

SOUTHWEST RESEARCH INSTITUTE

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December 22, 1993

Mr. Robert W. Stewart
Patriot Technologies International
8711 Burnet Road, Suite F-60
Austin, Texas 78758

Dear Mr. Stewart:

Wear testing has been completed on your six samples using ASTM method D2783-88, Measurement of Extreme-Pressure Properties of Lubricating Fluids (Four-Ball Method). The test method is used to differentiate between lubricating fluids having low, medium, and high levels of extreme-pressure properties. Three steel balls are clamped together and covered with the lubricant to be evaluated. A fourth steel ball is pressed into the cavity formed by the clamped balls for three point contact. The temperature is brought to 18.33 to 35°C, with a rotating speed of 1760±40 rpm, then a series of tests of 10 second duration are made at increasing loads until welding occurs.

Values are obtained for weld point (the load in kilograms at which the rotating ball welds to the three stationary balls, indicating the extreme pressure level of the lubricants-force has been exceeded) and load wear index (load-carrying property of a lubricant - the average of the sum of corrected loads determined for ten applied loads immediately preceding the weld point) for each sample. These values are shown in the table below, along with sample identification. Additional sheets attached show the individual load results for each material.

<u>Sample</u>	<u>Load Wear Index</u>	<u>Weld Point, Kg</u>
A. T-Plus Teflon	43.7	200
B. Supreme Plus	59.9	250
C. Slick 50	42.5	200
D. STP Engine treatment	58.5	315
E. QMI Engine treatment	49.0	250
F. MT-10 Engine Treatment	246.4	>800



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Repeatability of the test is such that the difference between successive results obtained by the same operator with the same apparatus under constant operation conditions on identical test material would, in the long run, in the normal and correct operation of the test method, exceed the following value only in one case in twenty: repeatability = 17% of the mean value. The Patriot product did not weld at the highest load the instrument was capable of running, so the load wear index for it is an approximation. It has extreme pressure levels much higher than any of the other samples. We appreciate the opportunity to be of service in this matter. If there are questions concerning the data, please contact me at (210)522-2071.

Sincerely,

Karen B. Kohl

Karen B. Kohl
Manager, Special Projects
Petroleum Products Research Dept.
Automotive Products and Emissions
Research Division