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9 SUPERIOR COURT OF CALIFORNIA

10 COUNTY OF SAN FRANCISCO – UNLIMITED JURISDICTION

11
12 GERALDINE BIERNER LEPORE,)
13 Individually and as Successor-in-Interest to)
14 GENE LEPORE, Decedent; KRISTIN)
15 MARIE REINHOLZ; MICHAEL JAMES)
LEPORE; and DOES ONE through TEN,)
inclusive,)

16 Plaintiffs,)

17 vs.)

18 AC AND S, INC., et al.,)

19 Defendants.)
20)
21)

Case No.: CGC-09-275411

**DECLARATION OF RUDY LIMPert,
PH.D.**

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24
25 I, RUDY LIMPert, Ph.D., DECLARE AS FOLLOWS:

26 I. I am a mechanical engineer. I obtained my Ph.D. in Mechanical Engineering
27 from the University of Michigan in 1972; Master of Science degree in Mechanical Engineering
28 from Brigham Young University in 1968; Bachelor of Engineering Science, Mechanical
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1 Engineering, from Brigham Young University in 1967. I also hold a B.S. degree in Mechanical
2 Engineering in Design and Manufacturing, which I obtained in Germany in 1958.

3 2. I have worked as a Design Engineer, a Production Engineer, a Brake Engineer,
4 and as a Safety Standards Engineer for the federal government. From 1973 through 1981, I was
5 a professor at the Department of Mechanical and Industrial Engineering at the University of
6 Utah. A true and correct copy of my curriculum vitae is attached hereto as **Exhibit A**.

7 3. In connection with this matter, I have reviewed a number of materials, including
8 but not limited to the following:

- 9 • October 2, 1975 interoffice memo, Ford Marketing Corporation, Jullien to
10 Weed, attached hereto as **Exhibit B**.
- 11 • Ford Technical Service Bulletin No. 99, October 24, 1975, attached hereto
12 as **Exhibit C**.
- 13 • January 12, 1976 correspondence from S. F. Svoboda at Ford Marketing to
14 R. G. Rosslip at Liberty Mutual, attached hereto as **Exhibit D**.
- 15 • May 10, 1977 memo to file by D. P. Cratti, Ford, attached hereto as
16 **Exhibit E**.
- 17 • February 23, 1979 interoffice memo from Hague to Anderson and others,
18 attached hereto as **Exhibit F**.
- 19 • July 14, 1980 EPA/CPSC Workshop on Substitutes for Asbestos by Jacko
20 et al., attached hereto as **Exhibit G**.
- 21 • September 20, 1983 memo from H. B. Lick, Industrial Hygiene Associate
22 (Ford) to Keoleian, Roslinski et al., attached hereto as **Exhibit H**.
- 23 • March 15, 1985 letter from Ford to the U. S. Environmental Protection
24 Agency, attached hereto as **Exhibit I**.
- 25 • July 23, 1987 letter from Jerome Amber, Principal Staff Engineer at Ford,
26 to K. D. Drachand, Chief Mobile Source, Division California Air
27 Resources Board, attached hereto as **Exhibit J**.
- 28

- 1 • A document from Ford's archives, Bates stamped FAFD0012807-809,
2 entitled "Ford Brakes for 1989," attached hereto as **Exhibit K**.
- 3 • October 8, 1992 letter from General Motors Corporation to John W.
4 Maloney of the Environmental Protection Agency, attached hereto as
5 **Exhibit L**.
- 6 • November 20, 1992 memo from R. J. Kinzler (Ford) to K. R. Landis et al.
7 re Action Plan for Removal of Asbestos from Service Parts, attached
8 hereto as **Exhibit M**.
- 9 • An undated report by John Kourik, formerly an engineer for Wagner
10 Electric, attached hereto as **Exhibit N**.
- 11 • Deposition testimony of Roger Newsock, dated September 11, 2008, who
12 was an engineer for General Motors during the years 1961 to 1990,
13 attached hereto as **Exhibit O**.

14 4. Based on my review of said materials and on my education, background, training,
15 and experience, it is my opinion that virtually all American cars built prior to 1980 came with
16 rear drum brakes. Non-asbestos lined brake shoes were not generally commercially available at
17 such time. Such vehicles, including Ford's, specified and required that asbestos lined brake
18 shoes (asbestos component parts) be used.¹

19 5. It is also my opinion that, until at least approximately 1990, Ford vehicles which
20 were built and sold with rear drum brakes, were designed to contain asbestos lined brake shoes in
21 the first instance, and were required by Ford thereafter to use asbestos-containing replacement
22 materials.

23 6. The February 23, 1979 memo from Hague to Anderson regarding the non-
24 asbestos development status for brakes to be used in Ford vehicles discusses that, among other
25 things, there were no suitable alternatives for asbestos lined brake shoes for use in drum braking
26 systems. This document, attached hereto as **Exhibit F**, reviews the status of development of

27 ¹ By using the cutoff date of 1980, I do not mean to imply that all vehicles after that date had drum brake systems
28 that did not contain asbestos linings. In fact, well into the mid-1980s, the vast majority of American cars built with
drum brake systems, including Ford's, continued to specify and require asbestos-containing pads.
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1 non-asbestos friction materials for use in drum brake systems and concludes that there is "no
2 known direct substitute for any critical application, hence new formulations must be developed
3 or suitable blends of fibers must be found." This document also contains a chart prepared by A.
4 E. Anderson, an engineer at Ford, which shows the availability and suitability of non-asbestos
5 brakes for use in passenger cars, light trucks, heavy trucks, tractors. That survey of major
6 friction material suppliers found that the only suitable non-asbestos linings were for use in clutch
7 facings on tractors. No non-asbestos materials were suitable and/or available for drum brakes,
8 disc brakes, and clutch facings for passenger cars, light trucks, and heavy trucks.

9 7. The EPA/CPSC Workshop on Substitutes for Asbestos, dated July 14, 1980,
10 attached hereto as **Exhibit G**, shows that non-asbestos substitutes were not generally available
11 for drum brake linings as of that date. That paper contains a discussion of the progress which
12 was then being made in finding non-asbestos substitutes and discusses the problems the industry
13 said it was facing in attempting to use alternate fibers for drum brake shoes. The report
14 concludes that "direct substitution for alternate fiber in existing formulations has been
15 unsuccessful." The report also predicts that the 1982/1983 time frame would be the very first
16 approximate date when first generation asbestos-free materials might even become commercially
17 available. The same report goes on to discuss challenges in the aftermarket posed by the use of
18 asbestos shoes in drum brake systems and discusses the possible safety issues in trying to
19 substitute asbestos-free materials directly in vehicles which were designed for asbestos brakes.

20 8. In March of 1985, Ford Motor Company wrote to the U. S. Environmental
21 Protection Agency to comment on potential rulemaking regarding asbestos brakes. In that letter,
22 Ford addressed the issue of whether it remained necessary to continue to use and sell asbestos-
23 containing parts, and in particular linings for drum brakes, for vehicles currently in production or
24 no longer in production which originally were designed to employ asbestos-containing parts.
25 (See Exhibit I, attached hereto.) Ford said it was important that vehicles already on the road
26 continue to have asbestos parts available for the remainder of those products' useful life and
27 urged that the regulatory measures contemplated by the EPA not interfere with that need. Ford
28 wrote that because car and truck brakes are "sophisticated systems," the shoes of car and truck

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1 braking systems that use asbestos materials have very different properties from the shoes of those
2 that do not contain asbestos. Ford admitted that one "cannot simply use a non-asbestos substitute
3 brake shoe in conjunction with a brake drum that was designed for asbestos-containing friction
4 material." Ford based this on a host of "performance, noise, durability and other problems may
5 occur if a friction material is introduced into a system which was not designed to employ it."

6 9. Again, in July of 1987, Ford issued comment with respect to potential
7 rulemaking—this time in connection with proposed rulemaking by the California Air Resources
8 Board concerning asbestos use in automotive friction materials. Attached hereto as **Exhibit J** is
9 a copy of the July 23, 1987 letter written by Jerome Amber, Principal Staff Engineer at Ford, to
10 the California Air Resources Board. That letter again urged the rulemakers to exercise caution in
11 restricting the use of asbestos-containing materials for brakes. Ford described that, as of that
12 date, Ford's light and heavy truck brakes are "well on the way" towards being asbestos free.
13 Ford also describes that a "parallel effort" in passenger cars was taking place and that the
14 following three years would show "dramatic progress toward completely asbestos free passenger
15 cars." Ford describes that its internal initiatives set forth goals to eliminate asbestos-containing
16 materials from all systems by the early 1990s. Ford concluded that models on the road, as well
17 as those still being manufactured with asbestos-containing brakes, "require for replacement those
18 asbestos parts which they were designed to use." (emphasis added). Again, Ford based this on
19 the fact that asbestos lined shoes have different performance characteristics from those that do
20 not contain asbestos. "For that reason, one cannot simply use a non-asbestos substitute brake
21 lining in conjunction with a drum that was designed for asbestos-containing friction materials."

22 10. Attached hereto as **Exhibit K** is a 1989 chart from Ford's internal documents
23 regarding Ford brakes by vehicle line shows that, as of 1989, out of thirty-one (31) models of
24 cars and light trucks, the rear brakes of only twelve (12) were being sold with non-asbestos lined
25 shoes. This means that almost two-thirds (2/3) of the 1989 vehicles made by Ford still had
26 asbestos lined shoes at the time of design and sale. Of those that were being sold with non-
27 asbestos linings, nine required brake systems redesign and development for use with non-
28

1 asbestos friction materials. Only three (or less than 1/10) were vehicles where an acceptable
2 replacement for asbestos lined shoes were found and adapted to the existing braking systems.

3 11. The October 8, 1992 letter from General Motors Corporation to John W. Maloney
4 of the Environmental Protection Agency, attached hereto as **Exhibit L**, demonstrates that the
5 situation described above was not unique to Ford, but rather reflected the status of asbestos
6 replacement for the American car market in general. This letter reflects that, as of 1992, it
7 continued to be General Motors' position that cars and light trucks sold with asbestos-containing
8 OEM lined shoes should be serviced with asbestos lined shoes. According to GM, the
9 conversion to non-asbestos brake linings required a "redesign of other brake components in an
10 effort to optimize overall braking system performance." Like Ford, GM stated that using "non-
11 asbestos brake linings as replacement parts in vehicles that were originally designed with
12 asbestos-containing linings will result in brake system performance compromises that range from
13 modest customer dissatisfaction...to significant stopping distance penalties."

14 12. My opinion in this case does not attempt to address instances of experimental use
15 of non-asbestos brakes on cars and vehicles that were not generally commercially available.

16 13. Therefore, it is my opinion that at least up until 1980 all American-made vehicles
17 with drum brakes contained asbestos lined brake shoes; that the systems which contained such
18 brakes were designed with the performance characteristics and wear characteristics of asbestos
19 shoes in mind; and that there were no generally commercially available non-asbestos brake shoes
20 which were suitable for use on Ford vehicles with drum brake systems.

21 14. It is further my opinion that even when non-asbestos lined brake shoes started to
22 become commercially available for general use in drum brake systems in approximately the mid-
23 1980s, their incorporation into Ford's product line was slow at best. Even by the late 1980s, the
24 vast majority of Ford's vehicles which used drum brakes still contained asbestos pads. Vehicles
25 sold with asbestos drum brakes were designed with asbestos-containing pads in mind. Ford has
26 admitted that systems designed with asbestos drum brakes in mind continued to require asbestos-
27 containing replacements lest there be significant potential compromise in performance, wear, and
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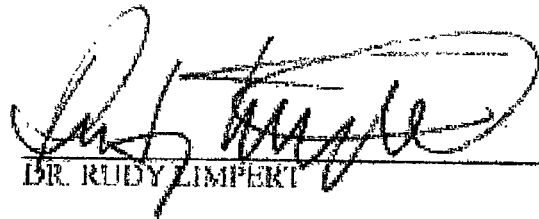
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1 safety. Ford specified and required that asbestos brake linings be used in its cars and trucks
2 which were originally sold with asbestos-containing drum brakes.

3 15. Drum brake systems work by having the shoes press against a spinning circular
4 surface, which is called a drum. The abrasion of the pads on the shoes, against the interior of the
5 drum, causes friction which results in wear of the material. It is the wear of the material which
6 makes it necessary to regularly inspect the linings for wear and periodically replace such linings.
7 The dust and debris from brake pad wear typically accumulates on the interior of the drum.
8 When drum brakes are inspected, it is frequently necessary for mechanics to remove dust from
9 the drum to visualize the thickness of the remaining material on the brake shoe pads. Also, when
10 brake shoes are replaced in a drum brake system, it is necessary to clean the drum of all dust and
11 debris. Thus, mechanics and those inspecting and replacing automobile and truck drum brakes
12 are necessarily exposed, during routine maintenance, to dust which is created by the normal
13 functioning of the brake system.

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15 I declare under penalty of perjury under the laws of the State of California that the
16 foregoing is true and correct and that this Declaration was executed on this 11th day of June,
17 2012, at Park City, Utah.

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21 DR. RUDY LIMPERT
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