QMI SERVICE BULLETIN

Date: May 26, 1993

Re: *Nutz & Boltz* articles: 1) "Beware Teflon Oil Additives"
2) "PTFE: R_X For Engine Death"

These articles published in *Nutz & Boltz* are an example of journalism at its worst. The very graphics warn the reader that the articles are a biased attack. As such, we hesitate to lend the dignity of a response. However, in keeping with our desire to counter glaring misinformation, several points must be addressed.

QMI has found it necessary to spend endless hours in our effort to secure documents related to these articles, especially since several items do not exist and others are outdated by as much a decade, and have been rendered inaccessible. Our research has disclosed a pattern of errors and misrepresentations, including damning references to tests and bulletins that do not exist.

Article 1:

1. First the article quotes a DuPont Specialist as saying "NO!" to a list of possible Teflon/PTFE product benefits, and adds:

> "In 1980 DuPont formally announced that it wasn't selling any more Teflon powder to firms who were using it to fortify oil. DuPont had reviewed extensive research by both its own scientists, as well as by others, and decided that: *Teflon is not useful as an ingredient in oil additives or oils for lubricating internal combustion engines*." (Italics in article.)

While DuPont declined to sell Teflon™ to PTFE additive manufacturers in 1980, they reversed their position and began selling Teflon™ to PTFE additive manufacturers within the same decade. Currently, several PTFE treatment products display the Teflon™ trademark with support from DuPont. The enclosed *Lubricants World/Additives Report* article, October 1-8, 1991, quotes Mr. David Silleman of DuPont Polymers, as follows:

> "We looked at the data and it suggests that there is something positive going on in the area of lubrication with PTFE . . . we are trying to be open-minded, and have shifted our position to a more neutral one." (See following document 1. a.)

Also, DuPont issued a letter on April 28, 1994, to end such misrepresentations of DuPont's position. The letter states:

> ". . . that DuPont had recently changed its policy on the sale of Teflon® fluoropolymer resins for use in automotive engine treatments. The change in policy was announced in the article "10-Year Teflon Ban Ends" that appeared in the October 1-8, 1991 issue of Lubricants World. ...we now sell these (PTFE) products into the automotive aftermarket industry. ...I hope this explanation clears up any confusion that may still exist about DuPont's current policy on selling PTFE for use in engine treatments and other automotive aftermarket products." Signed, Tracy E. Morgan, Teflon® Fluoroadditives. (Document 1. b.)

Also, our files contain a Dupont agreement between DuPont and QMI allowing QMI to use DuPont's Teflon® tradename on our products containing Teflon® . (Document 1. c.)

DuPont has extended great effort to publicize their change of position, demonstrating the strength of PTFE treatment's improved technology and proven effectiveness. Obviously, this statement concerning DuPont's position is a blatant misrepresentation of the facts.

2. The next paragraph quotes tests that were not performed on Teflon™ /PTFE treatments as your article indicates, but were performed on fuel additives. The article quotes North Dakota State concerning the effectiveness of Teflon™ /PTFE treatments as follows:

> "*The theory sounds good . . . the only problem is, the products don't work.*" (Italics in article.)

We contacted Dr. Mariusz Ziejewski, Associate Professor of Mechanical Engineering and Director of Internal Combustions at North Dakota State, who issued the following statement:

> "North Dakota State University has not done any tests on PTFE treatments. Any statements related to the additives tests done by North Dakota State University refer to other fuel additives not PTFE treatment." (Document 2.)

According to Dr. Ziejewski, this article makes a false statement, using quotes that relate to fuel additive tests rather than PTFE treatments.

3. Next the article states:

> "NASA Lewis Research Center sheds some light on these questions: *In the types of bearing surface contact we have looked at, we have seen no benefit. In some cases we have seen detrimental effects . . . the solids in the oil tend to accumulate at the inlet, and they act as a dam, which simply blocks the oil from entering . . . instead of helping, it is actually going to deprive that part of the lubricant.*" (Italics yours.)

Again, the alleged tests do not exist. We called Mr. Harold Sliney of the NASA Lewis Research Center, who emphatically stated that NASA Lewis Research center has done no testing of PTFE products. As indicated in his response letter, Mr. Sliney assumes that his discussion of a paper by Mr. Frank Reich (presented twelve years ago, on May 11-14, 1981!) is the source of misrepresentation, and adds:

> "I have never investigated PTFE dispersions . . . I have never made definitive statements about such dispersions in papers that I authored or co-authored." (Document 3.)

4. The article next quotes University of Utah researchers, stating that PetroLon (Slick-50) caused:

> ". . . *possible clogging of small passageways*", that "*iron contamination doubled . . indicating that wear didn't go down . . it appeared to shoot up*" and that "Researchers reported that microscopic examination of the engine parts failed to show any measurable evidence of Teflon on any of the engine parts." (All italics from article.)

The test in question is the University of Utah Engineering Experiment Station report, dated October, 1979, fourteen years ago. A brief examination of the report reveals the following:

A. Concerning “possible clogging of small passageways”, Page 17 states:

> “A pressure manometer was attached across the oil filter to see if any increase in pressure drop due to filter clogging could be noticed. Table 6 shows a slight increase in pressure drop, but this was so small that clogging was not indicated but could conceivably become a problem.” (Document 4. A.)

The report further concludes that “there were no data suggesting any deleterious effects.” (Document 4. B.)

B. Concerning the statement, “iron contamination doubled . . . indicating that wear didn’t go down—it appeared to shoot up.”

In fact, on page 16 the report states:

> “From Table 5, the oil tested with PetroLon showed an iron content double that of the untreated oil, although the amount of iron is easily within safe limits. The reason for this is not clear. It seems unlikely that wear has increased with the PetroLon, but further investigation is indicated. One possibility is that the PetroLon may have reduced the number of adhesion sites for a ‘normal’ distribution of wear particles, thereby increasing the number in suspension. This does not explain, however, the drop in iron content after the PetroLon was removed from the crankcase but with the engine still presumably plated.” (Document 4. C.)

The report gives a readily acceptable explanation for the increased iron content in the treatment oil, especially in light of the fact that after the PetroLon Slick-50 was removed from the crankcase the iron content dropped—a fact the article chose to ignore. Nowhere does the report indicate that wear “appeared to shoot up”.

C. Concerning “Researchers reported that microscopic examination of the engine parts failed to show any measurable evidence of Teflon on any of the engine parts.”
The report in fact states:

> “An attempt to measure the thickness of the Teflon coating via a light section microscope failed due either to the thinness of the coating (less than 1 micron) or the opaque properties of Teflon.” (Document 4. A., last paragraph.)

The article misrepresents the report on all three accounts while ignoring the weight of positive test results presented, including:

D. Reduced internal forces due to friction of 13.1% with product in crankcase, and 12.6% after removal of product, “indicates that the treatment is effective”.

E. Horsepower increase with product in crankcase/after removal at light loading of 12.4%/15.6%, and at heavy loading of 5.3%/8.1%. The report adds that a time study shows the product “continued to increase horsepower as time went on. . . . No indication of a tailing off of the friction reduction could be seen from the data.”

F. Fuel efficiency improved under light/heavy load with product in crankcase by 11.8%/3.8%, and with product removed by 17.5&/.1%. After providing projected figures for mileage improvement, the report states, “The fuel savings is due to the increase in the efficiency of the engine and reduction of internal friction.”

Again, the Utah Engineering Experiment Station report in question was completed in October of 1979. (See cover to Documents 4. A., B. and C.) This report in no way represents the Slick-50 product today. Fourteen year old reports related to developing technology are outdated, yet this article further misleads readers by giving no indication of the above.

5. Next the article addresses an informal test performed years ago by Briggs & Stratton on oilless engines (after showing that the test was faulted by oil remaining in the crankcase during the first “oilless” run). The article states that:

> “The Briggs study brings out another important problem with particulate oil additives: they can cause oil starvation. This is especially true in the area of piston ring lands, where there is a critical need for adequate oil flow.”

At the recommendation of a DuPont specialist, Southwest Research Institute performed the Sequence IIIE test on QMI Engine Treatment, utilizing a Buick V-6 engine. This QMI test is registered with the CMA (Chemical Manufacturers Association), and meets their standards. A primary function of Sequence IIIE is to address concern over product safety related to piston ring lands and scuffing, which would result from oil starvation. The test results show (Document 5. A. and B.):

OIL RING LAND DEPOSITS — all normal

SCUFFED AND/OR WORN PARTS (“scuffing” is reported below, which is directly related to oil starvation)

CAM	0
LIFTERS	0
VALVE STEM TIPS	0
ROCKER ARM PADS	0

RING AREA

OIL RINGS PLUGGED, %	0
NUMBER OF STUCK RINGS	0
NUMBER OF SLUGGISH RINGS	0

In a most demanding test performed by the most reputable laboratory in the U.S., QMI Engine Treatment produced no abnormal ring land deposits, no “oil starvation” which would have resulted in severe scuffing, and a total absence of plugged, stuck or sluggish rings. QMI also produced an 88% average reduction in wear, as is shown in the accompanying test results. (Document 5. A., C., and D.) A full copy of the test is also enclosed.

No tests exist showing a relationship between PTFE applications and “oil starvation”. As referenced in Mr. Harold Sliney’s letter responding to this article’s previous reference to lubricant deprivation (Item 3, Document 3), “oil depletion within the contact” referred to MoS_2 (molybdenum disulphide) tests, not PTFE. To falsely connect PTFE applications with “oil starvation” is a most damaging error.

6. The article's "CONCLUSION" states:

   A. "Research data has shown no significant differences in any of these products."

      This is blatantly untrue and a direct offence to manufacturers who have spent years and huge sums in product development. Comparative tests performed and reported by QMI and other manufacturers have clearly proven distinctive product differences. The above statement is indicative of the outright false statements contained in this article.

   B. ". . . Teflon treatments can actually starve bearings of oil resulting in engine failure."

      The tests referenced by this article to support such a claim do not exist. (See item 3 above.) Abundant evidence to the contrary is available, which this article ignores.

   C. ". . . manufacturers of these products rely on anecdotal data, as well as data gathered without using proper double-blind methodology."

   QMI happily supplies all those interested with complete Sequence IIIE test results, from one of the most reputable labs in the U.S., on a QMI test registered by and meeting the standards of the CMA. This test is utilized by all oil producers seeking API SG Service Classification, and the results of this lab are recognized as valid by engine manufacturers. To state that manufacturers "rely on anecdotal data" while naming QMI is a blatant falsehood.

7. Finally, the article proposes to list "The Cost of Snake Oil" as follows:

   A. "Voids car maker's warranty from any related OR unrelated engine damage."

      Blatantly false. QMI has letters on file stating that QMI Engine Treatment does not void warranties from all major domestic and many foreign engine manufacturers. Also, the Magneson-Moss Warranty Act clearly precludes manufacturers from voiding warranties based on items such as "unrelated engine damage".

   B. "Plugs up the oil filters, depriving the engine of clean oil."

      Again, blatantly false. Readily available tests clearly demonstrate that today's PTFE products (including three listed at the close of this article) do not clog oil filters. Our files contain a copy of a November 3 - 6, 1992, report from a major filter manufacturer, Fram Filters, based on Slick-50 and TufOil product tests. (Document 6.) The report is entitled "Teflon-Based Oil Additives Not Detrimental To Oil Filter Performance", and details tests utilizing Fram Extra Guard™ Filter media stating that:

         "Our studies have shown that these (Telfon™ /PTFE) additives are not detrimental to oil filters or their performance." "The fluid was allowed to flow through the filter at a typical automotive engine flow rate and temperature for 48 hours. The results proved that the oil mixture did not change filter performance under normal engine conditions. The filter operated as efficiently with the Teflon-based additive/oil mixture as it does when 100 percent motor oil is used." Etc.

Concerning QMI Engine Treatment specifically, we have on file filtering test results from Southwest Research Institute dated August, 1990. (Document 7.) A sample of QMI Engine Treatment was passed . . .

> ". . . through a 0.8 micron filter membrane. The results were as follows: The material was readily filterable through the membrane . . . There were no problems in filtering this material."

Conventional automotive filters remove particles as small as 10 to 40 microns, yet QMI's PTFE particles passed freely through a 0.8 micron filter.

Tests by very reputable firms prove the fallacy of this article's claims, including applications in high temperature engine operating conditions.

C. "Plugs oil passages, leading to piston wall scuffing."

PTFE treatments do not "plug up oil passages", and numerous tests, including Sequence IIIE, prove that no "piston wall scuffing" occurs. (See item 5 above.)

Next, to address article 2:

The article goes to great length to cite an anecdotal incident related to an automotive engine failure, and then connects the failure to an unnamed PTFE product as follows:

8. "However, under some conditions, PTFE will cause engine damage. In extreme cold climates, PTFE powder can congeal and plug up the oil pump as in Debby's Cougar."

   Readily available data proves this claim blatantly false. DuPont's *Teflon® Mechanical Design Data* handbook states that Teflon™ /PTFE remains useful at -450° F. ICI's *Physical properties of unfilled and filled polytetrafluoroethylene*states that their PTFE remains effective at -320° F. Obviously, these temperatures are well beyond the range of "extremely cold climates" encountered by PTFE product consumers, including "Debby's Cougar". Also, there is no evidence that PTFE dispersions congeal in engine crankcases.

9. Mr. Dennis Boggs of Phillips 66 is quoted to answer the article's question, "But what about the PTFE merchants claim that the PTFE stays in suspension?", as follows:

   > ". . . we found that some of the Teflon types don't stay in suspension."

   When we called Mr. Boggs concerning this matter, he informed me that the above quote was taken out of context, and sent a copy of the former material as proof thereof. The statement is a blatant falsehood—the latter quote is not found in his material. (Document 8.)

10. "Yet, no one has ever demonstrated in a controlled study that PTFE powder produced any positive benefit."

    See items 4 and 5 (with Document 5. A., B. and C.) to demonstrate the fallacy of this statement.

11. Under the subheader “Slick Testimonials”, the article states:

> “Well, it takes approximately 800° F. to make Teflon adhere to any metal surface and it is highly unlikely that a passenger car engine realizes temperatures that high.”

This quote contradicts the articles own statement following:

> “When PTFE resins reach about 800° F, they burn . . .”

The first quote states that Teflon™ /PTFE adheres to metal at 800° F, while the second states that the same material burns at 800° F. This contradiction within the article further illustrates its blatant disregard for accountability.

12. Under the subheader “Slick Testimonials”, the article further states:

> “It has also been shown that almost 75% of the teflon is filtered out after fifteen minutes running, which means that 75% of the $30 or $22.50 or whatever amount you paid for the product has just been thrown away.”

Well documented tests, by very reputable manufacturers and laboratories, demonstrate the untruth of this statement. (See item 7. B., and Documents 6 and 7.) This article attempts to lead consumers to believe that their money is “thrown away” when purchasing these products, based on a falsehood.

Further, both articles 1 and 2 relate an anecdotal aircraft engine failure credited directly to an “oil pump screen (that) was completely clogged with Teflon.” Article 1 adds, “He had treated the engine . . . some 200 hours before.”

If the above quote that “almost 75% of the teflon is filtered out after fifteen minutes running ” were true, it would have been impossible for the aircraft engine failure listed in the articles to have been caused by Teflon™ . The aircraft filter would have removed the Teflon™ “after fifteen minutes”, long before 200 hours, and any particles not removed by the filtering membrane (typically 10 micron for aircraft oil filters) would have freely passed through the much larger oil pump screen openings. This is another example of the articles’ blatant contradictions and lack of accountability.

13. The article states:

> “GM has issued an internal (secret) bulletin to its dealers warning against the use of Teflon oil additives in GM engines.”

A copy of this article was forwarded to Ms. Dee Sidorski, Bulletin Coordinator, General Motors Corporation. After searching GM’s complete files and speaking with GM personnel who write bulletins on lubrication matters, Ms. Sidorski responded:

> “Per your request for a search of our bulletin system for information on dealer bulletin pertaining to Teflon Oil Additives in GM engines.
>
> I have searched our system using all key words available to identify the above subject and have found ‘No’ bulletin pertaining to this subject.” (Document 9.)

We also spoke with numerous GM dealers and service representatives, none of which had heard of any such bulletin. Based on the response of GM's Bulletin Coordinator as well as dealers and service representatives, this article once again downgrades PTFE products by referring to an item that apparently does not exist.

14. Finally, the article also states:

> "BMW recently ran controlled studies on the effect PTFE resins have on engine parts . . . (reporting) increase in wear metals (and) accelerated wear . . . "

QMI files contain a copy of BMW's German headquarters response to rumors of such test. The letter is signed by Dr. Gerhard Schmidt, Head of Power Train Development, and dated July 7, 1992. The translation from German shows that the alleged tests have never been conducted, and adds, "Neither will we carry out such tests in the future . . . (This allegation) can clearly not have come from an authorized source. It is therefore irrelevant." (Document 10.)

Again, *Nutz & Boltz* makes claims based on tests that do not exist.

Conclusion:

We hope that this helps clarify these misrepresentations and falsehoods. If questions remain, please contact our technical services director, Mr. Owen Heatwole, at the following number:
1-800-255-8138.

Enclosures