

Long Beach Transit System

POWER TRAIN PROTECTION PROGRAM



INFORMATION PROVIDED BY:
LONG BEACH TRANSIT, TITAN LABORATORIES, AND TRANCERT MARKETING, INC.

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EXECUTIVE SUMMARY

In early 2002, Long Beach Transit System in Long Beach, California, entered into a Bus power train protection program with Enviro Save Products Company located in Point Roberts, Washington. Enviro Save® is a power-train treatment product designed to reduce friction with one-application for the life of the equipment. Such components include engine, transmission, differentials, power steering, and cooling systems.

Enviro Save® has been manufactured for 19 years with over 550,000 applications worldwide. Enviro Save is a TFE resin based product which reduces the coefficient of friction and increases the life cycle of equipment. Laboratory test from SAE and EPA certified labs have concluded a significant improvement in the use of this product.

The LBTS program was intended to evaluate the benefits of using Enviro Save metal treatment products in their bus and service fleets. The benefits they were targeting would include, but not limited to, long range reduction of cost and increased life expectancy of the fleet's major components.

THE APPROACH

The program was implemented using LBTS's 2200 series of new buses. After the break-in period, the data was collected and evaluated in two separate timeframes which were from January/February 2003 to October/November 2003 as the pre-treatment period and from January/February 2004 to September 2004 as the post treatment period.

Two groups of buses were used. Both groups which have the identical age and configuration were put into operation at the same period. One group was treated with Enviro Save, while the other group was not. The data from the oil analysis would be the determining factor to verify the benefits of using Enviro Save products.

The treated fleet was 2201 through 2220, and the non-treated fleet was 2221 through 2239. For purposes of evaluating (19) buses treated and (19) buses un-treated, the first bus in the series (2201) was not used during this evaluation – although the bus is treated and performing well.

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THE RESULTS

The attached reports reflect *Engine and Transmission* results from both the untreated fleet and treated fleet.

In order to do like-comparisons for statistical significance in any test, samples were equally taken. For example, this analysis used (6) oil samples in total; (3) oil analysis samples taken before the treatment; and (3) oil analysis samples taken after the treatment. For the untreated fleet, the same time frame was used to evaluate the same number of oil samples as the treated one. This evaluation method meets the test of statistics.

The results presented in this report do reflect statistical significance in the reduction of metal wear in both major components tested (Transmission and Engines).

In summary, the metal wear reduction results are:

Long Beach Transit Enviro Save Program – Oil Analysis Final Results							
ENGINE (%)				TRANSMISSION (%)			
	Baseline Control Fleet	Treated Fleet	Net Change		Baseline Control Fleet	Treated Fleet	Net Change
Chromium*	-49%	-67%	-18% better				
Copper	-18%	-88%	-70% better	Copper	+15%	-42%	-57% better
Iron	-19%	-45%	-26% better	Iron	-5%	-40%	-35% better
Lead	-38%	-52%	-14% better	Lead*	-63%	-55%	+8% worse
Tin*	+74%	-53%	-127% better	Tin*	-60%	-78%	-18% better
Aluminum*	-30%	-81%	-51% better	Aluminum	-30%	-55%	-25% better

* less than 1ppm in measurement

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Long Beach Transit Enviro Save Program – Oil Analysis Final Results											
ENGINE (ppm)					TRANSMISSION (ppm)						
	Baseline Control Fleet		Treated Fleet		Net Change		Baseline Control Fleet		Treated Fleet		Net Change
Chromium*	0.73	0.37	0.54	0.18	-18% better						
Copper	2.53	2.07	3.86	0.45	-70% better	Copper	224.76	257.68	251.39	145.21	-57% better
Iron	22.56	18.31	20.61	11.26	-26% better	Iron	47.33	44.83	49.94	30.12	-35% better
Lead	2.01	1.25	1.75	0.84	-14% better	Lead*	0.60	0.22	0.53	0.24	+8% worse
Tin*	0.10	0.17	0.21	0.10	-127% better	Tin*	1.86	0.75	2.54	0.57	-18% better
Aluminum*	0.53	0.37	0.69	0.13	-51% better	Aluminum	15.50	10.85	16.73	7.46	-25% better

Rolando Cruz, maintenance manager of Long Beach city buses talks about Enviro Save benefits. In his testimonial feedback about the oil analysis that they did with Titan labs, he said, "... we do see less metal wear and presence of elements listed (tested)." We talked about what this means to his fleet and he stated, "...this will translate to extended life on the engines, transmissions and other major components." Finally, Mr. Cruz was asked if he plans to do the entire fleet of buses at Long Beach Transit. He said, "We have and will continue to do this practice of the treatments as insurance..."

Rolando Cruz,
LBT Fleet Maintenance Manager
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