

Post Office Confirmation Federal Tire Sealant Spec's

Urgent Notice	page 1
Postal Service letter of certification	page 2-3
Postal Service letter of approval	page 4-5
Federal Tire Sealant Specifications	page 6-18

The tire sealant specifications begin at "Attachment A" on page 9 of this section.

URGENT NOTICE

Date: November 23, 1994

TO: **Manager, Operations Programs Support**

ATTN: **Manager, Vehicle Maintenance**
Manager, Vehicle Maintenance Facility

RE: Mr. J. Gerard Bohan's declaration in Fleet Maintenance
Bulletin # V-21-93, Life-Cycle Tire Care.

It is mandatory to extend the life of tire casings and utilize retread tires on **ALL** postal vehicles.

All tires, new and retreaded are to have the air pressure checked daily. Unless an approved tire sealant is used, then only visual tire inspections and pressure checks would be performed during the vehicle's PM program.

Executive Order #12759, Federal Energy Management, **requires Federal Agencies to reduce fuel usage by 10 percent by 1995.** In the spirit of this order, the Postal Service will attempt to meet this goal. Improved vehicle utilization and proper tire inflation will contribute to your doing so.

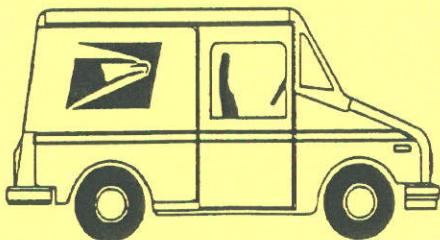
These are the 2 major choices that will help you meet the above requirements:

1. The tires air pressure must be checked and set to proper pressure **daily** on every vehicle that is being utilized in the fleet **(OR)**.....
2. Install an approved tire sealant, thereby eliminating the time consuming **daily air pressure checks.** This is extremely cost effective, as the daily labor to maintain air pressure in an LLV, would actually pay for the tire sealant in less than 10 days. Plus, the tire sealant will provide many other benefits, one being extended casing life.

Although it is required to use an **approved tire sealant**, it is not mandatory. It appears that with the low cost and proven effectiveness, a tire sealant is the only cost effective solution in maintaining air pressure and reducing tire and labor costs. With the adoption of retreads and a tire sealant, the Postal Service's commitment to the environmental issues present and future will be tremendously enhanced. For additional information on tire sealants/tire life extenders contact:

Ultraseal International, Inc.
1100 N. Wilcox Ave.
Los Angeles, CA. 90038-1515

Ron Aguirre, Vice President
(323) 466-1226 • (800) 346-9090
FAX (323) 465-94565



vehicle maintenance bulletin

UNITED STATES POSTAL SERVICE

VEHICLE MAINTENANCE

Number: V-06-94

Date: April 8, 1994

Subject: Multi-Item

TO: Manager, Operations Programs Support

ATTN: Manager, Vehicle Maintenance
Manager, Vehicle Maintenance Facility

1. ULTRA-SEAL APPROVED TIRE LIFE EXTENDER/SEALANT
2. CHANGE TO V-07-93 DATED DECEMBER 14, 1992
3. ADDITIONAL SOURCE FOR BRAKE SHOE SETS AND DISC BRAKE SETS
4. ADDITIONAL SOURCE FOR ALLISON/PALL AND PALL ELEMENTS

1. ULTRA-SEAL APPROVED TIRE LIFE EXTENDER/SEALANT

We are pleased to announce that Ultra-Seal has been certified as meeting or exceeding the specifications in V-21-93 for tire life extenders/sealants. Any VMF requiring additional information, please contact:

ULTRA-SEAL INTERNATIONAL INC
1100 N WILCOX AVE
LOS ANGELES CA 90038-1593

Ron G. Aguirre
Vice President Training & Technical Services

(800) 346-9090

This is the first company to have its product certified under the new specifications.



April 11, 1994

Ultra-Seal International, Inc.
Attn: Ron G. Aguirre
1100 N. Wilcox Ave.
Los Angeles, CA 90038-1593

Mr. Aguirre:

Please see attached copy of Vehicle Maintenance Bulletin, V-06-94, which references your company.

Thank you for your continued efforts on our behalf.

Sincerely,

A handwritten signature in dark ink, appearing to read "Colin W. Dunning".

Colin W. Dunning, Manager
Vehicle Maintenance
Operations Programs
Customer Service and Sales

Attachment

While V-21-93 authorized all VMFs to use retreaded tires on the steering axles of all Postal Service mail-hauling vehicles except buses, it should be noted that normal accepted practice is that new tires usually are mounted on the steering axle and, after retreading, are then mounted on the drive axle or trailers.

APPROVED TIRE SEALANTS

As of this printing, the following is the only tire sealant/tire-life extender approved for Postal Service use:

ULTRA-SEAL INTERNATIONAL INC
1100 N WILCOX AVE
LOS ANGELES CA 90038-1593

Ron G. Aguirre
(800) 346-9090

Also please note:

On page 3 of V-21-93, change where the results of testing and requests for approval should be sent to the following:

COLIN W DUNNING, MANAGER
VEHICLE MAINTENANCE
UNITED STATES POSTAL SERVICE
475 LENFANT PLAZA SW RM 7142
WASHINGTON DC 20260-2817

RETREADING IS RECYCLING

TIRE INFLATION HELPS THE NATION

DO YOUR PART



Colin W. Dunning, Manager
Vehicle Maintenance
Operations Programs
Customer Service and Sales



April 28, 1994

Ultra-Seal International, Inc.
Attn: Ron G. Aguirre
1100 N. Wilcox Ave.
Los Angeles, CA 90038-1593

Dear Mr. Aguirre:

Attached are copies of Vehicle Maintenance Bulletin, V-07-94, which references your company.

Thank you for your continued efforts on our behalf.

Sincerely,

For Wayne Day
Colin W. Dunning, Manager
Vehicle Maintenance
Operations Programs
Customer Service and Sales

Attachments



fleet maintenance bulletin

U.S. POSTAL SERVICE

MAINTENANCE POLICIES and PROGRAMS

Number: V-21-93

Date: September 24, 1993

Subject: Life-Cycle Tire Care

TO: Manager, Operations Programs Support

ATTN: Manager, Vehicle Maintenance
Manager, Vehicle Maintenance Facility

This supersedes FMB V-16-91 dated August 12, 1991

As part of compliance with the Environmental Protection Agency and the National Energy Strategy and in concert with Postal Service recycling efforts, the following policy is **MANDATORY** for extending the life of tire casings and making full use of available modern tire retreading technology.

All Vehicle Maintenance Facilities (VMFs) will make full use of retreading services for tires used on ALL postal vehicles. Wherever possible, the use of headquarters approved tire sealants is suggested, in order to extend the life of the tire casing. Use of tire sealants/tire life extenders will help reduce road calls and will assure constant tire pressure for the life of the tire. The results are cooler running tires, extended casing life, even tread wear, reduced maintenance costs, and protection against air pressure loss due to average punctures.

BACKGROUND

In most cases, tire casings are disposed of because the tread has worn down to or below recommended minimum tread depth. This practice ignores the fact that there are usually many more miles of casing life remaining in the tire. In order to make full use of the many miles engineered into the manufacture of tires, it is recommended that quality approved tire sealants and tire life extenders be used. It is **MANDATORY** that tires be retreaded as many times as possible by a quality retreading service. The tire retreaders listed on the General Services Administration (GSA) Qualified Products List (QPL) and/or are certified under the Quality Assurance Facility Inspection Program (QAFIP) are the **ONLY** ones approved by Postal Service headquarters. These retreaders have had their retreads subjected to extended testing which meets the same safety and performance standards as those for new tires.

The only restriction for use of retreaded tires on the steering axle of vehicles is found in the Code of Federal Regulations (CFR), Part 49, DOT-NHTSA, Chapter 3, Section 393.75, Paragraph D. This regulation states that retreaded tires are not to be placed on the steering axles of buses.

This Fleet Maintenance Bulletin provides authorization to use retreaded tires on the steering axle of all Postal Service mail-hauling and non mail-hauling vehicles except buses.

When considering the use of retreaded tires on the steering axles of Postal Service vehicles, the following conditions must be met.

- o Managers shall ensure that retreaded tires placed on the steering axle are on casings which, as original equipment, were designed to run on the steering axle position.
- o Retreaded tires whose casings required repairs before retreading should not be placed on the steering axle of any Postal Service vehicle.
- o Tires that have been retreaded more than one time should not be placed on the steering axle of any Postal Service vehicle.
- o All tires, new and retreaded, should have the pressure checked daily. This will help to lower the chances of premature tire failure due to excessive heat build-up at highway speeds when tire pressure is below recommended levels.
- o On 2-ton and larger vehicles, both new and retreaded steering axle tires, shall have a minimum tread depth of at least 4/32 of an inch remaining.

AVAILABILITY OF RETREADING SERVICES

Retreaded tires available through the GSA are certified as meeting standards as stated in Federal Specification ZZ-T-381, Tires, Pneumatic, Vehicular (Highway), New and Retreaded.

Information regarding existing QPL listings or contracts that are in effect for retreaded tires may be obtained by requesting "Federal Supply Schedule FSC 26, Part 2," from:

GSA CENTRALIZED MAILING LIST SERVICE
GSA 7CAFL
PO BOX 6477
FORT WORTH TX 76115-0477

(817) 334-5215

If you are contracting for retreaded tires or retreading services, the following paragraph must be included in any non-GSA solicitation and/or contract:

"Certification of compliance with all Federal Standards is required on all non-GSA contracts for retreaded tires or retreading services."

The retread facility must provide certification under the GSA Federal Tire Program "Quality Assurance Facility Inspection Program" (QAFIP). The tire retreaders listed on the General Services Administration (GSA) Qualified Products List (QPL) and/or are certified under the QAFIP are the ONLY ones approved by Postal Service headquarters. Keep in mind that, in order to get on the QPL list, the manufacturer's retreaded tires must undergo and pass the same specifications and testing that new tires are subjected to. This is to say that all retreaded tires that are approved and on the QPL are equal to or better than new tires. Also keep in mind that all manufacturers may not be qualified under all of the categories, such as; mold-cure/pre-cure, bias/radial, light-truck/truck.

AVAILABILITY OF APPROVED TIRE SEALANTS

In order for any Tire Sealants or Tire Life Extenders to be approved for use in Postal Service vehicles, they must meet certain safety, compatibility, and reliability standards. They must provide the following for the life of the tire:

- o Maintenance of proper air pressure,
- o Prevention of air migration,
- o Prevention of porosity leaks,
- o Conditioning and prevention of rot and weathering within the tire,
- o Cooler running tires, and
- o The sealant must be warranted in writing.

In order to meet these requirements, qualifying specifications and a testing process have been developed. Postal Service VMFs may only use headquarters approved sealant products in our vehicle tires.

Attached to this bulletin are an introductory letter, qualifying specifications for tire sealants to be used in Postal Service vehicles, and the testing process for tire sealants. You may present these attachments to any tire sealant vendor that may seek your business. The vendor must submit the results of the testing, along with a request for approval, to:

J GERARD BOHAN MANAGER
MAINTENANCE POLICIES & PROGRAMS
ROOM 6631
475 L'ENFANT PLAZA SW
WASHINGTON DC 20260-7312

CAUTION: Tire sealants must not be used as a substitute for tire repair. After a puncture occurs, the tire MUST be dismounted and repaired as soon as possible.

REMINDER

Proper inflation pressure on both new and retreaded tires is the single most important factor in overall tire performance and reliability. Underinflation is the worst enemy of tires. The primary cause for tire blow-outs, both new and retread, can be traced back to improper air pressure (underinflation). A tire, new or retread, at proper inflation pressure reaches its maximum operating temperature in 90 minutes at highway speeds. If an underinflation situation exists, the heat will continue to climb until either tire failure or damage to the casing construction occurs. If the casing damage goes undetected, the tire, when worn out, sometimes ends up as a retread tire that eventually fails in operation because of the initial casing damage when the tire was new.

Tire inflation also has a tremendous effect on fuel economy. Executive Order #12759, Federal Energy Management, requires Federal Agencies to reduce fuel usage by 10 percent by 1995, using 1991 as the base year. In the spirit of this order, the Postal Service is also attempting to meet this same goal. Improved vehicle utilization and proper tire inflation will contribute to our doing so.

Many of our challenges in the coming years will revolve around environmental issues. A positive commitment from each of us will enable the Postal Service to maintain its current high standing in environmental compliance within both Federal and private fleets. Start your commitment by use of retreading and by checking tire inflation pressures everywhere you go.

Anyone wishing additional information on retreading may contact the Tire Retread Information Bureau (TRIB) which is a non-profit, industry supported association dedicated to the recycling of tires through tire retreading and repairing. They will be glad to send a packet of information that might be helpful to reluctant users of retreaded tires. Their address is:

THE TIRE RETREAD INFORMATION BUREAU
900 WELDON GROVE PL
PACIFIC GROVE CA 93950-4719

HARVEY BRODSKY
MANAGING DIRECTOR
(408) 372-1917

Supporting retread associations that can also fulfill requests for information are:

AMERICAN RETREADERS ASSOCIATION
PO BOX 37203
LOUISVILLE KY 40233-7203

MARVIN BOZARTH
EXECUTIVE DIRECTOR
(502) 968-8900

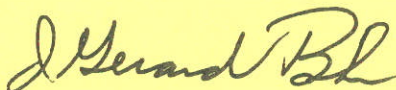
NATIONAL TIRE DEALERS & RETREADERS ASSOC
1250 I STREET NW SUITE 400
WASHINGTON DC 20005-3922

JOHN F BUETTNER, SR
DIR TIRE RETREADING INSTITUTE
(202) 789-2300

RETREADING IS RECYCLING

TIRE INFLATION HELPS THE NATION

DO YOUR PART



J. Gerard Bohan, Manager
Maintenance Policies and Programs
Processing and Distribution

Attachments

ATTACHMENT "A"

TO WHOM IT MAY CONCERN:

In order for any Tire Sealants or Tire Life Extenders to be approved for use in Postal Service vehicles, they must meet certain safety, compatibility, and reliability standards. They must provide the following for the life of the tire:

- o Maintenance of proper air pressure,
- o Prevention of air migration,
- o Prevention of porosity leaks,
- o Conditioning and prevention of rot and weathering within the tire,
- o Cooler running tires, and
- o They must be warranted in writing.

In order to meet these requirements, we have developed the attached qualifying specifications and testing process. Postal Service Vehicle Maintenance Facilities may only use headquarters approved products in our vehicle tires. Please submit the results of the testing, along with a request for approval, to:

J GERARD BOHAN MANAGER
MAINTENANCE POLICIES & PROGRAMS
ROOM 6631
475 L'ENFANT PLAZA SW
WASHINGTON DC 20260-7312

J. Gerard Bohan, Manager
Maintenance Policies & Programs
Processing and Distribution

Attachments

QUALIFYING SPECIFICATIONS
FOR TIRE SEALANTS
TO BE USED IN POSTAL SERVICE VEHICLES

1. SCOPE:

This specification covers tire sealants and/or tire life extenders (both shall henceforth be referred to as tire sealants) suitable for use in all pneumatic tires used in the postal service.

2. REQUIREMENTS:

2.1 QUALIFICATION

The tire sealant furnished under this specification shall be a product that has been tested by a United States federally recognized "Tire Testing Laboratory". The sample submitted must be from standard production stock and verified as such by the testing facility. Notarized documentation must be submitted that guarantees that the product submitted is the standard product manufactured by the submitter and must not be altered or reformulated without the submission of new test reports. The tire sealant and or tire life extender shall conform to all requirements of this specification. Three out of the four treated tires in the test must meet 3.7.4 of these specifications.

* Federally recognized tire testing laboratories:

SMITHERS SCIENTIFIC SERVICES INC
425 W MARKET STREET
AKRON OH 44303-2044 (216) 762-7441

STANDARDS TESTING LABORATORIES, INC.
PO BOX 592
1845 HARSH AVE SE
MASSILLON OH 44648-0592 (216) 833-8548

NEVADA AUTOMOTIVE TEST CENTER
PO BOX 234
CARSON CITY NV 89702-0234 (702) 882-3261

2.2 DATA

Unless otherwise specified, no data other than test reports accompanying qualification samples are required by this specification.

2.3 COMPOSITION

The composition of the tire sealant shall be optional with the manufacturer, but shall be restricted by the requirements of this specification. The tire sealant's chemicals and composition shall not be harmful to any types of rubber and/or materials used in tires and wheels. The composition shall not contain an adhesive or any material that would allow solidification such as bonding to the tire or wheel. The tire sealant must not contain asbestos, in any form, encapsulated or not, or any other substance which the Occupational Safety and Health Administration (OSHA) or the Environmental Protection Agency (EPA) might find harmful to Postal Service employees or the environment.

2.4 TOXICITY

The material shall have no adverse effect on the health of personnel, when used for its intended purpose.

2.5 WASTE DISPOSAL CHARACTERISTICS

Surfactants in the tire sealant shall be a minimum of 90% biodegradable. The compound shall not contain hexavalent chromium, methyl, ethyl or isopropyl alcohol, or any material considered as hazardous by the EPA, and shall not present a waste disposal problem.

2.6 PH VALUE

The PH limits of the material (as is) shall be 8.8 +/- 0.8 when tested fresh and after the tire sealing test (3.7 of these specifications). The PH test shall be conducted according to 3.1 of these specifications.

2.7 STABILITY

2.7.1 Chemical separation

The tire sealant must be homogeneous and can not separate in the container. The sealant must not require stirring or mixing.

2.7.2 Heat stability

The tire sealant shall not separate after being exposed to temperatures of 60 +/- 2 degrees C (140 +/- 4 degrees F) for a period of six hours, when test is performed in accordance with 3.2 of these specifications. A slight amount of clear liquid (less than 3% by volume) on top is allowed.

2.7.3 Cold Stability

The tire sealant shall not freeze at -40 +/- 5 degrees C (-40 +/- 9 degrees F).

2.7.4 Storage Stability

Material in storage for 12 months, but no longer than 60 months, in original containers shall meet the requirements of 2.6, 2.7, and 2.11 of these specifications.

2.8 FLAMMABILITY

The tire sealant, including chemical carriers and/or propellants, shall have no flash when tested up to and including the initial boiling point, when tested according to 3.4 of these specifications.

2.9 CORROSION

The tire sealant shall not cause more than slight discoloration on steel, aluminum and magnesium, when tested according to 3.5 of these specifications.

2.10 SEALING CAPABILITIES

The tire sealant must retain its sealing capabilities throughout the 20,000 mile test. To ascertain permanent sealing capabilities, the punctured tires must maintain air pressure throughout the test (3.7 of these specifications).

2.11 EVAPORATIVE CURING TEST

Fresh sealant and material from the sealant test, 3.7 of these specifications, when tested according to 3.6 of these specifications, shall have the required flexibility and elasticity required. It shall be flexible such that a 1/4" wide strip can be conformally wrapped around a 1/8" diameter mandrel/rod without cracking or separating, and shall resist tearing when elongated a minimum of 20% of its length.

3. QUALITY ASSURANCE PROVISIONS:

3.1 PH VALUE

Check the PH of the material (as is) at 25 degrees C (77 degrees F) using Beckman Type "E" high PH glass electrode or equal.

3.2 HEAT STABILITY

Place 100 ml sample of the material (as is) in a 100 ml graduated cylinder and stopper it. The cylinder shall be placed in a 60 ± 2 degrees C (140 ± 4 degrees F) water bath and maintained at that temperature for six hours. The water bath shall be of sufficient depth to cover at least 60 ml of the material. At the end of the test period, no separation or layering of the material shall be evident (see 2.7.1 of these specifications).

3.3 COLD STABILITY

About 50 ml of the material shall be poured into suitable size test tube and cooled to -18 ± 5 degrees C (0 ± 9 degrees F). Maintain the temperature for one hour. The material shall not be frozen or begin to show evidence of freezing. After examination, continue cooling the sample to -40 ± 5 degrees C (-40 ± 9 degrees F). Maintain the temperature for one hour. The material may be slushy but shall not be frozen. Sample shall be allowed to return to room temperature 25 ± 2 degrees C (77 ± 14 degrees F). The material shall return to original state complying to 2.7.2 of these specifications.

3.4 FLAMMABILITY

Check the flammability using Cleveland Open Cup (COC) flash point tester according to ASTM test No. D92., complying to 2.8 of these specifications.

3.5 CORROSION

Using extra fine emery paper, remove all corrosion and products from 1x2 inch panels of 1010 steel, bare aluminum and magnesium. Rinse in acetone and dry with tissue paper. Avoid touching the panels with bare hands. Place each panel into a 4 oz. jar half filled with sealant material. Place the closed jars in an oven heated to 60 ± 2 degrees C (140 ± 4 degrees F) for 24 hours. Remove panels, rinse with water and acetone, dry and examine for possible corrosion, complying with 2.9 of these specifications.

3.6 EVAPORATIVE CURING TEST

Pour 60 ml of unused (as is) and 60 ml of material retrieved from test 3.7 of these specifications, into two $3 \frac{1}{2} \times \frac{1}{2}$ " petri dishes. Allow to air dry 96 hours at 25 ± 2 degrees C (77 ± 4 degrees F) temperature and 50 ± 5 relative humidity. Take a $\frac{1}{4}$ " wide strip of the dried material and wrap conformally around a $\frac{1}{8}$ " diameter mandrel/rod. The material must remain flexible enough so that it does not crack or separate during this process. Take another $\frac{1}{4}$ " wide strip as above and stretch it. It should resist tearing when elongated a minimum of 20 percent of its length. Check for compliance according to 2.11 of these specifications.

3.7 LONGEVITY AND SEALING (20,000 MILE MINIMUM)

The purpose of this portion of the specification is to evaluate the tire sealant performance in tubeless steel belted radial tires and in no way shall be an evaluation of the tires and/or vehicles. A specific type tire is required only for uniformity and must comply with vehicle placard load and weight limits. Once a tire sealant has met the requirements of this specification, it will perform equally well in any size tire-wheel combination. End users of the tire sealant may require additional testing for extreme usage situations that are not covered within this generic minimum tire sealant specification.

3.7.1 Tires

Eight new tubeless steel belted light truck tires shall be utilized for the test (four tires are to be treated with sealant and the additional four tires are to be control tires). The interior of the tires must be clean and dry. Dry filtered air is to be used to inflate the tires. Test is conducted within tire manufacturer's air pressure and load requirements (minimum of 85 percent of load rating, with the maximum air pressure requirements. Two tires on each vehicle shall be untreated and used as control tires to complete verification of 3.7.5 of these specifications.

3.7.2 Actual highway - test track testing

This test is to be conducted on vehicles in actual "on-road and test track conditions" consisting of 70 percent interstate or interstate like roads, 10 percent secondary roads, 10 percent gravel roads, 10 percent off-road. Average speeds of 45-65 mph (maximum 65 mph), off-road testing is to be conducted at speeds of 10 to 25 mph. To simulate wet situations, each day the tires are to go through a trough with a minimum of 6" deep water, at 5 mph with a minimum of 3, 360 degree rotations.

3.7.3 Quantity of sealant and puncture requirements

The amount of sealant required to treat the tire is specified by the product manufacturer. Size of puncturing object is one eighth of an inch (3mm) in diameter and must go completely through the tire casing. This puncturing tool may be an ice pick with an 1/8" shank or an 1/8" bolt that has been sharpened. A total of four punctures shall be made in each of the sealant treated tires, with each puncture administered at specific intervals. The puncturing tool will be hammered into the tread area. Each puncture must alternate from centrally located in tread area to within one inch of the outermost edge of the tread (crown). Each puncture should be spaced no closer than 6 inches. After the puncturing tool is inserted into the tire, it must be removed, and the tire must then be rotated on its axis or the vehicle driven to allow the tire sealant to perform its function.

3.7.4 Seepage and air pressure maintenance

Vehicle and tires must be stored for 72 hours at room temperature - 25 +/- 2 degrees C (77 +/- 4 degrees F) every 5,000 miles or a minimum of four 72 hour periods throughout the test program. Air pressure checks are to be performed throughout the test program on cool tires. Pressure variances due to atmospheric pressure or climate changes are to be taken into account. Tire pressure check routine is to be established by the test facility. A tire is considered a failure, for the purpose of this specification, if it does not maintain proper air pressure within 10% of initial setting, due to any air pressure loss. If a tire does not seal after being punctured, it will be reinflated to proper pressure twice. If it continues to lose pressure it will be considered a failure.

3.7.5 Casing longevity enhancement

Physical tensile/tear tests on rubber innerliners taken from sealant containing tires after 20,000 miles shall be at least 10% higher than the control tires not containing sealant. Physical adhesion tests between tire components, i.e., ply to ply or sidewall rubber to ply cord, shall be at least 10% higher in the sealant containing tires vs the control tires.

3.7.6 Tread wear documentation

Tread wear measurements are to be taken every 5,000 miles for comparison.

TEST PHASES FOR TIRE SEALANTSPHASE #1

- 1-a Balance tires (maximum weight allowed - 2ozs per tire), check tires and wheels for out of round situation, replace as necessary.
- 1-b Install prescribed amount of tire sealant as per manufacturer.
- 1-c Set tire pressure to tire manufacturer's specifications.
- 1-d Drive vehicle for one hour to disperse tire sealant.

PHASE #2

- 2-a Begin test program immediately after establishing 1-d.
- 2-b Puncture #1 is made into the tire. The puncturing object is removed and the tire must then be rotated on its axis to allow the tire sealant to perform its function. This procedure should be followed after each puncture. The drive portion of the test program begins and the vehicle is driven for 5,000 miles (3.7.3). The mounted tires are then removed from the vehicle and stored for 72 hours. Air pressure checks are performed before puncture #2 is then made and the tire is rotated as before.
- 2-c At 10,000 miles, the treated tires are again stored for 72 hours. Then, air pressures are checked and puncture #3 is made. The vehicle is driven another 5,000 miles. By the end of Phase 2, the tires shall have 3 punctures each and have attained 15,000 miles.

PHASE #3

- 3-a At the end of 15,000 miles (Phase #2) and after a 72 hour storage period, the air pressure is to be checked prior to inserting puncture #4. The vehicle is then driven the final 5,000 miles, the treated tires are stored for 72 hours after which the tire pressures are checked. Must meet requirements of 2.10 of these specifications.

PHASE #4

- 4-a At the conclusion of the test, the sealant is to be removed from the tire and shall be tested. Must meet requirements of 2.9 of these specifications.
- 4-b The treated tires are to be cut into sections and x-rayed for corrosion within all puncture locations to determine if any obvious wire corrosion has occurred. The sections are to be inspected for any delamination or degradation within the casing. The sections are to be compared to sections of the untreated control tires and analyzed. A minimum of 10 percent increase in physical tensile/tear and physical adhesion properties over the control tires is required. Must meet all requirements of 3.7.5 of these specifications.