

MAINTENANCE BULLETIN # 36

Subject: Tires

Tire failures (blowouts) have become a growing problem on Cal OES engines and water tenders. Concurrently, tire industry standards have changed, and tire companies have begun to address tire age or "shelf life." In order to maintain a safe and efficient fleet of fire fighting vehicles, this office has determined the following to be a minimum standard for tires.

Tread Depth

Historically, tread depth has been used as a criteria for determining tire replacement. The California Vehicle Code, Section #27465 states that no person shall use a pneumatic tire on a vehicle axle when the following tread depth is reached: one thirty-second of an inch tread depth in any two adjacent grooves at any location on a tire; four thirty-second of an inch tread depth at all points in all major grooves on a tire on any steering axle; and two thirty-second of an inch tread depth at all points in all major grooves on all other tires on the axle of the vehicle.

Tire Age

Tires degrade over time, even when not being used. UV exposure, high ambient heat, and exposure to oil and ozone gas all are causes. Steel belts can rust inside tires if inflated by air with moisture in it. When in use, tires deteriorate from heat caused by hot climates, high speeds, and high loading conditions.

Most manufacturers design their tires for commercial truck applications where miles are more important than years; basically, tires are expected to wear out long before they rot out. As a result, the stabilizers in many tire rubber compounds are formulated to offer protection for only a limited time. Failures can include sudden sidewall blowouts or bead separations.

Tire age can be determined by checking the DOT code on the sidewalls. For tires manufactured before the year 2000, the last three digits represent the week and year of manufacture. For example, if the last three digits are "229", the tire was produced in the 22nd week of 1999. For tires made after Jan. 1, 2000, a four digit code is used: the first two digits represent the week of production, and the last two digits represent the year of production. So, if the last four digits are "2205", it means the tire was manufactured in the 22nd week of 2005.

Tire Replacement Policy

Regardless of appearance and tread wear, tires over 7 years old should be replaced with new ones. When replacing tires when located in the assignee's home locale, ensure that the vendor utilizes tires that are no more than 6 months old. When replacing tires during a deployment, ensure tires are no more than 12 months old.

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On occasion, a tire lug may be torn off from one of the drive (rear) tires. The lugs are usually torn from the outside edge of the tire. Replacement of these tires will be determined by the following criteria:

If there are no cords/steel belts showing in the location of the torn lug, the tire will not be replaced.

Conversely, if the cords/steel belts are visible, the tire will be replaced.

If multiple **adjacent** lugs are torn off, regardless of the lack of visible cords/steel belts, the tire will be replaced.

If multiple lugs are torn off, but they are not adjacent, the tire will only be replaced if there are cords/steel belts visible.

Standard Tires Used

Steering Axle (front): Goodyear G751 MSA with Dura Seal

Drive Axle w/**11R22.5** (rear): Goodyear G751 MSA with Dura Seal

Drive Axle w/**12R22.5** (rear): Goodyear G287 MSA with Dura Seal Note: Dura Seal may not be readily available for this tire size. If time allows, Dura Seal tires will be ordered.

Drive Axle option (rear): Cal OES will consider the use of the Goodyear G164 on a case-by-case basis for assignees who have a higher level of off road usage. Authorization must be obtained from the Cal OES Fire & Rescue Chief, or his designee, for use of this tire.

Notes regarding drive axle tire selection: Cal OES has utilized Goodyear G124's, G164's and G244's in the past. It has been found that these tires are susceptible to lug loss when utilized off-road. The G124's and G164's suffer from this problem more than the G244's. The G244's have a deeper tread depth which results in swaying and the rear of the apparatus being squirrely. The rubber compound in the G124's and G164's is softer than other tires and results in a shorter lifespan. Although the G287's have solid outside ribs, the two rows of inner lugs provide very adequate off-road traction. They have been successfully utilized by Cal Fire for Crew Buses as well as 2WD and 4WD engines. The solid outside ribs have been specifically designed to avoid cupping.

Tire Pressure Maintenance System

To maintain accurate and equal tire pressures in the rear tires, Cal OES has installed Cat's Eye Tire Pressure Maintenance Systems on Type 1 engines up to and including Engine 338 and Type 3 engines (Any unit built before the 2009 NFPA #1901 Standard for Automotive Fire Apparatus). These systems mount on a lug of the outside dual and connect the two valve stems via stainless steel hoses.

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The indicator or "Cat's Eye" is closed under proper inflation. When the eye opens, tire pressure has dropped below the designated minimum or an air leak is indicated. When a catastrophic failure occurs in one of the tires, a check valve operates to trap the air in the remaining tire. On engines starting with Engine 339 (units built under the 2009 NFPA #1901 Standard for Automotive Fire Apparatus), the dual rear tires are supplied with Crossfire tire equalization valves and stainless braided lines. This system provides dual tire blowout protection, as well as, slow leak protection between the rear tires. These units also have individual LED pressure monitors on the front wheels. These devices will blink with a red light when pressure drops below proper inflation.