



Tire Safety

Lt Col Keith W. Noe, CAP
Director of Safety
Kentucky Wing



Going Beyond the CAPF 73

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Introduction



- NTSB reported that:
 - >500 die in tire-related passenger vehicle crashes each year
 - ~19,000 injured
 - Most of these crashes are preventable
- Special Investigation Report: Selected Issues in Passenger Vehicle Tire Safety, NTSB, 2015



The CAPF-73



- The CAPF-73 has two items on tires to check
- #3 – Visually inspect tires for damage or abnormalities

CAP VEHICLE INSPECTION GUIDE AND USAGE DATA		
MONTH / YEAR	END OF MONTH ODOMETER READING	
WING / REGION	CHARTER	
VEHICLE IDENTIFICATION NO. (VIN)	YEAR OF VEHICLE	
VEHICLE MAKE	VEHICLE MODEL	FIELD ID NO.
ITEMS TO BE CHECKED DAILY		
<i>(operator's signature required on inside page to verify inspection)</i>		
1.	REGISTRATION / PROOF OF INSURANCE	
2.	DAMAGE <i>(exterior and interior, missing parts)</i>	
3.	TIRES <i>(visually check for damage / abnormalities)</i>	
4.	CHECK FLUID LEVELS <i>(oil, transmission, brake, power steering and coolant) (check according to manufacturers instructions.</i>	



The CAPF 73



- The CAPF-73 has two items on tires to check
- #19 – Tire pressure (checked monthly)

15.	EXHAUST SYSTEM
16.	WINDOWS <i>(functionally check proper operation)</i>
17.	RADIO MOUNTS <i>(CAP added equipment)</i>
18.	CURRENT STATE INSPECTION STICKER <i>(if applicable)</i>
19.	TIRE PRESSURE <i>(checked monthly – requires signature and date below)</i>
	Signature: _____ Date Performed: _____

CAP FORM 73, FEB 15 PREVIOUS EDITIONS WILL NOT BE USED AFTER 30 APR 15
OPR/ROUTING: LGT



Check Point



- How much does it take for you to complete a CAPF-73 inspection?
- How much time do you think it should take?
- Discuss this with the other attendees



Dry Rot



Dry Rot



- A condition often seen on cars when the owners have let the car sit unused for a while in storage
- purchased second-hand tires that still have plenty of good tread on them but were left sitting in an overheated storage area for months



Dry Rot



- Dry rot causes the rubber to become brittle, which makes the tire suddenly crack



Did You Know



- 'Dry rot' is actually a misnomer when used in regard to tires
- Actual meaning of this term is the damage caused to wooden objects by a particular fungus.
- Dry rot in tires is, in fact, a condition where its rubber becomes hard and brittle – which causes cracking of the sidewalls



Symptoms



- The first sign of dry rot is cracks running down the sidewalls
 - If the cracks are surrounded by discolored rubber, then the dry rot is in an advanced stage
- Dry rot commonly occurs on the sidewalls, it can spread to the tread too
 - a good tread does not indicate absence of dry rot



Symptoms



- Touch the surface of the tire
 - If the rubber appears dry, rigid or brittle, then this is a warning sign
- In advanced cases of dry rot, the tread starts separating from the tire
 - in the front tires, it will cause the steering wheel to wobble when driving at low speeds
 - the whole car wobbles if tread separation occurs in any rear wheel



Causes of Dry Rot



- Ultraviolet Light
 - Sunlight contains a type of radiation called ultraviolet or UV rays
 - These radiations cause deterioration of rubber by a process called photodegradation
 - parking your vehicle for extended periods in the sun can take its toll
 - This type of damage is more prominent in places which are sunny, such as Florida, rather than Virginia



Causes of Dry Rot



- **Ozone**

- Ozone is a type of gas made up of oxygen atoms
- Under normal circumstances, this gas is found only in the higher parts of the atmosphere
- due to pollution, increasing amounts of ozone are found near the Earth's surface
- This gas, together with UV, is one of the main reasons for dry rot of tires
- It breaks the chemical bonds in rubber by a process called ozonolysis, resulting in tire cracking



Causes of Dry Rot



- **Oxygen**

- oxygen is also known to damage tires by breaking carbon and sulfur bonds in rubber molecules
- it causes evaporation of protective waxes and oils, which shield the tire surface



Causes of Dry Rot



- **Age**

- Age does take a toll on tires
- All the factors like UV exposure, ozone damage, and physical weathering, produce a cumulative damage with time
- tires can also age on shelves without ever being used, because of exposure to the elements
- The inner lining of tires also deteriorates with age, due to the effect of oxidation by the air filled in the tire



Causes of Dry Rot



- **Disuse**

- During manufacture special additives and waxes are added to the rubber
- During regular use of the vehicle, the stresses placed on the tire forces these substances out of the rubber and onto the surface of the tire
- they form a protective coat against chemicals, UV, and ozone damage
- This process is called 'blooming'



Causes of Dry Rot



- **Disuse**

- When a tire is not used for extended periods, either on a vehicle parked in the garage, or on a shelf, blooming does not occur, and the tire surface deteriorates



Prevention of Dry Rot



- **Regular Use**

- Tires must be used regularly
- this places the rubber under stress, causing the protective waxes to make their way to the tire surface
- Even if the vehicle is not used frequently, moving it a bit in the garage itself will keep this process of 'blooming' on



Miscellaneous



- Always park your vehicle in the shade. If this is not possible, shield it from the sun by using a vehicle cover
- Keep the tires inflated to their recommended air pressure
- Examine the tires on a regular basis to spot any damage. This becomes more important 3 years after manufacture, and later
- Do not store the tires near gasoline, oil, or grease



Miscellaneous



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Video



- Let's view this video about dry rotting tire



Aged Tires



What Do Aged Tires Look Like?



These tires may look new

Date of Manufacture:
1810



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What Do Aged Tire Failures Look Like?



What Do Aged Tire Failures Look Like?



- In June 2012 Owner took a nearly unused tire obtained from relative to tire dealer who mounted it on a Ford Ranger.
- Tire was made 31st week of 1991.
- Four months later tire suffered catastrophic tread separation causing a rollover and severe injuries to the driver.



What Do Aged Tire Failures Look Like?



- March 2010 towing service places virtually unused spare made in 22nd week of 2001 on 2001 Ford F250 during trip from MI to FL.
- April 2010 tires are inspected by tire service center in MI.
- July 2010 catastrophic tread separation in VA; severe injury.



SAFETY RESEARCH
& STRATEGIES, INC.

What do Aged Tire Failures Look Like?



- Used tire made in 50th week of 2007 sold by shop in FL in July 2013.
- Placed on right-front position of 2002 Isuzu Trooper.
- Tread separation on highway Aug. 2013.
- Belted rear-seat passenger killed.



Drive Safely