CAL-TRANS

THE ULTIMATE IN TIRE PROTECTION

☆ ULTRASEAL ☆

TIRE SEALING PROCESS

CAL-TRANS TEST REPORT

"TIRE LIFE EXTENDER"

ADDS MILEAGE WITH LESS FUEL

ULTRA SEAL TIRE SEALING PROCESS

ULTRA•SEAL INTERNATIONAL INC.

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INTRODUCTION

A test was established and conducted at the Cal-Trans North Hollywood location, District #7. Mr. Fred Sindorf had selected the North Hollywood Maintenance Yard to be the test site. Mr. Bill Gantt was in charge of the test proceedings.

A 3 month (Nov.-Jan) survey was conducted by Bill Gantt to establish the amount of flats that had accumulated in the North Hollywood Maintenance Yard. There were 69 flats with tire repair costs of $ 744.00. This does not include tires damaged beyond repair or vehicle and employee down-time.

ULTRASEAL'S Purpose is to:

*Reduce tire maintenance expenditures.

*Provide optimum tire life by maintaining correct air pressure.

*Eliminate all flat tires resulting from punctures 1/4" or less.

*Provide a safety factor to the driver and vehicle.

*Reduce vehicle & employee downtime as a result of flat tires (Aver. downtime, 1 1/2 hrs).

*Save Cal-Trans thousands of dollars annually.

This test was conducted for 4 months (Feb-May). There were no flat tires caused by a puncture 1/4" or less. No driver or vehicle was subjected to a hazardous position in relation to a flat tire. This report indicates findings on all punctures over 1/4" that were investigated. Samplings of air pressure indicate that prior to test, tires were up to 55% underinflated and 33% overinflated. During and after test, all tires maintained 45 lbs.

(SEE PAGE 15-16 "TIRE INFLATION/TECHNICAL BULLETIN")
INFLATION VS. TIRE LIFE

2/10/83 BATCH #58284

Trip to Cal-Trans to install ULTRASEAL in (4) test vehicles. Installation instructions were given to Sam Arthur and Jim Sportsman and only truck # 4363 was treated as others were in the field. Sam and Jim would treat others as they returned to yard. Tire pressure was noted before installation; R/F-40 lbs. R/R-25 lbs., L/F-45 lbs., L/R-45 lbs. and spare-60 lbs. ULTRASEAL was installed and tire pressures were corrected to 45 lbs.

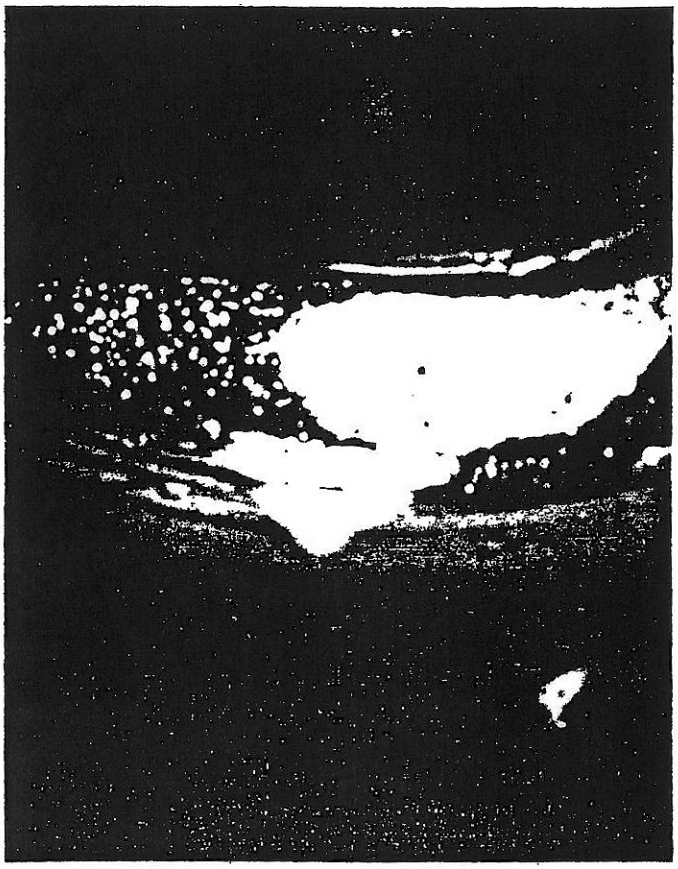
2/15/83 INCIDENT #1, TRUCK #4363

L/R tire went flat overnight and was removed. Inspection showed a cut approximately 1 1/2" in length in tread area. An additional 8 fl. oz. of product was applied and tire inflated to 45 lbs. Bouncing tire on ground stopped air loss and tire was placed back on truck.

Overnight, L/R tire went flat. Inspection at Chuck's Tire showed cut 1 1/2" on inside of tire as well as outside. Tire was also checked for proper amount and coating of sealant.

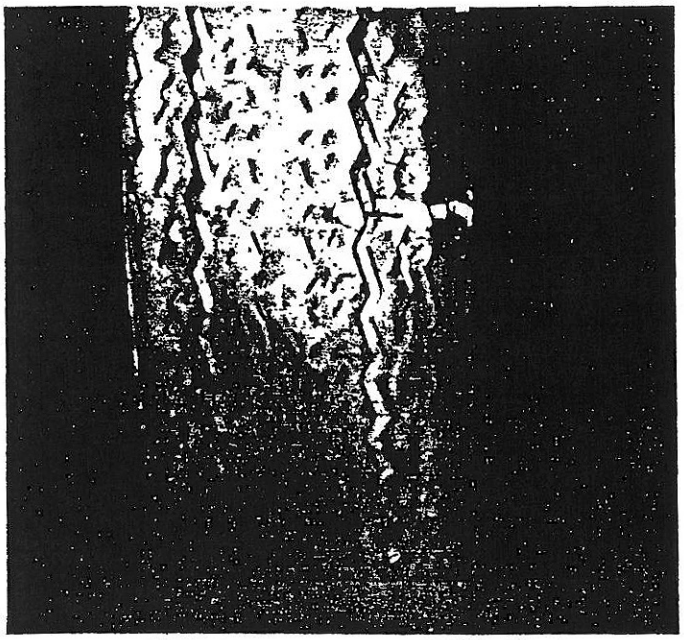
SUMMARY

Even though the cut was larger than 1/4" guarantee, the vehicle was not put into a dangerous situation, such as the tire having a blow-out which is normal for a cut of that size. The tire was also repairable, whereas without ULTRASEAL the casing would have definetly been ruined.



Truck # 1

Interior shows star shaped wound 1" X 1/2"



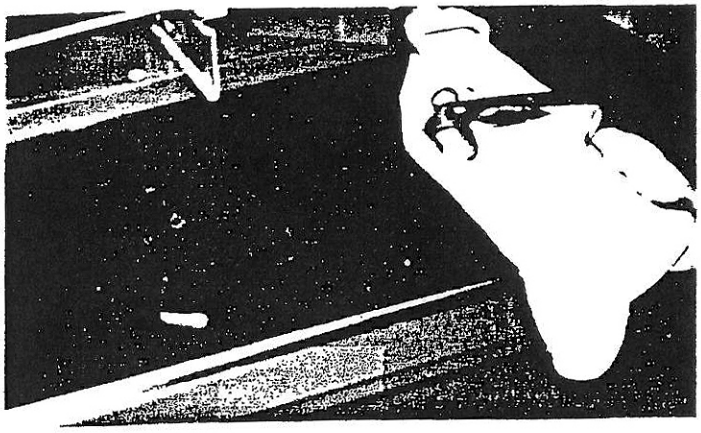
Exterior shows 1 1/2" cut

2/22/83 INCIDENT #2, TRUCK #2789

Reported flat ready for inspection at Chuck's Tire. It was stated that the nail was observed in the tire on 2/18/83 and 4 days later the tire went flat and was taken to Chuck's for repair. Inspection showed nail puncture in tread area. Tube had been punctured and puncturing object had ripped tube approximately 2" to 3" in length. Also the liner had been torn in half.

SUMMARY

In tube type tires, all puncturing objects must be removed. A routine inspection should be made on tube type tires. Puncturing objects left in the tire will cut and slice the tube beyond repair.

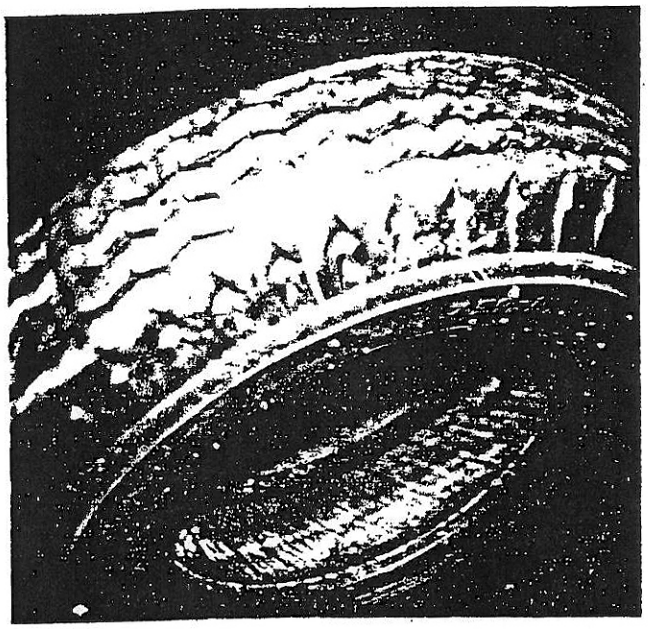


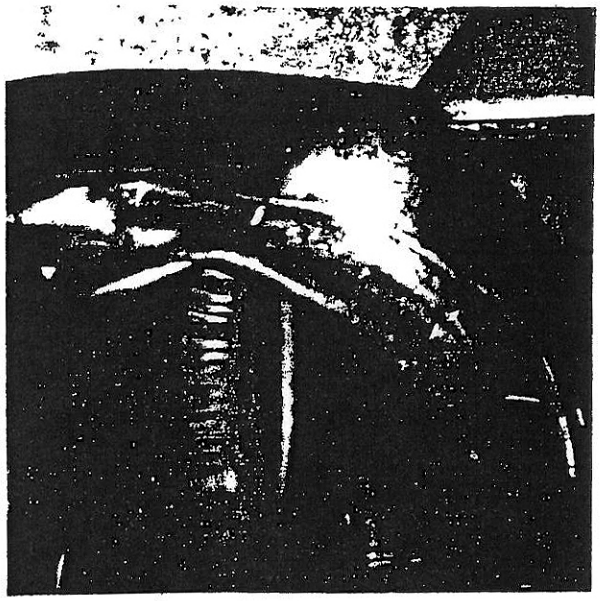
Truck # 2789

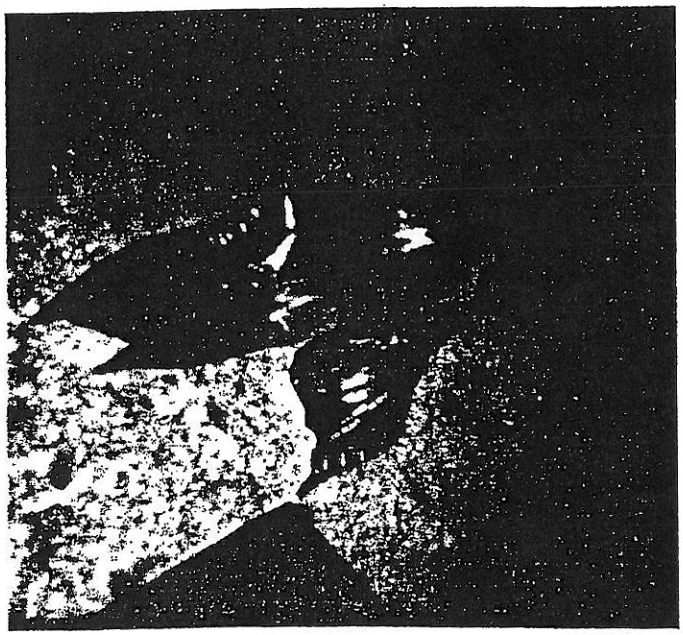
Photos indicate puncturing object and wound in tire

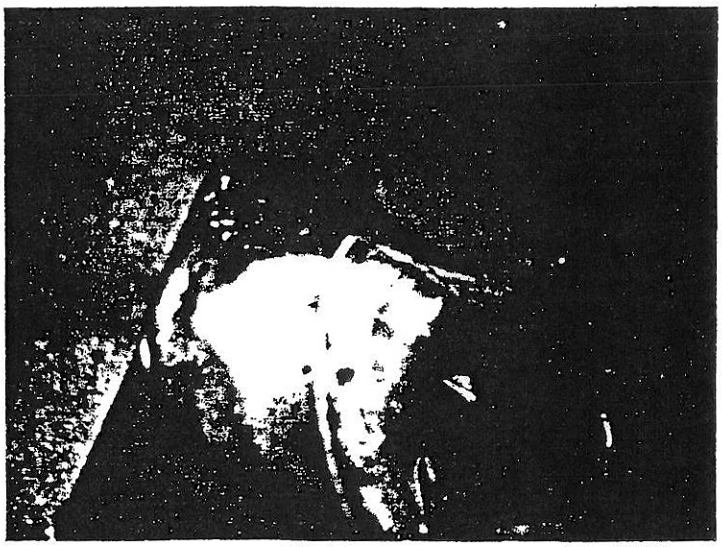
After 4 days of driving puncturing object tore tube and liner

Tube and liner damaged beyond repair









4/19/83 INCIDENT #3

Bi-monthly check with Cal-Trans to verify how test was progreesing, revealed flats that were un-reported to ULTRASEAL. Trip to yard to discuss (3) flats on truck #4980, (5) flats on truck #4363, and (3) flats on #2789. Further discussion prompted the inspection of the tires on vehicle #4980 and a piece of metal was found in left rear. The metal was removed and a slow air loss was apparent. Vehicle was driven around yard. ULTRASEAL did not establish a permanent seal. The vehicle and tire were needed in service. Inspection of punctured tire was postponed.

A telephone call later arranged availability of the tire for complete inspection. (The tire in question had been patched).

4/20/83

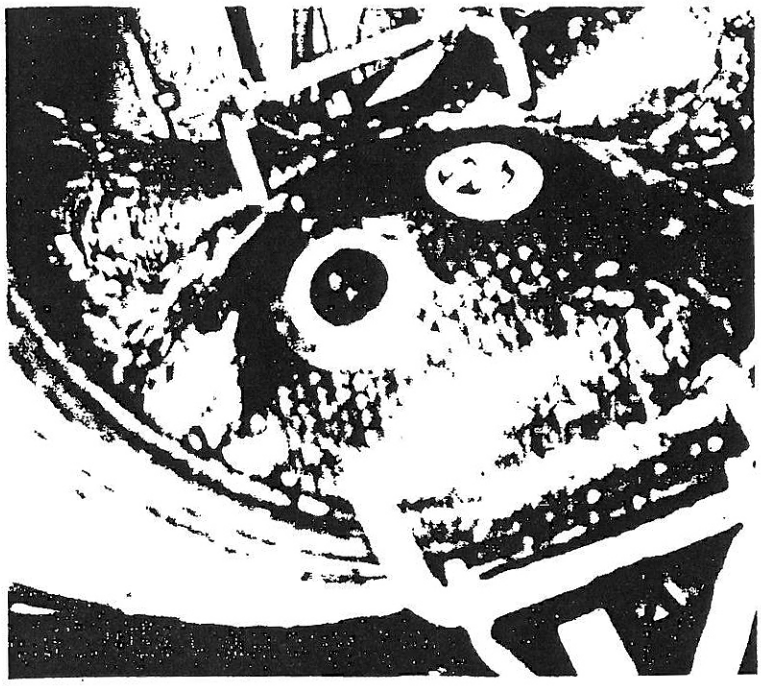
At the time the tire was picked up, Sam Arthur stated, "They had several flats, one of which appeared to be a nail hole that ULTRASEAL did not seal and to patch the tire required a great deal of time and work." The tire was taken to the Goodyear dealer for dismounting and thorough examination.

SUMMARY

Existing patch was removed and the tire cleaned out completely, left un-patched, remounted on wheel and treated with 25 fl.oz. of sealant #58284 (original product). Sealant slowed air loss but would not form a permanent plug. Sealant was removed and sent to laboratory for evaluation. Tire would be examined for broken plies and rubber composition. Product would be checked for fiber content, PH factor, and glycol percentage. Product was unable to form permaent plug because angle of penetration caused a slash-type wound, not allowing product to establish a permanent seal. The tire continued to bleed air as this is what the ULTRASEAL formulation is designed to do. After completion of inspection, patching was performed very easily--no problem in repatching existing wound, nor was there a problem in test patching.

Truck # 4980

Photos indicate patches installed by Chuck's tire. Removal of patches revealed one hole completely sealed by ULTRASEAL and a second hole that was 5/16" to 3/8" inside.



4/20/83 INCIDENT #4, TRUCK #4980

Reported flat. Trip to yard revealed ULTRASEAL had sealed puncture.

SUMMARY:

In most cases, removal of an object must be followed by rotation of the tire or drive the vehicle a short distance, allowing a permanent plug to form.

4/25/83 INCIDENT #5, TRUCK #4980

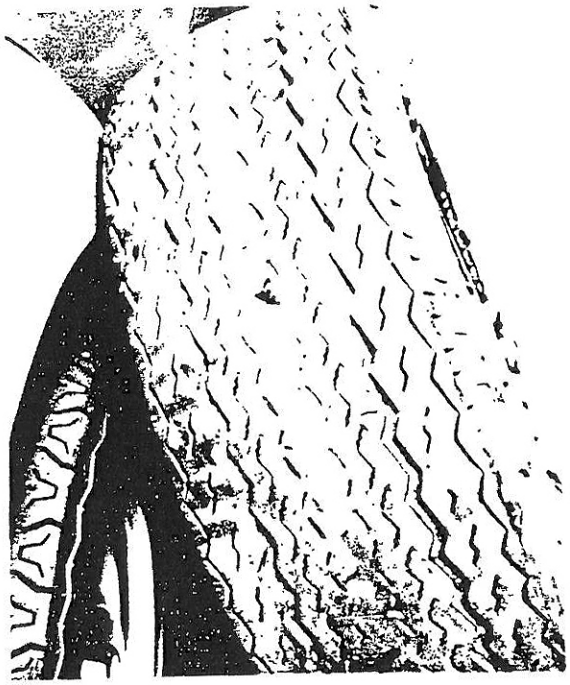
Position R/R, mileage 2,350 reported flat. Tire was picked up for inspection. Tire removed from wheel and spread. Wound very large and shaped like figure "X", one side 1/2" to 5/8" in length and other side 1/4" to 3/8" in length. Tire had to be plugged and patched.

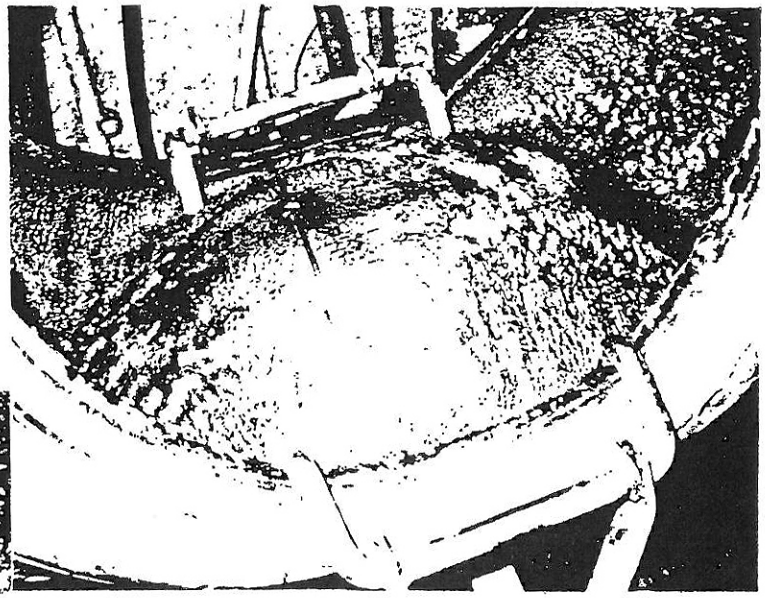
SUMMARY

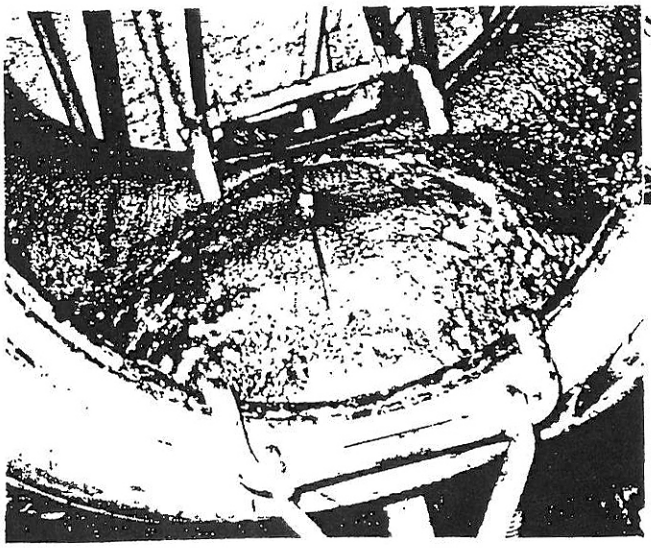
The use of ULTRASEAL allowed this vehicle to be driven safely back to yard and tire was repairable--not ruined.

Truck # 4980

R/R tire exterior photo indicates wound to be 1/2" and 5/8" in and X formation. Interior indicates wound to be 1/4" and 3/8" in an X formation.







5/4/83

PATCHING PROBLEMS

Further investigation of Sam Arthur's comments led to a trip to Chuck's Tire regarding the problems of patching. Chuck's comments: Product messy to work with, his normal routine was changed, he usually buffs area, applies glue, applies a patch and remounts tire on wheel.

He feels product must be removed completely to patch tire and that takes extra time. In some cases, removal is further complicated by objects that have penetrated the tire and are inside or still in tread area, in which case it is easy to cut your hand trying to wipe ULTRASEAL away.

SUMMARY

Through the discussion with Chuck, it is apparent that ULTRASEAL sealed numerous punctures prior to having a puncture that would not seal. All investigations indicate that all punctures that did not seal were larger than 1/4" in diameter.

The patching problem that was related to ULTRASEAL by Chuck is technically infeasible and has been proven on one specific tire that Chuck had complained about. When ULTRASEAL was wiped from the wound area, dried and buffed suffuicently, no patching problem occurred. There will be no effect to the balance of ULTRASEAL remaining in the tire.

5/4/83

Trip to see Sam Arthur; no flats since 4/25/83 and each of the test trucks now have one tire each without sealant in it. Sam related the same report that was told by Chuck in regards to the patching problems and if the ULTRASEAL needed to be removed, it would create additional labor.

A tire on his vehicle #4363 also had a patching problem. We were given authorization to pick up the tire in question for evaluation. We asked how many flats had occurred to date. Five since the beginning of the test period.

5/6/83 PATCHING PROBLEM

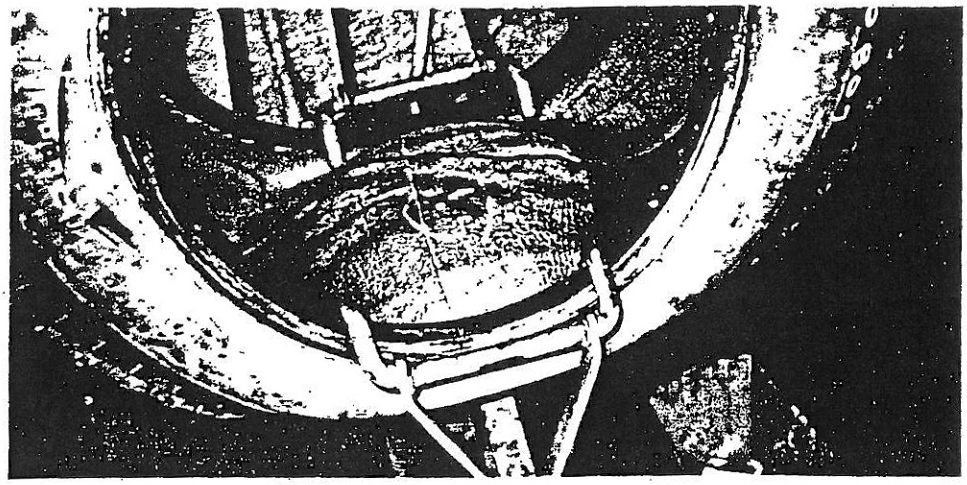
Tire off Sams truck #4363 was removed from wheel and placed on a spreader. No sealant in tire. It had been completely removed during patching. Inspection showed a large staple in tire tread that had not been removed. Head of staple was completely worn off. ULTRASEAL formed a permanent plug around the staple prongs preventing air loss.

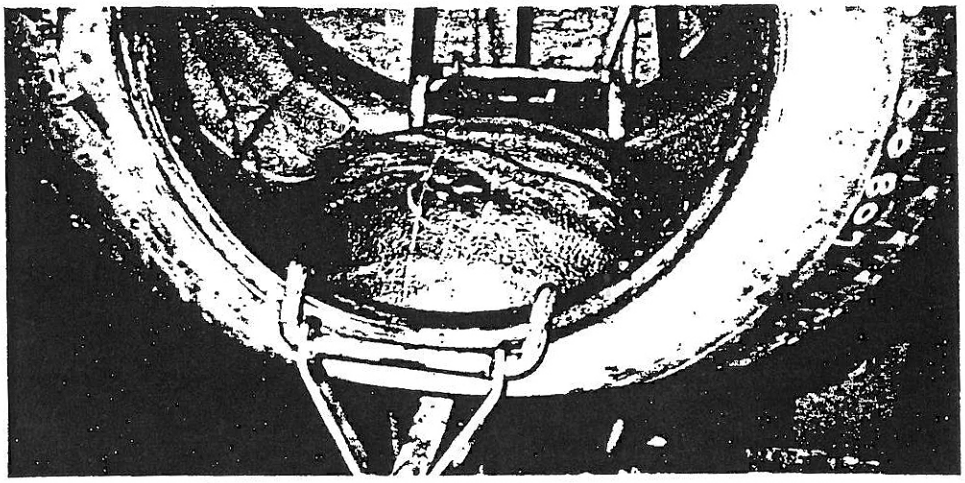
Staple prongs were removed and patching performed. Other patches did not show excessive buffing and punctures they had repaired were all very large in size. Tire was remounted on wheel and treated with 24 fl.oz. of ULTRASEAL, batch #38154 and returned to Cal-Trans.

SUMMARY

Patching at this time was not a problem. ULTRASEAL had sealed staple puncture even after tire was washed out completely with water. All other punctures that did not seal were larger than 1/4" in diameter and would not fall under guarantee.

Photos reveal staple prongs imbedded on interior of tire. ULTRASEAL completely sealed wound around prongs. Patches in tire were removed. Tire wounds were inspected and tire was completely repatched.





CONCLUSION AS OF 5/31/83

Due to the fact that ULTRASEAL was not applied to the total fleet within a specific yard, it will be impossible to ascertain the overall savings within the 90 day test period. ULTRASEAL was not notified and given the opportunity to inspect EACH TIRE FAILURE to determine the cause and report.

We did not have the opportunity to have Chuck's Tire patch a tire in our presence. We needed to establish why he was having difficulty. We took the tires in question to an Independent GOODYEAR dealer (Hollywood Tire Company). They patched and re-patched the tires using no additional labor, except to clean the wound prior to buffing. There was no need to clean or wash ULTRASEAL out of the tires.

All tires that were inspected clearly showed that the punctures were preater than 1/4" guarantee. Also, the same tires had several other punctures that ULTRASEAL did in fact seal permanetly. Not one casing was damaged beyond repair because ULTRASEAL slowly allowed air to escape from the oversize holes, thereby the vehicles were safely driven to the repair shop or to an area where the tire could be changed.

All tires treated with ULTRASEAL maintained constant air pressure, thereby eliminating underinflation and overinflation.

Just the fact of tire pressure maintenance alone will save Cal-Trans thousands of dollars annually over and above the cost of ULTRASEAL.

The reduction of flat tires and decreased downtime is also a great annual savings which, with strict record keeping program could be documented.

Last but not least is the safety aspect. Not one vehicle or driver was put into a hazardous position from a flat tire during the ULTRASEAL test program.

We would like the opportunity to directly establish a complete yard, servicing all vehicles and to be directly responsible for all flat tires, the repairs and the tire installation for the period of evaluation prescribed. When completed, a full detailed report could be presented to Cal-Trans for evaluation.

TIRE INFLATION/TECHNICAL BULLETIN

INTRODUCTION

Many technical publications have been devoted to tire problems and mantenance procedures for tires in the Heavy Duty Trucking Industry. We appreciate the extensive amounts of testing accomplished by the tire industry, from which many of the statistics included in this bulletin were obtained.

Within this bulletin, we shall explain how the use of ULTRASEAL'S TIRE SEALING PROCESS will substantially decrease tire operating costs, especially for the most maintenance-conscious firms.

TIRES AND INFLATION

A tire and wheel combination create an air chamber. The tire itself does not carry the vehicles load. It is the air within the tire which carries the load and provides the only support between the vehicle and the roadway. The complex construction of a modern tire is dependent upon correct air pressure within the tire and all tire manufacturers agree that under or over inflation will severly restrict tire life. Studies indicate approximately 80% of premature tire wear is the result of incorrect inflation.

"Proper inflation is the most important factor in tire life. Neglect of tire maintenance, and especially tire pressure maintenance, has cost truckers thousands of dollars. Underinflation should never be permitted."

The above quotation from Goodyear indicates the general concensus of all tire companies and a commonly known fact with most users.

PROBLEMS CREATED BY UNDERINFLATION

1. Excessive heat buildup.
2. Increases susceptibility to cuts & punctures.
3. Increased rolling resistance results in higher fuel consumption.
4. Destruction of casing.
5. Ply separation.
6. Tire's ability to grip roadway severly hampered.
7. Blow-out potential extremely high--hazardous safety factor.
8. Irregular tire wear.

The combinations of these factors and others not listed cause an extreme loss in overall tire life.

25% low air pressure = 40% loss of tire life.

30% low air pressure = 53% loss of tire life.

(Calculations by Firestone Tire Company)

Despite the fact that these statistics have been accepted throughout the trucking industry, in recent spot-checks on truck tire pressure, the proportion of tires significantly improperly inflated exceeded 80%. Heat is the absolute #1 killer of tires. An underinflated tire will generate extreme heat as it rotates and flexes. As the speed increases, so does the tires rate of flexing. Rolling resistance and friction are also increased and the tire will become so hot that ply separation and over-stressed components will destroy the tire and casing. Gas mileage will also suffer. The increase in temperature caused by underinflation is proportional to the increased amount of fuel consumed by the vehicle.

"The temperature may soar well over 300^{o}F on any vehicle driven at sustained high speeds, particularly if overloading or underinflation are present."
(Michelin Tire Company)

PROBLEMS CREATED BY OVERINFLATION

1. Extreme tension on tread, rubber and ply construction.
2. Vulnerability to punctures and cuts.
3. Harder ride characteristics, increased vibration.
4. Tire wears excessively and unevenly.
5. Casing fatigue.
6. Increased strain on tire bead and wheel.
7. Hydroplaning effect increases drastically.

All available data indicates that correct inflation is essential for optimum tire life.

THE SOLUTION: "ULTRASEAL TIRE SEALING PROCESS"

The inherent problems associated with a tire's proper inflation now has a viable solution. Ultra Seal International Inc. has a product that will virtually make any tire's air retention capabilities absolute! One application of ULTRASEAL coats the entire air cavity, creating a sealed air chamber, thereby allowing the tire to obtain its maximum tire life. ULTRASEAL also will eliminate flats due to punctures up to 1/4" in diameter for the life of the tire. ULTRASEAL has been proven after 14 years and millions of miles of actual use, that the product can not fail to perform as specified.

Bulletin # 5313