake Lining	Friction materials less than a nominal 3/4" thickness (See note on roll lining)	Normally, <u>one piece</u> to a shoe
Brake Blocks	Friction materials with a nominal thickness of 3/4" and over	Normally, <u>two pieces</u> to a shoe
Disc Brake Linings	Friction materials sold (for disc brakes) to be attached to the shoe, or sold as a unit molded, bonded or riveted to the shoe	Normally, <u>one piece</u> to a shoe
Clutch Facing	Friction materials of annular shape, or segments thereof	Normally, <u>two annular pieces</u> per clutch plate

Note: For roll lining only, consider each foot of length equals one piece.

REPLACEMENT SALES TO UNITED STATES MARKET

This reporting is for sales to the United States replacement market only. Do not include sales to other markets. This includes sales under the friction material manufacturer's own name or brand name used by the customer, to automotive warehouse distributors, jobbers, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies or other customers for use in the United States replacement market.

When a friction materials manufacturer is shipping to a vehicle manufacturer, brake manufacturer, or clutch manufacturer, but has no reasonable way of determining if the pieces are for original equipment or replacement purposes, estimates will not be used - these pieces will not be reported. However, where a friction material manufacturer is shipping to a point known to be used for replacement, or where he stencils or otherwise identifies the pieces as being for replacement purposes, or where the shipments otherwise are obviously known to be for replacement, these pieces will be reported.

The member who sells to the type customer or user indicated above will report those pieces sold, even if purchased from another Active Member or Regional Member.

When you sell your friction materials to another Member (Active or Regional) do not report those sales! Materials sold to Licensee Members of the Institute for the replacement market should be included.

B U L L E T I N

N O. 5 8 7

January 4, 1977

PRODUCT LIABILITY LITIGATION--ASBESTOS EXPOSURE

Over the past months, the Institute Office has received correspondence relating to asbestos. Most of this correspondence was referred to our Asbestos Study Committee. The Acting Chairman of the Committee felt it would be worthwhile to distribute the attached to the membership.

The Automotive Service Industry Association (ASIA) forwarded the attached copy of a letter sent by a Philadelphia Law firm. In this letter, the firm indicates a willingness to accept work in product liability litigation, and in the last paragraph specifically mentions cases involving exposure to asbestos.

The significance is that while workmen's compensation may cover a manufacturer for his own employees, litigation may be initiated by third parties. It is for this reason among others that OSHA warning labels and other means of alerting brake/clutch service personnel are recommended wherever the possibility of subsequent exposure to asbestos dust exists.

E. W. Drislane
Executive Director

Distribution: Active Members - Lists A, C
Regional Members (U.S. Dues)

500 LAND TRUST BUILDING
1600 CHESTNUT STREET
PHILADELPHIA, PA 19100
LOCUST 8 2656
AREA CODE 215

COPY

JOSEPH D. SHEIN
ALVIN BROCKMAN
ALLAN M. DARGOW
BARRY S. YACHES

OF COUNSEL
LEWIS J. FINESTONE
SAMUEL ABRAHAMSON
JAMES TERPOLILLI

MEMBER DISTRICT OF COLUMBIA BAR

MICHAEL IANNUZZI
1927-1964

CABLE ADDRESS
JORMEL

MONTGOMERY COUNTY O.
249 MERION ROAD
MERION, PA 19066
TELEPHONE
MO 7-0333

July, 1976

To my Colleagues in Law:

I have two questions for your consideration.

First, why does a lawyer usually sue the doctor and very seldom the drug company where there is a drug related injury?

Second, why does a lawyer usually collect only workmen's compensation where there may be a valid third party claim for personal injuries against a manufacturer or designer of a product?

It has been our experience that many suits against physicians should in reality be actions against drug companies and that many workmen's compensation cases should proceed into third party claims against the manufacturer, designer or distributor of a product.

If you find a result which is not reasonably related to an initial injury or an initial condition, ask yourself if a drug reaction may not have taken place.

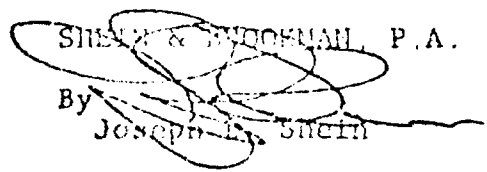
In a workmen's compensation case, ask yourself if an action does not lie against a third party for a design defect or failure to produce a safe product.

Naturally, this does not mean that every drug reaction or that every injury resulting from a product is compensable. It does mean that these matters should be investigated thoroughly.

This office will accept the forwarding of work in drug litigation and in product manufacture and design litigation. In addition, this office would be willing to accept cases involving injury or death from exposure to asbestos particularly where such exposure has been to an employee at the Philadelphia Naval Shipyard and other places of employment. This office represents approximately litigants in asbestos actions resulting in injury or death.

Sincerely,

SHEIN & BROCKMAN, P.A.

By 
Joseph D. Shein

JDS/as

FMSI 17715

B U L L E T I N

N O. 5 8 6

January 4, 1977

RECENT ITEMS ON ASBESTOS EXPOSURE: (1) NIOSH DOCUMENT; (2) CONTROL BY
WET CUTTING

NIOSH Recommendation for 0.1 Fiber/CC exposure level

The Asbestos Information Association (AIA) has sent me a copy of the most recent document concerning asbestos exposure put out by the National Institute for Occupational Safety and Health (NIOSH). This was transmitted to the Department of Labor on December 15, 1976.

As you realize, on October 9, 1975 the Occupational Safety and Health Administration (OSHA) proposed to lower the level for occupational exposure to asbestos from the current 2 fiber/cc level to 0.5 fiber/cc. This NIOSH document recommends the lowering of the exposure level to 0.1 fiber/cc.

This is a 110 page document. I am enclosing copies of Section V--BASIS FOR A STANDARD, and Section VI--RECOMMENDED STANDARD (10 pages).

Asbestos Dust Control - Wet Cutting of Brake Lining

The Acting Chairman of the Asbestos Study Committee sent along the enclosed article, as it appeared in BUSINESS WEEK of November 1, 1976, and suggested it may be of interest to the members.

In particular it describes water jet technology for the cutting of asbestos materials, and it proceeds to discuss this application at General Motor's Inland Division for the cutting of brake lining.

* * * * *

The enclosed is being sent as a matter of information.

E. W. Drislane
Executive Director

Distribution: Active Members - List C
Regional Members

A supersonic jet of water can cut with less waste, noise, and dust than a saw.

INDUSTRIAL PRODUCTION

Learning to cut with water

Researchers proved a decade ago that a high-pressure jet of water could slice like a knife through such material as cardboard, fabric, and asbestos. Since then, several companies have put waterjet cutters to work doing just that. But because most of the early waterjet applications were shrouded in secrecy, the market has been slow to develop.

Now the waterjet market is picking up momentum fast, however. Companies such as General Motors Corp., which uses a waterjet to trim brake lining material, are turning to the still-developing technology to help meet federal noise and dust regulations, cut down on material waste, or simplify maintenance. And some—in footwear, clothing, and boxboard plants—are marrying jet cutters to computer controls.

The two suppliers that dominate the waterjet industry—McCartney Mfg. Co. and Flow Research Inc.—say that customers are beginning to treat the waterjet cutter as a production tool rather than an experimental device. And Yih-Ho Pao, president of Flow Research, is bullish on sales. "The market should be more than \$10 million in 1977," he says, "and automation could make it \$1 billion eventually."

High investment. Waterjets use a "high-pressure intensifier" pump to boost water pressure as high as 60,000 psi, then blast it through a nozzle only about 0.008 in. in diameter at twice the speed of sound. The resulting stream can punch through most nonmetallic materials without many of the problems of conventional tools. "It does the same

thing a saw does, but without the noise, dust, or tool wear," says Walter W. Thrush, director of product engineering at GM's Inland Div. The division's Dayton (Ohio) plant uses a McCartney jet cutter to trim 40% of the division's brake lining output, and GM has ordered a second McCartney machine to double its water-cutting capacity. "The initial investment is the biggest problem," says Thrush, "but the total cost of operation

Waterjets gain acceptance as production tools; some have computerized controls

is less than with the carbide saws we were using.

The GM system works at simple, straight-line cutting. Flow Research sees a much bigger market for more sophisticated machines. It has just delivered an example of what it has in mind: the first waterjet system in the U. S. controlled by a minicomputer.

The \$300,000 system was bought by Weyerhaeuser Co. for its corrugated cardboard production plant in Austin, Minn. A battery of six Flow Research jets will slit board as it spews out at 500 ft. per minute, while mechanical devices score the board for later folding. The system is tied into a minicomputer that stores up to 75 different order sizes. It can reposition the cutters and scorers to within 1/64-in. accuracy in seven seconds. The system eliminates rotating knives and the manpower needed to sharpen and reposition them. And it produces cleaner cuts, according to Flow Re-

search's Yih-Ho, because the waterjet trims cardboard without crushing it.

Its own software. Flow Research, with about 55 jet cutters installed and some 160 sold over its five year lifetime, is aggressively marketing its integrated approach to the boxboard industry. The company developed its own software for Weyerhaeuser and has sold 72 similar systems to Genco International, a West German manufacturer of boxboard production equipment. "We're offering the basic \$30,000 machine or the complete system," says Yih-Ho.

An even more sophisticated system is scheduled for delivery in December to Oxford Industries Inc., a large apparel manufacturer. The computerized system that will control the cutter was developed by CAMSCO Inc., of Richardson, Tex., to create patterns for garments of varied size from a single sample size. It "nestles" them into the best arrangement for minimum material waste.

In the past, CAMSCO's machine would then map out full-sized patterns on paper, which were then placed on material and cut out by hand. The Oxford system will swap a waterjet cutter for the plotter that drew the patterns; it can cut more than 100 layers of material at once. John P. Hunter Jr., Oxford's vice-president for research and development, predicts that the new system's accuracy will reduce waste by allowing pieces to be placed so their lines touch. "We can't do that with steel rule dies or hand knives," he says.

The CAMSCO system uses jet cutters purchased from Flow Research or Petrodyne Corp., an industry newcomer based in Longview, Tex. The company has sold six of the systems, priced between \$175,000 and \$250,000, to apparel makers, furniture upholsterers, and footwear companies, according to Richard E. Jaffe, CAMSCO's general manager.

So far, McCartney has been considerably more cautious about the future for such highly sophisticated, expensive systems. "We have no role at all to play in developing computerized control equipment," says Gerald K. Faaborg, manager of fluids and cutting systems at McCartney, a subsidiary of Ingersoll-Rand Co. "Our forte is hardware." McCartney machines have been used to cut footwear pieces in three computerized systems, one of them developed by Genesco Inc., the U. S. apparel manufacturing giant, and two now under development by Britain's Shoe & Allied Trades Research Assn. But in these cases the computer software has been developed by the buyer.

Petrodyne has only four prototype machines in use. But it clearly sees boom times ahead. "I think we've got a bear by the tail," declares President Cecil I. Greer. "There are so many applications it's hard to tell how far it will all go."

V. BASIS FOR A STANDARD

The first modern approach to the setting of an asbestos standard was proposed by the British Occupational Hygiene Society (BOHS 1968) in terms of fiber concentration. In 1968, a subcommittee of the Society evaluated data on 290 men at work in an asbestos factory. This data was provided by company sources. All the men had been employed after January, 1933, following implementation of dust control measures mandated by the Factory Inspectorate in 1931. Estimates were also provided by the company of the fiber exposure of these workmen. Of the 290 individuals, 8 were stated to have x-ray evidence of asbestos disease and 16 to have rales. Noteworthy in the 1968 data was the preponderance of individuals who had been employed less than 20 years. Only 118 of 290 had worked for longer than 20 years and a scant 13 had been employed for 30 or more years.

After a review of these data, the BOHS proposed a standard which was adopted with minor modifications by the British government in 1969, and implemented in May, 1970. All fibers between 5 and 100 microns in length were counted by light microscopy. The standard required no action to be taken below 2 fibers/cc. Between 2 fibers/cc and 12 fibers/cc, control measures commensurate with the exposure circumstances (time and frequency of worker exposure) were prescribed; above 12 fibers/cc, full application of control measures, including respiratory protection, was mandatory. The BOHS predicted that the risk of being affected, to the extent of having the earliest clinical signs of asbestos exposure (rales), would be less than 1% for an accumulated exposure of 100 fiber-years/cc (2 fibers/cc for 50 years, 4 fibers/cc for 25, etc.). Data

(Lewinsohn 1972) from the same factory which formed the basis for the BOHS Standard demonstrate that a greater prevalence of x-ray abnormalities now exist (Table 1). These data in addition to demonstrating a dose-response relationship for radiographic abnormalities consistent with asbestosis, further showed a 17% prevalence of abnormal radiographic findings (6% consistent with asbestosis) among individuals employed since 1950.

Weill et al (1975) when considering lung function and irregular small opacities, reported that there was little evidence of a dose-response relationship below 100 mppcf-years. They further concluded that a concentration of 5 fibers/cc could be cautiously considered as "safe". Ayer and Berg (1976), however, report data which suggest that the BOHS standard, of an average cumulative exposure of 100 fiber-years/cc, for chrysotile asbestos may prevent significant decreases in pulmonary function only when combined with periodic spirometry and further reduction of exposure for affected workers. Holmes (1973) has since stated that the data upon which the BOHS standard was based were inadequate for the purpose of setting a standard to prevent asbestosis. The BOHS-recommended standard of 2 fibers/cc was based on data related only to asbestosis and the Society clearly cautioned that, since a quantitative relationship between asbestos exposure and cancer risk was not known, it was not possible at that time to specify an air concentration which was known to be free of increased cancer risk. (BOHS 1968)

Howard et al (1976), in a follow-up of the textile workers previously studied by Doll, (1955) and Knox et al (1965, 1968) for cancer, and by Lewinsohn (1972) for asbestosis, reported a statistically

significant increase in the risk of developing lung cancer (1.8 times the expected) among those first entering scheduled areas from 1933 to 1950. In the same study, they also reported an excess of deaths due to lung cancer (1.9 times the expected) after 15 or more years from initial exposure among those who started work subsequent to 1950, a period of improved industrial engineering control technology and regulation.

In a study of miners exposed to amphibole fibers (amosite) in the cummingtonite-grunerite ore series, with airborne concentrations of less than 2.0 fibers/cc (average concentration, 0.25 fibers/cc) and 94% of the fibers shorter than 5 μ m in length, Gillam et al (1976) have demonstrated three-fold increases in the risks of mortality from both malignant and nonmalignant respiratory diseases.

Newhouse (1969, 1973) and Newhouse et al (1972) have shown that the cancer risk following mixed exposure of factory workers to chrysotile, amosite, and crocidolite is dose-related. Those women reported to have heavier exposures (as judged by their occupations) showed a six-fold excess of cancer following only 15 years' latency, whereas those with moderate or low exposures required 25 years' latency to demonstrate an excess. The rate of mesothelioma increased with both the severity and the length of exposure. However, even with as little as two years of asbestos exposure, six mesotheliomas occurred among female employees.

McDonald (1973) states that the risk of developing lung cancer was essentially confined to persons with a dust index above 200 mppcf-years and Enterline et al (1973) showed no direct dose response for respiratory cancer below 125 mppcf-years. In a review of these two papers, Schneiderman (1974) concluded that, instead of being consistent with a threshold level at which

no cancer risk exists, these data did not provide evidence for a threshold or for a "safe" level of exposure. He pointed out that in the paper by Enterline et al. (1973) there is no dose group for which the SMR is below 100 (100 = normal), but that the 95% confidence limits on the SMR's included 100 for two of the three dose groups below 125 mppcf-years. One of the dose groups (25-62.4) had a statistically significant excess mortality from lung cancer, whereas for the other two this mortality rate was insignificantly elevated above the expected values. Regarding McDonald's paper, Schneiderman stated that it is hard to determine what is excess since no expected numbers for each group are given upon which to base this comparison.

Among amosite workers with 3 months or less employment, Selikoff (1976) reported excess cancer risks of 3.87, 1.68, and 1.65 times those expected for cancer of the lung, colon and rectum, and all sites, respectively.

Anderson et al (1976) have reported a significant excess of radiographic abnormalities of the chest characteristic of asbestos exposure (pleural and/or parenchymal) 25 - 30 years following the onset of household contamination. These abnormalities were observed in 35% of 326 otherwise healthy household contacts of amosite asbestos workers. In addition, four pleural mesotheliomas were found in this group.

VI. RECOMMENDED STANDARD

Available studies provide conclusive evidence that exposure to asbestos fibers causes cancer and asbestosis in man. Lung cancers and asbestosis have been demonstrated to follow exposure to chrysotile, crocidolite, amosite, and anthophyllite. Mesotheliomas, lung and gastrointestinal cancers have been shown to be excessive in occupationally exposed persons, while mesotheliomas have also been demonstrated to occur in individuals living in the neighborhood of asbestos factories; in persons living with asbestos workers; and in persons living near crocidolite deposits. Asbestosis has been identified among persons living near anthophyllite deposits.

Likewise, all commercial forms of asbestos are carcinogenic in rats, producing lung carcinomas and mesotheliomas following their inhalation, and mesotheliomas following intrapleural or intraperitoneal injection. Mesotheliomas and lung cancers were induced following even one day's exposure by inhalation.

The size and shape of the fibers are important factors; fibers less than 0.5 μm in diameter are most active in producing tumors. Other fibers, of a similar size, including glass fibers, can also produce mesotheliomas following intrapleural or intraperitoneal injection.

There are data that show that the lower the exposure, the lower the risk of developing cancer. Excessive cancer risks have been demonstrated at all fiber concentrations studied to date. Evaluation of all available human data provides no evidence for a threshold or for a "safe" level of asbestos exposure. Based upon the available data, no assessment can presently be made concerning the existence of a level of asbestos exposure

below which an increased risk of cancer could not be detected.

In view of the above, the standard should be set at the lowest level detectable by available analytical techniques, an approach consistent with NIOSH's most recent recommendations for other carcinogens (i.e. arsenic and vinyl chloride). Such a standard should also prevent the development of asbestosis.

Since phase contrast microscopy is the only generally available and practical analytical technique at the present time, this level is defined to be 100,000 fibers $>5 \mu\text{m}$ in length per m^3 (0.1 fibers/cc), on an 8-hour-time-weighted average basis with peak concentrations not exceeding 500,000 fibers $>5 \mu\text{m}$ in length per m^3 (0.5 fibers/cc) based on a 15-minute sample period. Sampling and analytical techniques should be performed as specified by NIOSH publication USPHS/NIOSH Membrane Filter Method for Evaluating Airborne Asbestos Fibers - T.R. 84 (1976).

This recommended standard of 100,000 fibers $>5 \mu\text{m}$ in length per m^3 is intended to (1) protect against the non-carcinogenic effects of asbestos, (2) materially reduce the risk of asbestos-induced cancer (only a ban can assure protection against carcinogenic effect of asbestos) and (3) be measured by techniques that are valid, reproducible, and available to industry and official agencies.

This recommended standard poses some difficulties in that specific work practices and innovative engineering control or process changes are needed. However, because of the well documented human carcinogenicity from all forms of asbestos, these difficulties should not be cited as cause for permitting continued exposure to asbestos at concentrations above 100,000 fibers $>5 \mu\text{m}$ in length per m^3 .

This standard was not designed for the population-at-large, and any extrapolation beyond general occupational exposures is not warranted. The standard was designed only for the processing, manufacturing, and use of asbestos and asbestos-containing products as applicable under the Occupational Safety and Health Act of 1970.

REFERENCES FOR BASIS FOR A STANDARD SECTION AND
RECOMMENDED STANDARD SECTION

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TABLE 1
B.O.H.S. ASBESTOS STANDARD
X-RAY FINDINGS IN AN ASBESTOS TEXTILE FACTORY
DECEMBER 1970 (MALES)

YEARS OF EXPOSURE	NO.	X-RAY FINDINGS			TOTAL ** ABNORMAL
		NORMAL	PLEURAL* FIBROSIS	PULMONARY FIBROSIS	
0 - 9	613	548	10	0	65(11%)
10 - 19	189	122	18	20	67(36%)
20 - 29	114	51	30	21	63(55%)
30 - 39	42	9	17	17	33(78%)
40 - 49	12	2	6	3	10(83%)

* Consistent with asbestos exposure

** Including changes not considered due to asbestos exposure

Lewinsohn, H.C., Medical Surveillance of Asbestos Workers.
Roy. Soc. Health J. 92:677, 1972.

BULLETIN

NO. 585

December 17, 1976

INDUSTRIA COLOMBIANA de ASBESTOS ("INCOLBESTOS")
OF BOGOTA, COLOMBIA--APPLICATION FOR REGIONAL MEMBERSHIP

This is to advise the membership that Industria Colombiana de Asbestos ("Incolbestos"), a brake block manufacturer in Bogota, Colombia has applied for Regional Membership in the Institute.

This company has been in the friction material business in Colombia for about five years, and works under a license from World Bestos Company, which continues with Royal Industries (after the World Bestos acquisition). Their market is national--in Colombia.

The Membership Committee is now reviewing the application after which it must be approved by the Board of Directors. Eventually, the application for membership must be approved by the Active Members of the Institute. No action is being asked of the Members at this time.

This notice is sent at this time to inform the membership.

EWD/erc

E. W. Drislane
Executive Director

Dist: Delegates & Alternates
List A

B U L L E T I N

N O. 5 8 4

November 24, 1976

LABORATORIES--ASBESTOS FIBRE COUNTS AND CONSULTING

In July 1976 we circulated a list of laboratories which would provide various services as regards asbestos monitoring. Based on suggestions since that bulletin, it was decided to expand that list. This is a more complete list based on those labs that replied to our request for information.

We have listed 16 laboratories that will run the OSHA approved fibre counts in their labs from samples sent in by clients. Some will provide technical services in taking the samples by the membrane filter method. Others will provide consulting services.

The listing is in summary form. If you wish to use the service of such a lab, you should contact the party indicated for more information. There may be set-up charges or minimum charges. All consulting fees are subject to additional charges for consultant's or technician's expenses.

The Institute is not endorsing or recommending the listed laboratories. They are simply listed for your information.

EWD/lmc

E. W. Drislane
Executive Director

cc. Active Members (C)
Regional (Canada)

Laboratory	Telephone	Contact	Fibre Count	Consultation (Expenses additional)
Actus Environmental Services 7370 Industrial Road Florence, Kentucky 41042	(606) 371-4010	Charles Nenadic	\$30 (1-9) \$27.50 (79)	Consultation \$35/hour
The Almaga Corporation 607 C Country Club Drive Bensenville, Illinois 60106	(312) 595-0175	Hank Taylor	\$25	Survey \$350-750/day
Bernville Biological Laboratory RD #1 - Route 183 Bernville, Pa. 19506	(215) 488-6258	Spencer Watts	\$20	Technical \$125/day
William A. Burgess 38 Fox Hill Street Westwood, Mass. 02090	(617) 226-0814	William Burgess	\$20	Consultation \$350/day
Clayton Environmental Assoc. 25711 Southfield Road Southfield, Michigan 48075	(513) 424-8860	Robert Soule	\$17.50	Senior Consultant \$320/day Technical \$200/day
Eco Science Laboratory 490 West Main Street Norwich, Conn. 06360	(203) 239-8104	Richard Benoit	\$21 plus set-up	Consultation \$240/day
Environmental Health Laboratory 1021 Georgia Avenue Macon, Georgia 31201	(912) 745-4702	John Savidge	\$30	Consultation available through affiliate at approx. \$300/day
Industrial Health Foundation Mellon Institute, CMU 4400 Fifth Avenue Pittsburgh, Pennsylvania 15213	(412) 621-1100	Dennis Balya	\$22 (1-5) \$17 (> 5)	
Kettering Laboratory-Analytical Section University of Cincinnati Eden & Bethesda Avenue Cincinnati, Ohio 45267	(513) 872-5739	David Yeager	\$10	Consultation \$300/day

Laboratory	Telephone	Contact	Fibre Count	Consultation (Expenses additional)
LFE Corporation Environmental Analysis Labs. 2030 Wright Avenue Richmond, Cal. 94804	(415) 235-2633	Walter Holland Robert Reinhart	\$20 (< 6) \$17 (6-10) \$15 (> 10)	Senior Hygienist \$330/day Technical \$215/day
Walter C. McCrone Associates 2820 South Michigan Avenue Chicago, Illinois 60616	(312) 842-7100	Ian Stewart	\$35	Professional \$400/day
MedLabs Microscopy Service 1905 Andrew Johnson Road Kinston, North Carolina 28501	(919) 527-0637	G. Dan Medlin	\$12 (min. 4)	
Particle Data Laboratories 115 Hahn Street Elmhurst, Illinois 60126	(312) 832-5658		\$.25	
Swanson Environmental, Inc. P.O. Box 735 Sheboygan, Wisconsin 53081	(414) 458-0502	James Yanko	\$25 (< 5) \$20 (5-9) \$15 (> 9)	Professional \$250/day Technical \$150/day
Swanson Environmental, Inc. 24680 Swanson Road Southfield, Michigan 48076	(313) 352-0960	Jon Swanson	(same)	(same)
Tulane University School of Medicine Pulmonary Diseases Section 1700 Perdido Street New Orleans, Louisiana 70112	(504) 866-0212	Dr. V. Dharmarajan	\$30	Professional \$300/day Technical \$100/day
U.S. Testing Company 1415 Park Avenue Hoboken, New Jersey 07087	(201) 792-2400	David Hansen	\$35	Professional \$300/day Technical \$250/day

NC

BULLETIN

NO. 583

November 24, 1976

EQUIPMENT AND MACHINERY--WANTED OR FOR SALE

In October 1975 and May 1976, the Institute issued bulletins listing used items of equipment or machinery either wanted, or for sale. Included were items such as Cogen machine, FAST machine, Grinders, Furnace, Ovens, etc. We plan to send out a new bulletin shortly and are requesting members who might have used equipment for sale, or are interested in purchasing such equipment, to send in their listing.

You should advise:

- (1) If "Wanted to Buy," or "For Sale."
- (2) Brief description of equipment or machinery.
- (3) Who to contact--where, name of person, telephone.

The guidelines for listing machinery and equipment are:

- (1) Used machinery or equipment.
- (2) Specialized for the friction materials industry.
- (3) Substantial--for guidelines, worth in excess of \$2,000 new.
3.1 Examples--test machine, grinder, press, drilling machine, oven.
- (4) The property of the member, or to be purchased by a member.
4.1 No offerings as an agent.

If you wish to list equipment in the forthcoming bulletin, we ask that you advise details of such equipment prior to December 31, 1976.

Active Members (C)
Regional Members

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 8 2

October 22, 1976

National Institute for Occupational Health (NIOSH)--Regulations for
Investigations of Places of Employment

Enclosed is a notice as it appeared in the Federal Register on October 14, 1976 concerning procedures to be used by the National Institute of Occupational Safety and Health (NIOSH) as regards investigations of places of employment. These regulations are a follow-up to the notice of proposed rule-making on June 24, 1975. In the first several sections of this notice, NIOSH has reviewed some of the comments that were received after the proposed rule-making was published.

Following that is the section with the new regulations. It is important to note that these are the regulations for NIOSH plant inspections as distinguished from those of the OSHA inspections. It is noted in the write-up that NIOSH inspections would be conducted primarily for the purposes of research, whereas OSHA inspections are made for the purposes of determining compliance.

This regulation is not particular to the asbestos problem but it is general for all manufacturing. This is sent along as a matter of information.

Active Members (List C)
Licensees (Domestic)

E. W. Drislane
Executive Director

FRICITION MATERIALS STANDARDS INSTITUTE, INC.
FR OCTOBER 14, 1976 - NIOSH PLANT INSPECTIONS

Title 42—Public Health

**CHAPTER 1—PUBLIC HEALTH SERVICE,
DEPARTMENT OF HEALTH, EDUCATION,
AND WELFARE**

**SUBCHAPTER G—OCCUPATIONAL SAFETY AND
HEALTH RESEARCH AND RELATED ACTIVITIES**

**PART 85a—OCCUPATIONAL SAFETY AND
HEALTH INVESTIGATIONS OF PLACES
OF EMPLOYMENT**

On June 24, 1975, a notice of proposed rulemaking was published in the *FEDERAL REGISTER* (40 FR 26530) to add a new Part 85a to Title 42, Code of Federal Regulations. As proposed, the part set forth the manner in which the National Institute for Occupational Safety and Health (NIOSH), Center for Disease Control, will conduct investigations of places of employment pursuant to section 20 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 689).

Interested persons were afforded the opportunity to participate in the rulemaking through the submission of comments. Seventy-eight letters were received from trade associations, state governments, environmental groups, and labor representatives. All comments have been considered and the major comments and principal changes to the proposal are summarized below.

SECTION 85a.2—DEFINITIONS

Definitions for "informed consent" and "legally authorized representative" were added to clarify what protection NIOSH must give to employees prior to the conduct of medical examinations, anthropometric measurements, and standardized and experimental functional tests as stipulated in § 85a.5(d). These definitions are the same as those promulgated by the Department of Health, Education, and Welfare in the regulation on protection of human subjects (45 CFR Part 46).

SECTION 85a.3—AUTHORITY FOR INVESTIGATIONS OF PLACES OF EMPLOYMENT

Twenty-two (22) comments questioned NIOSH's authority to conduct the investigations of places of employment and declared that these investigations duplicate and overlap inspections conducted by the Occupational Safety and Health Administration (OSHA). Twenty-two (22) comments questioned NIOSH's authority to review, duplicate and abstract "employment records, medical records, other records . . ." and a few questioned NIOSH's authority to conduct "medical examinations, anthropometric measurements and standardized and functional tests of employees." By virtue of section 20(b) of the Occupational Safety and Health Act of 1970, the Secretary of Health, Education, and Welfare is authorized to conduct investigations of places of employment and to question employers and employees, as provided in Section 8 of the Act, in order to carry out his section 20 functions and responsibilities. The review, duplication, or abstraction of employment records, as well as medical examinations and tests of consenting employees, are an integral part of the investigative authority and are necessary to carry out Section 20 functions and responsibilities. For those

concerned with possible duplication and overlap between NIOSH and OSHA in this area, it is important to note that NIOSH investigations of places of employment are conducted primarily for the purposes of research, as required by section 20 of the Act. The Occupational Safety and Health Administration conducts inspections of places of employment for the purpose of determining employer compliance with occupational safety and health standards established pursuant to Section 6 of the Act and recordkeeping requirements established pursuant to Section 8 of the Act. Every attempt is made by NIOSH to avoid duplication of effort with OSHA that would place additional and undue burdens on employers. To this end, the regulations require the NIOSH authorized representatives to notify the appropriate OSHA Assistant Regional Director of pending NIOSH investigations (§ 85a.4 (a)(3) and (b)).

With respect to the use by NIOSH of employment records, medical records, etc., which was mentioned in several comments, § 85a.3(a) now provides that systems of records in the custody of NIOSH are subject to the requirements of the Privacy Act of 1974 (5 U.S.C. 552a) and the Implementing Departmental regulation (45 CFR Part 5b).

SECTION 85a.4—PROCEDURES FOR INITIATING INVESTIGATIONS OF PLACES OF EMPLOYMENT

Twenty-four (24) comments indicated NIOSH should provide advance notice for all site visits and that lack of such notice detracts from the research aspects of the site visits, placing these visits in the realm of an OSHA compliance inspection. NIOSH's position on advance notice is that in nearly all cases advance notice will be given to the place of employment concerning a proposed site visit, and the details concerning the visit, such as time, date, etc., will be agreed upon. However, NIOSH must retain the right to withhold such advance notice from the place of employment in those instances where previously gathered facts indicate the notice would adversely affect the validity and effectiveness of the investigation. Also, NIOSH cannot identify a specific time period for advance notice because of emergency research situations that require immediate action (e.g., the recent episode with health hazards associated with vinyl chloride required a spontaneous research effort and subsequent short advance notice for site visits). For these reasons, § 85a.4(b) was not revised substantively.

Seven (7) comments indicated that NIOSH should not notify unions of investigations of places of employment and that such notification detracts from the research aspects of the investigations and nothing can be gained from such an interaction. NIOSH consistently has maintained that to conduct the research mandated by the Act properly, timely input must be obtained from all parties involved, including labor and industry. To fulfill this responsibility in regard to labor unions (i.e., the responsibility to question employees as provided in section 8 of the Act in order to carry out

section 20 functions and responsibilities), it is necessary that (1) the employees be notified through their local union representative(s) concerning pending investigation by NIOSH; (2) such notification be provided to an identified labor spokesman to avoid confusion and rumor; and (3) NIOSH, rather than the employer, provide the notification so that the impartiality of the Federal Government is maintained. For these reasons, a substantive revision was not made to § 85a.4 (a)(2).

One (1) comment questioned whether NIOSH would conduct an investigation of a place of employment where there already was an alleged OSHA violation. Under these circumstances, generally NIOSH would not conduct a site visit. If for some reason, such a visit was of prime importance to a research project and no other place of employment would suffice, the details and guidelines for the investigation would be agreed upon between OSHA and NIOSH. Also, in many instances, the area of the place of employment which NIOSH desires to visit may not be the subject of the alleged violation and, therefore, NIOSH could proceed with the investigation after the routine consultation with OSHA.

SECTION 85a.5—CONDUCT OF INVESTIGATIONS OF PLACES OF EMPLOYMENT

Twenty-one (21) comments questioned whether the employer had been given all his legal rights concerning trade secrets in § 85a.5(b). NIOSH is of the opinion that the approach utilized in § 85a.5(b) for handling trade secret information is reasonable and appropriate as evidenced by the fact that the same provision has been utilized successfully by NIOSH in the health hazard evaluation program (42 CFR 85.7(b)). It is noted that while these regulations authorize the Director, NIOSH, to make final determinations as to whether information is, in fact, a trade secret, trade secret designations generally will not be questioned. The determination to remove a trade secret designation will be made by the Director, NIOSH, only in a clear case. Even in such rare cases, employers would have a reasonable period of time to take whatever action they deemed necessary to protect their interests. Therefore, this paragraph of the regulation has not been revised.

Seventeen (17) comments argued that the use of contractors and consultants as NIOSH authorized representatives could compromise the effectiveness of the investigations and that these contractors could especially be a problem where trade secret information was involved. Consultants are special employees and are held to the same standards of conduct as regular NIOSH employees while performing their official duties. Nevertheless, in those instances where contractors and consultants are used to conduct investigations, NIOSH recognizes the problem an employer might have with revealing trade secret information to these individuals. Therefore, § 85a.5 (b) has been revised to provide that employers may, after advising the NIOSH contractor or consultant in writing,

withhold information deemed to be a trade secret from such NIOSH authorized representatives or prohibit entry into areas containing trade secrets in the place of employment. In these instances, NIOSH regular employees will then obtain the information or enter the subject area of the place of employment.

Even (11) comments indicated § 85a.5(c) was not clear in regard to whether or not a representative of the employer would be allowed to accompany the NIOSH authorized representatives during a site visit. Section 85a.5 (c)(3) has been revised to clarify that a representative of the employer will, in all instances, be permitted to accompany the NIOSH authorized representatives during a site visit of a place of employment. Section 85a.5(c) also has further been revised to permit accompaniment by a third party where good cause has been shown that it is reasonably necessary to the conduct of an effective site visit.

SECTION 85a.6—PROVISION OF SUITABLE SPACE FOR EMPLOYEE INTERVIEWS AND EXAMINATIONS

Seven (7) comments indicated that in all instances employers should not be required to provide suitable space for interviews, medical examinations, and other testing. The specific example given was the construction industry where such space would not normally be available. The provision of suitable space for employee medical examinations, interviews, and other testing is required by the regulation only if such space is reasonably available.

Twenty-six (26) comments indicated NIOSH should reimburse employers for lost time during medical examinations and other testing. There is no statutory requirement for NIOSH to pay for loss of work time incurred by employees during the conduct of medical examinations, etc. NIOSH considers such examinations and testing an extension of the interview authorized by section 8(a)(2) of the Act, which does not provide for reimbursement of the employer for the time required to interview employees. It should be noted when NIOSH conducts medical examinations and other testing of employees during investigations of places of employment, every attempt is made to conduct such examinations and other testing at times to minimize or avoid any loss of time to the employer and employee. Generally, one or two employees of a given job-type can be rotated off the job for the required testing time without interfering with production or causing lost time. Thus, § 85a.6 has not been revised except for wording clarification.

SECTION 85a.7—IMMINENT DANGER

Eight (8) comments indicated NIOSH does not have the authority to "declare" an imminent danger and the use of this term in the regulation should be better defined and be more consistent with the Act and the mandate of OSHA. NIOSH does not have the authority to declare an "imminent danger" and there is not such

a declaration in § 85a.7. Trained NIOSH representatives do, however, notify OSHA appropriate state agencies, the employer and employees of the existence of occupational conditions that could be expected to cause death or serious physical harm if not immediately corrected. NIOSH will continue to advise appropriate persons of the existence of such conditions and § 85a.7 remains unchanged. "Imminent danger" is not defined in the regulation and, therefore, as indicated in § 85a.2, the term has the same meaning given it in the Act.

SECTION 85a.8—REPORTING OF RESULTS OF INVESTIGATIONS OF PLACES OF EMPLOYMENT

Thirteen (13) comments indicated employers should be given the results of an individual employee's medical examination and other tests. Section 85a.8(b) provides that NIOSH will release such records only with the written consent of the employee. In the absence of a written consent by the employee, NIOSH is prohibited by the Privacy Act of 1974 (5 U.S.C. 552a) and the Implementing Departmental regulation (45 CFR Part 5b) from releasing the results of the employee's medical examination and tests to third parties.

Seven (7) comments questioned the need to make public the names of the places of employment upon which reports are written. Under the provisions of the Freedom of Information Act (5 U.S.C. 552) NIOSH must release to the public the names of places of employment where investigations have been conducted, as well as the specific reports that have been prepared. This release is made only upon request, however, and places of employment are not identified in the findings of a total investigation as stated in § 85a.8(c).

Three (3) comments asserted that NIOSH should not only release to the employer specific final reports but should also release, upon request, the data that went into developing the reports. Section 85a.8(a)(1) has been revised to provide that NIOSH will release to the employer, upon request, the data used to compile the specific reports mentioned in this subparagraph, except that data will not be released in a form that is individually identifiable, i.e., in a manner in which information concerning an employee could be connected with that employee.

It also was urged that employers should have the right to review "specific reports" mentioned in § 85a.8(a)(1) not only for trade secret information but also for inaccuracies. NIOSH agrees and § 85a.8(a)(1) has been revised accordingly.

Section 85a.8 also has been revised to provide:

1. That in certain types of NIOSH site visits, where a specific report is not required or is not useful, a closing conference in lieu of such a report will be held at the place of employment with those individuals participating in the site visit. This closing conference is for the purpose of discussing the findings of the site visit and appropriate recommendations.

2. For further explanation in § 85a.8 (b)(1) of the personal rights of an employee concerning records of medical examinations and other tests.

GENERAL

A number of those submitting comments requested that NIOSH hold a public hearing concerning these regulations. There is no legal requirement that NIOSH grant a public hearing. Since two months were provided for the submission of written comments and the comments received have been carefully considered, it has been determined that a hearing on the issues raised would not be in the public interest.

Therefore, a new Part 85a, as set forth below, is added to Title 42, Code of Federal Regulations, effective November 15, 1976.

Dated: April 14, 1976.

THEODORE COOPER,
Assistant Secretary for Health.

Approved: October 7, 1976.

MAJORIE LYNCH,
Acting Secretary.

Sec.	Applicability.
85a.1	Definitions.
85a.2	Authority for investigations of places of employment.
85a.3	Procedures for initiating investigations of places of employment.
85a.4	Conduct of investigations of places of employment.
85a.5	Provision of suitable space for employee interviews and examinations.
85a.6	Imminent dangers.
85a.7	Reporting of results of investigations of places of employment.
85a.8	

AUTHORITY: Sec. 8(g), 84 Stat. 1600; 29 U.S.C. 657(g).

§ 85a.1 Applicability.

(a) Except as otherwise provided in paragraph (b) of this section, the provisions of this part are applicable to investigations of places of employment which are conducted by NIOSH pursuant to sections 20 and 8 of the Occupational Safety and Health Act of 1970.

(b) The provisions of this part do not apply to those activities covered by Part 85 of this chapter.

§ 85a.2 Definitions.

Any term defined in the Occupational Safety and Health Act of 1970 and not defined below shall have the meaning given it in the Act. As used in this part:

(a) "Act" means the Occupational Safety and Health Act of 1970 (29 U.S.C. 651 et seq.).

(b) "Assistant Regional Director" means any one of the ten Occupational Safety and Health Administration Assistant Regional Directors for Occupational Safety and Health.

(c) "Informed consent" means the knowing consent of an individual or his legally authorized representative, so situated as to be able to exercise free power of choice without undue inducement or any element of force, fraud, deceit, duress, or other form of constraint or coercion. The basic elements of information necessary to such consent include:

(1) A fair explanation of the procedures to be followed, and their purposes, including identification of any procedures which are experimental;

(2) A description of any attendant discomforts and risks reasonably to be expected;

(3) A description of any benefits reasonably to be expected;

(4) A disclosure of any appropriate alternative procedures that might be advantageous for the subject;

(5) An offer to answer any inquiries concerning the procedures, and

(6) An instruction that the person is free to withdraw his consent and to discontinue participation in the investigation any time without prejudice to the subject.

(d) "Investigation" means research projects, experiments, demonstrations, studies and similar activities of NIOSH which are conducted pursuant to section 20 of the Act.

(e) "Legally authorized representative" means an individual or judicial or other body authorized under applicable law to consent on behalf of a prospective subject to such subject's participation in the particular activity or procedure.

(f) "NIOSH" means the National Institute for Occupational Safety and Health of the Center for Disease Control, Public Health Service, Department of Health, Education, and Welfare.

(g) "NIOSH authorized representative" means a person authorized by NIOSH to conduct investigations of places of employment, including any person that is fulfilling a contract agreement with NIOSH or is serving as an expert or consultant to NIOSH pursuant to the Act.

(h) "NIOSH Regional Office" means any one of the ten Department of Health, Education, and Welfare Regional Offices the addresses of which are specified in § 5.31 of Title 45, Code of Federal Regulations.

(i) "Place of employment" means any factory, plant, establishment, construction site, or other area, workplace or environment where work is performed by any employee of an employer.

§ 85a.3 Authority for investigations of places of employment.

(a) NIOSH authorized representatives who have been issued official NIOSH credentials are authorized by the Director, NIOSH, for the purpose of section 20 of the Act and this part and pursuant to section 8 of the Act: To enter without delay any place of employment for the purpose of conducting investigations of all pertinent processes, conditions, structures, machines, apparatus, devices, equipment, and materials within the place of employment; and to conduct medical examinations, anthropometric measurements and functional tests of employees within the place of employment as may be directly related to the specific investigation being conducted. Such investigations will be conducted in a reasonable manner, during regular working hours or at other reasonable times and within reasonable limits, in connection with any investigations, such

as NIOSH authorized representatives may question pursuant to the employee's career, position, agent, or employee from the place of employment, and review, abstract, or duplicate employment records, medical records, records required by the Act and regulations, and other related records. In those instances where systems of records subject to review, abstraction or duplication are of a confidential nature, such as medical records, and are abstracted or duplicated, NIOSH will maintain such systems in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the implementing regulation of the Department of Health, Education, and Welfare (45 CFR Part 5b).

(b) Areas under investigation which contain information classified by any agency of the United States Government in the interest of national security will be investigated only by NIOSH authorized representatives who have obtained the appropriate security clearance and authorization.

§ 85a.4 Procedures for initiating investigations of places of employment.

(a) Except as otherwise provided in paragraph (b) of this section, NIOSH authorized representatives will contact an official representative of the place of employment prior to any site visits and will provide the details of why an investigation of the place of employment is being conducted. Prior to the initiation of a site visit of a place of employment, representatives of the following organizations will be advised of the site visit and the reason for its conduct:

(1) The appropriate State agency designated under section 18(b) of the Act or if the State has been preempted as provided under the Act, the State agency which, in the judgment of NIOSH, would benefit the most from the investigation's findings;

(2) If there is a local union at the place of employment, the local president, business manager or other appropriate individual; and

(3) The appropriate Assistant Regional Director.

(b) Advance notice of site visits will not be given to the place of employment or local union at the place of employment when, in the judgment of the NIOSH authorized representatives, giving such notice would adversely affect the validity and effectiveness of an investigation. Those individuals and organizations specified in § 85a.4(a) (1) and (3) will be notified prior to the initiation of such a site visit. After the site visit has been initiated, and, as soon as possible thereafter, the NIOSH authorized representatives will contact those individuals specified in § 85a.4(a) (2) concerning the nature and details of the site visit.

(c) In those instances where site visits are not necessary to the conduct of an investigation, the NIOSH authorized representatives will contact an official representative of the place of employment either verbally or through a written communication and provide the details of why an investigation of the place of employment is being conducted. If appropriate, the NIOSH authorized representatives will contact those individuals stip-

ulated in paragraphs (a) (1), (a) (3), and (a) (3) of this section about the nature and details of the investigation.

§ 85a.5 Conduct of investigations of places of employment.

(a) (1) Prior to beginning a site visit, NIOSH authorized representatives will present their credentials to the employer, owner, operator or agent in charge at the place of employment, explain the nature, purpose and scope of the investigation and the records specified in § 85a.3 which they wish to review, abstract or duplicate.

(2) In those instances where site visits are not necessary to the conduct of an investigation and the initial contact is made verbally, NIOSH authorized representatives will, at the request of the employer, owner, operator or agent in charge at the place of employment, provide a written explanation of the nature, purpose and scope of the investigation and the records specified in § 85a.3 which they wish to review, abstract or duplicate.

(b) (1) At the commencement of an investigation, the employer, owner, operator or agent in charge at the place of employment shall precisely identify that information which is trade secret and might be seen or obtained by the NIOSH authorized representatives during the investigation. If the NIOSH authorized representatives have no clear reason to question such identification, such information will not be disclosed by NIOSH in accordance with the provisions of section 15 of the Act. Generally, NIOSH will not question trade secret designations; however, if NIOSH at any time does question such identification, not less than 15 days' notice to the employer, owner, operator or agent will be given of the intention to remove the trade secret designation from such information. The employer, owner, operator or agent may within that period submit a request to the Director, NIOSH, to reconsider this intention and may provide additional information in support of the trade secret designation. The Director, NIOSH, will notify the employer, owner, operator or agent in writing of the decision which will become effective no sooner than 15 days after the date of such notice.

(2) In those instances where the NIOSH authorized representative is a person fulfilling a contract agreement with NIOSH or is serving as an expert or consultant to NIOSH pursuant to the Act, the employer, owner, operator or agent in charge at the place of employment may, after advising the NIOSH contractor or consultant in writing, elect to withhold information deemed to be a trade secret from such a NIOSH authorized representative or prohibit entry into the area of the place of employment where such entry will reveal trade secrets. In those instances, where the subject information is needed or access to the area of the place of employment is necessary, in the judgment of NIOSH, to fulfill the goals of the investigation, NIOSH regular employees will then obtain the information or enter the subject area of the place of employment.

(c) (1) NIOSH authorized representatives will be in charge of site visits conducted pursuant to this part.

(2) Where there is a request by the representative of the State agency and/or employees, who were notified pursuant to § 85a.4(a)(1) or § 85a.4(a)(2) to accompany the NIOSH authorized representatives during the site visit of the place of employment, the NIOSH authorized representatives will allow this request if they determine that this will aid the investigation; or where, in the judgment of the NIOSH authorized representatives, good cause has been shown why accompaniment by a third party who is not an employee of the employer is reasonably necessary to the conduct of an effective and thorough site visit, they may permit such third party to accompany them during the site visit. *Provided, however,* That access by such persons to areas described in § 85a.5(c)(4) shall be in accordance with the requirements of such provision and access to areas containing trade secrets shall be with the consent of the employer, owner, operator or agent in charge at the place of employment.

(3) NIOSH authorized representatives are authorized to deny the right of accompaniment under this paragraph to any person whose conduct in their judgment interferes with a fair and orderly site visit. In all instances, a representative of the employer shall be permitted to accompany the NIOSH authorized representatives during the site visit of the place of employment.

(4) With regard to information classified by an agency of the United States Government in the interest of national security, only persons authorized to have access to such information may accompany NIOSH authorized representatives in areas containing such information.

(d) (1) NIOSH authorized representatives are authorized: To collect environmental samples and samples of substances; to measure environmental conditions and employee exposures; to take or obtain photographs, motion pictures or video tapes related to the purpose of the investigation; to employ other reasonable investigative techniques, including medical examinations, anthropometric measurements and standardized and experimental functional tests of employees with the informed consent of such employees; to review, abstract and duplicate such personnel records as are pertinent to mortality, morbidity, injury, safety and other similar studies; and to question and interview privately any employer, owner, operator, agent or employee from the place of employment. The employer, owner, operator, or agent shall have the opportunity to review photographs, motion pictures and video tapes taken or obtained for the purpose of identifying those which contain or might reveal a trade secret.

(2) Prior to the conduct of medical examinations, anthropometric measurements or functional tests of any employees, the NIOSH authorized representatives will obtain approval of the

procedures to be utilized from the NIOSH Human Subjects Review Board and no employee examination, measurement or test will be undertaken without the informed consent of such employee.

(e) NIOSH authorized representatives will comply with all safety and health rules and practices at the place of employment and all NIOSH and Occupational Safety and Health Administration regulations and policies during a site visit and will provide and use appropriate protective clothing and equipment. In situations requiring specialized or unique types of protective equipment, such equipment shall be furnished by the employer, owner, operator or agent in charge at the place of employment.

(f) The conduct of site visits will be such as to preclude unreasonable disruption of the operations of the place of employment.

§ 85a.6 Provision of suitable space for employee interviews and examinations.

An employer, owner, operator or agent in charge at the place of employment shall, on request of the NIOSH authorized representatives, provide suitable space at the place of employment, if such space is reasonably available, to NIOSH to conduct private interviews with, and medical examinations, anthropometric measurements and functional tests of employees. NIOSH authorized representatives will consult with the employer, owner, operator or agent as to the time and place of the private interviews, medical examination, anthropometric measurements and functional tests and will schedule same so as to avoid undue disruption of work at the place of employment. NIOSH will conduct the medical interviews, measurements, examinations and tests specified under this part at its own expense.

§ 85a.7 Imminent dangers.

Whenever, during the course of, or as a result of, an investigation under this part, the NIOSH authorized representatives believe there is a reasonable basis for an allegation of an imminent danger, NIOSH will immediately advise the employer, owner, operator or agent in charge at the place of employment and those employees who appear to be in immediate danger of such allegation and will inform the appropriate Assistant Regional Director and the appropriate State agency designated under section 18(b) of the Act, or if there is no State agency designated under section 18(b) of the Act, the appropriate State labor or health agency.

§ 85a.8 Reporting of results of investigations of places of employment.

(a) (1) Specific reports of investigations of each place of employment under this part, with identification of the place of employment, will be made available by NIOSH to the employer, owner, operator or agent in charge at the place of employment, with copies to the appropriate officials and Agencies notified pursuant to § 85a.4(a). Prior to release of

such reports, a preliminary report will be sent by NIOSH to the employer, owner, operator or agent for review for trade secret information and technical inaccuracies that may inadvertently be presented in the report. If requested in writing, the data used to compile the reports will be made available by NIOSH to the employer, owner, operator or agent in charge at the place of employment, except that data will not be released in a form that is individually identifiable.

(2) All specific reports of investigations of each place of employment under this part will be available to the public from the NIOSH Regional Consultant for Occupational Safety and Health in the appropriate NIOSH Regional Office.

(3) In certain instances, specific reports of investigations of each place of employment will not be prepared. In such instances, a listing conference at the place of employment will be conducted by the NIOSH authorized representatives and those individuals participating in the site visit to discuss the findings of the site visit and appropriate recommendations.

(b) (1) Any specific findings of individual employee medical examinations, anthropometric measurements and functional tests will be released by NIOSH authorized representatives to the company physician, private physician, or other person only pursuant to the written authorization of the employee; otherwise, the specific findings and other personal records concerning individuals will be maintained in accordance with 45 CFR Part 5b and section 3 of the Privacy Act of 1974 (5 U.S.C. 552a). Notice of all NIOSH systems of records as defined in 45 CFR 5b.1(n) as a result of the investigations of places of employment pursuant to this part will be published in the FEDERAL REGISTER under Notices of Systems of Records for the Department of Health, Education, and Welfare.

(2) In cases where an employee shows positive significant medical findings, the employer and the physician(s) designated by the employee under § 85a.8(b)(1) will be immediately notified by NIOSH.

(3) A summary of the findings of the examinations for each employee will be sent by NIOSH to the individual.

(c) The findings of a total investigation generally will be disseminated as part of NIOSH criteria documents, NIOSH technical reports, NIOSH information packets, scientific journals, presentations at technical meetings, or in other similar manners. These findings of a total investigation will be presented in a manner which does not identify any specific place of employment; however, it should be noted that the specific reports of investigations of each place of employment under this part are subject to mandatory disclosure, upon request, under the provisions of the Freedom of Information Act (5 U.S.C. 552).

[FR Doc. 76-30134 Filed 10-13-76; 9:45 am]

BULLETIN

NO. 581

October 12, 1976

CONTROL OF AIRBORNE ASBESTOS CONCENTRATIONS

IN THE WORKPLACE -- INDUSTRIAL TYPE VACUUM CLEANERS

Over the past many months, without de-emphasis on problems in the factory area, those in favor of stringent regulations on the use of asbestos have targeted friction materials servicing--particularly brake lining service--as a potentially hazardous area. Technical papers in this area have not based observations on the OSHA standard's 8 hour time weighted average for fibers greater than 5 microns in length. Most papers have emphasized peak concentrations (as blowing brake lining dust from a used brake awaiting reline) and the fibers shorter than 5 microns in length.

Based on discussions at the Asbestos Information Association meeting in September, efficient vacuum cleaning systems should be of help not only in the factory but in the brake service area. I have, therefore, enclosed sales literature from two manufacturers, along with the NIOSH (National Institute of Occupational Safety and Health) recommended procedures for asbestos brake and clutch servicing. Before distributing this information, I reviewed this data with Mr. I. H. Weaver, acting Chairman of our Asbestos Study Committee, to be sure this information was worthwhile. He concurred that the following information was worthy of distribution to the membership:

1. NIOSH Recommended (Interim) Procedures for Asbestos Brake and Clutch Servicing
2. NILFISK literature
 - 2.1 NILFISK absolute filter
 - 2.2 NILFISK manometer
 - 2.3 Dust free disposal
3. TEMPO Brake and Clutch Service Vacuum

This literature is being enclosed (one copy to each member) with the mailing to:

EWD/erc

E. W. Drislane
Executive Director

cc-Active Members
Regional Members (Active Dues Level)
Asbestos Study Committee

B U L L E T I N

N O. 5 8 0

October 6, 1976

HISTORICAL SALES PROGRAM

The historical sales program continues on a quarterly basis. Regional Members using the copyrighted FMSI Numbers for marketing their products in the United States may participate if they wish.

The Institute is requesting details of pieces sold for the first nine months of 1976 (9 months ending September 30, 1976). The rules for the reporting details remain unchanged.

1. Quantities will be reported in pieces (not units). For roll lining, each foot of length will be one piece.
2. Our Accountants will report the names of the members from whom reports are received, and the number of members reporting in each of the four groups.
3. Total pieces in each group will be reported.
4. "Clutch Facings" does not include gear tooth discs, automatic transmission discs, or the 8-14" dia., (3/16 to 1/2" thick) asbestos composition discs.

The data as filed will be confidential. Totals for each group will be shown and there is no way of determining quantities by individual members.

Please review the form and the description as they apply to this year's reporting. You will be receiving from Marshall Granger & Company, Certified Public Accountants, a form for completing this information. Please return it to;

Marshall Granger & Company, C. P. A.
1600 Harrison Avenue
Mamroneck, New York 10543

If you report, please have your figures in by November 15, 1976. If you do not wish to report these figures, no reply is necessary. Only those reporting figures will receive the industry totals when the data is summarized. A sample form and definitions are attached.

EWD/lmc
Encs.

E. W. Drislane
Executive Director

Distribution: Delegates & Alternates
Regional Members (paying
Active Member Dues)

EXHIBIT "A"

STATISTICAL PROGRAM OF THE
FRICTION MATERIALS STANDARDS INSTITUTE, INC.

Mail to:

MARSHALL GRANGER & CO., C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

* * * * *

See instructions for sales to other members!

Pieces sold to United States distributors, jobbers, private brands,
rebuilders, brake specialists, fleets, mass merchandisers, direct
consumers, government agencies, or other customers for use in the
United States replacement market:

9 MONTHS JANUARY 1 to SEPTEMBER 30, 1976

Brake linings less than 3/4"
nominal thickness (See explanation
for roll lining).

Brake blocks, nominal thickness
of 3/4" and over

Disc brake linings

Clutch facings

By: _____
Signature

Company

Date

EXHIBIT "B"

DEFINITION FOR HISTORICAL SALES

PIECES

The reports will show pieces of friction material, in groups as shown:

<u>Group</u>	<u>Description</u>	<u>Normal Usage</u>
Brake Lining	Friction materials less than a nominal 3/4" thickness (See note on roll lining)	Normally, <u>one piece</u> to a shoe
Brake Blocks	Friction materials with a nominal thickness of 3/4" and over	Normally, <u>two pieces</u> to a shoe
Disc Brake Linings	Friction materials sold (for disc brakes) to be attached to the shoe, or sold as a unit molded, bonded or riveted to the shoe	Normally, <u>one piece</u> to a shoe
Clutch Facing	Friction materials of annular shape, or segments thereof	Normally, <u>two annular pieces</u> per clutch plate

Note: For roll lining only, consider each foot of length equals one piece.

REPLACEMENT SALES TO UNITED STATES MARKET

This reporting is for sales to the United States replacement market only. Do not include sales to other markets. This includes sales under the friction material manufacturer's own name or brand name used by the customer, to automotive warehouse distributors, jobbers, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies or other customers for use in the United States replacement market.

When a friction materials manufacturer is shipping to a vehicle manufacturer, brake manufacturer, or clutch manufacturer, but has no reasonable way of determining if the pieces are for original equipment or replacement purposes, estimates will not be used - these pieces will not be reported. However, where a friction material manufacturer is shipping to a point known to be used for replacement, or where he stencils or otherwise identifies the pieces as being for replacement purposes, or where the shipments otherwise are obviously known to be for replacement, these pieces will be reported.

The member who sells to the type customer or user indicated above will report those pieces sold, even if purchased from another Active Member or Regional Member.

When you sell your friction materials to another Member (Active or Regional) do not report those sales! Materials sold to Licensee Members of the Institute for the replacement market should be included.

BULLETIN

N O. 5 7 9

September 23, 1976

1975 BRAKE BLOCK IDENTIFICATION CATALOG

In the fall of 1975 we published the "1975 Brake Block Identification Catalog." Our only earlier Brake Block catalog was in 1972. Both catalogs quickly sold out.

As there have been only five (5) Series 4000 Blocks released since the 1975 book, there are no plans for a new block catalog in the foreseeable future.

I have recently been asked by three members to consider a reprint, and have contacted the printer on prices. Obviously, the greater the re-print order, the lower the price. Depending on volume, the price to our members for a reprint should not be more than 10% in excess of the 1975 price. All catalogs would have the 5 hole punching. I do not know if the printer will adjust the price for catalogs without covers or the assembly of a member's cover. Arrangements for special covers should be made well in advance of the printing.

In any event, we estimate the price to be \$200/M including punching. (The 1975 price was \$194/M with punching).

The Institute will purchase these catalogs from the printer and have them shipped to the member. Please have your purchase order made out to:

Friction Materials Standards Institute, Inc.
E-210 Route 4
Paramus, New Jersey 07652

Please advise shipping instructions--and any special instructions if you are not taking the standard cover. Please have your order in the Institute Office by November 1, 1976. We will have to cut off orders at that time so as to ship before the Christmas season.

EWD/erc

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 7 8

August 3, 1976

REGULATION VESC-14 - MINIMUM REQUIREMENTS FOR BRAKE COMPONENT WEAR WARNING

Over the last several years the Vehicle Equipment Safety Commission (VESC) has been working on a regulation to require some signal that brake friction materials are worn out so as not to require that a drum or wheel be removed. Their work also aimed at telling when a rotor or a drum had reached a safe limit.

In 1973 the Vehicle Equipment Safety Commission advised that they were proposing a Regulation for brake component wear warning. At that time they drafted a regulation which could have caused some difficulty for brake lining manufacturers:

Every replacement component should meet the original component performance specification established by the vehicle manufacturer.

A reasonable interpretation of this requirement could have meant that replacement brake lining would have had to be that lining originally approved by the vehicle manufacturer. After meetings and correspondence on this particular regulation, that section of the requirement was revised to read as follows:

Every replacement brake component for a wear warning system or assembly should allow the system to retain the same type of warning as in the original system design.

This wording was incorporated in the final write-up for Regulation VESC-14. While the Vehicle Equipment Safety Commission has finalized their regulation VESC-14 and established an effective date of January 1, 1978 I am not aware of any state that has as yet required that regulation VESC-14 be complied with. On the latest list of AAMVA jurisdictions for equipment approvals (dated April 15, 1976) Regulation VESC-14 was not listed.

A copy of VESC-14 is enclosed. It is suggested that you fold the regulation in half (5-1/2 x 4-1/4) and use in booklet form. This is sent for your information.

EWD/lmc
CC: Active Members - List B
Regional Members
Licensees
Enc.

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 7 7

July 27, 1976

DOT STANDARDS 105-75 AND 121

On May 27, 1976 we issued BULLETIN NO. 568A which forwarded our assembled copies of DOT Federal Motor Vehicle. Safety Standards 105-75 (Hydraulic Brake Systems) and 121 (Air Brake Systems). These were assembled from notices as they had appeared in the Federal Register. From all apperances the standards as assembled were quite accurate. I had reviewed them with individuals at NHTSA.

Acting on recommendations of our Brake Performance Study Committee, the Institute petitioned NHTSA to publish complete texts of Standards 105-75 and 121 in the Federal Register. Acting in response to our petitions and those of other interested parties, NHTSA did publish the entire texts of Standards 105-75 and 121 in the Federal Register on July 19, 1976.

Enclosed are copies of the complete official versions of DOT Standards 105-75 and 121.

EWD/erc
Enclosure

E. W. Drislane
Executive Director

DOT STANDARD 105-75 (HYDRAULIC BRAKE SYSTEMS) - JULY 19 1976

RULES AND REGULATIONS

CHAPTER V—NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

[Docket Nos. 75-07; 75-10; Notices 03, 09]

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

Republication of Brake System Standards

STANDARD NOS. 105-75 AND 121

§ 571.105-75 Standard No. 105-75;
Hydraulic brake systems (Effective
Jan. 1, 1976).

S1. Scope. This standard specifies requirements for hydraulic service brake and associated parking brake systems.

S2. Purpose. The purpose of this standard is to insure safe braking performance under normal and emergency conditions.

S3. Application. This standard applies to passenger cars equipped with hydraulic service brake systems, and to school buses manufactured on and after October 12, 1976, with hydraulic service brake systems.

S4. Definitions. "Antilock system" means a portion of a service brake system that automatically controls the degree of rotational wheel slip at one or more road wheels of the vehicle during braking.

"Backup system" means a portion of a service brake system, such as a pump, that supplies energy, in the event of a primary brake power source failure.

"Brake power assist unit" means a device installed in a hydraulic brake system that reduces the operator effort required to actuate the system, and that if inoperative does not prevent the operator from braking the vehicle by a continued application of muscular force on the service brake control.

"Brake power unit" means a device installed in a brake system that provides the energy required to actuate the brakes, either directly or indirectly through an auxiliary device, with the operator action consisting only of modulating the energy application level.

"Hydraulic brake system" means a system that uses hydraulic fluid as a medium for transmitting force from a service brake control to the service brake, and that may incorporate a brake power assist unit, or a brake power unit.

"Initial brake temperature" means the average temperature of the service brakes on the hottest axle of the vehicle 0.2 mi before any brake application.

"Lightly loaded vehicle weight" means:

(a) For vehicles with a GVWR of 10,000 lb or less, unloaded vehicle weight plus 300 lb. (including driver and instrumentation);

(b) For vehicles with a GVWR greater than 10,000 lb, unloaded vehicle weight plus 500 lb (including driver and instrumentation).

"Parking mechanism" means a component or subsystem of the drive train that locks the drive train when the transmission control is placed in a parking or other gear position and the ignition key is removed.

"Pressure component" means a brake system component that contains the brake system fluid and controls or senses the fluid pressure.

"Skid number" means the frictional resistance of a pavement measured in accordance with American Society for Testing and Materials (ASTM) Method E-274-70 (as revised July, 1974) at 40 mph, omitting water delivery as specified in paragraphs 7.1 and 7.2 of that method.

"Snub" means the braking deceleration of a vehicle from a higher reference speed to a lower reference speed that is greater than zero.

"Speed attainable in 2 mi" means the speed attainable by accelerating at maximum rate from a standing start for 2 mi on a level surface.

"Spike stop" means a stop resulting from the application of 200 lbs of force on the service brake control in 0.08 s.

"Split service brake system" means a brake system consisting of two or more subsystems actuated by a single control designed so that a leakage-type failure of a pressure component in a single subsystem (except structural failure of a housing that is common to two or more subsystems) shall not impair the operation of any other subsystem.

"Stopping distance" means the distance traveled by a vehicle from the point of application of force to the brake control to the point at which the vehicle reaches a full stop.

"Variable proportioning brake system" means a system that automatically adjusts the braking force at the axles to compensate for vehicle static axle loading and/or dynamic weight transfer between axles during deceleration.

S5 Requirements.

S5.1 Service brake system. Each vehicle shall be capable of meeting the requirements of S5.1.1 through S5.1.6, under the conditions specified in S6 when tested according to the procedure and in the sequence set forth in S7. Except as noted in S5.1.1.2 and S5.1.1.4, if a vehicle is incapable of attaining a speed specified in S5.1.1, S5.1.2, S5.1.3, or S5.1.6, its service brakes shall be capable of stopping the vehicle from the multiple of 5 mph, but not less than 4 to 8 mph less than the speed attainable in 2 miles, within distances that do not exceed the corresponding distances specified in table II. If a vehicle is incapable of attaining

a speed specified in S5.1.4 in the time or distance interval set forth, it shall be tested at the highest speed attainable in the time or distance interval specified.

S5.1.1 Stopping distance. The service brakes shall be capable of stopping each vehicle in four effectiveness tests within the distances, and from the speeds specified below.

S5.1.1.1 In the first (preburnished) effectiveness test, the vehicle shall be capable of stopping from 30 mph and 60 mph within the corresponding distances specified in column I of table II.

S5.1.1.2 In the second effectiveness test, the vehicle shall be capable of stopping from 30 and 60 mph within the corresponding distances specified in column II of table II. If the speed attainable in 2 miles is not less than 84 mph, a passenger car shall also be capable of stopping from 80 mph within the corresponding distance specified in column II of table II.

S5.1.1.3 In the third effectiveness test the vehicle shall be capable of stopping at lightly loaded vehicle weight from 60 mph within the corresponding distance specified in column III of table II.

S5.1.1.4 In the fourth effectiveness test, a vehicle with a GVWR of 10,000 pounds or less shall be capable of stopping from 30 and 60 mph within the corresponding distances specified in Column I of Table II. If the speed attainable in 2 miles is not less than 84 mph, a passenger car shall also be capable of stopping from 80 mph within the corresponding distance specified in Column I of Table II.

If the speed attainable in 2 miles is not less than 99 mph, a passenger car shall, in addition, be capable of stopping from the applicable speed indicated below, within the corresponding distance specified in Column I of Table II.

Speed attainable in 2 miles (mph)	Required to stop from (mph)
Not less than 99 but less than 104.....	95
104 or more.....	100

S5.1.2 Partial failure. **S5.1.2.1** In vehicles manufactured with a split service brake system, in the event of a rupture or leakage type of failure in a single subsystem, other than a structural failure of a housing that is common to two or more subsystems, the remaining portion(s) of the service brake system shall continue to operate and shall be capable of stopping a vehicle from 60 mph within the corresponding distance specified in Column IV of Table II.

S5.1.2.2 In vehicles not manufactured with a split service brake system, in the event of any one rupture or leakage type of failure in any component of the service brake system the vehicle shall, by operation of the service brake control, be

capable of stopping 10 times consecutively from 60 mph within the corresponding distance specified in Column IV of Table II.

S5.1.3 Inoperative brake power assist unit or brake power unit. A passenger car equipped with one or more brake power assist units shall meet the requirements of either S5.1.3.1, S5.1.3.2, or S5.1.3.4 (chosen at the option of the manufacturer), and a passenger car equipped with one or more brake power units shall meet the requirements of either S5.1.3.1, S5.1.3.3, or S5.1.3.4 (chosen at the option of the manufacturer). A vehicle other than a passenger car shall meet the requirements of S5.1.3.1.

S5.1.3.1 The service brakes on a vehicle equipped with one or more brake power assist units or brake power units, with one such unit inoperative and depleted of all reserve capability, shall be capable of stopping a vehicle from 60 mph within the corresponding distance specified in column IV of table II.

S5.1.3.2 Brake power assist units. The service brakes on a vehicle equipped with one or more brake power assist units, with one such unit inoperative, shall be capable of stopping a vehicle from 60 mph:

(a) In six consecutive stops at an average deceleration for each stop that is not lower than that specified in column I of table III, when the inoperative unit is not initially depleted of all reserve capability; and

(b) In a final stop, at an average deceleration that is not lower than 7 fspms (equivalent stopping distance 554 feet) when the inoperative unit is depleted of all reserve capability.

S5.1.3.3 Brake power units. The service brakes of a vehicle equipped with one or more brake power units with an accumulator-type reserve system, with any one failure in any one unit shall be capable of stopping the vehicle from 60 mph—

(a) In 10 consecutive stops at an average deceleration for each stop that is not lower than that specified in column II of table III, when the unit is not initially depleted of all reserve capability; and

(b) In a final stop, at an average deceleration that is not lower than 7 fspms (equivalent stopping distance 554 feet) when the failed element of the unit is depleted of all reserve capability.

S5.1.3.4 Brake power assist and brake power units. The service brakes of a vehicle equipped with one or more brake power assist units or brake power units with a backup system, with one brake power assist unit or brake power unit inoperative and depleted of all reserve capability and with only the backup system operating in the failed subsystem, shall be capable of stopping the vehicle from 60 mph in 15 consecutive stops at an average deceleration for each stop that is not lower than 12 fspms (equivalent stopping distance 323 feet).

S5.1.4 Fade and recovery. The service brakes shall be capable of stopping each vehicle in two fade and recovery tests as specified below.

S5.1.4.1 The control force used for the baseline check stops or snubs shall be not less than 10 pounds, nor more than 60 pounds, except that the control force for a vehicle with a GVWR of 10,000 pounds or more may be between 10 pounds and 90 pounds.

S5.1.4.2 (a) Each vehicle with GVWR of 10,000 lbs or less shall be capable of making 5 fade stops (10 fade stops on the second test) from 60 mph at a deceleration not lower than 15 fspms for each stop, followed by 5 fade stops at the maximum deceleration attainable from 5 to 15 fspms.

(b) Each vehicle with a GVWR greater than 10,000 pounds shall be capable of making 10 fade snubs (20 fade snubs on the second test) from 40 mph to 20 mph at 10 fspms for each snub.

S5.1.4.3(a) Each vehicle with a GVWR of 10,000 pounds or less shall be capable of making five recovery stops from 30 mph at 10 fspms for each stop, with a control force application that falls within the following maximum and minimum limits:

(1) A maximum for the first four recovery stops of 150 pounds, and for the fifth stop, of 20 pounds more than the average control force for the baseline check; and

(2) A minimum of—

(A) The average control force for the baseline check minus 10 pounds, or

(B) The average control force for the baseline check times 0.60,

whichever is lower (but in no case lower than 5 pounds).

(b) Each vehicle with a GVWR of more than 10,000 pounds shall be capable of making five recovery snubs from 40 mph to 20 mph at 10 fspms for each snub, with a control force application that falls within the following maximum and minimum limits:

(1) A maximum for the first four recovery snubs of 150 pounds, and for the fifth snub, of 20 pounds more than the average control force for the baseline check (but in no case more than 100 pounds); and

(2) A minimum of—

(A) The average control force for the baseline check minus 10 pounds, or

(B) The average control force for the baseline check times 0.60, whichever is lower (but in no case lower than 5 pounds).

S5.1.5 Water recovery. The service brakes shall be capable of stopping each vehicle in a water recovery test, as specified below.

S5.1.5.1 The control force used for the baseline check stops or snubs shall be not less than 10 pounds, nor more than 60 pounds, except that the control force for a vehicle with a GVWR of 10,000 pounds or more may be between 10 and 90 pounds.

S5.1.5.2(a) After being driven for 2 minutes at a speed of 5 mph in any combination of forward and reverse directions through a trough having a water depth of 6 inches, each vehicle with a GVWR of 10,000 pounds or less shall be

capable of making five recovery stops from 30 mph at ten fspms for each stop with a control force application that falls within the following maximum and minimum limits:

(1) A maximum for the first four recovery stops of 150 pounds, and for the fifth stop, of 45 pounds more than the average control force for the baseline check (but in no case more than 90 pounds, except that the maximum control force for the fifth stop in the case of a vehicle manufactured before September 1, 1976, shall be not more than plus 60 pounds of the average control force for the baseline check (but in no case more than 110 pounds).

(2) A minimum of—

(A) The average control force for the baseline check minus 10 pounds, or

(B) The average control force for the baseline check times 0.60,

whichever is lower (but in no case lower than 5 pounds).

(b) After being driven for 2 minutes at a speed of 5 mph in any combination of forward and reverse directions through a trough having a water depth of 6 inches, each vehicle with a GVWR of more than 10,000 pounds shall be capable of making five recovery stops from 30 mph at 10 fspms for each stop with a control force application that falls within the following maximum and minimum limits:

(1) A maximum for the first four recovery stops of 150 pounds, and for the fifth stop, of 60 pounds more than the average control force for the baseline check (but in no case more than 110 pounds); and

(2) A minimum of—

(A) The average control force for the baseline check minus 10 pounds, or

(B) The average control force for the baseline check times 0.60, whichever is lower (but in no case lower than 5 pounds).

S5.1.6 Spike stops. Each passenger car shall be capable of making 10 spike stops from 30 mph, followed by 6 effectiveness (check) stops from 60 mph, at least one of which shall be within a corresponding stopping distance specified in column I of table II.

S5.2 Parking brake system. Each vehicle shall be manufactured with a parking brake system of a friction type with a solely mechanical means to retain engagement, which shall under the conditions of S6, when tested according to the procedures specified in S7, meet the requirements specified in S5.2.1, S5.2.2, or S5.2.3 as appropriate, with the system engaged—

(a) In the case of a passenger car, with a force applied to the control not to exceed 125 pounds for a foot-operated system and 90 pounds for a hand-operated system; and

(b) In the case of a school bus, with a force applied to the control not to exceed 150 pounds for a foot-operated system and 125 pounds for a hand-operated system.

55.2.1 Except as provided in S5.2.2, the parking brake system on a vehicle with a GVWR of 10,000 pounds or less shall be capable of holding the vehicle stationary (to the limit of traction on the braked wheels) for 5 minutes in both a forward and reverse direction on a 30 percent grade.

S5.2.2 A vehicle of a type described in S5.2.1 at the option of the manufacturer may meet the requirements of S5.2.2.1, S5.2.2.2, and S5.2.2.3 instead of the requirements of S5.2.1 if:

(a) The vehicle has a transmission or transmission control which incorporates a parking mechanism, and

(b) The parking mechanism must be engaged before the ignition key can be removed.

S5.2.2.1 The vehicle's parking brake and parking mechanism, when both are engaged, shall be capable of holding the vehicle stationary (to the limit of traction of the braked wheels) for 5 minutes, in both forward and reverse directions, on a 30 percent grade.

S5.2.2.2 The vehicle's parking brake, with the parking mechanism not engaged, shall be capable of holding the vehicle stationary for 5 minutes, in both forward and reverse directions, on a 20 percent grade.

S5.2.2.3 With the parking mechanism engaged and the parking brake not engaged, the parking mechanism shall not disengage or fracture in a manner permitting vehicle movement, when the vehicle is impacted at each end, on a level surface, by a barrier moving at 2½ mph.

S5.2.3 The parking brake system on a vehicle with a GVWR greater than 10,000 pounds shall be capable of holding the vehicle stationary for 5 minutes, in both forward and reverse directions, on a 20 percent grade.

S5.3 Brake system indicator lamp. Each vehicle shall have one or more brake system indicator lamps, mounted in front of and in clear view of the driver, which meet the requirements of S5.3.1 through S5.3.5. However, the options provided in S5.3.1(a) shall not apply to a vehicle manufactured without a split service brake system; such a vehicle shall, to meet the requirements of S5.3.1(a), be equipped with a warning indicator that activates under the conditions specified in S5.3.1(a)(4). This warning indicator shall, instead of meeting the requirements of S5.3.2, through S5.3.5, activate (while the vehicle remains capable of meeting the requirements of S5.1.2.2 and the ignition switch is in the "on" position) a continuous or intermittent audible signal and a flashing warning light, displaying the words "STOP—BRAKE FAILURE" in block capital letters not less than one-quarter of an inch in height.

S5.3.1. An indicator lamp shall be activated when the ignition (start) switch is in the "on" ("run") position and whenever any of conditions (a), (c), or (d) occur, or, at the option of the manufacturer, whenever any of conditions (b), (c), or (d) occur:

(a) A gross loss of pressure (such as caused by rupture of a brake line but not by a structural failure of a bearing that is common to two or more subassemblies) due to one of the following conditions (chosen at the option of the manufacturer):

(1) Before or upon application of a differential pressure of not more than 225 lb/in² between the active and failed brake system measured at a master cylinder outlet or a slave cylinder outlet.

(2) Before or upon application of 50 pounds of control force upon a fully manual service brake.

(3) Before or upon application of 75 pounds of control force upon a service brake with a brake power assist unit.

(4) When the supply pressure in a brake power unit drops to a level not less than one-half of the normal system pressure.

(b) A drop in the level of brake fluid in any master cylinder reservoir compartment to less than the recommended safe level specified by the manufacturer or to one-fourth of the fluid capacity of that reservoir compartment, whichever is greater.

(c) A total functional electrical failure in an antilock or variable proportioning brake system.

(d) Application of the parking brake.

S5.3.2 All indicator lamps shall be activated as a check of lamp function either when the ignition (start) switch is turned to the "on" (run) position when the engine is not running, or when the ignition (start) switch is in a position between "on" (run) and "start" that is designated by the manufacturer as a check position. However, in vehicles equipped with an automatic transmission, the activation as a check of lamp function is not required when the transmission shift lever is in a forward or reverse drive position.

S5.3.3 Each indicator lamp activated due to a condition specified in S5.3.1 shall remain activated as long as the condition exists, whenever the ignition (start) switch is in the "on" (run) position, whether or not the engine is running.

S5.3.4 When an indicator lamp is activated it may be steady burning or flashing.

S5.3.5 Each indicator lamp shall have a lens labeled in letters not less than ⅛-inch high, which shall be legible to the driver in daylight when lighted. The lens and the letters shall have contrasting colors, one of which is red. If a single common indicator is used, the lens shall be labeled "Brake". If separate indicator lamps are used for one or more of the various functions described in S5.3.1(a) to S5.3.1(d), the lens shall include the word "Brake" and appropriate additional labeling (use "Brake Pressure," "Brake Fluid" for S5.3.1(a) and S5.3.1(b)) except that if a separate parking indicator lamp is provided, the single word "Park" may be used. An anti-lock system may have a separate lens labeled "Antilock", in letters not less than one-eighth of an inch high, which shall be

legible to the driver in daylight when lighted, if the indicator is used only for the antilock system. The lens and the letters shall have contrasting colors, one of which is yellow.

S5.4 Reservoirs.

S5.4.1 Master cylinder reservoirs. A master cylinder shall have a reservoir compartment for each service brake subsystem serviced by the master cylinder. Loss of fluid from one compartment shall not result in a complete loss of brake fluid from another compartment.

S5.4.2 Reservoir capacity. Reservoirs, whether for master cylinders or other type systems, shall have a total minimum capacity equivalent to the fluid displacement resulting when all the wheel cylinders or caliper pistons serviced by the reservoirs move from a new lining, fully retracted position (as adjusted initially to the manufacturer's recommended setting) to a fully worn, fully applied position, as determined in accordance with S7.18(c) of this standard. Reservoirs shall have completely separate compartments for each subsystem except that in reservoir systems utilizing a portion of the reservoir for a common supply to two or more subsystems, individual partial compartments shall each have a minimum volume of fluid equal to at least the volume displaced by the master cylinder piston servicing the subsystem, during a full stroke of the piston. Each brake power unit reservoir servicing only the brake system shall have a minimum capacity equivalent to the fluid displacement required to charge the system piston(s) or accumulator(s) to normal operating pressure plus the displacement resulting when all the wheel cylinders or caliper pistons serviced by the reservoir or accumulator(s) move from a new lining fully retracted position (as adjusted initially to the manufacturer's recommended setting) to a fully worn, fully applied position.

S5.4.3 Reservoir labeling.—Each vehicle shall have a brake fluid warning statement that reads as follows, in letters at least one-eighth of an inch high: "WARNING, Clean filler cap before removing. Use only ----- fluid from a sealed container". (Inserting the recommended type of brake fluid as specified in 49 CFR 571.116, e.g. "DOT 3"). The lettering shall be—

(a) Permanently affixed, engraved, or embossed;

(b) Located so as to be visible by direct view, either on or within 4 inches of the brake fluid reservoir filler plug or cap; and

(c) Of a color that contrasts with its background, if it is not engraved or embossed.

S5.5 Antilock and variable proportioning brake systems. In the event of failure (structural or functional) in an antilock or variable proportioning brake system the vehicle shall be capable of meeting the stopping distance requirements specified in S5.1.2 for service brake system partial failure.

S5.6 Brake system integrity. Each vehicle shall be capable of completing all performance requirements of S5 without—

(a) Detachment or fracture of any component of the braking system, such as brake springs and brake shoe or disc pad facing, other than minor cracks that do not impair attachment of the friction facing. All mechanical components of the braking system shall be intact and functional. Friction facing tearout (complete detachment of lining) shall not exceed 10 percent of the lining on any single frictional element.

(b) Any visible brake fluid or lubricant on the friction surface of the brake, or leakage at the master cylinder or brake power unit reservoir cover, seal and filler openings.

S6. Test conditions. The performance requirements of S5 shall be met under the following conditions. Where a range of conditions is specified, the vehicle shall be capable of meeting the requirements at all points within the range.

S6.1 Vehicle weight.

S6.1.1 Other than tests specified at lightly loaded vehicle weight in S7.7, S7.8, and S7.9, the vehicle is loaded to its GVWR such that the weight on each axle as measured at the tire-ground interface is in proportion to its GAWR, except that the fuel tank is filled to any level from 100 percent of capacity (corresponding to full GVWR loading) to 75 percent of capacity. However, if the weight on any axle of a vehicle at lightly loaded vehicle weight exceeds the axle's proportional share of the gross vehicle weight rating, the load required to reach GVWR is placed so that the weight on that axle remains the same as a lightly loaded vehicle weight.

S6.1.2 For the applicable tests specified in S7.7, S7.8, and S7.9, vehicle weight is lightly loaded vehicle weight, with the added weight distributed in the front passenger seat area in passenger cars and in the area adjacent to the driver's seat in buses.

S6.2 (Reserved)

S6.3 Tire inflation pressure. Tire inflation pressure is the pressure recommended by the vehicle manufacturer for the GVWR of the vehicle.

S6.4 Transmission selector control. For S7.3, S7.5, S7.8, S7.15, S7.17, S7.11.1.2, S7.11.2.2, S7.11.3.2, and as required for S7.13, the transmission selector control is in neutral for all decelerations. For all other tests during all decelerations, the transmission selector is in the control position, other than overdrive, recommended by the manufacturer for driving on a level surface at the applicable test speed. To avoid engine stall during tests required to be run in gear a manual transmission may be shifted to neutral (or the clutch disengaged) when the vehicle speed decreases to 20 mph.

S6.5 Engine. Engine idle speed and ignition timing settings are according to the manufacturer's recommendations. If the vehicle is equipped with an adjustable engine speed governor, it is adjusted according to the manufacturer's recommendation.

S6.6 Vehicle openings. All vehicle openings (doors, windows, hood, trunk, convertible top, cargo doors, etc.) are closed except as required for instrumentation purposes.

S6.7 Ambient temperature. The ambient temperature is any temperature between 22° F. and 100° F.

S6.8 Wind velocity. The wind velocity is zero.

S6.9 Road surface. Road tests are conducted on a 12-foot-wide, level roadway having a skid number of 81. Burnish stops are conducted on any surface. The parking brake test surface is clean, dry, smooth Portland cement concrete.

S6.10 Vehicle position. The vehicle is aligned in the center of the roadway at the start of each brake application. Stops, other than spike stops, are made without any part of the vehicle leaving the roadway. Except as noted below, stops are made without lockup of any wheel at speeds greater than 10 mph. There may be controlled lockup on an antilock-equipped axle, and lockup of not more than one wheel per vehicle, uncontrolled by an antilock system. Locked wheels at speeds greater than 10 mph are allowed during spike stops (but not spike check stops), partial failure stops and inoperative brakepower or power assist unit stops.

S6.11 Thermocouples. The brake temperature is measured by plug-type thermocouples installed in the approximate center of the facing length and width of the most heavily loaded shoe or disc pad, one per brake, as shown in figure 1. A second thermocouple may be installed at the beginning of the test sequence if the lining wear is expected to reach a point causing the first thermocouple to contact the metal rubbing surface of a drum or rotor. For center-grooved shoes or pads, thermocouples are installed within one-eighth of an inch to one-quarter inch of the groove and as close to the center as possible.

S6.12 Initial brake temperature. Unless otherwise specified the brake temperature is 150° F. to 200° F.

S6.13 Control forces. Unless otherwise specified, the force applied to a brake control is not less than 15 lb and not more than 150 lb.

S7. Test procedures and sequence. Each vehicle shall be capable of meeting all the requirements of S5 when tested according to the procedures and in the sequence set forth below, without replacing any brake system part or making any adjustments to the brake system other than as permitted in burnish and reburnish procedures and in S7.9 and S7.10. Automatic adjusters may be locked out, according to the manufacturer's recommendation, when the vehicle is prepared for testing. If this option is selected, adjusters must remain locked out for entire sequence of tests. A vehicle shall be deemed to comply with the stopping distance requirements of S5.1 if at least one of the stops at each speed and load specified in each of S7.3, S7.5, S7.8, S7.9, S7.10, S7.15, or S7.17 (check stops) is made within a stopping distance that does not exceed the corresponding distance specified in table II. When the transmission selector con-

trol is required to be in neutral for a deceleration, a stop or snub shall be obtained by the following procedures: (1) Exceed the test speed by 4 to 8 mph; (2) close the throttle and coast in gear to approximately 2 mph above the test speed; (3) shift to neutral; and (4) when the test speed is reached, apply the service brakes.

S7.1 Brake warming. If the initial brake temperature for the first stop in a test procedure (other than S7.7 and S7.16) has not been reached, heat the brakes to the initial brake temperature by making not more than 10 snubs from not more than 40 to 10 mph, at a deceleration not greater than 10 fpsps.

S7.2 Pretest instrumentation check. Conduct a general check of instrumentation by making not more than 10 stops from a speed of not more than 30 mph, or 10 snubs from a speed of not more than 40 to 10 mph, at a deceleration of not more than 10 fpsps. If instrument repair, replacement, or adjustment is necessary, make not more than 10 additional stops or snubs after such repair, replacement, or adjustment.

S7.3 Service brake system—first (pre-burnish) effectiveness test. Make six stops from 30 mph. Then make six stops from 60 mph.

S7.4 Service brake system—burnish procedure.

S7.4.1 Vehicles with GVWR of 10,000 lb or less.

S7.4.1.1 Burnish. Burnish the brakes by making 200 stops from 40 mph at 12 fpsps (the 150 lb control force limit does not apply here). The interval from the start of one service brake application to the start of the next shall be either the time necessary to reduce the initial brake temperature to between 230° F. and 270° F., or the distance of 1 mile, whichever occurs first. Accelerate to 40 mph after each stop and maintain that speed until making the next stop.

S7.4.1.2 Brake adjustment — post burnish. After burnishing, adjust the brakes manually in accordance with the manufacturer's recommendation if the brake systems are manual or if the automatic adjusters are locked out, or by making stops as recommended by the manufacturer if the automatic adjusters are operative.

S7.4.2 Vehicles with GVWR greater than 10,000 lb.

S7.4.2.1 Burnish. Burnish the brakes by making 500 snubs at 10 fpsps in the sequence specified in Table IV and within the speed ranges indicated. After each brake application accelerate to the next speed specified and maintain that speed until making the next brake application at a point 1 mi from the initial point of the previous brake application. If a vehicle cannot attain any speed specified in 1 mi, continue to accelerate until the speed specified is reached or until a point 1.5 mi from the initial point of the previous brake application is reached, whichever occurs first. If during any of the brake applications specified in Table IV the hottest brake reaches 500° F. make the remainder of the 500 applications from that snub condition, except that a higher

or lower snub condition shall be followed (up to the 60 mph initial speed) as necessary to maintain a temperature of $500^{\circ}\text{F} \pm 50^{\circ}\text{F}$.

TABLE IV

Series	Snubs	Snub conditions (highest speed indicated, miles per hour)
1	175	40-20
2	25	45-20
3	25	50-20
4	25	55-20
5	250	60-20

S7.4.2.2 Brake adjustment — post burnish. After burnishing, adjust the brakes manually in accordance with the manufacturer's recommendation if the brake systems are manual or if the automatic adjusters are locked out, or by making stops as recommended by the manufacturer if the automatic adjusters are operative.

S7.5 Service brake system—second effectiveness test. Repeat S7.3. Then (for passenger cars) make four stops from 80 mph if the speed attainable in 2 miles is not less than 84 mph.

S7.6 First reburnish. Repeat S7.4, except make 35 burnish stops or snubs. Reburnish a vehicle whose brakes are burnished according to S7.4.2.1 by making 35 snubs from 60 mph to 20 mph, but if the hottest brake reaches $500^{\circ}\text{F} \pm 50^{\circ}\text{F}$, make the remainder of the 35 applications from such initial speed divisible by five but less than 60 mph as necessary to maintain a temperature of $500^{\circ}\text{F} \pm 50^{\circ}\text{F}$.

S7.7 Parking brake test. The parking brake tests for any vehicle on different grades, in different directions, and for different loads may be conducted in any order. The force required for actuation of a hand-operated brake system shall be measured at the center of the hand grip area or at a distance of $1\frac{1}{2}$ inches from the end of the actuation lever, as illustrated in Figure II.

S7.7.1 Test procedure for requirements of S5.2.1.

S7.7.1.1 Condition the parking brake friction elements so that the temperature at the beginning of the test is at any level not more than 150°F . (When the temperature of components on both ends of an axle are averaged).

S7.7.1.2 Drive the vehicle, loaded to GVWR, onto the specified grade with the longitudinal axis of the vehicle in the direction of the slope of the grade. Stop the vehicle and hold it stationary by application of the service brake control, and place the transmission in neutral.

S7.7.1.3 With the vehicle held stationary by means of the service brake control, apply the parking brake by a single application of the force specified in (a) or (b), except that a series of applications to achieve the specified force may be made in the case of a parking brake system design that does not allow the application of the specified force in a single application:

(a) In the case of a passenger car, not more than 125 pounds for a foot-operated system, and not more than 90 pounds for a hand-operated system; and

(b) In the case of a school bus, not more than 150 pounds for a foot-operated system, and not more than 125 pounds for a hand-operated system.

S7.7.1.4 Following the application of the parking brake in accordance with S7.7.1.3, release all force on the service brake control and commence the measurement of time if the vehicle remains stationary. If the vehicle does not remain stationary, reapplication of the service brake to hold the vehicle stationary, with reapplication of a force to the parking brake control at the level specified in S7.7.1.3 (a) or (b) as appropriate for the vehicle being tested (without release of the ratcheting or other holding mechanism of the parking brake) may be used twice to attain a stationary position.

S7.7.1.5 Following observation of the vehicle in a stationary condition for the specified time in one direction, repeat the same test procedure with the vehicle orientation in the opposite direction on the specified grade.

S7.7.1.6 Check the operation of the parking brake application indicator required by S5.3.1(d).

S7.7.2 Test procedure for requirements of S5.2.2. (a) Check that transmission must be placed in park position to release key;

(b) Test as in S7.7.1, except in addition place the transmission control to engage the parking mechanism; and

(c) Test as in S7.7.1 except on a 20 percent grade, with the parking mechanism not engaged.

S7.7.3 Lightly loaded vehicle. Repeat S7.7.1 or S7.7.2 as applicable except with the vehicle at lightly loaded vehicle weight.

S7.7.4 Non-service brake type parking brake systems. For vehicles with parking brake systems not utilizing the service brake friction elements, burnish the friction elements of such systems prior to parking brake tests according to the manufacturer's published recommendations as furnished to the purchaser. If no recommendations are furnished, run the vehicle in an unburnished condition.

S7.8 Service brake system—lightly loaded vehicle (third effectiveness) test. Make six stops from 60 mph with vehicle at lightly loaded vehicle weight.

S7.9 Service brake system test—partial failure.

S7.9.1 With the vehicle at lightly loaded vehicle weight, alter the service brake system to produce any one rupture or leakage type of failure, other than a structural failure of a housing that is common to two or more subsystems. Determine the control force, pressure level, or fluid level (as appropriate for the indicator being tested) necessary to activate the brake system indicator lamp. Make four stops if the vehicle is equipped with a split service brake system, or 10 stops if the vehicle is not so equipped, each from 60 mph, by a continuous application of the service brake control. Restore the service brake system to normal at completion of this test.

S7.9.2 Repeat S7.9.1 for each of the other subsystems.

S7.9.3 Repeat S7.9.1 and S7.9.2 with vehicle at GVWR. Restore the service brake system to normal at completion of this test.

S7.9.4 (For vehicles with antilock and/or variable proportioning brake systems). With vehicle at GVWR, disconnect functional power source, or otherwise render antilock system inoperative. Disconnect variable proportioning brake system. Make four stops, each from 60 mph. If more than one antilock or variable proportioning brake subsystem is provided, disconnect or render one subsystem inoperative and run as above. Restore system to normal at completion of this test. Repeat for each subsystem provided.

Determine whether the brake system indicator lamp is activated when the electrical power source to the antilock or variable proportioning unit is disconnected.

S7.10 Service brake system—inoperative brake power unit or brake power assist unit test. (For vehicles equipped with brake power unit or brake power assist unit.)

S7.10.1 Regular procedure. (This test need not be run if the option in S7.10.2 is selected.) On vehicles with brake power assist units, render the brake power assist unit inoperative, or one of the brake power assist unit subsystems if two or more subsystems are provided, by disconnecting the relevant power supply. Exhaust any residual brake power reserve capability of the disconnected system. On vehicles with brake power units, disconnect the primary source of power. Make four stops, each from 60 mph by a continuous application of the service brake control. Restore the system to normal at completion of this test. For vehicles equipped with more than one brake power unit or brake power assist unit, conduct tests of each in turn.

S7.10.2 Optional Procedures—passenger cars only. On vehicles with brake power assist units, the unit is charged to maximum prior to start of test. (Engine may be run up in speed, then throttle closed quickly to attain maximum charge on vacuum assist units.) Brake power units shall also be charged to maximum accumulator pressure prior to start of test. No recharging is allowed after start of test.

(a) (For vehicles with brake power assist units.)

Disconnect the primary source of power. Make six stops each from 60 mph, to achieve the average deceleration for each stop as specified in table III. Apply the brake control as quickly as possible. Maintain control force until vehicle has stopped.

At the completion of the stops specified above, deplete the system of any residual brake power reserve capability. Make one stop from 60 mph at an average deceleration of not lower than 7 fspas for passenger cars (equivalent stopping distance 554 feet), or 6 fspas for vehicles other than passenger cars (equivalent stopping distance 646 feet) and determine whether the control force exceeds 150 pounds.

(b) (For vehicles with brake power units with accumulator type systems) Test as in S7.10.2(a), except make 10 stops instead of 6 and, at the completion of the 10 stops, deplete the failed element of the brake power unit of any residual brake power reserve capability before making the final stop.

(c) (For vehicles with brake power assist or brake power units with backup systems.) If the brake power or brake power assist unit operates in conjunction with a backup system and the backup system is activated automatically in the event of a primary power failure, the backup system is operative during this test. Disconnect the primary source of power of one subsystem. Make 15 stops, each from 60 mph, with the backup system activated for the failed subsystem, to achieve an average deceleration of 12 fpsps for each stop.

(d) Restore systems to normal at completion of these tests. For vehicles equipped with more than one brakepower assist or brakepower unit, conduct tests of each in turn.

S7.11 Service brake system—first fade and recovery test.

S7.11.1 Baseline check stops or snubs.

S7.11.1.1 Vehicles with GVWR of 10,000 lb or less. Make three stops from 30 mph at 10 fpsps for each stop. Control force readings may be terminated when vehicle speed falls to 5 mph. Average the maximum brake control force required for the three stops.

S7.11.1.2 Vehicles with GVWR greater than 10,000 pounds. With transmission in neutral (or declutched), make three snubs from 40 to 20 mph at 10 fpsps for each snub. Average the maximum brake control force required for the three snubs.

S7.11.2 Fade stops or snubs.

S7.11.2.1 Vehicles with GVWR of 10,000 pounds or less. Make 5 stops from 60 mph at 15 fpsps followed by 5 stops at the maximum attainable deceleration between 5 and 15 fpsps for each stop. Establish an initial brake temperature before the first brake application of 130° to 150°F. Initial brake temperatures before brake applications for subsequent stops are those occurring at the distance intervals. Attain the required deceleration within 1 second and, as a minimum, maintain it for the remainder of the stopping time. Control force readings may be terminated when vehicle speed falls to 5 mph. Leave an interval of 0.4 mi between the start of brake applications. Accelerate immediately to the initial test speed after each stop. Drive 1 mi at 30 mph after the last fade stop, and immediately follow the recovery procedure specified in S7.11.3.1.

S7.11.2.2 Vehicles with GVWR greater than 10,000 lb. With transmission in neutral (or declutched) make 10 snubs from 40 to 20 mph at 10 fpsps for each snub. Establish an initial brake temperature before the first brake application of 130° F. to 150° F. Initial brake temperatures before brake application for subsequent snubs are those occurring in the time intervals specified below. Attain the required deceleration within 1 s and maintain it for the remainder of the

snubbing time. Leave an interval of 30 s between snubs (start of brake application to start of brake application). Accelerate immediately to the initial test speed after each snub. Drive for 1.5 mi at 40 mph after the last snub and immediately follow the recovery procedure specified in S7.11.3.2.

S7.11.3 Recovery stops or snubs.

S7.11.3.1 Vehicles with GVWR of 10,000 lb or less. Make five stops from 30 mph at 10 fpsps for each stop. Control force readings may be terminated when vehicle speed falls to 5 mph. Allow a braking distance interval of 1 mi. Immediately after each stop accelerate at maximum rate to 30 mph and maintain that speed until making the next stop. Record the maximum control force for each stop.

S7.11.3.2 Vehicles with GVWR greater than 10,000 lb. With transmission in neutral (or declutched) make five snubs from 40 to 20 mph at 10 fpsps for each snub. After each snub, accelerate at maximum rate to 40 mph and maintain that speed until making the next brake application at a point 1.5 mi from the point of the previous brake application. Record the maximum control force for each snub.

S7.12 Service brake system—second reburnish. Repeat S7.6.

S7.13 Service brake system—second fade and recovery test. Repeat S7.11 except in S7.11.2 run 15 fade stops or 20 snubs instead of 10.

S7.14 Third reburnish. Repeat S7.6.

S7.15 Service brake system—fourth effectiveness test. Repeat S7.5. Then (for passenger cars) make four stops from either 95 mph if the speed attainable in 2 mi is 99 to (but not including) 104 mph, or 100 mph if the speed attainable in 2 mi is 104 mph or greater.

S7.16 Service brake system—water recovery test.

S7.16.1 Baseline check stop. Make three stops from 30 mph at 10 fpsps for each stop. Control force readings may be terminated when vehicle speed falls to 5 mph. Average the maximum brake control force required for the three stops.

S7.16.2 Wet brake recovery stops. With the brakes fully released at all times, drive the vehicle for 2 min at a speed of 5 mph in any combination of forward and reverse directions, through a trough having a water depth of 8 in. After leaving the trough, immediately accelerate at a maximum rate to 30 mph without a brake application. Immediately upon reaching that speed make five stops, each from 30 mph at 10 fpsps for each stop. After each stop (except the last), accelerate the vehicle immediately at a maximum rate to a speed of 30 mph and begin the next stop.

S7.17 Spike stops. Make 10 successive spike stops from 30 mi/h with the transmission in neutral, with no reverse stops. Make spike stops by applying a control force of 200 lb while recording control force versus time. Maintain control force until vehicle has stopped. At completion of 10 spike stops, make six effectiveness stops from 60 mi/h.

S7.18 Final inspection. Inspect—

(a) The service brake system for detachment or fracture of any components, such as brake springs and brake shoes or disc pad facing.

(b) The friction surface of the brake, the master cylinder or brake power unit reservoir cover and seal and filler openings, for leakage of brake fluid or lubricant.

(c) The master cylinder or brake power unit reservoir for compliance with the volume and labeling requirements of S5.4.2 and S5.4.3. In determining the fully applied worn condition assume that the lining is worn to: (1) Rivet or bolt heads on riveted or bolted linings, or (2) within one thirty-seconds of an inch of shoe or pad mounting surface on bonded linings, or (3) the limit recommended by the manufacturer, whichever is larger relative to the total possible shoe or pad movement. Drums or rotors are assumed to be at nominal design drum diameter or rotor thickness. Linings are assumed adjusted for normal operating clearance in the released position.

(d) The brake system indicator light(s), for compliance with operation in various key positions, lens color, labeling, and location, in accordance with S5.3.

S7.19 Moving barrier test. (Only for vehicles that have been tested according to S7.7.2.) Load the vehicle to GVWR, release parking brake, and place the transmission selector control to engage the parking mechanism. With a moving barrier as described in paragraph 3.3 of SAE recommended practice J972 "Moving Barrier Collision Tests," November 1966, impact the vehicle from the front at 2½ mi/h. Keep the longitudinal axis of the barrier parallel with the longitudinal axis of the vehicle. Repeat the test, impacting the vehicle from the rear.

Note.—The vehicle used for this test need not be the same vehicle that has been used for the braking tests.

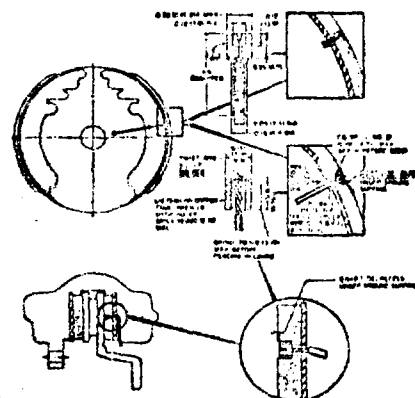
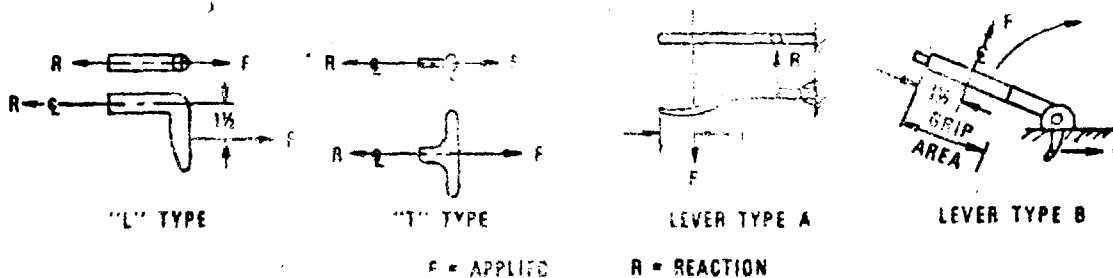


FIGURE 1 - TYPICAL PLUG THERMOCOUPLE INSTALLATIONS

Note: The second thermocouple shall be installed at .000 inch depth within 1 inch circumferentially of the thermocouple installed at .000 inch depth.



**LOCATION FOR MEASURING BRAKE APPLICATION FORCE
(HAND BRAKE)**

FIGURE 11

**TABLE I—BRAKE TEST PROCEDURE
SEQUENCE AND REQUIREMENTS**

No.	Sequence	Test load		Test procedure	Requirements
		Light	GVWR		
1	Instrumentation check			87.2	
2	First (preburnish) effectiveness test		X	87.3	88.1.1.1
3	Burnish procedure		X	87.4	
4	Second effectiveness		X	87.5	88.1.1.2
5	First reburnish		X	87.6	
6	Parking brake	X		87.7	88.2
7	Third effectiveness (lightly loaded vehicle)	X	X	87.8	88.1.1.3
8	Partial failure	X		87.9	88.1.2
9	Inoperative brake power and power assist units		X	87.10	88.1.3
10	First fade and recovery		X	87.11	88.1.4
11	Second reburnish		X	87.12	
12	Second fade and recovery		X	87.13	88.1.4
13	Third reburnish		X	87.14	
14	Fourth effectiveness		X	87.15	88.1.1.4
15	Water recovery		X	87.16	88.1.5
16	Spike stops		X	87.17	88.1.6
17	Final inspection		X	87.18	88.6
18	Moving barrier test		X	87.19	88.2.2.8

TABLE II.—Stopping distances

Vehicle test speed (miles per hour)	Stopping distance in feet for tests indicated											
	I			II			III			IV		
	1st (preburnish) and 4th effectiveness; spike effectiveness check			2d effectiveness			3d (lightly loaded vehicle) effectiveness			Inoperative brake power and power assist unit; partial failure		
	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
30	57	109(1st)	109(4th)	54	105	101	81	85	81	114	104	218
35	74	110	132	70	110	132	87	110	132	155	264	312
40	90	144	173	91	144	173	107	144	173	202	345	386
45	121	182	218	115	182	218	110	182	218	257	430	490
50	150	226	264	142	226	264	135	226	264	317	538	606
55	181	272	326	172	272	326	163	272	326	383	651	732
60	216	323	388	204	323	388	194	323	388	456	775	872
65	246	(9)	(9)	233	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)
70	277	(9)	(9)	263	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)
75	307	(9)	(9)	293	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)
80	338	(9)	(9)	323	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)

1 Distances for specified tests.
2 Not applicable.

NOTE.—(a) Passenger cars; (b) vehicles other than passenger cars with GVWR of 10,000 lb or less; (c) vehicles other than passenger cars with GVWR greater than 10,000 lb.
(80 F.R. 25945—July 13, 1975)

**TABLE III.—Inoperative brake power assist and brake power units
[Passenger cars]**

Stop No.	Average deceleration, FPS ²		Equivalent stopping distance, feet	
	Col. 1 Brake power assist	Col. 2 Brake power unit	Col. 3 Brake power assist	Col. 4 Brake power unit
1	16	16	242	242
2	12	13	323	298
3	10	12	348	323
4	9	11	431	352
5	8	10	494	384
6	7.5	9.5	517	409
7	(Depleted)			
	7.0	9.0	554	481
8	N.A.	8.5	N.A.	456
9	N.A.	8.0	N.A.	484
10	N.A.	7.5	N.A.	517
11	N.A.	(Depleted)	N.A.	554
		7.0		

DOT STANDARD 121 — (AIR
BRAKE SYSTEMS) — JULY 19 1976

RULES AND REGULATIONS

CHAPTER V—NATIONAL HIGHWAY
TRAFFIC SAFETY ADMINISTRATION
[Docket Nos. 75-07; 75-16; Notices 03, 09]

PART 571—FEDERAL MOTOR VEHICLE
SAFETY STANDARDS

Republication of Brake System Standards
STANDARD NOS. 105-75 AND 121

§ 571.121 Standard No. 121, Air Brakes
Systems.

S1 Scope. This standard establishes performance and equipment requirements for braking systems on vehicles equipped with air brake systems.

S2 Purpose. The purpose of this standard is to insure safe braking performance under normal and emergency conditions.

S3 Application. This standard applies to trucks, buses, and trailers equipped with air brake systems. However, it does not apply to a fire fighting vehicle manufactured before June 1, 1976, or a heavy hauler trailer manufactured before September 1, 1977, or to any vehicle manufactured before September 1, 1977, that has a gross axle weight rating (GAWR) for any axle of 24,000 pounds or more, two or more front steerable axles with a GAWR of 16,000 pounds or more for each axle, or that, in combination with another vehicle, constitutes a part of an "auto transporter" as defined in S4. In addition, the standard does not apply to any trailer whose unloaded vehicle weight is not less than 95 percent of its GVWR, or any vehicle that meets any one of criteria (a) through (d) as follows.

- (a) An overall vehicle width of 108 inches or more;
- (b) An axle that has a GAWR of 29,000 pounds or more;
- (c) A speed attainable in 2 miles of not more than 33 mph; or
- (d) (1) A speed attainable in 2 miles of not more than 45 mph; and
- (2) An unloaded vehicle weight that is not less than 95 percent of the vehicle GVWR; and
- (3) No passenger-carrying capacity.

S4 Definitions.

"Air brake system" means a system that uses air as a medium for transmitting pressure or force from the driver control to the service brake, but does not include a system that uses compressed air or vacuum only to assist the driver in applying muscular force to hydraulic or mechanical components.

"Antilock system" means a portion of a service brake system that automatically controls the degree of rotational wheel slip at one or more road wheels of the vehicle during braking.

"Heavy hauler trailer" means a trailer with one or more of the following characteristics:

(1) Its brake lines are designed to adapt to separation or extension of the vehicle frame; or

(2) Its body consists only of a platform whose primary cargo-carrying surface is not more than 40 inches above the ground in an unloaded condition, except that it may include slides that are designed to be easily removable and a permanent "front-end structure" as that term is used in § 393.106 of this title.

"Auto transporter" means a truck and a trailer designed for use in combination to transport motor vehicles, in that the towing vehicle is designed to carry cargo at a location other than the fifth wheel and to load this cargo only by means of the towed vehicle.

"Speed attainable in 2 miles" means the speed attainable by accelerating at maximum rate from a standing start for 2 miles on a level surface.

"Skid number" means the frictional resistance of a pavement measured in accordance with American Society for Testing and Materials Method E-274-65T at 40 m.p.h., simulating water delivery as specified in paragraph 7.1 of that method.

S5 Requirements. Each vehicle shall meet the following requirements under the conditions specified in S6.

S5.1 Required equipment—trucks and buses. Each truck and bus shall have the following equipment:

S5.1.1 Air compressor. An air compressor of sufficient capacity to increase air pressure in the supply and service reservoirs from 85 pounds per square inch (p.s.i.) to 100 p.s.i. when the engine is operating at the vehicle manufacturer's maximum recommended r.p.m. within a time, in seconds, determined by the quotient

$$\frac{\text{Actual reservoir capacity} \times 25}{\text{Required reservoir capacity}}$$

S5.1.2 Reservoirs. One or more service reservoir systems, from which air is delivered to the brake chambers, and either an automatic condensate drain valve for each service reservoir or a supply reservoir between the service reservoir system and the source of air pressure.

S5.1.2.1 The combined volume of all service reservoirs and supply reservoirs shall be at least 12 times the combined volume of all service brake chambers at maximum travel of the pistons or diaphragms.

S5.1.2.2 Each reservoir shall be capable of withstanding an internal hydrostatic pressure of five times the compressor cutout pressure or 500 p.s.i., whichever is greater, for 10 minutes.

S5.1.2.3 Each service reservoir system shall be protected against loss of air pressure due to failure or leakage in the system between the service reservoir and the source of air pressure, by check valves or equivalent devices whose proper functioning can be checked without disconnecting any air line or fitting.

S5.1.2.4 Each reservoir shall have a condensate drain valve that can be manually operated.

S5.1.3 Towing vehicle protection system. If the vehicle is intended to tow another vehicle equipped with air brakes, a system to protect the air pressure in the towing vehicle from the effects of a loss of air pressure in the towed vehicle.

S5.1.4 Pressure gauge. A pressure gauge in each service brake system, readily visible to a person seated in the normal driving position, that indicates the service reservoir system air pressure. The accuracy of the gauge shall be within plus or minus 7 percent of the compressor cut-out pressure.

S5.1.5 Warning signal. A signal, other than a pressure gage, that gives a continuous warning to a person in the normal driving position when the ignition is in the "on" or "run" position and the air pressure in the service reservoir system is below 60 p.s.i. The signal shall be either visible within the driver's forward field of view, or both audible and visible.

S5.1.6 Antilock warning signal. A signal on each vehicle equipped with an antilock system that gives a continuous warning to a person in the normal driving position when the ignition is in the "on" or "run" position in the event of a total electrical failure of the antilock system. The signal shall be either visible within the driver's forward field of view or both audible, for a duration of at least 10 seconds, and continuously visible. The signal shall operate in the specified manner each time the ignition is returned to the "on" or "run" position.

S5.1.7 Service brake stop lamp switch. A switch that lights the stop lamps when the service brake control is statistically depressed to a point that produces a pressure of 6 p.s.i. or less in the service brake chambers.

S5.2 Required equipment—trailers. Each trailer shall have the following equipment:

S5.2.1 Reservoirs. One or more reservoirs to which the air is delivered from the towing vehicle.

S5.2.1.1 A reservoir shall be provided that is capable, when pressurized to 90 p.s.i., of releasing the vehicle's parking brakes at least once and that is unaffected by a loss of air pressure in the service brake system.

S5.2.1.2 Total service reservoir volume shall be at least eight times the combined volume of all service brake chambers at maximum travel of the pistons or diaphragms.

(29073)

S5.2.1.3 Each reservoir shall be capable of withstanding an internal hydrostatic pressure of 500 p.s.i. for 10 minutes.

S5.2.1.4 Each reservoir shall have a condensate drain valve that can be manually operated.

S5.2.1.5 Each service reservoir shall be protected against loss of air pressure due to failure or leakage in the system between the service reservoir and its source of air pressure by check valves or equivalent devices.

S5.3 *Service brakes—road tests.* The service brake system on each truck and bus shall, under the conditions of S6.1, meet the requirements of S5.3.1, S5.3.3, and S5.3.4 when tested without adjustments other than those specified in this standard. The service brake system on each trailer shall, under the conditions of S6.1, meet the requirements of S5.3.2, S5.3.3, and S5.3.4 when tested without adjustments other than those specified in this standard. However, the truck and trailer portions of an auto transporter (if both are manufactured after September 1, 1976), shall, in combination, meet the requirements of S5.3.1 as they apply to a single unit truck or bus, in place of the requirements of S5.3.2 as they apply to the trailer portion, and in place of the requirements of S5.3.1 as they apply to the truck portion in the loaded condition.

S5.3.1 *Stopping distance—trucks and buses.* Except for a bus manufactured before January 1, 1977, and except as provided in S5.3.1.2 and S5.3.1.3, when stopped six times for each combination of weight, speed, and road condition specified in S5.3.1.1, in the sequence specified in Table I, the vehicle shall stop at least once in not more than the distance specified in Table II, measured from the point at which movement of the service brake control begins, without any part of the vehicle leaving the roadway and without lockup of any wheel at speeds above 10 mph except for:

- Controlled lockup of wheels allowed by an antilock system, or
- Lockup of wheels on nonsteerable axles other than the two rearmost nonliftable, nonsteerable axles on a vehicle with more than two nonsteerable axles.

TABLE I—STOPPING SEQUENCE

- Burnish.
- Control trailer service brake stops at 60 mi/h (for truck-tractors tested with a control trailer in accordance with S6.1.10.6).
- Control trailer emergency brake stops at 60 mi/h (for truck-tractors tested with a control trailer in accordance with S6.1.10.7).
- Stops with vehicle at gross vehicle weight rating:
 - 20 mi/h service brake stops on skid number of 30.
 - 60 mi/h service brake stops on skid number of 75.
- 20 mi/h service brake stops on skid number of 30.
- 20 mi/h emergency brake stops on skid number of 75.
- 60 mi/h emergency brake stops on skid number of 75.
- Parking brake test with vehicle loaded to gross vehicle weight rating.
- Stops with vehicle at unloaded weight plus 500 lb:
 - 20 mi/h service brake stops on skid number of 75.
 - 60 mi/h service brake stops on skid number of 75.

(c) 20 mi/h service brake stops on skid number of 30.

(d) 20 mi/h emergency brake stops on skid number of 75.

(e) 60 mi/h emergency brake stops on skid number of 75.

7. Parking brake test with vehicle at unloaded weight plus 500 lb.

S5.3.1.1 Stop the vehicle from 60 m.p.h. and 20 m.p.h. on a surface with a skid number of 75, and from 20 m.p.h. on a wet surface with a skid number of 30, with the vehicle (a) loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including driver and instrumentation). If the speed attainable in 2 miles is less than 60 m.p.h., the vehicle shall stop from a speed in Table II that is 4 to 8 m.p.h. less than the speed attainable in 2 miles.

S5.3.1.2 When stopped in accordance with S5.3.1, with its brakes fully applied, a truck manufactured before September 1, 1977, that has a front steerable non-driving axle with a GAWR of 16,000 pounds or more, or a front steerable drive

TABLE II—Stopping distance in feet

Vehicle speed in miles per hour	Service brake		Emergency brake, skid No. 75	
	Skid No. 75 (1)	Skid No. 30 (2)	(3)	(4)
20	85	60	85	85
25	125	-----	125	131
30	175	-----	175	186
35	194	-----	225	239
40	181	-----	299	325
45	165	-----	359	409
50	213	-----	425	501
55	246	-----	529	606
60	280	-----	613	729

axle with a GAWR of less than 16,000 pounds, and a truck manufactured before September 1, 1975, that has a front steerable drive axle of any GAWR, need not meet the requirement that it stop in the distance specified in Table II for stops on a surface with a skid number of 75 if the brakes on its front axle conform to the retardation formula and Column 1 values of S5.4.1. These vehicles must nevertheless meet the requirements of staying within the 12-foot lane and those relating to wheel lock-up.

S5.3.2 *Stopping capability—trailers.* When tested at each combination of weight, speed, and road condition specified in S5.3.2.1, in the sequence specified in Table I, with air pressure of 90 p.s.i. in the control line and service reservoir system and with no application of the towing vehicle's brakes, a trailer shall

stop without any part of the trailer leaving the roadway and without lockup of any wheel at speeds above 10 mph, except for

- Controlled lockup of wheels allowed by an antilock system, or
- Lockup of wheels on nonsteerable axles other than the two rearmost nonliftable, nonsteerable axles on a trailer with more than two nonsteerable axles.

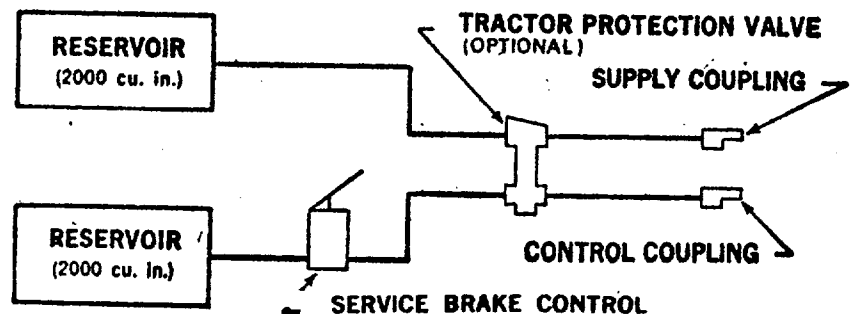
S5.3.2.1 Stop the vehicle from 60 m.p.h. and 20 m.p.h. on a surface with skid number of 75, and from 20 m.p.h. on a wet surface with a skid number of 30, with the vehicle (a) loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including instrumentation).

S5.3.3 *Brake actuation time.* With an initial service reservoir system air pressure of 100 psi, the air pressure in each brake chamber shall, when measured from the first movement of the service brake control, reach 60 psi in not more than 0.45 seconds in the case of trucks and buses, 0.35 seconds in the case of trailer converter dollies, and 0.30 seconds in the case of trailers other than trailer converter dollies. A vehicle designed to tow a vehicle equipped with air brakes shall be capable of meeting the above actuation time requirement with a 50-cubic-inch test reservoir connected to the control line coupling. A trailer, including a trailer converter dolly, shall meet the above actuation time requirement with its brake system connected to the test rig shown in Figure 1.

S5.3.4 *Brake release time.* With an initial service brake chamber air pressure of 95 psi, the air pressure in each brake chamber shall, when measured from the first movement of the service brake control, fall to 5 psi in not more than 0.55 seconds in the case of trucks and buses, and fall to 5 psi in not more than 0.65 seconds in the case of trailers, including trailer converter dollies. A vehicle designed to tow another vehicle equipped with air brakes shall be capable of meeting the above release time requirement with a 50-cubic-inch test reservoir connected to the control line coupling. A trailer, including a trailer converter dolly, shall meet the above release time requirements with its brake system connected to the test rig shown in Figure 1.

FIGURE 1

TRAILER TEST RIG



S5.4 Service brake system—dynamometer tests. When tested without prior road testing, under the conditions of S6.2, each brake assembly shall meet the requirements of S5.4.1, S5.4.2, and S5.4.3 when tested in sequence and without adjustments other than those specified in the standard. For purposes of the requirements of S5.4.2 and S5.4.3, an average deceleration rate is the change in velocity divided by the deceleration time measured from the onset of deceleration.

S5.4.1 Brake retardation force. The sum of the retardation forces exerted by the brakes on each vehicle designed to be towed by another vehicle equipped with air brakes shall be such that the quotient

$$\frac{\text{sum of the brake retardation forces}}{\text{sum of GVWR's}}$$

relative to brake chamber air pressure, shall have values not less than those shown in Column 1 of Table III. Retardation force shall be determined as follows:

TABLE III

Brake Retardation Force

Brake retardation force, GVWR	Brake chamber pressure, psi, Col. 2
Col. 1	
0.05	20
0.12	30
0.14	40
0.25	50
0.33	60
0.37	70
0.41	80

S5.4.1.1 After burnishing the brake pursuant to S6.2.6, retain the brake assembly on the inertia dynamometer. With an initial brake temperature between 125° F. and 200° F., conduct a stop from 50 m.p.h., maintaining brake chamber air pressure at a constant 30 p.s.i. Measure the average torque exerted by the brake from the time the specified air pressure is reached until the brake stops and divide by the static loaded tire radius specified by the tire manufacturer to determine the retardation force. Repeat the procedure six times, increasing the brake chamber air pressure by 10 p.s.i. each time. After each stop, rotate the brake drum or disc until the temperature of the brake falls to between 125° F. and 200° F.

S5.4.2 Brake power. When mounted on an inertia dynamometer, each brake shall be capable of making 10 consecutive decelerations at an average rate of 9 f.p.s.p.s. from 50 m.p.h. to 15 m.p.h., at equal intervals of 72 seconds, and shall be capable of decelerating to a stop from 20 m.p.h. at an average deceleration rate of 14 f.p.s.p.s. 1 minute after the 10th deceleration. The series of decelerations shall be conducted as follows:

S5.4.2.1 With an initial brake temperature between 150° F. and 200° F. for the first brake application, and the drum or disc rotating at a speed equivalent to 50 m.p.h., apply the brake and decelerate at an average deceleration rate of 9 f.p.s.p.s. to 15 m.p.h. Upon reaching 15 m.p.h., accelerate to 50 m.p.h. and apply the brake for a second time 72 seconds

after the start of the first application. Repeat the cycle until 10 decelerations have been made. The service line air pressure shall not exceed 100 p.s.i. during any deceleration.

S5.4.2.2 One minute after the end of the last deceleration required by S5.4.2.1 and with the drum or disc rotating at a speed of 20 m.p.h., decelerate to a stop at an average deceleration rate of 14 f.p.s.p.s.

S5.4.3 Brake recovery. Starting 2 minutes after completing the tests required by S5.4.2, the brake of a vehicle other than either front axle brake of a truck-tractor shall be capable of making 20 consecutive stops from 30 mph at an average deceleration rate of 12 ft/s/s, at equal intervals of 1 minute measured from the start of each brake application. The service line air pressure needed to attain a rate of 12 ft/s/s shall be not more than 85 lb/in², and not less than 20 lb/in² for a brake not subject to the control of an antilock system, or 12 lb/in² for brake subject to the control of an antilock system.

S5.5 Antilock system.

S5.5.1 Antilock system failure. On a vehicle equipped with an antilock system, electrical failure of any part of the antilock system shall not increase the actuation and release times of the service brakes.

S5.5.2 Antilock system power—trailers. On a trailer equipped with an antilock system that requires electrical power for operation, the power shall be obtained from the stop lamp circuit. Additional circuits may also be used to obtain redundant sources of electrical power.

S5.6 Parking brake system. Each vehicle other than a trailer converter dolly shall have a parking brake system that under the conditions of S6.1 meets the requirements of S5.6.1 or S5.6.2, at the manufacturer's option, and the requirements of S5.6.3 and S5.6.4. However, a trailer manufactured before June 30, 1976, that is designed to transport bulk agricultural commodities in off-road harvesting sites and to a processing plant or storage location, as evidenced by skeletal construction that accommodates harvest containers, a maximum length of 28 feet, and an arrangement of air control lines and reservoirs that minimizes damage in field operations, shall meet the requirements of this section or, at the option of the manufacturer, the requirements of § 293.43 of this title.

S5.6.1 Static retardation force. With all other brakes rendered inoperative, during a static drawbar pull in a forward or rearward direction, the static retardation force produced by the application of the parking brakes shall be:

(a) In the case of a vehicle other than a truck-tractor that is equipped with more than two axles, such that the quotient

$$\frac{\text{static retardation force}}{\text{GVWR}}$$

is not less than 0.28 for any axle other than a steerable front axle; and

(b) In the case of a truck-tractor that is equipped with more than two axles, such that the quotient

$$\frac{\text{static retardation force}}{\text{GVWR}}$$

is not less than 0.14.

S5.6.2 Grade holding. With all parking brakes applied, the vehicle shall remain stationary facing uphill and facing downhill on a smooth, dry portland cement concrete roadway with a 20-percent grade, both (a) when loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including driver and instrumentation).

S5.6.3 Application and holding. The parking brakes shall be applied by an energy source that is not affected by loss of air pressure or brake fluid pressure in the service brake system. Once applied, the parking brakes shall be held in the applied position solely by mechanical means.

S5.6.4 Parking brake control—trucks and buses. The parking brake control shall be separate from the service brake control. It shall be operable by a person seated in the normal driving position. The control shall be identified in a manner that specifies the method of control operation. The parking brake control shall control the parking brakes of the vehicle and of any air braked vehicle that it is designed to tow.

S5.7 Emergency brake system—trucks and buses. Each vehicle shall be equipped with an emergency brake system which, under the conditions of S6.1, conforms to the requirements of S5.7.1 through S5.7.3. The emergency brake system may be a part of the service brake system or incorporate portions of the service brake and parking brake systems.

S5.7.1 Emergency brake system performance. When stopped six times for each combination of weight and speed specified in S5.3.1.1 on a road surface with a skid number of 75 with a single failure in the service brake system of a part designed to contain compressed air or brake fluid (except failure of a common valve, manifold, brake fluid housing, or brake chamber housing), the vehicle shall stop at least once in not more than the distance specified in Column 3 of Table II, measured from the point at which movement of the service brake control begins, without any part of the vehicle leaving the roadway, except that a truck-tractor tested at its unloaded vehicle weight plus 500 pounds shall stop at least once in not more than the distance specified in Column 4 of Table II.

S5.7.2 Emergency brake system operation. The emergency brake system shall be applied and released, and be capable of modulation, by means of the service brake control.

S5.7.3 Towing vehicle emergency brake requirements. In addition to meeting the other requirements of S5.7, a vehicle designed to tow another vehicle equipped with air brakes shall—

(a) In the case of a truck-tractor in the unloaded condition and a single unit truck which is capable of towing an air-brake equipped vehicle and is loaded to gross vehicle weight rating, be capable of meeting the requirements of S5.7.1 by operation of the service brake control only, with the trailer air supply line and air control line from the towing vehicle vented to the atmosphere in accordance with S6.1.14;

(b) In the case of a truck-tractor loaded to gross vehicle weight rating, be capable of meeting S5.7.1 by operation of the service brake control only, with the air control line from the towing vehicle vented to the atmosphere in accordance with S6.1.14; and

(c) Be capable of modulating the air in the supply or control line to the trailer by means of the service brake control with a single failure in the towing vehicle service brake system as specified in S5.7.1.

S5.8 Emergency braking capability—trailers. Each trailer other than a trailer converter dolly shall have a parking brake system that conforms to S5.6 and that applies with the force specified in S5.6.1 or S5.6.2 when the air pressure in the supply line is at atmospheric pressure. A trailer converter dolly shall have, at the manufacturer's option, (a) a parking brake system that conforms to S5.6 and that applies with the force specified in S5.6.1 or S5.6.2 when the air pressure in the supply line is at atmospheric pressure, or (b) an emergency system that automatically controls the service brakes when the service reservoir is at any pressure above 20 lb/in² and the supply line is at atmospheric pressure. However, a trailer manufactured before June 30, 1976, that is designed to transport bulk agricultural commodities in off-road harvesting sites and to a processing plant or storage location, as evidenced by skeletal construction that accommodates harvest containers, a maximum length of 28 feet, and an arrangement of air control lines and reservoirs that minimizes damage in field operations, shall meet the requirements of this section or, at the option of the manufacturer, the requirements of § 393.43 of this title.

S6 Conditions. The requirements of S5 shall be met under the following conditions: Where a range of conditions is specified, the vehicle must be capable of meeting the requirements at all points within the range.

S6.1 Road test conditions.

S6.1.1 Except as otherwise specified the vehicle is loaded to its gross vehicle weight rating, distributed proportionately to its gross axle weight ratings.

S6.1.2 The inflation pressure is as specified by the vehicle manufacturer for the gross vehicle weight rating.

S6.1.3 Unless otherwise specified, the transmission selector control is in neutral or the clutch is disengaged during all decelerations and during static parking brake tests.

S6.1.4 All vehicle openings (doors, windows, hood, trunk, cargo doors, etc.) are in a closed position except as required for instrumentation purposes.

S6.1.5 The ambient temperature is between 32° F. and 100° F.

S6.1.6 The wind velocity is zero.

S6.1.7 Stopping tests are conducted on a 12-foot wide level roadway having a skid number of 75, unless otherwise specified. The vehicle is aligned in the center of the roadway at the beginning of a stop.

S6.1.8 The brakes on a vehicle manufactured before September 1, 1976, are burnished before testing, at the manufacturer's option, in accordance with S6.1.8.1 or S6.1.8.2. The brakes on a vehicle manufactured on or after September 1, 1976, are burnished before testing in accordance with S6.1.8.1. However, for vehicles with parking brake systems not utilizing the service brake friction elements, burnish the friction elements of such systems prior to the parking brake test according to the manufacturer's recommendations.

S6.1.8.1 With the transmission in the highest gear appropriate for the series given in Table IV make 500 brake applications at a deceleration rate of 10 ft/s/s, or at the vehicle's maximum deceleration rate, if less than 10 ft/s/s, in the sequence specified in Table IV. After each brake application, accelerate to the speed specified and maintain that speed until making the next brake application at a point 1 mile from the initial point of the previous brake application. If a vehicle cannot attain the specified speed in 1 mile, continue to accelerate until the specified speed is reached or until the vehicle has traveled 1.5 miles from the initial point of the previous brake application. If during any of the brake applications specified in Table IV, the hottest brake reaches 500° F., make the remainder of the 500 applications from that snub condition except that a higher or lower snub condition shall be used as necessary to maintain an after-stop temperature of 500° F. ± 50° F. Any automatic pressure limiting valve is in use to limit pressure as designed, except that any automatic front axle pressure limiting valve is bypassed if the temperature of the hottest brake on a rear axle exceeds the temperature of the hottest brake on a front axle by more than 125° F. A bypassed valve is reconnected if the temperature of the hottest brake on a front axle exceeds the temperature of the hottest brake on a rear axle by 100° F. After burnishing, adjust the brakes as recommended by the vehicle manufacturer.

TABLE IV

Series	Snub	Snub conditions (highest speed specified in miles per hour)
1.....	175	40-20
2.....	25	45-20
3.....	25	50-20
4.....	25	55-20
5.....	250	60-20

S6.1.8.2 With the transmission in the highest gear range appropriate for 40 mph, make 400 brake applications from 40 mph to 20 mph at 10 ft/s/s. After each brake application accelerate to 40 mph and maintain that speed until making

the next application at a point 1.5 miles from the point of the previous brake application. After burnishing, adjust the brakes as recommended by the vehicle manufacturer.

S6.1.9 Static parking brake tests for a semitrailer are conducted with the front-end supported by an unbraked dolly. The weight of the dolly is included as part of the trailer load.

S6.1.10 In a test other than a static parking brake test, a truck-tractor manufactured before September 1, 1976, is tested at its gross vehicle weight rating by loading it without a trailer or, at the manufacturer's option, by coupling it to a flatbed semitrailer (hereafter, control trailer) as specified in S6.1.10.1 to S6.1.10.7. In a test other than a static parking brake test, a truck-tractor manufactured on or after September 1, 1976, is tested at its gross vehicle weight rating by coupling it to a control trailer as specified in S6.1.10.1 to S6.1.10.7.

S6.1.10.1 The center of gravity of the to this standard.

S6.1.10.2 The center of gravity of the loaded control trailer is on the trailer's longitudinal centerline at a height of 66 ± 3 in. above the ground.

S6.1.10.3 For a truck-tractor with a rear axle gross axle weight rating of 26,000 lb or less, the control trailer has a single axle with a gross axle weight rating of 18,000 lb and a length, measured from the transverse centerline of the axle to the centerline of the kingpin, of 258 ± 6 in.

S6.1.10.4 For a truck-tractor with a total rear axle gross axle weight rating of more than 26,000 lb the control trailer has a tandem axle with a combined gross axle weight rating of 32,000 lb and a length, measured from the transverse centerline between the axles to the centerline of the kingpin, of 390 ± 6 in.

S6.1.10.5 The control trailer is loaded so that its axle is loaded to its gross axle weight rating and the tractor is loaded to its gross vehicle weight rating, with the tractor's fifth wheel adjusted so that the load on each axle measured at the tire-ground interface is most nearly proportional to the axles' respective gross axle weight ratings.

S6.1.10.6 Test equipment specification. The control trailer's service brakes are capable of stopping the combination from the maximum speed at which the tractor is tested, under the conditions of S6.1, without assistance from the tractor brakes, in the distance found by multiplying the value 68, 90, 116, 143, 174, 208, or 245 (corresponding to a speed of 30, 35, 40, 45, 50, 55, or 60 mph as appropriate for the truck-tractor tested) by the ratio:

$$\frac{\text{weight on all axles of combination}}{\text{weight on trailer axles}}$$

with the tractor's fifth wheel adjusted as specified in S6.1.10.5, the trailer service reservoirs pressurized to 100 lb/in², and the trailer loaded so that its axle is at gross axle weight rating and its kingpin is at empty vehicle weight. The stopping distance is measured from the point at which movement of the valve control-

ling the trailer brakes begins. The service brake chambers on the trailer reach 60 lb/in² in not less than 0.20 second and not more than 0.30 second, measured from the instant at which movement of the valve controlling the trailer brakes begins.

S6.1.10.7 Test equipment specification. The control trailer's emergency brakes are capable of stopping the combination under the conditions of S6.1 from the maximum speed at which the tractor is tested, without assistance from the tractor's brakes. In the distance found by multiplying the emergency brake stopping distance in column 3 of table II by the ratio:

$$\frac{\text{weight on all axles of combination}}{\text{weight on trailer axles}}$$

with the combination loaded in accordance with S6.1.10.5. Stopping distance is measured from the point at which movement of the valve controlling the trailer brakes begins. The pressure in trailer brakes begins. In the case of control trailers that utilize parking brakes for emergency stopping capability, the pressure in the trailer's spring parking brake chambers falls from 95 lb/in² to 5 lb/in² in not less than 0.50 second and not more than 0.60 second, measured from the instant at which movement of the valve controlling the trailer's spring parking brakes begins.

S6.1.11 Special drive conditions. A vehicle equipped with an interlocking axle system or a front wheel drive system that is engaged and disengaged by the driver is tested with the system disengaged.

S6.1.12 Lifiable axles. A vehicle with a liftable axle is tested at gross vehicle weight rating with the liftable axle down and at unloaded vehicle weight with the liftable axle up.

S6.1.13 After September 1, 1975, the trailer test rig shown in Figure 1 is capable of increasing the pressure in a 50 cubic inch reservoir from atmospheric to 60 lb/in² in 0.06 second, measured from the first movement of the service brake control to apply service brake pressure and of releasing pressure in such a reservoir from 95 to 5 lb/in² in 0.22 second measured from the first movement of the service brake control to release service brake pressure.

S6.1.14 In testing the emergency braking system of towing vehicles under S5.7.3(a) and S5.7.3(b), the hose(s) is vented to the atmosphere at any time not less than 1 second and not more than 1 minute before the emergency stop begins, while the vehicle is moving at the speed from which the stop is to be made and any manual control for the towing vehicle protection system is in the position to supply air and brake control signals to the vehicle being towed. No brake application is made from the time the line(s) is vented until the emergency stop begins and no manual operation of the parking brake system or towing vehicle protection system occurs from the time the line(s) is vented until the stop is completed.

S6.2 Dynamometer test conditions

S6.2.1 The dynamometer load for each wheel is equivalent to the load on the wheel with the axle loaded to its gross axle weight rating.

S6.2.2 The ambient temperature is between 75° and 100° F.

S6.2.3 All of ambient temperature is directed uniformly and continuously over the brake drum or disc at a velocity of 2,200 feet per minute.

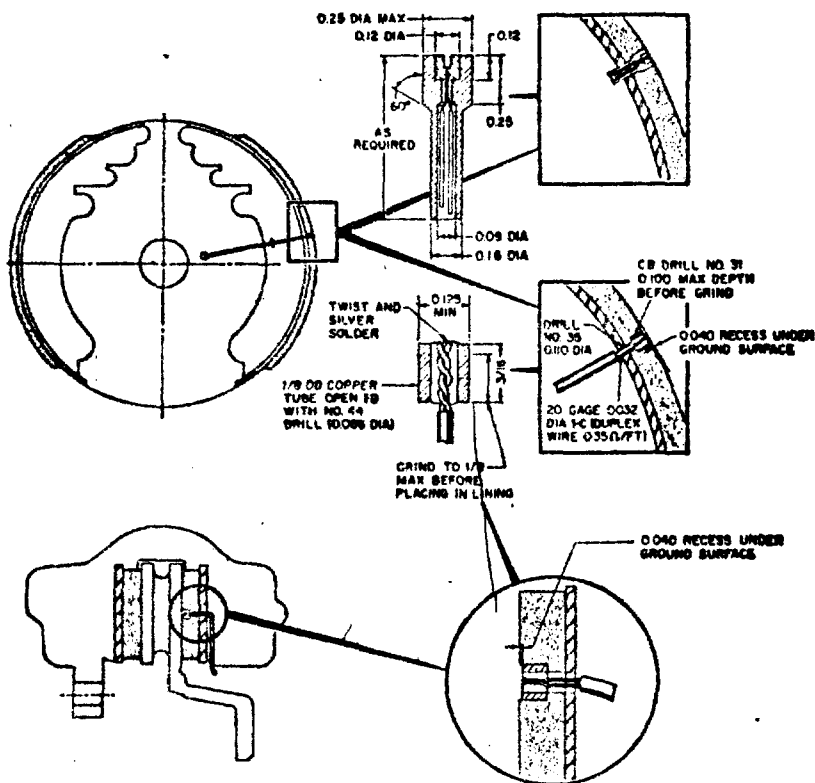
S6.2.4 The temperature of each brake is measured by a single plug-type thermocouple installed in the center of the lining surface of the most heavily loaded shoe or pad as shown in Figure 2. The thermocouple is outside any center groove.

S6.2.5 The rate of brake drum or disc rotation on a dynamometer corresponding to the rate of rotation on a vehicle at a given speed is calculated by assuming a tire radius equal to the static loaded radius specified by the tire manufacturer.

S6.2.6 Brakes are burnished before testing as follows: Place the brake assembly on an inertia dynamometer and adjust the brake as recommended by the brake manufacturer. Make 200 stops from 40 m.p.h. at a deceleration of 10 f.p.s.p.s., with an initial brake temperature on each stop of not less than 315° F. and not more than 385° F. Make 200 additional stops from 40 m.p.h. at a deceleration of 10 f.p.s.p.s. with an initial brake temperature on each stop of not less than 450° F. and not more than 550° F. After burnishing, the brakes are adjusted as recommended by the brake manufacturer.

S6.2.7 The brake temperature is increased to a specified level by conducting one or more stops from 40 m.p.h. at a deceleration of 10 f.p.s.p.s. The brake temperature is decreased to a specified level by rotating the drum or disc at a constant 30 m.p.h.

**FIGURE 2
THERMOCOUPLE INSTALLATION**



EFFECTIVE DATE NOTE:

1. The provisions of S5.7 above become effective September 1, 1976. For the convenience of the user, the superseded text is set forth below:

S5.7 Emergency braking capability—trucks and buses. Each truck and bus shall have a braking system with emergency braking capability that meets the requirements of S5.7.1, or, at the manufacturer's option, the requirements of S5.7.2.

S5.7.1 Parking brake system with automatic application. Each vehicle shall have a parking brake system acting on each axle, except steerable front axles, that conforms to S5.6 and that meets the following requirements:

S5.7.1.1 Automatic application. The parking brakes shall be automatically applied and the supply line to any towed vehicle vented to atmospheric pressure when the air pressure in all service reservoirs is less than the automatic application pressure level. The automatic application pressure level shall be between 20 and 45 p.s.i.

S5.7.1.2 Automatic braking performance. With the parking brake automatically applied, a vehicle shall either be capable of meeting the requirements of S5.7.2.3, with distances measured from the point of automatic application, or shall have a static retardation force quotient not greater than 0.40 for any axle, determined in accordance with S5.6.1.

S5.7.1.3 Release after automatic application. After automatic application, the parking brakes shall be releasable at least once

by means of a parking brake control. The parking brakes shall be releasable only if they can be automatically applied and exert the force required by S5.6 immediately after release.

S5.7.1.4 Manual operation. The parking brakes shall be manually operable and releasable when the air pressure in the service reservoir system is sufficient to keep the parking brakes from automatically applying.

S5.7.2 Modulated emergency braking system. Each vehicle that does not have a parking brake system that is automatically applied in the event of air pressure loss shall have a parking brake system conforming to S5.6 that is capable of manual application at any reservoir system pressure level, and shall have an emergency braking system that meets the following requirements.

S5.7.2.1 Emergency braking control. The emergency braking system shall be controlled by the service brake control or the parking brake control. The control for the emergency braking system shall control the brakes on any towed vehicle equipped with air brakes.

S5.7.2.2 Emergency braking system failure. In the event of a failure of a valve, manifold, brake fluid housing, or brake chamber housing that is common to the service brake and emergency braking systems, loss of air shall not cause the parking brake to be inoperable.

S5.7.2.3 Emergency braking stopping distance. Except as specified in S5.7.2.3.1 and S5.7.2.3.2, when stopped six times for each combination of weight and speed specified in S5.3.1.1 on a road surface with a skid

number of 75, with a single failure in the service brake system of a part designed to contain compressed air or brake fluid (except failure of a common valve, manifold, brake fluid housing, or brake chamber housing), the vehicle shall stop at least once in not more than the distance specified in column 3 of Table II, measured from the point at which movement of the brake control begins, without any part of the vehicle leaving the roadway, except that a truck-tractor tested at its unloaded vehicle weight plus 500 pounds shall stop at least once in not more than the distance specified in Column 4 of Table II.

S5.7.2.3.1 A truck manufactured before September 1, 1976, that has a front steerable non-driving axle with a GAWR of 18,000 pounds or more, or a front steerable drive axle with a GAWR of less than 18,000 pounds, and a truck manufactured before September 1, 1976, that has a front steerable drive axle of any GAWR, must stop in accordance with S5.7.2.3 without any part of the vehicle leaving the roadway, but need not stop in the distances specified.

S5.7.2.3.2 When stopped in accordance with S5.7.2.3, a truck or bus manufactured before September 1, 1976, other than a truck described in S5.7.2.3.1, shall stop at least once for each speed and weight condition on a surface with a skid number of 75 in not more than the distance specified in Table IIa instead of meeting the stopping distances specified in Table II for stops on a surface with a skid number of 75.

EFFECTIVE DATE NOTE 2: New paragraph S5.1.14 above becomes effective September 1, 1976.

B U L L E T I N

N O. 5 7 6

July 15, 1976

FRICION MACHINE TESTS, DYNAMOMETERS, AND THE AAMVA

In 1975 we circulated a bulletin advising the membership on availability of testing services on friction test machines and dynamometers, and on the sources for manufacturing such equipment. We are now enclosing an up-date on this information, as shown on the attached listing.

We are also enclosing a second listing of those independent laboratories who have been approved by the American Association of Motor Vehicle Administrators (AAMVA) for certification of brake linings in compliance with Regulation V-3. This AAMVA listing of approved laboratories is as of July 1, 1976.

Also enclosed is an AAMVA chart dated April 1, 1976 on approval programs indicating that fourteen states now require brake lining certification using VESC-3: Kentucky, Louisiana, Maryland, Massachusetts, New Jersey, New York, North Carolina, North Dakota, Ohio, Pennsylvania, Rhode Island, South Carolina, South Dakota and Washington. Some of these are new. I believe Ohio still requires direct certification.

These listings are forwarded for information of those concerned with test equipment and certification requirements.

EWD/erc
Enclosure:
cc-Delegates & Alternates
Brake Performance Study Committee

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 7 5

July 15, 1976

RECOMMENDATIONS FOR 1980 CENSUS

The U. S. Department of Commerce has sent the enclosed memo concerning the 1980 Census to all trade associations.

This memorandum is asking for recommendations on the type of information to be gathered in that census. They are particularly interested in getting recommendations from the users of the decennial census.

If your company has any recommendations for the 1980 census, would you kindly send them directly to:

Director
U. S. Bureau of the Census
Washington, D. C. 20233

EWD/erc
Enclosure:

E. W. Drislane
Executive Director

cc-Delegates & Alternates
Licensees (U.S.)

BULLETIN

NO. 574

July 15, 1976

LABORATORIES--ASBESTOS FIBRE COUNTS AND CONSULTING

In 1973 we circulated a list of laboratories which would provide various services as regards asbestos monitoring. This is a 1976 up-date on that type laboratory.

We have listed eight (8) laboratories (one has two locations) that will run the OSHA approved fibre counts in their labs from samples sent in by clients. Some will provide technical services in taking the samples by the membrane filter method. Others will provide consulting services.

The listing is in summary form. If you wish to use the service of such a lab, you may contact the party indicated for more information. There may be set-up charges for a few counts. All consulting fees are subject to additional charges for the consultant's or technician's expenses.

The Institute is not in any way endorsing or recommending the listed laboratories. They are simply listed for your information.

EWD/erc

E. W. Drislane

cc-Delegates & Alternates
Asbestos Study Committee
Regional Members (Canada)

Laboratory	Telephone (215) 488-6258	Contact Spencer Watts	Fibre Count \$20	*Consultation Daily Fee \$125
Bernville Biological Laboratory RD # 1 - Route 183 Bernville, Pa. 19506				
William A. Burgess 38 Fox Hill Street Westwood, Mass 02090	(617) 326-0814	William Burgess	\$20	Daily Fee \$350
Clayton Environmental Assoc. 25711 Southfield Road Southfield, Michigan 48075	(313) 424-8860	Robert Soule	\$17.50	Senior Consultant \$320/day Technical Specialist \$200/day
Eco Science Laboratory 490 West Main Street Norwich, Conn. 06360	(203) 889-8104	Richard Benoit	\$21 plus set-up	Daily Fee \$240
Environmental Health Laboratory 1021 Georgia Avenue Macon, Georgia 31201	(912) 745-4702	John Savidge	\$30	Consultation available at approx. \$200/day affiliate at approx. \$200/day
Kettering Laboratory-Analytical Section University of Cincinnati Eden & Bethesda Avenue Cincinnati, Ohio 45267	(513) 872-5739	David Yeager	\$10	Daily Fee \$300
LFE Corporation Environmental Analysis Labs. 2030 Wright Avenue Richmond, Cal. 94804	(415) 235-2633	Walter Holland Robert Reinhart	\$20 (< 6) \$17 (6-10) \$15 (> 10)	Senior Hygienist \$330/day Technician \$215/day
Swanson Environmental, Inc. P. O. Box 735 Sheboygan, Wisconsin 53081	(414) 458-0502	James Yanko	\$25 (< 5) \$20 (5 - 9) \$15 (> 9)	Professional \$250/day Technical \$150/day
Swanson Environmental, Inc. 24680 Swanson Road Southfield, Michigan 48076	(313) 352-0960	Jon Swanson	(same)	(same)

* In addition to fee, expenses are charged.

JUL 15 1976

BULLETIN

NO. 573

July 6, 1976

HISTORICAL SALES PROGRAM

The historical sales program is continuing on a quarterly basis. Regional Members using the copyrighted FMSI Numbers for marketing their products in the United States may participate if they wish.

The Institute is requesting details of pieces sold for the first half of 1976 (6 months ending June 30, 1976). The rules for the reporting details remain unchanged.

1. Quantities will be reported in pieces (not units).
For roll lining, each foot of length will be one piece.
2. Our Accountants will report the names of the members from whom reports are received, and the number of members reporting in each of the four groups.
3. Total pieces in each group will be reported.
4. "Clutch Facings" does not include gear tooth discs, automatic transmission discs, or the 8-14" dia, (3/16 to 1/2" thick) asbestos composition discs.

The data as filed will be confidential. Totals for each group will be shown and there is no way of determining quantities by individual members.

Please review the form and the description as they apply to this year's reporting. You will be receiving from Marshall Granger & Company, Certified Public Accountants, a form for completing this information. Please return it to:

Marshall Granger & Company, C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

If you report, please have your figures in by August 15, 1976. If you do not wish to report these figures, no reply is necessary. Only those reporting figures will receive the industry totals when the data is summarized. A sample form and definitions are attached.

EWD/erc
Encs.

Distribution: Delegates & Alternates
Regional Members (paying
Active Member Dues)

E. W. Drislane
Executive Director

EXHIBIT "B"

DEFINITION FOR HISTORICAL SALES

PIECES

The reports will show pieces of friction material, in groups as shown:

<u>Group</u>	<u>Description</u>	<u>Normal Usage</u>
Brake Lining	Friction materials less than a nominal 3/4" thickness (See note on roll lining)	Normally, <u>one piece</u> to a shoe
Brake Blocks	Friction materials with a nominal thickness of 3/4" and over	Normally, <u>two pieces</u> to a shoe
Disc Brake Linings	Friction materials sold (for disc brakes) to be attached to the shoe, or sold as a unit molded, bonded or riveted to the shoe	Normally, <u>one piece</u> to a shoe
Clutch Facing	Friction materials of annular shape, or segments thereof	Normally, <u>two annular pieces</u> per clutch plate

Note: For roll lining only, consider each foot of length equals one piece.

REPLACEMENT SALES TO UNITED STATES MARKET

This reporting is for sales to the United States replacement market only. Do not include sales to other markets. This includes sales under the friction material manufacturer's own name or brand name used by the customer, to automotive warehouse distributors, jobbers, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies or other customers for use in the United States replacement market.

When a friction materials manufacturer is shipping to a vehicle manufacturer, brake manufacturer, or clutch manufacturer, but has no reasonable way of determining if the pieces are for original equipment or replacement purposes, estimates will not be used - these pieces will not be reported. However, where a friction material manufacturer is shipping to a point known to be used for replacement, or where he stencils or otherwise identifies the pieces as being for replacement purposes, or where the shipments otherwise are obviously known to be for replacement, these pieces will be reported.

The member who sells to the type customer or user indicated above will report those pieces sold, even if purchased from another Active Member or Regional Member.

When you sell your friction materials to another Member (Active or Regional) do not report those sales! Materials sold to Licensee Members of the Institute for the replacement market should be included.

BULLETIN

NO. 572

July 1, 1976

CONSTITUTION AND BY-LAWS

Based on a mail ballot during the year and action taken at the recent Membership Meeting, the Institute's Constitution is being amended through July 1, 1976. The amendments clarify rights of Regional Members, the date of Directors' meeting, duties of Treasurer, the date of Annual Membership Meeting, and the use of mail ballot.

ARTICLE III. MEMBERSHIP, Section 5

Specifies that Regional Members (non U.S.A.) paying the same Annual Dues as Active Members (U.S.A.) have the same rights as Active Members except for the right to vote. In addition, this section more specifically states the rights of other Regional Members.

ARTICLE IV. DIRECTORS, Section 8

This change calls for our regular meeting of the Board of Directors in June each year (as is actual practice) rather than four meetings "...fourth Wednesday of July, October, January and April..."

ARTICLE VI. DUTIES OF OFFICERS, Section 4

In essence, the Treasurer who may be with a member firm in Chicago, Los Angeles or elsewhere, cannot have custody of all monies, and monies cannot be sent him. This change states duties of Treasurer realistically allowing for this distance problem.

ARTICLE VII. MEMBERSHIP MEETING, Section 1

This change eliminates Annual Meeting on "third Wednesday of June" and calls for a meeting "on a Wednesday in June." Flexibility is needed for scheduling purposes.

ARTICLE VII. MEMBERSHIP MEETING, Section 2,

This amendment specifically permits a mail ballot when it is felt not necessary to hold a special meeting.

ARTICLE VII. QUORUM AND VOTING, Section 3

The wording on mail ballots is removed, as it is now more explicit in Section 2.

ARTICLE IX. FEES AND ASSESSMENTS, Section 2

A sentence is added to the effect that Regional Members (non U.S.A.) with essentially the same rights as Active Members (U.S.A.) must pay the same Annual Fee as Active Members.

ARTICLE XI. AMENDMENTS, Section 1

This Amendment clarifies ambiguous wording by specifically permitting amendments of the Constitution by mail ballot. (The earlier wording indicated necessity of a meeting).

ARTICLE IIIMEMBERSHIPSection 5. Rights of Members. Sub part (b) Regional Members

Regional Members shall be entitled to receive from the Institute, as completely and promptly as Active Members, all scientific, engineering, technological and statistical information collected, assembled or disseminated by the Institute and may fully and freely call upon the Institute for all such available information and assistance in connection therewith. The participation of Regional Members in the activities of the Institute shall be restricted as in this paragraph (b) set forth and they shall not be bound by, enjoy or participate in any other rights, obligations, privileges, benefits or activities otherwise available to Active Members, except that Regional Members may serve on Committees. Nothing contained in this section, however, shall limit the provisions of Article X.

Regional Members paying the same annual fee as Active Members have the same rights as Active Members except they shall have no right to vote or to serve as Officers, or as Members of the Board of Directors. Regional Members not paying the same annual fee as Active Members, shall be entitled only to (1) serve on committees, (2) receive scientific, engineering, and technological information available from the Institute, and (3) fully and freely call upon the Institute for all such information and assistance in connection therewith. The participation of Regional Members in the activities of the Institute shall be restricted as in this paragraph (b) set forth and they shall not be bound by, enjoy or participate in any other rights, obligations, privileges, benefits or activities otherwise available to Active Members. Nothing contained in this section, however, shall limit the provisions of Article X.

ARTICLE IVDIRECTORSSection 8. Meetings and Notices. (first sentence only)

Regular meetings of the Board of Directors will be held quarterly on the fourth (4th) Wednesday of July, October, January and April each year at a place to be fixed by the President.

Regular meetings of the Board of Directors will be held annually in June of each year at a place to be fixed by the President.

ARTICLE VIDUTIES OF OFFICERSSection 4. Treasurer. (first three sentences)

The Treasurer shall have the custody of all the monies of the Institute and shall order and direct the payments of all bills. The Treasurer shall keep a proper account of all receipts and disbursements and shall submit his books and other records of his office to the Board of Directors upon request, and shall submit to the Board of Directors

The Treasurer shall order and direct the payment of all bills. The Treasurer shall keep a proper account of all receipts and disbursements and shall submit his books and other records of his office to the Board of Directors upon request, and shall submit to the Board of Directors written reports covering all receipts and disbursements during

ARTICLE VI (Cont.)

not later than the 25th days of October, January, April and July written reports covering all receipts and disbursements during the last preceding quarter. All monies received by the Treasurer shall be deposited in the name of the Institute with such depository as may be designated by the Board of Directors.

the year. All monies received shall be deposited in the name of the Institute with such depository as may be designated by the Board of Directors.

ARTICLE VIIMEMBERSHIP MEETINGSSection 1. Annual Meeting.

The Annual Meeting of the Members of the Institute shall be held each year on the third Wednesday of June in a place to be designated by the Board of Directors or by the President.

The Annual Meeting of the Members of the Institute shall be held each year on a Wednesday in June at a place to be designated by the Board of Directors or by the President.

ARTICLE VIIMEMBERSHIP MEETINGSSection 2. Special Meetings.

The time and place of holding special meetings of the members of the Institute shall be determined by the Board of Directors or by the President, either of whom shall have authority to call such meetings as may be desirable for the conduct of the Institute's business.

The time and place of holding special meetings of the members of the Institute shall be determined by the Board of Directors or by the President, either of whom shall have authority to call such meetings as may be desirable for the conduct of the Institute's business.

If in the discretion of the President of the Institute or a majority of the Board of Directors, it is not necessary to hold a special meeting in order to reach a decision of the members, the vote of the membership may be taken by mail ballot with the same effect as though a special meeting had been held.

Section 3. Quorum and Voting

A majority of the Active Members of the Institute shall constitute a quorum at any meeting for the transaction of business, except when otherwise provided by law. At all meetings of the members of the Institute, each member shall be entitled to one vote, regardless of the number of delegates present. The votes of the membership may be taken by mail

A majority of the Active Members of the Institute shall constitute a quorum at any meeting for the transaction of business, except when otherwise provided by law. At all meetings of the members of the Institute, each member shall be entitled to one vote, regardless of the number of delegates present.

ARTICLE VII Section 3 (Cont.)

ballot if, in the discretion of the President of the Institute or of a majority of the Board of Directors, a record of a vote in that manner is deemed advisable

ARTICLE IXFEES AND ASSESSMENTSSection 2. Annual Dues. Sub part (b) Regional Members

The Annual Membership fee of a Regional Member and the Annual Membership fee of a Regional Trade Group shall be fixed by the Board of Directors. A qualified member of a Regional Trade Group will not be required to pay any additional fee to the Institute.

The Annual Membership fee of a Regional Member and the Annual Membership fee of a Regional Trade Group shall be fixed by the Board of Directors. A qualified member of a Regional Trade Group shall not be required to pay any additional fee to the Institute. Regional Members with the same rights as Active Members except the right to vote or to serve as Officers or as Members of the Board of Directors, shall pay the same annual fees as Active Members.

ARTICLE XIAMENDMENTSSection 1. Vote Required

The Constitution and By-Laws may be amended at any regular or special meeting of the members of the Institute only (a) by vote of two-thirds of all the Active Members or (b) by the written assent of not less than two-thirds of all the Active Members providing all Active Members have previously had written notice of the proposed amendment.

The Constitution and By-Laws may be amended only (a) at any regular or special meeting of the members of the Institute by vote of two-thirds of all the Active Members or (b) by the written assent of not less than two-thirds of all the Active Members providing all Active Members have previously had written notice of the proposed amendment.

FRICTION MATERIALS STANDARDS INSTITUTE, INC., E-210 ROUTE 4, PARAMUS, N. J. 07652

B U L L E T I N

N O. 5 7 1

June 4, 1976

1976 BRAKE SHOE IDENTIFICATION CATALOG

The 1976 BRAKE SHOE IDENTIFICATION CATALOG was recently published by the Printer, Success, Inc., of Indianapolis. Those orders placed on Success, Inc. for more than 100 copies had all been shipped during the week of May 24, 1976.

The originally projected price was over that actually to be charged. In BULLETIN NO. 563 we had estimated 40,000 copies of a 72 page catalog. We actually ordered 40,000 copies of a 64 page catalog. The reduced price is:

\$265.40/M Catalog
9.60/M Punching

We have not as yet received our copies from the Printer. When we do, we will fill all orders for less than 100 copies and send samples to our membership.

You may wish to advise your Purchasing Department of this price reduction. Also, we have a sizable overrun from the Printer. If anyone wishes to order additional copies, please place your order on the Institute at the prices shown.

EWD/erc

EWD/erc

cc- Active Members
Regional Members
Licensees

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 7 0

June 4, 1976

APPLICATION FOR ACTIVE MEMBERSHIP--SCAN-PAC, INC.

The Institute is advising the membership at this time on the receipt of an application for Active Membership for Scan-Pac, Inc., of Mequon, Wisconsin. The application is now being reviewed by the Membership Committee.

Mr. H. A. Scandrett, President of Scan-Pac, is fairly well known in the industrial (non-automotive) friction materials area. Up until Johns-Manville went out of the friction materials business, he was a distributor of J-M products. Back in 1973, Scan-Pac purchased manufacturing equipment and technical assistance to finish sheeter stock purchased from J-M. The Scan-Pac operation is a manufacturing operation, using sheeter stock as its basic material. They roll, mold, cure, drill, grind and finish the material.

Over the past three years I have had correspondence with Scan-Pac and had talked with Mr. Scandrett about membership. An early stumbling block to Scan-Pac's membership was the cost to them. Based on earlier correspondence, I told them it might be three categories--brake linings, brake blocks and clutch facings. In going over this question, they would actually be charged for one category only--brake linings. Their blocks are essentially molded segments up to 1/2" thick and their facings are not used in markets "where the FMSI numbering system is available." (Snowmobiles, cranes, presses, etc.)

Actually, Scan-Pac does not use the FMSI numbers even in the brake lining category. I have reviewed their catalog--roll lining to 3/8" thick; molded "blocks" to 1/2" thick; molded facings 1/8" to 3/8" thick; molded flat sheets; and other non-friction material products. The catalog does not show any FMSI numbers. All applications are non-automotive.

This information is forwarded for background only. No action is being solicited from the membership at this time. However, if the Membership Committee and the Board of Directors recommend acceptance of this application, before the Annual Membership Meeting, and at least 75% of our membership is in attendance at the meeting, it may be put up for a vote at that time. If not, mail ballots will be used.

E. W. Drislane
Executive Director

FRICTION MATERIALS STANDARDS INSTITUTE, INC., E-210 ROUTE 4, PARAMUS, N. J. 07652

BULLETIN

NO. 569

May 10, 1976

1976 SUPPLEMENT TO THE 1975 AUTOMOTIVE DATA BOOK

The 1976 SUPPLEMENT TO THE 1975 AUTOMOTIVE DATA BOOK has now been printed. The printer, Tweddle Litho Company has already made most shipments. Some smaller shipments will be handled by the Institute. We have not as yet received our copies to make these smaller shipments.

The preliminary price for the Supplements is the final price. We ordered 60,000 copies of a 32 page book. The price was:

Supplements	\$108.60/M
Punching	4.50/M

While we estimated correctly on quantities, the Printer gave us an under-run. For that reason we can not fill additional orders. If an individual copy is needed, we can provide that.

EWD/erc

E. W. Drislane
Executive Director

cc-Delegates & Alternates
Regional Members

FRICTION MATERIALS STANDARDS INSTITUTE, INC., E-210 ROUTE 4, PARAMUS, N. J. 07652

B U L L E T I N

N O. 5 6 8 A

May 17, 1976

DOT STANDARDS 105-75 AND 121

On April 22, 1976 we issued BULLETIN NO. 568, which advised that the FMSI had "patched together" all notices on both Standard 105-75 (Hydraulic Brake Systems) and Standard 121 (Air Brake Systems) through March 31, 1976. We distributed one copy to the individual in your company listed below.

Subsequent to that mailing, Mr. Frank Skelton of Maremont had an official write-up of both Standards 105-75 and 121 sent to me, which included changes through October 1, 1975. We took these write-ups and patched with all subsequent notices through April 30, 1976.

Since this was considerably less patching than before, we believe these are more accurate and of course they are more recent (thru April 30, 1976).

The copy of this work for your company is being sent to:

Would you please destroy your earlier copies and replace them with these copies.

EWD/erc

E. W. Drislane
Executive Director

cc-Delegates and Alternates
Regional Members
Brake Performance Study Committee

FMSI 17772

FRICTION MATERIALS STANDARDS INSTITUTE, INC., E-210 ROUTE 4, PARAMUS, N. J. 07652

BULLETIN

N O. 5 6 8

April 22, 1976

DOT STANDARDS 105-75 AND 121

Because of the numerous changes in Standard 105-75 (Hydraulic Brake Systems) and Standard 121 (Air Brake Systems) we have patched together all amendments to arrive at Standards as now written.

We have also listed all notices on each Docket referring to subject standard:

Standard 105-75, as starting September 2, 1972
Standard 121, as starting February 24, 1972

These refer to all amendments, corrections, proposals and other notices pertaining to these standards. We have patched up the standards as they should be through March 31, 1976. While we believe the assembled standards are correct, we cannot assume any responsibility for errors or omissions.

The copy of this work for your company is being sent to:

EWD/erc

E. W. Drislane
Executive Director

cc-Delegates & Alternates
Regional Members
Brake Performance Study Committee

FMSI 17773

B U L L E T I N

N O. 5 6 7

April 19, 1976

DRILL PATTERNS FOR DISC BRAKE SHOES

There are three new disc brake lining-shoe releases on domestic vehicles for which the original equipment lining is not drilled. We have released the linings and shoes as shown by the original equipment drawings:

7053-D-119	Monza, lanced shoes, integrally molded
7054-D-120	Ford Truck, integrally molded
7055-D-121	Chevette, bonded

The Ford Truck #7054 lining is identical in contour to the earlier #771. Overall thickness is heavier on #7054. The D-120 shoe replaces the D-20. From what I understand, where the aftermarket is riveting the assemblies, the same drill pattern is used on #7054-D-120 as was used with #771-D-20.

As regards the D-119 Monza shoes, the fact that these shoes were subsequently lanced (upset) disrupted what had been a normal rivet pattern. I am showing what had been an earlier Bendix pattern for drilling, prior to the time that Monza decided to go integrally molded on an O.E. basis. Next is a Certified drilling pattern, which locates the four bottom holes at same location as the integrally molded holes used for O.E. purposes with the lanced D-119 shoes. There is a difference.

Next is the Chevette 7055-D-121 assembly. As this is bonded on an O.E. basis, a drill pattern is up for grabs. Enclosed is the Certified drill pattern for the D-121 shoes.

A PROLIFERATION OF DRILL PATTERNS IN THE AFTERMARKET

The Institute releases lining and shoe information as provided for O.E. purposes. We do not recommend (or criticize) drilled assemblies in the aftermarket. However, we feel it in the best interests of the manufacturer, distributor and consumer that there not be a proliferation in drill patterns for the aftermarket. Please review this. If you are using, or plan to use different drill patterns, let us know and we will attempt to disseminate that information.

Active Members
Regional Members
Licensees

E. W. Drislane
Executive Director

FRICION MATERIALS STANDARDS INSTITUTE, INC., E-210 ROUTE #4, PARAMUS, N.J. 07652

B U L L E T I N

N O. 5 6 6

April 19, 1976

EQUIPMENT AND MACHINERY--WANTED OR FOR SALE

On October 31, 1975 the Institute issued a bulletin listing used items of equipment or machinery either wanted, or for sale. Included were items such as a Gogan machine, FAST machine, Blanchard Grinder, Furnace, etc. We plan to send out a new bulletin shortly and are requesting members who might have used equipment for sale, or are interested in purchasing such equipment, to send in their listing.

You should advise:

- (1) If "Wanted to Buy," or "For Sale".
- (2) Brief description of equipment or machinery.
- (3) Who to contact--where, name of person, telephone.

The guidelines for listing machinery and equipment are:

- (1) Used machinery or equipment.
- (2) Specialized for the friction materials industry.
- (3) Substantial--for guidelines, worth in excess of \$2,000 new.
3.1 Examples--test machine, grinder, press, drilling machine, oven.
- (4) The property of the member, or to be purchased by a member.
4.1 No offerings as an agent.

If you wish to list equipment in the forthcoming bulletin, we ask that you advise details of such equipment prior to May 15, 1976.

Active Members
Regional Members

E. W. Drislane
Executive Director

The historical sales report for full calendar year 1975 should be in the mail this week.

The report was not issued earlier because input had not been received from all significant manufacturers who ordinarily report to the accountants. All data--on which the summary report will be issued--has now been received.

B U L L E T I N

N O. 5 6 5

April 5, 1976

HISTORICAL SALES PROGRAM

The historical sales program is continuing on a quarterly basis. Regional Members using the copyrighted FMSI Numbers for marketing their products in the United States may participate if they wish.

The Institute is requesting details of pieces sold for the first quarter of 1976 (3 months ending March 31, 1976). The rules for the reporting details remain unchanged.

1. Quantities will be reported in pieces (not units).
For roll lining, each foot of length will be one piece.
2. Our Accountants will report the names of the members from whom reports are received, and the number of members reporting in each of the four groups.
3. Total pieces in each group will be reported.
4. "Clutch Facings" does not include gear tooth discs, automatic transmission discs, or the 8-14" dia. (3/16 to 1/2" thick) asbestos composition discs.

The data as filed will be confidential. Totals for each group will be shown and there is no way of determining quantities by individual members.

Please review the form and the description as they apply to this year's reporting. You will be receiving from Marshall Granger & Company, Certified Public Accountants, a form for completing this information. Please return it to:

Marshall Granger & Company, C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

If you report, please have your figures in by May 15, 1976. If you do not wish to report these figures, no reply is necessary. Only those reporting figures will receive the industry totals when the data is summarized. A sample form and definitions are attached.

EWD/lmc
Encs.

E. W. Drislane
Executive Director

Distribution: Delegates & Alternates
Regional Members (paying
Active Member Dues)

EXHIBIT "A"

STATISTICAL PROGRAM OF THE
FRICTION MATERIALS STANDARDS INSTITUTE, INC.

Mail to:

Marshall Granger & Co., C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

* * * * *

See instructions for sales to other members!

Pieces sold to United States distributors, jobbers, private brands, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies, or other customers for use in the United States replacement market:

3 MONTHS JANUARY 1 to MARCH 31, 1976

Brake linings less than 3/4" nominal
thickness (See explanation for
roll lining).

Brake blocks, nominal thickness
of 3/4" and over

Disc brake linings

Clutch facings

By: _____
Signature

Company

Date

EXHIBIT "B"

DEFINITION FOR HISTORICAL SALES

PIECES

The reports will show pieces of friction material, in groups as shown:

<u>Group</u>	<u>Description</u>	<u>Normal Usage</u>
Brake Lining	Friction materials less than a nominal 3/4" thickness (See note on roll lining)	Normally, <u>one piece</u> to a shoe
Brake Blocks	Friction materials with a nominal thickness of 3/4" and over	Normally, <u>two pieces</u> to a shoe
Disc Brake Linings	Friction materials sold (for disc brakes) to be attached to the shoe, or sold as a unit molded, bonded or riveted to the shoe	Normally, <u>one piece</u> to a shoe
Clutch Facing	Friction materials of annular shape, or segments thereof	Normally, <u>two annular pieces</u> per clutch plate

Note: For roll lining only, consider each foot of length equals one piece.

REPLACEMENT SALES TO UNITED STATES MARKET

This reporting is for sales to the United States replacement market only. Do not include sales to other markets. This includes sales under the friction material manufacturer's own name or brand name used by the customer, to automotive warehouse distributors, jobbers, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies or other customers for use in the United States replacement market.

When a friction material manufacturer is shipping to a vehicle manufacturer, brake manufacturer, or clutch manufacturer, but has no reasonable way of determining if the pieces are for original equipment or replacement purposes, estimates will not be used - these pieces will not be reported. However, where a friction material manufacturer is shipping to a point known to be used for replacement, or where he stencils or otherwise identifies the pieces as being for replacement purposes, or where the shipments otherwise are obviously known to be for replacement, these pieces will be reported.

The member who sells to the type customer or user indicated above will report those pieces sold, even if purchased from another Active Member or Regional Member.

When you sell your friction materials to another Member (Active or Regional) do not report those sales! Materials sold to Licensee Members of the Institute for the replacement market should be included.

B U L L E T I N

N O. 5 6 4

March 24, 1976

OSHA ASBESTOS STANDARD--RECORDKEEPING REQUIREMENTS

On March 19, 1976, OSHA published an amendment to the Standard for Occupational Exposure to Asbestos. This amendment extends the time period for retention of exposure records from 3 years (as in the July 7, 1972 standard) to 20 years.

The proposed amendments to the standard for which April 9, 1976 is the cut-off date for comments, would further extend retention period to 40 years, or duration of employment plus 20 years. This March 19, 1976 amendment places retention requirements at 20 years immediately.

EWD/erc
enc.
Delegates & Alternates
Asbestos Study Committee

E. W. Drislane
Executive Director

**FR-MARCH 19, 1976 - OSHA AMENDMENT TO ASBESTOS
STANDARD - RECORDKEEPING REQUIREMENTS**

Title 29—Labor

**CHAPTER XVII—OCCUPATIONAL SAFETY
AND HEALTH ADMINISTRATION, DE-
PARTMENT OF LABOR**

**PART 1910—OCCUPATIONAL SAFETY
AND HEALTH STANDARDS**

Standard for Exposure to Asbestos

Pursuant to sections 6(b) and 8(c) of the Occupational Safety and Health Act of 1970 (84 Stat. 1593, 1599; 29 U.S.C. 655, 657), Secretary of Labor's Order No. 12-71 (36 FR 8754), and 29 CFR Part 1911, § 1910.1001(i)(1) of Part 1910 of Title 29, Code of Federal Regulations, is hereby amended in the manner set forth below, in order to extend the retention period for asbestos exposure monitoring records from three years to twenty years.

On December 7, 1971 (36 FR 23207), OSHA issued an emergency temporary standard on asbestos in response to a petition by the Industrial Union Department of the AFL-CIO, pursuant to section 6(c) of the Act (84 Stat. 1596, 29 U.S.C. 655). This emergency temporary standard was designed primarily to immediately reduce and control occupational exposure to asbestos dust concentrations, and did not contain recordkeeping procedures. However, on January 12, 1972 (37 FR 466), OSHA published a proposed comprehensive standard for asbestos exposure which did include recordkeeping provisions. Paragraph (h)(1) of the proposal (37 FR 466) provided that exposure monitoring records, and records of medical examinations, be maintained for a period of twenty years. After public hearings the Secretary promulgated a new, permanent OSHA standard for asbestos on June 7, 1972 (37 FR 11318). In accordance with section 6(b) of the Act (84 Stat. 1593, 29 U.S.C. 655). This new regulation, which appeared as 29 CFR 1910.93a prior to recodification, contained a three-year requirement for retaining exposure monitoring records, 29 CFR 1910.93a(i)(1) (now 29 CFR 1910.1001(i)(1)).

On July 27, 1972, pursuant to section 6(f) of the Act, (84 Stat. 1597, 29 U.S.C. 655), a petition for judicial review of the asbestos standard was filed with the United States Court of Appeals for the District of Columbia. The principal petitioners, the Industrial Union Department, AFL-CIO, objected to several substantive portions of the standard, including those dealing with recordkeeping. The Court affirmed the Secretary's judgments and the standard's validity except for two provisions, one of which was the retention period for exposure monitoring records. "Industrial Union Department, AFL-CIO v. Hodgson," 499 F. 2d 467 (C.A.D.C. 1974). The Court directed the Secretary to re-examine the standard with respect to the three-year recordkeeping provision and to reconsider whether such time period adequately assured employee protection from asbestos-related diseases.

In discussing this issue, the Court noted that many of the problems facing the Secretary in developing an asbestos standard were directly attributable to

the lack of information concerning asbestos-related diseases, and particularly to the lack of reliable data on past exposure levels. Noting the close functional relationship between medical records and exposure records, and the fact that the standard required that medical records be maintained for at least 20 years, the Court expressed surprise at the short three-year retention period for monitoring records. After reviewing the Secretary's obligation under the Act to require retention of records necessary for the development of information concerning the causes of disease and the importance of exposure data in establishing this causal relationship, the Court remanded the recordkeeping requirements to the Secretary "for such modification or clarification as may be necessary to ensure that the statutory objectives will be fulfilled" 499 F. 2d at 488.

Pursuant to the Court's direction, OSHA has completed its review, and has concluded that the opinion expressed by the Court is an accurate reflection of the record, and that the agency's initial judgment warrants correction.

OSHA believes that extension of the recordkeeping requirement for exposure monitoring from three years to twenty years as originally proposed would be in harmony with the twenty-year retention period now required for employee medical records, 29 CFR 1910.1001(j)(6)(i). As the court noted (499 F. 2d at 488), the two sets of records when read together would provide a more complete record of an employee's history of exposure, a factor vitally important with respect to asbestos-related diseases. The extended period for retention, with resultant data accumulation, will be critical to medical and scientific investigations studying such questions as dose-response relationships in diseases caused by occupational exposure to asbestos. This decision would also be responsive to the agency's declared concern that the past inadequacy of health and monitoring records have hindered research into the consequences of asbestos exposure at the workplace. 37 FR 11318, June 7, 1972.

The long latency periods associated with asbestos-related diseases, and the consequent need for a standard to take such latency periods into account, were recognized by both the OSHA Advisory Committee on Asbestos Dust (proceedings at pp. 103-105, February 17, 1972) and the NIOSH Criteria Document for a Recommended Standard on Asbestos (generally chapters I and II). In addition, testimony by two witnesses at the OSHA hearings also supported longer retention periods for exposure monitoring records (Tr. at 527, 538, March 17, 1972). A consensus of the evidence in the record indicates that exposure monitoring records should be held for at least 20 years in order to make such a requirement meaningful in view of what is generally recognized as the minimum latency period for many asbestos-related diseases. OSHA is of the view that the interests of worker health would be best served by requiring the retention of exposure moni-

toring records for a period which reflects an appreciation of this recognized latency factor.

Accordingly, pursuant to the Court's remand for further consideration of the retention period for monitoring records, we have concluded, based on the existing record and for the reasons stated above, that a 20-year retention period is supported by the evidence and necessary for the protection of employees. It is noted that in a new proposal on exposure to asbestos (40 FR 47652, October 9, 1975), which reflects the most recent scientific and medical developments in the field, a 40-year retention period (or the duration of employment plus twenty years) for both exposure measurement and medical records has been proposed.

For the reasons stated above, the exposure records provision of the asbestos standard will be corrected to require retention of exposure monitoring records for at least 20 years, effective March 19, 1976. OSHA believes that a delay in the effective date of this requirement is not warranted since this rule only requires that affected employers retain records which they have already compiled and therefore does not impose a new burden of action, and since the initial three-year retention period for such records has now lapsed and these records might be destroyed. Loss of such records would be irreparable. Continued access to such records by all concerned is essential in the public interest, and is an appropriate means of effectuating the goals of improved worker safety and health under the Act. Good cause is found, therefore, pursuant to section 4(d)(3) of the Administrative Procedure Act (5 U.S.C. 553 (d)(3)), for making this rule effective.

Accordingly, pursuant to the direction of the United States Court of Appeals ("Industrial Union Department, AFL-CIO v. Hodgson, supra"), and the above referenced authority, paragraph (i)(1) of 29 CFR 1910.1001 is hereby amended to read as follows:

§ 1910.1001 Asbestos.

(1) *Recordkeeping*—(1) *Exposure records*. Every employer shall maintain records of any personal or environmental monitoring required by this section. Records shall be maintained for a period of at least 20 years and shall be made available upon request to the Assistant Secretary of Labor for Occupational Safety and Health, the Director of the National Institute for Occupational Safety and Health, and to authorized representatives of either.

(Secs. 6, 8, Pub. L. 91-596, 84 Stat. 1593, 1598 (29 U.S.C. 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 8754); 29 CFR Part 1911).

Signed at Washington, D.C. this 12th day of March 1976.

MORTON CORN,
Assistant Secretary of Labor.

[FR Doc.76-7791 Filed 3-18-76; 8:45 am]

BULLETIN

NO. 563

March 10, 1976

1976 BRAKE SHOE IDENTIFICATION CATALOG

The contract for the printing of the '1976 Brake Shoe Identification Catalog' has been awarded to:

Success, Inc.
1345 West 16th Street
Indianapolis, Indiana 46202

It is believed that it will contain 72 pages.

On an estimate of the total order being 40,000 copies of a 72 page book, the price is:

\$294.00 per M
10.00 per M additional for five hole punching

If there is a change in the price per thousand due to a change in number of pages or to changes in order quantities, or for author's alterations, you will be notified.

Please forward all orders to the Institute Office. Do Not send them to the printer. This is our only means of checking the total quantities ordered and the price charged, as well as whether only members are ordering.

The orders should be made out to Success, Inc. and state punching and shipping instructions.

Kindly forward your orders so that they reach the Institute Office by April 20, 1976.

D. W. Drislane
Executive Director

Distribution: Active Members
Regional Members
Licensees
Data Book Committee

B U L L E T I N

N O. 5 6 2

February 24, 1976

DECLARATION RE PRODUCT CATEGORIES

FEE

FORMULA BASIS

According to our Constitution and By-Laws, the Fee Formula for Active Members must be reviewed annually. Data on categories is accumulated and reported to the Board of Directors who then make recommendations on the fee schedule to the membership.

As a member may be engaged in a category one year and not the following (or the reverse) declarations must be filed annually in order to arrive at a proper fee formula and category assessment.

At the June 1975 meeting, the Board of Directors resolved that category filing information will no longer be confidential. This change was reviewed by Counsel and reported to the Membership. All categories in which your firm is engaged must be reported. Category filing information will be assembled and reported in summary form to the Membership.

Would you kindly complete and return one copy of the attached form to the Institute Office. We will prepare a summary to assist the Board of Directors in establishing the fee formula for the fiscal year starting July 1, 1976.

Filing categories are unchanged from those of recent years. Refer to the 'Explanation of Category Filing' attached to the form. If you have questions, please give me a call.

Kindly return your declaration by March 31, 1976. A stamped return envelope is enclosed with the Delegate's copy.

EWD/lmc
Encs.

E. W. Drislane
Executive Director

EXPLANATION OF CATEGORY FILING

General - A member must be engaged in at least one of the first three categories, in order to be a member. The number of categories checked is used to determine the fees paid during the next fiscal year. Any member not filing this information correctly will be assessed the full fee for all categories.

Confidentiality - The fee category information is no longer confidential. The data will be reviewed by the Board of Directors to determine its reasonableness. Summary results will be distributed to the Membership.

Your Company is Engaged as follows: - If a member manufactures and sells, purchases and sells, or both purchases and manufactures, and sells the product indicated in the replacement market, he is "engaged" in that category. In other words, if he sells that product he is engaged in that category. Further, the replacement market includes automotive, industrial, and off road equipment--where Friction Materials Standards Institute, Inc. performs a service, either through cataloguing, assignment of copyrighted FMSI numbers, or the maintaining of prints. If a member sells a certain product type, but only to market where FMSI does not provide services, he does not report that category. Where a member sells a certain product only to a market where there are FMSI services available, but he declines to use these services, he must report that category.

Brake Lining - Under 3/4" Nominal, Including Disc Brake Linings

This includes linings whether loose, attached to shoes, or in roll form, sold to market where the FMSI numbering system is available.

Brake Blocks and Disc Brake Linings - 3/4" Nominal and Over

This includes brake blocks, whether loose or attached to shoes, sold to markets where the FMSI numbering system is available. The 3/4" nominal includes tapered blocks with a maximum thickness of approximately .700", with minimum thickness below .500". This also includes disc brake linings 3/4" and over, measuring lining thickness only at its thickest point. When measuring a lined shoe, to determine lining thickness, measure from the top of the shoe.

Clutch Facings

This includes loose facings or facings attached to plates, sold to markets where the FMSI numbering system is available.

Brake Shoes - New Unlined, Including New Unlined Disc Brake Shoes

This category includes new and unlined shoes (whether drum or disc type) which are sold as new and unlined shoes in the replacement market. If all the new and unlined shoes are sold as lined shoe assemblies, do not report this category.

Friction Materials Standards Institute, Inc.
E-210 Route #4
Paramus, N.J. 07652

Gentlemen:

In response to Bulletin #562 of February 24, 1976 concerning the
declaration of information to be used in determining
the fees, our company is engaged as follows:

<u>Category</u>	<u>We sell to the domestic replacement market:</u>
Brake Linings - Under 3/4" Nominal, Including Disc Brake Linings	☐
Brake Blocks - 3/4" Nominal or over	☐
Clutch Facings	☐
Brake Shoes - New Unlined, Including New Unlined Disc Brake Shoes	☐

Affix an "X" in the square to the right of the category or categories
your company is engaged in.

Signature _____

Company _____

Date _____

Kindly return declaration to the Institute Office by March 31, 1976.

BULLETIN

NO. 561

February 10, 1976

THE OSHA ASBESTOS STANDARD

There have been several recent items of interest concerning asbestos and the proposed revisions to the asbestos standard.

1. Postponement of date for filing comments to OSHA

We have been advised by the Asbestos Information Association (AIA) that OSHA has postponed the cut-off date for filing comments on proposed revisions to the OSHA asbestos standard until April 2, 1976. While a notice has not appeared in the Federal Register as yet, AIA advised that this postponement should be announced shortly.

Yesterday, February 9, 1976, was the date for cut-off of comments (which was a postponement from the original December 8, 1975 comment closing date.) The Institute mailed its comments to OSHA on Friday, February 6, 1976.

2. AIA meeting in Washington, D.C. February 4, 1976

I attended a meeting organized by the AIA concerning their comments to OSHA on the proposed revisions to the standard. They put on a most professional meeting with the following major sections:

- (a) Review by Dr. Hans Veill, Professor of Medicine, Tulane University. He reviewed literature cited in the OSHA proposal as it related to proposed revisions in the standard.
- (b) Report Prepared by Roy F. Weston, Consultant for AIA on "Technological Feasibility and Economic Impact of OSHA Proposed Revision to the Asbestos Standard."
- (c) A review in detail of the proposed revisions by the Standards and Technical Committee of the AIA.

The AIA did an outstanding job in preparing a balanced objective report to OSHA. The time limit permitted Weston to cover 'primary' employers only--the manufacturer who introduces asbestos into the product. They did not have time to cover 'secondary' or 'consumer' segments of the industry. With the time extension, I believe they will now review and report on these users (your customers).

We ask that if you are asked for information or help by Roy Weston, that you cooperate fully. They will have a most difficult time gathering this additional information in so short a time.

E. W. Drislane
Executive Director

BULLETIN

NO. 560

February 3, 1976

ORDERS FOR THE 1976 SUPPLEMENT TO THE 1975 AUTOMOTIVE DATA BOOK

The contract for the printing of the 1976 Supplement has been awarded to:

Tweddle Litho Company
24000 Harper Avenue
St. Clair Shores, Michigan 48080

It is believed that it will contain 32 pages with self-cover.

On an estimate of the total order being 60,000 copies of a 32 page book, the preliminary price is:

\$108.60 per M
4.50 per M additional for five hole punching

If there is a change in the price per thousand due to a change in number of pages or to changes in order quantities, or for author's alterations, you will be notified.

Please forward all orders to the Institute Office. Do not send them to the printer. This is our only means of checking the total quantities ordered and the price charged, as well as whether only members are ordering.

The orders are to be made out to Tweddle Litho Company, and are to state punching and shipping instructions.

With the last three catalogs printed by the Institute, we did not have sufficient extra copies to handle all the late orders. We suggest that your order be placed prior to March 1, 1976 if you want to be sure to receive copies.

Please forward your orders so that they reach the Institute Office by March 1, 1976.

EWD/erc

E. W. Drislane
Executive Director

Distribution: Active Members
Regional Members

B U L L E T I N

N O. 5 5 9

January 28, 1976

- (1) INSTITUTE COMMENTS TO OSHA ON THE ASBESTOS STANDARD
- (2) REQUEST FOR MEMBER COMPANY ENDORSEMENTS OF FMSI COMMENTS

Over the past several weeks, your Asbestos Study Committee has reviewed and revised comments to OSHA concerning their proposed revisions to the standard for occupational exposure to asbestos. Comments are due at OSHA by Monday February 9, 1976.

The Institute had earlier recommended that individual manufacturers comment directly to OSHA. We sent out information on the proposed revisions in October 1975, and in December 1975 we reported on our Seminar where Mr. Kwon, of OSHA, specifically requested input from industry.

Attached is a copy of the Institute's comments. These have been subject to considerable revisions since their first draft. It is now too late to revise again. It must be understood that it is difficult to get agreement from various members who probably have different viewpoints on certain proposals in the notice of rulemaking. This is the best that could be done in the short time available.

We are asking for your endorsement of these comments. From your company, we are requesting that the following officer/employee seek that endorsement from the President, Division Manager, Factory Manager, Personnel Manager, or other officer/employee who might best be able to speak for your company in this area:

It has been suggested to FMSI that our comments, with these individual endorsements, will have more weight with OSHA than if the comments are sent in as is. Most committee members concur in this viewpoint.

We are therefore asking that the appropriate officer/employee prepare a brief endorsement, on his letterhead, and send it to the FMSI Office to reach the office no later than Friday February 6, 1976. This would be in addition to any comments a member might wish to make to OSHA directly. For guidance, a sample endorsement is attached. You of course, are encouraged to use your own wording and to add to your endorsement as you see fit. If you do not have time to make an endorsement on your company's letterhead, you may use this sample to complete the endorsement and forward to us. We ask your quick turn-around on this endorsement.

We will forward all endorsements received by February 6, 1976, along with our comments to OSHA, in time to meet the OSHA filing date of February 9, 1976.

EWD/erc
Enclosure
cc-Delegates and Alternates
Asbestos Study Committee

E. W. Drislane
Executive Director

FRICTION MATERIALS STANDARDS INSTITUTE, INC.

BERGEN MALL OFFICE CENTER

E. 210 ROUTE 4

PARAMUS, N. J. 07652

February 6, 1976

Docket Officer, Docket H-033
 U. S. Department of Labor, Room N-3620
 200 Constitution Avenue, N. W.
 Washington, D. C. 20210

Gentlemen:

The Friction Materials Standards Institute, Inc. is an association of most of the domestic brake lining and clutch facing manufacturers. We also service eighteen foreign manufacturers of friction materials. Asbestos is an important ingredient in most friction articles, and the proposed revisions to the standard for occupational exposure to asbestos will have a major impact on this industry.

Our members support the concept of government regulation to safeguard the health of its workers, and with the cooperation of the workers this can be done. However, we feel that certain elements of the proposed regulations and the background data used for their development are highly controversial and need to be reviewed and reconsidered in light of their possible future social and economic impacts on business, labor, and the general public.

The Institute has urged its members to make individual replies in order to participate in this rulemaking. The Institute's comments will not cover certain subjects such as monitoring procedures, exhaust ventilation, and hygiene facilities that can best be commented on by individual manufacturers. As an association, we cannot speak for all our members because certain proposals are controversial within our industry. Because of this we do not necessarily concur with those proposals on which we have not commented. We hope that individual members of the industry will comment directly to OSHA on those subjects.

1. PERMISSIBLE EXPOSURE TO AIRBORNE CONCENTRATIONS OF ASBESTOS FIBERS

The proposed 8 hour time weighted average concentration limit of 0.5 fibers/cc and the ceiling concentrations limit of 5 fibers/cc are the most controversial requirements.

1.1 Exposure limit rationale based on British experience

In developing the rationale for the 0.5 fiber limit (TWA), considerable weight was given to Great Britain's 2 fiber/cc limit, and improved working conditions that resulted from their 1931 Factory Regulations. Our members contend that their friction materials factories are far cleaner today than were their Great Britain counterparts of 1933 "when important improvements in work practices had been achieved." Our members doubt that levels consistently below 10 fiber/cc were achieved until after Great Britain imposed the revised Asbestos Regulations in 1968. Knowledgeable individuals claim British factories have not achieved the 2 fiber/cc level on a consistent basis on all operations. We believe alleged British compliance with the

2 fiber/cc limit has had an unwarranted bearing on the development of proposed reduced airborne fiber limits in the United States.

1.2 Manufacturers have not achieved the July 1, 1976 2-fiber/cc limit

Members working to meet the current 5 fiber/cc limit (and the 2 fiber/cc July 1, 1976 limit) state that in areas where they have concentrated efforts--mixing, pressing, grinding--they still obtain in excess of 5 fiber/cc. Often a State or Federal OSHA inspector will check the same area within several days of the company's own sampling and in many cases will indicate the area is in compliance. While OSHA will not officially release their counts in such cases, some have privately stated they showed no fiber present in the sample. This disparity in counts has made several members very concerned that OSHA may be using these low (or "zero") counts as a basis for proposing the 0.5 fiber/cc limit, under the mistaken assumption that industry is already in or near compliance. Our members wish to emphasize that they are striving to get below the 2 fiber/cc limit by July 1, 1976 and that they are not already in compliance with the new proposals.

1.3 Epidemiology based on crocidolite asbestos is not applicable to friction materials

Crocidolite (blue) asbestos is not used in friction materials. Any epidemiological data extrapolated from sources using crocidolite, where that type asbestos is considered the significant carcinogen (mesothelioma for example), should not be used where a standard is applied to all asbestos manufacturing. This point must be emphasized as regards mesothelioma where these malignancies have been experienced at exposure levels below those causing asbestosis. If the mesothelioma evidenced at lower exposure levels is associated primarily with crocidolite asbestos, it is suggested that this evidence not be used in support of a lower exposure level for all types of asbestos.

1.4 Reliability of the membrane filter method and its use for enforcement

During industry's endeavors to comply with the existing OSHA Asbestos Regulations, fiber counts in the 2-10 fiber/cc range often have been difficult to reproduce. Skilled counters frequently obtain readings varying by much more than 0.5 fiber/cc on the same sample. Tests made at the same work station under seemingly identical conditions often will vary beyond 2 fiber/cc. (The proposed 0.5 fibers/cc standard is much less than variations routinely encountered in many existing clean work areas).

Industry appreciates that the membrane filter method is the only presently available working method for assessing airborne fiber levels in plant environments. However, the use of this method for enforcement of the 0.5 fiber/cc limit is of serious concern. Many users believe the method as currently applied by OSHA is not a reliable reproducible means of accurately quantifying airborne asbestos concentrations.

1.5 The proposed exposure levels will expand applicability of the standard to brake lining shops, car dealers, etc.

The proposed exposure limits, and the proposed ceiling concentrations in particular, would bring most garages and shops doing brake lining work, as well as their suppliers (re-builders, job shops, and the like) under requirements of this standard. In addition to the brake work done at car dealers

and the national-regional automotive service shops, brake service is offered at most garages and at many service stations. A 1972 Census of Manufacturers indicated that there are over 300,000 auto mechanics and garage workers in the United States. A 1973 analysis by Hunter Publishing Company estimated that there were over 200,000 shops doing brake service work in the United States.

Equal enforcement would mean that the regulated area, monitoring, ventilation, record-keeping and other requirements intended for manufacturers would now be required by these small businessmen.

Technical papers have been written citing studies that drilling, grinding, cutting, or other subsequent operations on brake linings can raise concentrations above the proposed limits. At the installation level, ceiling concentrations may be exceeded only a few times a day or even less often, but this still would bring many small garages under the scope of this standard. It must be assumed that all workers are to be protected equally, and we question whether OSHA took this expanded applicability of the standard into consideration during development of these proposals.

1.6 Friction materials manufacturers cannot project costs and problems with these proposed exposure levels until their new equipment and procedures are evaluated

It is difficult to segregate cost considerations from the standards section of the OSHA notice of proposed rulemaking. However, industry has embarked on a series of procedures and designs to meet the current 5 fiber/cc limit, and the forthcoming 2 fiber/cc limit. Increased costs have been incurred in many ways including dust collection and ventilation systems, bag opening machinery, special work benches, new processing methods, enclosures, etc. Normally it can not be determined whether such equipment and processing changes can meet the existing standards until after they are in place and working under full production conditions. Often there is no way of knowing whether these investments are worthless and may have to be discarded in favor of new technology that will have to be developed to achieve compliance with the new proposals. Industry needs to evaluate new equipment and methods that are now in the acquisition and implementation phases before it can begin to predict the costs of meeting these new limits, or predict whether or not these limits are in fact attainable. At this time, our industry does not know if it can meet the new limits. It will have much better information on what is feasible after completion of the programs it has already scheduled in anticipation of the July 1, 1976 effective date for the 2 fiber/cc limit.

2. REGULATED AREAS - DAILY ROSTER

Several members have indicated the requirement for a daily roster of all persons entering a regulated area will be a problem as regards enforcement, productivity, and recordkeeping. Depending on how this requirement is enforced, it could require additional guards or gatekeepers and could cause a reduction in worker productivity.

There is continued movement of lift trucks and other material handling equipment, and transfer of job orders and the like by factory personnel during the manufacture of friction materials. In addition, the areas must be serviced by machine set-up men, maintenance workers and occasionally by factory-office and engineering workers. Some areas, where there is no work

on asbestos-containing products are located adjacent to what may be regulated areas. In many cases, the work force may have to pass through the regulated area to get to and leave their work stations. For epidemiological purposes, it is recommended that an individual's personnel record be noted that he was required to enter a regulated area with a certain frequency. For example: Often--several times daily; Regularly--once or twice daily; Occasionally--about once a week; Seldom--no more than once a month. This could be up-dated on a personnel record every six months. Such a procedure would eliminate the productivity problems in enforcement of the roster requirement and would post information directly to an employee's personnel record for subsequent epidemiological study.

3. MONITORING - EMPLOYEE NOTIFICATION

It is felt that bulletin board notification of employee's exposure would serve the intent of "...shall notify each employee in writing..."

4. WORK PRACTICES

The friction materials business is under regulatory surveillance by the Department of Transportation's National Highway Traffic Safety Administration (NHTSA). An Air Brake Systems Standard (Standard 121) took effect in 1975. The Hydraulic Brake Systems Standard (Standard 105-75) took effect on January 1, 1976. Brake lining is an essential part of all brake systems, and friction materials manufacturers cannot change formulation or processing methods without considerable additional testing on their part, as well as by brake systems manufacturers and vehicle manufacturers.

For example, a major axle manufacturer projects 4,860 combinations of conditions under which a given friction material could be used in air brake systems. Based on this consideration, the manufacturer insists that a friction materials supplier must run at least 10 individual dynamometer tests under varying conditions before they can consider a particular material. This is in addition to 6-10 dynamometer tests that the friction materials supplier would run to select each candidate for submission. With current independent laboratory costs of \$2,300 for a Standard 121 dynamometer test, the certifying test costs to the friction materials supplier would be approximately \$40,000 per customer. For each additional customer 10 tests, or \$23,000 would be necessary. As for Standard 105-75, one friction materials manufacturer estimates his costs at \$25,000 for the tests necessary to certify a new product.

The costs noted are for the friction materials manufacturer's certification only, and do not include those costs required by the axle, brake, or vehicle manufacturer. The friction materials manufacturer's costs for material certification do not include pilot plant work, screening tests or other costs for developing the new product. Any significant change in processing would require additional certification tests.

Some manufacturers claim certain friction products have superior performance characteristics when manufactured using dry methods. The friction materials industry must conform to the above mentioned regulations, and is caught between forces of "more performance" on the one hand and limited options in manufacturing methods on the other. While wet manufacturing methods are recommended "insofar as practical," it should be understood

that brake lining manufacturers have additional regulatory problems that do not affect other users of asbestos.

5. RESPIRATOR PROGRAM - EMPLOYEE ROTATION

The requirements for rotation of an employee--based on examination of a physician--with the "same seniority, status, and rate of pay" could seriously affect worker assignment responsibilities of management. In many cases, labor and industry have collective bargaining agreements which contain pay differentials for night shifts, work on especially difficult tasks, work in certain areas, outdoor versus indoor assignments, etc. The newly hired employee generally starts with premiums for night differential, more difficult tasks, etc. Should re-assignment be called for, the worker normally would be moved to an area that would not command a premium, but under the proposed standard, the worker would be an exception and would receive the premium. This could cause untold difficulty with existing and future labor agreements. Such a requirement may be beyond the authority of OSHA, inasmuch as it could disrupt existing contracts.

6. MEDICAL SURVEILLANCE

6.1 Medical Surveillance--Preplacement

With the extensive data available showing that cigarette smoking causes a drastic increase in lung cancer, some members advocate that discrimination be permitted against the hiring of those smoking cigarettes in a factory using asbestos in its products. Some further advocate that an employer be permitted to require the use of respirators by those known to smoke cigarettes. Support of a non-smoker status would be permitted by affidavit or other similar requirement.

6.2 Medical Examination Requirement

The proposed rules for medical examinations for each employee exposed to airborne concentrations of asbestos fibers need clarification. Several members contend that the medical examination and exposure level should be more specific. It is generally agreed that factory workers in areas where the asbestos containing product is being processed or handled would require examinations.

Would examinations be required for the worker in areas such as the factory office, quality control, tool design or other where, for example, airborne asbestos dust concentrations might be 0.1 to 0.3 fiber/cc (TWA) and never above 2 fiber/cc ceiling concentration?

Would examinations be required for purchasing, accounting, engineering or other office personnel who work in areas with little more airborne asbestos dust than the trace amounts that might be found in a downtown office building?

Would examinations be required for factory workers, located in the same building or group of buildings where others are working on asbestos-containing products, but who are not themselves working on asbestos-containing products, and where concentrations of airborne asbestos fibers are either negligible or non-existent? For example, employees could be working on

iron castings or steel stampings in an area separate from the employees working on asbestos-containing products.

Would examinations be required for those workers who work in the clean areas above, but who on occasion enter a factory area where the full-time worker is considered exposed to airborne asbestos dust concentrations?

It is suggested that a more specific definition of the medical examination requirement based on employee exposure to asbestos would help in implementing these proposed regulations. In other words, what is the level, and how much time at this level is considered exposure to airborne asbestos dust concentrations for purposes of the medical examination requirement?

7. DANGER LABELS

The danger label normally connotes a highly toxic or poisonous material--such as cyanide or arsenic. With asbestos, the "danger" can only result if dust is created and breathed. To put the warning in proper perspective, it should be indicated that the problem exists only if airborne dust is generated. The label as proposed could cause some employees to refuse to pack, unpack, stencil, assemble or in other fashion touch finished products containing asbestos. The primary purpose of the label or sign should be to get the employee's cooperation to avoid creating dust. We suggest:

WARNING
Avoid Creating Dust
Contains Asbestos Fibers
Breathing Asbestos Dust
May Cause Serious Bodily Harm

We do not believe OSHA is out to panic employees and recommend it be positive in emphasizing "Avoid Creating Dust."

8. HOUSEKEEPING - WASTE DISPOSAL

The requirements on waste disposal appear to overlap EPA requirements, as detailed in their National Emission Standards for Hazardous Air Pollutants. We suggest that this requirement, which may infer the need for "sealed impermeable bags," be examined and re-written to maintain harmony with the EPA requirements.

9. RECORDKEEPING

The Institute supports most provisions of the recordkeeping requirements. When this data is gathered (and reviewed by objective analysts) the biological effects of asbestos exposure in friction materials factories can be determined and threshold limit values developed. In particular, we support the proposed recordkeeping requirements for (1) Exposure records, (2) Medical records, (3) Mechanical ventilation, and (4) Employee training. It is assumed such records can be stored using technology that will be available in years to come. Microfilm and EDP storage--with adequate safeguards to avoid unwarranted corrections or erasures--must be permitted. Full size hard copy records could become

a warehousing problem.

We commented earlier on the requirements for a daily roster, and recommended an alternate approach. In the event a daily roster will be required in the final regulations, we recommend the maintenance of roster records in a summary or abbreviated form as an alternate to the keeping of the daily roster record. This would serve the epidemiological purposes of the proposed recordkeeping requirements.

10. INFLATIONARY IMPACT

In discussing items of this nature, the Institute does not have access to specific cost data. That is only available from individual manufacturers. The subjects of cost impact, competition, and effects on employment are related to each other. The OSHA regulations for asbestos exposure will require considerable expenditures for equipment. In addition there will be continual additional costs of monitoring, respirator usage, medical examinations, productivity losses in use of regulated areas, recordkeeping and the like. Information on these costs must be collected from individual companies. The Institute would like to point out two items of concern to domestic manufacturers of friction materials.

10.1 There are fewer United States friction materials manufacturers in 1976 than in 1972-73

In our 1972-73 fiscal year, the Institute had 25 Active Members--those are manufacturers of brake lining or clutch facings resident in the United States. Today we have 19 Active Members. Reasons other than OSHA regulations have contributed to this decline in domestic manufacturing, but there is no question but that some manufacturers were influenced in their decisions to discontinue operations because of earlier OSHA and EPA regulations.

Some of the discontinued friction materials manufacturing operations since 1972-73 were:

Auto Specialties Mfg. Co. (St. Joseph, Michigan) discontinued automotive disc brake lining business

Johns-Manville Corp. (Waukegan, Ill.) discontinued all automotive and truck friction materials business

Scandura, Inc. (Charlotte, N. C.) discontinued all friction materials manufacturing

Silver Line Products, Inc. (Los Angeles, Cal.) discontinued all friction materials manufacturing

Standco Industries, Inc. (Houston, Texas) withdrew from industrial and truck clutch facing manufacturing

In addition, the Firestone Tire & Rubber Company discontinued production at its World Bestos Co. Division in New Castle, Indiana, with Royal

Industries subsequently taking over some of these operations. Major manufacturing operations were closed by members in Passaic, New Jersey, and Richmond, Kentucky. The only new entrant has been Hayes-Albion Corporation, with a plant in Johnson City, Tennessee, set up under a Federal Trade Commission order.

Friction materials manufacturers are a diverse group. Some will be better able to cope with the proposed regulations than others. If the trend indicated continues, it would seem logical that OSHA and EPA regulations contributed to this decline in domestic manufacturing and loss in employment.

10.2 Will stricter regulation export the jobs of American workers?

Most of our members support the principles of free trade. Some have manufacturing facilities in other countries. Others sell their products worldwide. Others have licensing agreements with foreign manufacturers. Where competition is free and un-restricted, the domestic manufacturers can compete. However, if the proposed asbestos regulations are implemented, domestic manufacturers will be working with the most restrictive exposure levels in the world. While some multi-national companies indicate that they will go to the same exposure levels worldwide, they are a minority. Except for Great Britain and the Province of Ontario, we are not aware of other jurisdictions with numerical exposure levels.

If the capital and on-going costs for compliance with the proposed regulations go significantly beyond those costs scheduled for compliance with the July 1, 1976 exposure level, brake linings, brake blocks, and clutch facings manufactured in foreign countries--without asbestos control--will be even more price competitive than now. In today's replacement market, foreign manufacturers are increasing their share of the market steadily. In a recent Labor Department notice on the application of Wagner Electric Corporation employees for worker adjustment assistance, it was stated:

Imports of automotive brake products like or directly competitive with those produced at the Plymouth Avenue St. Louis plant.....increased in value from \$46,000,000 in 1970 to \$118,000,000 in 1974. The ratio of imports to domestic consumption (I/C) and production (I/P) rose from 10.0% and 8.6% respectively to 15.3% and 13.2% respectively in 1974.

We believe that brake linings and brake blocks are in the class of products competitive with Wagner Electric Corporation's St. Louis plant. If the proposed asbestos regulations add significantly to our members' costs, they will be at a price disadvantage with manufacturers in foreign countries where asbestos regulations are either less restrictive or not in effect at all. This imbalance in international occupational regulations could end up protecting the American worker at the cost of his job. It is a problem that should be called to the attention of the regulators, the legislators, and the workers and unions who are directly involved.

* * * * *

The Institute asks for OSHA consideration of its comments and suggestions in the areas discussed. We trust also that comments received directly from friction materials manufacturers will be considered in this rule-making and we have asked our members to contribute statements for your review.

The Institute wishes to emphasize its concern on the limits for permissible exposure to airborne concentrations of asbestos fibers. Until there is sufficient medical evidence to justify reduction of the exposure limits, we ask that the limit for the 8 hour time weighted average airborne concentration of asbestos fibers be maintained at 2 fibers per cubic centimeter as due to take effect on July 1, 1976. We ask also that the ceiling concentration be maintained at 10 fibers per cubic centimeter.

If additional information is needed on any of the subjects raised by these comments, the Institute would be pleased to attempt gathering such information.

Respectfully submitted,

FRICITION MATERIALS STANDARDS INSTITUTE

E. W. Drislane
Executive Director

END/ed

Company: _____

Date: _____

Docket Officer, Docket H-033
U. S. Department of Labor
Room N-3620
200 Constitution Avenue, N. W.
Washington, D. C. 20210

Gentlemen:

Our company, a United States manufacturer of friction materials, and a member of the Friction Materials Standards Institute, Inc., wishes to go on record as supporting the comments the Institute is making to OSHA on the proposed revisions to the standard for occupational exposure to asbestos.

In particular, we support the Institute's request for maintaining the limit for the 8 hour time weighted average airborne concentration of asbestos fibers at 2 fibers per cc, and the ceiling concentration at 10 fibers per cc.

Respectfully,

COMPANY: _____

Signature: _____

Name (Typed): _____

Title: _____

B U L L E T I N

N O. 5 5 8

January 5, 1976

HISTORICAL SALES PROGRAM

The historical sales program is continuing on a quarterly basis. Regional Members using the copyrighted FMSI Numbers for marketing their products in the United States may participate if they wish.

The Institute is requesting details of pieces sold for the full calendar year 1975 (12 months ending December 31, 1975). The rules for the reporting details remain unchanged.

1. Quantities will be reported in pieces (not units).
For roll lining, each foot of length will be one piece.
2. Our Accountants will report the names of the members from whom reports are received, and the number of members reporting in each of the four groups.
3. Total pieces in each group will be reported.
4. "Clutch Facings" does not include gear tooth discs, automatic transmission discs, or the 8-14" dia. (3/16 to 1/2" thick) asbestos composition discs.

The data as filed will be confidential. Totals for each group will be shown and there is no way of determining quantities by individual members.

Please review the form and the description as they apply to this year's reporting. You will be receiving from Marshall Granger & Company, Certified Public Accountants, a form for completing this information. Please return it to:

Marshall Granger & Company, C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

If you report, please have your figures in by February 15, 1976. If you do not wish to report these figures, no reply is necessary. Only those reporting figures will receive the industry totals when the data is summarized. A sample form and definitions are attached.

EWD/erc
Encs.

Distribution: Delegates & Alternates
Regional Members (paying
Active Member Dues)

E. W. Drislane
Executive Director

EXHIBIT "A"

STATISTICAL PROGRAM OF THE
FRICTION MATERIALS STANDARDS INSTITUTE, INC.

Mail to:

Marshall Granger & Co., C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

* * * * *

See instructions for sales to other members!

Pieces sold to United States distributors, jobbers, private brands, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies, or other customers for use in the United States replacement market:

12 MONTHS JANUARY 1 to DECEMBER 31, 1975

Brake linings less than 3/4" nominal
thickness (See explanation for
roll lining).

Brake blocks, nominal thickness
of 3/4" and over

Disc brake linings

Clutch facings

SAMPLE
FORM

USE REPORTING FORM TO
BE SENT BY ACCOUNTANTS

By: _____
Signature

Company

Date

EXHIBIT "B"

DEFINITION FOR HISTORICAL SALES

PIECES

The reports will show pieces of friction material, in groups as shown:

<u>Group</u>	<u>Description</u>	<u>Normal Usage</u>
Brake Lining	Friction materials less than a nominal 3/4" thickness (See note on roll lining)	Normally, <u>one piece</u> to a shoe
Brake Blocks	Friction materials with a nominal thickness of 3/4" and over	Normally, <u>two pieces</u> to a shoe
Disc Brake Linings	Friction materials sold (for disc brakes) to be attached to the shoe, or sold as a unit molded, bonded or riveted to the shoe	Normally, <u>one piece</u> to a shoe
Clutch Facing	Friction materials of annular shape, or segments thereof	Normally, <u>two annular pieces</u> per clutch plate

Note: For roll lining only, consider each foot of length equals one piece.

REPLACEMENT SALES TO UNITED STATES MARKET

This reporting is for sales to the United States replacement market only. Do not include sales to other markets. This includes sales under the friction material manufacturer's own name or brand name used by the customer, to automotive warehouse distributors, jobbers, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies or other customers for use in the United States replacement market.

When a friction materials manufacturer is shipping to a vehicle manufacturer, brake manufacturer, or clutch manufacturer, but has no reasonable way of determining if the pieces are for original equipment or replacement purposes, estimates will not be used - these pieces will not be reported. However, where a friction material manufacturer is shipping to a point known to be used for replacement, or where he stencils or otherwise identifies the pieces as being for replacement purposes, or where the shipments otherwise are obviously known to be for replacement, these pieces will be reported.

The member who sells to the type customer or user indicated above will report those pieces sold, even if purchased from another Active Member or Regional Member.

When you sell your friction materials to another Member (Active or Regional) do not report those sales! Materials sold to Licensee Members of the Institute for the repladement market should be included.

B U L L E T I N

N O. 5 5 7

December 22, 1975

PROPOSED OSHA REVISIONS TO ASBESTOS STANDARD

On December 17, 1975, the Occupational Safety and Health Administration (OSHA) published a notice extending the time for filing comments on the proposed revisions to the standard for occupational exposure to asbestos. The new deadline for filing comments is February 9, 1976.

Also, OSHA printed several corrections to the October 9, 1975 proposal. The corrections were primarily editorial.

Again we urge all members to comment to OSHA on these proposed regulations.

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 5 6

December 9, 1975

INSTITUTE ASBESTOS SEMINAR

The Institute held its Seminar on asbestos at the Ramada Inn, Rochelle Park, New Jersey on December 3-4, 1975. Over 40 representatives from our membership attended. Formal programs were presented with slides and sound. The Seminar was apparently well received by those attending. A brief summary of the presentations at the Seminar follows. Enclosed also is more detailed coverage of the presentation made by Mr. Byung Kwon, of the Occupational Safety & Health Administration.

Johns-Manville Presentation

This was a three star attraction starting with Mr. Bill Reitze discussing the facts on three diseases associated with asbestos: asbestosis, lung cancer and mesothelioma. Ed Fenner followed with an up-date on the proposed revisions to the OSHA standard for asbestos exposure in the work place, and on the revised EPA standards for asbestos air emissions. Noel Hendry followed with information on the handling of asbestos (railroad cars, bag opening, etc.) as well as information on their Canadian J-M mining facility.

For further information on the J-M presentation contact either your local J-M representative or:

Mr. Noel Hendry
Johns-Manville Sales Corporation
Greenwood Plaza
Denver, Colorado 80217

Ferro-Tech, Inc.--Pelletizing Solid Waste

Mr. John Young of Ferro-Tech discussed agglomeration of solid waste, and in particular the pelletizing of asbestos waste products. He covered techniques other than pelletizing and presented slides on some installations already made at some friction materials manufacturers.

For a copy of his presentation, or additional information, contact:

Mr. John S. Young
Ferro Tech, Incorporated
1221 Banksville Road
Pittsburgh, Pa. 15216

Milfisk of America--Housekeeping in the Work Place

Mr. Robert Magdelain of Milfisk presented a history of sanitation, with recommendations for the factory. At the conclusion of his presentation, he demonstrated features of some of his larger industrial vacuum cleaners with emphasis on non-clogging of filters

and ease of use and emptying of the units.

For more background on his presentation, or additional information, contact:

Mr. Robert S. Magdelain
Nilfisk of America, Inc.
3244 Prospect St., N.W.
Washington, D.C. 20007

Occupational Safety & Health Administration

Mr. Byung Kwon of OSHA made a presentation emphasizing the proposed standards for occupational exposure to asbestos. A lengthy summary of Mr. Kwon's presentation is attached. His emphasis was that he needs input from industry so that a realistic and effective standard can be written.

To contact Mr. Kwon:

Mr. Byung Kwon
Occupational Safety & Health Administration
Room N-3660
200 Constitution Avenue, N.W.
Washington, D.C. 20210

Asbestos Information Association (AIA/NA)

Mr. Robert H. Mereness, Executive Director of the Asbestos Information Association discussed the AIA and its history. He mentioned the work done by AIA and services rendered its members. Four members of the Institute are AIA members and he would welcome additional corporate members. To contact AIA:

Mr. Robert H. Mereness
Asbestos Information Association, N.A.
1660 L Street, N.W.
Washington, D.C. 20036

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 5 5

November 20, 1975

ADDITIONS TO MEMBERSHIP

FRENOS VENEZOLANOS, C. A., VENEZUELA (Regional)

AND

UTIL, S. P. A., ITALY (Licensee)

The membership has voted to accept the application for Regional Membership submitted by Frenos Venezolanos, C. A. of Caracas, Venezuela. Frenos Venezolanos, C. A. is a manufacturer of brake linings, brake blocks and clutch facings with manufacturing at Urbanizacion Soco, Edo Aragua, Venezuela (office in Caracas, Venezuela). They produce friction materials under licensing arrangements with a United States and European manufacturer. They do not intend to use the copyrighted FMSI numbers for exporting products to the U. S. A.

The Board of Directors has reviewed the application for Licensee Membership submitted by Util, S. P. A. of Villanova d'Asti, Italy. Util, S. P. A. is a manufacturer of brake shoes. The Directors voted to accept the Util, S. P. A. application and they are now our newest Licensee.

EWD/erc

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 5 4

November 11, 1975

1975 Brake Block Identification Catalog

In BULLETIN NO. 544 we solicited orders for our new 1975 Brake Block Identification Catalog.

There will be a price reduction from that quoted, as we ended up ordering 40,000 copies. The final price will be:

\$185.00/M
9.00/M for punching

There are additional copies on hand over those ordered. If anyone wishes to order copies--not already ordered--their Purchase Order should be made out to the Friction Materials Standards Institute, and mailed to the Institute Office in Paramus.

Please let your Purchasing Department know of this price change.

E. W. Drislane
Executive Director

BULLETIN

NO. 553

November 3, 1975

INSTITUTE SEMINAR ON ASBESTOS

Mr. Harry Wagner, Chairman, and the members of the Asbestos Study Committee are arranging a seminar on asbestos for December 3-4, 1975, at the Ramada Inn, Rochelle Park, New Jersey (near Paramus).

A tentative agenda for the seminar is enclosed. The foundation for the seminar is a Johns-Manville presentation, up-dated for 1975, which is scheduled for December 3, 1975. A reception will be held afterwards at which individuals can meet others with similar problems and perhaps solutions. The December 4, 1975 session will present information on pelletizing solid waste and cleaning equipment to help control dust in the work place. This will be followed with sessions on the Occupational Safety and Health Administration (OSHA) and the Asbestos Information Association (AIA).

You are invited. Also, those in your firm who must cope with the asbestos regulations at the plant level are invited.

Information on the program, how to get to the Ramada Inn--and other motels in the area--are enclosed. Will you please list the names of those who plan to attend this seminar on the enclosed return form. There is a \$10.00 registration fee per person to cover costs of the reception and luncheon.

Please: return the enclosed return form to me, with the \$10.00 per person, by no later than November 25, 1975. You should make your hotel/motel reservations directly to the hotel/motel you wish to stay at.

EWD/erc
Enclosure:

E. W. Drislane
Executive Director

RETURN FORM - INSTITUTE SEMINAR

(Please use for attendance at Institute December 3-4, 1975 Seminar on Asbestos. Hotel/Motel, reservations are not included, and should be made separately).

Friction Materials Standards Institute, Inc.
E-210 Route 4
Paramus, New Jersey 07652

Subject: Institute Seminar on Asbestos

Gentlemen:

Please register the following for your Asbestos Seminar on December 3-4, 1975:

NAME	COMPANY	ADDRESS

The \$10.00 fee, per attendee, should be enclosed with this form, made out to Friction Materials Standards Institute, Inc.

BY _____

Company _____

Date _____

HOTEL/MOTEL RESERVATIONS -- PARAMUS AREA

The seminar is to be held at the Ramada Inn, Rochelle Park, New Jersey (near Paramus).

RAMADA INN, ROCHELLE PARK

Enclosed is a copy of a brochure for the Ramada Inn (Exit 160, Garden State Parkway) with directions to find it. Also enclosed are reservation request cards which you can mail to the Ramada Inn, attention of Judy Williams. You may prefer to make your own reservations directly using the Ramada Inn toll free line (800) 228-2828.

OTHER HOTELS/MOTELS

There are a cluster of three large hotels/motels nearby at Saddle Brook, New Jersey. (Exit 159, Garden State Parkway). There are a Marriott, Holiday Inn and Howard Johnsons. These are 1 mile from the Ramada Inn.

In addition, there are many hotels/motels in Bergen County and a list of these is also enclosed.

DIRECTIONS FROM AIRPORTS TO RAMADA INN

From JFK and La Guardia: Grand Central Parkway to Triboro Bridge; North on Major Deegan Expressway (Rte 87) to George Washington Bridge; West on Route 4 about 8 miles, (1 mile past Route 17); South on Paramus Road about 1/2 mile (Ramada Inn).

From Newark Airport: North on Jersey Turnpike; West on Route 80; to Garden State Parkway North; 1 mile on Garden State Parkway to Exit 160 (Ramada Inn).

FRICTION MATERIALS STANDARDS INSTITUTE, INC., E-210 ROUTE 4, PARAMUS, N. J. 07652

TENTATIVE SCHEDULE - SEMINAR ON ASBESTOS

Location: Ramada Inn, Rochelle Park, N. J. (near Paramus)

Date: December 3-4, 1975

Wednesday December 3, 1975

12:00 Noon - 1:30 PM	Check-in
1:30 PM - 5:00 PM	"A Johns-Manville review on asbestos"
	W. B. Reitze: Medical aspects
	E. M. Fenner: OSHA, EPA Regulations
	N. W. Hendry: Fiber handling; plans for the new regulations.
5:30 PM - 7:30 PM	Reception with beverages and hors d'ouvres

Thursday December 4, 1975

8:30 AM - 9:15 AM	"Solid Waste disposal by pelletizing" W. Engelleitner (Ferro Tech, Inc.)
9:15 AM - 10:00 AM	"Housekeeping in the work place" R. S. Magdelain (Nilfisk of America, Inc.)
10:00 AM - 10:30 AM	Coffee break
10:30 AM - 11:45 AM	"Occupational Safety and Health Administration" B. K. Kwon (OSHA)
11:45 AM - 12:30 PM	Cocktails
12:30 PM - 2:00 PM	Luncheon with guest speaker R. H. Mereness (Asbestos Information Association)

B U L L E T I N

N O. 5 5 2

November 3, 1975

1975 SUPPLEMENT TO 1974 BRAKE SHOE IDENTIFICATION CATALOG

When the 1975 Supplement to the 1975 Brake Shoe Identification Catalog was printed this year we later received several orders we could not fill because we were out of stock.

Because of the demand for these catalogs, we are making a special reprint. The cost for this catalog will be \$.30 each (\$300/1000 Copies). All copies will be punched.

If you wish additional copies, please forward your order now to the Institute Office. If this reprint is oversubscribed we will fill orders on a first come - first served basis.

EWD/erc

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 5 1 B

October 30, 1975

PROPOSED AMENDMENTS TO THE OSHA ASBESTOS STANDARD

When BULLETIN NO 551A was mailed, a copy of the proposed amendments to the OSHA Asbestos Standard was sent to one individual for each Active Member. These proposed amendments were in the Federal Register of October 9, 1975. If an additional copy of these proposed amendments is needed, please contact the Institute Office.

We are enclosing with this notice copies of three overviews of the proposed OSHA Asbestos Standard. These overviews are by:

Asbestos Information Association
Occupational Health and Safety Letter
Internal Overview-Member Company

We believe these three overviews, when read with the full text as it appeared in the Federal Register, help highlight areas of concern to manufacturers of asbestos containing friction materials. The main item is the proposed lower limit of 0.5 fibers/cc (TWA). However, there are several additional requirements that may prove quite burdensome and costly.

It is strongly recommended that individual companies make their views known to the regulatory authorities. Written comments were called for (in quadruplicate) by December 8, 1975. We will ask for additional time in which to comment. Comments should be addressed to:

Docket Officer, Docket H-033
U. S. Department of Labor, Room N-3620
200 Constitution Avenue, N. W.
Washington, D. C. 20210

In particular, we call your attention to the Federal Register notice, page 47659, VII - PUBLIC PARTICIPATION.

On a separate write-up we are including some concerns raised at our recent Asbestos Study Committee meeting relevant to the proposed amendments. We suggest any comments be your own--as they affect your plant. The discussion is simply to call your attention to some of the problem areas with these proposals. Among the comments made at the committee meeting were:

- (1) Don't say "We can't do it!"
- (2) Do not dispute the medical evidence unless you have solid medical records to prove your point.
- (3) Don't expect arguments by the Asbestos Information Association or the FMSI to carry the day. If individual manufacturers don't comment, the Department of Labor may feel there will be no problem meeting these new standards.

EWD/erc
Enclosure:

E. W. Drislane
Executive Director

FMSI 17812

INFORMAL COMMENTS ON PROPOSED OSHA ASBESTOS STANDARD

The proposed OSHA standard is far reaching. The main problem is the new more difficult numerical standard (0.5 fiber/cc). OSHA has put out a list of rather specific items for public participation with the main item being that the comments must be postmarked on or before December 8, 1975. Written comments concerning the proposal must be submitted in quadruplicate:

Docket Officer, Docket H-033
U. S. Department of Labor, Room N-3620
200 Constitution Avenue, N. W.
Washington, D. C. 20210

While an extension of time for filing comments is being requested, there is no way of knowing whether an extension will be granted.

The question has been asked as to what would be the most effective means of communicating with Washington to indicate the problems with this new numerical standard. Should the Institute comment? Should the individual members comment? It is not enough for the manufacturer to feel his views will be represented to the regulators by the Asbestos Information Association or FMSI. It was suggested that it would be best if both the Institute and individual members respond with points that are particular to their factories. If it is felt that participation by the small manufacturer will be most meaningful. It should be pointed out that even if members comment to the effect that they support the AIA comments or they support the FMSI comments, at least they will be on record espousing their viewpoints. Obviously, the AIA and FMSI comments will have to be prepared before this can be done.

It is most important that the individual companies make a response. They should not expect that someone else will write it for them. The comments must be those of the individual member and they should not echo the suggested outline of problems which the Institute prepared.

1. Medical

It is suggested that unless a member has specific medical information suitable to refute the proposals in the standard that he not attempt to resist the 0.5 fiber/cc limit based on non-professional observations of workers made in the past. In other words, if it is not good medical information don't use it. The Asbestos Information Association will try to assemble some realistic medical information for consideration by the Department of Labor.

2. Technology for reaching 0.5/fiber/cc TWA level

A point to be mentioned is not to adopt the tactic of "You can't do it." The point is that at the present time technology is not available in the factory to get down to these levels. The industry does not know what the costs are. How can comments be made on cost impact, competition, employment, energy, etc. when the technology to get there is not known?

A comment was made to the effect that everyone has been gearing to get their concentrations down to the 2 fiber/cc limit by July 1, 1976. The technology necessary to take the count down to 0.5 fiber/cc is not known. How can comments be made, when the technology for getting to the 0.5 fiber/cc is not even known at this time?

Members have made extensive plans for equipment, exhaust systems and procedures to get to the 2 fibers/cc limit on July 1, 1976. Since this equipment will not get them to the 0.5 fiber/cc level, this huge capital investment should perhaps be stopped until such time as a new standard is decided. Should a manufacturer discontinue his heavy commitment to equipment for the 2 fibers/cc limit when this equipment will not meet the 0.5 fibers/cc limit?

Industry conditions in 1975 (under the current 5 fibers/cc limit) are much improved over industry conditions which were in effect through most of the 1960's. Each additional step approaching zero fibers/cc is a lot more difficult than the steps that were taken to get industry down to the 5 fibers/cc limit. While it will be burdensome to move the concentrations to the 2 fibers/cc limit, the steps necessary to get to 0.5 fibers/cc are not known.

As regards energy who can say that if double the horsepower was added to collection systems that they would get down to the new limit? How can the energy cost be estimated until this same equipment has actually reduced the concentration down to the new levels?

3. Fiber counts by the membrane filter method

The members don't know how low they can get in fiber counts until new collection equipment is actually installed and in operation. Suggestions made for cleaning the work area are all well and good but the only proof that one has reached an arbitrary fiber limit is when the installation is completed.

In general there seems to be agreement that different experienced counters may total up results showing as much as a 30% variation in counts from the same sample. This is already a problem. However these counts where the 30% variation is evidenced are in the 2 fibers per cc to 5 fibers/cc area. A 30% difference with a 5 fiber/cc count is 1.5 fibers/cc. Here, OSHA is asking for a concentration limit of 0.5 fibers/cc when with current observations there can be variations of as much as 1.5 fibers/cc. As concentrations move towards 0.5 fiber/cc not only does technology get more difficult, but the readings get more difficult.

The friction materials business is different from regular asbestos manufacturing. In addition to asbestos, we have other materials in the product such as resins, carbon blacks, friction dust and various minerals. It is possible that some of these may be picked up during the sample gathering before the count. In some cases these could be counted by inexperienced operators as asbestos fibers. In essence it is more difficult to count asbestos in a friction material environment than it is in a textile environment. It is felt that there may be greater difficulty in getting consistent readings on fiber counts in the friction materials business. For that reason friction material manufacturers would prefer a work practices oriented standard.

While the membrane filter method may be the only method that is available currently for measuring airborne asbestos, and it is not felt that there is another method that can take its place, it is a tool that should be used by manufacturers trying to clean up their areas. It is not felt that this tool is accurate enough to be used for enforcement purposes. It is suggested that OSHA inspectors must realize this before factories are closed down and fines are levied when there is doubt as to how accurate the measurement is. Because of the wide variation in results there is concern among members as to the millions of dollars now being put into control methods. Even with these expenditures, there is no way of knowing positively whether industries are getting their counts down to the required levels. Various words are used to describe the reliability of the membrane filter method for enforcement: It has been called "unreliable" and "inadequate". While it is the only tool now available it is not the proper tool for enforcement.

4. Groups other than manufacturers will now be involved

The reduction of the limit to the 0.5 level is going to effect processors such as the re-builder and the garages who were not really included in this standard before. Any outfit that handles friction materials may very well find airborne concentrations of asbestos fibers that exceed the 0.5 fiber/cc level. For example, a junk yard which might have a side line in brakes might have no problem at the present time. However any work that they might do which could bring their concentration above 0.5 fiber/cc would now be a problem. These people would now be covered by the requirements of the OSHA standard. Many smaller operators have to drill materials to adapt them to unique shoes in the field. Additional drilling would probably move concentration levels well above the maximum ceiling concentration of 5 fiber/cc.

It is also pointed out that there are alot of new items in the proposed regulations including loading, unloading and storing of asbestos cargo. The carrier--be it a railcar, ship or other--must make a visual inspection of the cargo and cargo space to determine if leakage or spillage of asbestos has occurred. Who does this? Does the carrier do this? Are the carriers aware of this problem? A close reading of the proposed OSHA standards revealed many problems of this nature which will have to be pointed out to others who may not feel that they are affected by the asbestos regulations.

5. NHTSA demands on brake lining manufacturers are at cross purposes with OSHA and EPA restrictions on formula and processing.

As regards the problem with cost impact on the consumers, it may be that clean rooms for the elimination of asbestos may be required. Without knowing figures perhaps costs will more than double with poorer performance at a time when the National Highway Traffic Safety Administration is calling for even higher performance.

The friction materials industry does not know whether the 0.5 fiber/cc limit can be reached. Perhaps it will be necessary to go to materials with a material cost ten times that of asbestos in order to get the work place down to the proposed level. Industry is confronted with requirements for Standard 121 and Standard 105-75 from the National Highway Traffic Safety Administration with stringent friction materials requirements at the same time that they must evaluate whether they can still use asbestos in their products.

There would be considerable costs for members in the friction materials industry to requalify brake blocks and heavy duty segments for the requirements of the NHTSA Standard 121 which went into effect during 1975. There has been a considerable expenditure of funds for Standard 105-75 (hydraulic brake systems standard) by many members. Any changes in the processing or compounding of friction materials necessitated by the proposed OSHA standard would add additional costs for manufacturers in requalifying their materials. The friction materials industry in particular is caught between the forces of improved performance of braking materials along with restrictions on how to manufacture and distribute their materials. There may be considerable testing to requalify materials if there should be a change in processing or compounding.

6. Competition and industry dislocation

As regards the costs to consumers and society in general the industry does not know what can be done if it is necessary to remove asbestos from brake lining. The industry could be subject to 5 - 10 years of serious dislocation. In addition to the problem with the OSHA standard that appear evident, cost can not be quantified at this time.

As regards the effect on competition it was pointed out that this may very well be the trigger which would close down some marginal operations with a resulting transfer of jobs outside of the U. S. Even in Great Britain where much medical information has been gathered they have not gone to the 0.5 fibers/cc limit. It does not appear that Great Britain has sufficient medical evidence to support such a limit. Countries on the continent do not have this 0.5 fiber/cc limit. The Latin American countries have no limits. As regards the effect on employment and competition, the huge capital expenditures required for the U. S. plants may very well export additional jobs.

7. Record-keeping and monitoring

One of the requirements for record keeping stated that the records must be maintained for forty years, or for an employment interval plus 20 years, which ever is longer. This is a considerable record keeping requirement. However it was stated that perhaps this is necessary in order for subsequent study of the epidemiology of asbestos. It was suggested that perhaps this is one of the new proposals that can be lived with.

Costs will be increased because of the new monitoring requirements.

8. Worker assignment and protective equipment

While some of the procedures recommended for handling asbestos and removing the worker from contact with the product may show labor saving results, the actual exposure to the remaining people from these changes will still be quite difficult.

Where regulated areas are established where allowable concentrations may be exceeded, it is difficult to get employees to wear the proper clothing. If one were trying to operate a clean room along with proper protective clothing, employees would want air-conditioning in the work place for the uncomfortable clothing. One can't match up air-conditioning in the work place with the extensive exhaust systems because one is at cross purposes with the other.

Could there be more emphasis on protective clothing with cover-alls, smocks, boots and gloves as well as a respirator rather than numerical limits? With reduction to the two fibers/cc level on July 1, 1976 and better work practices, the clothing might do the job as well as the new difficult-to-measure 0.5 fiber/cc limit.

There are requirements in the proposed standard for worker re-assignment. If many employees are moved to lesser and lesser duties maintaining the same premium pay that they had received for working with the asbestos products, there will be a negative productivity result. It has been industry practice in the past for night shifts and more difficult tasks to command higher pay premiums. This rotation to another job with no loss in pay will be another penalty to productivity.

FRICTION MATERIALS STANDARDS INSTITUTE, INC.

BERGEN MALL OFFICE CENTER
E. 210 ROUTE 4
PARAMUS, N. J. 07652

October 30, 1975

0071

Docket Officer, Docket H-033
U. S. Department of Labor, Room N-3620
200 Constitution Avenue, N. W.
Washington, D. C. 20210

Gentlemen:

The Friction Materials Standards Institute is a trade association representing most of the domestic manufacturers of asbestos-containing brake linings and clutch facings. We also have many members in other parts of the world.

Asbestos is a material basic to the manufacture of brake linings and clutch facings. The proposed amendments to the regulations for occupational exposure to asbestos will require considerable study before a balanced response can be made thereto.

Our industry has been engaged in a serious and costly effort to reduce the asbestos concentrations in the work place to the 2 fiber/cc TWA limit to be effective July 1, 1976. This has been an awesome task, and the technology to move to this level is quite advanced. Our members do not even know what the technology will be to go to a 0.5 fiber/cc limit. It may be that the expensive equipment installed to get to 2 fiber/cc will have to be discarded for completely new technology.

Still further, our segment of industry is under two opposing regulatory forces. One is the National Highway Traffic Safety Administration pushing for more and more performance from brake linings. Standard 105-75 (Hydraulic Brake Systems) goes into effect on January 1, 1976. Standard 121 (Air Brake Systems) went into effect in 1975. The opposite force is the Occupational Safety and Health Administration and the Environmental Protection Agency who in effect are limiting our options for formulating and processing brake linings.

We ask you to consider the heavy impact on our industry and extend the date for comments to April 1, 1976. The December 8, 1975 cut-off date for comments will not permit a balanced responsible participation by our industry regarding these proposed regulations.

Respectfully,

FRICTION MATERIALS STANDARDS INSTITUTE

EWD/erc

E. W. Drislane
Executive Director

FMSI 17817

FRICTION MATERIALS STANDARDS INSTITUTE, INC., E-210 ROUTE 4, PARAMUS, N. J. 07652

B U L L E T I N

N O. 5 5 1 A

October 23, 1975

Subject: OSHA Proposed Standard - Occupational Exposure to Asbestos

We have finally copied the proposed OSHA Standard for Asbestos,
as it appeared in the Federal Register.

A copy is being sent to the individual listed in earlier BULLETIN
NO. 551.

EWD/erc

Enclosure:

cc: Delegates & Alternates

Asbestos Study Committee

Regional Members (U.S.Fee)

E. W. Drislane

Executive Director

FRICTION MATERIALS STANDARDS INSTITUTE, INC., E-210 ROUTE 4, PARAMUS, N. J. 07652

BULLETIN

NO. 551

October 14, 1975

Subject: OSHA Proposed Standard - Occupational Exposure to Asbestos
EPA Amended Standard - Emissions Standards for Asbestos

The proposed OSHA Standard for Asbestos and the amended EPA Emissions Standards for Asbestos have appeared in the Federal Register.

I am sending one copy of each to:

EWD/erc

Enclosure:

cc: Delegates & Alternates
Asbestos Study Committee
Regional Members (U.S. Fee)

E. W. Drislane

Executive Director

*OSHA - Proposed Standard - was not sent with
the Bulletin 551 - Xerox machine broke down.
OSHA Proposed standard - was sent with Bulletin
551-A -*

FMSI 17819

B U L L E T I N

N O. 5 5 0

October 7, 1975

OSHA PROPOSED NEW ASBESTOS STANDARD

Enclosed is a copy of an article as it appeared in the New York Times of Sunday October 5, 1975. The full publication of the proposed standard will be in the Federal Register on October 9, 1975.

The proposed new standard is rough. The current regulations call for the 5 fibers/cc limit to be reduced to 2 fiber/cc on July 1, 1976. This new proposal calls for a standard of 0.5 fibers/cc (effective date not established).

I have excerpted some of the more significant parts of the OSHA proposed standard (from a covering letter from the Asbestos Information Association):

1. Reduce the permissible exposure limit to a TWA of 0.5 fibers per cubic centimeter (500,000 fibers per cubic meter) and reduce the ceiling limit to 5 fibers per cubic centimeter (5 million fibers per cubic meter).
2. Add a 15 minute sampling period for determination of the ceiling limit.
3. Establish additional requirements for regulating areas, employee rosters, hygiene facilities, employee information and training, signs and labels, monitoring and medical surveillance.
4. Extend the period for retention of monitoring and medical records to 40 years or for the duration of the employees' employment plus 20 years, whichever is longer.

It would appear that comments on technical feasibility, costs to the employer, and possible plant shut-downs might have some bearing on adoption of this stringent new standard.

From the draft copy I have seen, they are asking for objections or comments prior to December 8, 1975. Written data should be in quadruplicate to:

Docket Officer, Docket H-033
U.S. Department of Labor
Room N-3620
200 Constitution Avenue, N.W.
Washington, D.C. 20210
Telephone (202) 523-8076

Again, this proposed new standard will be in the Federal Register of October 9, 1975.

E. W. Drislane
Executive Director

FMSI 17820

NEW YORK TIMES - SUNDAY OCTOBER 5, 1975

THE PROPOSED OSHA ASBESTOS STANDARD REVISION

NEW RULES URGED FOR ASBESTOS RISK

Labor Department Seeking
Reduction in Exposure of
Workers and Families

By JANE BRODY

The United States Department of Labor has proposed a new standard to protect workers and their families from the lung-scarring and cancer-causing effects of asbestos, a mineral of a thousand uses to which millions of American workers are exposed.

The existing asbestos standard, which has been widely contested by labor groups, was designed only to prevent asbestosis, a scarring of the lungs that, if severe, can turn a worker into a cripple in a respirator.

However, the Labor Department's Occupational Safety and Health Administration said in its proposal that new information had developed showing that the existing standard would not prevent asbestosis and would certainly not prevent asbestos-caused cancers.

Cancers, especially those involving the lung, gastrointestinal tract and lining of the chest and abdominal cavities, have accounted for more than 40 per cent of deaths among some groups of asbestos workers, a rate three to four times higher than that in the general population.

In addition, studies in South Africa and New Jersey have shown that the families of asbestos workers also face an increased cancer risk because they are exposed to asbestos fibers carried home on the workers' clothing.

Delayed Fiber Effect

Asbestos enters the body mainly through inhalation. It may also be ingested in food or drink contaminated with the mineral fibers. Once in the body, the fibers tend to persist, remaining dormant for many years. However, 20 or more years later, cancers caused by these fibers may become clinically apparent.

The Labor Department's proposed standard would greatly reduce the amount of asbestos fibers now allowable in the air a worker breathes and would sharply reduce a lower standard scheduled to take effect next year. Currently the standard permits a level of five million fibers per cubic meter of air. This was to have been reduced to two million fibers per cubic meter by next July.

The two million level was decided upon on the basis of experience in one British asbestos factory, where a study of 290 men indicated that, at about twice that level, only a small percentage of workers exposed for 10 years or longer developed lung scarring.

However, these workers have since been re-examined, and X-ray evidence of lung abnormalities was found in 40 to 70 per cent of the same group of workers in addition, a number of asbestos-related cancers was found.

The proposed standard would reduce worker exposure to asbestos to 500,000 fibers per cubic meter, averaged over an eight-hour day, with a maximum exposure at any one time of five million fibers. Workers would have to be educated as to the hazards of asbestos and how to avoid them and tested periodically to be sure they were suffering no ill effects.

Records Kept Longer

Records of both the medical examinations and tests of asbestos levels in the work environment would have to be kept for 40 years, or for the duration of the worker's employment plus 20 years, whichever is longer. The current standard requires retention of medical records for 20 years and monitoring of records for only three years.

Employers would also be required under the new standards to provide shower and change rooms for asbestos workers to guard against their inadvertently carrying the fibers home. No food, drink or smoking would be allowed where asbestos was used and workers would have to wash thoroughly before eating during the work day.

The new standard would cover an estimated total of 50,000 workers involved in the manufacture of asbestos-containing products and about 40,000 field insulation workers who are exposed to asbestos dust, plus many thousands of others who work with products that contain asbestos.

The standard would not cover millions of workers in the construction industry, where three-fourths of all asbestos products are used. The Labor Department said it intended to formulate a separate standard for these workers, since they are usually employed in nonfixed work places and tend to be highly transient.

The Labor Department must now prepare an environmental impact and an inflationary impact statement before holding a hearing on the proposed standard.

In addition to asbestos standards, the department last week issued proposed new standards to limit worker exposure to lead and toluene, both widely used hazardous industrial substances, and established procedures for handling other toxic chemicals in the work environment.

BULLETIN

NO. 549

October 1, 1975

HISTORICAL SALES PROGRAM

The historical sales program is continuing on a quarterly basis. Regional Members using the copyrighted FMSI Numbers for marketing their products in the United States may participate if they wish.

The Institute is requesting details of pieces sold for the first nine months of 1975 (9 months ending September 30, 1975). The rules for the reporting details remain unchanged.

1. Quantities will be reported in pieces (not units). For roll lining, each foot of length will be one piece.
2. Our Accountants will report the names of the members from whom reports are received, and the number of members reporting in each of the four groups.
3. Total pieces in each group will be reported.
4. "Clutch Facings" does not include gear tooth discs, automatic transmission discs, or the 8-14" dia. (3/16 to 1/2" thick) asbestos composition discs.

This data as filed will be confidential, and as totals for each group will be shown, there is no way of determining quantities by individual members.

Please review the form and the descriptions, as they apply to this year's reporting. You will be receiving from Marshall Granger & Company, Certified Public Accountants, a form for completing this information. Please return it to:

Marshall Granger & Company, C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

If you report, please have your figures in by November 15, 1975. If you do not wish to report these figures, no reply is necessary. Only those reporting figures will receive the industry totals when the data is summarized. A sample form and definitions are attached.

EWD/erc
Encs.

E. W. Drislane
Executive Director

Distribution: Delegates & Alternates
Regional Members (paying
Active Member Dues)

EXHIBIT "A"

STATISTICAL PROGRAM OF THE
FRICTION MATERIALS STANDARDS INSTITUTE, INC.

Mail to:

Marshall Granger & Co., C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

* * * * *

See instructions for sales to other members!

Pieces sold to United States distributors, jobbers, private brands, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies, or other customers for use in the United States replacement market:

9 MONTHS JANUARY 1 to SEPTEMBER 30, 1975

Brake linings up to 3/4" nominal
thickness (See explanation for
roll lining).

Brake blocks, nominal thickness
of 3/4" and over

Disc brake linings

Clutch facings

SAMPLE
FORM

USE REPORTING FORM TO
BE SENT BY ACCOUNTANTS

By: _____
Signature

Company

Date

EXHIBIT "B"

DEFINITION FOR HISTORICAL SALES

PIECES

The reports will show pieces of friction material, in groups as shown:

<u>Group</u>	<u>Description</u>	<u>Normal Usage</u>
Brake Lining	Friction materials up to a nominal 3/4" thickness (See note on roll lining)	Normally, <u>one piece</u> to a shoe
Brake Blocks	Friction materials with a nominal thickness of 3/4" and over	Normally, <u>two pieces</u> to a shoe.
Disc Brake Linings	Friction materials sold (for disc brakes) to be attached to the shoe, or sold as a unit molded, bonded or riveted to the shoe	Normally, <u>one piece</u> to a shoe
Clutch Facing	Friction materials of annular shape, or segments thereof.	Normally, <u>two annular</u> pieces per clutch plate

Note: For roll lining only, consider each foot of length equals one piece.

REPLACEMENT SALES TO UNITED STATES MARKET

This reporting is for sales to the United States replacement market only. Do not include sales to other markets. This includes sales under the friction material manufacturer's own name or brand name used by the customer, to automotive warehouse distributors, jobbers, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies or other customers for use in the United States replacement market.

When a friction material manufacturer is shipping to a vehicle manufacturer, brake manufacturer, or clutch manufacturer, but has no reasonable way of determining if the pieces are for original equipment or replacement purposes, estimates will not be used - these pieces will not be reported. However, where a friction material manufacturer is shipping to a point known to be used for replacement, or where he stencils or otherwise identifies the pieces as being for replacement purposes, or where the shipments otherwise are obviously known to be for replacement, these pieces will be reported.

The member who sells to the type customer or user indicated above will report those pieces sold, even if purchased from another Active Member or Regional Member.

When you sell your friction materials to another Member (Active or Regional) do not report those sales! Materials sold to Licensee Members of the Institute for the replacement market should be included

B U L L E T I N

N O. 5 4 8

September 29, 1975

1975 AUTOMOTIVE DATA BOOK

When we announced the 1975 AUTOMOTIVE DATA BOOKS, we received orders for about 76,000 copies. The printer printed over 78,000 copies. Since then, several members who had not ordered originally, placed orders that quickly ate up the extra copies. We have no more copies on hand. Several members have since asked for copies. To help them out, I indicated that I would contact the membership.

DOES A MEMBER HAVE EXTRA COPIES ON HAND?

If a member has too many copies, and would like to get rid of them, please let me know and I will advise those seeking copies. The price originally was \$310.00/M plus \$15.60 for punching, or \$325.60/M total; (approx. \$.33/copy).

POSSIBLE RE-ORDER FROM PRINTER

In our bid from the printer we asked for possible cost for reprints. Prices would be about as follows:

<u>Total Order</u>	<u>Cost/M</u>	<u>(Cost/Copy)</u>
5,000	\$527.20	53¢
10,000	\$434.90	44¢

If a member would like additional copies, at these re-print prices, please let me know. We must have at least 5,000 total orders to call for a re-print.

INDIVIDUAL REPRINT OF THE CATALOG

If a member wishes, I will grant permission for an individual reprint of the Data Book by the member's printer. However, I must give written permission, and can do this only on request.

If you (1) have extra copies on hand, or (2) wish to order copies at our Printer's re-print price, please advise on the attached form.

Active Members
Regional Members

E. W. Drislane
Executive Director

Reference: 1975 Automotive Data Book
BULLETIN NO. 548

Friction Materials Standards Institute
E-210 Route 4
Paramus, N.J. 07652

Gentlemen:

Relative to subject bulletin:

(1) I HAVE EXTRA COPIES I WISH TO SELL

Number of copies for sale _____

Who should be contacted? _____

(2) I AM INTERESTED IN PURCHASING ADDITIONAL COPIES AT THE PRINTER'S
RE-PRINT PRICE

Number of copies to purchase _____

Who would issue order: _____

By _____

Company _____

Date _____

B U L L E T I N

N O. 5 4 7

September 23, 1975

APPLICATION FOR REGIONAL MEMBERSHIP

This is to advise the membership that we have received an application for Regional Membership from Frenos Venezolanos, C.A., of Caracas, Venezuela.

Frenos Venezolanos, C.A. is a manufacturer of brake linings, brake blocks and clutch facings with manufacturing at Urbanizacion Soco, Edo Araqua, Venezuela (office in Caracas, Venezuela). They produce friction materials under licensing arrangements with a United States and European manufacturer.

The required \$1,300 deposit (for the annual fee) was received with their application. They do not intend to use the copyrighted FMSI numbers for exporting products to the U.S.A.

No action is to be taken by the Membership at this time, as their application is now being reviewed by the Membership Committee. This is simply background information upon which you will act, pending recommendations of the Membership Committee and the Board of Directors.

CC: Delegates & Alternates

E. W. Drislane
Executive Director

B U L L E T I N

N O. 546

September 23, 1975

NHTSA PROPOSALS ON DEFECT AND NONCOMPLIANCE REPORTS

The NHTSA had earlier (May 6, 1975) proposed regulations extending the defect notification requirements of the National Traffic and Motor Vehicle Safety Act to equipment manufacturers. These proposed amendments to Part 577 were to take effect on September 1, 1975.

Some members have expressed concern over the marking and identification requirements. These proposals did not specify identification or marking requirements. However, identification is inferred, as the better a manufacturer is able to identify equipment for a recall, the fewer items he may have to recall.

The NHTSA is now proposing amendment to Part 573, Defect and Noncompliance Reports. See enclosed notice as it appeared in the Federal Register on September 19, 1975.

To quote from this notice:

The NHTSA did not intend by this proposed regulation to impose increased recordkeeping burdens on equipment manufacturers. It has been this agency's intention that manufacturers meet the requirements for providing information in whatever ways their present recordkeeping practices permit. It is true that without records capable of precisely identifying involved equipment, a manufacturer may have to recall a greater number of equipment items in a given recall than he would have were his records able to specifically identify the equipment involved. However, given the rather rare instance of defects found to exist in equipment items, these expenses would seemingly be easier to bear than the costs associated with wholesale changes in manufacturer methods of recordkeeping. At the same time, it is hoped that manufacturers will develop more accurate methods of recordkeeping for identifying equipment items and implement them gradually as part of normal business development.

The proposed requirements for the reports are covered in this notice. The foregoing is for your information.

EWD/lmc
CC: Delegates & Alternates
Brake Performance Study Com.
Quality Control Study Com.
Regional Members (U.S. Fee)

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 4 5

September 9, 1975

EQUIPMENT AND MACHINERY - WANTED/FOR SALE

The Institute has on occasion advised the Membership on special machinery and equipment that might be of interest--particularly pertaining to asbestos control in the work place. A suggestion was made that it might be advantageous to have the membership posted where other used equipment was either available from, or wanted by a Member.

It has been decided to try this as a service to the Membership. The equipment available or wanted should be:

1. Used machinery or equipment.
2. Specialized for the friction materials industry
3. Substantial - for guidelines, worth in excess of \$2,000 new.
 - 3.1 Examples - test machines, grinder, press, drilling machine, oven.
4. The property of the member, or to be purchased by a member.
 - 4.1 No offerings as an agent.

The Institute would have no guarantor position, but would simply list the equipment and details.

Those wishing to avail themselves of this service should advise a description of the equipment and who to contact.

Our first two listing follow:

<u>WANTED TO BUY</u>	
<u>Equipment</u>	<u>Contact</u>
Gogan Machine	Mr. Adrian Comins Auto Friction Corporation Lawrence, Massachusetts
FAST Test Machine	Ing. Ricardo Escobedo Duramax, S.A. Ap Postal 10-880 Mexico 10 D.F., Mexico

Any replies should be made directly to the parties involved.

Active Members
Regional Members

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 4 4

August 28, 1975

1975 Brake Block Identification Catalog

The contract for the printing of the "1975 Brake Block Identification Catalog" has been awarded to:

Tweddle Litho Company
24000 Harper Avenue
St. Clair Shores, Michigan 48080

Our first printing of a "Brake Block Identification Catalog" was in 1972. This was sold out at the time and we had to reprint. This is the first up-date since 1972. It contains all the blocks in the 1972 Edition plus those released since then. It will not contain the 1/2" and 3/8" segments which were in the earlier catalog.

It is believed that it will contain 32 pages plus cover.

On an estimate of the total order being 30,000 copies of a 32 page book, the price is:

\$204.00 per M
9.00 per M additional for five hole punching

If there is a change in the price per thousand due to a change in number of pages or to changes in order quantities, or the author's alterations, you will be notified.

Please forward all orders to the Institute Office. Do Not send them to the printer. This is our only means of checking the total quantities ordered and the price charged, as well as whether only members are ordering.

The orders should be made out to Tweddle Litho Company and state punching and shipping instructions.

Kindly forward your orders so that they reach the Institute Office before September 30, 1975.

EWD/erc
Distribution: Active Members
Regional Members
Data Book Committee

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 4 3

August 18, 1975

1975 BRAKE BLOCK IDENTIFICATION CATALOG

The Institute is now reviewing bids for the new 1975 Brake Block Identification Catalog. It appears that the Catalog will cost somewhere between \$.17 and \$.22 per copy, depending on the number of pages and the number of copies ordered.

There are no more copies of the Brake Block Identification Catalog (1972 Edition) left. This new catalog will add all blocks released since that 1972 Catalog--particularly FMVSS 121 blocks. The catalog will not include the 3/8" and 1/2" segments which were in the 1972 Catalog.

Would you please alert your catalog people that we will be soliciting orders about September 1, 1975. The printer has not been selected and a preliminary price has not been established as yet.

However, I would like to point out that we are already out of stock on the 1975 Automotive Data Book and the 1975 Supplement to the 1974 Brake Shoe Identification Catalog, so it will help all concerned if your order for these new catalogs is received soon after we solicit them next month. The sooner the orders are in, the sooner we can have the printer make delivery.

END/erc
Distribution: Active Members
Regional

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 4 2

August 15, 1975

NIOSH - RECOMMENDED (INTERIM) PRACTICES FOR ASBESTOS BRAKE AND CLUTCH SERVICING

I received a recent release from the National Institute for Occupational Safety and Health (NIOSH) concerning subject practices.

I believe you are aware that servicing of brake linings is under study by Dr. Selikoff's colleagues at Mt. Sinai, and that this group has been in contact with the Chief Industrial Hygienists of General Motors, Ford and Chrysler concerning work practices for brake servicing in the field.

This particular release advocates work practices for servicing both brake linings and clutch facings containing asbestos. It is suggested that these Recommended Procedures be distributed to those in your organization who would ordinarily feed information to your customers so that re-builders, brake service shops and others who work with brake linings and clutch facings would have this information.

Along these lines, but not from NIOSH, is a copy of an advertisement for "Brake-O-Vac" as it appeared in a recent issue of Brake and Front End Magazine.

DWD/erc
Enclosure

E. W. Drislane
Executive Director



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL

NATIONAL INSTITUTE FOR OCCUPATIONAL
SAFETY AND HEALTH
5600 FISHERS LANE
ROCKVILLE, MARYLAND 20852

August 8, 1975

Dear Colleague:

This communication is intended to alert you to recently gathered information indicating a potential health hazard for persons exposed to asbestos during the servicing of motor vehicle brake and clutch assemblies.

On July 21, 1975, the National Institute for Occupational Safety and Health convened a meeting of government and university scientists, industry representatives, and labor union officials to discuss the present state of knowledge with respect to this problem. Data was presented by investigators from the Mount Siani School of Medicine in New York City indicating that workers engaged in the maintenance and repair of automobile and truck brake linings are exposed to potentially hazardous levels of airborne asbestos dust. Specific brake servicing operations studied included blow-out of automobile drum brake assemblies, grinding of used truck brake linings, and bevelling of new truck brake linings. Average peak asbestos air concentrations for these three activities based on personal samples taken within ten feet of the operator were, respectively, 10.5, 3.75, and 37.3 fibers (>5 microns in length) per ml. An analysis of samples of brake drum dust revealed that almost all of the asbestos fibers found were shorter than 0.4 microns in length.

Previous studies of the extent of asbestos emissions from automobile brake lining wear showed that only a very small fraction of the original asbestos content of the brake lining is found in brake drum dust (Ref. 1-3). It was presumed that this is due to thermal degradation of the fibers during braking. The present findings indicate that enough asbestos is preserved to produce significant exposures during certain brake servicing procedures.

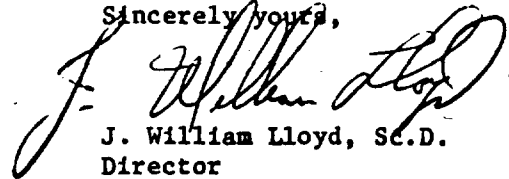
The full extent of asbestos-related disease in brake servicing personnel is not known at present because this particular occupational group has not been studied systematically up to now. However, a review of the scientific literature on the association between asbestos exposure and mesothelial tumors of the pleura and peritoneum has revealed at least four cases of these rare tumors in persons who were employed in jobs involving automobile brake servicing (Ref. 4-6).

Page 2

For your information and guidance, we are enclosing pertinent references, estimates of the population at risk, a NIOSH interim recommendation for brake and clutch servicing procedures, and a copy of the Department of Labor standard covering exposure to asbestos in the work place.

The environmental studies of brake lining servicing operations outlined above together with observations of mesothelial tumors in persons so employed affirms the necessity for instituting and maintaining recommended control measures in this industry so that the health hazards of asbestos are minimized.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "J. William Lloyd", is written over the typed name.

J. William Lloyd, Sc.D.

Director

Office of Occupational Health
Surveillance and Biometrics

Enclosures

REFERENCES

1. Lynch, J.R.: Brake Lining Decomposition Products. J Air Pollution Control Assoc, 18:824-26, 1968
2. Hickish, D.E. and Knight, K.L.: Exposure to Asbestos During Brake Maintenance. Ann Occup Hyg, 13:17-21, 1970
3. Jacko, M.G. and DuCharme, R.T.: Brake Emissions: Emission Measurements from Brake and Clutch Linings from Selected Sources. EPA Report 68-04-0020, 1973
4. Newhouse, M.L. and Thompson, H.: Mesothelioma of Pleura and Peritoneum Following Exposure to Asbestos in the London Area. Brit J Ind Med, 22:261-69, 1965
5. McDonald, A.D. et al.: Epidemiology of Primary Malignant Mesothelial Tumors in Canada. Cancer, 26:914-19, 1970
6. Greenberg, M. and Lloyd Davies, T.A.: Mesothelioma Register 1967-1968. Brit J Ind Med, 31:91-104, 1974

ESTIMATES OF THE WORKFORCE POTENTIALLY EXPOSED TO ASBESTOS
IN THE MANUFACTURING AND SERVICING OF BRAKE LININGS AND CLUTCHES.

Auto Mechanics	833,535
Garage Workers	67,679
Manufacture (original and rebuilding)	<u>6,657</u>
TOTAL	907,871

SOURCE: Adapted from 1972 Census of Manufacturers, 1972 County
Business Patterns, and Census of Population: 1970 Occupation by
Industry (all are Department of Commerce, Census Bureau
publications)

RECOMMENDED (INTERIM) PROCEDURES FOR
ASBESTOS BRAKE AND CLUTCH SERVICING

The National Institute for Occupational Safety and Health (NIOSH) has research underway concerning dust exposures during brake and clutch servicing. Due to preliminary data demonstrating significant asbestos exposures during presently used brake and clutch servicing techniques, NIOSH has reviewed alternate techniques whereby asbestos exposures are reduced. The following are interim procedures recommended by NIOSH to minimize dust exposures.

1. If possible, an area shall be designated for all brake and clutch repairs. Entrances into this area shall be posted with an asbestos exposure warning sign as follows:

Asbestos
Dust Hazard
Avoid Breathing Dust
Wear Assigned Protective Equipment
Do Not Remain in Area Unless Your Work Requires It
Breathing Asbestos Dust May Cause Asbestosis and Cancer

2. During brake servicing, an air purifying respirator, either single use or with replaceable particulate filter(s), as approved by the Mining Enforcement and Safety Administration (formerly Bureau of Mines) or NIOSH, shall be worn during all procedures starting with the removal of the wheels and including reassembly. During manual clutch servicing, such a respirator shall be worn during removal and cleaning of the clutch, pressure plate and housing assembly and during installation of the new clutch assembly.
3. Dust shall first be cleaned from brake drums, brake backing plates, brake assemblies and clutch assemblies using an industrial type vacuum cleaner equipped with a high efficiency filter system (>99% efficiency for 0.3 μ m diameter aerosols). After vacuum cleaning, any remaining dust shall be removed using a rag soaked in water and wrung until nearly dry. Under no circumstances shall compressed air or dry brushing be used for cleaning.
4. During arcing and riveting operations, an approved respirator, as described in (2) above, shall be worn. Grinding (arc)ing machines shall be provided with local exhaust ventilation such that worker exposures are maintained at least below the 1976 OSHA asbestos standard (29 CFR 1910.1001).^{*} At a minimum, the dust bag of the arcing machine shall be removed and replaced with the hose of the high efficiency industrial vacuum described in (3) above.

5. Industrial vacuum cleaner bags containing asbestos dust and cloths used for wiping brake and clutch assemblies shall be sealed in plastic bags and labeled with the following warning label printed in letters of sufficient size and contrast to be readily visible and legible;

Caution
Contains Asbestos Fibers
Avoid Breathing Dust
Breathing Asbestos Dust May Cause Asbestosis and Cancer

All asbestos waste shall be disposed of in accordance with the OSHA asbestos regulation, 29 CFR 1910.1001(h). During removal of vacuum bags, an approved respirator, as described in (2) above, shall be worn.

6. All floor cleaning in areas where brakes and clutches are repaired shall be done with the high efficiency industrial vacuum cleaner as described in (3) above. Grinding (arcing) machines shall also be cleaned with such a vacuum cleaner and any remaining dust wiped with a damp cloth. An approved respirator, as described in (2) above, shall be used during this cleaning.
7. Although adherence to the above procedures should minimize any contamination of work clothing, it is required that the appropriate portions of the OSHA regulations on asbestos (29 CFR 1910.1001(d) (3 and 4)) concerning special clothing, change rooms, etc. be followed.

NOTE: Strict adherence to the above procedures should minimize exposures to mechanics during brake and clutch servicing. These are interim recommendations and are subject to revision pending results of ongoing NIOSH research.

* Section 1910.1001 of the Code of Federal Regulations was formerly Section 1910.93a. This change was noted in the Federal Register, May 28, 1975.

Prepared By
Division of Field Studies and Clinical Investigations
National Institute for Occupational Safety and Health
Cincinnati, Ohio



Don't hold your breath! Throw away the respirator! Clear the air of road dirt, asbestos and cast iron dust.

INTRODUCING...

BRAKE-O-VAC

BRAKE ASSEMBLY CLEANER from PER-LUX

The Brake-O-Vac. As easy as inserting a standard air hose. It vacuums all foreign matter into a self-contained dust bag in less than 30 seconds. Available with adapters to clean brake assemblies from 9" to 12".

The Brake-O-Vac. Saves time on cleanup chores. Protects vehicles and equipment. Helps to comply with OSHA requirements.

Breathe a little easier. Call or write for details about the new Brake-O-Vac:

PER-LUX, INC.

804 East Edna Place / Covina, Calif. 91723 / (213) 331-4801

B U L L E T I N

N O. 5 4 1

August 12, 1975

ASBESTOS INFORMATION ASSOCIATION/N.A. CONFERENCE

The Asbestos Information Association/N.A. will be holding its second annual Industry-Government Conference, September 10-11, in the Presidential Room of the Mayflower Hotel, Washington, D. C.

Mr. R. H. Mereness, Executive Director of the Association has extended his invitation to me and the members of our Institute. I have accepted and will attend.

A copy of the Advance Program for this conference is enclosed. If you wish to attend, please contact:

Mr. R. H. Mereness
Asbestos Information Association
1660 L. Street, N. W.
Washington, D. C. 20036
Telephone (202) 223-4885

To cover luncheon and reception costs, a \$40 registration fee is required. All arrangements for attendance should be made directly with the Asbestos Information Association.

END/erc
Enclosure:

E. W. Drislane
Executive Director

ASBESTOS INFORMATION ASSOCIATION/NORTH AMERICA
INDUSTRY-GOVERNMENT CONFERENCE
Mayflower Hotel SEPTEMBER 10-11, 1975 Washington, D.C.

ADVANCE PROGRAM

Wednesday, September 10

<u>TIME</u>	<u>EVENT/PARTICIPANTS</u>
NOON	Luncheon - Speaker: Roy E. Albert, M.D., Deputy Assistant Administrator, Health & Ecological Effects, EPA
2:00 - 2:45	EPA Panel: Air - James Crowder Water - Gordon Robock Effluents - Allen Cywin
2:45 - 3:00	Break
3:00 - 4:15	Panel: Asbestos and Health Joseph L. Goodman, M.D. Aurel Goodwin, Ph.D., Bureau of Mines Lawrence H. Plumlee, M.D., EPA Marie Rhyne, M.D., OSHA
4:15 - 4:45	Remarks: Ian C. Campbell/Michel Lesage, M.D. Quebec Asbestos Mining Association
5:30	Reception

Thursday, September 11

8:00	Breakfast - Speaker: Marshall L. Miller, Deputy Assistant Secretary of Labor (OSHA)
9:15 - 10:15	OSHA Panel: Standards Development Daniel P. Boyd, Ph.D. Grover C. Wrenn Dyun K. Kwon Standards Compliance Donald A. Shay Charles A. McClure
10:15 - 10:30	Break
10:30 - 11:00	Remarks: Cyril X. Latty, President, Chambre Syndicale de L'Amiante (France)
11:00 - 11:30	Remarks: Noel W. Hendry, Johns-Manville Corporation
11:30 - 2:30	Reception/Luncheon - Speaker: Guy Gabrielson, Chairman of the Board, Nicolet Industries
2:30	Conclusion of Conference

B U L L E T I N

N O. 5 4 0

July 28, 1975

CROSS REFERENCES--BRAKE SHOES

Attached is a cross reference listing for all the brake shoes on file at the Institute.

Some members may reference into more than one shoe, since a print may have covered more than one shoe. Also, some "shoe" numbers may in fact be lining-shoe assembly numbers. Also, most numbers are original equipment numbers. Most manufacturers have service or kit numbers that may not be included.

While this list covers all numbers that we have on record, it in no way covers all the manufacturer numbers.

E. W. Drislane
Executive Director

APPENDIX SHOE PART NUMBERS

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
35,693	79R	301,305	32	305,287	44
36,797	26R	301,306	59	305,340	70
37,710	27	301,422	11	306,214	87
41,083	29	301,731	9	306,344	12R
41,384	38	302,063	106RL	306,383	63R
41,486	76	302,064	106RR	306,620	16
41,717	10	302,156	52R	306,629	16
41,788	28	302,195	87	306,668	13
43,480	26	302,211	39	306,674	13
43,481	26R	302,212	73	306,746	15R
43,593	29	302,330	18	306,761	15R
43,594	20	302,333	56	306,883	12
43,606	25	302,344	17	306,903	12R
43,607	25R	302,569	18	307,037	72R
43,608 & 9	52R	302,570	56	307,130	14R
44,270	75	302,571	10	307,136	14R
44,271	75RL	302,572	17	307,213	72R
44,272	75RR	302,661	58	307,462	10
44,292	55	302,665	61	307,530	22
45,742	76	302,666	58	307,543	22 & 186
47,662	276	302,799	41	307,603	23
47,779	82	302,816 & 17	60R	307,724	83
47,926	73	302,822	60R	307,744	24
47,949	77	302,846	36R	307,752	24
48,154	53	303,138	40	307,811	19
48,183	53	303,169	33R	307,812	10
48,276	77	303,171	33R	307,822	83
48,811	54	303,177	40	307,972	33R
48,827	62	303,285	43	307,973	33R
49,042	51	303,325	22	308,039	45
49,270	34	303,326	41	308,441	10
49,313	51	303,327	60R	308,444	10
49,343	10	303,328	36R	308,453	12
49,425	21	303,852	37	308,456	12
49,428	34	303,986	74	308,479	78
49,528	62	304,098	57	308,486	31
49,529	54	304,106	57	308,487	78
49,581	30	304,210	35	308,490	31
49,608	39	304,216	71	308,910	28
49,882	63R	304,227	35	308,911	29
49,941	19	304,228	71	308,912	20
300,079	55	304,282	74	308,914	82
300,793	59	304,792	30	308,915	37
300,808	33R	304,896	105R	308,918	70
300,901	32	304,972	110	308,919	12

BENDIX (CONT)

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
308,920	12R	312,375	157R	317,311	293
308,923	23	312,431	156R	317,320	291
308,924	19	312,636	120	317,367	283R
308,925	42	312,639	11	317,375	282R
308,930	68	313,396	185	317,604	300
308,955	115	313,487	171	317,611	301
308,979	12R	313,495	172	318,015	306
309,111	112	313,548	173	318,024	288
309,138	114	313,719	182	318,557	305
309,853	113		280	318,973	295
309,973	16R	313,720	181	319,051	288
310,090	120	313,800	184	319,059	286
310,095	11	313,801	183	319,066	290
310,291	131R	314,104	33R	319,074	294
310,467	124	314,288	188	319,344	305
310,476	125	314,742	227	319,345	305
310,495	126	314,746	228	319,353	307
310,794	113	314,557	33R	319,354	307
310,795	115	314,769	310R	320,346	330
310,889	86	315,063	184	320,385	329
310,891	85	315,072	183	320,526	307
310,893	84	315,075	174	320,545	D-16**
311,032	50	315,080	148	320,778	D-16**
311,047	46	315,095	154	320,845	398
311,057	47	315,099	151	320,878	402
311,158	131R	315,102	152	320,916	308
311,161	125	315,136	243	321,082	263R
311,205	148	315,145	244	321,266 & 67	33R
311,214	126	315,251	55	321,271	308
311,218	125R	315,263	10	321,470	267
311,243	187	315,318	31	321,497	22
311,495	126	315,325	78	321,584	314LP
311,565	147R	315,488	266	321,585	314RP
311,889	155	315,760	184	321,588	314LS
311,940	174	315,929	267	321,589	314RS
311,940	126	316,038	112	321,592	316LP
311,992	145	316,043	114	321,593	316RP
311,997	146	316,053	155	321,596	316LS
312,008	139	316,267	263	321,597	316RS
312,068	151	316,557	264	321,629	33R
312,080	152	316,564	265	321,747	D-12-I
312,092	153R	316,916	300	321,752	D-14-I
312,251	154	316,919	300	321,796	265
312,316	112	317,161	278	321,797	263R
312,326	114		295	321,843	D-14-0

** Integrally molded

BENDIX (CONT)

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
321,868	263	323,173	336	2,235,084	D-92-1
321,926	D-22	323,354	338	2,235,122	D-90-0
322,107	D-12-0	323,805-06	399	2,235,128	D-90-1
322,473-84	357	323,998	348	2,235,142	D-91-0
322,496-99	358	324,570	362	2,235,148	D-91-1
322,502-09	358	556,976	139	3,201,329-30	391
322,562	355	2,230,362	D-89-0	3,202,636	417-P
322,563	D-23	2,230,363	D-89-0	3,202,637	417-S
322,778	D-16	2,230,368	D-89-1	3,202,634	418-P
322,899	282-R	2,230,369	D-89-1	3,202,635	418-P
322,902	282R	2,235,081	D-92-0	3,202,956	415
322,962	355	2,235,082	D-92-0	3,202,884	416
323,150	339	2,235,083	D-92-1	3,203,576	432

CHEVROLET SHOE PART NUMBERS

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
3,681,166	122	3,841,174	242	5,461,962	227
3,697,709-10	109	3,841,194	241	5,461,963&64	11
3,702,217	347LH	3,841,736	248R	5,461,965	228
3,702,218	347RH	3,841,737	248R	5,462,546&81	189
3,748,507	108	3,843,206	123R	5,462,666&67	180
3,748,510-12	108	3,846,300	228	5,462,668&69	189
3,748,514	108	3,846,311	227	5,462,761	189
3,756,378	123	3,853,551	257	5,462,921	241
3,756,386	109R	3,856,838	273	5,462,922	242
3,756,399	108	3,873,446	285	5,462,978	241
3,771,270	108	3,873,474	285	5,462,980	242
3,777,597-99	147R	3,873,515	299R	6,255,533	111R
3,793,423-24	150	3,882,737	312	6,255,540	111R
3,820,149	182	3,889,567	347	6,257,666&68	111R
3,820,151	182	3,976,625	D-35	9,402,073	403
3,820,280& 2	181	3,982,221	360	94,021,482	404
3,823,367& 8	149	3,987,471	427	94,021,483	404
3,840,920	347	5,461,960&61	120	94,021,484	404

CHRYSLER SHOE PART NUMBERS

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
303612	89	1925744	33R	2823179	305
622117	259	1943674	86	2823192	291
854060	45	1943801	84		308
870630	44	1943802	85	2823209	309
1137278	43	1943805	84	2823215	295
1137279	43	1943806	85	2880529	333
1188740 & 1	97	2070664	112	2880530	332
1188752 & 3	98	2072670	114	2880544	337
1190290	116	2072685 & 6	114	2880545	336
1195005	92	2072687 & 8	112	2880546	337
1261211	90	2122212 & 14	95	2880547	331
1270997	89	2260654	185	2880584	334
1406751	45	2260812	155	2880585	335
1406752	44	2260836 & 41	148	2880595	330
1406757	45	2260848 & 9	155	2880632	329
1500757	103	2260882 & 3	126	2910138	402
	104	2260886	174	2910139	402
1500815	104	2266286 & 7	112	2925194	D-22**
1501095	107	2266288 & 9	114	2944501	329
1508852	91	2266872	278	2944503	331
1509007	102	2266874	278	2944505	333
1509008	102	2409862	254	2944506	334
1631812	48	2409868	254	2944508	335
1664536	33R	2409918	253	2944510	336
1664556	60R	2460638	254	2944607	330
1664557	60R	2525194	D-22	2944609	332
1664558	60R	2530144	253	2944671	329
1668243	238	2533806	154		330
1674000	49	2533812	154	2944672	331
1674065	46	2533818	256	2944674	330RS
1674064 & 6	47	2533842	151	2944675	330LS
1699563	239	2533848	151	2944676	332RS
1699575	240	2533854	255	2944677	332LS
1738900	50	2660334 & 7	274	2944678	333RS
1788375	41	2660346 & 9	275	2944679	333LS
1796535	96	2660349	309	2944680	337RS
1796558	99	2768030	D-11	2944681	337LS
1797260	93	2781634	D-10	2944682	336RS
1799514	99	2800554	304	2944683	336LS
1799711	94	2800569	306	2944684	329RS
1857043	86	2800585	290	2944685	329LS
1923396	12	2800593	293	2944686	331RS
1923397	12	2800607	294	2944687	331LS
1923410	10	2823166	286	2944688	334RS
1923411	10	2823179	288	2944689	334LS

** Integrally molded

CHRYSLER (CONT)

<u>Part #</u>	<u>FMSI #</u>	<u>Part #</u>	<u>FMSI #</u>	<u>Part #</u>	<u>FMSI #</u>
2944690	335RS	2954554	355	3100112	D-86-1
2944691	335LS	3461954	D-85-0	3130312	D-86-0
2944751	329	3492476 & 7	357	3580946	D-85-1
	320	3492635-7	357	3637560	D-86-0
2944752	331	3492640 & 1	357	3637561	D-86-1
2944752	332	3492818-20	358	3638329	D-86-0
	333	3492822 & 3	358	3638331	D-86-1
2044354	337	3492825 & 6	358	3699851	D-93-0
2952417	355	3580788	D-84-1		
2953984-6	282R	3580789	D-84-0		

DELCO-MCRAINE SHOE PART NUMBERS

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
556,576	19	5,454,514	70	5,462,978	242
1,319,177	20	5,455,641	64	5,462,980	241
5,300,951	20		127	5,463,152	D-3
	29	5,455,721&7	64	5,465,232&7	245
5,450,022	161		127	5,465,506	246
5,450,475	18	5,456,985	81	5,465,667	262
5,452,471	119	5,459,046	299	5,465,757&2	260
5,452,649	262	5,459,204	80	5,466,747	120
5,452,673	260	5,459,725	139	5,467,033	261
5,452,674	261	5,459,839	135	5,467,135&6	241
5,453,715	19	5,459,869	136	5,467,156&7	246
5,453,751	52R	5,460,094	138	5,468,643	D-52-1
5,453,889	66	5,460,121	137	5,468,647	D-13-1
5,453,914	66	5,460,123	137	5,468,648	D-13-0
5,453,995	67	5,460,875	D-3	5,470,364	349
5,454,013	69R	5,461,129	160	5,470,370	350
5,454,022	17	5,461,153	161	5,471,496	349
	42	5,461,725	160	5,472,307	D-52-0
5,454,038	25R	5,462,134	197	5,472,361	D-52-1
5,454,085	65	5,462,151	138	5,472,369	D-52-1
5,454,170	64	5,462,152	194	5,472,647	D-52-0
5,454,171	64	5,462,335	191	5,474,512	D-52-0
5,454,490	70	5,462,933	242		

FORD SHOE PART NUMBERS

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
C3AA-2024-A	157R	C70A-2018-D	154 (P)	D20A-2B114-AA	D-50-0
-2220-C	156R	-2019-A	154 (S)	-2B300-AA	D-50-1
C4UA-2220-A	31	C80A-2018-F	769 (O)	D-22A-2220-AA	391
C5AA-2018-E	265	-2019-F	769 (I)	-2220-BA	391
-2218-D	263 (S)	C90A-2B114-B	D-17-0	D42A-2B114-AA	D-90-0
C5AA-2219-C	263 (L)	C90A-2B300-B	D-14-1	D42A-2B300-AA	D-90-1
C5NN-2220-B	303	CDZ2-915436	352	D52A-2220-AB	431
-2220-D	302		353	D0AA-2B114-C	D-33-0
-2236-A	302	D1DA-2020-AA	352	-2018-A	D-34-0
-2252-C	302	-2220-AA	353	-2018-F&L	D-33-0
C8AA-2B114-D	D-12-0	D2TZ-2001-A	395	D0AA-2019-D, G	D-33-1
C8RZ-2220-A	394	D3TZ-2001-C	415	-2019-L	D-33-1
C9AA-2B300-A	D-12-1	D4DA-2B114-AA	D-91-0	D00A-2B114-A&B	D-34-0
C20A-2218-M	151 (P)	D4DA-2B300-AA	D-91-1	-2B300-B&C	D-34-1
-2219-E	151 (S)	D12A-2B114-AB	D-36	-2018-A&C	D-34-0

GENERAL MOTORS SHOE PART NUMBERS

<u>Part #</u>	<u>F.M.S.I. #</u>
3,840,934)	
3,842,990)	
3,850,121)	
3,850,122)	182
5,462,335	228

GIRLING SHOE PART NUMBERS

<u>Part #</u>	<u>F.M.S.I. #</u>
64,932,570)	
64,932,571)	D-49
64,937,136	397

KELSEY-HAYES SHOE PART NUMBERS

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
C-54165	D-11	D-86788 & 89	D-34-0	E-55877	361
D-42337 & 9	88	D-86793 & 4	D-34-1	E-55933 & 34	401
D-56095	D-1	D-87437	D-53-1	E-55935 & 36	400
D-59163	D-11	D-87852 & 53	D-53-0	E-56039)	302
D-70418 & 19	D-1	D-87856	D-53-1	E-56040)	303
D-71091 & 2	152	D-89841	D-55-1	E-56042 & 43	303
D-78472	D-12-0	D-90112	D-55-1	E-89839	D-55-0
D-78788	D-34-0	D-91123	D-87-1	E-90113	D-55-1
D-82016	D-14-1	D-91129	D-87-0	E-91124	D-87-1
D-82075	D-12-1	E-36529	88	E-91130	D-87-0
D-86730 & 1	D-33-0	E-42545, 6, 8	72R		
D-86737 & 38	D-33-1	E-55866	361		

TEVES SHOE PART NUMBERS

<u>Part #</u>	<u>F.M.S.I. #</u>
13.8107-8001.2	D-56**

** Integrally molded

VOLKSWAGEN SHOE PART NUMBERS

<u>Part #</u>	<u>F.M.S.I. #</u>
11J-609-237G	392
211-609-521	397
211-609-522	397
211-609-537J	374
211-609-537N	421

WAGNER SHOE PART NUMBERS

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
FD- 3,347	82H	FD-72,320&23	324	FE-46,296	31
-29,700	100	FE- 1,245&6	129	-49,308&21	244
-29,718	177	- 1,420&21	128	-49,340&50	243
FD- 8,302	2H	- 3,335	252	-57,237	326
- 8,305	2	- 3,340	235	-57,513	375
FD- 8,461	1H	FE- 3,347	82	FE-57,763	321H
- 8,462	1	- 3,410	117	-57,771	325
-17,727	3 & 5	- 3,416	130	-59,210	322H
-18,144	6	-18,693	7	-59,450-9	325H
-18,424	4	-18,723	8	-70,310	346
FD-18,694	7	FE-18,726	8	FE-70,311	331
-18,726	8	-19,143	346	-70,312	383
-20,587	251		377	-70,320	385
-27,062C	236	-19,297	99	-70,321	386
-29,702&3	100	-19,535	384	-70,330	376
FD-29,706&7	4	FE-19,552	96	FE-70,331	379
-29,878	100	-20,421	99	-71,725	367
-29,909	101	-20,424	96	-71,785	324
-30,383	247	-24,481	93	-74,850	352
-31,992&3	134	-24,482	93	-74,851	353
FD-38,033	158	FE-25,514	94	FE-74,904	356
-38,038	159	-25,515	94	-75,855B	155
-39,541	190	-25,515	94	75,863	267
-40,383	176	-26,270	380	76,760	393
-40,709	177	-31,197	382	FF-32,384&5	235
FD-40,900	172	FE-31,916&18	232	FF-32,620&1	237
-40,709	177	-31,920	232	-33,083&4	134
-41,886	176	-31,993	134	-33,384&5	232
-41,893	175	-32,378&80	237	-33,491&2	177
-41,901	177	-41,233	31	-33,495&6	177
FD-41,902	177	FE-41,234	78	FF-33,526&7	190
-55,408B	296	-44,648	78	-39,543&4	190
-64,580&1	323	-46,268	247	-57,771	367H
-71,784	324	-46,295	78	-71,725	325H

BULLETIN

NO. 539

July 22, 1975

FRICITION TEST MACHINES AND DYNAMOMETERS

Over the years, friction materials manufacturers have needed access to friction test machines and/or dynamometers for product development and certification purposes. This bulletin is to up-date information which is already known by most Institute members. However, as there still are questions concerning the availability of machines or testing, this bulletin will attempt to help.

GREENING ASSOCIATES, INC.

Address:

Greening Associates Inc.
19465 Elliott Avenue
Detroit, Michigan 48234

Telephone:

(313) 366-7160

Contact:

Mr. C. W. Greening
Mr. B. H. Hooker

This company will manufacture:

- (1) Inertia Brake Dynamometers
- (2) Friction Test Machine ("Chase" J661a machine)
for the V-3 Regulation

This company will do in-house testing:

- (1) Regulation V-3 for AAHVA State Certification purposes.
- (2) Brake dynamometer tests for development or Standard 121 purposes.
- (3) Test equipment and fixtures for various SAE recommended practices for friction materials and assemblies.

LINK ENGINEERING CO.

Address:

Link Engineering Co.
13840 Elmira Avenue
Detroit, Michigan 48227

LINK ENGINEERING CO. (Cont'd)

Telephone:

(313) 933-4900

Contact:

Mr. Roy Link

This company will manufacture:

- (1) Inertia Brake Dynamometers.
- (2) Friction Test Machine ("Chase" J661a machine) for the V-3 Regulation.
- (3) FAST Machine (Friction Assessment and Screening Test) to Ford Motor Company Standards.

This company will do in-house testing:

- (1) Regulation V-3 for AAMVA State Certification purposes.
- (2) Brake dynamometer tests for development or Standard 121 purposes.

AUTOMOTIVE RESEARCH ASSOCIATES

Address:

Automotive Research Associates, Inc.
5404-8 Bandera Road
San Antonio, Texas 78238

Telephone:

(512) 684-2310

Contact:

Mr. Thomas A. Michelhaugh

This company is not a manufacturer. They will do in-house testing.

- (1) Brake dynamometer tests for development or Standard 121 purposes.

USED EQUIPMENT OR TIME AVAILABLE

It has been suggested that if any member has used equipment (Chase Machine, FAST machine, etc.) which is no longer in use, and he wishes to either sell the equipment or sell in-house testing that he contact the Institute, and we could circularize our Members to see if they are interested.

AAMVA CERTIFICATION

Before using an independent facility for AAMVA Certification, it would be necessary to check to see if the facility is an "AAMVA Approved Testing Laboratory" for V-3 regulation purposes.

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 3 8

July 21, 1975

"THE HAZARDS OF ASBESTOS FOR BRAKE MECHANICS"

The advocates of stricter standards for asbestos in the work place are now putting emphasis on brake lining repair and installation practices. Along these lines, Dr. Selikoff of Mount Sinai Hospital has met with the Chief Industrial Hygienists of General Motors, Ford and Chrysler concerning asbestos in brake linings and practices relative to their installation in the field.

Mr. Weaver, Chairman of the Asbestos Study Committee, forwarded copies of an article that appeared in "Public Health Reports" May-June 1975. The article is entitled "The Hazards of Asbestos for Brake Mechanics." This article advocates procedures to reduce dust when "repairing brakes," and a copy is enclosed.

A copy of a leaflet advocated in this article is also enclosed. It is entitled: "Brake Repair Work Can Be Hazardous to your Health." In addition, Mr. Weaver advises that a small card or tag has been suggested for every box containing brake linings manufactured at his company (Raybestos-Manhattan):

IMPORTANT

- AVOID EXPOSURE TO ASBESTOS DUST.
- DO NOT USE AIR HOSE WHEN PERFORMING BRAKE SERVICE WORK OR FOR CLEANING WORK AREA.
- USE VACUUM CLEANING OR WET CLEANING METHODS SUCH AS DAMP CLOTH OR OIL TREATED BRUSHES.
- DO NOT GRIND OR OTHERWISE MACHINE BRAKE LINING MATERIAL WITHOUT ADEQUATE DUST EXHAUST AND COLLECTION EQUIPMENT.

Mr. Weaver strongly recommends that other brake lining manufacturers adopt a similar procedure.

E. W. Drislane
Executive Director

The Hazards of Asbestos for Brake Mechanics

BARRY CASTLEMAN, LUCILLE A. CAMAROTA, ALBERT J. FRITSCH,
SUSAN MAZZOCCHI, and ROBERT G. CRAWLEY

ASBESTOS is the generic name of a group of hydrated magnesium silicate mineral fibers. There are two groups of these minerals—serpentine (chrysotile) and amphibole (amosite, crocidolite, anthophyllite, tremolite, and actinolite). Ninety-five percent of the world's asbestos production is chrysotile.

Reports of epidemiologic and pathological studies (1-4) reveal that occupational exposure to commercial asbestos minerals enhances the likelihood of a number of diseases—asbestosis and cancers of the lung, pleura, peritoneum, larynx, and gastrointestinal tract. The time from onset of exposure to the time of clinically apparent disease is usually more than 20 years. Cancer from asbestos is not limited to workers who handle the material. There are also reports of pleural and peritoneal mesothelioma (tumors rarely seen in the general population) in persons with family, or neighborhood, or indirect occupational exposure to asbestos (4-7).

Mesothelioma was the cause of death of a man who had regularly sanded vinyl asbestos floor tile (8). Under simulated conditions of this man's work, a maximum asbestos dust concentration of 1.3 fibers per ml (fibers longer than 5 microns) was found in air samples passed through membrane filters worn by a person sanding vinyl asbestos (8). The type of asbestos now used in domestic floor tile is chrysotile—the same as that used in brake friction materials, according to the Asbestos Information Association. A case of mesothelioma in a brake mechanic has been reported (9).

Commercial friction materials used in the United States for braking passenger cars and trucks contain an average composition of 50 percent chrysotile by weight (10). Asbestos has been used for brake drum linings,

disk pads, and clutch facings for the past 50 years. Jacko and DuCharme (11) estimated that the United States annually uses 103 million pounds of asbestos for brake friction materials and 4.5 million pounds in automotive clutch friction materials.

In 1968 Lynch reported that because of the heat of friction caused by braking, almost all of the asbestos in brake linings is transformed to a nonfibrous mineral, and a small fraction of asbestos escapes as free fiber (12). Jacko and co-workers determined that vehicles in this country emit 158,000 pounds of asbestos per year, of which 11.2 percent is retained in the brake and disposed of during service (13).

Brake mechanics have low and intermittent exposure to asbestos. This exposure has been reported to be 0.79 fiber per ml time-weighted average (fibers longer than 5 microns), with peaks up to 7 fibers per ml when brake parts are being cleaned (14). The standard method for removing dust from brake parts is to blow it out with a

□ Mr. Castleman, an environmental engineer, was with the Center for Science in the Public Interest when this paper was prepared; he is now with the Maryland Public Interest Research Group. Dr. Fritsch is director of the Center for Science in the Public Interest. Ms. Camarota is an occupational health nurse, District of Columbia Department of Human Resources. Ms. Mazzocchi was a research associate, Environmental Cancer Research Project, Environmental Sciences Laboratory, Mount Sinai School of Medicine, New York City. Mr. Crawley is a sanitarian, Baltimore County Department of Health.

Reprint requests to Barry Castleman, Maryland Public Interest Research Group, 3110 New Main Dining Hall, University of Maryland, College Park, Md. 20742.

compressed air hose. In 1970 several reports (14-18) described the levels of exposure of brake mechanics to asbestos, alternative friction materials, and specific changes in brake repair practices which would reduce the levels of exposure.

Baltimore and Washington Studies

In December 1972, the Baltimore County Department of Health mailed a 1-page mimeographed circular to about 130 establishments which provide brake repair service. These businesses included new car and truck dealerships, certified motor vehicle inspection stations, and other concerns advertising brake repair as a specialty. Some of the establishments initially contacted had either gone out of business or replied that they do not do brake repairs. The circular warned that inhalation of the dust from brake cleaning could cause serious diseases, including cancer, and advised vacuuming brakes of accumulated dust. Additional measures suggested were improved ventilation and the use of face masks (19). Two student volunteers went to 100 of the places on the mailing list 4 months later to ask shop managers what methods they were using in brake repair.

A similar study was started in Washington, D.C., in August 1973. This work was conducted by the Center for Science in the Public Interest and the District of Columbia Department of Human Resources. Of 186 brake service establishments initially contacted, 120 were followed up. Several new methods were tried in order to improve the effectiveness of the warning. The warning leaflet was more eye-catching and readable than the paragraph-form sheet used in Baltimore; the leaflets were handed out by an occupational health nurse to the mechanics themselves—none were mailed; and followup to ascertain the degree of effectiveness was conducted by the same nurse who interviewed the repair shop managers. The Washington study was also featured in a local television program at the time the leaflets were first handed out.

To assure that students trained in brake repair by public vocational schools would learn proper methods, health officials met with appropriate school officials in both locations. At the time they were contacted, school officials in Baltimore and Washington reported that the schools were teaching the "blow out" method of brake dust removal to the trainees.

The standard method of cleaning brakes is "blowing out" with a compressed air hose. In Baltimore, 65 percent (65 per 100) of the brake repair establishments contacted were using this method at the time they received the warning circulars. In Washington, the figure was 91 percent (110 of 120). Most of the managers and workers interviewed had never heard about the hazardous potential of brake dust. Predictably, the responses ranged from annoyance to appreciation.

Of the 65 places in Baltimore initially blowing out brakes, 11 were using either vacuum or wet brushing methods at the time of followup. Four others were still blowing out brakes, but had improved ventilation or provided dust masks, or both, to reduce workers' exposures.

In Washington, only two establishments had changed to wet brushing, but none were vacuuming brakes. Four others provided face masks. Interestingly, two others decided to change brake shoes in all brake repairs, thereby simplifying the problem of dust removal and reducing the mechanics' exposures.

The degree of improvement, indexed by the percentage of establishments converting from blowing out brakes to safer techniques after a single warning, was 23 percent in Baltimore County and 7 percent in Washington. This disparity probably arises more from differences in the methods of the studies than from differences in the study groups.

It may be critically important to approach management at the outset in order to enlist the cooperation needed to implement any changes in practice. A mechanic who is approached directly with a warning may simply disregard it. The mechanic might reason that if the dust were really dangerous, there would be a law requiring the use of preferred methods in brake repair. And the employer, if not asked to participate from the beginning, may well conclude that he need not be concerned with the matter. The failure to involve management may be the main reason why the Washington study produced less gratifying results than the Baltimore study.

Brake warning programs consisting merely of mailed warning notices require little manpower, compared to other health programs. Also, the effort to implement safe techniques in public vocational schools is time well spent.

Conclusion

Over a 7-year period ending in 1976 (20,21), the U.S. standard for time-averaged exposure to asbestos will have been reduced from 5 million particles per cubic

Preventive Health Care	Do's & Don'ts For You	What Are The Risks?
Men with long exposure to asbestos should have a chest x-ray at least once a year. Preferably every six months. Physicians should be informed of the patient's job and his exposure. If you have or have had asbestos, cigarette smoke, or both, you are at high risk.	DO protect yourself and your family against the dust. DON'T clean brake drums with air (the dust is very high). DON'T break or, by any means, dust. DO vacuum out all the dust. DO wet down the parts and hardware. DO use a protective mask or respirator if needed. Several companies manufacture masks. If you 11 30 For information, contact the National Center for Science in the Public Interest at (202) 331-6000.	Brake dusts contain asbestos fibers, a real health hazard. The risk of lung and other cancer is much greater than for most other dusts. Among a number of the workers, one out of five died due to lung cancer. The risk of a serious chest infection, and body, was about 10 times greater than for most other dusts. At present, it is not known if exposure to brake dust from a used car is dangerous at home. Asbestos-related diseases take 20 to 30 years to develop. In some cases, they can be fatal.

BRAKE REPAIR WORK CAN BE Hazardous TO YOUR HEALTH



Source: National Center for Science in the Public Interest, Washington, D.C. 20036. Reprinted with permission of the National Center for Science in the Public Interest.

foot of air to 2 fibers per ml (fibers longer than 5 microns). For asbestos textile plants, this reduction is about 15-fold (22). Present and scheduled standards claim only to protect workers against asbestosis, the disease for which the dose-response relationship is most quantitatively known. The British standards for chrysotile and amosite asbestos, which are comparable to the asbestos standard scheduled to take effect in the United States in 1976, do not purport to provide protection against increased risk of cancer (23,24).

Previously studied cohorts of asbestos workers were exposed to time-averaged concentrations greater than 2 fibers per ml (fibers longer than 5 microns). Current studies of cohorts with time-averaged exposure on the order of 1 fiber per ml (greater than 5 microns in length) may provide evidence of hazard at that level. In view of alarming preliminary findings of pulmonary fibrosis in such a cohort, the National Institute of Occupational Safety and Health has suggested to the Department of Labor that consideration be given to further lowering of the asbestos standard (25).

The average brake mechanic is not aware of the potential hazard of airborne brake dust. Nor is he quick to change time-hardened habits when warned of dangers if he cannot feel their effects. Nonetheless, substantial reduction in asbestos exposures during brake repair can be achieved by simple changes in technique, with the use of equipment already available in most brake service establishments.

In view of the tendency of the accumulating literature to reveal cancer induction from asbestos at progressively lower levels of exposure, mechanics should be advised not to blow out brake parts and to use instead methods which create less airborne dust. The manufacturers of automotive friction materials could easily attach a clear hazard warning to every item sold.

The limited success of both the Baltimore and Washington studies shows the limited efficacy of voluntary compliance with health warnings—the shop managers and the mechanics simply do not have the same regard for a warning that they have for a regulation. The margin of safety, if any, provided by the current asbestos standards has been sharply criticized as insufficient (26). While it is advisable that brake mechanics at least be warned of the potential hazard of their work, it is also apparent that blowing out brakes will be a common practice so long as health regulations permit it.

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Preventive Health Care

Men with long experience as brake mechanics should have a physical examination at least once a year and preferably every six months. This should include a chest X-ray. The examining physician should be informed of the man's job and his exposure to asbestos.

If you have, or have had, exposure to asbestos, cigarette smoking is particularly bad. If you smoke, stop.

How You May Contact Us

Please let us know what action you are taking, what ideas you may have to offer, and what problems you encounter in following our suggestions for making your workplace safer.

Contact:

Center for Science in the Public Interest
1779 Church Street, N.W.

Washington, D. C. 20036

(202) 332-6000

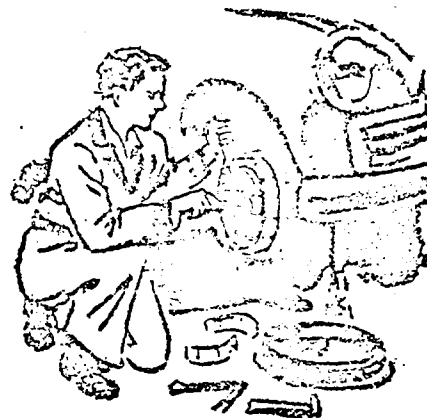


BRAKE REPAIR WORK

CAN BE

Hazardous

TO YOUR HEALTH



District of Columbia Department of Human Resources
Community Health and Hospital Administration
Occupational and Employee Health Program
Center for Science in the Public Interest

What Are The Hazards?

- Brake linings contain large amounts of asbestos fiber, a substance harmful to your body.
- The risk of lung cancer for people who smoke and work with asbestos is 92-times greater than for people who neither smoke nor work with asbestos.
- Among a number of groups of asbestos workers, one out of every five deaths is due to lung cancer.
- The risk of a serious lung disease, called asbestosis, and cancer of other body sites is about the same for smokers and nonsmokers alike who work with asbestos.
- At present, it is not known what level of exposure to asbestos, if any, is safe. Even a small amount may be dangerous in some circumstances.
- Asbestos-related disease usually takes 20 to 30 years from the time of exposure to become evident. Working with asbestos for even a short time could result in asbestos-related disease later on.

Do's & Don'ts For Your Protection

To protect yourself and others in your workplace against this hazardous substance:

DON'T clean brake assemblies and drums with an air hose. (Fiber dusts generated by this method are dangerously high.)

DON'T brush or, by any other method, raise dust.

DO vacuum out all the fiber you can.

DO wet-wash the parts with paintbrush and kerosene.

DO use a protective mask when exposure to asbestos dust cannot be avoided. Several companies manufacture disposable masks, costing from \$.50 to \$1.50. For information on where these may be purchased locally, call the Center for Science in the Public Interest at (202) 332-6000.

BULLETIN

N O. 537

July 16, 1975

ASBESTOS INFORMATION ASSOCIATION/N.A. (AIA)

The Institute has worked with the Asbestos Information Association/N.A. since the founding of AIA in 1970. Our Directors and the members of our Asbestos Study Committee feel that our liaison with the AIA is most worthwhile. The AIA represents a responsible viewpoint for both asbestos producers and asbestos users. There is no association or group that has done more to present a responsible industry position to regulators such as OSHA and EPA than the Asbestos Information Association.

For that reason, at the March 13, 1975 meeting of the Board of Directors, a resolution was passed directing the Secretary to contact the AIA "... as to possible financial support of that Association by the Institute." On April 1, 1975, I wrote Mr. R. H. Mereness, Executive Director of the AIA, concerning possible financial support of that Association.

On June 12, 1975, after a meeting of the AIA Executive Committee, Mr. Mereness replied to our letter. A copy of his June 12, 1975 letter is enclosed. In his letter, Mr. Mereness declined direct financial support by our Institute, while pointing out "... that company membership in the Association is the best means of supporting our work and contributing to the interests of the industry at large." He asked that we encourage members of the Institute to join the AIA.

If your company wishes to contact the Asbestos Information Association regarding membership or support of the AIA, it is suggested you contact Mr. R. H. Mereness at:

Asbestos Information Association
1660 L Street N. W.
Washington, D. C. 20036

EWD/erc
Enclosure:

E. W. Drislane
Executive Director



ASBESTOS INFORMATION ASSOCIATION

1660 L Street, N.W. / Washington, D.C. 20036 / (202) 223-4885

12 June 1975

Mr. E. W. Drislane
Executive Director
Friction Materials Standards Institute, Inc.
Bergen Mall Office Center
E. 210 Route 4
Paramus, New Jersey 07652

Dear Ed:

At the meeting of our Executive Committee this past week, the interest in exploring financial support for AIA/NA by the Institute or by its members, as addressed in your letter of April, was discussed.

First, let me advise that we are indeed appreciative of the thoughts expressed in your letter. Our Executive Committee asks that you convey the appreciation of our Association to your members.

As you know, we have much work to do and many challenges. The Association needs the support of all segments of the industry. We are established to serve the industry in matters pertaining to occupational safety and health and environmental matters and look to the closest of working relationships within the industry to accomplish our information and education objectives.

Our by-laws state that any company or corporation involved in the mining, milling, processing or selling of asbestos in the United States or Canada is eligible for membership in the Association. In our brief years of existence, we have concentrated our efforts on the problems of the health issue, utilizing our membership and the trade or product and technical organizations associated with the asbestos industry as our means of industry communication. We have not conducted an extensive membership program.

Page Two

The Association has elected to maintain membership on an individual company basis. At the same time, however, the Association is intent on maintaining the closest of working relations with the various groups involved in asbestos usage. We see this relationship on an informal, non-structured basis.

The events over the past several months, and what can be foreseen clearly, point to the need for industry understanding and positive addressal to problems related to the asbestos-health issue. It is for this reason the AIA/NA exists and we believe that company membership in the Association is the best means of supporting our work and contributing to the interests of the industry at large. The work of the Association is funded by the dues of its members. As currently formulated, dues are based on a percentage of cost of fiber purchased for use in the manufacture of products. At present there is a minimum fee of \$2,000. The dues of non-manufacturing members are \$2,000. It is of interest that our budget by comparison to a similar organization in the United Kingdom is quite low. It is of further interest that we were able to reduce our dues this past year.

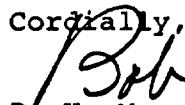
We hope that you will encourage your members to join the Association. In this way we believe the Association can best benefit from the support you generously and thoughtfully suggest in your letter.

We are now involved in a major effort to produce materials that will serve the industry in several important areas related to the asbestos-health issue. Our work practices series will soon be distributed. There are several pamphlets now in existence and you have seen the series of posters designed for use in the workplace. Our employee information pamphlet on asbestos and health is being distributed throughout the industry. We are now preparing for our annual Industry-Government Conference to be held in Washington, September 10-11, 1975. We plan to invite leaders throughout the industry to this important gathering and hope that you will bring this event to the attention of your members. Additional information will be provided at a later date.

Ed, I hope this letter provides the information you require to respond to your membership. We shall be very pleased to discuss the above and any other matters related to areas of mutual concern with you and your members whenever desired.

With all good wishes,

Cordially,



R. H. Mereness
Executive Director

FMSI 17865

BULLETIN

NO. 536

July 15, 1975

ADDITIONS TO CROSS REFERENCES

This cross reference listing combines all cross reference additions for brake linings and clutch facings since the September 1963 printing of the "Cross Reference Master List."

It combines all brake linings and clutch facing additions (not brake shoes) cross referenced in the following bulletins:

Bulletin #366 (February 16, 1970)
#400 (April 28, 1971)
#437 (May 22, 1972)
#477 (June 11, 1973)

Please note that this bulletin does not cross reference brake shoes. We intend to print a full cross reference listing for brake shoes later in 1975.

EWD/erc
Enclosure:

E. W. Drislane
Executive Director

AMERICAN MOTORS

<u>Part #</u>	<u>F.M.S.I. #</u>
3,213.677	2089-AT
3,213,678	2089-AT

BENDIX PART NUMBERS

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
40,800	2103-TT	317,709	4605	321,399	2141-T
40,900	2103-TT	317,710	4602	321,494	2041
41,100	2104	317,898	2131	321,495	2041
43,100	1002	317,900	2131	321,502	768
	2132-TT	318,108	4562	321,574	2075
48,700	2132-TT	318,109	4562	321,575)	
306,214	1244	318,130	1290	321,576)	2075
306,816	2032	318,133	4562	321,577)	
307,807)		318,557	2132	321,688	769
307,808)	2026-T	318,923	2070-T	321,707	2130-TT
307,817)		318,925	2059-T	321,710	2130-TT
307,818)	2041	319,092	4602	322,294	2153-T
307,836	220-AT	319,132	4605	322,302	2153-T
308,766)		319,152	2137	322,490	2146-T
308,767)	220-A	319,160	2131	322,492	2146-T
309,254	2086	319,331	2137	322,511	2140-AT
310,792	2066-A	319,590	767	322,513	2140-AT
312,085)		320,475	4615	322,565	1236
312,086)	2135-T	320,526	2137	322,591	4605
312,902	2097	320,545	767	322,884	2097-AT
314,104	220	320,681	2141-T	322,886	2097-AT
314,824)		320,682	2141-T	322,903	2146-T
314,827)	2002-A	320,697	2143-T	322,904	2146-T
314,838	2012-C	320,698	2143-T	322,906	2140-AT
314,852	2038	320,700	2143-T	322,907	2140-AT
314,855	2038	320,701	2143-T	323,252	4615
315,266	2066-A	320,919	1293	323,278	2140-T
315,268	2012-C	320,920	1293	323,279	2140-T
316,414	4615	320,922	1293	323,282	2131-T
316,419	4605	320,923	1293	323,283	2131-T
316,854	2121-ET	321,171	2131-T	323,903	2146-T
316,918	2070-T	321,172	2131-T	323,904	2146-T
316,930	4602-B	321,236	2140-T	323,906	2140-AT
316,947	4615	321,237	2140-T	323,907	2140-AT
316,948	4605	321,271	1293	324,425	220-AT
316,949	4602-B	321,309	2135-T	324,427	220-AT
317,156	4602-B	321,310	2135-T	324,530	2145-AT
317,339	2097	321,344	220-AT	324,805	4603-B
317,616	2059-T	321,389	766	324,988	2146-AT
317,708	4615	321,398	2141-T	324,990	2146-AT

BENDIX (Cont.)

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
324,992	2140-BT	3,200,484	2143-ATT	3,203,881	2121-TT
1,150,062	1292	3,200,493	2141-ATT	3,203,882	2121-TT
1,150,408)	2103-TT	3,200,496	2141-ATT	3,203,885	2121-TT
1,150,409)		3,200,599	2129-TT	3,203,886	2121-TT
1,150,411	2104	3,200,602	2129-TT		
1,150,453	1192	3,200,613	2075-A		
1,150,898)	787	3,200,616	2075-A		
1,150,899)	787	3,200,685	2152		
2,235,036	7013-A	3,200,686	2152		
2,235,130	7026-A	3,200,688	2070-A		
2,235,144	7027-A	3,200,689	2152-T		
2,235,150	7027-A	3,200,694	2059-AT		
2,235,206	7024-A	3,200,695	2059-AT		
2,235,209	7024-A	3,200,696	2059-AT		
2,535,984	770	3,200,697	2059-AT		
3,200,369	2089-AT	3,201,332	2151-T		
3,200,372	2089-AT	3,201,335	2151-T		
3,200,375	2012-FT	3,201,785	2140-BT		
3,200,378	2012-FT	3,202,959	2075-BT		
3,200,481	2143-ATT	3,202,962	2075-BT		

BORG & BECK (Clutch Facing)

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
6,471	1166-A	13,364	1236-A
	1169-A	13,423	1161-C
8,416	11008	13,450	1185-A
8,425	506-E	13,519	1166-A
8,451	1003-E	13,539	1003-C
8,488	9012-C	13,711	1057-H
8,566	1173-A	13,734	1236-C
9,057	10007	13,821	1148-D
9,059	10008	13,946	11004
9,061	10009	14,015	1056-B
9,063	10010	14,017)	1142-E
11,653	1233-B	14,018)	1142-E
12,472	1142-E	14,067	1373
12,559	1142-E	52,696	11009
12,824	1236-C	383,833	1173-A
12,942	1236-A	165-10124	1169-B
12,944	1142-E	165-10126	1169-B
13,195	1057-H	165-10176	1142-J
13,363	11004	165-10304	990-B

CHEVROLET

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
331,423	2157-T	3,779,138	* 1056-E	3,867,220	* 1166-A
333,216	2157-T	3,789,734	*11004	3,873,470	4639
335,626	2042-AT		* 1166-A	3,873,476	4639
335,627	2042-AT	3,792,369	* 1056-E	3,875,770	4640
900,018	*11004	3,799,355	*10000	3,892,502	2065
904,765	* 1236-C	3,805,675	* 1166-A	3,892,503	2065
907,052	* 909-C	3,828,056	* 909-C	3,969,214	728-A
909,442	* 1056-E	3,828,848	* 1166-A	3,969,289	2105-T
	* 1166-A	3,828,909	*11004	3,969,352	2065
941,804	* 1236-C	3,829,996	2108-T	3,976,628	778
2,405,959	2040	3,832,875	2109-T	3,982,220	1300
3,742,566	* 1051-A	3,832,876	2109-T	5,452,536	S- 727
3,758,987	* 1236-C	3,832,892	2108-T	5,452,537	S- 727
3,770,220	2073	3,832,893	2108-T	9,402,073	* 145
3,771,264	2040	3,845,292	2109	94,021,482	* 2155
3,771,265	2040	3,862,220	* 1166-A	94,021,483	* 2155
3,773,503	1245	3,862,222	* 1166-A	94,021,484	* 2155
3,773,504	1245	3,862,742	* 1142-E		

* Clutch Facing

CHRYSLER

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
58,332	2012-T	2,768,032)		3,492,817)	
316,770)		2,768,036)	730	3,492,828)	2140- AT
316,774)	2053-T	2,781,034	2055-T	3,699,500	*7017
1,500,741	1125	2,781,089	2025-T	3,699,501	*7017
1,668,243	4560	2,781,160	2070-T	3,699,502	*7017
1,668,244	4560	2,781,178	2126-T	3,699,503	*7017
1,798,466	1125	2,781,193	2089-T	3,699,506)	
2,072,752)		2,781,229)		3,699,507)	
2,072,753)	2070 & T	2,781,230)	2065-T	3,699,508)	
2,233,164	*1007-A	2,781,231)		3,699,509)	7018
2,260,836	2126-T	2,781,238	2006-T	3,699,512)	
2,260,882	2025 & T	2,781,625)		3,699,513)	
2,409,865	2065	2,781,636)	732	3,699,514)	
2,460,640	2065 & T	2,808,442	1276	3,699,516)	*7019
2,512,838	2053	2,808,451	2032	3,699,710	1306
2,512,841	2053	2,825,996)		3,699,853)	
2,525,190	774	2,825,999)	1276	3,699,904)	7029
2,530,144)		2,925,189	774	3,699,956	*7017
2,530,146)	2006-T	2,925,190	774	3,699,958)	
2,534,712	2065	2,944,824	2065-T	3,699,959)	7018
2,534,715)		2,944,828	2055-T	3,699,960)	
2,534,718)	2006	2,955,065	2042	3,699,961)	*7019
2,534,761	2012-T	3,461,574	2065-T	75,061,059	8113
2,534,767	2051-T	3,492,631)			
2,534,863	2065	3,492,642)	2146-T		

* Clutch Facing

DANA CORPORATION (CLUTCH FACINGS)

(SPICER)

<u>Part #</u>	<u>F.M.S.I. #</u>
114-C-174	946 -A
114-C-264	1277-A
114-C-224-2	1380-A

DELOO-MORAIN

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
1,150,411	2104		
2,622,078 & 79	2038-AT	5,463,153	762
5,452,337	2132-TT	5,463,952 & 53	728-A
5,452,398	2102-ATT	5,464,094	296-BTT
5,454,419	2025-TT		2114-TT
5,454,421	2025-TT	5,464,214 & 15	2102-ATT
5,454,423	2006-TT	5,464,216 & 17	2077-TT
5,454,425	2006-TT	5,464,455 & 56	2025-CTT
5,454,491	2125	5,464,458 & 59	2025-CTT
5,456,513	2125	5,464,466 & 67	2006-BTT
5,456,828 & 29	2025-TT	5,464,468 & 69	2006-BTT
	2116-TT	5,464,485 & 86	2116-TT
5,456,896 & 97	2006-TT	5,464,488 & 89	2116-TT
	2103-TT	5,464,495	2103-TT
5,456,969	2005-BTT	5,464,498	2103-TT
	2113-TT	5,464,526 & 27	2077-AT
5,459,004	2113-TT	5,464,520	2077-AT
5,459,017	2114-TT	5,464,534	2077-AT
5,459,434	2102-ATT	5,464,536 & 37	2102-T
5,459,553 & 4	2117-ATT	5,464,539	2102-T
5,459,628	2096-TT	5,464,544	2102-T
5,459,847	2005-BTT	5,464,660 & 61	2103
5,459,876	2078-TT	5,464,668 & 69	2103
5,459,883	2078-TT	5,464,711 & 12	2104
5,460,090 & 1	296-BTT	5,464,758	2132-TT
5,460,096	296-BTT	5,464,827	2077-TT
	2114-TT	5,465,014 & 16	2110-TT
5,460,098	296-BTT	5,465,018 & 19	2110-TT
5,460,122	2084-TT	5,465,026 & 27	2107-TT
5,460,126	2096-TT	5,465,030 & 31	2107-TT
5,460,173	2005-BTT	5,465,263	2102-BT
5,460,250	2125	5,465,273	2103-BTT
5,460,513 & 14	2077-TT	5,465,295 & 96	2005-BTT
5,460,515 & 16	2078-TT		2113-TT
5,460,617	2114-TT	5,465,298	296-BTT
5,460,618 & 19	2113-TT		2114-TT
5,460,803	762	5,465,299	2114-TT
5,460,829	762	5,465,599	2124
5,462,658	2077-TT	5,465,653	2124
5,462,963 & 64	2105-T	5,465,666 & 67	2119-TT
5,462,973	2102-ATT	5,465,672 & 73	2119-TT
5,462,981	2102-ATT	5,465,676 & 67	2119-TT
5,463,133	762	5,465,754,55,56	2118-TT
5,463,134	766	5,465,577,78,79	2118-TT

DELCO-MORaine (CONT.)

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
5,465,931	1299	5,467,170 & 71	2117-TT
5,465,987	2102-BT	5,467,179	2102-BT
5,465,988 & 89	2102-BT	5,467,194 & 95	2117-TT
5,466,842	2118-TT	5,467,196 & 97	2102-T
5,466,843	2142-TT	5,467,517	2125
5,467,004	2120-TT	5,467,573	2125
5,467,033	2120-TT		2139-TT
5,467,039 & 40	2120-TT	5,467,673	2125-T
5,467,051 & 52	2120-TT	5,467,693	2125-T
5,467,135 & 36	2102-BT	5,467,886 & 87	2118-TT
5,467,137 & 38	2117-ATT	5,467,888 & 89	2142-TT
5,467,141 & 42	2117-ATT	5,467,894	2118-TT
5,467,143	2102-BT	5,467,896	2142-TT
5,467,144 & 45	2117-ATT	5,468,080 & 81	762
5,467,160	2102-T	5,468,645 & 46	728-A
5,467,161,62,63	2102-T	5,468,704	728-A
5,467,164 & 65	2102-T	5,468,863 & 64	2139-TT
5,467,166,67,68	2117-TT	5,470,514 & 15	2158
5,467,169	2117-TT	5,471,666 & 67	2134-ATT
	2102-BT	5,471,672 & 73	2114-TT

EATON BRAKES

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
30-DS	4327	1,911	4311-A	20,500	4311-A & C
	4594		4317-G		4525
	4596		4452	20,501	4317-C, E & G
32-M	4195-B	1,918	4602		4525
	4311-C	1,919	4311-A & C	20,503)	
	4317-G		4452	20,801)	4311-C
32-MFA, MRA	4317-G	2,011	4311-C	40,871	4195-B
34-D	4195-B	2,731	4311-C	40,880	4195-B
	4311-C & G		4317-G		4317-G
	4317-G	13,802	2032	43,224	4195-B
34-DA	4595	16,600	4195-B	43,909	4317-G
34-M	4595	16,800	4327	44,609	4317-G
	4597	16,802	4596	45,238	4311-C
34-R	4195-B	17,800	4595	45,321	4410-B
	4311-C & G		4597	45,334	4195-B
34-D, DT	4317-G			45,350)	
	4605			45,351)	4311-C
35-F	4286	17,801	1254	45,500	4502
36-M	4311-A & C		4195-B	45,501	4502
36-MA, MFA &)	4311-C & G		4317-G	48,727	4317-G
MRA)	4317-G	17,810	4317-G	48,728	4317-G
38-D, DS	4452	18,802	4602	51,086	4311-C
38-D, DTA, R)	4311-C	18,803		52,193)	
42-D)	4317-G	18,808)	4195-B	53,467)	4311-C
42-M	4311-C	18,812)	4317-G	53,736	4526
	4527-B	19,501	4311-C	53,748)	
42-MA	4311-C		4317-G	53,750)	4317-G
42-MFA, MRA	4311-C	19,502	4602	53,762)	
	4527-B		4605	55,551)	4311-C
42-R	4311-C	19,503	4311-A & C	57,556	4317-G
	4317-G		4317-G	60,510)	
45-AR	4311-C		4452	60,511)	4195-B
50-M	4311-A	19,507)		62,085	4631
	4527-B	19,512)		64,156)	
56-M	4525	19,801	4311-C	64,157)	4311-G
57-F	4286	19,803	4311-A	65,048-HE	4286
	4366-B		4452	147,015	4311-A
1,615	4195-B	20,000	4056-B	1,000,239	4527-B
1,618	4596		4311-A	1,000,240&41	4527-B
1,790-A	4595	20,220	4311-C	1,000,313	4223-A
	4597	20,437	4308	1,000,490)	
1,791	4311-C	20,441	4056-B	1,000,491)	4311-J
1,800	4514	20,442)		1,000,656)	
1,863	4317-G	20,443)		1,000,717)	
1,893	4311-C	20,445)		1,000,739)	
1,910	4602	20,448 & 9	4056-B	1,001,085)	4311-J
			4286		

FID CORPORATION

<u>Part #</u>	<u>F.M.S.I. #</u>
196,505)	
196,506)	4651
197,054)	
197,055)	4650
197,360)	
197,361)	4652
752,614	4614-A

FIAT-ALLIS

<u>Part #</u>	<u>F.M.S.I. #</u>
7,009,4868	2002

FORD

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
AF-2284-N	2002-AT	C4TA-2022-A	2002-ATT
-2285-C	2002-AT		2038-TT
C1AA-2021-AE	2083-AT	-2234-A,B,C	2038-TT
	2083-CT	C4UA-2284-A	2012-CT
-C	2080-AT	C5A-2284-A,B,C,D	2121-T,A
C1AA-2021-S	2083-T	C5A-2285-D,E,F	2121-T
-Y	2080-AT	C5AA-2284-D	2121-T
	2080-CT	-D,E,F	2121-ATT
-2022-B	2083-AT	C5AA-2285-A,B,C,D	2121-ATT
	2083-BT	-D	2121-T,ET
C1AA-2022-C	2080-AT	C5AA-7550-A	*10000-A
-J	2080-AT	-F	* 1174
-S	2083-T	-J	* 990-B
-2284-B	2080-T	-K,L	* 1170-A
-D	2121-ATT	C5DA-7550-B	* 857-B
C1AA-2285-D	2121-ATT	C5MA-2284-A,B,C	2121-BT
-S	2080-T	-2285-A,B,C	2121-BT
	2083-T	C5TA-2021-D	2129-TT
C1DD-2021-A,B,C	2071-T	-4001-VA	2075
	2071-AT	-4005-VA	2042
C1DD-2022-K,L,M	2071-T	C5TA-4005-VA	2075
-2284-A,B,C	2072-T	-7550-D	* 1142-H
-7550-C,EL & 2 *	857-B	C5TZ-2007-L	4317-G
C1TT-4005-V	2042	-2284-C	4317-G
C1TZ-2007-A	1276	C6AA-2285-A	2121-T
C1TZ-2007-D	4625	C6AA-7550-E	* 1170-A
C1UU-2285-A,B,C	2012-AT	-F	* 1174 & A
	2012-CT	C6DA-7550-D	* 9021
C3AA-2018-K	2083-T	C6MA-7550-D	* 1170-A
-2019-K	2083-T	C6TA-2022-K	2129-TT
C3AA-2020-E	2083-T	C6TA-2022-K	2130-TT
-2218-S	2080-T	-3002-AB	2075
-2219-F	2080-T	-AK	2038-TT
-7550-A	* 1142-H	-AN	2129-TT
-E	* 1174	C6TW-4001-F	2022-ATT
C3AA-7550-G,H	*10000-A	C6TW-4001-H	2066-ATT
-N	* 990-B	-U	2002-ATT
C3DA-2022-A,B	2071-T	C6TZ-2007-A	2032
-2285-A,BN	2072-T	C6UW-4001-C	2006-AT
C3MA-7750-A	* 1174	-U	2012-BT
C3SA-2284-G,H,J	2100-G	C7AA-2021-A	2092-T
C3TZ-2007-F	4626	-7550-A	* 1005-A
C4AA-7550-A	* 1181	C7DA-7550-A	* 1005-A
C4TA-2021-A,B,C	2002-ATT	C7VA-2021-A	773
	2083-TT	C7ZA-2284-A	2012-BT

*Clutch Facing

FORD (Cont.)

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
C7ZA-2285-A,B	2012-BT	C9UA-2210-A	2131-T
-7550-B	*10000-A	C9ZA-2209-D	2012-BT
C8AA-2010-J	2080-AT	-2209-E	2135-T
-2011-J	2080-AT	-2210-C	2012-BT
-2021-C	768	C20A-2021-A	2051-AT
C8AA-2022-A	2083-AT	C20A-2021-G,M	2092-T
-2209-D	2121-T	-2022-6	2051-AT
-2210-D	2121-T	-AA	2012-BT
C8DA-2009-A	2072-T	-M	2090-T
-2010-A	2072-T	-N	2089-T
C8DA-2010-C	2071-T	C20A-2284-AA	2012-BT
-2011-C	2071-T	-M	2091-T
C8R2-2200-A	8112	-2285-G	2012-BT
C8TA-2010-AG	2075	-M	2091-T
-2010-AU	2141-T	-N	2135-T
C8TA-2011-AG	2075	C20A-7550-A	* 1005-A
-2011-AU	2141-T	-E,F	*10000-A
-2209-AG	2141-T	-H	* 857-B
-2209-AS	2141-T	C30A-2021-R	2089-TT
-2210-AG	2141-T	-2285-A	2089-TT
C8TA-2210-AS	2141-T	C30A-7550-A	* 1005-A
C8TZ-2007-L	4647	-E,F,H	*10000-A
-M	4639	-L	* 1005-A
-N	4646	C60A-2021-A	2089-T
C8UA-2010-C	2143-T	-2284-D	2135-T
C8UA-2011-C	2143-T	C60A-7550-D	* 1005-A
-2209-D	2141-T	-G	* 1170-A
-2210-D	2141-T	-H	9021-A
C8VA-2B118019F	773	C70A-2021-D	2092-T
C8ZA-2209-A	2012-BT	-2022-A,B	2092-T
C8ZA-2210-A	2012-BT	C70A-7550-B	* 1170-A
C9AA-2010-C	2083-AT	-C,D	* 9021-A
-2011-C	2083-AT	-E	* 9027-A
-2021-B,C	773	C80A-2010-J	2089-T
-2022-B	773	-2011-J	2089-T
C9AA-2284-A	2121-BT	C80A-2010-K	2092-T
-2285-A	2121-BT	-2011-K	2092-T
C9DM-2007-A	2051-BT	-2018-F	769
-2007-B	2012-ET	-2021-E,F	769
C9TA-2010-D	2131-T	-2209-A	2089-T
C9TA-2209-D,E	2131-T	C80A-2210-A	2089-T
-2210-D,E	2131-T	-B,C,D	2135-T
C9UA-2010-C	2140-T	-E	2012-BT
-2011-C	2140-T	C90A-2010-C	2089-T
-2209-A	2131-T	-2011-C	2089-T

*Clutch Facing

FORD (Cont.)

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
C90A-2011-D	2092-T	D12A-2284-BA	2145-T
-2021-A	776	-CA	2145-T
-2022-A	769	-2285-AB	2145-T
	776	-BA	2145-T
-2209-A	2072-T	-CA	2145-T
C90A-2010-A	2072-T	D20A-2018-CA	788
	2089-T	-2019-CB	788
-B,D	2135-T	-2021-BB,CA	788
-2210-H	2135-T	-2022-BB,CA	788
DORY-2007-A	8064	-7550-BA	* 1037-F
DORY-2007-A	8112	D22A-2021-AA	779-A
D1AA-2022-AA	2080-CT	-2284-AA	2151-T
-BA	2083-CT	-2285-AC	2151-T
D1DA-2022-AB	2071-AT	D3AA-2284-GB	2080-TT
-2284-AA	2072-AT	-2284-HB,JB	2080-TT
D1DA-2285-AA	2072-AT	D3AA-2284-KA,LA	2121-TT
D1UZ-2284-A	2012-GT	-2284-MA	2121-TT
D1TZ-2021-A	2146-AT	-2285-GA,HA	2080-TT
-2021-B	2140_BT	-2285-JA	2080-TT
-2022-A	2146-AT	-2285-LA	2121-TT
D2RY-2007-A	8115	D3AA-2285-LA,MA	2121-TT
D2TZ-2001-A	8114	D32A-2284-AA,BA	2154-T
D2UZ-2285-A	2012-GT	-2284-CA	2154-T
D4VA-2284-AA	2081-TT	-2285-AA,BA	2154-T
-BA	2081-TT	-CA	2154-T
D4VA-2284-CA	2081-TT	D35A-2021-BB	7013-A
D4VA-2285-AA	2081-TT	-2022-BB	7013-A
-BA	2081-TT	D4VA-2284-AA,BA	2081-TT
-CA	2081-TT	-CA	2081-TT
D12A-2018-CC	779	-2285-AA,BA	2081-TT
D12A-2021-BA	2144-T	D4VA-2285-CA	2081-TT
-CA	2144-T	FC -1646-A	2012-ET
-DB	779	-1650-A	2051-BT
-2022-BA	2144-T	-1709-B	2012-ET
-CA	2144-T	-1710-A	2051-BT

FRUEHAUF

<u>Part #</u>	<u>F.M.S.I. #</u>
A-CD-2230)	
-2231)	4649

* Clutch Facing

GENERAL MOTORS

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
92,724)		2,429,329	* 1374	3,789,762	*11004
94,677)	6061	2,431,586	4398-B	3,799,136	*10000
106,729	* 1325-C	2,443,320	4580	3,799,138	* 1056-E
1,293,643	*11004	2,462,929	4398-B	3,805,629	* 1095
1,382,336	767	2,464,079	4592-A	3,805,675	* 1166-A
2,251,836)		2,468,528	4524	3,828,054	* 909-C
2,263,529)	4398-B	2,470,622	1289	3,832,875	2105-T
2,329,893	* 1236-B	2,471,307)		3,832,876	2105-T
2,393,293	* 1095	2,471,943)	* 1325-C	3,832,890	2106-T
2,393,340	* 1166-A	2,473,918	2086	3,832,892	2106-T
2,395,340	* 1248	2,475,366	S 1560	3,835,629	* 1166-A
	* 1236-B	2,485,756	* 1248	3,881,551	4640
2,405,596	4592-A	2,485,758	* 1236-B	5,464,614	2110
2,407,789	4580	2,489,328	* 1374	5,464,616	2107
2,416,234	1193	2,492,036	* 1248	5,464,904	2102
2,416,236	1252	2,492,376)		5,464,906	2077
	4639	2,492,377)	* 1374	5,465,246	2102
2,416,240	1193	2,621,817	7028-A	5,465,248	2077
2,416,242	1252	3,513,019)		8,870,271	4592-A
	4639	3,513,521)	2044-A	8,879,344	4514-F
2,425,357	1150	3,771,264)		8,879,345	4514-F
2,425,359	4598	3,771,265)	2040		

* Clutch Facing

INTERNATIONAL HARVESTER CORPORATION

Part # F.M.S.I. #

40,383 DC	*1527
93,927)	
93,928)	
93,929)	4515
93,930)	
93,931)	4515
98,747 RI	1247
99,058 RI	6048
108,954 R2	4311-C
119,092 C91	2875
316,197 C92	*1388
346,639 R91	4629
654,594 C1	* 786
658,354 C1	*10012
659,746 C1	*1629
659,761 C1	*1278

* Clutch Facing

JEEP CORPORATION

(FORMERLY KAISER JEEP)

Part # F.M.S.I. #

807,283)	
807,284)	
912,476)	
912,477)	2011
917,515)	
917,516)	2038
918,099	2042
918,100	2042
925,902)	
925,903)	220-A
936,985	2042

Part # F.M.S.I. #

936,986)	
937,159)	
937,160)	2045
937,209	2038
937,210)	
937,213)	
937,214)	
937,215)	2038
937,216)	
938,140)	
938,141)	2038

KELSEY HAYES

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
B-17,023)		E-55,536	4646
-17,024)		-55,538	4647
-55,536)	4646	-55,799	4646
-55,742	4647	-56,678)	2128
-55,799	4646	-56,679)	
-77,021	4647	-59,553)	
C-59,164	730	-59,555)	
-82,017	776	-70,420)	728
-82,145)		-79,030	768
-82,241)	773	-79,042	769
D-42,541)		-80,437)	4639
-42,542)		-80,438)	
-42,543)		-80,439)	4639
-42,544)	2060	-49,135	2060-T
-47,800	728	-49,138	2060-T
-59,169	730	-88,108)	
-82,019)		-88,109)	
-82,020)	776	-88,136)	
-91,127	7020-A	-88,137)	787
-91,131	7020-A	-89-840	781-A
E-36,535)		-92,559)	
-36,536)		-92,566)	7027-A
-37,094)		-92,580	7026-A
-37,095)			
-37,096)	2032		
-37,097	2032	E-09,294,701)	
		-09,322,201)	7041

LIPE-ROLLAWAY

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
C-18- 99	1372	C-18-437	1361-A	C-18-466	1372
-18-287	1325-C	-18-438	1317-D	-18-484	1561
-18-329	1235	-18-445	1427-A	-18-488	1389
C-18-377	1372	C-18-447	1372-A	C-18-495	1312-C
-18-409	1312-B	-18-450	1374	-18-506	1372
-18-432	1626	-18-462	1553-A	140-19-1012	1372-A

Clutch Facings

LONG

<u>Part #</u>	<u>FMSI #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
C-45- 90	1325	C-42-187	1142-H	C-42-293-91	1325-D
-52- 25	1325-A	-42-198	1277	-42-304	1276*
-15-812	1325-B	-42-208-91	1276	-42-X-67- 75	902-B
C-42-130	1372-B	C-42-213	1276-A	C-46-680	1170-A
-42-136	749-A	-42-235	9029	-58-581	1628
-42-160	1170-A	-42-246	1174-A	65-10006	8025-A

Clutch Facings

*Bonded

MACK TRUCK

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
3- QD-2148	4637	101-HBA-3181	*1372A		
74-QDA-31	7041	151- HB-410	*1628		
74-QDA-32	7041	-410P8	*1628A		
101-HBA-374C	*1333B	-3102	*1371A		

202 Series

SM - 47	1142	SM -130	4055	SM -1001	4328
SM - 50	1170	SM -131	4106	SM -1002	4358
SM - 58	1144	SM -132	4315	SMH -1003	4376-B
SMM- 61	4185	SM -133	4317-E	SMM -1004	4468
SM - 62	4233	SM -134	4465	SM -1005	4056-C
SM - 63	4152-A	SM -135	4516	SM -1006	4109
SM - 64	4314	SM -137	4600	SM -1007	4102
SMM- 67	1207	SM -139	4605	SM -1008	4138
SMH- 68-A	4316	SM -140	4610	SM -1009	4151
SM - 71-A	1212	SM -144	4602	SM -1010	4190
SM - 72	1107	SMH-145	4516-A	SM -1011	4195-B
SMM- 73	1131	SM -147	4635	SM -1012	4195-B
SM - 75	1143	SM -149	4611	SM -1013	4197-A
SM - 79	4064	SM -150	659	SM -1014	4206
SM - 80-A	4427-A	SM -151	1193	SM -1015	4224
SM - 82-A	4268-B	SM -152	1195	SM -1016	4227
SM - 83-A	4311	SM -153	1199	SM -1017	4227-A
SM - 86-A	4366	SM -154	1230	SM -1018	4227-B
SM - 90-A	4490	SM -155	1239	SM -1019	4227-B
SM - 91-A	4492	SM -156	1241	SM -1020	4227-G
SM - 92-A	1226	SM -159	4602	SM -1021	4228
SM - 97-A	4312	SM -167	4610	SM -1022	4228-A
SMH- 98	1239	SM -171	4153-A	SM -1023	4228-A
SMM-102	1241	SM -172	4637	SM -1024	4237
SMM-104	1230	SMH-173	4317-C	SM -1025	4242
SM -105	4317-F	SMH-174	4311-B	SM -1026	4258
SM -106	4312-B	SMH-175	4307	SM -1027	4284
SMM-111	4254	SMH-179	4152-A	SM -1028	4286
SM -112	659	SMH-181	4515	SM -1029	4286-A
SMM-117	4471	SMH-193	4524	SM -1030	4286-B
SM -119	4268	SMH-194	4549	SM -1031	4289
SMM-120	1261	SMH-196	4524	SM -1032	4289-B
SMM-121	4515	SMH-197	4471	SM -1033	4289-C
SMM-123	1260	SMH-200	4471	SM -1034	4289
SMA-124	4514-A	SM-1000	4327	SM -1035	4299

* Clutch Facing

MACK TRUCK (Cont.)

202 Series (Cont.)

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
SM -1036	4305-A	SM -1079	4444	SM -1120	4541-C
SM -1037	4307-A	SM -1080	4446	SM -1121	4542
SM -1038	4311-A	SM -1081	4450	SM -1122	4543
SM -1039	4311-C	SM -1082	4451	SM -1123	4546
SM -1041	4317-G	SM -1083	4452	SM -1124	4548
SM -1042	4321	SM -1084	4460	SM -1125	4549
SM -1043	4321-A	SM -1085	4461	SM -1126	4550
SM -1044	4326	SM -1086	4468-C	SM -1127	4551
SM -1045	4327-A	SM -1087	4468-A	SM -1128	4552
SM -1046	4328-A	SM -1088	4468-B	SM -1129	4557
SM -1047	4330	SM -1089	4469	SM -1130	4561
SM -1048	4331	SM -1090	4473	SM -1131	4563
SM -1049	4335-A	SM -1091	4475	SM -1132	4564
SM -1050	4336	SM -1092	4476	SM -1133	4564-A
SM -1051	4337	SM -1093	4480	SM -1134	4568
SM -1052	4343	SM -1094	4481	SM -1135	4570
SM -1053	4343-A	SM -1095	4488	SM -1136	4592
SM -1054	4343-C	SM -1096	4489	SM -1137	1139
SM -1055	4343-S	SM -1097	4498	SM -1138	4567
SM -1056	4350	SM -1098	4501	SM -1140	4615
SM -1057	4354-A	SM -1099	4503	SM -1141	4056-B
SM -1060	4364	SM -1100	4504	SM -1143	4462
SM -1061	4364-B	SM -1101	4504	SM -1144	4527-B
SM -1062	4365-A	SM -1102	4507	SM -1145	4592-A
SM -1063	4367	SM -1103	4508	SM -1146	4592-B
SM -1064	4375	SM -1104	4509	SM -1147	4594
SM -1065	4376	SM -1105	4511	SM -1148	4595
SM -1066	4379	SM -1106	4513	SM -1149	4617
SM -1067	4380	SM -1107	4514-A	SM -1150	4618
SM -1068	4390	SM -1108	4575-A	SM -1151	4619
SM -1069	4396	SM -1109	4517	SM -1152	4620
SM -1070	4397	SM -1110	4523	SM -1153	4622
SM -1071	4398	SM -1112	4525	SM -1154	4626
SM -1072	4398-A	SM -1113	4526	SM -1155	4627
SM -1073	4398-B	SM -1114	4527	SM -1156	4628
SM -1074	4410-B	SM -1115	4527-A	SM -1157	4629
SM -1075	4410	SM -1116	4540	SM -1158	4631
SM -1076	4423-A	SM -1117	4541	SM -1159	1245-A
SM -1077	4424	SM -1118	4541-A	SM -1160	1252
SM -1078	4442	SM -1119	4541-B	SM -1161	1254
				SM -1162	1255

ROCKFORD (CLUTCH FACINGS)

<u>Part #</u>	<u>F.M.S.I. #</u>
CL-11,301-107	1335
-11,945	1388
-12,403	1390
-12,695-63	1380-A

ROCKWELL
(FORMERLY TIMKEN)

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
<u>2000 Series</u>					
A- 287	4580	E- 447	4524	U- 307	4619
- 365	4629	G- 137	4515	- 437	1290
C- 549	1295	K- 375	1280-A	V- 256	4515
D- 238	4610	- 973	1245-B	W- 439	4562-A
D- 298	4636	N- 482	4524	W- 621	4524
- 316	No # Metallic	P- 172	4249	Z- 130	6050
- 550	589	T- 202	4580		
E- 239	4615	- 436	1245-B		
<u>2240 Series</u>					
A- 391	4541-B	F-1956	4551-B	U-1893	4549-B
-1015	4398-B	-2242	1311	-2439	4655
-1223	4515	G-1047	4328-B	-2829	17,738
	4644	-1307	4326-B	V- 594	4305
-2497	4655	-1385	4327-B	-1894	4515
B-1224	4515	G-1957	4551-B	V-2440	4655
	4644	-2243	1311	-2492	4524-C
-1536	4514-G	-2295	1307	-2518	4653
-2498	4655	H-1048	4328-E	-2569	4228-F
-2524	1307	-1308	4326-B	W-1349	4398-B
C-1303	4327-B	H-1386	4327-B	W-1791	4621
-1537	4514-G	-2244	1311	-1895	4515
-1953	4515	-2530	4653	-2241	4655
-2291	4625-B	J-1050	4328-E	-2493	4524-C
-2498	4655	-2246	1311	-2570	4228-F
C-2525	1307	J-2532	4653	X-1792	4621
D-1304	4327-B	K-1051	4328-E	-2286	1308
-2240	1311	-1389	4358-B	-2442	4655
-2292	4625-B	L-1390	4358-B	-2520	4654
-2526	1308	M-1391	4358-B	Y-1221	4515
D-2578	4625-B	Q-1343	4398-B	Y-1221	4644
E-1045	4327-B	R-1250	4601-A	-1377	4514-G
-1305	4358-B	-1630	4515	-1793	4621
-1383	4327-B	-1890	4514-E	-1923	4515
-2241	1311	S-1631	4515	-2521	4654
E-2527	1308	S-1891	4514-E	Z-1378	4514-G
- 2579	4625-B	-2541	1307	-1794	4621
F-1046	4327-B	T-1892	4549-B	-1924	4515
-1306	4358-B	-2542	1308	-1925	4515
-1384	4327-B	-2828	17,738		

ROCKWELL (Cont.)

(FORMERLY TIMKEN)

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
<u>2740 Series</u>					
A- 859	1245-B	C-1300	4643	E-1721	4618
-1665-F	4398-B	-1771	4629	-1773	4629
-1769	4629	-1795	4635	-1798	4635
-1821	4642	-1797	4635	-1825	4644
-2601	4601-A	-1823	4644	-1877	1245
A-2861	4562-A	C-2239	4398-B	E-1877	1280-A
-2887	4592	-2577	4524 & B	-2579	4524
-3147	4524	-2603	4601-A		4524-B
-3277	4515	-2889	4592	-2604	4601-A
-4187	4592	-3643	1131	-2667	17,731
A-4811	4592	C-4111	4514-F	E-3151	4524
-5071	4515-E	-4813	4592	-3307	4513
-5097	4549	-5021	4515	-3515	17,735
	4549-C	-5073	4515-E	-3645	1131
B- 756	4580	-5099	4549	-4815	4592
B- 860	1245-B	D- 342	4514-G	E-5023	4515
-1198	1295	- 758	4580	-5075	4515-E
-1199	1295	-1200	1295	-5101	4549
-1666	4398-B	-1278	4549	F- 786	4604
-1692	1297	-1772	4629	- 852	1239-A
B-1693	1297	D-1798	4635	F-1202	1295
-1770	4629	-1824	4644	-1254	4633
-1822	4642	-2578	4524	-1280	4549
-2576	4524		4524-B	-1607	4541-B
	4524-B	-2604	4601-A	-1800	4635
B-2602	4601-A	D-3150	4524	F-1826	4644
-2862	4562-A	-3644	1131	-1878	1280-A
-2888	4592	-4112	4514-F	-2268	17,731
-3148	4524	-4814	4592	-2580	4524
-3278	4515	-5022	4515		4524-B
B-4188	4592	D-5074	4515-E	F-3152	4524
-4812	4592	-5100	4549	-3308	4513
-5020	4515	E- 447	4524	-3542	17,732
-5072	4515-E	- 551	1131	-3646	1131
-5098	4549	- 759	4580	-4114	4514-F
C- 29	4538	E- 889	1259	F-4816	4592
- 341	4514-G	-1201	1295	-5024	4515
- 757	4580	-1253	4633-A	-5076	4515-E
-1251	4633-A	-1279	4549	-5102	4549
-1277	4549	-1669	4541-B	G- 914	1296

ROCKWELL (Cont.)

(FORMERLY TIMKEN)

<u>Part #</u>	<u>F.M.S.I.</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
<u>2740 Series (Cont.)</u>					
G-1281	4549	K-1987	4602	N-3524	4602
-1827	4642	-2585	4524-B	-4278	17,738
-1879	1280-A	-2819	1290	-4798	4592
-2581	4524	-2871	4592	P- 926	1131
	4524-B	-3261	1131		4211
G-2815	1290	K-3651	1131	P-1810	4619 & A
-3153	4524	-3443	1276	-2590	4524-B
-3309	4513	-4899	17,736	-2876	4592
-3543	17,732	-5081	4471-B	-3162	1289
-3647	1131	-5185	4471	-3214	17,732
G-4063	4610	L- 168	6050	P-3448	1276
-5025	4515	-1286	4549	-4800	4592
-5077	4515-E	-1312	4514-G	Q- 849	1234-A
-5103	4549	-2118	4602	-1421	4627
-5181	4471	-2586	4524-B	-1889	4626
H- 398	4592	L-2872	4592	Q-2591	4524-B
-1282	4549	-3262	1131	-2877	4592
-1828	4642	-3444	1276	-3163	1289
-1880	1280-A	-4796	4592	-3215	17,732
-2582	4524-B	-4900	17,736	-3267	4515
H-3648	1131	L-5082	4471-B	Q-3449	1276
-5182	4471	-5186	4471	-3839	4514-F
J- 400	4592	M-1131	4592-A	-4281	17,738
	4592-A	-1287	4549	-4801	4592
- 686	4628-A	-2119	4602	R- 980	4610
J-1128	4515	M-2587	4524-B	R-1240	4627
-1284	4549	-2873	4592-A	-1422	4627
-1466	4633	-3263	1131	-1890	4626
-1882	1280-A	-3445	1276	-2150	4601-A
-2584	4524-A	-4277	17,738	-3216	17,732
J-2818	1290	M-4797	4592	R-3268	4515
-3442	1276	-4901	17,736	-3450	1276
-3650	1131	-5187	4471	-3840	4514-F
-4898	17,736	N- 430	4227-G	-4048	4514-F
-5184	4471	- 482	4524	-4282	17,738
K-1129	4515	N-2588	4524-B	R-4802	4592
-1285	4549	-2874	4592-A	S- 253	330
-1311	4514-G	-3212	17,732		1256
-1675	1303	-3264	1131	- 435	4514-D
-1883	1280-A	-3446	1276	-1241	4627

ROCKWELL (Cont.)

(FORMERLY TIMKEN)

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
S-1423	4627	V-1894-X	4626	X-3274	4515
-1891	4626	-1998	4629	-3378	17,731
-2151	4601-A	-2154	4601-A	-4288	17,738
-2853	4562-A	-2856	4562-A	-4808	4592
-3451	1276	-2882	4592	Y-1299	4636
S-4049	4514-F	V-3272	4515	Y-1377	4514-G
-4283	17,738	-3324	4524-A	-2599	4601-A
-4803	4592	-4286	17,738	-2859	4562-A
T- 436	4541-B	-4806	4592	-3275	4515 & E
- 695	4628 & A	W- 569	4470	-3379	17,731
T- 696	4628	W- 855	1286	Y-3847	4618-A
-1018	580	-1245	4625	-4185	4592
-1424	4627	-1297	4636	-4289	17,738
-1892-X	4626		4643	-4809	4592
-2022	580	-1427	4627	-4965	1303
T-2152	4601-A	W-1895-X	4626	Z- 26	1247
-2854	4562-A	-1921	4524	- 858	1245-B
-2880	4592		4524-B	-1144	4592-A
-3270	4515	-1999	4629	-1300	4636
-4284	17,738	-2155	4601-A	-1690	4398
T-4804	4592	W-2266	17,731	Z-1768	4629
U- 255	330	-2857	4562-A	-2600	4601-A
	1258	-2883	4592	-2860	4562-A
- 437	4343-C	-3273	4515	-2886	4592
- 567	4470	-3325	4524-A	-3276	4515 & E
U-1425	4627	W-3351	4610	Z-3380	17,731
-1763	4619	-4287	17,738	-3848	4618-A
-1893	4626	-4807	4592	-4186	4592
-2153	4601-A	X- 570	4470	-4810	4592
-2287	17,733	- 856	1286	-5018	17,734
U-2855	4562-A	X-1297	4643	Z-5070	4515-E
-2881	4592	-1298	4636	-5096	4549 & C
-3271	4515	-1350	4592-B		
-3323	1289	-1428	4637		
-4285	17,738	-1896-X	4626		
U-4805	4592	X-1922	4524		
V- 256	330		4524-B		
- 568	4470	-2000	4629		
-1244	4625	-2598	4601-A		
-1426	4627	-2858	4562-A		

ROCKWELL (Cont.)

(FORMERLY TIMKEN)

2840 Series

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
X- 154	4249		

3222 Series

E- 707	4513
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3722 Series

A- 495	4541	P- 432	4592-B
B- 496	4398	- 640	4398
D- 368	4398	- 822	4572

32,500	189
	659-B

4222V594)	4511
W595)	
X596)	
Y597)	

SHULER

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
B-1,663	4542-A	FE-10A-43	4563
-1,727-A,C	4552	-12A-34	4563
-1,778-A,C	4524	FX-1	4563
B-1,794	4375	T-14-265	4464
-1,909-A,C	4551	-18C-267	4468-B
-2,062-3&4	4602-A		4591

SPICER (CLUTCH FACINGS)

(See DANA CORP.)

STUDEBAKER

<u>Part #</u>	<u>F.M.S.I. #</u>
682,842)	
682,843)	1191

TEVES

<u>Part #</u>	<u>F.M.S.I. #</u>
13,8107-4801.2	736**
13,8107-5482.2	7034**
13,8107-8001.2	791**

VOLKSWAGEN

<u>Part #</u>	<u>F.M.S.I. #</u>
111-698-151-B	7022**
211-609-537-J	8080
211-609-537-N	8128
411-698-151-A,B,C	796**
411-698-151-D	7023**

** Integrally Molded

WAGNER

<u>Part #</u>	<u>F.M.S.I. #</u>	<u>Part #</u>	<u>F.M.S.I. #</u>
FC- 7,762 & 3	153-A	FD-45,892	2115-T
-13,760	1191	-55,226 & 8	4602-A
-14,890	1225	-55,408	296
-14,892	1225	-56,316	2136-T
-22,431	1234	-57,229-31	2045
FC-28,831 & 2	1245-A	FD-57,269	4638
-33,126	1245-A	-57,511 & 512	4645-A
-33,248	4598	-59,444	1245-C
-49,793	1245-C	-59,445	1280-B
-49,803	1280-B	-70,520 & 21	2150
FC-55,409	1294	FD-71,108 & 9	2150
-55,410	1294 & A	-71,178 & 79	2150
-56,346-A	1216-TT	-72,321	2097-T
-56,493-A	1216-TT	-72,322	2097-T
-56,495-A	1216-TT	-72,324 & 5	2097-T
FC-59,395	1294-A	FD-80,427 & 28	1308-A
FD- 8,852,& 3	1245-A	FE-35,507	2066-T
- 9,723 & 4	1245-A	-35,513	2066-T
-18,722	2042		2066-AT
-18,731	2042	-40,909 & 14	2071-T
FD-20,327 & 8	1273	FE-40,925 & 30	2071-T
-22,343	2026	-44,629	2066-AT
-22,346	2026	-49,309 & 10	2072-T
-22,426	4564	-49,322 & 3	2072-T
-24,349	4596	-57,268 & 91	4638
FD-27,060	1288	FE-75,749)	2072-AT
-28,830 & 2	1245	-75,750)	
	1278	-75,751)	
-29,052	2015	-75,752)	
-32,101	2015	-75,753)	
-33,246	1150	FE-75,760)	2072-AT
-33,494	2015-TT	-75,761)	
	2136-T	-75,762)	
-33,495 & 6	2015	-75,763)	
-33,498	2015	-75,764)	
FD-34,196 & 7	1219	FE-76,755	2012-GT
-36,554	1150	FF-33,491	2015-TT
-36,570	4598	-33,492	2015-TT
-45,884	2112	-57,777	4602-A
-45,886	2111-T	-57,778	4602-A
FD-45,888	2111-T		
	2112-T		
-45,890	2115-T		

WHITE

<u>Part #</u>	<u>F.M.S.I. #</u>
545,066	*1312
545,067	*1312
	*1367
545,068	*1367
566,667	*1312
569,966	*1312
672,934	*1329-A
819,192	*1312
	*1367
853,129	*1329-A
894,616	4625

*Clutch Facing

B U L L E T I N

N O. 5 3 5

July 1, 1975

HISTORICAL SALES PROGRAM

The historical sales program is now on a quarterly basis. Regional Members using the copyrighted FMSI Numbers for marketing their products in the United States have been invited to participate.

The Institute is requesting details of pieces sold for the first six months of 1975 (6 months ending June 30, 1975). Some consideration on the reporting details are:

1. Quantities will be reported in pieces (not units). For roll lining, each foot of length will be one piece.
2. Our Accountants will report the names of the members from whom reports are received, and the number of members reporting in each of the four groups.
3. Total pieces in each group will be reported.
4. "Clutch Facings" does not include gear tooth discs, automatic transmission discs, or the 8-14" dia. (3/16 to 1/2" thick) asbestos composition discs.

This data will be confidential, and as totals for each group will be shown, there is no way of determining quantities by individual members.

Please review the form and the descriptions, as they apply to this year's reporting. You will be receiving from Marshall Granger & Company, Certified Public Accountants, a form for completing this information. Please return it to:

Marshall Granger & Company, C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

If you report, please have your figures in by August 15, 1975. If you do not wish to report these figures, no reply is necessary. Only those reporting figures will receive the industry totals when the data is summarized. A sample form and definitions are attached.

EWG/erc
Encs.

E. W. Drislane
Executive Director

Distribution: Delegates & Alternates
Regional Members (paying
Active Member Dues)

EXHIBIT "A"

STATISTICAL PROGRAM OF THE
FRICTION MATERIALS STANDARDS INSTITUTE, INC.

Mail to:

Marshall Granger & Co. C. P. A.
1600 Harrison Avenue
Mamaroneck, New York 10543

* * * * *

See instructions for sales to other members!

Pieces sold to United States distributors, jobbers, private brands,
rebuilders, brake specialists, fleets, mass merchandisers, direct
consumers, government agencies, or other customers for use in the
United States replacement market:

6 MONTHS JANUARY 1 to JUNE 30, 1975

Brake linings up to 3/4" nominal
thickness (See explanation for
roll lining).

Brake blocks, nominal thickness
of 3/4" and over

Disc brake linings

Clutch facings

Total pieces:

SAMPLE

FORM

**USE REPORTING FORM TO
BE SENT BY ACCOUNTANTS**

By: _____
Signature

Company

Date

EXHIBIT "B"

DEFINITION FOR HISTORICAL SALES

PIECES

The reports will show pieces of friction material, in groups as shown:

<u>Group</u>	<u>Description</u>	<u>Normal Usage</u>
Brake Lining	Friction materials up to a nominal 3/4" thickness (See note on roll lining)	Normally, <u>one piece</u> to a shoe
Brake Blocks	Friction materials with a nominal thickness of 3/4" and over	Normally, <u>two pieces</u> to a shoe.
Disc Brake Linings	Friction materials sold (for disc brakes) to be attached to the shoe, or sold as a unit molded, bonded or riveted to the shoe	Normally, <u>one piece</u> to a shoe
Clutch Facing	Friction materials of annular shape, or segments thereof.	Normally, <u>two annular pieces</u> per clutch plate

Note: For roll lining only, consider each foot of length equals one piece.

REPLACEMENT SALES TO UNITED STATES MARKET

This reporting is for sales to the United States replacement market only. Do not include sales to other markets. This includes sales under the friction material manufacturer's own name or brand name used by the customer, to automotive warehouse distributors, jobbers, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies or other customers for use in the United States replacement market.

When a friction material manufacturer is shipping to a vehicle manufacturer, brake manufacturer, or clutch manufacturer, but has no reasonable way of determining if the pieces are for original equipment or replacement purposes, estimates will not be used - these pieces will not be reported. However, where a friction material manufacturer is shipping to a point known to be used for replacement, or where he stencils or otherwise identifies the pieces as being for replacement purposes, or where the shipments otherwise are obviously known to be for replacement, these pieces will be reported.

The member who sells to the type customer or user indicated above will report those pieces sold, even if purchased from another Active Member or Regional Member.

When you sell your friction materials to another Member (Active or Regional) do not report those sales! Materials sold to Licensee Members of the Institute for the replacement market should be included.

B U L L E T I N

N O. 5 3 4

June 26, 1975

REPORTS AT ANNUAL MEMBERSHIP MEETING

Enclosed are copies of the reports which were presented at the June 17, 1975 Board of Directors Meeting, and at the June 18-19, 1975 Annual Membership Meeting.

We are distributing copies of these reports at this time, as it will be several weeks before the minutes will be written, approved and distributed. Please save these report copies as they will be referred to in the minutes.

EWD/erc
Enclosure:
CC-Delegates & Alternates
Meeting attendees
Regional Members (Active Dues)

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 3 3

May 21, 1975

REPORT ON ASBESTOS STUDY COMMITTEE MEETING

In late April, the Asbestos Study Committee met and discussed several subjects -- with emphasis on asbestos in the work place. One of the agenda items was entitled: "The OSHA Regulations and the Membrane Filter Method for Measurement."

Excerpts of the minutes of this meeting on the above agenda item are enclosed. These excerpts indicate our industry's problems with the reliability of the membrane filter method for measuring airborne asbestos concentrations, and they emphasize the Members' concern where this procedure will be used for enforcement.

We are making additional enclosures with the copies being sent to the individual listed below:

These additional enclosures include:

1. Price Sheet on Nilfisk Industrial Vacuum Cleaner Models GA-71, GA-72, GA-73.

Nilfisk of America, Inc.
706-8 Buncombe Street
P. O. Box 143
Greenville, S. C. 29602

2. Report of Joint AIHA-ACGIH Aerosol Hazards Evaluation Committee: "Recommended Procedures for Sampling and Counting Asbestos Fibers."

This article is copyrighted and reprints are available as indicated on the first page (Page 83)

Note: In the first two pages, a guard or shroud is attached to the filter holder. This may help in eliminating sporadic high counts.

Reasons for two enclosures are given in the excerpts from the Asbestos Study Committee meeting: (1) The Nilfisk Cleaner has helped in cleaning up the workplace, when used in addition to a good central collecting system; (2) Use of the shroud may be of help in reducing the sporadic high counts from asbestos that ordinarily would not be taken into the respiratory tract.

The foregoing information is sent for use by those responsible for compliance with the OSHA Regulations.

EWD/erc

Enclosures:

cc- Active Members

Regional Members (U.S. Copyright)
Asbestos Study Committee

E. W. Drislane

Executive Director

EXCERPTS FROM APRIL 28, 1975 MEETING

OF ASBESTOS STUDY COMMITTEE

The OSHA Regulations and the Membrane Filter Method for Measurement

Originally this subject was to be two items on this agenda: (1) The Membrane Filter Method for measuring airborne asbestos concentrations, (2) The OSHA standards with emphasis on the July 1, 1976 two fibers/cc limit. In discussing these subjects it was found difficult to separate the membrane filter technique from the OSHA standards. They are being combined for purposes of these minutes.

It was suggested that with the current economic climate that perhaps there might be some de-emphasis in OSHA regulations. There has been de-emphasis on seat belts, and bumpers, emissions control and it was suggested that perhaps OSHA might ease off on their regulations. One Committee member said that it was most unlikely that there would be backtracking on the OSHA regulations. If anything they might be stiffened. One member stated that there were five different types of asbestos and that some were more harmful than others. It was suggested that while this might be so, all asbestos is apparently linked with lung cancer and asbestosis. It would be difficult to win an argument that there are some types of asbestos that are not harmful to the respiratory tract.

At this point the method for counting fibers was discussed. It was stated by one member that originally a fiber would ~~be~~^{not} counted if it was not totally within the field. This was from Johns-Manville course on the use of the membrane filter technique. It was stated now that anything that is in the top or the left hand borders of the sample, even if only partly in the field, are to be counted. Another member indicated that when he took the NIOSH course at Cincinnati that this was the way that he was told to count: any fiber on the left hand or top border, even if not fully within the field being counted, would be counted in that field.

It was stated that the crystallization of the solvent used on the slide could sometimes make it appear to be an asbestos fiber. There is a method of preparing the slides so that the formation of crystals will not appear similar to asbestos fibers for counting purposes. This method is apparently used by most companies doing their own counting of the fibers. It was pointed out also that slides should not be re-used. Re-used slides may accelerate crystallization of the solvent.

It was stated there is as much variation in readings of fiber count as there are people making readings. One member suggested that he used the NIOSH manual as a Bible. It was stated that this manual was subject to wide interpretation. A member indicated that he exchanged samples with NIOSH in Cincinnati and has had decent correlation with their counts. It was stated that on the lower counts that three different readings would come out plus or minus 10% on the count. However, when higher counts were read, the three different readings would come out with plus or minus 50% in the count. Over how long a period were these samples collected? One member stated that OSHA takes 8-hour samples. Another states that they took samples for a minimum 3-hour period with a 30-minute cycling. Another had three one-hour periods for collecting samples using one filter. As regards differences, it was stated by two members that the OSHA inspectors have actually picked up lower counts than some of the members. It was stated that there were differences in results depending upon whether the counts were done in house, by outside organizations or by government people. With these differences in fiber count, a question was raised

as to how can one solve a problem when they don't know how severe the problem is. In response to a question as to what this Committee could recommend it was suggested that members should at least test each operation every six months.

In attempting to get counts down to the 5 fiber limit and eventually down to two fibers a member stated that good housekeeping is required. Several members mentioned the Nilfisk vacuum cleaner. This particular vacuum cleaner can be used for getting into places that a central unit cannot reach. It has a plastic bag liner and runs on a 15 amp circuit. Of the movable type vacuum cleaner the members seem to prefer this Nilfisk. This is a Swedish make vacuum cleaner. More information will be gathered on this vacuum cleaner for distribution to the members. In addition it was suggested that one must have a good central collection system. One that was mentioned was the JM modified central vacuum system, which utilizes the main duct system as a central vacuum system. Several members stated that good-housekeeping was one of the main things that must be taken care of in order to bring the fiber count down. It was suggested that there are three points for good housekeeping: (1) Good shrouding and good dust collection; (2) There should be a central cleaning system for the work area; (3) The Nilfisk vacuum cleaner should be used for general housekeeping in the work area. In addition it was stated that there should be no dry sweeping in the work area.

It was suggested that the friction materials business is different from regular asbestos manufacturing. In addition to asbestos, we have other materials in the product such as resins, carbon blacks, friction dust and various minerals. It is possible that some of these may be picked up during the sample gathering before the count. In some cases these will be counted by operators as being asbestos fibers. In essence it is more difficult to count asbestos in a friction material environment than it is in a textile environment. It is felt that there may be greater difficulty in getting consistent readings on fiber counts in the friction materials business. For that reason friction material manufacturers would prefer a work practices oriented standard.

It was stated that the membrane filter method should not be abandoned as it is the only tool for measurement. However, reliance on this tool for enforcement may be almost unbearable in friction materials factories. It was suggested that OSHA be advised of our industry's concern with the wide variation in fiber counts. Based on the fact that materials other than asbestos might be involved, it is necessary that the counts be interpreted realistically. In other words, while the membrane filter method may be the only method that is available currently for measuring airborne asbestos, and it is not felt that there is another method that can take its place, it is a tool that should be used by manufacturers only in trying to clean up their areas. It is not felt that this tool is accurate enough to be used for enforcement purposes. It is suggested that OSHA inspectors must realize this before factories are closed down and fines are levied when there is doubt as to how accurate the measurement is. Because of the wide variation in results there is concern among members as to the millions of dollars now being put into control methods. Even with these expenditures, there is no way of knowing positively whether industries are getting their counts down to required levels. Various words were used to describe the reliability of the membrane filter method for enforcement: One indicated that it was "unreliable," and another indicated that it was "inadequate". The emphasis was that it is the only tool now available but it is not the proper tool for enforcement.

Ironically, it had been suggested by some government people in the past that the friction material industry would be the first to comply with the OSHA standards. NIOSH felt that the friction materials business could most readily meet these standards. At this meeting, industry members are indicating that it may be more difficult for the friction materials business to meet the levels because of the difficulty in counting fiber samples. It was suggested that if we're having difficulty

meeting the 5 fibers/cc limit currently, it would be near impossible to meet the 2 fibers/cc limit due July 1, 1976. It was suggested that the Industry should oppose this change.

It was stated that realistically it is unlikely that OSHA will not go to the 2 fiber/cc limit on July 1, 1976. The only question is will they go lower than the 2 fiber limit? Dr. Selikoff has spoken of a 1 fiber/cc limit and has even said no fibers. It was stated that the Asbestos Information Association had circulated information concerning the NIOSH suggestion that the friction materials business would come under the standard now. Such literature was never received by the Institute. Most members on the Committee were unfamiliar with this NIOSH suggestion.

As had been suggested earlier, it is necessary to make the counts as accurate as possible. For this reason suggestions on counting procedures, possible crystallization of solvents, and a prohibition on the re-use of slides are important. Dr. Weaver pointed out that in a recent publication he noted that a plastic shroud is placed about the entrance to the pump being worn at the work place, in order to keep large particles of asbestos from getting pulled in to the filter. This shroud would prevent material from being taken from a worker's clothes as well as from some large pieces that would ordinarily fall to the floor without being inhaled. He stated that Turner Brothers has been using such a shroud. The unit is completely open on the front and it is felt that this technique gets rid of some sporadic high counts. Mr. Weaver will get a copy of this and distribute it to the members. This could be another possible improvement in the sampling technique which might make the membrane filter method more palatable. It was suggested that this be considered and perhaps a proposal be made to OSHA for its use. The problem is twofold: (1) Improving the reliability of the membrane filter technique, and (2) The use of the membrane filter as a tool for enforcement with its lack of reliability.

This subject has been fairly well covered. There was some agreement about the problems in using this technique as a tool for enforcement of the OSHA regulations. The question was what should be done about it? One member stated that the Committee would be remiss if it did not advise the members of these difficulties. It was suggested that the Board of Directors be advised that there is a problem and that there is going to be more of a problem when the 2 fiber limit is put into effect. To repeat the problem: while we need the membrane filter method as a tool for measurement, this tool is not suitable for enforcement purposes. It is suggested that when the 2 fibers/cc limit takes effect that this will become a most serious problem.

Recommendations should be put into effect on instructions to employees, the use of vacuum cleaners, the use of dust collecting systems, disposal, etc. When these work practices are put into effect the area will be cleaner. It was suggested that the Institute contact the Asbestos Information Association concerning the use of the membrane filter technique for enforcement. (See later section of these minutes concerning Asbestos Information Association). The Industry must concentrate on collecting, cleaning and housekeeping, using the membrane filter as a tool to see how the levels are being reduced.

One member brought along a work sheet with target dates for completion of various items that will help in meeting the OSHA standards. This is essentially a schedule with dates projected for each step which will move their factory nearer to compliance. The aim is to have the factory at the 2 fiber limit by July 1, 1976. Various critical areas are covered with detailed steps projected to clean up each area. It was suggested that this was almost necessary for control and would certainly help in proving intent to comply with the regulations.

In another area, a question arose as to what were the Canadian standards. At the present time, there is no national standard in Canada. However, it is likely, with the recent furor over asbestos in Toronto, that Canada will be moving to a 2 fiber/cc limit. Upon motion duly made, seconded and unanimously passed, it was

RESOLVED: That the Committee requests guidance from the Board of Directors concerning the problem of the 2 fiber/cc limit and the lack of reliability of the membrane filter method for measurement of fiber counts.

B U L L E T I N

N O 5 3 2

May 15, 1975

1975 AUTOMOTIVE DATA BOOK

We are enclosing one copy of the recently published 1975 AUTOMOTIVE DATA BOOK.

These books were recently shipped by the printer to those who placed orders. The price that was given earlier was too high. We had based that price on a 112 page book plus cover. The book as printed was 100 pages plus cover. The final price is:

Catalogs	\$310.00/M
Punching	15.60/M

Would you kindly advise your Purchasing Department on this price reduction.

We have a small inventory of these Data Books left after shipment to those ordering. Any orders received from here on out will be handled on a "first come - first served" basis.

EWD/erc
Distribution:
Delegates & Alternates
Data Book Committee
Regional Members

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 3 1

May 7, 1975

1975 SUPPLEMENT TO THE 1974 BRAKE SHOE IDENTIFICATION CATALOG

We are enclosing one copy of the recently published 1975 SUPPLEMENT TO THE 1974 BRAKE SHOE IDENTIFICATION CATALOG.

These books were recently shipped by the printer to those who placed orders. The preliminary price that was given earlier is the final price:

Catalogs	\$137.25/M
Punching	4.00/M

We estimated correctly on quantities, and there was a minimum overrun. While an individual copy will be available on request, we will be unable to fill additional orders beyond the orders already received.

END/erc
Distribution:
Delegates & Alternates
Regional Members
Licensees

E. W. Drislane
Executive Director

BULLETIN

NO. 530

May 7, 1975

ADDITIONAL MEMBERS

Hemispheres International Manufacturing Co.--Regional Member

The Members of the Institute have voted to accept the application of Hemispheres International Manufacturing Co. for Regional Membership.

Fenwick Automotive Products is the parent company of Hemispheres International Manufacturing Co. Fenwick has been in the clutch rebuilding business for many years and I believe they purchase facings from members of the Institute. A few years back they purchased equipment and know-how for the Johns-Manville disc brake linings. Hemispheres International is now marketing these disc brake linings in Canada and the United States.

Hemispheres International is aware that Regional Members using the copyrighted FMSI Numbering System for marketing their products in the United States pay the same annual fee as an Active Member, and they are paying this higher fee level.

Their address is:

Hemispheres International Mfg. Co.
420 Canarctic Drive
Downsview, Ontario M3J 2V3
Canada

Kenebuc (Galt) Limited--Licensee

The Board of Directors recently voted to accept Kenbuc (Galt) Limited as a Licensee in the Institute.

Kenebuc (Galt) Limited purchased tooling from one of our Members and now manufactures steel for disc brake shoes. Another Member got Kenebuc (Galt) Ltd. and the Institute together. They paid the annual fee with their application.

Their address is:

Kenebuc (Galt) Limited
P. O. Box 126
Cambridge, Ontario N1R 5S9

* * * * *

The foregoing is for your information.

EWD/erc

E. W. Drislane
Executive Director

BULLETIN

NO. 529

May 1, 1975

CHANGE IN LEGAL COUNSEL

This is to advise the Membership that the New York City law firm of Stickles, Kennedy and Van Steenburgh will no longer serve as Legal Counsel to the Institute as of June 30, 1975. Mr. Lester Stickles of this firm has served as Legal Counsel to the Institute since its formation in 1948, and he served as Legal Counsel to the predecessor organization, Brake Lining Manufacturers Association, for several years prior to 1948.

As of June 1, 1975, the Newark, New Jersey law firm of Clapp & Eisenberg will serve as Legal Counsel to the Institute. (We are planning a one month overlap of Counsel should there be need for consultation). Mr. Robert Gorman of this firm will serve as our Legal Counsel. We expect that Mr. Gorman will be attending our Membership meeting at Innisbrook in June of this year.

The foregoing is for your information.

EWD/erc
cc-Active Members
Regional Members (US Copyright)

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 2 8

April 7, 1975

APPLICATIONS FOR INSTITUTE MEMBERSHIP

This is to advise the membership that we have received applications from two Canadian firms for membership.

KENEBUC (GALT) LIMITED, CAMBRIDGE, ONTARIO - LICENSEE

An application was received in February from Kenebuc (Galt) Limited for Licensee Membership. Due to an error on my part, their application was not handled properly, and it is just now being reviewed by the Board of Directors.

After purchasing tooling from one of our members, they started production of disc brake plates for the after market. Another of our Active Members put us in contact with each other, which supports the fact that they are now in production. A check for the \$500 annual fee was received with the application (as required). They are eligible for Licensee Membership according to our Constitution and By-Laws.

HEMISPHERES INTERNATIONAL MANUFACTURING CO., DOWNSVIEW, ONTARIO -
REGIONAL MEMBER

The parent company of Hemispheres International Manufacturing Co. is Fenwick Automotive Products. Fenwick Automotive Products has been in the clutch rebuilding business for many years and I believe they purchase clutch facings from members of the Institute. A few years back they purchased equipment and know - how for the Johns-Manville disc brake linings. They are now marketing these disc brake linings in Canada and the United States.

I pointed out to the principals at both Fenwick and Hemispheres International that use of the copyrighted FMSI numbers for marketing their products in the United States as a Regional Member required a dues level the same as an Active Member. They have applied for Membership at the higher dues level of the Active Member.

Their application was reviewed favorably by our Membership Committee and is now being reviewed by our Board of Directors.

* * * * *

There is no action to be taken by the Membership at this time. The Kenebuc (Licensee) application will be decided by the Board of Directors. The Hemispheres International (Regional Member) application will later be submitted to the Membership for balloting. The foregoing is for your information.

E. W. Drislane
Executive Director

BULLETIN

NO. 527

March 31, 1975

HISTORICAL SALES PROGRAM

By resolutions of the Board of Directors, the historical sales program is being moved to a quarterly basis. Also Regional Members using the copyrighted FMSI Numbers for marketing their products in the United States have been invited to participate.

The Institute is requesting details of pieces sold for the first three months of 1975 (Quarter ending March 31, 1975). Some considerations on the reporting details are:

1. Quantities will be reported in pieces (not units).
For roll lining, each foot of length will be one piece.
2. Our Accountants will report the names of the members from whom reports are received, and the number of members reporting in each of the four groups.
3. Total pieces in each group will be reported.
4. "Clutch Facings" does not include gear tooth discs, automatic transmission discs, or the 8-14" dia. (3/16 to 1/2" thick) asbestos composition discs.

This data will be confidential, and as totals for each group will be shown, there is no way of determining quantities by individual member.

Please review the form and the descriptions, as they apply to this year's reporting. You will be receiving from Marshall Granger & Company, Certified Public Accountants, a form for completing this information. Please return it to:

Marshall Granger & Company, C.P.A.
1600 Harrison Avenue
Mamaroneck, New York 10543

If you report, please have your figures in by May 15, 1975. If you do not wish to report these figures, no reply is necessary. Only those reporting figures will receive the industry totals when the data is summarized. A sample form and definitions are attached.

EWJ/erc
Encs.

Distribution: Regional Members (paying
Active Member Dues)
Delegates and Alternates

E. W. Drislane
Executive Director

EXHIBIT "A"

STATISTICAL PROGRAM OF THE
FRICTION MATERIALS STANDARDS INSTITUTE, INC.

Mail to:

Marshall Granger & Co. C.P.A.
1600 Harrison Avenue
Mamaroneck, N. Y. 10543

* * * * *

See instructions for sales to other members!

Pieces sold to United States distributors, jobbers, private brands, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies, or other customers for use in the United States replacement market:

3 MONTHS JANUARY 1 to MARCH 31, 1975

Brake linings up to 3/4" nominal
thickness (See explanation for
roll lining).

Brake blocks, nominal thickness
of 3/4" and over

Disc brake linings

Clutch facings

Total pieces:

By: _____

Signature

Company

Date

FMSI 17913

EXHIBIT "B"

DEFINITION FOR HISTORICAL SALES

PIECES

The reports will show pieces of friction material, in groups as shown:

<u>Group</u>	<u>Description</u>	<u>Normal Usage</u>
Brake Lining	Friction materials up to a nominal 3/4" thickness (See note on roll lining)	Normally, <u>one piece</u> to a shoe
Brake Blocks	Friction materials with a nominal thickness of 3/4" and over	Normally, <u>two pieces</u> to a shoe.
Disc Brake Linings	Friction materials sold (for disc brakes) to be attached to the shoe, or sold as a unit molded, bonded or riveted to the shoe	Normally, <u>one piece</u> to a shoe
Clutch Facing	Friction materials of annular shape, or segments thereof.	Normally, <u>two annular</u> pieces per clutch plate

Note: For roll lining only, consider each foot of length equals one piece.

REPLACEMENT SALES TO UNITED STATES MARKET

This reporting is for sales to the United States replacement market only. Do not include sales to other markets. This includes sales under the friction material manufacturer's own name or brand name used by the customer, to automotive warehouse distributors, jobbers, rebuilders, brake specialists, fleets, mass merchandisers, direct consumers, government agencies or other customers for use in the United States replacement market.

When a friction material manufacturer is shipping to a vehicle manufacturer, brake manufacturer, or clutch manufacturer, but has no reasonable way of determining if the pieces are for original equipment or replacement purposes, estimates will not be used - these pieces will not be reported. However, where a friction material manufacturer is shipping to a point known to be used for replacement, or where he stencils or otherwise identifies the pieces as being for replacement purposes, or where the shipments otherwise are obviously known to be for replacement, these pieces will be reported.

The member who sells to the type customer or user indicated above will report those pieces sold, even if purchased from another Active Member or Regional Member.

When you sell your friction materials to another Member (Active or Regional) do not report those sales! Materials sold to Licensee Members of the Institute for the replacement market should be included

BULLETIN

NO. 526

March 7, 1975

FEDERAL MOTOR VEHICLE SAFETY STANDARD 121 - AIR BRAKE SYSTEMS

On August 20, 1974 we issued Bulletin No. 511, on the above subject. At that time we issued a work sheet with the various amendments to Standard 121 since its adoption. That took us up through May 1974.

Since then there have been several small amendments:

November 12, 1974

January 7, 1975

January 17, 1975

March 5, 1975

The amendment of January 7, 1975 changed the brake retardation force requirements in Table III. Most of the other amendments had to do with exemptions, effective dates and emergency brakes. To keep the worksheet sent earlier up-to-date we are enclosing new work sheets. These are for addition to those earlier sheets.'

EWD/erc
Enclosure:

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 2 5

February 28, 1975

1975 SUPPLEMENT TO 1974 BRAKE SHOE IDENTIFICATION CATALOG

The contract for the printing of the "1975 Supplement to the 1974 Brake Shoe Identification Catalog" has been awarded to:

Tweddle Litho Company
24000 Harper Avenue
St. Clair Shores, Michigan 48080

It is believed that it will contain 24 pages.

On an estimate of the total order being 35,000 copies of a 24 page book, the price is:

\$137.25 per M
4.00 per M additional for five hole punching

If there is a change in the price per thousand due to a change in number of pages or to changes in order quantities, or for author's alterations, you will be notified.

Please forward all orders to the Institute Office. Do Not send them to the printer. This is our only means of checking the total quantities ordered and the price charged, as well as whether only members are ordering.

The orders should be made out to Tweddle Litho Company and state punching and shipping instructions.

Kindly forward your orders so that they reach the Institute Office before April 15, 1975.

E. W. Drislane
Executive Director

Distribution: Active Members
Regional Members
Licensees
Data Book Committee

B U L L E T I N

N O. 5 2 4

February 11, 1975

DECLARATION RE PRODUCT CATEGORIES

FOR

FEE FORMULA BASIS

According to the Constitution and By-Laws, the Fee Formula for the Active Members must be reviewed annually and then presented to the Board of Directors who make recommendations to the membership.

Inasmuch as a member may be engaged in a category one year and not the following, or the reverse, it is necessary to have a confidential declaration filed annually in order to arrive at a proper assessment for each category.

Therefore, would you kindly return one of the attached to the Institute Office. We will prepare a summary to aid the Board of Directors in determining the fee formula for the fiscal year starting July 1, 1975.

Please note that the filing categories are unchanged from those on the declarations in recent years. Please refer to the "Explanation of Category Filing" attached to the Form. If you have questions, please give me a call.

Kindly return your declaration by March 15, 1975. A stamped return envelope is enclosed with the Delegate's copy.

EWD/lmc
Distribution: Delegates &
Alternates

E. W. Director
Executive Director

FMSI 17917

EXPLANATION OF CATEGORY FILING

General - A member must be engaged in at least one of the first three categories, in order to be a member. The number of categories checked is used to determine the fees paid during the next fiscal year. Any member not filing this information correctly will be assessed the full fee for all categories.

Confidential - This fee category information is confidential and is not available to other members. The data is reviewed by the Secretary for purposes of determining its reasonableness.

"Our Company is Engaged as follows:" - If a member manufactures and sells, purchases and sells, or both purchases and manufactures, and sells the product indicated in the replacement market, he is "engaged" in that category. In other words, if he sells that product he is engaged in that category. Further, the replacement market includes automotive, industrial, and off road equipment - where Friction Materials Standards Institute, Inc. performs a service, either through cataloging, assignment of copyrighted FMSI numbers, or the maintaining of prints. If a member sells a certain product type, but only to market where FMSI does not provide services, he does not report that category. Where a member sells a certain product only to a market where there are FMSI services available, but he declines to use these services, he must report that category.

Brake Lining - Under 3/4" Nominal, Including Disc Brake Linings
This includes linings whether loose, attached to shoes, or in roll form, sold to market where the FMSI numbering system is available.

Brake Blocks and Disc Brake Linings - 3/4" Nominal and Over
This includes brake blocks, whether loose or attached to shoes, sold to markets where the FMSI numbering system is available. The 3/4" nominal includes tapered blocks with a maximum thickness of approximately .700", with minimum thickness only at its thickest point. When measuring a lined shoe, to determine lining thickness, measure from the top of the shoe.

Clutch Facings
This includes loose facings or facings attached to plates, sold to markets where the FMSI numbering system is available.

Brake Shoes - New Unlined, Including New Unlined Disc Brake Shoes
This category includes new and unlined shoes (whether drum or disc type) which are sold as new and unlined shoes in the replacement market. If all the new and unlined shoes are sold as lined shoe assemblies, do not report this category.

BULLETIN

NO. 523

January 29, 1975

NEW REGIONAL MEMBERS

The Membership Committee and the Board of Directors had recommended for acceptance for Regional Membership the applications filed by Duramax, S. A. (Mexico) and Mintex Federal Limited (Canada). The Membership has now voted 15 in favor (4 Abstentions) for acceptance. This meets the requirement of our Constitution that 75% of the Active Members must vote for acceptance.

Duramax, S. A. and Mintex Federal Limited have therefore been voted into Regional Membership. Mintex Federal Limited (Canada) will be paying dues equivalent of an Active Member as they intend to use the copyrighted FMSI Numbers for marketing their products in the United States. (They are also members of the Friction Materials Standards Institute of Canada).

Addresses of these new Regional Members are:

Duramax, S. A.
Emiliano Zapata No.13
Puente de Vigos
Edo de Mexico
Mexico

Mintex Federal Limited
189 Rexdale Boulevard
Rexdale (Toronto) Ontario
Canada

EWD/erc

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 2 2

January 20, 1975

ORDERS FOR THE 1975 AUTOMOTIVE DATA BOOK

The contract for the printing of the 1975 Automotive Data Book has been awarded to:

Success, Inc.
1345 West 16th Street
Indianapolis, Indiana 46202

It is believed that it will contain 112 pages.

On an estimate of the total order being 80,000 copies of a 112 page book, the price is:

\$341.80 per M
\$ 17.40 per M additional for five hole punching
(This will be the only type punching.)

If there is a change in the price per thousand due to a change in number of pages or to changes in order quantities, or for author's alterations, you will be notified.

Please forward all orders to the Institute Office in Duplicate. Do not send them to the printer. This is our only means of checking the total quantities ordered and the price charged, as well as whether only members are ordering.

The orders should be made out to Success, Inc. and state punching and shipping instructions.

REMEMBER - The orders are to be sent to the Institute Office.

Kindly forward your orders so that they reach the Institute Office before March 1, 1975.

E. W. Drislane
Executive Director

Distribution: Active Members
Regional Members
Data Book Committee

B U L L E T I N

N O. 5 2 1

January 13, 1975

ENVIRONMENTAL PROTECTION AGENCY (EPA) EFFLUENT GUIDELINES AND STANDARDS
FOR ASBESTOS MANUFACTURING POINT SOURCE CATEGORIES

On January 9, 1975, the EPA published their Effluent Guidelines and Standards for Asbestos Manufacturing Point Source Categories. This is the end result from work the EPA has done through 1974 and covered in the following Bulletins:

Bulletin #504 - Draft report by Sverdrup and Parcel
(June 30, 1974) on a development document for the
proposed effluent guidelines

Bulletin #513 - Copy of EPA Proposed Effluent
(Sept. 6, 1974) Limitations and Guidelines

Bulletin #514 - Arthur D. Little Economic Analysis
(October 9, 1974) of Proposed Effluent Guidelines

Pages 1874-1878 cover a notice establishing "final effluent limitations and guidelines for existing sources and standards of performance and pretreatment standards for new sources." In addition, on pages 1879-1880, the EPA proposes pretreatment standards for existing sources.

Persons interested in commenting on these proposed pretreatment standards should submit written comments (in triplicate) to:

EPA Information Center
Environmental Protection Agency
Washington, D. C. 20460
Attention: Mr. Philip B. Wisman

Copies of this January 9, 1975 Federal Register Notice are being distributed to one individual at each member firm. Your copy is being sent to:

If you wish additional copies, please write the Institute Office.

EWD/erc

E. W. Drislane
Executive Director

BULLETIN

NO. 520

January 9, 1975

HISTORICAL SALES PROGRAM

The Historical Sales Program will be continued with the next reporting for the twelve months ended December 31, 1974. There will be no change in the reporting details from that requested in Bulletin 505 of July 8, 1974.

To repeat some of the reporting details, the following items should be considered:

1. Quantities will be reported in pieces (not units). For roll lining, each foot of length will be one piece.
2. Our accountants will report the names of the members from whom reports are received, and the number of members reporting in each of the four groups.
3. Total pieces in each group will be reported (average will not be shown).
4. "Clutch Facings" does not include gear tooth discs, automatic transmission discs, or the 8-14" dia, (3/16 to 1/2" thick) asbestos composition discs with teeth normally on the I. D.

As in the past, this data will be confidential, and as totals for each group will be shown, there is no way of determining quantities by individual member.

Please review the form and the descriptions, as they apply to this year's reporting. The Delegate or Alternate will be receiving from Marshall-Granger & Company, Certified Public Accounts, a form for completing this information. Please return it to:

Marshall Granger & Company, C.P.A.
1600 Harrison Avenue
Mamaroneck, New York 10543

If you do not wish to report these figures, no reply is necessary. Only those reporting figures will receive the industry totals when the data is summarized. A sample form and definitions are attached.

EWD/erc
Encs.

E. W. Drislane
Executive Director

Distribution: Delegates & Alternates

EXHIBIT "A"

STATISTICAL PROGRAM OF THE
FRICTION MATERIALS STANDARDS INSTITUTE, INC.

Mail to:

Marshall Granger & Co.
1600 Harrison Avenue
Yamaronneck, N.Y. 10543

=====

Pieces sold to domestic distributors, direct consumers, rebuilders and private
brands for use in the replacement market:

12 MONTHS JANUARY 1 to DECEMBER 31, 1974

Brake linings up to 3/4" nominal
thickness (See explanation for roll
lining.)

Brake blocks, nominal thickness of
3/4" and over

Disc brake linings

Clutch facings

Total pieces:

By: _____

Signature

Company

Date

DEFINITION FOR HISTORICAL SALESPIECES

The reports will show pieces of friction material, in groups as shown:

<u>Group</u>	<u>Description</u>	<u>Normal Usage</u>
Brake Lining	Friction materials up to a nominal 3/4" thickness (See note on roll lining)	Normally, <u>one piece</u> to a shoe.
Brake Blocks	Friction materials with a nominal thickness of 3/4" and over.	Normally, <u>two pieces</u> to a shoe.
Disc Brake Linings	Friction materials sold (for disc brakes) to be attached to the shoe, or sold as a unit molded, bonded or riveted to the shoe.	Normally, <u>one piece</u> to a shoe.
Clutch Facing	Friction materials of annular shape, or segments thereof.	Normally, <u>two annular pieces</u> for clutch plate.

Note: For roll lining only, consider each foot of length equals one piece.

REPLACEMENT SALES

This reporting is for domestic sales to the replacement field. Do not include export sales. This includes sales under the friction material manufacturer's own name or brand name, or brand name used by the customer, to automotive warehouse distributors, brake specialists, jobbers, direct consumers of automotive friction materials, government agencies and re-manufacturers of brakes, clutches and automatic transmissions.

Where one friction material manufacturer member purchases from another member of the Institute, each member who purchases will deduct the number of pieces purchased from the number of pieces sold in arriving at pieces sold. Purchases from non-members will not be deducted.

When a friction material manufacturer is shipping to a vehicle manufacturer, but has no reasonable way of determining if the pieces are for original equipment or replacement purposes, estimates will not be used - these pieces will not be reported. However, where a friction material manufacturer is shipping to a point known to be used for replacement, or where he stencils or otherwise identifies the pieces as being for replacement purposes, or where the shipments otherwise are obviously known to be for replacement, these pieces will be reported.

BULLETIN

N O. 5 1 9

December 4, 1974

APPLICATIONS FOR MEMBERSHIP

There has been considerable activity relative to Membership over the past several weeks.

HAYES-ALBION CORPORATION (ACTIVE MEMBERSHIP)

The Membership has voted on the application for Active Membership by Hayes-Albion Corporation. With 15 affirmative - 0 negative, the Membership has voted Hayes-Albion into Membership, with the effective date of membership to be when Hayes-Albion is producing disc brake linings in commercial quantities. It is expected that the Hayes-Albion facility in Johnson City, Tennessee will be producing friction materials in commercial quantities by April 1, 1975.

DURAMAX, S.A., MEXICO (REGIONAL MEMBERSHIP)

On November 20, 1974 we received an application for Regional Membership from Duramax, S. A. of Puente de Vigas, Mexico. They are a manufacturer of clutch facings. Their application was received in good form with the \$1,300 Annual Fee. It is their intention to use the copyrighted FMSI Numbers in marketing their products outside the United States.

Their application form is now being reviewed by the Membership Committee.

MINTEX FEDERAL LIMITED, CANADA (REGIONAL MEMBERSHIP)

The background of this application goes to Scandura's withdrawal from manufacture of friction materials in 1973. Scandura, Mintex Federal and Cantex Corporation are all subsidiaries of Mintex Limited of Great Britain, a member of the BBA Group. Cantex Corporation, a New York State resident corporation, at that time wished to continue Scandura's membership. However, the Board of Directors at the June 1973 meeting decided that since Cantex was a warehouse and marketing organization only, that they were not eligible for Membership.

I advised Mintex Federal Limited and Cantex Corporation of their decision in July 1973. After advising them I contacted Mr. Dan Easveld concerning the Cantex use of the copyrighted FMSI numbers. (The same people running Mintex Federal Limited run Cantex Corporation). Cantex was authorized to use these copyrighted FMSI numbers as they purchased blocks and disc brake linings from Members of the Institute.

Meanwhile, they were gearing the Mintex Federal Limited plant in Rexdale, Ontario, to manufacture disc brake linings (up until recently Mintex Federal Limited was not a manufacturer of friction materials). As a manufacturer, Mintex Federal Limited would be eligible for Regional Membership. If elected into Membership, they will pay the same dues as an Active Member since they wish to use the copyrighted FMSI Numbers in marketing their products in the United States. Their application is now being reviewed by the Membership Committee. No action is required on your part at this time. This bulletin is to keep the Membership informed.

EWD/erc

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 1 8

November 15, 1974

PUBLICATION: INDUSTRIAL FRICTION MATERIAL (17,000 SERIES)

The Institute has just published a new Catalog entitled INDUSTRIAL FRICTION MATERIAL. This Catalog covers the FMSI 17,000 Series of numbers, which have been relatively unknown and little used. The 17,000 Series covers materials used on cranes, shovels, rollers and other off-road applications. Most numbers are for external bands using woven lining, but there are many other shapes - primarily for internal shoes - which use molded friction articles.

The 17,000 Series dates back to World War II. To expedite publication of a catalog we published all data on hand as of July 1, 1974. Therefore, some data will be obsolete. Also, considerable data is not available. It was felt that to get this project done it was preferable to make a cut-off and get the book out without waiting for changes.

We do not have prints for all 17,000 Series Numbers! Also, the prints we do have are not necessarily complete or up-dated.

We printed a limited number of these Catalogs. We'd be happy to send one or two copies to Members on a No Charge basis. For quantities up to 100, the price will be \$1.00 each. For quantities above 100, please indicate your requirements and we will try to negotiate a lower price, by combining your order with others.

Please pass this information on to your Product Manager or to the individual responsible for catalogs.

EWD/erc
Enclosure:
cc: Delegates & Alternates
Data Book Committee
Regional Members

E. W. Drislane
Executive Director

BULLETIN

N O. 5 1 7

November 13, 1974

PUBLICATION: CLUTCH FACINGS -- LISTED IN ORDER OF SIZE

In early 1974 we printed a Catalog entitled CLUTCH FACINGS, which was essentially a master list of all FMSI Clutch Facings, in numerical sequence. That Catalog explained the listing and included drilling diagrams of clutch facings.

Miss Collins has reviewed that entire Catalog and listed all facings in the order of size. We printed this listing and by covering it are calling it: CLUTCH FACINGS - LISTED IN ORDER OF SIZE. It might well serve as a clutch facing identification catalog.

Because we initially printed at low volume locally, these Catalogs will cost \$1.50 each in small quantities. (By small quantities, I mean under 100). If I were to receive orders in greater quantities, I would try to get better prices. Frankly, in quantities over 1,000 we probably could market these at \$.30 to \$.40 each. If any member is interested in quantities over 100 I will try to assemble orders and get a price.

If members wish a few individual copies, we would be happy to provide them at No Charge. Please pass this copy on to your Product Manager or the individual responsible for Cataloging to see whether there is an interest in such a listing.

EWD/erc
Enclosure:
cc-Delegates & Alternates
Data Book & Technical Committee
Regional Members

E. W. Drislane
Executive Director

BULLETIN

NO. 516C

December 4, 1974

PROPOSED AMENDMENTS TO EPA EMISSIONS STANDARDS

We have issued earlier Bulletins 516, 516A, and 516B concerning the proposed amendments to the EPA emissions standards. While we had a few verbal comments on these proposals there was no written comment sent to the office that we could incorporate into a letter to the EPA.

The cut-off date for comments was December 5, 1974. After discussion with Mr. I. H. Weaver, Chairman of our Asbestos Study Committee, I prepared the attached memo to EPA, and sent it on its way yesterday.

In addition to the waste disposal problem, an area for concern is that some of your customers ("fabricators" in the proposed amendments) who do subsequent drilling, grinding or cutting of friction materials are covered by these proposed revisions to the national emissions standards.

1. When an assembler grinds or drills or cuts
2. When a debonder burns off the linings
3. When any assembler, debonder or other disposes of friction material waste.

Without any comments from the manufacturers or fabricators, these proposed amendments will become the standards. If your customers are not aware of the problem, perhaps they, or the EPA, will fault the manufacturers for not having alerted them.

The following notices in the Federal Register cover these national emissions standards for asbestos:

April 6, 1973	National Emissions Standards
May 3, 1974	Clarifying Revisions
October 25, 1974	Proposed Amendments

If you wish a copy of any of these notices, we will be happy to send you a copy. In the meanwhile, it is felt that your customers who do subsequent work on these products should be advised on the scope of these proposed amendments.

EWD/erc
Enclosure:

E. W. Drislane
Executive Director

FRICTION MATERIALS STANDARDS INSTITUTE, INC.

BERGEN MALL OFFICE CENTER

E. 210 ROUTE 4

PARAMUS, N. J. 07652

December 3, 1974

Emissions Standards and Engineering Division
 Environmental Protection Agency
 Research Triangle Park
 North Carolina 27711

Attention: Mr. Don R. Goodwin

Gentlemen:

The Friction Materials Standards Institute, Inc. is a trade association representing most of the manufacturers of brake linings and clutch facings in the United States, and we serve several manufacturers outside of the United States.

We wish to comment on the proposed amendments to the National Emissions Standards for asbestos, as published in the Federal Register on October 25, 1974. There are items in these proposed amendments which will have considerable impact on customers of our members (fabricators of friction products) and on land-fill operators who provide our members with waste disposal services.

61.22 (h) (2) Inclusion of fabricators of friction products in the requirements of the emissions standards

While we can understand the Administrator's reasons for including fabricators of asbestos friction products in the emissions standards, we do not feel that these fabricators are sufficiently aware of the impact of these proposed amendments on their operations, particularly in the waste disposal area. We feel your December 5, 1974 cut-off for acceptance of relevant comments was too early to get satisfactory input from those most affected by the proposed amendments. We suggest that this paragraph be postponed until fabricators of friction products have the opportunity to consider the impact of these proposed amendments on their operations.

61.22 (1) (2) The requirement for warning signs on inactive waste disposal sites

This affects individuals and companies who service our members. There may be a reaction on the part of such operators which could make waste disposal sites unavailable to both manufacturers and fabricators. Many operators and developers plan their land use with the intention of later re-sale. These warning signs could be required forever on inactive waste disposal sites and this would effectively remove them from future development. We recommend this requirement for warning signs at inactive waste disposal sites be reconsidered.

Sincerely,

FRICTION MATERIALS STANDARDS INSTITUTE

LWD/lmc

E. W. Drislane
 Executive Director

FMSI 17929

BULLETIN

NO. 516B

November 15, 1974

PROPOSED AMENDMENTS TO EPA EMISSIONS STANDARDS

On October 29, 1974 and November 5, 1974 we issued Bulletins 516 and 516A concerning the proposed amendments to the EPA Emissions Standards. The impact of these proposed amendments may not be fully understood, but they are quite far-reaching, and they may create problems in the solid waste disposal area.

FENCING

First, I must correct Bulletin No. 516A, where it stated that "--- all such sites must be fenced."

1. In the case of active waste disposal sites, fencing is not required provided 6" (15cm.) of compacted non-asbestos containing cover is applied at least once every 24 hour period.
2. In the case of inactive waste disposal sites, fencing is not required provided:
 - (A) 6" (15cm.) of compacted non-asbestos containing cover is applied with a cover of vegetation, or
 - (B) 2' (60cm.) of compacted non-asbestos containing cover is applied without a vegetation cover.

"NO VISIBLE EMISSIONS"

The proposed standards state "no visible emissions" during the disposal - collecting, packaging, transporting or dumping (unless either the specified wetting or pelletizing methods are used).

Where they say "no visible emissions" at the disposal site, they interpret this to mean not just the borderline but anywhere in the dump.

DE-BONDING OPERATIONS

De-bonding operations by re-builders are considered fabricating operations and the materials removed must be disposed of in accordance with the procedure for manufacturers and fabricators. The re-builders with de-bonding operations are fabricators and it is proposed that they be covered.

THE EXCEPTION FOR BRAKE SHOE RADIUS GRINDING

Where the EPA is making an exception (i.e., not covering) brake shoe radius grinding, that is only when brake shoe radius grinding is done at the garage or shop actually installing the shoes on a vehicle. Where brake shoe radius grinding is done by a manufacturer or fabricator, that operation is not an exception.

WASTE DISPOSAL SITE SIGNS - INACTIVE SITES

There will be a problem where a site has been filled by a developer and the inactive site must have Asbestos Waste Disposal Sign posted thereon. This may make it difficult for a developer to market the property and in turn make it impossible for a manufacturer or fabricator to use this disposal site.

ACTION

There are many problems for asbestos friction materials manufacturers with these proposed amendments, particularly on disposal of solid waste. It is suggested that the Standards (sent with Bulletin 516) be reviewed by those responsible for asbestos control in the factory, and that comments be sent (in triplicate), not later than December 5, 1974. to:

Emissions Standards and Engineering Division
Environmental Protection Agency
Research Triangle Park, North Carolina 27711
Attention: Mr. Don Goodwin.

If you need additional copies of the proposed amendments please let me know. If you would rather have FMSI respond, please send your written comments to the Institute to arrive no later than December 2, 1974.

EWD/erc
cc- Delegates, Alternates
Asbestos Study Committee

E. W. Drislane
Executive Director

B U L L E T I N

N O 5 1 6 A

November 5, 1974

PROPOSED AMENDMENTS TO EPA EMISSIONS STANDARDS

On October 29, 1974 we issued Bulletin No 516 concerning the EPA Emissions Standards and we sent one copy of the notice as it appeared in the Federal Register to one person for each Member. Mr. I. H. Weaver, Chairman of our Asbestos Study Committee, has condensed the more important items of concern to friction materials manufacturers and his comments follow:

It is proposed to extend coverage of the standard to fabrication of friction products, except those operations that primarily install asbestos friction materials on motor vehicles. Brake shoe radius-grinding is specifically ~~excepted~~ in the rationale on Page 38065.

Waste disposal requirements are spelled out in considerable detail. It appears that if there are no visible emissions with existing waste disposal methods, no change will be required. However, if existing methods entail visible emissions, then one or the other of two alternates must be pursued:

- a. Wetting with water and sealing the wetted waste into impermeable containers labeled to provide notice that a hazardous material is contained, and depositing the filled containers at a disposal site.
- b. Pelletizing into non-friable pellets and depositing at a disposal site.

Incineration of containers such as paper or plastic bags that previously contained asbestos will be prohibited.

Warning signs will be required at waste disposal sites to alert the public of the potential asbestos hazard, and all such sites must be fenced.

In the event there are visible emissions from waste disposal sites, one of the following alternates must be followed:

- a. Cover with 15 centimeters of non-asbestos-containing material, and establish cover of vegetation adequate to control erosion.
- b. Cover with 60 centimeters of non-asbestos-containing material and maintaining such cover in an erosion-free condition.

EWD/erc
cc-Delegates, Alternates
Asbestos Study Committee

E. W. Drislane
Executive Director

BULLETIN

N O. 5 1 6

October 29, 1974

PROPOSED AMENDMENTS TO EPA EMISSIONS STANDARDS

On October 25, 1974 the EPA published proposed amendments to their National Emissions Standards. To avoid confusion: these are EPA proposals (not OSHA). They concern the requirements of "no visible emissions" into the environment.

While these proposed amendments are concerned primarily with the demolition and removal of "friable asbestos materials", there are at least two proposals affecting the friction materials business.

One is that fabricators of friction products (such as re-builders) would come under the provisions of these regulations, whereas currently the manufacturers are covered. A more important item is that proposals are made in the solid waste disposal area which should affect all manufacturers.

A copy of these proposed amendments for your company is being sent to:

The foregoing is for your information.

EWD/erc
cc-Delegates, Alternates
Asbestos Study Committee

E. W. Drislane
Executive Director

BULLETIN

NO. 515

October 25, 1974

HAYES-ALBION CORPORATION - APPLICATION FOR MEMBERSHIP

An application for Active Membership was received from Hayes-Albion Corporation, Jackson, Michigan. The application was received in good form with the required one-time initiation fee of \$1,000. The Membership Committee recommended acceptance of this application and it is now being reviewed by the Board of Directors.

The Hayes-Albion entrance into the friction materials field is somewhat unique. Illinois Central Industries, parent of the Abex Corporation, was ordered by the FTC to form a new friction materials competitor as a result of the ICI acquisition of Midas-International. Hayes-Albion, an established manufacturer of automotive parts, will be the new friction materials manufacturer.

Hayes-Albion will finish their factory in Johnson City, Tennessee in December 1974.

They expect to start production in the February-April 1975 period. For this reason, they are not currently qualified for Membership, since a Member must actually be manufacturing friction materials in commercial quantities. Because of the uniqueness of their entrance into this industry, the Membership Committee recommended approval of their application, with the condition that their Membership will start when they are actually manufacturing friction materials in commercial quantities. Your Board of Directors is now reviewing the Committee's recommendations.

No action is called for by the Membership at this time. This is strictly to keep the Membership posted on this application.

EWD/erc
cc: Alternates & Delegates

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 1 4

October 9, 1974

ARTHUR D. LITTLE STUDY - ECONOMIC ANALYSIS OF
PROPOSED EFFLUENT GUIDELINES - THE ASBESTOS
PRODUCT MANUFACTURING INDUSTRY

On September 6, 1974 we distributed Bulletin #513 with the EPA's "Proposed Effluent Guidelines for the Asbestos Manufacturing Point Source Category" (Certain Sub Categories). With that bulletin we advised that we were trying to get copies of the Arthur D. Little report.

We have just received copies from the EPA and are distributing one copy to each Member. Your copy is being sent to:

If you wish additional copies, please contact:

EPA Information Center
Environmental Protection Agency
Washington, D. C. 20460
Att: Mr. P. B. Wisman

EWD/erc
Enclosure:

E. W. Drislane
Executive Director

Copies sent to all names below

X Mr. E. H. Feierabend
Friction Products Group
Abex Corporation
Winchester, Va. 22601

X Mr. D. E. Stone
Friction Materials Division
Bendix Corporation
P.O. Box 238
Troy, N.Y. 12181

X Mr. William Simon
Prassbestos Manufacturing Corp.
45 East 5 Street
Paterson, N.J. 07524

X Mr. E. R. Zacharias
Carlisle Corporation
Molded Materials Division
P.O. Box P
Ridgway, Pa. 15853

X Mr. J. A. Penberthy
Safeguard Manufacturing Corp.
P.O. Box 985
Tappahannock, Va. 22560

X Mr. W. M. Sleeth
Royal Industries Brake Products
Stewart Lane
Danville, Ky. 40422

X Mr. L. E. May
World Bestos Company, Division of
The Firestone Tire & Rubber Company
1112 South 25 Street
New Castle, Ind. 47362

X Mr. F. W. Barton, Jr.
Reddaway Mfg. Co., Inc.
32 Euclid Avenue
Newark, N.J. 07105

X Mr. T. Terrell
Molded Industrial Friction Corp.
327 Walnut Street
Prattville, Ala. 36707

X Mr. J. Clegg
The S. K. Wellman Corporation
200 Egbert Road
Bedford, Ohio 44146

X Mr. W. K. Knight
Grizzly Friction Products
Maremont Corporation
700 West Caroline Street
Paulding, Ohio 45879

X ~~Mr. E. L. Werner~~
~~H. K. Porter Corp., Inc.~~
~~Thermoid Division~~
~~601 Grant Street~~
~~Pittsburgh, Pa. 15219~~

*Mr. E. P. Stoff
H. K. Porter Co. Inc.
Thermoid Division
Southern Bldg. Assoc.
P. O. Box 100
10/47*

X Mr. J. H. Marsh
Raybestos-Manhattan, Inc.
205 Middle Street
Bridgeport, Conn. 06603

X Mr. L. Burgess
Wheeling Brake Block Mfg. Co.
100 West Boyd Avenue
Bridgeport, Ohio 43912

X Mr. R. J. Kick
Staff Engineer Products Service
Delco-Moraine Division
General Motors Corporation
1420 Wisconsin Boulevard
Dayton, Ohio 45401

X Mr. J. Gallagher
Thiokol Chemical Corporation
Panelyte Industrial Division
Enterprise Avenue
Trenton, N.J. 08604

X Mr. Stuart Comins
Auto Friction Corporation
651 Andover Street
Lawrence, Mass. 01842

~~Mr. H. H. Knoll~~
~~Chemical Division~~
~~Chrysler Corporation~~
~~947 W. Jefferson~~
~~Trenton, Mich. 48483~~

X Mr. F. T. Gatke
Gatke Corporation
228 North La Salle Street
Chicago, Ill. 60601

X Mr. T. J. Laher
Lasco Brake Products Corporation, Ltd.
2615 Magnolia Street
Oakland, Calif. 94607

BULLETIN

NO. 513

September 6, 1974

PROPOSED EFFLUENT LIMITATIONS AND GUIDELINES FOR THE ASBESTOS MANUFACTURING
POINT SOURCE CATEGORY (CERTAIN SUB CATEGORIES)

Enclosed is a copy of the Proposed Effluent Limitations and Guidelines for the Asbestos Manufacturing Point Source Category - including the friction materials business. The industries referred to are the textile, friction materials, and sealing devices segment of the asbestos manufacturing point source category.

Originally EPA promulgated effluent limitations guidelines for asbestos manufacturing point source categories on February 26, 1974. The sub-categories at that time were asbestos cement pipe, sheet, paper, millboard, roofing and floor tiles.

This August 29, 1974 notice proposes to amend the earlier regulations by adding the following sub-categories:

- Coating or finishing of asbestos textiles
- Solvent recovery
- Vapor Absorption
- Wet Dust Collection

There are two reports covering point sources including the friction materials industry:

Sverdrup & Parcel: "Development Document for Proposed Effluent Limitations Guidelines and New Source Performance Standards for the Textile, Friction Materials and Sealing Devices Segment of the Asbestos Manufacturing Point Source Category"

Arthur D. Little: "Economic Analysis of Proposed Effluent Guidelines - The Asbestos Products Manufacturing Industry."

We had earlier sent one copy of the Sverdrup & Parcel report to each Member

We are trying to get ahold of copies of the Arthur D. Little report for a similar distribution. However if you wish to get a copy directly you may try:

EPA Information Center
Environmental Protection Agency
Washington, D. C. 20460
Attention: Mr. P. B. Wisman

September 6, 1974

Comments on these proposed regulations are requested. Please see page 31596 of the notice. If comments are made directly to the EPA, please send a copy to the Institute Office. If Committee Members or others feel the Institute should reply, please let us have your comments directly.

EWD/erc
Enclosure:
cc-Delegates & Alternates
Asbestos Study Committee

E. W. Drislane
Executive Director

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 + M. L. G.
 + H. L. G.
 + J. L. G.
 + K. L. G.
 + L. L. G.
 + M. L. G.
 + N. L. G.
 + O. L. G.
 + P. L. G.
 + Q. L. G.
 + R. L. G.
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 + T. L. G.
 + U. L. G.
 + V. L. G.
 + W. L. G.
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 + Y. L. G.
 + Z. L. G.

E. H. J. J. J.
 D. E. J. J. J.
 W. J. J. J. J.
 E. R. J. J. J.
 J. A. J. J. J.
 W. M. J. J. J.
 L. E. J. J. J.
 F. W. J. J. J.
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 F. J. J. J. J.
 T. J. J. J. J.

THURSDAY, AUGUST 29, 1974

WASHINGTON, D.C.

Volume 39 ■ Number 169

PART II



ENVIRONMENTAL PROTECTION AGENCY

ASBESTOS MANUFACTURING POINT SOURCE CATEGORY

Proposed Effluent Limitations and
Guidelines for Certain Subcategories

the engineering aspects of the application of various types of control techniques, process changes, non-water quality environmental impact (including energy requirements) and other factors.

The data upon which the above analysis was performed included EPA permit applications, EPA sampling and inspections, consultant reports, and industry submissions.

The pretreatment standards proposed herein are intended to be complementary to the pretreatment standards proposed for existing sources under 40 CFR Part 128. The basis for such standards is set forth in the FEDERAL REGISTER of July 19, 1973, 38 FR 19236. The provisions of Part 128 are equally applicable to sources which would constitute "new sources," under section 306 if they were to discharge pollutants directly to navigable waters, except for § 128.133. That section provides a pretreatment standard for "incompatible pollutants" which requires application of the "best practicable control technology currently available," subject to an adjustment for amounts of pollutants removed by the publicly owned treatment works. Since the pretreatment standards proposed herein apply to new sources, §§ 427.86, 427.96, 427.106 and 427.116 below amend § 128.133 to specify the application of the standard of performance for new sources rather than the "best practicable" standard applicable to existing sources under sections 301 and 304(b) of the Act.

(2) Summary of conclusions with respect to the coating or finishing of asbestos textiles subcategory (Subpart H), the solvent recovery subcategory (Subpart I), the vapor absorption subcategory (Subpart J), and the wet dust collection subcategory (Subpart K), of the asbestos manufacturing point source category.

(i) *Categorization.* For purposes of developing effluent limitations guidelines for existing sources and standards of performance for new sources, the textile, friction materials and sealing devices segment of the asbestos manufacturing point source category has been divided into four subcategories: Coating or finishing of asbestos textiles, solvent recovery, vapor absorption, and wet dust collection. The subcategories, largely based on the source of waste waters and their nature, are only indirectly related to raw materials and finished products. In the first subcategory, coating or finishing of asbestos textiles, the waste waters may be considered near true process wastes, while in the other three subcategories, waste waters result from essentially ancillary operations (e.g., waste or by-product recovery and air emissions control). Three of the subcategories are encountered in the textile segment of the industry and three are encountered in the friction materials segment. The actual textile weaving and sealing devices segments are dry industries and do not generate waste waters.

(1) Subpart H—Coating or Finishing of Asbestos Textiles Subcategory: Much of the asbestos textiles production is coated or impregnated with various ma-

terials to impart particular properties to the finished product or to eliminate the problem of airborne particles in further handling of the textiles. Wastes may be generated by spills or by dumps of remaining coating solutions and equipment cleanup at the end of a run.

(2) Subpart I—Solvent Recovery Subcategory: In some textile coating and friction materials operations, the solvents driven off in drying ovens are captured by adsorption onto activated carbon. The solvents are then removed from the activated carbon by steam stripping and recovered by decanting or distilling the condensate. Waste waters are generated by this recovery of solvents.

(3) Subpart J—Vapor Absorption Subcategory: In some drying operations the solvents driven off are removed from the exhaust gases by absorption in wet scrubbers. No attempt is made to recover the solvents and they are discharged as a component of the waste waters from the wet scrubbers.

(4) Subpart K—Wet Dust Collection Subcategory: Many of the finishing operations associated with friction materials (e.g., grinding and drilling) generate large amounts of air-borne particulates. Quality control of ambient air within the plant is attained by use of positive ventilation and results in a potential atmospheric discharge with a high level of particulates. In some facilities, use of wet scrubbers to remove particulates prior to discharge to the atmosphere results in a waste water which in turn is discharged.

(i) *Waste characteristics.* The pollutants contained in the raw waste waters represent either materials lost through direct processing of raw materials or through ancillary operations and are found in both the dissolved and particulate state. The first state is largely represented by various organic solvents used in the industry, while the latter is represented by fillers (pigments, metals, etc.) and binders (primarily resins) incorporated into the products. The great dissimilarities of the wastes among the subcategories require individual consideration of their characteristics.

The volume of waste waters generated in the coating (impregnating) of asbestos textiles cannot be related directly to the quantity of textiles treated, since it varies with the number and length of runs and the particular coatings being applied on a given day. Total volume, however, is expected to be less than 750 liters (200 gallons) per day for a coating operation. The wide variety of coatings applied is tailored to the specifications of the customer, and thus the specific composition of the waste water is quite variable. In general, the waste is high in COD (largely contributed by solvents) and suspended solids (primarily pigments, metals and other fillers incorporated into the coatings).

The quantity of waste water from solvent recovery operations is dependent on the type and size of the equipment and, since it arises from an activated carbon regeneration process, cannot be

related directly to the level of production in a plant. The discharge is normally steady and a typical volume is of the order of 38,000 liters (10,000 gallons) per day. The waste waters may contain solvents and/or other organic materials that are either evaporated from the product or generated during the recovery process. The suspended solids level is normally very low and asbestos fibers should be absent. Typical waste water characteristics from one solvent recovery operation are: BOD₅ 1125 mg/l, COD 1930 mg/l, and suspended solids 0 mg/l.

Waste waters from the vapor absorption unit are discharged about once every three weeks for a 18 hour period. The rate of discharge is approximately 3.8 liters per second (60 gallons per minute) for a total volume per period of approximately 200 cubic meters (58,000 gallons). The effluent waste load is estimated to be 410 kg (900 pounds), of COD, representing a concentration of approximately 1860 mg/l; and the pH of the waste will be above 9.5 due to charging of the scrubber with 22.7 kg (50 pounds) of sodium hydroxide.

The water use rate in wet dust collectors varies from 0.06 to 1.3 liters per second per cubic meter per minute of air scrubbed (0.5 to 10 gpm per 1,000 scfm) and the plant air systems served by wet scrubbers range from 280 to 1,700 cubic meters per minute (10,000 to 60,000 scfm). The resulting waste water volumes are from 190 to 570 cubic meters (50,000 to 150,000 gallons) per day. The waste waters from wet dust collectors are slurries of the dust emanating from grinding and drilling operations used in finishing friction products and are characterized by high suspended solids. Since friction materials are specifically designed to be hydrophobic dissolved solids content should be low.

(iii) *Origin of waste water pollutants.* The waste water pollutants among the four subcategories are of such diverse origin as to require independent discussion of each subcategory. None of the waste waters or waste water pollutants are true process wastes. The wastes and waste waters associated with the coating and finishing of asbestos textiles most closely approximate true process wastes in that they are associated with the actual production line for manufacture of the finished product. In the other three subcategories the waste waters and waste water pollutants originate in ancillary operations.

Within the coating and finishing of asbestos textiles subcategory, the waste waters originate from two sources: (1) washdown of spills (primarily dragout from the coating tanks) and the small remnants of coating solutions dumped at the end of runs, and (2) cleanup of the equipment following runs. The pollutants represent the entire spectrum of materials (solvents, solutes and fillers) found in the various coating solutions.

The solvent recovery subcategory represents an ancillary operation associated with some textile coating, friction material and sheet gasket material facilities. Solvents used in the manufacture of the products are driven off in drying

Capital and annual costs for the segments of the industry affected are low. For 1977, costs are incurred by one sheet gasket materials plant (solvent recovery subcategory). For 1983, costs are incurred by one sheet gasket and four friction materials plants (solvent recovery and wet dust collection subcategories respectively).

(vi) *Energy requirements and non-water quality environmental impacts.* Increase in energy requirements for implementation of the recommended levels of control are associated primarily with two subcategories, solvent recovery and vapor absorption. Within the solvent recovery subcategory, pumping and aeration for biological treatment would consume approximately 350,000 kwh/yr of electricity and pumping for the carbon column unit would consume approximately 40,000 kwh/yr. These represent added energy use for the subcategory. The added energy requirement for the vapor absorption subcategory is that of fuel (natural gas or oil) to furnish approximately 5 to 5 billion BTU/yr for the fume incinerator. This is partially offset by elimination of the electrical consumption of the wet scrubber (50-60,000 kwh/yr) presently employed.

For the wet dust collection subcategory, the best practicable control technology available is the level of control that constitutes minimum current practice; hence, there is no effect of this level of control on energy requirements. Implementation of best available technology economically achievable through replacing wet scrubbers with bag houses reduces energy requirements by eliminating the consumption of electricity for pumping scrubber water.

Energy requirements for the coating or finishing of asbestos textiles subcategory are those associated with transportation and final disposal of the containerized wastes. At most they are several hundred gallons per year of motor fuel.

Non-water quality environmental impacts are minimal, constituting only the added sanitary landfill space required for disposal of fewer than 3,000 drums per year of containerized wastes from the textile coating subcategory.

(vii) *Economic impact analysis.* The economic impact of the guidelines for the textiles, friction materials, and sealing devices segment of the asbestos manufacturing point source category is very limited. Since many of the operations (e.g., textile weaving and sealing devices manufacture) are representative of dry industry and much of the waste water from wet operations is discharged to municipal systems, only 5 plants are affected. Affected plants include one sheet gasket material plant and four friction materials plants. None of the affected plants are expected to close due to the economic impact of the guidelines.

For the various segments of the industry the estimated net after tax returns as a percent of sales are: textiles, 3.3%; friction materials, 3.0%; and sealing devices, 5.0%. One sheet gasket plant incurs costs for implementation of BPCTA (1977) guidelines, equal to 0.7 percent of

sales. Five plants incurred costs for implementation of BATEA (1983) guidelines. The types of plants and the costs incurred as a percent of sales are: one sheet gasket plant, 1.0%, and four friction material plants, ranging from 0.65 to 1.2%. It is believed that most of the waste control costs can be recovered by increased prices. Complete recovery would require price increases of less than 2.0% for the affected plants.

The report entitled "Development Document for Proposed Effluent Limitations Guidelines and New Source Performance Standards for the Textile, Friction Materials and Sealing Devices Segment of the Asbestos Manufacturing Point Source Category" details the analysis undertaken in support of the regulation being proposed herein and is available for inspection in the EPA Information Center, Room 227, West Tower, Waterside Mall, Washington, D.C.; at all EPA regional offices, and at State water pollution control offices. A supplementary analysis prepared for EPA of the possible economic effects of the proposed regulation is also available for inspection at these locations. Copies of both of these documents are being sent to persons or institutions affected by the proposed regulation, or who have placed themselves on a mailing list for this purpose (see EPA's Advance Notice of Public Review Procedures, 38 FR 21202, August 6, 1973). An additional limited number of copies of both reports are available. Persons wishing to obtain a copy may write the EPA Information Center, Environmental Protection Agency, Washington, D.C. 20460, Attention: Mr. Philip B. Wisman.

On June 14, 1973, the Agency published procedures designed to insure that, when certain major standards, regulations, and guidelines are proposed, an explanation of their basis, purpose and environmental effects is made available to the public (38 FR 15653). The procedures are applicable to major standards, regulations and guidelines which are proposed on or after December 31, 1973, and which prescribe national standards of environmental quality or require national emission, effluent or performance standards and limitations.

The Agency determined to implement these procedures in order to ensure that the public was apprised of the environmental effects of its major standards setting actions and was provided with detailed background information to assist it in commenting on the merits of a proposed action. In brief, the procedures call for the Agency to make public the information available to it delineating the major nonenvironmental factors affecting the decision, and to explain the viable options available to it and the reasons for the option selected.

The procedures contemplate publication of this information in the FEDERAL REGISTER, where this is practicable. They provide, however, that where, because of the length of these materials, such publication is impracticable, the material may be made available in an alternate format.

The report entitled "Development Document for Proposed Effluent Limitations Guidelines and New Source Performance Standards for the Textile, Friction Materials and Sealing Devices Segment of the Asbestos Manufacturing Industry Point Source Category" contains information available to the Agency concerning the major environmental effects of the regulation proposed below, including:

(1) the pollutants presently discharged into the Nation's waterways by manufacturers of asbestos and the degree of pollution reduction obtainable from implementation of the proposed guidelines and standards (see particularly sections IV, V, VI, IX, X, and XI);

(2) the anticipated effects of the proposed regulation on other aspects of the environment including air, solid waste disposal and land use, and noise (see particularly section VIII); and

(3) options available to the Agency in developing the proposed regulatory system and the reasons for its selecting the particular levels of effluent reduction which are proposed (see particularly sections VI, VII, and VIII).

The supplementary report entitled "Economic Impact of 1972 Federal Water Pollution Control Amendments on the Asbestos Industry" contains an estimate of the cost of pollution control requirements and an analysis of the possible effects of the proposed regulation on prices, production levels, employment, communities in which asbestos manufacturing plants are located, and international trade. In addition, the Development Document describes, in section VIII, the cost and energy consumption implications of the proposed regulations.

The two reports described above in the aggregate exceed 100 pages in length and contain a substantial number of charts, diagrams, and tables. It is clearly impracticable to publish the material contained in these documents in the FEDERAL REGISTER. To the extent possible, significant aspects of the material have been presented in summary form in foregoing portions of this preamble. Additional discussion is contained in the following analysis of comments received and the Agency's response to them. As has been indicated, both documents are available for inspection at the Agency's Washington, D.C. and regional offices and at State water pollution control agency offices. Copies of each have been distributed to persons and institutions affected by the proposed regulations or who have placed themselves on a mailing list for this purpose. Finally, so long as the supply remains available, additional copies may be obtained from the Agency as described above.

When this regulation is promulgated, revised copies of the Development Document will be available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Copies of the Economic Analysis will be available through the National Technical Information Service, Springfield, Virginia 22151.

- Sec.
427.82 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 427.83 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 427.84 Reserved.
- 427.85 Standards of performance for new sources.
- 427.86 Pretreatment standards for new sources.
- Subpart I—Solvent Recovery Subcategory**
- 427.90 Applicability; description of the solvent recovery subcategory.
- 427.91 Specialized definitions.
- 427.92 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 427.93 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 427.94 Reserved.
- 427.95 Standards of performance for new sources.
- 427.96 Pretreatment standards for new sources.
- Subpart J—Vapor Absorption Subcategory**
- 427.100 Applicability; description of the vapor absorption subcategory.
- 427.101 Specialized definitions.
- 427.102 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 427.103 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 427.104 [Reserved]
- 427.105 Standards of performance for new sources.
- 427.106 Pretreatment standards for new sources.
- Subpart K—Wet Dust Collection**
- 427.110 Applicability; description of the wet dust collection subcategory.
- 427.111 Specialized definitions.
- 427.112 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.
- 427.113 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.
- 427.114 [Reserved]
- 427.115 Standards of performance for new sources.
- 427.116 Pretreatment standards for new sources.

AUTHORITY: Secs. 301, 304 (b) and (c), 306(b), 307(c), Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251, 1311, 1314 (b) and (c), 1316(b), 1317(c), 86 Stat. 816 et seq.; P.L. 92-500.

Subpart H—Coating or Finishing of Asbestos Textiles

§ 427.80 Applicability; description of the coating or finishing of asbestos textiles subcategory.

The provisions of this subpart are applicable to discharges resulting from the process of coating or impregnating asbestos textiles with various materials to impart specific desired qualities to the finished product.

§ 427.81 Specialized definitions.

For the purpose of this subpart:

(a) Except as provided below, the general definitions, abbreviations and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 427.82 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

In establishing the limitations set forth in this section, EPA took into account all information it was able to collect, develop and solicit with respect to factors (such as age and size of plant, raw materials, manufacturing processes, products produced, treatment technology available, energy requirements and costs) which can affect the industry subcategory and effluent levels established. It is, however, possible that data which would affect these limitations have not been available and, as a result, these limitations should be adjusted for certain plants in this industry. An individual discharger or other interested person may submit evidence to the Regional Administrator (or to the State, if the State has the authority to issue NPDES permits) that factors relating to the equipment or facilities involved, the process applied, or other such factors related to such discharger are fundamentally different from the factors considered in the establishment of the guidelines. On the basis of such evidence or other available information, the Regional Administrator (or the State) will make a written finding that such factors are or are not fundamentally different for that facility compared to those specified in the Development Document. If such fundamentally different factors are found to exist, the Regional Administrator or the State shall establish for the discharger effluent limitations in the NPDES permit either more or less stringent than the limitations established herein, to the extent dictated by such fundamentally different factors. Such limitations must be approved by the Administrator of the Environmental Protection Agency. The Administrator may approve or disapprove such limitations, specify other limitations, or initiate proceedings to revise these regulations. The following limitations establish the quantity or quality of pollutants or pollutant properties controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best practicable control technology currently available; there shall be no discharge of waste water pollutants to navigable waters.

§ 427.83 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties controlled by this section, which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable; there shall be no discharge of waste water pollutants to navigable waters.

§ 427.84 [Reserved]

§ 427.85 Standards of performance for new sources.

The following standards of performance establish the quantity or quality of pollutants or pollutant properties which may be discharged by a new source subject to the provisions of this subpart: there shall be no discharge of waste water pollutants to navigable waters.

§ 427.86 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act for a source within the coating or finishing of asbestos textiles subcategory, which is a user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to the navigable waters), shall be the standard set forth in 40 CFR Part 128, except that, for the purpose of this section, 40 CFR 128.133 shall be amended to read as follows:

In addition to the prohibitions set forth in 40 CFR 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works shall be the standard of performance for new sources specified in 40 CFR 427.85: *Provided*, That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall, except in the case of standards providing for no discharge of pollutants, be correspondingly reduced in stringency for that pollutant.

Subpart I—Solvent Recovery Subcategory

§ 427.90 Applicability; description of the solvent recovery subcategory.

The provisions of this subpart are applicable to discharges resulting from the process of solvent recovery in the manufacture of asbestos products.

§ 427.91 Specialized definitions.

For the purpose of this subpart:

(a) Except as provided below, the general definitions, abbreviations and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 427.92 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

In establishing the limitations set forth in this section, EPA took into account all information it was able to collect, develop and solicit with respect to

§ 427.103 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable: there shall be no discharge of waste water pollutants to navigable waters.

§ 427.104 [Reserved]

§ 427.105 Standards of performance for new sources.

The following standards of performance establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a new source subject to the provisions of this subpart: there shall be no discharge of waste water pollutants to navigable waters.

§ 427.106 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act for a source within the vapor absorption subcategory, which is a user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to the navigable waters), shall be the standard set forth in 40 CFR 128, except that, for the purpose of this section, 40 CFR 128.133 shall be amended to read as follows:

In addition to the prohibitions set forth in 40 CFR 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works shall be the standard of performance for new sources specified in 40 CFR 427.105: *Provided*, That, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall, except in the case of standards providing for no discharge of pollutants, be correspondingly reduced in stringency for that pollutant.

Subpart K—Wet Dust Collection

§ 427.110 Applicability; description of the wet dust collection subcategory.

The provisions of this subpart are applicable to discharges resulting from the removal of dust (particulates) from atmospheric emissions by means of wet scrubbers.

§ 427.111 Specialized definitions.

For the purpose of this subpart:

(a) Except as provided below, the general definitions, abbreviations and methods of analysis set forth in 40 CFR Part 401 shall apply to this subpart.

§ 427.112 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available.

In establishing the limitations set forth in this section, EPA took into account all information it was able to collect, develop and solicit with respect to factors (such as age and size of plant, raw materials, manufacturing processes, products produced, treatment technology available, energy requirements and costs) which can affect the industry subcategorization and effluent levels established. It is, however, possible that data which would affect these limitations have not been available and, as a result, these limitations should be adjusted for certain plants in this industry. An individual discharger or other interested person may submit evidence to the Regional Administrator (or to the State, if the State has the authority to issue NPDES permits) that factors relating to the equipment or facilities involved, the process applied, or other such factors related to such discharger are fundamentally different from the factors considered in the establishment of the guidelines. On the basis of such evidence or other available information, the Regional Administrator (or the State) will make a written finding that such factors are or are not fundamentally different for that facility compared to those specified in the Development Document. If such fundamentally different factors are found to exist, the Regional Administrator or the State shall establish for the discharger effluent limitations in the NPDES permit either more or less stringent than the limitations established herein, to the extent dictated by such fundamentally different factors. Such limitations must be approved by the Administrator of the Environmental Protection Agency. The Administrator may approve or disapprove such limitations, specify other limitations, or initiate proceedings to revise these regulations. The following limitations establish the quantity or quality of pollutants or pollutant properties which may be discharged by a point source subject to the provisions of this subpart after application of the best practicable control technology currently available:

Effluent Characteristic	Effluent Limitations	
	Maximum for any one day	Average daily values for thirty consecutive days shall not exceed
	mg/l	
TSS	60	30
pH	Within the range 6.0 to 9.0	

§ 427.113 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable.

The following limitations establish the quantity or quality of pollutants or pollutant properties which may be discharged by a point source subject to the provisions of this subpart after application of the best available technology economically achievable: there shall be no discharge of waste water pollutants to navigable waters.

§ 427.114 [Reserved]

§ 427.115 Standards of performance for new sources.

The following standards of performance establish the quantity or quality of pollutants or pollutant properties, controlled by this section, which may be discharged by a new source subject to the provisions of this subpart: there shall be no discharge of waste water pollutants to navigable waters.

§ 426.116 Pretreatment standards for new sources.

The pretreatment standards under section 307(c) of the Act for a source within the wet dust collection subcategory, which is a user of a publicly owned treatment works (and which would be a new source subject to section 306 of the Act, if it were to discharge pollutants to the navigable waters), shall be the standard set forth in 40 CFR 128, except that, for the purpose of this section, 40 CFR 128.133 shall be amended to read as follows:

In addition to the prohibitions set forth in 40 CFR 128.131, the pretreatment standard for incompatible pollutants introduced into a publicly owned treatment works shall be the standard of performance for new sources specified in 40 CFR 427.115; provided that, if the publicly owned treatment works which receives the pollutants is committed, in its NPDES permit, to remove a specified percentage of any incompatible pollutant, the pretreatment standard applicable to users of such treatment works shall, except in the case of standards providing for no discharge of pollutants, be correspondingly reduced in stringency for that pollutant.

[FR Doc.74-19639 Filed 8-28-74; 8:45 am]

BULLETIN

N O. 5 1 2

SEPTEMBER 3, 1974

PASTA CLUTCH, S.A. - REGIONAL MEMBERSHIP

On August 7, 1974 the Membership was advised of the application for Regional Membership filed by Pasta Clutch, S.A., and ballots were enclosed.

This is to advise that Pasta Clutch, S.A. was voted into Regional Membership by an affirmative vote in excess of the 75% required. Seventeen members voted yes, with two members not voting.

The address of the new Regional Member is:

Pasta Clutch, S.A.
Insurgentes Sur 933-70. Piso
Mexico, D. F.

Pasta Clutch, S.A. is on the same (higher) fee schedule as a United States Member with rights to use the copyrighted FMSI numbers for marketing their products in the United States.

EWD/erc

CC. Delegates & Alternates

E. W. Drislane
Executive Director

BULLETIN

5 1 1

August 20, 1974

FEDERAL MOTOR VEHICLE SAFETY STANDARD - 121 - AIR BRAKE SYSTEMS

At the June 1974 meeting, a summary of FMVSS 121, and the various amendments which were adopted, were discussed. The office was directed to distribute copies to the Membership. Copies had earlier been distributed to the Brake Performance Study Committee.

This summary is arranged in 17 pages, starting with the S1 paragraph, Scope, and finishing with the Illustrations, Figure 2. There are four key dates showing the changes:

February 24, 1972	New Standard Adopted
June 24, 1972	Several amendments
January 3, 1974	Several amendments
May 17, 1974	Several amendments

We are not including corrections under separate revisions but rather have entered the corrections with the applicable amendments.

For those not familiar with FMVSS 121 it is the air brake systems standard for new vehicles. There is no Federal standard for replacement brake blocks.

EWD/erc
Enclosure:

E. W. Drislane
Executive Director

BULLETIN

510

August 14, 1974

FEDERAL MOTOR VEHICLE SAFETY STANDARD - 105a - HYDRAULIC BRAKE SYSTEMS

At the June 1974 meeting, a summary of FMVSS 105a, and the various amendments which were adopted, were discussed. The office was directed to distribute copies to the Membership. Copies had earlier been distributed to the Brake Performance Study Committee.

This distribution was held up slightly due to the fact that NHTSA adopted additional amendments on July 15, 1974.

This summary is arranged in 28 pages, starting with the S1 paragraph, Scope, and finishing with the Illustrations, Figure 11. There are four key dates showing the changes:

September 2, 1972	New Standard Adopted
May 18, 1973	Several amendments
February 22, 1974	Several amendments
July 15, 1974	Several amendments

We are not including corrections under separate revisions but rather have entered the corrections with the applicable amendments.

For those not familiar with FMVSS 105a it is the hydraulic brake systems standard for new vehicles. There is no Federal standard for replacement brake linings. That is under study as Docket 1-4, "Brake Shoe and Pad Assemblies".

We will shortly be distributing a similar summary for Standard 121, Air Brake Systems.

EWD/erc
Enclosure:

E. W. Drislane
Executive Director

تذکرہ محدثان ہند

John J. Williams, "Intelsat" system" is a portion of a service brake system that automatically controls the degree of rotational wheel slip at one or more road wheels of the vehicle during braking.

FMSI 17948

"Brake pedal" means the pedal which the driver uses to actuate the brakes, and controls or senses the brake pressure.

"Skid number" means the frictional resistance of a pavement measured in accordance with American Society for Testing and Materials Method E-274-65T at 40 mph, omitting water delivery as specified in paragraph 7.1 of that method.

"S₁₀₀₀" means the braking deceleration of a vehicle from a higher reference speed to a lower reference speed that is greater than zero.

"S₁₀₀₀ attainable in 2 miles" means the S₁₀₀₀ attainable by accelerating at

maximum rate from a standing start for 2 miles on a level surface.

"Spoke stop" means a stop resulting from the application of 200 pounds of force on the service brake pedal in 0.60 second.

"Split service brake system" means a brake system consisting of two or more subsystems actuated by a single control designed so that a leakage-type failure of a pressure component in a single subsystem (except structural failure of a housing that is common to all subsystems) shall not impair the operation of any other subsystem.

"Stopping distance" means the distance traveled by a vehicle from the point of application of force to the brake control to the point at which the vehicle reaches a full stop.

"Split service brake system" means a brake system consisting of two or more subsystems actuated by a single control designed so that a leakage-type failure of a pressure component in a single subsystem (except structural failure of a housing that is common to two or more subsystems) shall not impair the operation of any other subsystem.

"Stopping distance" means the distance traveled by a vehicle from the point of application of force to the brake control to the point at which the vehicle reaches a full stop.

"Variable proportioning brake system" means a system that automatically adjusts the braking force at the axles to compensate for vehicle static axle loading and/or dynamic weight transfer between axles during deceleration.

S6. Requirements.

S6.1 Service brake system. Each vehicle shall be manufactured with a split service brake system, and shall be capable of meeting the requirements of S5.1.1 through S5.1.6, under the conditions specified in S6, when tested according to the procedures and in the sequence in S7. If a vehicle is incapable of attaining a speed specified in S5.1.1, S5.1.2, S5.1.3, or S5.1.6 its service brakes shall be capable of stopping the vehicle from the multiple of 5 mph, that is 4 mph, to 8 mph, less than the speed attainable in 2 miles, within distances and with pedal forces that do not exceed the distances and forces specified in Table II. If a vehicle is incapable of attaining a speed specified in S5.1.4 in the time or distance interval set forth, it shall be tested at the highest speed attainable in the time or distance interval specified.

S5 Requirements.

S5.1 Service brake system.—Each vehicle shall be manufactured with a split service brake system, and shall be capable of meeting the requirements of S5.1.1 through S5.1.6, under the conditions specified in S6, when tested according to the procedures and in the sequence in S7. Except as noted in S5.1.1.2 and S5.1.1.4, if a vehicle is incapable of attaining a speed specified in S5.1.1, S5.1.2, S5.1.3, or S5.1.6, its service brakes shall be capable of stopping the vehicle from the multiple of 5 mi/h, that is 4 to 8 mi/h less than the speed attainable in 2 miles, within distances that do not exceed the corresponding distances specified in table II. If a vehicle is incapable of attaining a speed specified in S5.1.4 in the time or distance interval set forth, it shall be tested at the highest speed attainable in the time or distance interval specified.

The vehicle shall be capable of stopping from 30 and 60 mi/h within the corresponding distances specified in column I of table II. If the speed attainable in 2 miles is not less than 64 mi/h, the vehicle shall also be capable of stopping from 60 mi/h within the corresponding distance specified in column I of table II.

55.1.1.1 In the first effectiveness test, the vehicle shall be capable of stopping from 30 and 60 mi/h within the corresponding distances specified in column I of table II. If the speed attainable in 2 miles is not less than 64 mi/h, the vehicle shall also be capable of stopping from 60 mi/h within the corresponding distance specified in column I of table II.

55.1.1.2 In the second effectiveness test, the vehicle shall be capable of stopping from 30 and 60 mi/h within the corresponding distances specified in column II of table II. If the speed attainable in 2 miles is not less than 64 mi/h, the vehicle shall also be capable of stopping from 60 mi/h within the corresponding distance specified in column II of table II.

55.1.1.3 In the third effectiveness test, the vehicle shall be capable of stopping from 30 and 60 mi/h within the corresponding distances specified in column III of table II. If the speed attainable in 2 miles is not less than 64 mi/h, the vehicle shall also be capable of stopping from 60 mi/h within the corresponding distance specified in column III of table II.

55.1.1.4 In the fourth effectiveness test, the vehicle shall be capable of stopping from 30 and 60 mi/h within the corresponding distances specified in column IV of table II. If the speed attainable in 2 miles is not less than 64 mi/h, the vehicle shall also be capable of stopping from 60 mi/h within the corresponding distance specified in column IV of table II.

55.1.1.5 In the fifth effectiveness test, the vehicle shall be capable of stopping from 30 and 60 mi/h within the corresponding distances specified in column V of table II. If the speed attainable in 2 miles is not less than 64 mi/h, the vehicle shall also be capable of stopping from 60 mi/h within the corresponding distance specified in column V of table II.

55.1.1.2

In the second effectiveness test, the vehicle shall be capable of stopping from 30 and 60 mi/h within the corresponding distances specified in column II of table II. If the speed attainable in 2 miles is not less than 64 mi/h, a passenger car or other vehicle with a GVWR of 10,000 pounds or less shall also be capable of stopping from 60 mi/h within the corresponding distance specified in column II of table II.

55.1.1.3 In the third effectiveness test, the vehicle shall be capable of stopping from 30 and 60 mi/h within the corresponding distances specified in column III of table II. If the speed attainable in 2 miles is not less than 64 mi/h, the vehicle shall also be capable of stopping from 60 mi/h within the corresponding distance specified in column III of table II.

55.1.1.4 In the fourth effectiveness test, the vehicle shall be capable of stopping from 30 and 60 mi/h within the corresponding distances specified in column IV of table II. If the speed attainable in 2 miles is not less than 64 mi/h, the vehicle shall also be capable of stopping from 60 mi/h within the corresponding distance specified in column IV of table II.

55.1.1.5 In the fifth effectiveness test, the vehicle shall be capable of stopping from 30 and 60 mi/h within the corresponding distances specified in column V of table II. If the speed attainable in 2 miles is not less than 64 mi/h, the vehicle shall also be capable of stopping from 60 mi/h within the corresponding distance specified in column V of table II.

If the speed attainable in 2 miles is not less than 64 mi/h, the vehicle shall also be capable of stopping from the applicable speed attainable indicated below, within the corresponding distance specified in column I of table II.

Speed attainable in 2 miles (mi/h):	Required to stop from (mi/h)
60 to (but not including) 64	104
64 or more	109

55.1.1.4

In the fourth effectiveness test, the vehicle shall be capable of stopping from 30 and 60 mi/h within the corresponding distances specified in column IV of table II. If the speed attainable in 2 miles is not less than 64 mi/h, a passenger car or other vehicle with a GVWR of 10,000 pounds or less shall also be capable of stopping from 60 mi/h within the corresponding distance specified in column IV of table II.

If the speed attainable in 2 miles is not less than 64 mi/h, a passenger car or other vehicle with a GVWR of 10,000 pounds or less shall, in addition, be capable of stopping from the applicable speed indicated below, within the corresponding distance specified in column I of table II.

Speed attainable in 2 miles (mi/h):	Required to stop from (mi/h)
Not less than 64	104
64 or more	109

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S5.1.1.3 the following is added at the end thereof: " * * * However, a vehicle other than a passenger car with a GVWR of 8,000 pounds or greater and whose wheelbase is 151 inches or less, manufactured between September 1, 1975 and September 1, 1976, may stop within the corresponding distance specified in parentheses in column III(b) of Table II if its GVWR does not exceed 10,000 pounds, or column III(c) of Table II if its GVWR exceeds 10,000 pounds.

**SEPT 2, 1972 - ESTABLISHED
NEW STANDARD**

**MAY 18, 1973 - SEVERAL
AMENDMENTS ADOPTED**

**FEBRUARY 22, 1974-ADDITIONAL
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S5.1.2 Partial failure. In the event of a rupture or leakage-type failure in a single subsystem, other than a structural failure of a housing that is common to two or more subsystems, the remaining portion(s) of the service brake system shall continue to operate, and shall be capable of stopping a vehicle from 60 m.p.h. within distances and with pedal forces that do not exceed the distances and forces specified in Column III of Table II.

S5.1.3 Inoperative brake power assist unit or brake power unit. The service brakes shall be capable of stopping a vehicle equipped with a brake power assist unit or brake power unit with such unit rendered inoperative, from 60 m.p.h. within distances and with pedal forces that do not exceed the distances and forces specified in Column III of Table II.

S5.1.2 Partial failure.—In the event of a rupture or leakage type of failure in a single subsystem, other than a structural failure of a housing that is common

to two or more subsystems, the remaining portion(s) of the service brake system shall continue to operate, and shall be capable of stopping a vehicle from 60 mi/h within the corresponding distance specified in column IV of table II.

S5.1.3 Inoperative brake power assist unit or brake power unit.—The service brakes shall be capable of stopping a vehicle equipped with one or more brake power assist units or brake power units as specified in either S5.1.3.1 or S5.1.3.2 (if equipped with brake power assist units), and either S5.1.3.1 or S5.1.3.3 (if equipped with brake power units).

S5.1.3.1 The service brakes on a vehicle equipped with one or more brake power assist units or brake power units, with one such unit inoperative and depleted of all reserve capability, shall be capable of stopping a vehicle from 60 mi/h within the corresponding distance specified in column IV of table II.

S5.1.3.2 Brake power assist units.—The service brakes on a vehicle equipped with one or more brake power assist units, with one such unit inoperative, shall be capable of stopping a vehicle from 60 mi/h:

(a) In six consecutive stops at an average deceleration for each stop that is not lower than that specified in column I of table III, when the inoperative unit is not initially depleted of all reserve capability; and

(b) In a final stop, in a distance that does not exceed 554 ft, when the inoperative unit is depleted of all reserve capability.

S5.1.3.3 Brake power units.—(a) The service brakes of a vehicle equipped with one or more brake power units with an accumulator-type reserve system, with one such unit inoperative, shall be capable of stopping the vehicle from 60 mi/h:

(i) In 10 consecutive stops at an average deceleration for each stop that is not lower than that specified in column 2 of table III, when the inoperative unit is not initially depleted of all reserve capability; and

(ii) In a final stop, in a distance that does not exceed 554 ft, when the inoperative unit is depleted of all reserve capability.

(b) The service brakes of a vehicle equipped with one or more brake power units with a backup type system, shall be capable of stopping the vehicle from 60 mi/h in 15 consecutive stops at an average deceleration for each stop that is not lower than 18 ft/s/s.

S5.1.3 Inoperative brake power assist unit or brake power unit. The service

brakes shall be capable of stopping a vehicle equipped with one or more brake power assist units or brake power units as specified in either S5.1.3.1, S5.1.3.2 or S5.1.3.4 (if the vehicle is equipped with brake power assist units), and either S5.1.3.1, S5.1.3.3, or S5.1.3.4 (if the vehicle is equipped with brake power units).

S5.1.3.3 Brake power units. The service brakes of a vehicle equipped with one or more brake power units with an accumulator-type reserve system, with one such unit inoperative, shall be capable of stopping the vehicle from 60 mi/h—

(a) In 10 consecutive stops at an average deceleration for each stop that is not lower than that specified in column II of table III, when the inoperative unit is not initially depleted of all reserve capability; and

(b) In a final stop, in a distance that does not exceed 554 feet, when the inoperative unit is depleted of all reserve capability.

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SS.1.3.2

(b) In a final stop, at an average deceleration that is not lower than 7 fpsps for passenger cars (equivalent stopping distance 554 feet) or 6 fpsps for vehicles other than passenger cars (equivalent stopping distance 646 feet), as applicable, when the inoperative unit is depleted of all reserve capability.

SS.1.3.3

(b) In a final stop, at an average deceleration that is not lower than 7 fpsps for passenger cars (equivalent stopping distance 554 feet) or 6 fpsps for vehicles other than passenger cars (equivalent stopping distance 646 feet), as applicable, when the inoperative unit is depleted of all reserve capability.

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S5.1.4 *Fade and recovery.* The service brakes shall be capable of stopping each vehicle in two fade and recovery tests.

S5.1.4.1 The pedal force used for the baseline check stops or snubs shall be not less than 15 pounds, nor more than 60 pounds.

S5.1.4.2 (a) Each vehicle with a GVWR of 10,000 pounds or less shall be capable of making 10 fade stops (15 fade stops on the second test) from 60 m.p.h. at 15 f.p.s.p.s. for each stop with a pedal force that does not exceed 150 pounds for any stop.

(b) Each vehicle with a GVWR greater than 10,000 pounds shall be capable of making 10 fade snubs (20 fade snubs on the second test) from 40 m.p.h. to 20 m.p.h. at 10 f.p.s.p.s. for each snub, with a pedal force that does not exceed 150 pounds for any snub.

S5.1.4.3 (a) Each vehicle with a GVWR of 10,000 pounds or less shall be capable of making five recovery stops from 30 m.p.h. at 10 f.p.s.p.s. for each stop, with a pedal force that does not exceed 150 pounds for any of the first four stops, and that for the fifth recovery stop is within plus 20 pounds and minus 5 pounds or minus 40 percent (whichever is greater) of average pedal force for the baseline check.

(b) Each vehicle with a GVWR greater than 10,000 pounds shall be capable of making five recovery snubs from 40 m.p.h. to 20 m.p.h. at 10 f.p.s.p.s. for each snub, with a pedal force that does not exceed 150 pounds for any of the first four snubs, and that for the fifth snub is within plus 20 pounds and minus 5 pounds or minus 40 percent (whichever is greater) of the average pedal force for the baseline check.

S5.1.4 *Fade and recovery.*—The service brakes shall be capable of stopping each vehicle in two fade and recovery tests as specified below.

S5.1.4.1 The control force used for the baseline check stops or snubs shall be not less than 15 lbs, nor more than 60 lbs.

S5.1.4.2 (a) Each vehicle with GVWR of 10,000 lbs or less shall be capable of making 5 fade stops (10 fade stops on the second test) from 60 mi/h at an average deceleration not lower than 15 ft/s/s for each stop, followed by 5 fade stops at the maximum deceleration attainable from 5 to 15 ft/s/s.

(b) Each vehicle with a GVWR greater than 10,000 pounds shall be capable of making 10 fade snubs (20 fade snubs on the second test) from 40 mi/h to 20 mi/h at 10 ft/s/s for each snub.

S5.1.4.3 (a) Each vehicle with a GVWR of 10,000 pounds or less shall be capable of making five recovery stops from 30 mi/h at 10 ft/s/s for each stop with a control force for the fifth recovery stop that is within plus 20 pounds and minus 10 pounds or minus 40 percent (whichever is greater) of the average control force for the baseline check.

(b) Each vehicle with a GVWR greater than 10,000 pounds shall be capable of making five recovery snubs from 40 mi/h to 20 mi/h at 10 ft/s/s for each snub, with a control force for the fifth snub that is within plus 20 pounds and minus 10 pounds or minus 40 percent (whichever is greater) of the average control force for the baseline check.

S5.1.3.4 *Brake power assist and brake power units.* The service brakes of a vehicle equipped with one or more brake power assist units or brake power units with a backup system, with one brake power assist unit or brake power unit inoperative and depleted of all reserve capability and with only the backup system operating in the failed subsystem, shall be capable of stopping the vehicle from 60 mi/h in 15 consecutive stops at an average deceleration of each stop that is not lower than 12 ft/s/s (reference maximum stopping distance 323 feet).

S5.1.4.2 paragraph (a) is revised by deleting the words "an average", and substituting the word "a".

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S5.1.3.1

the third from last
line is changed to read "an
average deceleration for each stop that"

S5.1.4.1

The control force used for the baseline check stops or snubs shall be not less than 10 pounds, nor more than 60 pounds, except that the control force for a vehicle with a GVWR of 15,000 pounds or more manufactured between September 1, 1975, and September 1, 1977, may be between 10 and 90 pounds.

S5.1.4.3(a) Each vehicle with a GVWR of 10,000 pounds or less shall be capable

of making five recovery stops from 30 mph to 10 fps for each stop, with a control force for the fifth recovery stop that is within plus 20 pounds and minus 10 pounds or minus 40 percent (whichever is greater) of the average control force for the baseline check, but not less than 5 pounds.

(b) Each vehicle with a GVWR between 10,000 pounds and 15,000 pounds, and each vehicle with a GVWR greater than 15,000 pounds manufactured on and after September 1, 1977, shall be capable of making five recovery snubs from 40 mph to 20 mph at 10 fps for each snub, with a control force for the fifth snub that is within plus 20 pounds or minus 40 percent (but not less than 5 pounds) of the average control force for the baseline check.

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(c) Each vehicle with a GVWR greater than 15,000 pounds manufactured between September 1, 1975 and September 1, 1977, shall be capable of making five recovery snubs from 40 mph to 20 mph at 10 fpsps for each snub, with a control force for the fifth snub that is within the lesser of plus 20 pounds of the average control force for the baseline check or 100 pounds, and the greater of minus 10 pounds or minus 40 per cent (but not less than 5 pounds) of the average control force for the baseline check.

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S5.1.5 Water recovery. The service brakes shall be capable of stopping each vehicle in a water recovery test, within the distances, and from the speeds and with the pedal forces specified below.

S5.1.5.1 The pedal force used for the baseline check stops shall be not less than 15 pounds nor more than 60 pounds.

S5.1.5.2 After being driven for at least 2 minutes at a speed of 5 m.p.h., in any combination of forward and reverse directions, through a trough having a water depth of 6 inches, each vehicle shall be capable of making 5 recovery stops from 30 m.p.h. at 10 f.p.s.s. for each stop with a pedal force that does not exceed 150 pounds for any of the first four stops, and that for the fifth recovery stop is within plus 20 pounds and minus 5 pounds or minus 40 percent (whichever is

greater) of the average pedal force for the baseline check.

S5.1.5 Water recovery.—The service brakes shall be capable of stopping each vehicle in a water recovery test, as specified below.

S5.1.5.1 The control force used for the baseline check stops shall be not less than 15 pounds nor more than 60 pounds.

S5.1.5.2 After being driven for 2 minutes at a speed of 5 mi/h in any combination of forward and reverse directions through a trough having a water depth of 6 inches, each vehicle shall be capable of making five recovery stops from 30 mi/h at 10 ft/s/s for each stop with a control force for the fifth recovery stop that is within plus 30 pounds and minus 10 pounds or minus 40 percent (whichever is greater) of the average control force for the baseline check.

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S5.1.5.1

The control force used for the baseline check stops or snubs shall be not less than 10 pounds, nor more than 50 pounds, except that the control force for a vehicle with a GVWR of 15,000 pounds or more manufactured between September 1, 1975, and September 1, 1977, may be between 10 and 50 pounds.

S5.1.5.2 (a) Except as provided in paragraph (b), after being driven for 2 minutes at a speed of 5 mph in any combination of forward and reverse directions through a trough having a water depth of 6 inches, each vehicle shall be capable of making five recovery stops from 30 mph at 10 fpsps for each stop with a control force for the fifth recovery stop that is within plus 30 pounds and the greater of minus 10 pounds, or minus 40 percent (but not less than 5 pounds) of the average control force for the baseline check.

In S5.1.5.2 a new paragraph (b) is added to read:

(b) Each vehicle with a GVWR greater than 15,000 pounds manufactured between September 1, 1975, and September 1, 1977, after being driven for 2 minutes at a speed of 5 mph in any combination of forward and reverse directions through a trough having a water depth of 6 inches, shall be capable of making five recovery stops from 30 mph at 10 fpsps for each stop with a control force for the fifth recovery stop that is within the lesser of plus 30 pounds of the average control force for the baseline check or 110 pounds, and the greater of minus 10 pounds or minus 40 percent (but not less than 5 pounds) of the average control force for the baseline check.

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S5.1.6 *Spike stops.* Each vehicle shall be capable of making 10 spike stops from 30 m.p.h., followed by six effectiveness (check) stops from 60 m.p.h., at least one of which shall be within a stopping distance and with a pedal force that does not exceed the distances and forces specified in column II of table II.

S5.1.6 *Spike stops.*—Each vehicle shall be capable of making 10 spike stops from 30 mi/h, followed by 6 effectiveness (check) stops from 60 mi/h, at least one of which shall be within a corresponding stopping distance specified in column I of table II.

S5.2 *Parking brake system.*—Each vehicle shall be manufactured with a parking brake system of a friction type with a solely mechanical means to retain engagement, which shall under the conditions of S6, when tested according to the procedures specified in S7, meet the requirements specified in S5.2.1, S5.2.2, or S5.2.3 as applicable, when the system is engaged with a force applied to the control not to exceed 125 pounds for a foot-operated system and 90 pounds for a hand-operated system.

S5.2.1. Except as provided in S5.2.2, the parking brake system on each passenger car, and on each multipurpose passenger vehicle, truck or bus, with a GVWR of 10,000 pounds or less, shall be capable of holding the vehicle stationary for 5 minutes, in both a forward and reverse direction, on a 30 percent grade.

S5.2.1 Except as provided in S5.2.2, the parking brake system on each passenger car, and on each multipurpose passenger vehicle, truck or bus, with a GVWR of 10,000 pounds or less, shall be capable of holding the vehicle stationary (to the limit of traction of the braked wheels) for 5 minutes, in both a forward and reverse direction on a 30 percent grade.

S5.2.2 A vehicle of a type described in S5.2.2.1 at the option of the manufacturer may meet the requirements of S5.2.2.1, S5.2.2.2, and S5.2.2.3 instead of the requirements of S5.2.1 if:

- (a) The vehicle has a transmission or transmission control which incorporates a parking mechanism (hereafter referred to as the "mechanism"); and
- (b) The mechanism must be engaged before the ignition key can be removed.

S5.2.2 A vehicle of a type described in S5.2.1 at the option of the manufacturer may meet the requirements of S5.2.2.1,

S5.2.2.2, and S5.2.2.3 instead of the requirements of S5.2.1 if:

- (a) The vehicle has a transmission or transmission control which incorporates a parking mechanism, and
- (b) The parking mechanism must be engaged before the ignition key can be removed.

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S5.2.2.1 The vehicle's parking brake and the mechanism, when both are engaged, shall be capable of holding the vehicle stationary for 5 minutes, in both the forward and reverse directions, on a 30 percent grade.

S5.2.2.1 The vehicle's parking brake and parking mechanism, when both are engaged, shall be capable of holding the vehicle stationary (to the limit of traction of the braked wheels) for 5 minutes, in both forward and reverse directions, on a 30 percent grade.

S5.2.2.2 The vehicle's parking brake, with the mechanism not engaged, shall be capable of holding the vehicle stationary for 5 minutes, in both the forward and reverse directions, on a 20 percent grade.

S5.2.2.3 With the mechanism engaged and the parking brake not engaged the mechanism shall not disengage or fracture in a manner permitting vehicle movement, when the vehicle is impacted at each end, on a level surface, by a barrier moving at 2½ m.p.h.

S5.2.2.3 With the parking mechanism engaged and the parking brake not engaged, the parking mechanism shall not disengage or fracture in a manner permitting vehicle movement, when the vehicle is impacted at each end, on a level surface, by a barrier moving at 2½ mi/h.

S5.2.3 The parking brake system on each multipurpose passenger vehicle, truck, or bus, with a GVWR greater than 10,000 pounds, shall be capable of holding the vehicle stationary for 5 minutes, in both the forward and reverse directions, on a 20 percent grade.

S5.3 Brake system indicator lamp. Each vehicle shall have one or more brake system indicator lamps mounted in front of and in clear view of the driver, which meet the requirements of S5.3.1 through S5.3.4.

**SEPT 2, 1972 - ESTABLISHED
NEW STANDARD**

S5.3.1 An indicator lamp shall be activated when the ignition switch is in the "on" position and whenever any of the following conditions occur:

- (a) A pressure failure in any part of the service brake system, other than a structural failure of a housing that is common to two or more subsystems, before or upon application of 50 pounds of pedal force upon a fully manual service brake or of 25 pounds of pedal force upon a service brake with a brakepower assist unit, or when the supply pressure in a brakepower unit drops to not less than one-half of the normal system pressure.
- (b) A drop in the level of brake fluid in a master cylinder reservoir to less than the recommended safe level specified by the manufacturer, or to not less than one-fourth the fluid reservoir capacity in any reservoir compartment, whichever is greater.
- (c) A total electrical failure in an antilock or brake proportioning system.
- (d) Application of the parking brake.

S5.3.2 All indicator lamps shall be activated when the ignition switch is turned from the "on" or "run" position to the "start" position.

S5.3.3 Except for the momentary activation required by S5.3.2, each indicator lamp, once activated, shall remain activated as long as the condition exists, whenever the ignition switch is in the "on" position. An indicator lamp activated when the ignition switch is turned to the "start" position shall be deactivated upon return of the switch to the "on" or "run" position or when the parking brake is released, unless a failure of the kind described in S5.3.1(a) to S5.3.1 (c) exists in the service brake system.

S5.3.4 Each indicator lamp shall have a lens labeled "Brake" in letters not less than one-eighth inch high, which shall be legible to the driver in daylight when lighted. The lens and the letters shall have contrasting colors, one of which is red. An antilock system may have a separate lens labeled "Antilock," in letters not less than one-eighth inch high, which shall be legible to the driver in daylight when lighted, if the indicator is used only for the antilock system. The lens and the letters shall have contrasting colors, one of which is yellow.

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S5.3.1 An indicator lamp shall be activated when the ignition (start) switch is in the "on" (run) position and whenever any of the following conditions occur:

- (a) A pressure failure in any part of the service brake system, other than a structural failure of a housing that is common to two or more subsystems, before or upon application of either (1) a line pressure of not more than 200 lb/in² measured at a master cylinder outlet (or at a slave cylinder outlet if the master cylinder controls a slave cylinder at a booster unit), or (2) 50 pounds of control force upon a fully manual service brake, or (3) 25 pounds of control force upon a service brake with a brake power assist unit, or (4) when the supply pressure in a brake power unit drops to a level not less than one-half of the normal system pressure.
- (b) A drop in the level of brake fluid in a master cylinder reservoir to less than the recommended safe level specified by the manufacturer, or to not less than one-fourth the fluid reservoir capacity in any reservoir compartment, whichever is greater.
- (c) A total functional electrical failure in an antilock or variable proportioning brake system.
- (d) Application of the parking brake.

S5.3.2 All indicator lamps shall be activated as a check of lamp function

either when the ignition (start) switch is turned to the "on" (run) position when the engine is not running, or when the ignition (start) switch is in a position between "on" (run) and "start" that is designated by the manufacturer as a check position.

S5.3.3 Each indicator lamp activated due to a condition specified in S5.3.1 shall remain activated as long as the condition exists, whenever the ignition (start) switch is in the "on" (run) position, whether or not the engine is running.

S5.3.4 When an indicator lamp is activated it may be steady burning or flashing.

**FEBRUARY 22, 1974-ADDITIONAL
AMENDMENTS**

S5.3.1

(a) A pressure failure in any part of the service brake system, other than a structural failure of a housing that is common to two or more subsystems, due to any one of the following conditions:

- (1) Before or upon application of a differential pressure of not more than 225 lb/in² between the active and failed brake system measured at a master cylinder outlet or a slave cylinder outlet.
- (2) Before or upon application of 50 pounds of control force upon a fully manual service brake.
- (3) Before or upon application of 25 pounds of control force upon a service brake with a brake power assist unit.
- (4) When the supply pressure in a brake power unit drops to a level not less than one-half of the normal system pressure.

10. In S5.3.1 paragraph (b) is revised by deleting the words "in any reservoir compartment".

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(a) A gross loss of pressure (such as caused by rupture of a brake line but not

by a structural failure of a lining that is common to two or more subsystems), due to any one of the following conditions:

(b) A drop in the level of brake fluid in a master cylinder reservoir to less than the recommended safe level specified by the manufacturer or one-fourth of the fluid reservoir capacity in any reservoir compartment, whichever is greater.

In S5.3.1 the following sentence is added at the end thereof:

• • • A vehicle other than a passenger car, with a GVWR greater than 10,000 pounds, manufactured between September 1, 1973 and September 1, 1976, need not meet the requirements of subparagraph (b).

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S5.3.5 Each indicator lamp shall have a lens labeled in letters not less than $\frac{1}{8}$ -inch high, which shall be legible to the driver in daylight when lighted. The lens and the letters shall have contrasting colors, one of which is red. If a single common indicator is used, the lens shall be labeled "Brake". If separate indicator lamps are used for one or more of the various functions described in S5.3.1(a) to S5.3.1(d), the lens shall include the word "Brake" preceded by appropriate labeling, e.g., "Park", "Service". An anti-lock system may have a separate lens labeled "Antilock", in letters not less than one-eighth of an inch high, which shall be legible to the driver in daylight when lighted, if the indicator is used only for the antilock system. The lens and the letters shall have contrasting colors, one of which is yellow.

S5.4 Reservoirs.

S5.4.1 Master cylinder reservoirs. A master cylinder shall have a reservoir compartment for each service brake subsystem serviced by the master cylinder. Loss of fluid from one compartment shall not result in a complete loss of brake fluid from another compartment.

S5.4.2 Capacity. Each reservoir compartment shall have a minimum capacity equivalent to the fluid displacement resulting when all the wheel cylinders or caliper pistons serviced by the reservoir move from a new lining, fully retracted position (as adjusted initially to the manufacturer's recommended setting) to a fully worn, fully applied position. Each brake power unit reservoir servicing only the brake system shall have a minimum capacity equivalent to the fluid displacement required to charge the system piston(s) or accumulator(s) to normal operating pressure plus the displacement resulting when all the wheel cylinders or caliper pistons serviced by the reservoir or accumulator(s) move from a new lining fully retracted position (as adjusted initially to the manufacturer's recommended setting) to a fully worn, fully applied position.

S5.4.2 Reservoir capacity.—Each reservoir compartment, whether for master cylinders or other type systems, shall have a minimum capacity equivalent to the fluid displacement resulting when all the wheel cylinders or caliper pistons serviced by the reservoir move from a new lining, fully retracted position (as adjusted initially to the manufacturer's recommended setting) to a fully worn, fully applied position, as determined in accordance with S7.18(c) of this standard. Each brake power unit reservoir servicing only the brake system shall have a minimum capacity equivalent to the fluid displacement required to charge the system piston(s) or accumulator(s) to normal operating pressure plus the displacement resulting when all the wheel cylinders or caliper pistons serviced by the reservoir or accumulator(s) move from a new lining fully retracted position (as adjusted initially to the manufacturer's recommended setting) to a fully worn, fully applied position.

S5.3.5.

If separate indicator lamps are used for one or more of the various functions described in S5.3.1(a) to S5.3.1(d), the lens shall include the word "Brake" and appropriate additional labeling (use

"Brake Pressure," "Brake Fluid" for S5.3.1(a) and S5.3.1(b)) except that if a separate parking indicator lamp is provided, the single word "Park" may be used.

S5.4.2 Reservoir capacity. Reservoirs, whether for master cylinders or other type systems, shall have a total minimum capacity equivalent to the fluid displacement resulting when all the wheel cylinders or caliper pistons serviced by the reservoirs move from a new lining, fully retracted position (as adjusted initially to the manufacturer's recommended setting) to a fully worn, fully applied position, as determined in accordance with S7.18(c) of this standard. Reservoirs shall have completely separate compartments for each subsystem except that in reservoir systems utilizing a portion of the reservoir for a common supply to two or more subsystems, individual partial compartments shall each have a minimum volume of fluid equal to at least the volume displaced by the master cylinder piston servicing the subsystem, during a full stroke of the piston. • • •

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S5.4.3 Reservoir label. Each vehicle shall have the following label appropriately completed with the manufacturer's recommendation as to the type of fluid, as specified in Standard No. 116 (49 CFR 571.116), to be used in the vehicle brake system. The label shall be located so as to be visible by direct view, permanently affixed, stamped, or embossed either on or within 4 inches of the brake fluid reservoir filler plug or cap, in lettering at least one-eighth of an inch high on a contrasting background:

WARNING

Use only ----- fluid
from a sealed container.

Clean filler cap before removing.

S5.5 Antilock and brake proportioning systems. In the event of failure (structural or functional) in an antilock or brake proportioning system the vehicle shall be capable of meeting the stopping distance requirements specified in S5.1.2 for service brake system partial failure.

S5.6 Brake system integrity. Each vehicle shall be capable of completing all performance requirements of S5 without:

(a) Detachment or fracture of any component of the braking system, such as brakesprings and brakeshoe or disc pad facing, other than minor cracks that do not impair attachment of the friction facing. All mechanical components of the braking system shall be intact and functional. Friction facing tearout (detachment) shall not exceed 10 percent of the lining surface area on any single frictional element.

(b) Any visible brake fluid or lubricant on the friction surface of the brake, or at the master cylinder or brake power unit reservoir cover, seal and filler openings.

S6. Test conditions. The performance requirements of S5 shall be met under the following conditions. Where a range of conditions is specified, the vehicle shall be capable of meeting the requirements at all points within the range.

S5.4.3 Reservoir labeling.—Each vehicle shall have a brake fluid warning statement that reads as follows, in letters at least one-eighth of an inch high: "WARNING, Clean filler cap before removing. Use only ----- fluid from a sealed container. Inserting the recom-

mended type of brake fluid as specified in 49 CFR 571.116, e.g. "DOT 3". The lettering shall be—

(a) Permanently affixed, engraved, or embossed;

(b) Located so as to be visible by direct view, either on or within 4 inches of the brake fluid reservoir filler plug or cap; and

(c) Of a color that contrasts with its background, if it is not engraved or embossed.

S5.5 Antilock and variable proportioning brake systems.—In the event of failure (structural or functional) in an antilock or variable proportioning brake system the vehicle shall be capable of meeting the stopping distance requirements specified in S5.1.2 for service brake system partial failure.

S5.6 Brake system integrity.—Each vehicle shall be capable of completing all performance requirements of S5 without—

(a) Detachment or fracture of any component of the braking system, such as brake springs and brake shoe or disc pad facing, other than minor cracks that do not impair attachment of the friction facing. All mechanical components of the braking system shall be intact and functional. Friction facing tearout (complete detachment of lining) shall not exceed 10 percent of the lining on any single frictional element.

(b) Any visible brake fluid or lubricant on the friction surface of the brake, or leakage at the master cylinder or brake power unit reservoir cover, seal and filler openings.

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S6.1 Vehicle weight.

S6.1.1 Except for tests specified in S7.6.3, S7.7, and S7.8.1, the vehicle is loaded to its gross vehicle weight rating, distributed proportionally to its gross axle weight rating, except that the fuel tank is filled to any level from 100 percent of capacity (corresponding to full GVWR loading) to 75 percent of capacity.

S6.1.2 For the tests specified in S7.6.3, S7.7, and S7.8.1, vehicle weight is lightly loaded vehicle weight, with the added weight distributed in the front passenger seat area in passenger cars, multipurpose passenger vehicles and trucks, and in the area adjacent to the driver's seat in buses.

S6.1.1 Other than tests specified at lightly loaded vehicle weight in S7.7, S7.8, and S7.9, the vehicle is loaded to its gross vehicle weight rating, with the test loads specified in S6.2 distributed proportionally to its gross axle weight rating, except that the fuel tank is filled to any level from 100 percent of capacity (corresponding to full GVWR loading) to 75 percent of capacity.

S6.1.2 For the applicable tests specified in S7.7, S7.8, and S7.9, vehicle weight is lightly loaded vehicle weight, with the added weight distributed in the front passenger seat area in passenger cars, multipurpose passenger vehicles and trucks, and in the area adjacent to the driver's seat in buses.

S6.2 Test loads.—The load material is of the density specified below and is distributed in vehicle cargo areas and/or seating areas as follows:

Seating areas: 50 to 125 lb/ft³ (all vehicles).

Cargo areas: 50 to 125 lb/ft³ (passenger cars), 100 to 200 lb/ft³ (vehicles other than passenger cars with a GVWR of 10,000 lb or less), 450 to 725 lb/ft³ (vehicles with a GVWR that exceeds 10,000 lb).

The load material for trucks with a tanker type body is water. If GVWR is not reached, weight is added to obtain GVWR, distributed proportionally to GAWR.

S6.3 Tire inflation pressure.—Tire inflation pressure is the pressure recommended by the vehicle manufacturer for the GVWR of the vehicle.

S6.2 Tire inflation pressure. Tire inflation pressure is the pressure recommended by the vehicle manufacturer for the GVWR of the vehicle.

S6.3 Transmission selector control. For S7.3, S7.5, S7.7, S7.14, S7.16, S7.10.1.2, S7.10.2.2, S7.10.3.2, and as required for S7.12, the transmission selector control is in neutral for all decelerations. For all other tests during all decelerations, the transmission selector control is in the control position, other than overdrive, recommended by the manufacturer for driving on a level surface at the applicable test speed. To avoid engine stall in vehicles equipped with a manual transmission, the transmission may be shifted to neutral (or the clutch disengaged) when the vehicle speed decreases to 20 m.p.h.

S6.4 Transmission selector control.—For S7.3, S7.5, S7.8, S7.15, S7.17, S7.11.1.2, S7.11.2.2, S7.11.3.2, and as required for S7.13, the transmission selector control is in neutral for all decelerations. For all other tests during all decelerations, the transmission selector is in the control position, other than overdrive, recommended by the manufacturer for driving on a level surface at the applicable test speed. To avoid engine stall during tests required to be run in gear a manual transmission may be shifted to neutral (or the clutch disengaged) when the vehicle speed decreases to 20 mi/h.

S6.1.1 Other than tests specified at lightly loaded vehicle weight in S7.7, S7.8, and S7.9, the vehicle is loaded to its GVWR such that the weight on each axle as measured at the tire-ground interface is in proportion to its GAWR, with the test load material densities specified in S6.2, except that the fuel tank is filled to any level from 100 percent of capacity (corresponding to full GVWR loading) to 75 percent of capacity.

S6.2

Seating areas: 50 to 450 lb/ft³ (all vehicles).
Cargo areas: 50 to 450 lb/ft³ (all vehicles, including passenger cars, with a GVWR of 10,000 lbs or less).
400 to 725 lb/ft³ (vehicles with a GVWR that exceeds 10,000 lbs).

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S6.1.1. is amended by adding at the end thereof:

• • • However, if the weight on any axle of a vehicle at lightly loaded vehicle weight exceeds the axle's proportional share of the gross vehicle weight rating, the load required to reach GVWR is placed so that the weight on that axle remains the same as at lightly loaded vehicle weight.

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S6.4 Engine. Engine idle speed and ignition timing settings are according to the manufacturer's recommendations. If the vehicle is equipped with an adjustable engine speed governor, it is adjusted according to the manufacturer's recommendation.

S6.5 Engine.—Engine idle speed and ignition timing settings are according to the manufacturer's recommendations. If the vehicle is equipped with an adjustable engine speed governor, it is adjusted according to the manufacturer's recommendation.

S6.5 Vehicle openings. All vehicle openings (doors, windows, hood, trunk, convertible top, cargo doors, etc.) are closed except as required for instrumentation purposes.

S6.6 Vehicle openings.—All vehicle openings (doors, windows, hood, trunk, convertible top, cargo doors, etc.) are closed except as required for instrumentation purposes.

S6.6 Ambient temperature. The ambient temperature is any temperature between 32° F. and 100° F.

S6.7 Ambient temperature.—The ambient temperature is any temperature between 32° F. and 100° F.

S6.7 Wind velocity. The wind velocity is zero.

S6.8 Wind velocity.—The wind velocity is zero.

S6.8 Road surface. Road tests are conducted on a 12-foot-wide, level roadway having a skid number of 75. Burnish stops are conducted on any surface. The parking brake test surface is clean, dry, smooth portland cement concrete.

S6.9 Road surface.—Road tests are conducted on a 12-foot-wide, level roadway having a skid number of 75. Burnish stops are conducted on any surface. The parking brake test surface is clean, dry, smooth Portland cement concrete.

S6.9 Vehicle position. The vehicle is aligned in the center of the roadway at the start of each brake application. Stops, other than spike stops, are made without any part of the vehicle leaving the roadway. Stops are made without lockup of any wheel at speeds greater than 10 m.p.h., except that there may be (a) controlled lockup on an antilock-equipped axle, and (b) lockup of not more than one wheel uncontrolled by an antilock system.

S6.10 Vehicle position.—The vehicle is aligned in the center of the roadway at the start of each brake application. Stops, other than spike stops, are made without any part of the vehicle leaving the roadway. Except as noted below, stops are made without lockup of any wheel at speeds greater than 10 mi/h. There may be controlled lockup on an antilock-equipped axle, and lockup of not more than one wheel uncontrolled by an antilock system. Locked wheels at speeds greater than 10 mi/h are allowed during spike stops (but not spike check stops), partial failure stops and inoperative brakepower or power assist unit stops.

S6.10

"There may be controlled lockup on an antilock-equipped axle, and lockup of not more than one wheel per vehicle, uncontrolled by an antilock system."

S6.10 Thermocouples. The brake temperature is measured by plug-type thermocouples installed in the approximate center of the facing length and width of the most heavily loaded shoe or disc pad, one per brake, as shown in Figure 1. For center-grooved shoes or pads, thermocouples are installed within one-eighth to one-quarter inch of the groove and as close to the center as possible.

S6.11 Thermocouples.—The brake temperature is measured by plug-type thermocouples installed in the approximate center of the facing length and width of the most heavily loaded shoe or disc pad, one per brake, as shown in figure 1. A second thermocouple may be installed at the beginning of the test sequence if the lining wear is expected to reach a point causing the first thermocouple to contact the metal rubbing surface of a drum or rotor. For center-grooved shoes or pads, thermocouples are

installed within one-eighth of an inch to one-quarter inch of the groove and as close to the center as possible.

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S6.11 *Initial brake temperature.* Unless otherwise specified the initial brake temperature is 150° F. to 200° F.

S6.12 *Initial brake temperature.*— Unless otherwise specified the brake temperature is 150° F. to 200° F.

S6.12 *Test loads.* The load is distributed on the load carrying platform, and the load material density is any value from 50 to 725 pounds per cubic foot.

S6.13 *Control forces.*—Unless otherwise specified, the force applied to a brake control is not less than 15 lb and not more than 150 lb.

S7. *Test procedures and sequence.* Each vehicle shall be capable of meeting all the requirements of S5 when tested according to the procedures and in the sequence set forth below, without replacing any brake system part or making any adjustments to the brake system other than as permitted in S7.4, S7.8, and S7.9. A vehicle shall be deemed to comply with S5.1 if at least one of the stops at each speed and load specified in each of S7.3, S7.5, S7.7, S7.8, S7.9, S7.14, or S7.16 is made within a stopping distance and with a pedal force that does not exceed the limits specified in Table II.

S7. *Test procedures and sequence.*— Each vehicle shall be capable of meeting all the requirements of S5 when tested according to the procedures and in the sequence set forth below, without replacing any brake system part or making any adjustments to the brake system other than as permitted in burnish and reburnish procedures and in S7.9 and S7.10. Automatic adjusters shall be locked out prior to burnish and for the remainder of the test sequence. A vehicle shall be deemed to comply with the stopping distance requirements of S5.1 if at least one of the stops at each speed and load specified in each of S7.3, S7.5, S7.8, S7.9, S7.10, S7.15, or S7.17 (check stops) is made within a stopping distance that does not exceed the corresponding distance specified in table II.

S7.
"Automatic adjusters may be locked out when the vehicle is prepared for testing. If this option is selected, adjusters must remain locked out for entire sequence of tests.

S7.1 *Brake warming.* If the initial brake temperature for the first stop in a test procedure (other than S7.6 and S7.15) has not been reached, heat the brakes to the initial brake temperature by making not more than 10 snubs from not more than 40 m.p.h. to 10 m.p.h., at a deceleration not greater than 10 f.p.s.p.s.

S7.1 *Brake warming.*—If the initial brake temperature for the first stop in a test procedure (other than S7.7 and S7.16) has not been reached, heat the brakes to the initial brake temperature by making not more than 10 snubs from not more than 40 to 10 mi/h, at a deceleration not greater than 10 ft/s/s.

S7.2 *Pretest instrumentation check.* Conduct a general check of instrumentation by making not more than 10 stops from a speed of not more than 30 m.p.h., or 10 snubs from a speed not more than 40 m.p.h. to 10 m.p.h., at a deceleration of not more than 10 f.p.s.p.s. If instrument repair, replacement, or adjustment is necessary, make not more than 10 additional stops or snubs after such repair, replacement or adjustment.

S7.2 *Pretest instrumentation check.*— Conduct a general check of instrumentation by making not more than 10 stops from a speed of not more than 30 mi/h, or 10 snubs from a speed of not more than 40 to 10 mi/h, at a deceleration of not more than 10 ft/s/s. If instrument repair, replacement, or adjustment is necessary, make not more than 10 additional stops or snubs after such repair, replacement, or adjustment.

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In S7, the second sentence is revised to read:

• • • Automatic adjusters may be locked out, according to the manufacturer's recommendation, when the vehicle is prepared for testing. • • •

The following sentence is added at the end of S7:

• • • When the transmission selector control is required to be in neutral for a deceleration, a stop or snub shall be obtained by the following procedures: (1) Exceed the test speed by approximately 7 mph; (2) close the throttle and coast in gear to approximately 2 mph above the test speed; (3) shift to neutral; and (4) when the test speed is reached, apply the service brakes.

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S7.3 Service brake system—first (pre-burnish) effectiveness test. Make six stops from 30 m.p.h. with a pedal force of 15 to 100 pounds. Then make six stops from 60 m.p.h. with a pedal force of 15 to 120 pounds.

S7.3 Service brake system—first (pre-burnish) effectiveness test.—Make six stops from 30 mi/h. Then make six stops from 60 mi/h.

S7.4 Service brake system—burnish procedure.

S7.4.1 Vehicles with GVWR of 10,000 pounds or less.

S7.4.1.1 Burnish. Burnish the brakes by making 200 stops from 40 m.p.h. at 12 f.p.s.s. The interval from the start of one service brake application to the start of the next shall be either the time necessary to reduce the initial brake temperature to between 230° F. and 270° F., or the distance of 1 mile, whichever occurs first. Accelerate to 40 m.p.h. after each stop and maintain that speed until making the next stop.

S7.4.1.1 Burnish.—Burnish the brakes by making 200 stops from 40 mi/h at 12 ft/s/s (the 150 lb control force limit does not apply here). The interval from the start of one service brake application to the start of the next shall be either the time necessary to reduce the initial brake temperature to between 230° F. and 270° F., or the distance of 1 mile, whichever occurs first. Accelerate to 40 mi/h after each stop and maintain that speed until making the next stop.

S7.4.1.2 Brake adjustment—post burnish. After burnishing, adjust the brakes in accordance with the manufacturer's recommendation.

S7.4.1.2 Brake adjustment—post burnish.—After burnishing, adjust the brakes manually in accordance with the manufacturer's recommendation.

S7.4.1.2

Brake adjustment—post burnish. After burnishing, adjust the brakes manually in accordance with the manufacturer's recommendation if the automatic adjusters have been locked out, or by making stops as recommended by manufacturer if automatic adjusters are operative.

S7.4.2 Vehicles with GVWR greater than 10,000 pounds.

S7.4.2 Vehicles with GVWR greater than 10,000 lb.

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S7.4.1.2

After burnishing, adjust the brakes manually in accordance with the manufacturer's recommendation if the brake systems are manual or if the automatic adjusters are locked out, or by making

stops as recommended by the manufacturer if the automatic adjusters are operative.

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S7.4.2.1 Burnish. Burnish the brakes by making 400 snubs from 40 m.p.h. to 20 m.p.h. at 10 ft./s. After each brake application accelerate to 40 m.p.h. and maintain that speed until making the next brake application at a point 1.5 miles from the point of the start of the previous brake application.

S7.4.2.1 Burnish.—Burnish the brakes by making 400 snubs from 40 to 20 mi/h at 10 ft/s/s (the 150 lb control force limit does not apply here). After each brake application accelerate to 40 mi/h and maintain that speed until making the next brake application at a point 1.5 miles from the point of the start of the previous brake application.

18. S7.4.2.1 is revised and a new Table IV added, to read:

S7.4.2.1 Burnish. The brakes of a vehicle manufactured between September 1, 1975 and September 1, 1976 may be burnished according to S7.4.2.1.1 or S7.4.2.1.2. The brakes of a vehicle manufactured on or after September 1, 1976, shall be burnished according to S7.4.2.1.2.

S7.4.2.1.1 Burnish the brakes by making the 400 snubs from 40 mi/h to 20 mi/h at 10 ft/s/s (the 150-lb control force limit does not apply here). After each brake application, accelerate to 40 mi/h and maintain that speed until making the next brake application at a point 1.5 miles from the initial point of the previous brake application.

S7.4.2.1.2 Burnish the brakes by making 500 snubs at 10 ft/s/s in the sequence specified in Table IV and within the speed ranges indicated. After each brake application accelerate to the next speed specified and maintain that speed until making the next brake application at a point 1 mi from the initial point of the previous brake application. If during any of the brake applications specified in Table IV the hottest brake reaches 500°F, make the remainder of the 500 applications from that snub condition, except that a higher or lower snub condition shall be followed (up to the 60 mi/h initial speed) as necessary to maintain a maximum temperature of 500°F. ±50°F.

TABLE IV

Series	Snubs	Snub conditions (highest speed indicated, miles per hour)
1	175	40-20
2	25	45-20
3	25	50-20
4	25	55-20
5	250	60-20

S7.4.2.2 Brake adjustment—post burnish. After burnishing, adjust the brakes in accordance with the manufacturer's recommendation.

S7.4.2.2 Brake adjustment—post burnish.—After burnishing, adjust the brakes manually in accordance with the manufacturer's recommendation.

S7.4.2.2

Brake adjustment—post burnish. After burnishing, adjust the brakes manually in accordance with the manufacturer's recommendation if the automatic adjusters have been locked out, or by making stops as recommended by manufacturer if automatic adjusters are operative.

S7.5 Service brake system—second effectiveness test. Repeat S7.3. Then, with a pedal force of 20 to 150 pounds, make four stops from 80 m.p.h. and four stops from the multiple of 5 m.p.h. that is 4 m.p.h. to 8 m.p.h. less than the speed attainable in 2 miles if that speed is 95 m.p.h. or greater.

S7.5 Service brake system—second effectiveness test.—Repeat S7.3. Then make four stops from 80 mi/h if the speed attainable in 2 miles is not less than 84 mi/h.

19. S7.5 is revised to read:

S7.5 Service brake system—second effectiveness test. Repeat S7.3. Then (for passenger cars and other vehicles with a GVWR of 10,000 lbs. or less) make four stops from 80 mi/h if the speed attainable in 2 miles is not less than 84 mi/h.

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S7.4.2.1.1

the second line
is corrected by deleting the
word "the" before the words "400 snuba".

S7.4.2.1.2

Is revised by deleting the
word "maximum" in the final sentence,
and by adding the following sentence be-
tween the second and third sentences:
* * * If a vehicle cannot attain any
speed specified in 1 mi, continue to ac-
celerate until the speed specified is
reached or until a point 1.5 mi from the
initial point of the previous brake appli-
cation is reached, whichever occurs
first. * * *

S7.4.2.2

After burnishing, adjust the brakes
manually in accordance with the manu-
facturer's recommendation if the brake
systems are manual or if the automatic
adjusters are locked out, or by making
stops as recommended by the manufac-
turer if the automatic adjusters are op-
erative.

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S7.6 Parking brake test.

S7.6.1 Vehicle with transmission not utilizing parking mechanisms. Starting with an initial brake temperature of not more than 150° F., drive the vehicle, loaded to GVWR, onto the grade with the longitudinal axis of the vehicle in the direction of the grade. Apply the service brakes with a force not exceeding 150 pounds to stop the vehicle. Place the transmission in neutral. Apply the parking brakes by exerting a force not exceeding 125 pounds for a foot-operated system, or 90 pounds for a hand-operated system. Release the service brake and allow the vehicle to remain at rest for 5 minutes. Repeat the test with the vehicle parked in the reverse position on the grade. Check parking brake indicator operation.

S7.6.2 Vehicles with transmission utilizing parking mechanisms.

- (a) Check that transmission must be placed in park position to release key.
- (b) Repeat S7.6.1, except in addition place the transmission control to engage the parking pawl or detent mechanism.
- (c) Repeat S7.6.1, except on a 20 percent grade, with the mechanism not engaged.

S7.6.3 Lightly loaded vehicle. Repeat S7.6.1 or S7.6.2 as applicable except with the vehicle at lightly loaded vehicle weight.

S7.6 First reburnish.—Repeat S7.4, except make 35 burnish stops or snubs instead of 200 stops or 400 snubs. Adjust brakes manually after reburnish in accordance with the manufacturer's recommendation.

S7.7 parking brake test.—Parking brake tests may be run in any sequence within this subsection. The force required for actuation of a hand-operated brake system shall be measured at the center of the hand grip area or at a distance of 1½ inches from the end of the actuation lever, as illustrated in figure II.

S7.7.1 Vehicles with transmission not utilizing parking mechanism.—(This test need not be run if the option in S7.7.2 is selected for passenger cars or vehicles with GVWR of 10,000 or less.) Starting with an initial brake temperature of not more than 150° F., drive the vehicle, loaded to GVWR, onto the grade specified with the longitudinal axis of the vehicle in the direction of the grade. Apply the service brakes to stop the vehicle. Place the transmission in neutral. Apply the parking brake by exerting a force or a series of forces none of which exceeds 125 lb for a foot-operated system, or 90 lb for a hand-operated system. Release the service brake and allow the vehicle to remain at rest for 5 minutes. When releasing the service brake, it may be necessary to reapply it, if the vehicle moves slightly, to take up the parking brake system slack. Vehicle must be held stationary at the start of the observation period. Repeat the test with the vehicle parked in the reverse position on the grade. Check the parking brake indicator operation.

S7.7.2 Vehicles with transmission utilizing parking mechanism.—(a) Check that transmission must be placed in park position to release key;

(b) Test as in S7.7.1, except in addition place the transmission control to engage the parking mechanism; and

(c) Test as in S7.7.1 except on a 20 percent grade, with the parking mechanism not engaged.

S7.7.3 Lightly loaded vehicle.—Repeat S7.7.1 or S7.7.2(c) as applicable except with the vehicle at lightly loaded vehicle weight.

S7.6 is revised by deleting the final sentence.

S7.7.3, the figure "S7.7.2(c)" is revised to read "S7.7.2".

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S7.6 First reburnish. Repeat S7.4, except make 35 burnish stops or snubs. Reburnish a vehicle whose brakes are burnished according to S7.4.2.1.2 by making 35 snubs from 60 mph to 20 mph, but if the hottest brake reaches $500^{\circ} \pm 50^{\circ} \text{ F}$, make the remainder of the 35 applications from such initial speed divisible by five but less than 60 mph as necessary to maintain a temperature of $500^{\circ} \text{ F} \pm 50^{\circ} \text{ F}$.

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S7.6.4 Nonservice brake type parking brake systems. For vehicles with parking brake systems not utilizing the service brake friction elements, the friction elements of such systems shall be burnished prior to parking brake tests according to the manufacturer's published recommendations as furnished to the purchaser. If no recommendations are furnished, run the vehicle in an unburnished condition.

S7.7.4 Nonservice brake type parking brake systems.—For vehicles with parking brake systems not utilizing the service brake friction elements, burnish the friction elements of such systems prior to parking brake tests according to the manufacturer's published recommendations as furnished to the purchaser. If no recommendations are furnished, run the vehicle in an unburnished condition.

S7.7 Service brake system—lightly loaded vehicle effectiveness test. Make six stops from 60 m.p.h. with a pedal force of 15 to 120 pounds, with vehicle at lightly loaded vehicle weight.

S7.8 Service brake system—lightly loaded vehicle (third effectiveness) test.—Make six stops from 60 mi/h with vehicle at lightly loaded vehicle weight.

S7.8 Service brake system test—partial failure.

S7.9 Service brake system test—partial failure.

S7.8.1 With vehicle at lightly loaded vehicle weight, alter the service brake system to induce a complete loss of braking, including normal pedal travel loss, in any one subsystem. Determine the pedal force (or pressure level in a brake power unit system) necessary to cause the brake system indicator to operate. Make four stops from 60 m.p.h. by a continuous application of the service brake control with a pedal force not exceeding 150 pounds. Restore the service brake system to normal at completion of this test.

S7.9.1 With vehicle at lightly loaded vehicle weight, alter the service brake to induce a complete loss of braking, including normal control travel loss, in any one subsystem. Determine the control force (or pressure level in a brake-power unit system) necessary to cause the brake system indicator to operate. Make four stops, each from 60 mi/h, by a continuous application of the service brake control. Restore the service brake system to normal at completion of this test.

— S7.9.1 the words "(or pressure level in a brake power unit system)" are deleted, and the words "or pressure level" substituted.

S7.8.2 Repeat S7.8.1 for each of the other subsystems.

S7.9.2 Repeat S7.9.1 for each of the other subsystems.

S7.8.3 Repeat S7.8.1 and S7.8.2 with vehicle at GVWR. Determine that the brake system indicator is operating when the reservoir fluid level is less than the level specified in S5.3.1(b). Check for proper operation with each reservoir in turn at a low level. Restore the service brake system to normal at completion of this test. The fully applied worn condition is determined with the automatic

S7.9.3 Repeat S7.9.1 and S7.9.2 with vehicle at GVWR. Determine that the brake system indicator is operating when the reservoir fluid level is at or greater than the level specified in S5.3.1(b). Check for proper operation with each reservoir in turn at a low level. Restore the service brake system to normal at completion of this test.

adjusting mechanism inoperative (for vehicles equipped with self-adjusting mechanism), or without adjustment after setting to the manufacturer's initial new lining condition (for vehicles equipped with manual adjustment mechanism).

**SEPT 2, 1972 - ESTABLISHED
NEW STANDARD**

S7.8.4 (For vehicles with antilock and brake proportioning systems.) With vehicle at GVWR, disconnect power source, or otherwise render antilock or brake proportioning system inoperative. Make four stops from 60 m.p.h. with a pedal force not exceeding 150 pounds. If more than one independent antilock or brake proportioning system is provided, disconnect or render one subsystem inoperative and run as above. Restore system to normal at completion of this test. Repeat for each subsystem provided. Disconnect electrical power source to unit. Check for operation of warning indicator.

S7.9 Service brake system—inoperative brake power unit or brake power assist unit test. (For vehicles equipped with brake power unit or brake power assist unit.) On vehicles with brake power assist units, render the brake power assist unit inoperative, or one of the brake power assist unit systems if entirely independent duplicate systems are provided, by disconnecting the relevant power supply. Exhaust any residual brake power reserve capability of the disconnected system. On vehicles with brake power units, disconnect the primary source of power. Make four stops from 60 m.p.h. by a continuous application of the service brake control with a pedal force not to exceed 150 pounds. Restore the system to normal at completion of this test. For vehicles equipped with more than one brake power unit or brake power assist unit, conduct tests of each in turn.

**MAY 18, 1973 - SEVERAL
AMENDMENTS ADOPTED**

S7.9.4 (For vehicles with antilock and/or variable proportioning brake systems). With vehicle at GVWR, disconnect functional power source, or otherwise render antilock system inoperative. Disconnect variable proportioning brake system. Make four stops, each from 60 mi/h. If more than one antilock or variable proportioning brake subsystem is provided, disconnect or render one subsystem inoperative and run as above. Restore system to normal at completion of this test. Repeat for each subsystem provided. Disconnect electrical power source to unit. Check for operation of warning indicator.

S7.10 Service brake system—inoperative brake power unit or brake power assist unit test.—(For vehicles equipped with brake power unit or brake power assist unit.)

S7.10.1 Regular procedure.—On vehicles with brake power assist units, render the brake power assist unit inoperative, or one of the brake power assist unit subsystems if two or more subsystems are provided, by disconnecting the relevant power supply. Exhaust any residual brake power reserve capability of the disconnected system. On vehicles with brake power units, disconnect the primary source of power. Make four stops, each from 60 mi/h, by a continuous application of the service brake control. Restore the system to normal at completion of this test. For vehicles equipped with more than one brake power unit or brake power assist unit, conduct tests of each in turn.

**FEBRUARY 22, 1974-ADDITIONAL
AMENDMENTS**

S7.10.1 the following sentence is added between the title and first sentence: "(This test need not be run if the option in S7.10.2 is selected)".

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S7.10.2 Optional procedures.—On vehicles with brake power assist units, the unit is charged to maximum prior to start of test. (Engine may be run up in speed, then throttle closed quickly to attain maximum charge on vacuum assist units.) Brake power units shall also be

charged to maximum accumulator pressure prior to start of test. No recharging is allowed after start of test.

(a) (For vehicles with brake power assist units.)

Disconnect the primary source of power. Make six stops each from 60 mi/h, to achieve the average deceleration for each stop as specified in table III. Apply the brake control as quickly as possible. Maintain control force until vehicle has stopped.

At the completion of the stops specified above, deplete the system of any residual brake power reserve capability. Make one stop from 60 mi/h in not more than 554 ft and determine whether the control force exceeds 150 lb.

(b) (For vehicles with brakepower units.)

(1) (For vehicles with accumulator type systems.) Test as in S7.10.2(a), except make 10 stops instead of 6.

(2) (For vehicles with back-up type systems.) Disconnect the primary source of power. Make 15 stops, each from 60 mi/h, to achieve an average deceleration of 12 ft/s/s for each stop.

(c) Restore systems to normal at completion of these tests. For vehicles equipped with more than one brakepower assist or brakepower unit, conduct tests of each in turn.

S7.10.2.

(b) (For vehicles with brake power units with accumulator type systems.) Test as in S7.10.2(a), except make 10 stops instead of 6.

(c) (For vehicles with brake power assist or brake power units with backup systems.) If the brake power or brake power assist unit operates in conjunction with a backup system and the backup system is activated automatically in the event of a primary power failure, the backup system is operative during this test. Disconnect the primary source of power of one subsystem. Make 15 stops, each from 60 mi/h, with the backup system activated for the failed subsystem, to achieve an average deceleration of 12 ft/s/s for each stop.

S7.10 Service brake system—first fade and recovery test.

S7.11 Service brake system—first fade and recovery test.

S7.10.1 Baseline check stops or snubs.

S7.11.1 Baseline check stops or snubs.

S7.10.1.1 Vehicles with GVWR of 10,000 pounds or less. Make three stops from 30 m.p.h. at 10 f.p.s.p.s. for each stop, terminating pedal force readings when vehicle speed falls to 5 m.p.h. Average the maximum brake pedal force required for the three stops.

S7.11.1.1 Vehicles with GVWR of 10,000 lb or less.—Make three stops from 30 mi/h at 10 ft/s/s for each stop. Control force readings may be terminated when vehicle speed falls to 5 mi/h. Average the maximum brake control force required for the three stops.

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JULY 15, 1974 - ADDITIONAL
AMENDMENTS

In S7.10.2 revise the last sentence of paragraph (a) to read:

• • • Make one stop from 60 mph at an average deceleration of not lower than 7 fpsps for passenger cars (equivalent stopping distance 554 feet), or 6 fpsps for vehicles other than passenger cars (equivalent stopping distance 646 feet) and determine whether the control force exceeds 150 pounds.

**SEPT 2, 1972 - ESTABLISHED
NEW STANDARD**

**MAY 18, 1973 - SEVERAL
AMENDMENTS ADOPTED**

**FEBRUARY 22, 1974-ADDITIONAL
AMENDMENTS**

S7.10.1.2 Vehicles with GVWR greater than 10,000 pounds. With transmission in neutral (or declutched), make three snubs from 40 to 20 m.p.h. at 10 f.p.s.p.s. for each snub. Average the maximum brake pedal force required for the three snubs.

S7.11.1.2 Vehicles with GVWR greater than 10,000 pounds.—With transmission in neutral (or declutched), make three snubs from 40 to 20 mi/h at 10 ft/s/s for each snub. Average the maximum brake control force required for the three snubs.

S7.10.2 Fade stops or snubs.

S7.11.2 Fade stops or snubs.

S7.10.2.1 Vehicles with GVWR of 10,000 pounds or less. Make 10 stops from 60 m.p.h. at 15 f.p.s.p.s. for each stop. Establish an initial brake temperature before the first brake application of 130° to 150° F. Initial brake temperatures before brake applications for subsequent stops are those occurring at the distance intervals. Attain the required deceleration within 1 second and, as a minimum, maintain it for the remainder of the stopping time. Leave an interval of 0.4 mile between the start of brake applications. Accelerate immediately to the initial test speed after each stop. Drive 1 mile at 30 m.p.h. after the last fade stop, and immediately follow the recovery procedure specified in S7.10.3.1.

S7.11.2.1 Vehicles with GVWR of 10,000 pounds or less.—Make 10 stops from 60 mi/h at the maximum attainable deceleration between 5 and 15 ft/s/s for each stop. Establish an initial brake temperature before the first brake application of 130° to 150° F. Initial brake temperatures before brake applications for subsequent stops are those occurring at the distance intervals. Attain the required deceleration within 1 second and, as a minimum, maintain it for the remainder of the stopping time. Control force readings may be terminated when vehicle speed falls to 5 mi/h. Leave an interval of 0.4 mi between the start of brake applications. Accelerate immediately to the initial test speed after each stop. Drive 1 mi at 30 mi/h after the last fade stop, and immediately follow the recovery procedure specified in S7.11.3.1.

S7.11.2.1

"Make 5 stops from 60 mi/h at 15 ft/s/s followed by 5 stops at the maximum attainable deceleration between 5 and 15 ft/s/s for each stop."

S7.10.2.2 Vehicles with GVWR greater than 10,000 pounds. With transmission in neutral (or declutched) make 10 snubs from 40 to 20 m.p.h. at 10 f.p.s.p.s. for each snub. Establish an initial brake temperature before the first brake application of 130° F. to 150° F. Initial brake temperatures before brake application for subsequent snubs are those occurring in the time intervals specified below. Attain the required deceleration within 1 second and maintain it for the remainder of the snubbing time. Leave an interval of 30 seconds between snubs (start of brake application to start of brake application). Accelerate immediately to the initial test speed after each snub. Drive for 1.5 miles at 40 m.p.h. after the last snub and immediately follow the recovery procedure specified in S7.10.3.2.

S7.11.2.2 Vehicles with GVWR greater than 10,000 lb.—With transmission in neutral (or declutched) make 10 snubs from 40 to 20 mi/h at 10 ft/s/s for each snub. Establish an initial brake temperature before the first brake application of 130° F. to 150° F. Initial brake temperatures before brake application for subsequent snubs are those occurring in the time intervals specified below. Attain the required deceleration within 1 s and maintain it for the remainder of the snubbing time. Leave an interval of 30 s between snubs (start of brake application to start of brake application). Accelerate immediately to the initial test speed after each snub. Drive for 1.5 mi at 40 mi/h after the last snub and immediately follow the recovery procedure specified in S7.11.3.2.

S7.10.3 Recovery stops or snubs.

S7.11.3 Recovery stops or snubs.

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**SEPT 2, 1972 - ESTABLISHED
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**FEBRUARY 22, 1974-ADDITIONAL
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S7.10.3.1 Vehicles with GVWR of 10,000 pounds or less. Make five stops from 30 m.p.h. at 10 f.p.s.p.s. for each stop. Allow a braking distance interval of not more than 1 mile. Immediately after each stop accelerate at maximum rate to 30 m.p.h. and maintain that speed until making the next stop. Record the maximum pedal force for each stop.

S7.10.3.2 Vehicles with GVWR greater than 10,000 pounds. With transmission in neutral (or declutched) make five snubs from 40 to 20 m.p.h. to 10 f.p.s.p.s., for each snub. After each snub, accelerate at maximum rate to 40 m.p.h. and maintain that speed until making the next brake application at a point not more than 1.5 miles from the point of the previous brake application. Record the maximum pedal force for each snub.

S7.11 Service brake system—first re-burnish. Repeat S7.4, except make 35 burnish stops or snubs instead of 200 stops or 400 snubs. Do not adjust brakes after reburnish.

S7.13 Second reburnish. Repeat S7.11.

S7.12 Service brake system—second fade and recovery test. Repeat S7.10, except in S7.10.2 run 15 fade stops or 20 snubs instead of 10.

S7.14 Service brake system—fourth effectiveness test. Repeat S7.5.

S7.11.3.1 Vehicles with GVWR of 10,000 lb or less.—Make five stops from 30 mi/h at 10 ft/s/s for each stop. Control force readings may be terminated when vehicle speed falls to 5 mi/h. Allow a braking distance interval of 1 mi. Immediately after each stop accelerate at maximum rate to 30 mi/h and maintain that speed until making the next stop. Record the maximum control force for each stop.

S7.11.3.2 Vehicles with GVWR greater than 10,000 lb.—With transmission in neutral (or declutched) make five snubs from 40 to 20 mi/h at 10 ft/s/s, for each snub. After each snub, accelerate at maximum rate to 40 mi/h and maintain that speed until making the next brake application at a point 1.5 mi from the point of the previous brake application. Record the maximum control force for each snub.

S7.12 Service brake system—second reburnish.—Repeat S7.6.

S7.13 Service brake system—second fade and recovery test.—Repeat S7.11 except in S7.11.2 run 15 fade stops or 20 snubs instead of 10.

S7.14 Third reburnish.—Repeat S7.6.

S7.15 Service brake system—fourth effectiveness test.—Repeat S7.5. Then make four stops from either 95 mi/h if the speed attainable in 2 mi is 99 to (but not including) 104 mi/h, or 100 mi/h if the speed attainable in 2 mi is 104 mi/h or greater.

S7.15 Service brake system—fourth effectiveness test. Repeat S7.5. Then (for passenger cars and other vehicles with a GVWR of 10,000 lbs. or less) make four stops from either 95 mi/h if the speed attainable in 2 mi is 99 to (but not including) 104 mi/h, or 100 mi/h if the speed attainable in 2 mi is 104 mi/h or greater.

SEPT 2, 1972 - ESTABLISHED
NEW STANDARDMAY 18, 1973 - SEVERAL
AMENDMENTS ADOPTEDFEBRUARY 22, 1974 - ADDITIONAL
AMENDMENTS**S7.15 Service brake system—water recovery test.**

S7.15.1 Baseline check stop. Make three stops from 30 m.p.h. at 10 f.p.s.p.s. for each stop, terminating pedal force readings when vehicle speed falls to 5 m.p.h. Average the maximum brake pedal force required for the three stops.

S7.15.2 Wet brake recovery stops. With the brakes fully released at all times, drive the vehicle for not less than 2 minutes at a speed of 5 m.p.h., in any combination of forward and reverse directions, through a trough having a water depth of 6 inches. After leaving the trough, immediately accelerate at maximum rate to 30 m.p.h. without a brake application. Immediately upon reaching that speed make five stops, each from 30 m.p.h. at 10 f.p.s.p.s. for each stop. After each stop (except the last), accelerate the vehicle immediately at a maximum rate to a speed of 30 m.p.h. and begin the next stop.

S7.16 Spike stops. Make 10 successive spike stops from 30 m.p.h. with the transmission in neutral, with no reverse stops. Make spike stops by applying a pedal force of 200 pounds while recording pedal force versus time. Maintain pedal force until vehicle has stopped. At completion of 10 spike stops, make six effectiveness stops from 60 m.p.h. with a pedal force of 15 to 120 pounds.

S7.16 Service brake system—water recovery test.

S7.16.1 Baseline check stop.—Make three stops from 30 mi/h at 10 ft/s/s for each stop. Control force readings may be terminated when vehicle speed falls to 5 mi/h. Average the maximum brake control force required for the three stops.

S7.16.2 Wet brake recovery stops.—With the brakes fully released at all times, drive the vehicle for 2 min at a speed of 5 mi/h in any combination of forward and reverse directions, through a trough having a water depth of 6 in. After leaving the trough, immediately accelerate at maximum rate to 30 mi/h without a brake application. Immediately upon reaching that speed make five stops, each from 30 mi/h at 10 ft/s/s for each stop. After each stop (except the last), accelerate the vehicle immediately at a maximum rate to a speed of 30 mi/h and begin the next stop.

S7.17 Spike stops.—Make 10 successive spike stops from 30 mi/h with the transmission in neutral, with no reverse stops. Make spike stops by applying a control force of 200 lb while recording control force versus time. Maintain control force until vehicle has stopped. At completion of 10 spike stops, make six effectiveness stops from 60 mi/h.

SEPT 2, 1972 - ESTABLISHED
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MAY 18, 1973 - SEVERAL
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FEBRUARY 22, 1974 - ADDITIONAL
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S7.17 Final inspection. Inspect—

(a) The service brake system for detachment or fracture of any components, such as brake springs and brakeshoes or disc pad facing.

(b) The friction surface of the brake, the master cylinder or brakepower unit reservoir cover and seal and filler open-

ings, for leakage of brake fluid or lubricant.

(c) The master cylinder or brakepower unit reservoir for compliance with the labeling and volume requirements of S5.4.2 and S5.4.3.

(d) The brake system indicator light, for compliance with operation in various key positions, lens color, labeling and location, in accordance with S5.3.

S7.18 Moving barrier test. (Only for vehicles that have been tested according to S7.6.2.) Load the vehicle to GVWR, release parking brake and place the transmission selector control to engage pawl or detent mechanism. With a moving barrier as described in paragraph 3.3 of SAE Recommended Practice J972 "Moving Barrier Collision Tests," November 1966, impact the vehicle from the front at 2½ m.p.h. The longitudinal axis of the barrier is parallel with the longitudinal axis of the vehicle. Repeat the test, impacting the vehicle from the rear.

S7.18 Final inspection.—Inspect—

(a) The service brake system for detachment or fracture of any components, such as brake springs and brake shoes or disc pad facing.

(b) The friction surface of the brake, the master cylinder or brake power unit reservoir cover and seal and filler openings, for leakage of brake fluid or lubricant.

(c) The master cylinder or brake power unit reservoir for compliance with the volume and labeling requirements of S5.4.2 and S5.4.3. In determining the fully applied worn condition assume that the lining is worn to: (1) Rivet or bolt heads on riveted or bolted linings, or (2) within one thirty-seconds of an inch of shoe or pad mounting surface on bonded linings, or (3) the limit recommended by the manufacturer, whichever is larger relative to the total possible shoe or pad movement. Drums or rotors are assumed to be at nominal design drum diameter or rotor thickness. Linings are assumed adjusted for normal operating clearance in the released position.

(d) The brake system indicator light(s), for compliance with operation in various key positions, lens color, labeling, and location, in accordance with S5.3.

S7.19 Moving barrier test.—(Only for vehicles that have been tested according to S7.7.2.) Load the vehicle to GVWR, release parking brake, and place the transmission selector control to engage the parking mechanism. With a moving barrier as described in paragraph 3.3 of SAE recommended practice J972 "Moving Barrier Collision Tests," November 1966, impact the vehicle from the front at 2½ mi/h. Keep the longitudinal axis of the barrier parallel with the longitudinal axis of the vehicle. Repeat the test, impacting the vehicle from the rear.

TABLE I

September 2, 1972 Adopt FMVSS 105a

TABLE I—BRAKE TEST PROCEDURES
SEQUENCE AND REQUIREMENTS

Number	Sequence	Test load		Test procedure	Requirements
		Light	GVWR		
1	Instrumentation check.....			87.2	
2	First (preburnish) effectiveness test.....		X	87.3	85.1.1.1
3	Burnish procedure.....		X	87.4	
4	Second effectiveness.....		X	87.5	85.1.1.2
5	Parking brake.....	X	X	87.6	85.2.1
					85.2.2
6	Third effectiveness (lightly loaded vehicle).....	X		87.7	85.1.1.3
7	Partial failure.....	X	X	87.8	85.1.2
8	Inoperative brake power and power assist units.....		X	87.9	85.1.3
9	First fade and recovery.....		X	87.10	85.1.4
10	First reburnish.....		X	87.11	
11	Second fade and recovery.....		X	87.12	85.1.4
12	Second reburnish.....		X	87.13	
13	Fourth effectiveness.....		X	87.14	85.1.1.3
14	Water recovery.....		X	87.15	85.1.4
15	Spike stops.....		X	87.16	85.1.4
16	Final inspection.....			87.17	85.6
17	Parking brake pawl or detent systems.....		X	87.18	85.2.2.3

May 18, 1973 FMVSS 105a Amended

TABLE I—BRAKE TEST PROCEDURES
SEQUENCE AND REQUIREMENTS

No.	Sequence	Test load		Test procedure	Requirements
		Light	GVWR		
1	Instrumentation check.....			87.2	
2	First (preburnish) effectiveness test.....		X	87.3	85.1.1.1
3	Burnish procedure.....		X	87.4	
4	Second effectiveness.....		X	87.5	85.1.1.2
5	First reburnish.....		X	87.6	
6	Parking brake.....	X	X	87.7	85.2
7	Third effectiveness (lightly loaded vehicle).....	X		87.8	85.1.1.3
8	Partial failure.....	X	X	87.9	85.1.2
9	Inoperative brake power and power assist units.....		X	87.10	85.1.3
10	First fade and recovery.....		X	87.11	85.1.4
11	Second reburnish.....		X	87.12	
12	Second fade and recovery.....		X	87.13	85.1.4
13	Third reburnish.....		X	87.14	
14	Fourth effectiveness.....		X	87.15	85.1.1.4
15	Water recovery.....		X	87.16	85.1.4
16	Spike stops.....		X	87.17	85.1.4
17	Final inspection.....			87.18	85.6
18	Moving barrier test.....		X	87.19	85.2.2.3

February 27, 1974 FMVSS 105a Amended

No changes

TABLE II - STOPPING DISTANCES AND PEDAL FORCES

September 2, 1972 FMVSS 105a Adopted

May 18, 1973 - FMVSS 105a Amended
February 22, 1974 - No change (see correction)

RULES AND REGULATIONS

TABLE II-STOPPING DISTANCES AND PEDAL FORCES

Vehicle test speed, m.p.h.	Stopping distance in feet for tests indicated									
	I		II				III			
	1st (preburnish) effectiveness		2nd and 4th effectiveness: vehicle (third) effectiveness check				Inoperative brake power and power assist unit, partial failure			
	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)	(d)
20	84	61	70	49	74	84	108	121	139	15-100
25	74	53	65	67	74	81	147	165	189	Col. I
30	66	46	56	59	66	74	165	189	216	246 15-120
35	59	40	49	51	59	66	189	216	246	273 15-120
40	53	35	43	45	51	59	216	246	273	312 Col. II
45	48	31	39	41	45	51	246	273	312	343 15-120
50	43	27	34	36	41	45	273	312	343	385 Col. III
55	39	24	30	32	36	41	312	343	385	426 15-120
60	35	21	27	28	32	36	343	385	426	468 15-120
65	31	18	23	24	28	32	385	426	468	510 15-120
70	27	16	20	21	24	28	426	468	510	552 15-120
75	24	14	18	19	21	24	468	510	552	594 15-120
80	21	12	16	17	19	21	510	552	594	636 15-120
85	18	10	14	15	17	19	552	594	636	678 15-120
90	16	9	12	13	15	17	594	636	678	720 15-120
95	14	8	11	12	14	16	636	678	720	762 15-120
100	12	7	10	11	13	15	678	720	762	804 15-120
105	11	6	9	10	12	14	720	762	804	846 15-120
110	10	5	8	9	11	13	762	804	846	888 15-120
115	9	4	7	8	10	12	804	846	888	930 15-120
120	8	4	6	7	9	11	846	888	930	972 15-120

* Distances for specified tests.
† For speeds in excess of 120 m.p.h. use $S = 0.000 V^3$ where S is stopping distance in feet and V is test speed in miles per hour.

- (a) Passenger car.
- (b) Vehicles other than passenger cars with GVWR of 10,000 pounds or less.
- (c) Vehicles other than passenger cars with GVWR greater than 10,000 pounds.

[72 Doc. 72-14762 Filed 9-1-72; 8:45 am]

TABLE II-STOPPING DISTANCES AND PEDAL FORCES

Vehicle test speed, MPH	Stopping distance in feet for tests indicated									
	I		II				III			
	Fourth effectiveness; spike effectiveness check		Second effectiveness				Third (lightly loaded vehicle) effectiveness			
	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)	(d)
20	87	66	76	54	75	86	51	68	81	114
25	74	53	65	46	64	74	46	64	74	100
30	66	46	56	40	56	66	40	56	66	90
35	59	40	49	35	49	59	35	49	59	81
40	53	35	43	31	43	53	31	43	53	74
45	48	31	39	27	39	48	27	39	48	68
50	43	27	34	24	34	43	24	34	43	63
55	39	24	30	21	30	39	21	30	39	59
60	35	21	27	18	27	35	18	27	35	54
65	31	18	23	16	23	31	16	23	31	51
70	27	16	20	14	20	27	14	20	27	48
75	24	14	18	12	18	24	12	18	24	46
80	21	12	16	10	16	21	10	16	21	44
85	18	10	14	9	14	18	9	14	18	42
90	16	9	12	8	12	16	8	12	16	40
95	14	8	11	7	11	14	7	11	14	38
100	12	7	10	6	10	12	6	10	12	37

- * Distances for specified tests.
- (a) Passenger car.
- (b) Vehicles other than passenger cars with GVWR of 10,000 lb or less.
- (c) Vehicles other than passenger cars with GVWR greater than 10,000 lb.
- NA Not applicable.

February 22, 1974 - Correct Table II

28. In table II, the stopping distance value from 50 mph in column I(c) is corrected to read "193".

July 15, 1974 - FMVSS 105a Amended

17. In Table II, the words "AND PEDAL FORCES" are deleted from the title, and Columns III(b) and III(c) are revised to read as follows:

Vehicle test speed (miles per hour)	(b)	(c)
20	57 (61)	68 (70)
25	46 (48)	50 (52)
30	40 (42)	43 (45)
35	35 (37)	38 (40)
40	31 (33)	34 (36)
45	27 (29)	30 (32)
50	24 (26)	27 (29)
55	21 (23)	24 (26)
60	18 (20)	21 (23)
65	16 (18)	19 (21)
70	14 (16)	17 (19)
75	12 (14)	15 (17)
80	11 (13)	14 (16)
85	10 (12)	13 (15)
90	9 (11)	12 (14)
95	8 (10)	11 (13)
100	7 (9)	10 (12)

TABLE III - INOPERATIVE POWER ASSIST

September 2, 1972 - No Table III
May 18, 1973 - FMVSS 105a Amended

TABLE III--INOPERATIVE BRAKE POWER ASSIST AND
BRAKE POWER UNIT

Stop No.	Average deceleration (feet per second per second)		Equivalent stopping distance feet	
	Col. 1	Col. 2	Col. 3	Col. 4
1	16	16	242	242
2	15	14	277	277
3	14	13	323	323
4	13	12	384	384
5	12	11	464	464
6	11	10	567	567
7	10	9	698	698
8	9	8	861	861
9	8	7	1064	1064
10	7	6	1325	1325

[FEB Doc. 73-9746 Filed 8-11-73; 4:16 pm]

February 22, 1974 - FMVSS 105a Amended

29. In table III, with respect to Stop No. 7 the initials "N.A." appearing under columns 1 and 3 respectively are replaced with "(Depleted)" and "554". and a new "Stop No. 11" is added with the following entries under columns 1, 2, 3, and 4 respectively: "N.A.", "(Depleted)", "N.A.", and "554".

July 15, 1974 - FMVSS 105a Amended

TABLE III--Inoperative brake power assist and brake power unit

Stop No.	Average deceleration, F/MS ²			Equivalent stopping distance, feet		
	Column 1--Brake power assist		Column 2--Brake power unit	Column 3--Brake power unit		Column 4--Brake power unit
	(a)	(b), (c)	(a)	(b), (c)	(a)	(b), (c)
1	16.0	14.0	16.0	14.0	242	242
2	15.0	13.0	15.0	13.0	277	277
3	14.0	12.0	14.0	12.0	323	323
4	13.0	11.0	13.0	11.0	384	384
5	12.0	10.0	12.0	10.0	464	464
6	11.0	9.0	11.0	9.0	567	567
7	10.0	8.0	10.0	8.0	698	698
8	9.0	7.0	9.0	7.0	861	861
9	8.0	6.0	8.0	6.0	1064	1064
10	7.0	5.0	7.0	5.0	1325	1325
11	NA	NA	NA	NA	NA	NA
12	NA	NA	NA	NA	NA	NA

* Depleted.

(a) Passenger cars.

(b) Vehicles other than passenger cars with GVWR of 10,000 lb or less.

(c) Vehicles other than passenger cars with GVWR greater than 10,000 lb.

NA - Not applicable.

September 2, 1972 - FMVSS 105a Adopted

September 2, 1972 - FMVSS 105a Adopted

May 18, 1973 - FMVSS 105a Amended
February 22, 1974 - No change

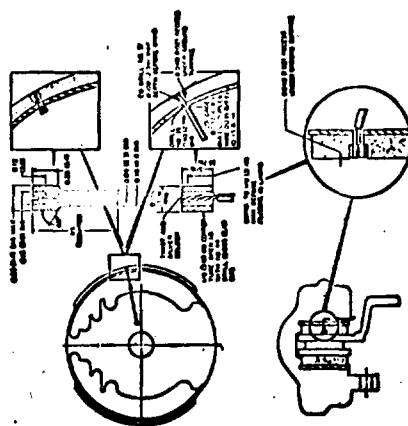
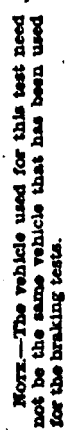
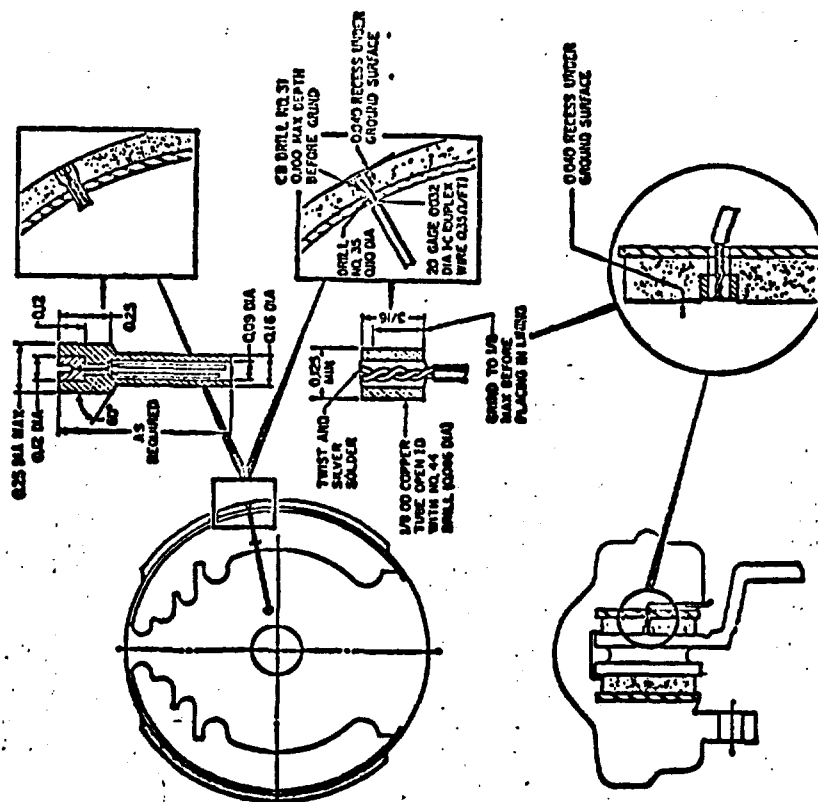


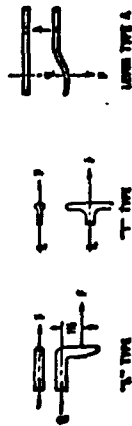
FIGURE 1 - TYPICAL PLUG THERMOCOUPLE INSTALLATIONS
The second thermocouple shall be installed at .000 inch depth within 1 inch circumferentially of the thermocouple installed at .000 inch depth.



September 2, 1972 - No Figure 11
 May 18, 1973 - FMVSS 105a Amended

February 22, 1974 - FMVSS 105a Amended

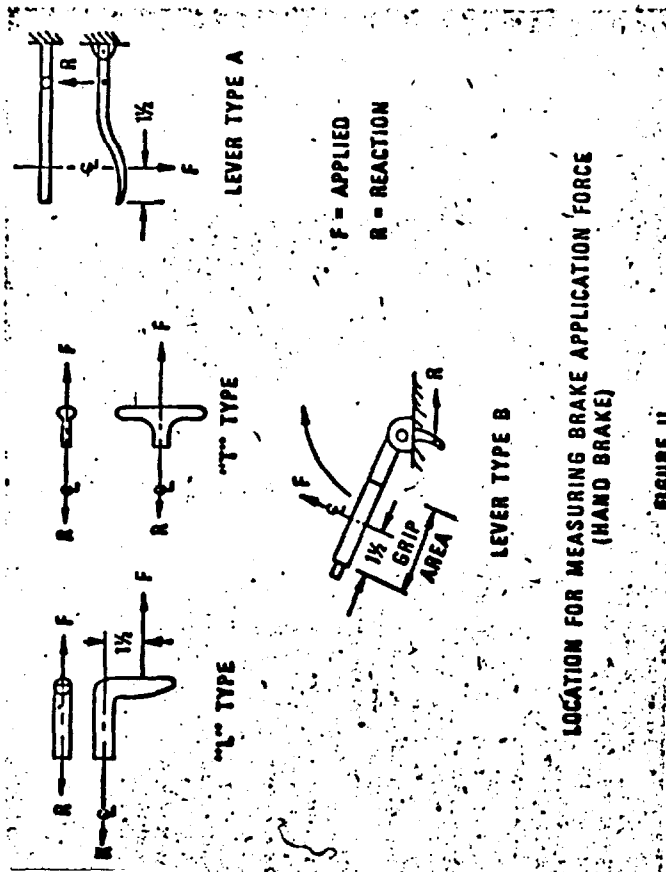
RULES AND REGULATIONS



LEVER TYPE B

LOCATION FOR MEASURING BRAKE APPLICATION FORCE (HAND BRAKE)

FIGURE 11



LEVER TYPE A

LEVER TYPE B

LEVER TYPE C

F = APPLIED
 R = REACTION

LEVER TYPE B

LOCATION FOR MEASURING BRAKE APPLICATION FORCE (HAND BRAKE)

FIGURE 11

BULLETIN

NO. 509

August 12, 1974

AMERICAN ASSOCIATION OF MOTOR VEHICLE ADMINISTRATORS (AAMVA)

On May 22, 1974 the AAMVA published revised submission requirements to obtain an AAMVA Certificate of Approval.

Mr. Nelson, Chairman of the Brake Performance Study Committee, wrote AAMVA for clarification. Essentially, the changes to the previous procedure for certifying brake linings were:

1. Submission of two copies of the laboratory test report is now required.
2. Samples are no longer required. In place of the samples they now require clear photographs or halftone prints showing the required markings.

In the AAMVA announcement to manufacturers, they advised that Massachusetts had now joined the Equipment Approval Program. For those filing through AAMVA, this may mean that submissions will not be required by Massachusetts. Mr. Nelson has asked for clarification on this by the Massachusetts authorities.

A copy of AAMVA's May 22, 1974 release is enclosed.

EWD/erc

Enclosure:

cc: Delegates & Alternates

Regional Members (U.S. Copyright)

E. W. Drislane

Executive Director

AMERICAN ASSOCIATION OF MOTOR VEHICLE ADMINISTRATORS



An Association of State and Provincial Officials Responsible
for the Administration and Enforcement of Motor Vehicle
and Traffic Laws in the United States and Canada.

1828 L STREET, N.W., SUITE 500 • WASHINGTON, D. C. 20036 • TELEPHONE 202/296-1955

Raymond A. Jackson
President
Louis P. Spitz
Executive Director

May 22, 1974

TO: Safety Equipment Manufacturers and Accredited Testing
Laboratories

FROM: Armond Cardarelli, Director
Equipment Approval and Vehicle Inspection Division

SUBJECT: Revised Submission Requirements to Obtain an AAMVA
Certificate of Approval

Enclosed find copies of revised submission requirements and AAMVA
Equipment Approval Chart reflecting status of safety equipment
products subject to AAMVA approval on behalf of its member juris-
dictions.

The revised policy changes were based on requests from industry
groups to eliminate the need for sample submissions. However,
in lieu of the sample, the required test reports shall contain
glossy photographs or halftone prints to clearly define the
product and that AAMVA reserves the right to request samples when
necessary for evaluation purposes.

Since the printing of the enclosed equipment status chart, two
additional jurisdictions became members of the AAMVA Equipment
Approval Program. We recommend marking your chart to show that
the State of Massachusetts and the Province of Ontario as members.

W.C. 3/3

Enclosures

RECEIVED		MAY 24 1974	
		NFA	FILE
REN 8/1 5/31			

FMSI 17990

EFFECTIVE DATE: 5/20/74

BASIC REQUIREMENTS FOR OBTAINING AN AAMVA EQUIPMENT APPROVAL CERTIFICATE

1. Applications for approval must be made on form EA-3 furnished by the American Association of Motor Vehicle Administrators (AAMVA) or the form may be reproduced by submitting agency.

2. Application must be mailed to:

American Association of Motor Vehicle Administrators
Equipment Approval Division
1828 L Street, N.W.
Washington, D.C. 20036

3. Each application must be signed by a responsible representative of the submitting agency.

4. Separate application must be made for:

Each device
Each part
Each type of material, including safety glass
Each assembly

5. Each application must be accompanied by:

A-Two copies of a laboratory test report from an AAMVA approved testing laboratory, indicating that the device meets the current applicable standard. (See list of approved laboratories and approval expiration policy.)

B-Check payable to the American Association of Motor Vehicle Administrators in the amount of \$250.00 for each application.

C-Sample device not required. In lieu of sample, test reports must contain one 8 x 10 glossy photograph or halftone print showing the device in a three-quarter front view and any additional views to clearly define identification markings and where possible, a view of the disassembled components in a minimum 5 x 7 glossy or half tone.

D-Two copies of instructions for adjusting the device or directions for the use of the device. (When applicable.)

**BASIC REQUIREMENTS FOR OBTAINING
AN AMENDED AAMVA EQUIPMENT APPROVAL CERTIFICATE**

Extended or amended AAMVA Approval Certificates can be granted for minor changes in previously approved equipment. The following conditions must be met in order to obtain an extended or amended Approval Certificate.

1. A new application must be filed with an accompanying statement that the request for extension or amendment is being made because of a minor change, such as:
 - a. A change of identification or model number.
 - b. A correction to a Test Report.
 - c. A Subtle modification which does not materially affect the performance specification of the original approved item.
2. An appendix to the Test Report (from the same Test Laboratory) certifying that the item is not changed functionally and that the engineering characteristics and resultant performance data are identical to the previously approved item.
3. Production sample not required.
4. A \$50.00 extension or amendment fee.
5. All correspondence regarding an extended or amended Certificate must contain the proper reference to the previously approved AAMVA Approval Certificate number.

BULLETIN

N O. 5 0 8

August 7, 1974

APPLICATION OF PASTA CLUTCH, S.A. - REGIONAL MEMBERSHIP

An application has been received from Pasta Clutch, S. A. for Regional Membership in the Friction Materials Standards Institute, Inc. This application was received during our annual meeting in South Carolina, and a preliminary notice concerning this application was in the FMSI NEWS of July 10, 1974.

The application was reviewed by the Board of Directors who voted 6-0 (1 abstention) for acceptance of this application.

Pasta Clutch, S.A. is a Mexican manufacturer of clutch facings. Their application was accompanied by a check for \$1,700, the same fee as for an Active Member with one category. It is their intention to use the copyrighted FMSI numbers in marketing their clutch facings in the United States.

From long correspondence with Pasta Clutch, S.A., they have recently been sold to new owners who I believe include U. S. and Candian citizens. Actually, in 1972, Pasta Clutch, S.A. had applied for and been voted into Membership. I had--through inexperience-- not collected the annual fee in advance. I since have learned that at about that time, the former management had been victimized by some type of fraud. I had corresponded with the former management concerning their fee and the use of our copyrighted numbers. Since the new ownership has moved in, our relationship with Pasta Clutch, S. A. has improved.

Pasta Clutch, S. A. is apparently qualified for Regional Membership. Their dues have been properly paid in advance, and the new owners have been both responsive and cooperative.

Your ballot is important as I must have affirmative votes of 3/4 of the Membership. A stamped return envelope is enclosed with the Delegate's copy along with the ballot.

EWD/erc
Enclosure:
cc: Delegates & Alternates

E. W. Drislane
Executive Director

MEMBERS' BALLOT

(Re Memo August 7, 1974)

Friction Materials Standards Institute, Inc.
E-210 Route 4
Paramus, New Jersey #07652

Gentlemen:

My vote on the acceptance of the application for Regional
Membership filed by Pasta Clutch, S. A. (of Mexico) is:

YES ☐

NO ☐

Signature_____

Company_____

Date_____

BULLETIN

NO. 507

August 5, 1974

AMENDMENT TO CONSTITUTION AND BY-LAWS

During the 1973-74 fiscal year the Membership ratified an amendment to our Constitution and By-Laws. This amendment was effective June 30, 1974. It concerns eligibility requirements for Licensee's only.

This amendment to our Constitution and By-Laws is the first amendment since that of October 8, 1970

Former wording. Article III - Membership. Section 2 - Eligibility. last sentence:

Any person, firm or corporation located in any country, other than one "behind the iron curtain," engaged in the manufacture of brake shoes in commercial quantities shall be eligible to become a Licensee.

Amended wording: effective June 30, 1974. Article III- Membership. Section 2 - Eligibility. last sentence:

Any person, firm or corporation located in any country, engaged in the manufacture of brake shoes, or materials for their attachment or assembly, in commercial quantities, or in the manufacture of tools and/or equipment used in the preparation and installation of friction materials, shall be eligible to become a Licensee.

A copy of our Constitution and By-Laws, as amended June 30, 1974, is enclosed.

EWD/erc
Enclosure:
CC-Active Members
Regional Members
Licensees

E. W. Drislane
Executive Director

CONSTITUTION AND BY-LAWS
of
FRICTION MATERIALS STANDARDS INSTITUTE, INC.

CONSTITUTION

ARTICLE I

NAME

The name of this Institute shall be Friction Materials Standards Institute, Inc.

ARTICLE II

OBJECTS

The objects of this Institute shall be:

(a) To maintain and raise the standards of all products manufactured by the members of this corporation and by the brake lining, brake shoe and friction materials industry as a whole.

(b) To prevent unfair and fraudulent practices and methods and to cause the observance of a high standard of ethics by all members of the said industry.

(c) To encourage and support research in sources of supply, materials and manufacturing processes.

(d) To collect, assemble and disseminate to members of the said industry, scientific, engineering, technological, statistical and other relevant information pertaining to brake linings and clutch facings and pertaining to the said industry.

(e) To cooperate with the United States Government through its various departments and bureaus and with the respective States and Municipalities through their various departments and bureaus for the general benefit of the public and the enhancement of the industry.

(f) To acquire property for the corporate purposes by grant, gift, purchase, devise or bequest, and to hold and to dispose of the same subject to such limitations as are prescribed by statute.

(g) To carry on all or any of its activities and to purchase or acquire, hold and dispose of such property, real personal and mixed, as may be requisite for the transaction of its business or the conduct of its affairs, in any of the states, districts, territories or possessions of the United States, and in any and all foreign countries, subject to the laws of such state, district, territory, possession or country.

ARTICLE III

MEMBERSHIP

Section 1. Classification. In addition to active membership in the Institute, entitling members to all rights, privileges and benefits of the Institute, there shall be two classifications, one known as "Regional Members" and a second known as "Licensees". The participation in the activities of the Institute of Regional Members and Licensees shall be limited and restricted in the manner set forth in Section 5 hereof.

Section 2. Eligibility. Any person, firm or corporation of good repute, residing in or having its principal office located in the United States of America and engaged in the manufacture of brake linings or clutch facings in commercial quantities shall be eligible to become a Member. Any person, firm or corporation of good repute, residing or having its principal office outside of the United States and engaged in the manufacture of brake linings or clutch facings in commercial quantities for use outside of the United States, or any trade association of manufacturers of brake linings or clutch facings as herein described having a principal office outside the United States shall be eligible to become a Regional Member. Any person, firm or corporation who is a member of a trade association Regional Member shall be entitled to membership benefits through such trade associations. Any person, firm or corporation located in any country, engaged in the manufacture of brake shoes, or materials for their attachment or assembly, in commercial quantities, or in the manufacture of tools and/or equipment used in the preparation and installation of friction materials, shall be eligible to become a Licensee.

Section 3. Applications. Applications for membership shall be made in writing and shall contain such information as may be required by the Board of Directors and an agreement on the part of the applicant that upon election to membership, to accept the Constitution and By-Laws of the Institute, together with any amendments that may, from time to time, be made thereto. Applications for admission as a Regional Member or as a Licensee likewise shall be made in writing and shall be subject to acceptance by the Board, but shall not require agreement by the applicant to be bound by the Constitution and By-Laws or by other regulations or codes adopted by the Institute, except as specifically provided herein.

Section 4. Election to Membership. Application for membership shall be submitted to the Board of Directors which shall consider the information contained in the application, the reputation of the applicant in the industry and any other information submitted to it. The President may appoint a Membership Committee from among the members of the Institute for the purpose of collecting such additional information as the Board may deem necessary or desirable to assist in its consideration of the application. The Board shall submit its recommendation at the next ensuing meeting of the Members, at which time, the application shall be acted upon, or it may canvass the vote by mail by mailing to each of the Members a copy of its report and recommendation together with a ballot. If the voting is conducted by mail, a period of twenty-one (21) days from the date of mailing of the report and ballot shall ensue before the vote is determined. The affirmative vote of three-fourths of the Members of the Institute shall be necessary for election to membership.

Section 5. Rights of Members.

(a) Active Members. Active Members shall be entitled to participate in all the activities and to receive the benefit of all of the services of the Institute and to vote upon all matters which come before the membership for action.

(b) Regional Members. Regional Members shall be entitled to receive from the Institute, as completely and promptly as Active Members, all scientific, engineering, technological and statistical information collected, assembled or disseminated by the Institute and may fully and freely call upon the Institute for all such available information and assistance in connection therewith. The participation of Regional Members in the activities of the Institute shall be restricted as in this paragraph (b) set forth and they shall not be bound by, enjoy or participate in any other rights, obligations, privileges, benefits or activities otherwise available to Active Members, except that Regional Members may serve on committees. Nothing contained in this section, however, shall limit the provisions of Article X.

(c) Licensees. A Licensee shall receive any and all information, data, circulars or written material released by the Institute pertaining to the specific product line or category for which he is licensed to use such information. Licensees shall not be entitled to attend membership meetings of the Institute nor shall Licensees have the right to vote or become members of the Board of Directors. Licensees may be invited to act in an advisory capacity on questions pertaining to the product line or category for which the license was granted. Invitations to Licensees to attend committee meetings will be in writing by the Institute Secretary at the direction of the committee chairman.

ARTICLE IV

DIRECTORS

Section 1. Number. The government of the Institute shall be vested in a Board of Directors consisting of seven directors who shall pursue such policies and principles as shall be in accordance with the Certificate of Incorporation, the Constitution and By-laws, the laws of the state of New York and the statutes of the United States.

Section 2. Classes. It is the expressed policy of the Institute that the Board of Directors shall, at all times, be representative of a cross section of the industry and to that end three classes of directors shall be created as follows:

- Class 1. Consisting of two directors, each associated with an Active Member whose annual fee payable to the Institute is within the top one-third bracket of annual fees paid.
- Class 2. Consisting of two directors, each associated with an Active Member whose annual fee payable to the Institute is within the middle one-third bracket of annual fees paid.
- Class 3. Consisting of two directors, each associated with an Active Member whose annual fee payable to the Institute is within the lowest one-third bracket of annual fees paid.

The seventh director shall be selected from the industry at large and without limitation.

Section 3. Election. The directors shall be elected by ballot at the annual meeting of the Institute. A majority vote of the members present shall be required for their election. Voting shall be by classes and each member shall be entitled to cast one vote for each vacancy being filled in each class and one vote for the director at large.

Section 4. Term of Office. At the first annual meeting of the Institute, one Class 1 director, one Class 2 director and one Class 3 director shall be elected for terms of one year each, and one Class 1 director, one Class 2 director, one Class 3 director and a director at large shall be elected for terms of two years each. Thereafter, at each successive annual meeting in the odd numbered years, a Class 1 director, a Class 2 director and a Class 3 director shall be elected and in the even numbered years, a Class 1 director, a Class 2 director, a Class 3 director and a director at large shall be elected, all of whom shall be elected for a term of two years.

Section 5. Vacancies. If the office of any director or directors becomes vacant by reason of death, resignation, retirement, disqualification, removal from office or otherwise, the remaining directors, though less than a quorum, shall choose a successor or successors who shall be of the same class as the director whose vacancy he is filling. Such successor or successors shall hold office until the next annual election and until a successor or successors have been duly elected, unless sooner displaced. In the event that any member of the Board of Directors shall change his employment to a company, other than the one from which he was elected to the Board, and is re-employed by another member company, his term of office as a director shall automatically cease.

Section 6. Validity. The failure of the members or of the Board of Directors to observe the limitations in the election of the various classes of directors shall not invalidate the election of any director, except that the members at any annual or special meeting, by vote of a majority of those present, may remove any director who is not representative of the class to which he has been elected and the members shall thereupon elect a successor of the proper class.

Section 7. Annual Report. The Board of Directors shall submit at the annual meeting of members, a report of their proceedings for the year.

Section 8. Meetings and Notices. Regular meetings of the Board of Directors will be held quarterly on the fourth (4th) Wednesday of July, October, January and April in each year at a place to be fixed by the President. A special meeting of the Board of Directors may be called by the President whenever there is, in his opinion, necessity for such meeting and a meeting shall be called by him at the request in writing of any three directors. Except as hereafter in this section provided or as may be otherwise provided by law, a notice of the time and place of holding every meeting of the directors shall be delivered personally or mailed in a postage prepaid envelope not less than three (3) nor more than twenty (20) days before such meeting to each director. Any meeting of the Board at which all of the directors shall be present, or of which notice shall be waived either before or after such meeting, in writing or by telegraph by all absentees, shall be valid for all purposes provided a quorum is present thereat. Notice of any adjourned meeting need not be given.

Section 9. Quorum. Any four (4) of the directors shall constitute a quorum for any meeting of the Board.

ARTICLE V

OFFICERS

Section 1. Number. The officers of the Institute shall be a President, a Vice-President, a Secretary and a Treasurer and such other officers as may from time to time be appointed by the Board.

Section 2. Election and Term of Office. The Board of Directors at its annual meeting shall, from among its members, elect a President and a Vice President to hold office until the next annual meeting of the Board and until their successors in office shall be elected and shall qualify. The officers elected by the Board shall be eligible to succeed themselves for the ensuing year. The Board, at its annual meeting, shall also appoint a Secretary and a Treasurer who need not be members of or associated with a member of the Institute. The Secretary and the Treasurer shall not be elected for a specific term, but shall hold office at the pleasure of the Board.

ARTICLE VI

DUTIES OF OFFICERS

Section 1. President. It shall be the duty of the President to preside at all meetings of the directors and the Institute. He shall appoint such committees as may be necessary and call special meetings of the members of the Institute and of the Board of Directors as provided for herein. In the event of the death, disability, or resignation of the Treasurer and during his absence, the President shall perform all duties of the Treasurer.

Section 2. Vice President. It shall be the duty of the Vice President to act in the absence or disability of the President and in case of his death or resignation, the Vice President shall assume the title, duties and powers of the President. In the event of death, disability or resignation of both the President and Vice President the Board of Directors shall convene within ten (10) days at the call of the Secretary and shall fill the vacancies by ballot from among the directors.

Section 3. Secretary. It shall be the duty of the Secretary to keep all records of the Institute, notify candidates for membership of their admission or rejection, register the names of the members, issue all notices required and, under the direction of the President, to collect all membership fees, dues and assessments and any other monies due to the Institute and transmit same to the Treasurer.

Section 4. Treasurer. The Treasurer shall have the custody of all the monies of the Institute and shall order and direct the payment of all bills. The Treasurer shall keep a proper account of all receipts and disbursements and shall submit his books and other records of his office to the Board of Directors upon request, and shall submit to the Board of Directors not later than the 25th days of October, January, April and July written reports covering all receipts and disbursements during the last preceding quarter. All monies received by the Treasurer shall be deposited in the name of the Institute with such depository as may be designated by the Board of Directors. The Treasurer shall sign all checks on behalf of the Institute, except that such checks shall be countersigned by such other officers as the Board of Directors shall, from time to time, order and direct.

ARTICLE VII

MEMBERSHIP MEETINGS

Section 1. Annual Meeting. The annual meeting of the members of the Institute shall be held each year on the third Wednesday of June at a place to be designated by the Board of Directors or by the President.

Section 2. Special Meetings. The time and place of holding special meetings of the members of the Institute shall be determined by the Board of Directors or by

the President, either of whom shall have authority to call such meetings as may be desirable for the conduct of the Institute's business.

Section 3. Quorum and Voting. A majority of the Active Members of the Institute shall constitute a quorum at any meeting for the transaction of business, except when otherwise provided by law. At all meetings of the members of the Institute, each member shall be entitled to one vote, regardless of the number of delegates present.

The votes of the membership may be taken by mail ballot if, in the discretion of the President of the Institute or of a majority of the Board of Directors, a record of a vote in that manner is deemed advisable.

Section 4. Adjournments. When a quorum is not present at any meeting of the members, any lesser number may adjourn such meeting from time to time and the meeting may be held as adjourned upon written notice (telegraphic notice if meeting is to be held within forty-eight (48) hours) to all absent members.

Section 5. Vote Required. Except as otherwise provided in the Constitution and By-Laws, at all meetings of the Institute a majority vote of those present shall rule. In connection with any action taken by mail ballot, a majority vote of all eligible voting members of the Institute shall rule.

Section 6. Notice of Meetings. Notice of the time and place of holding all meetings of the Institute shall be given by mailing a written notice or telegraphic notice of such meeting to all members entitled to such notice at least seven (7) days before said meeting.

ARTICLE VIII

FISCAL

Section 1. Fiscal Year. The fiscal year of the Institute shall commence on July 1st and end on June 30th.

Section 2. Budget. The directors shall prepare and submit to the annual meeting of the members a budget of the estimated expenses which are necessary or desirable, in their opinion, for the conduct of the business during the ensuing fiscal year. The budget shall be submitted for approval at such annual meeting of the members. In the event that between annual meetings the directors, in their absolute discretion, determine that the best interests of the Institute require expenditures of monies in addition to those provided for in the budget, they shall have the power to determine the amount so required and to levy an assessment therefore against the members of this Institute on the ratio set forth in Article IX, Section 2 hereto, provided, however, that notwithstanding the power of the Board of Directors to levy additional assessments, such additional assessments shall be limited, in any one fiscal year, to an amount equal to ten (10) per cent of the budget approved at the last annual meeting of the members.

ARTICLE IX

FEES AND ASSESSMENTS

Section 1. Initiation Fee. The initiation fee payable upon admission to the Institute shall be \$1,000.00 except that any member elected to membership as a Charter Member by the incorporators at their first meeting shall not be required to pay any initiation fee. No initiation fee shall be charged to or be payable by any Regional Member or by any Licensee.

Section 2. Annual Fees.

(a) Active Members. The annual fee of Active Members shall be based upon a formula developed by the Board of Directors annually and reviewed and approved by the membership.

(b) Regional Members. The annual membership fee of a Regional Member and the annual membership fee of a regional trade group shall be fixed by the Board of Directors. A qualified member of a regional trade group will not be required to pay any additional fee to the Institute.

(c) Licensees. The annual fee of a Licensee shall be fixed by the Board of Directors and shall be payable semi-annually in advance on the first days of July and January. There shall be no prorating of such annual fees of a Licensee and such Licensee who is admitted during the fiscal year shall be obligated to pay the full amount of the annual fees for the current fiscal year.

Section 3. Additional Assessments. The Board of Directors shall have the power from time to time to levy against the Active Members of the Institute such additional assessments as the Board in its sole discretion deems desirable in accordance with the financial requirements of the Institute provided, however, that a schedule of any such additional assessments shall be mailed to every Active Member of the Institute within thirty (30) days after the adoption of a resolution authorizing such assessments and providing that it meets with the requirements of Article VIII, Section 2 hereof.

Section 4. Termination of Membership. The Board of Directors may at its option terminate participation in the Institute by a Member, Regional Member or a Licensee (providing two weeks notice has been given by registered mail) upon failure of such Member, Regional Member or Licensee to pay its annual fees or assessments within thirty (30) days after the time designated for such payments.

Section 5. Cessation of Participation. Any Member, Regional Member or Licensee may withdraw from participation in the Institute at any time upon payment of its annual fees for the current fiscal year and all rights to participate shall cease as of such date.

Section 6. Reinstatement. Any Member, Regional Member or Licensee dropped because of non-payment of fees or other proper charges may be reinstated if he shall give thereafter to the Board of Directors a sufficient and reasonable excuse in writing for such non-payment and shall discharge his indebtedness. It shall be solely within the discretion of the Board of Directors to determine what shall be considered a reasonable excuse and their decision thereon is final.

ARTICLE X

DISCIPLINE OF MEMBERS

Section 1. Expulsion. The commission by any Active Member, Regional Member or Licensee of an act which, in the opinion of the members or of the Board of Directors discredits, or tends to discredit, or otherwise injures the Institute or its members, may be cause for expulsion of such member by the Board of Directors.

Section 2. Procedure. Any member charged with the commission of any act or acts referred to herein shall be duly notified in writing of the charge or charges against him and he shall be given fair opportunity to be heard at a meeting of the Board of Directors or to submit a defense in writing as he may elect.

Section 3. Vote Required. The vote of five (5) members of the Board of Directors shall be necessary to find a member guilty of an offense and to expel him, as provided in this article.

ARTICLE XI

AMENDMENTS

Section 1. Vote Required. The Constitution and By-Laws may be amended at any regular or special meeting of the members of the Institute only (a) by vote of two-thirds of all the Active Members or (b) by the written assent of not less than two-thirds of all the Active Members providing all Active Members have previously had written notice of the proposed amendment.

Section 2. Notice. The call for a meeting referred to in this article shall be signed by the President or such person as he may direct and shall contain a statement of any proposed amendment and shall be mailed not less than two weeks before the meeting.

BY-LAWS

ARTICLE I

RULES

Section 1. Designation of Delegates. No member shall have more than one vote. Any one duly authorized may appear for and cast a vote for any member of the Institute and such vote shall be binding in all respects upon the member company. Each member may file the name of its delegate and alternate annually with the Secretary of the Institute and providing no such annual list is filed, then each member is required to file the name of its delegate to any meeting of the Institute twenty-four hours prior to such a meeting.

Section 2. Roll Call. Any member may demand a roll call on any vote.

Section 3. Minutes. At every annual meeting and every special meeting of the Institute some competent person shall act as the official stenographer for the meeting.

Section 4. Reports. The reports of the Board of Directors and of the officers and all committees shall be written reports.

Section 5. Publication of Reports. An official report of the proceedings of each annual meeting and of each special meeting shall be published as the Board of Directors may require and a copy of such report, if published, shall be sent to every member.

ARTICLE II

ORDER OF BUSINESS

The order of business at all regular and special meetings of the members of the Institute or of the Board of Directors shall be as follows:

- (1) Call of Roll
- (2) Reading of Minutes of Previous Meeting
- (3) Reports of Officers

- (4) Reports of Committees
- (5) Unfinished Business
- (6) New Business

ARTICLE III

Surety bonds for the Treasurer, if any, shall be provided at the expense of the Institute. The amounts of such bonds shall be fixed by the Board of Directors.

ARTICLE IV

DIRECTORS' EXPENSES

Directors shall not be reimbursed for attending any directors' meetings.

ARTICLE V

RESIGNATIONS

No member shall have the right to resign from the Institute while in debt for dues or assessments.

ARTICLE VI

COUNSEL

At each annual meeting of the members of the Institute legal counsel shall be retained for the ensuing year. It shall be the duty of the Secretary to send to such counsel notice of all meetings of the membership, of the Board of Directors and of all committees and it shall be the duty of such counsel to be present at all such meetings.

BULLETIN

NO. 506

July 18, 1974

MEMBERSHIP CHANGES

There have been three changes in our Membership in the past several weeks.

CHRYSLER CORPORATION (ACTIVE MEMBER)

The Chrysler Corporation's Chemical Division had been an Active Member of the Institute for many years. Responsibility for marketing their friction materials has been moved, and they will no longer be using the copyrighted FMSI Numbers in marketing their products. Their resignation is effective June 30, 1974.

INDUSTRIAS TECNICAS AUTOMOTRICES DE PUEBLA, S.A. (REGIONAL MEMBER)

Based on additional mail ballots received after the 14 affirmative votes at the Annual Meeting, Industrias Tecnicas Automotrices de Puebla, S.A. (of Mexico) has been admitted to the Institute as a Regional Member. Their Membership is effective as of July 1, 1974. Industrias Tecnicas Automotrices de Puebla, S.A. is a manufacturer of brake linings and brake blocks.

Industrias Tecnicas. Automotrices de Puebla, S.A.
Iturbide No. 71
Ixtapalapa 13, D.F. Mexico
(Contact: Guillermo Buendia Q., Sales Manager)

WISCONSIN GASKET AND MANUFACTURING CO. (Licensee Member)

Wisconsin Gasket and Manufacturing Co. was admitted to Licensee Membership by vote of the Board of Directors. Their Licensee Membership is effective as of July 1, 1974. Wisconsin Gasket is a manufacturer of disc brake shoe insulators or silencer gaskets.

Wisconsin Gasket and Manufacturing Co.
11500 West Brown Deer Road
Milwaukee, Wisconsin #53224
(Contact: W.H. Wetterau, Director of Sales)

EWD/erc

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 0 5

July 8, 1974

HISTORICAL SALES PROGRAM

The Historical Sales program will be continued with the next reporting for the six months ended June 30, 1974. There will be no change in the reporting details from that requested in Bulletin 490 of January 11, 1974.

To repeat some of the reporting details, the following items should be considered:

1. Quantities will be reported in pieces (not units). For roll lining, each foot of length will be one piece.
2. Our accountants will report the names of the members from whom reports are received, and the number of members reporting in each of the four groups.
3. Total pieces in each group will be reported (average will not be shown).

As in the past, this data will be confidential, and as totals for each group will be shown, there is no way of determining quantities by individual member.

Please review the form and the descriptions, as they apply to this year's reporting. The Delegate or Alternate will be receiving from Marshall-Granger & Company, Certified Public Accountants, a form for completing this information. Please return it to:

Marshall Granger & Co., C.P.A.
1600 Harrison Avenue
Mamaroneck, N.Y. 10543

If you do not wish to report these figures, no reply is necessary. Only those reporting figures will receive the industry totals when the data is summarized. A sample form and definitions are attached.

EWD:lmc
Encs.
Distribution: Active Members

E. W. Drislane
Executive Director

EXHIBIT "A"

STATISTICAL PROGRAM OF THE
FRICTION MATERIALS STANDARDS INSTITUTE, INC.

Mail to:

Marshall Granger & Co.
1600 Harrison Avenue
Yamaronneck, N.Y. 10543

Pieces sold to domestic distributors, direct consumers, rebuilders and private
brands for use in the replacement market:

6 months
(January 1 - June 30, 1974)

Brake linings up to 3/4" nominal
thickness (See explanation for roll
lining.)

Brake blocks, nominal thickness of
3/4" and over

Disc brake linings

Clutch facings

Total pieces:

By: _____
Signature

Company

Date

DEFINITION FOR HISTORICAL SALESPIECES

The reports will show pieces of friction material, in groups as shown:

<u>Group</u>	<u>Description</u>	<u>Normal Usage</u>
Brake Lining	Friction materials up to a nominal 3/4" thickness (See note on roll lining)	Normally, <u>one piece</u> to a shoe.
Brake Blocks	Friction materials with a nominal thickness of 3/4" and over.	Normally, <u>two pieces</u> to a shoe.
Disc Brake Linings	Friction materials sold (for disc brakes) to be attached to the shoe, or sold as a unit molded, bonded or riveted to the shoe.	Normally, <u>one piece</u> to a shoe.
Clutch Facing	Friction materials of annular shape, or segments thereof.	Normally, <u>two annular pieces</u> for clutch plate.

Note: For roll lining only, consider each foot of length equals one piece.

REPLACEMENT SALES

This reporting is for domestic sales to the replacement field. Do not include export sales. This includes sales under the friction material manufacturer's own name or brand name, or brand name used by the customer, to automotive warehouse distributors, brake specialists, jobbers, direct consumers of automotive friction materials, government agencies and re-manufacturers of brakes, clutches and automatic transmissions.

Where one friction material manufacturer member purchases from another member of the Institute, each member who purchases will deduct the number of pieces purchased from the number of pieces sold in arriving at pieces sold. Purchases from non-members will not be deducted.

When a friction material manufacturer is shipping to a vehicle manufacturer, but has no reasonable way of determining if the pieces are for original equipment or replacement purposes, estimates will not be used - these pieces will not be reported. However, where a friction material manufacturer is shipping to a point known to be used for replacement, or where he stencils or otherwise identifies the pieces as being for replacement purposes, or where the shipments otherwise are obviously known to be for replacement, these pieces will be reported.

B U L L E T I N

N O. 5 0 4

June 30, 1974

EPA - EFFLUENT LIMITATION GUIDELINES,
FRICTION MATERIALS MANUFACTURERS

A draft report was recently delivered to the Environmental Protection Agency (EPA) by Sverdrup and Parcel, Consulting Engineers. The draft is entitled:

DEVELOPMENT DOCUMENT FOR PROPOSED EFFLUENT
LIMITATIONS GUIDELINES AND NEW SOURCE
PERFORMANCE STANDARDS FOR THE TEXTILE,
FRICTION MATERIALS, AND SEALING DEVICES
SEGMENT OF THE ASBESTOS MANUFACTURING
POINT SOURCE CATEGORY

This is a long title and it is a long report--85 pages. I was only able to get 13 copies. We therefore made additional copies so that all Active Members could receive one copy. That copy is being sent to the company representative indicated on the attached list.

The EPA representative on this study is:

John E. Riley
Chief, Effluent Analysis Section
Effluent Guidelines Division
Environmental Protection Agency
Waterside Mall, 923 East Tower
401 M Street, S.W.
Washington, D. C. 20460
(Telephone: 202-426-2554)

If there are comments on this draft, it is suggested they be sent to the EPA. If a Member prefers, they may be sent to the Institute, and we will forward them to the EPA.

It is requested that the individual receiving this Report forward it to the person responsible for environmental problems.

EWD/lmc
Enc.

Copies: Active Members

E. W. Drislane
Executive Director

BULLETIN

N O. 5 0 3

June 5, 1974

1974 BRAKE SHOE IDENTIFICATION CATALOGS

The 1974 BRAKE SHOE IDENTIFICATION CATALOGS have been printed and were shipped by the Printer (Success, Inc.) during the last week in May.

The book - a copy of which is enclosed - went the full 64 pages plus cover. This is 12 pages more than the 1972 Catalog, a change which is tied directly to the increased coverage of imported cars.

While the basic price remains unchanged from that in Bulletin 498 (\$234.48/M) the price of punching is increased from:

Original Price	\$ 9.60/M
Final Price	10.20/M

Would you please advise your Purchasing Departments of this change in price for the punching.

EWD/erc
Enclosure:

E. W. Drislane
Executive Director

Active Members (Delegates, Alternates)
Licensees
Regional Members

B U L L E T I N

N O. 5 0 2

May 3, 1974

PUBLICATION: "FRICTION MATERIALS STANDARDS INSTITUTE, INC."

The Institute Office has been asked several times for a booklet or other publication concerning the Institute - its history, and its activities, publications, and the like.

When answering questions or when trying to explain the Institute, its necessary to repeat several items concerning membership types, the copyright, and publications.

Miss Duschek had gathered information in the past, and this was blended with input from the Public Relations Committee. We have now printed this enclosed booklet.

This booklet is not copyrighted. Members are free to reproduce it in whole or in part.

Additional copies of this booklet are available from the Institute (in quantities up to 10) on a no charge basis. If larger quantities are required, we will charge \$20.00 per 100 copies.

EWD/erc
Enclosure:

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 0 1

April 25, 1974

1974 SUPPLEMENT TO THE 1973 AUTOMOTIVE DATA BOOK

We are enclosing one copy of the recently published 1974 SUPPLEMENT TO THE 1973 AUTOMOTIVE DATA BOOK.

These books were recently shipped by the printer to those who placed orders. The preliminary price that was given earlier is the final price:

Catalogs	\$94.88/M
Punching	4.80/M

We have a small inventory of these Supplements left after shipment to those ordering. Any orders received from here on out will be handled on a "first come - first served " basis.

EWD/erc
Distribution: Active Members
Regional Members

E. W. Drislane
Executive Director

B U L L E T I N

N O. 5 0 0

March 29, 1974

PROPOSED REGULATIONS - MINNESOTA, NHTSA DEFECT REPORTING

It has been stated over the past years that whether our industry likes it or not, we are a regulated industry. At a recent meeting of the Brake Performance Study Committee two sets of proposed regulations were discussed and I was directed to pass this information on to the Membership.

PROPOSED MINNESOTA REGULATIONS

Mr. Nelson, Chairman of the Committee has been in contact with the Minnesota Department of Public Safety concerning proposed regulations for brake systems and brake linings. The Committee's review of the regulations as proposed indicated several problem areas--drum and rotor discard, lining cracks, and data relative to "lining fade temperature." The Chairman will be in contact with Minnesota to seek clarification of the proposed regulations. When we have additional information, we will pass it along to the Membership. At this time, these regulations are proposed.

NHTSA DEFECT REPORTING REQUIREMENTS

On January 15, 1974 the National Highway Traffic Safety Administration (NHTSA) proposed extensions and modifications to their Defect Reporting regulation. The proposed amendment which would have impact on our industry was that ".....it would extend the regulation to manufacturers of motor vehicle equipment....." In addition it would modify reporting requirements adopted in the earlier regulations.

The proposed regulations would cover "equipment" such as brake lining, lined brake shoes, etc. In addition, the proposed regulations state: "Equipment manufacturers would bear the sole responsibility for reporting defects in aftermarket equipment."

The requirement of Defect Reporting is that a manufacturer show "good faith" in reporting a possible safety related defect and in notification of customers of the defect when it is adjudged a safety related defect.

In reviewing these proposed regulations, it is apparent that brake lining is "motor vehicle equipment". However, it would appear that re-builders or others in the distribution network who assemble lining to shoes are also equipment manufacturers.

Interpretations and definitions will be more precise when the final regulations are adopted. Actually, it was the intent of the National Traffic and Motor Vehicle Safety Act of 1966 that not only would vehicles have to conform to standards, but that parts and equipment containing defects would be subject to notification requirements.

When further information is available on these Defect Reporting Requirements, the Institute will pass this information on to the Membership. These requirements are to be an agenda item at the next meeting of the Quality Control Sub-Committee.

EWD:lmc

cc: Active Members

Regional Members (U.S. Copyright)

E. W. Drislane

Executive Director

FRICITION MATERIALS STANDARDS INSTITUTE, INC.

F2 - JAN 15, 1974 DEFECT REPORTING REQUIREMENTS, AMENDMENTS TO REGULATION PROPOSED BY NHTSA

[49 CFR Part 573]

[Docket No. 69-31; Notice 5]

DEFECT REPORTING REQUIREMENTS

Proposed Extensions and Modifications

This notice proposes several amendments to the Defect Reports regulation, appearing in 49 CFR Part 573. The proposal would extend the requirements of the regulation to manufacturers of motor vehicle equipment, modify the information required to be reported in defect and quarterly reports including deletion of the requirement for the reporting of production figures, and make other modifications below. The Defect Reports regulation was issued February 17, 1971 (36 FR 3064).

The regulation would be amended to require the filing of defect information reports (§ 573.4) by manufacturers of motor vehicle equipment, including manufacturers of tires. When equipment has been used as original equipment in the vehicles of more than one vehicle manufacturer, a separate defect report would be required from the equipment manufacturer and from each vehicle manufacturer using the equipment. When equipment is used as original equipment in the vehicles of only one manufacturer, only one report would be required, and either the vehicle or equipment manufacturer would be permitted to submit it. Equipment manufacturers would bear sole responsibility for reporting defects in aftermarket equipment. In addition to submitting the information presently required to be submitted by vehicle manufacturers, equipment manufacturers (other than tire manufacturers) would be required to include the name and address, where known, of each distributor, dealer, and vehicle manufacturer to whom potentially defective equipment has been sold, and the number of items sold to each. The proposal will provide NHTSA with more comprehensive defect information in situations involving motor vehicle equipment, particularly in situations where the defect involves equipment not manufactured specifically for the vehicles of one vehicle manufacturer. Such situations have arisen in the past several years, usually involving

multistage vehicles. In these cases, the equipment manufacturer has generally been in a better position than the individual vehicle manufacturers to determine whether a defect existed, and to provide much of the information required in the defect information report. The NHTSA has tentatively determined that the most effective way to obtain this information is to make the equipment manufacturer directly responsible for reporting it.

The proposal would also require equipment manufacturers who conduct defect notification campaigns directed at distributors, dealers, or purchasers to file quarterly reports (§ 573.5). The NHTSA recognizes that equipment manufacturers, except for tire manufacturers, are not required by law to conduct notification campaigns unless the NHTSA formally orders such a campaign pursuant to proceedings under section 113(c) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1402(e)). In the past, however, numerous equipment manufacturers who have discovered safety related defects in their products have voluntarily conducted campaigns. The proposed amendment would not enlarge the duties of manufacturers of equipment under the National Traffic and Motor Vehicle Safety Act to notify distributors, dealers, or purchasers, and would require the filing of quarterly reports only when such notification campaigns are conducted.

The proposed amendment would revoke the requirement that manufacturers include in quarterly reports the production figures for vehicles they manufacture. Based on its experience with this requirement, the NHTSA has decided that the information is not of sufficient benefit to justify the cost to manufacturers of providing it. Revoking the requirement will eliminate the need for filing quarterly reports by manufacturers who are not conducting notification campaigns.

The regulation would also be amended to specifically state that vehicles and equipment found not to conform to a motor vehicle safety standard, except for inconsequential nonconformities, will be considered to contain safety related defects. There is apparently some confu-

sion as to whether a nonconformity to a safety standard is a safety related defect under the Safety Act. The NHTSA position has been that all but inconsequential nonconformities are safety related defects, and to eliminate further ambiguity this regulation would require that a nonconformity with a safety standard, except for one deemed inconsequential in its relation to safety, must be reported similarly to other safety related defects. Nonconformities that are determined not to be safety related defects would be required to be reported under a separate provision.

The requirements pertaining to the furnishing to NHTSA of notices, bulletins, and other communications to dealers and purchasers, where more than one dealer or purchaser is involved, for all defects whether or not safety related (§ 573.7), would similarly be extended to equipment manufacturers. Among equipment manufacturers, however, only manufacturers of tires would be required to maintain owner lists (§ 573.6). Tire manufacturers are the only equipment manufacturers presently required under the Safety Act to maintain the names and addresses of first purchasers.

There has been some question whether a defect report must be filed regarding vehicles in the hands of distributors and dealers. The NHTSA has taken the position that, under the existing regulatory provisions, defect reports must be filed regarding vehicles that have been delivered to dealers, as well as those that have been delivered to purchasers.

The NHTSA does not believe there is justification for continuing to allow vehicles that have left the immediate control of the manufacturer to be exempt from the reporting requirements. The practice has tended to hide from the NHTSA and the public the precise details of these motor vehicle defects. In practice, apart from situations where such defects may not have been reported at all, they have been reported in many instances only after the manufacturer has privately corrected them. This is not

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comment. When the purpose of a defect notification is to inform the public of a defect, the manufacturer, in the interest of public safety, should be required to provide notice of defects to the public in order that it can, if it determines it is necessary, make specific defect information available to the public. In the case of NHTSA, the information is closely related to its ability to monitor the correction of vehicles found to be defective. The practice further allows manufacturers to avoid compliance with section 113, and both the Defect Reports and Defect Notification (49 CFR Part 573) regulations, when it later appears that the requirements applied with respect to it were some of the vehicles involved. This notice, therefore, proposes that defect and quarterly reports include all defective vehicles and equipment that have been transported from their place of final manufacture.

The proposal also suggests some changes in the information presently supplied in both defect information and quarterly reports (apart from those changes necessitated solely by applying the requirements to equipment manufacturers). In the defect information report, the requirement for identifying affected vehicles would be modified to list separate criteria for passenger cars, vehicles other than passenger cars, and motor vehicle equipment. The revised criteria are intended to facilitate the identification of vehicles and equipment for the purposes of submitting the report. The information required as part of quarterly reports, including the number of vehicles inspected, found to contain the defect, and corrected, would be replaced by requirements that each of the following be reported: the total number of vehicles inspected, the number needing and receiving corrective action, the number needing but not receiving corrective action, and the number not needing corrective action. This information would provide a more complete picture to NHTSA of the extent of campaign completion, and resolve what appears to be some confusion as to meaning of "inspected" under the existing requirements.

Some changes have been proposed in the present language of the standard for purely editorial purposes. In addition, the address to which information is to be submitted has been revised.

In light of the above, it is proposed that 49 CFR Part 573, Defect Reports be revised to read as set forth below.

Interested persons are invited to submit comments on the proposal. Comments should refer to the docket number and be submitted to: Docket Section, National Highway Traffic Safety Administration, Room 5221, 400 Seventh Street, S.W., Washington, D.C. 20590. It is requested but not required that 10 copies be submitted.

All comments received before the close of business on the comment closing date indicated below will be considered and will be available for examination in the office at the above address both before and after that date. To the extent possible, comments filed after the closing

date will also be considered. However, the rulemaking action may proceed at any time after that date, and comments received after the closing date and too late for consideration in regard to the action will be treated as suggestions for future rulemaking. The NHTSA will continue to file relevant material as it becomes available in the docket after the closing date, and it is recommended that interested persons continue to examine the docket for new material.

Comment closing date: April 16, 1974.

Proposed effective date: 180 days from date of publication of the final rule.

Issued on January 9, 1974.

JAMES B. GREGORY,
Administrator.

PART 573—DEFECT REPORTS

Section

- 573.1 Scope.
- 573.2 Purpose.
- 573.3 Application.
- 573.4 Defect information report.
- 573.5 Quarterly report.
- 573.6 Owner lists.
- 573.7 Notices, bulletins, and other communications.
- 573.8 Address for submitting required reports and other information.

AUTHORITY: (Secs. 108, 112, 113, and 119, Public Law 89-563, 80 Stat. 718 as amended, Sections 2, 4 Public Law 91-265, 84 Stat. 262 (15 U.S.C. 1397, 1401, 1402, 1408); delegation of authority at 49 CFR 1.51) unless otherwise noted.

§ 573.1 Scope.

This part specifies requirements for manufacturers to maintain lists of owners of defective motor vehicles and tires, and for reporting to the National Highway Traffic Safety Administration safety related and other defects in motor vehicles and motor vehicle equipment, for reporting nonconformities to motor vehicle safety standards, for providing quarterly reports on defect notification campaigns, and for providing copies to NHTSA of communications regarding defects with distributors, dealers, and purchasers.

§ 573.2 Purpose.

The purpose of this part is to inform NHTSA of defective and noncomplying motor vehicles and items of motor vehicle equipment, and to obtain information for NHTSA on the adequacy of manufacturers' defect notification campaigns, on corrective action, on owner response, and to compare the defect incidence rate among different groups of vehicles.

§ 573.3 Application.

This part applies to manufacturers of complete motor vehicles, incomplete motor vehicles, and motor vehicle equipment, with respect to all vehicles and equipment that have been transported from their place of final manufacture.

In the case of vehicles or equipment manufactured outside the United States, compliance with §§ 573.4 and 573.5 by either the fabricating manufacturer or the importer of the vehicle or item of

equipment at which time it is first placed in commerce shall be deemed compliance with §§ 573.4 and 573.5 by either the manufacturer of the motor vehicle or one of the subsequent manufacturers of the vehicle shall be considered compliance by all manufacturers. In the case of motor vehicle equipment, compliance with §§ 573.4 and 573.5 by either the vehicle or equipment manufacturer shall be considered compliance by both. For purposes of this part, a manufacturer of tires includes an owner of a tire brand name that is not owned by the tire manufacturer.

§ 573.4 Defect information report.

(a) Each manufacturer shall furnish a defect information report to the NHTSA for each defect in his vehicle or items of equipment that he or the Administrator determines to be related to motor vehicle safety, including any nonconformity with a motor vehicle safety standard except a nonconformity having an inconsequential relationship to motor vehicle safety.

(b) Each defect information report shall be submitted not more than 5 working days after a defect in a vehicle or item of equipment has been determined to be safety related, or a noncompliance with a motor vehicle safety standard has been discovered. Information required by paragraph (c) of this section that is not available within that period shall be submitted as it becomes available. Each manufacturer submitting new information relative to a previously submitted report shall refer to the notification campaign number when a number has been assigned by the NHTSA.

(c) Each manufacturer shall include in each defect information report the information specified below. Manufacturers of motor vehicles and tires shall include only the information specified in paragraphs (c)(1) through (c)(3) of this section. Manufacturers of motor vehicle equipment other than tires shall include, in addition, the information specified in paragraph (c)(9) of this section.

(1) The manufacturer's name: The full corporate or individual name of the fabricating manufacturer of the vehicle or item of equipment shall be spelled out, except that such abbreviations as "Co." or "Inc.", and their foreign equivalents, and the first and middle initials of individuals, may be used. In the case of imported vehicles or items of equipment, the agent designated by the fabricating manufacturer pursuant to section 110(e) of the National Traffic and Motor Vehicle Safety Act (15 USC 1399(e)) shall be also stated. If the fabricating manufacturer is a corporation that is controlled by another corporation that assumes responsibility for compliance with all requirements of this part, the name of the controlling corporation may be used.

(b) The manufacturer shall identify the defect by specifying the nature and location of the defect, the date of manufacture, and any other descriptive information necessary to identify the defect.

(c) In the case of vehicles other than motor vehicles, the identification shall be by vehicle identification number, make, model, and year of manufacture, and any other descriptive information necessary to identify the defect.

(d) In the case of motor vehicles, the identification shall be by vehicle identification number, make, model, and year of manufacture, and any other descriptive information necessary to identify the defect.

(e) The number of vehicles or items of equipment potentially containing the defect, and the number of vehicles or items of equipment in each group identified pursuant to paragraph (c) of this section.

(f) The number of vehicles or items of equipment potentially containing the defect, and the number of vehicles or items of equipment in each group identified pursuant to paragraph (c) of this section.

(g) The number of vehicles or items of equipment potentially containing the defect, and the number of vehicles or items of equipment in each group identified pursuant to paragraph (c) of this section.

(h) A description of the defect, including both a brief summary and a detailed description, with graphic aids as necessary, of the nature and physical location of the defect.

(i) A chronology of all principal events that were the basis for the determination that the defect related to motor vehicle safety, including all warranty claims, field service bulletins, and other information, with their dates of receipt.

(j) A statement of measures to be taken to repair the defect.

(k) Three copies of all notices, bulletins, and other communications that relate directly to the defect and are sent to more than one manufacturer, distributor, dealer, or purchaser. These copies shall be submitted to the NHTSA not later than they are initially sent to manufacturers, distributors, dealers, or purchasers.

(l) For manufacturers of equipment other than tires: The name and address (where known) of each distributor and dealer of such manufacturer, and the name of each vehicle manufacturer, to whom a potentially defective item of equipment has been sold, the number of such items sold to each, and the date of delivery.

§ 573.5 Quarterly reports.

Each manufacturer who is conducting a defect notification campaign shall submit to the NHTSA a quarterly report, within paragraphs (b) (3), (4), and (5) of this section, not later than 25 working days after the close of each calendar quarter.

(b) The manufacturer shall identify the defect by specifying the nature and location of the defect, the date of manufacture, and any other descriptive information necessary to identify the defect.

(c) In the case of vehicles other than motor vehicles, the identification shall be by vehicle identification number, make, model, and year of manufacture, and any other descriptive information necessary to identify the defect.

(d) In the case of motor vehicles, the identification shall be by vehicle identification number, make, model, and year of manufacture, and any other descriptive information necessary to identify the defect.

(e) The number of vehicles or items of equipment potentially containing the defect, and the number of vehicles or items of equipment in each group identified pursuant to paragraph (c) of this section.

(f) The number of vehicles or items of equipment potentially containing the defect, and the number of vehicles or items of equipment in each group identified pursuant to paragraph (c) of this section.

(g) The number of vehicles or items of equipment potentially containing the defect, and the number of vehicles or items of equipment in each group identified pursuant to paragraph (c) of this section.

(h) A description of the defect, including both a brief summary and a detailed description, with graphic aids as necessary, of the nature and physical location of the defect.

(i) A chronology of all principal events that were the basis for the determination that the defect related to motor vehicle safety, including all warranty claims, field service bulletins, and other information, with their dates of receipt.

(j) A statement of measures to be taken to repair the defect.

(k) Three copies of all notices, bulletins, and other communications that relate directly to the defect and are sent to more than one manufacturer, distributor, dealer, or purchaser. These copies shall be submitted to the NHTSA not later than they are initially sent to manufacturers, distributors, dealers, or purchasers.

(l) For manufacturers of equipment other than tires: The name and address (where known) of each distributor and dealer of such manufacturer, and the name of each vehicle manufacturer, to whom a potentially defective item of equipment has been sold, the number of such items sold to each, and the date of delivery.

§ 573.6 Owner lists.

Each manufacturer of motor vehicles or tires shall maintain in a form suitable for inspection, such as computer information storage devices or card files, a list of the names and addresses of each first purchaser for a purpose other than resale of his vehicles or tires, and of any other owner known to the manufacturer, for each vehicle or tire involved in a safety defect notification campaign initiated after the effective date of this part. In the case of motor vehicles, the list shall include the vehicle identifica-

tion number, make, model, and year of manufacture, and any other descriptive information necessary to identify the defect.

§ 573.7 Notices, bulletins, and other communications.

Each manufacturer shall furnish the Administration a copy of all notices, bulletins, and other communications, other than those required to be submitted pursuant to § 573.4(c)(3) of this part, sent to more than one manufacturer, distributor, dealer, or purchaser, relating to any defect in his vehicles or items of equipment, whether or not safety-related. Copies shall be furnished monthly, not more than 5 working days after the last day of each month.

§ 573.9 Address for submitting required reports and other information.

All required reports and other information except that required pursuant to § 573.7 of this part shall be submitted to the Office of Defects Investigation, National Highway Traffic Safety Administration, Washington, D.C. 20590.

§ 573.9 Address for submitting required reports and other information.

All required reports and other information except that required pursuant to § 573.7 of this part shall be submitted to the Office of Defects Investigation, National Highway Traffic Safety Administration, Washington, D.C. 20590.

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