GMC RV Rally

Temecula, California

April, 2003

Agenda

- Background
- Tire Basics
- Issues
- Summary

Disclaimer

- Michelin has issued a statement denying any paternity involvement in regards to their Corporate Logo “Bibendum”

Background

- GMC RV Members asked for Basic Tire Information
- Consumer relations in Greenville asked me to give a presentation

Tire Information

- Size nomenclature
- DOT nomenclature
- Load / Pressure information
- Wear conditions
- Repair
- RV Related issues

Most Frequent Questions

- Size determination
- Age of tires
- Sidewall cracking
- Air pressure
- Steel vs Fabric sidewalls

Tire Size Nomenclature

Sizes reported on GMC RV's

- LT215/75R16
- LT225/75R16 (Most popular)
- LT235/85R16
- LT245/75R16
- 8.75R16.5
- 9.50R16.5

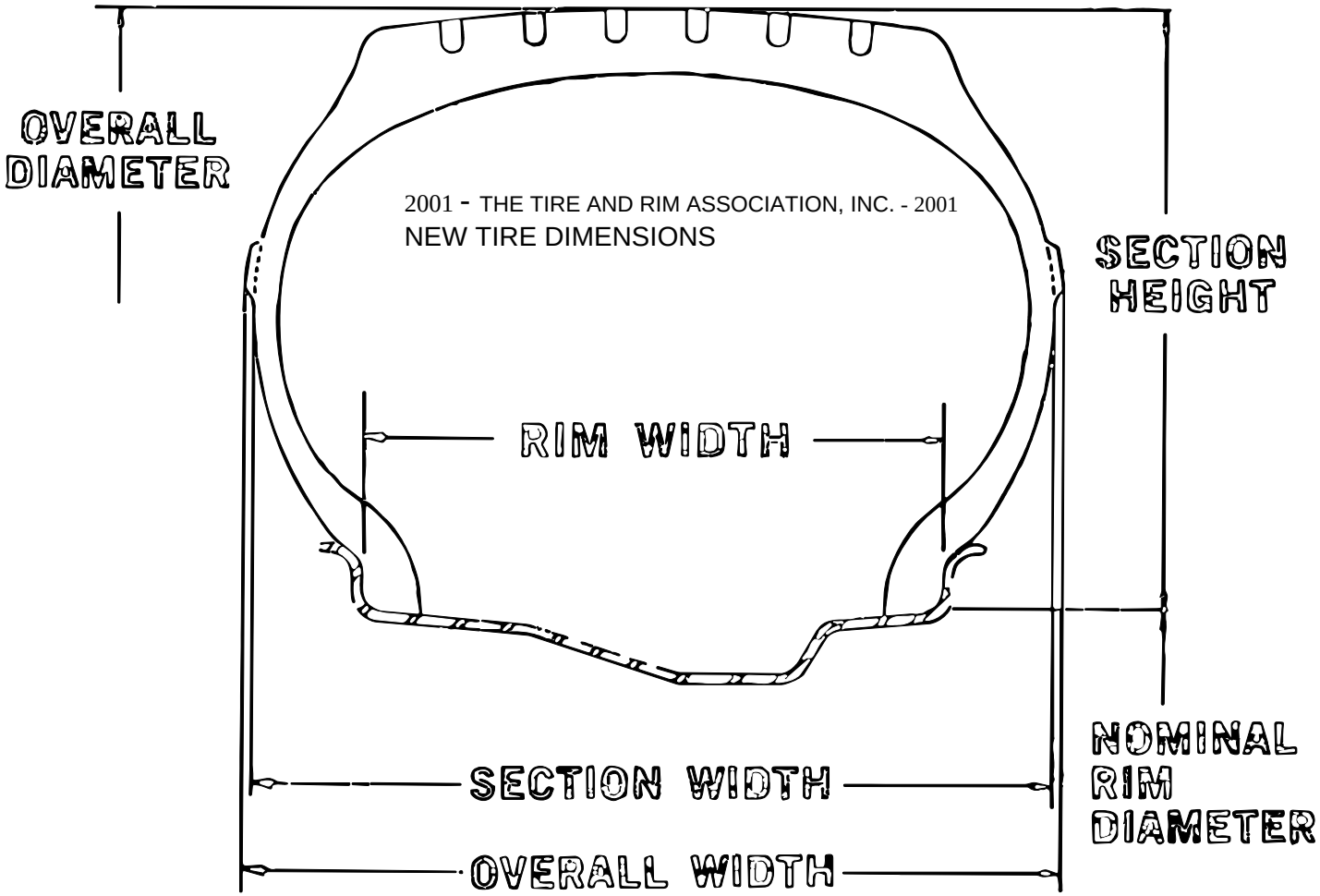

MICH
LT 225 / 75 R 16

Size Nomenclature

- LT 225/75R16 is typical
- LT indicates Light Truck
- 225 is the section width of the tire in mm
- 75 is the aspect ratio of Height over Width
- R indicates it is a Radial tire
- 16 is the wheel diameter in inches

Aspect ratio

- Aspect ratio is the ratio of the tire's section height over the tires section width
- Section height is ½ of the diameter of the tire less the wheel diameter
- Section width is the widest point of a tire
- Percentages over 85 are usually not included in the tire size designation


OVERALL DIAMETER
2001 - THE TIRE AND RIM ASSOCIATION, INC. - 2001
NEW TIRE DIMENSIONS
SECTION HEIGHT
RIM WIDTH
NOMINAL RIM DIAMETER
SECTION WIDTH
OVERALL WIDTH


ST225/75D15

DOT Nomenclature


DOT FWJH AHWX 4602

DOT Nomenclature

- DOT is the Department of Transportation
- Requires that all tires used over the road be identified by manufacturer and date of manufacturer
- New tire manufacturers are identified by 2 digit codes
- Date codes are either 3 or 4 digits


DOT FWJH AHWX 4602

DOT Nomenclature

- Example: FW JH AHWX 4602
- FW = Factory where tires were made
- JH = DOT code for tire size
- AHWX = Manufacturer optional code
- 4602 = week / year code
- 46 = 46th week; 02 = Year 2002


HWX
4602


GIA RWX 14
B5H X514


GIA RWX 14
B5H X514

Load / Pressure information

Specifications for Tread Design: LTX® A/S

Size (1)	Sidewall (2)	Load Range	Catalog Number	Overall Diameter		Overall Width (3)		Approved Rims (4)	Revs per Mile	Tread Depth	Max. Tire Load Single			Max. Tire Load Dual		
				in.	*mm.*	in.	*mm.*			32nds	lbs.	*kg.*	psi	lbs.	*kg.*	*kPa*
LT215/85R16	ORBL	E	41550	30.3	*772*	8.7	*221*	5.5 - 7.0	687	13	2680	*1215*	80	2470	*1120*	550
LT225/75R16	ORBL	C	77390	29.3	*743*	9.3	*237*	6.0 - 7.0	712	13	1940	*880*	50	1765	*800*	350
LT225/75R16	ORWL	D	80482	29.2	*745*	9.1	*231*	6.0 - 7.0	715	13	2335	*1060*	65	2150	*975*	450
LT225/75R16	ORBL	D	66593	29.2	*745*	9.1	*231*	6.0 - 7.0	715	13	2335	*1060*	65	2150	*975*	450
LT225/75R16	ORBL	E	46049	29.3	*745*	9.1	*231*	6.0 - 7.0	709	13	2680	*1215*	80	2470	*1120*	550
LT235/85R16	ORBL	E	15038	31.8	*808*	9.2	*234*	6.0 - 7.0	653	14	3042	*1380*	80	2778	*2778*	550
LT245/75R16	ORBL	E	63532	30.6	*777*	9.6	*244*	6.5 - 7.0	679	14	3042	*1380*	80	2778	*1260*	550
LT265/75R16	ORBL	E	54265	31.8	*808*	10.6	*269*	7.0 - 8.0	654	13	3415	*1550*	80	3085	*1400*	550
LT245/70R17*	RRBL	E	90771	30.6	*777*	9.5	*241*	6.5 - 7.5	675	15	3000	*1360*	80	2755	*1250*	550
LT265/70R17*	RRBL	E	83116	31.4	*798*	10.4	*264*	7.0 - 8.5	657	15	3195	*1450*	80	2910	*1320*	550
LT265/70R17*	ORBL	E	63836	31.4	*798*	10.4	*264*	7.0 - 8.5	657	15	3195	*1450*	80	2910	*1320*	550


MAX. LOAD SINGLE
MAX. LOAD DUAL
2680 LBS
2470 LBS
AT
AT
80 PSI
80 PSI
LESS

LT 225/75R16 LR E

- Single tire can hold 2,680 pounds at 80 psi
- Front axle, or an axle singled out can carry 5,360 pounds at 80 psi

LT 225/75R16 LR E

- In a dual configuration, the tire can carry 2,470 pounds at 80 psi
- Four tires across an axle in a dual configuration can carry 9,880 pounds
- Lower capacity rating for duals due to unequal effects on the tires from road crown and bouncing

Weighed Coaches

- 47 coaches were weighed
- Average Front axle weight = 4,312 lbs
- Average 2nd axle weight = 3,930 lbs
- Average 3rd axle weight = 3,832 lbs
- Average total vehicle weight = 12,074 lbs

Load and inflation industry standards are in a constant state of change. Michelin continually updates its product information to reflect these changes.

Therefore, printed material may not reflect the current load and inflation information.

* Ahnraysrefer to the tire sidewall ~arkings formaxim~m Iq~d **and** pressure information to determine **the proper load/inflation table.** NOTE: Never exceed the wheel manufacturer's maximum air pressure limitation.

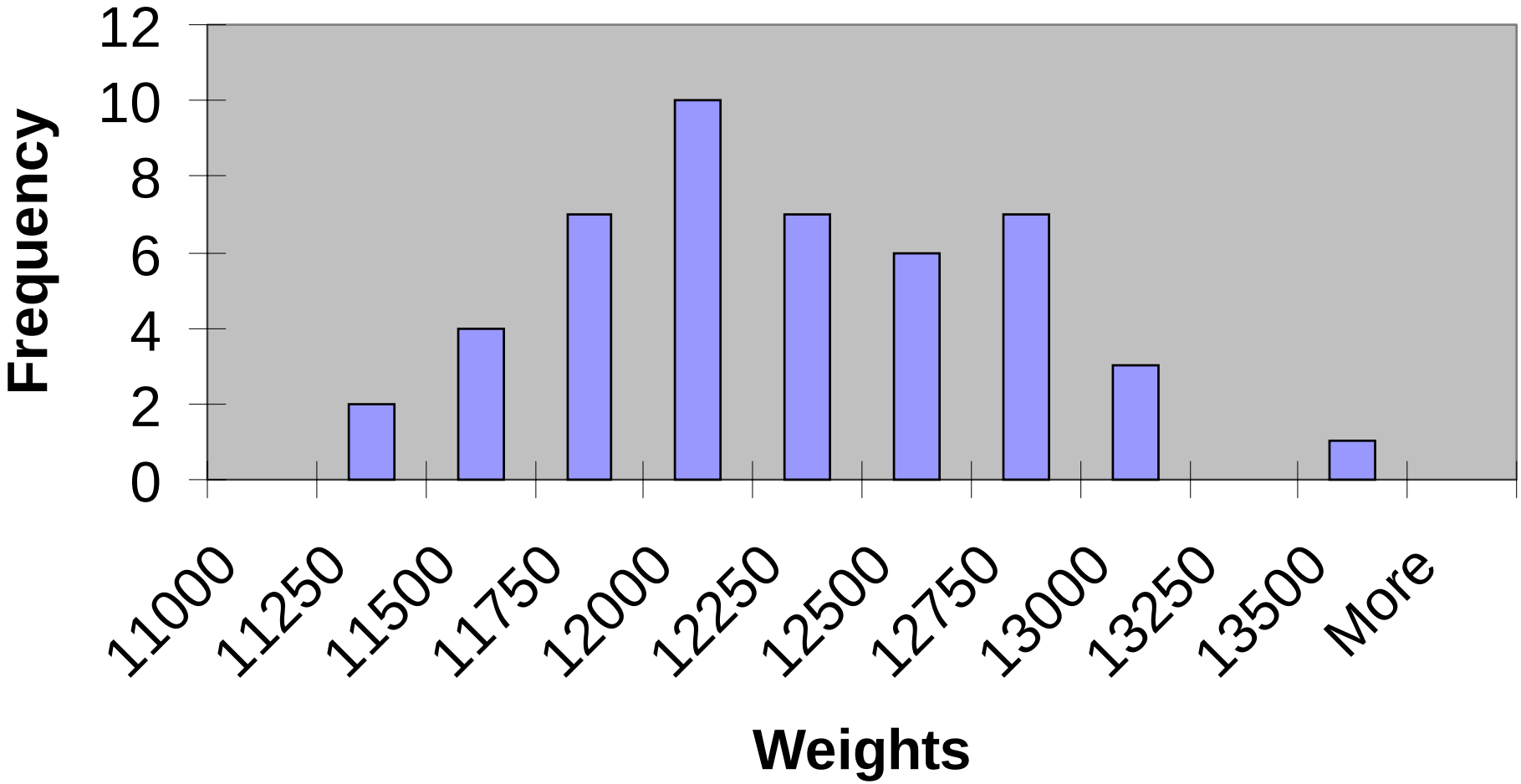
S = Single configuration - 2 tires per axle. D = Dual configuration - 4 tires per axle.

WHEEL DIAMETER - 16"

LT225/75R16 LRE

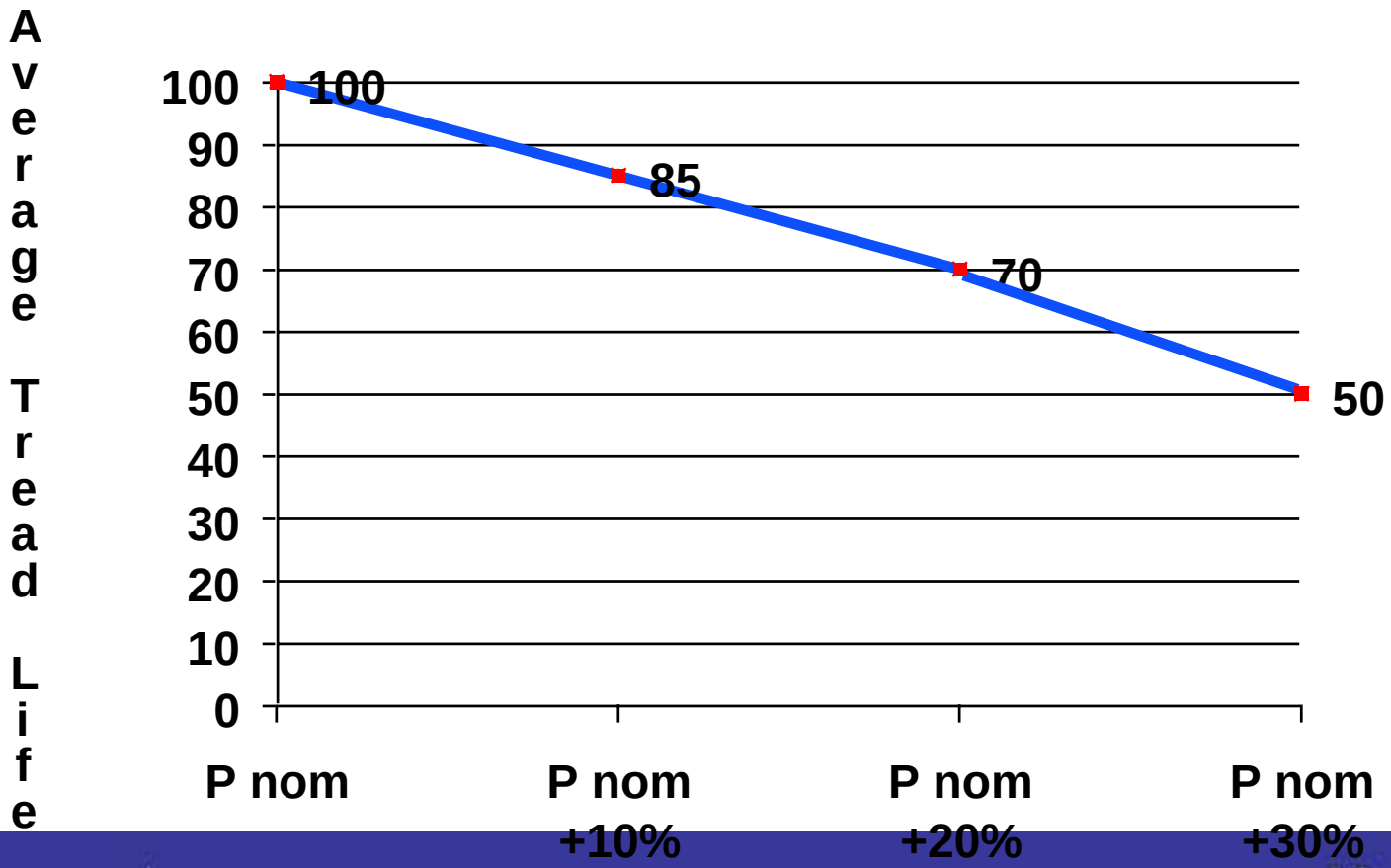
LOAD PER AXLE														MAX LOA
psi kPa		35 250	40 280	45 310	50 350	55 380	60 410	65 450	70 480	75 520	80 550	85 590	90 620	psi kPa
lbs.	S	3090	3295	3500	3880	4080	4280	4670	4870	5140	5360			bs.
	D	5600	6000	6400	7060	7430	7800	8600	8860	9340	9880			
kg.	S	1400	1495	1590	1760	1850	1940	2120	2210	2330	2430			kg.
	D	2540	2720	2900	3200	3370	3540	3900	4020	4240	4480			

Vehicle weights



Influence of Inflation Pressure on Average Tread Life

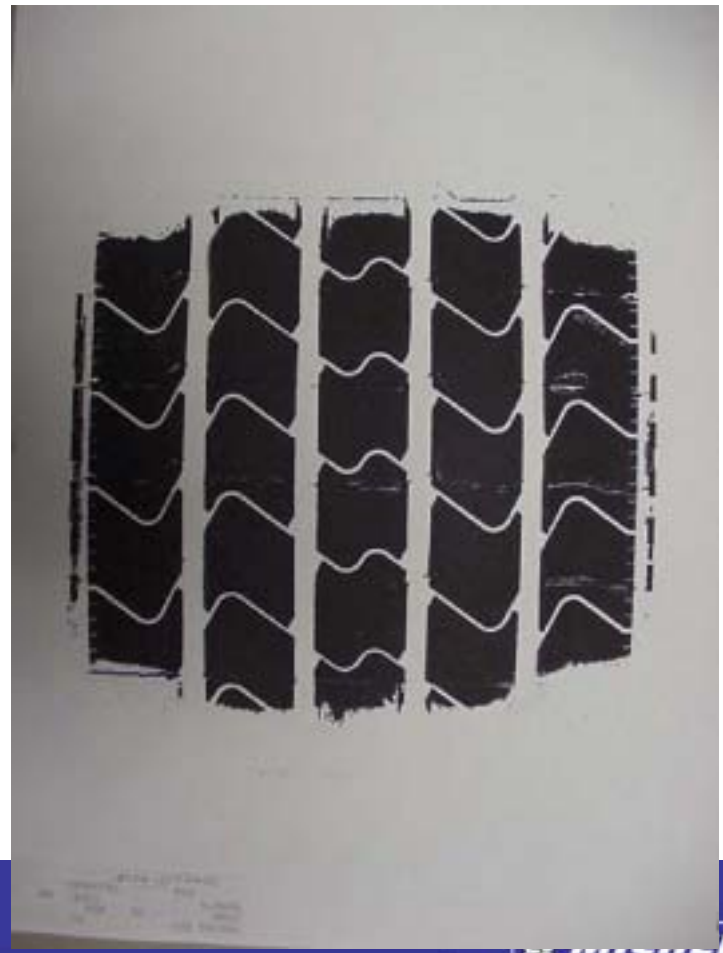
(Constant Load & P = Inflation Pressure)



Footprint Loading
Foot print for 17,000 axle load

Loaded 90 psi, 430 sq. cm.

Loaded 110 psi, 400 sq. cm.



Loads

- Check vehicles data plate for GVWR
- Check wheel for load / pressure limits
- Weigh each axle end separately
- Can be overloaded on an axle end but not overloaded for the axle

Air pressure

- Adjust pressure for actual load carried
- Use heaviest axle end for psi for both ends
- Check tires when cold before each trip
- Insure air pressure gauge is accurate
- Use metal valve caps on stems

Age / Sidewall cracking

“Ozone” cracking caused by:

- Natural aging of the tire
- Direct sunlight during storage on tire
- Sidewall dressings

Sidewall Dressings

- Michelin does not recommend the use of additives for sidewall dressings
- If used, do not use an additive which contains petroleum, silicone, or alcohol products
- The best thing to do is wash with soap and water, then cover up for storage

When to replace tires

- When tread / sidewall conditions dictate
- When age cracking reaches 2/32nds deep
- When tread down to 2/32” **
- Start keeping close eye on tires at 6 years
- Dependent upon use

Tire rotation

- Rotate to alleviate tread wear (extend mileage, wear conditions)
- If wearing even, no need to rotate
- No restriction to pattern (front to back, cross rotate)
- Include spare tire in rotation pattern

Steel vs Fabric Sidewall Casings

- Steel is more robust – more commercial
- Steel weighs 10 lbs more (LT225/75R16)
- Steel costs ~ $30.00 more
- Dimensions are about the same
- Capacity’s are the same

Tire Repair


X2


CT451

Tire Repair

- **Never** allow a nail hole repair to be performed “On the wheel”, without taking the tire off the wheel for internal inspection
- **Never** perform a string repair
- Always use a patch and plug/insert repair
- Perforations larger than 1/4” in diameter in LT tires should be scrapped.

Tire Conditions

- Wear, impact, road hazard, mounting, etc.
- Far too many to cover here
- Try to cover 5-6 basic conditions

Crown Penetration

(Puncture through crown and interior rubber of the tire.)

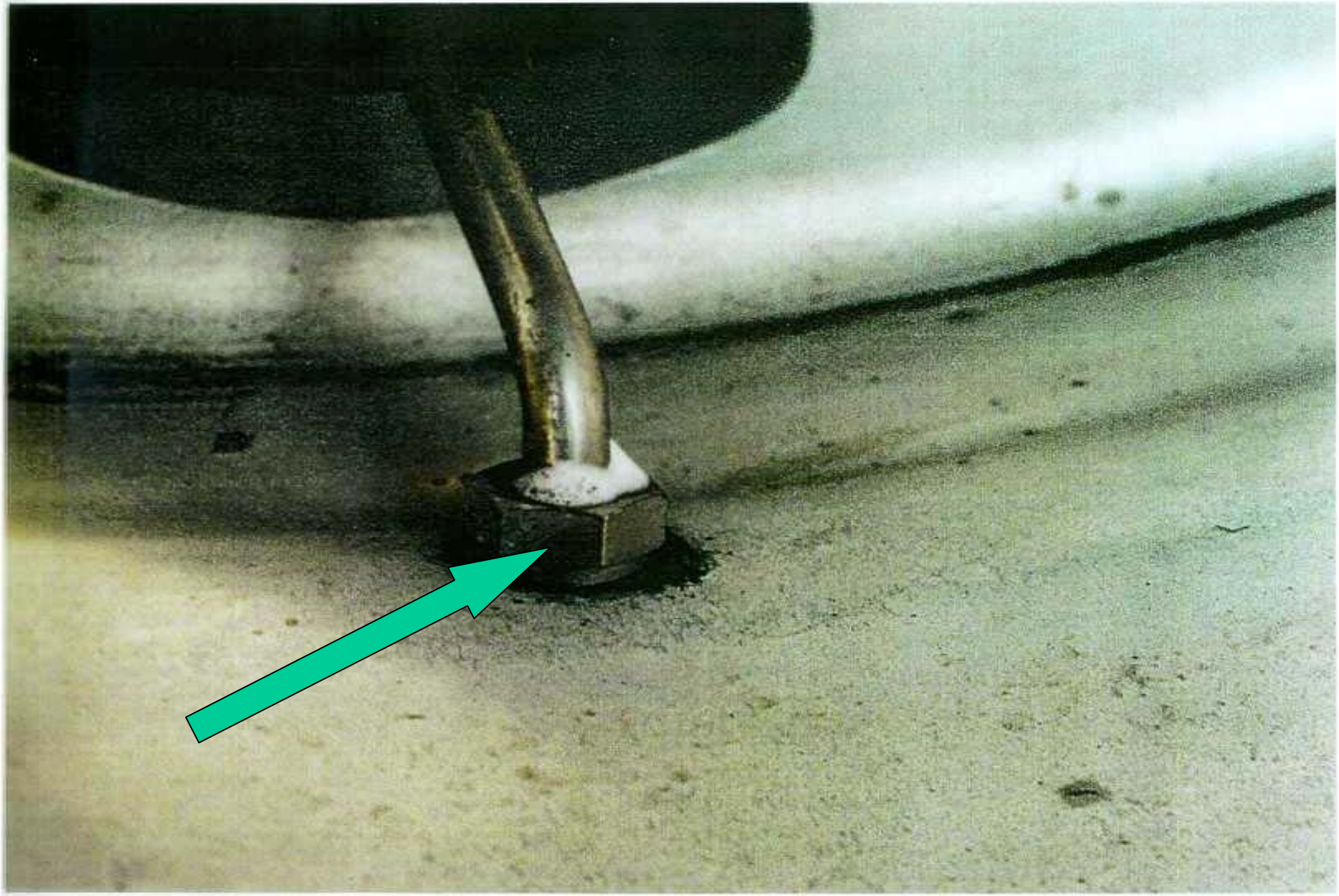

BELOW
15PSI

Run Flat (with Zipper)

Low Tire – Steel casing

- If tire is 20% below recommended inflation pressure, remove from vehicle
- Do **NOT** reinflate while on the vehicle
- Take to a tire dealer for complete inspection to check for ruptured cables

Oxidization between the ‘O’ ring, valve stem and the aluminum wheel.

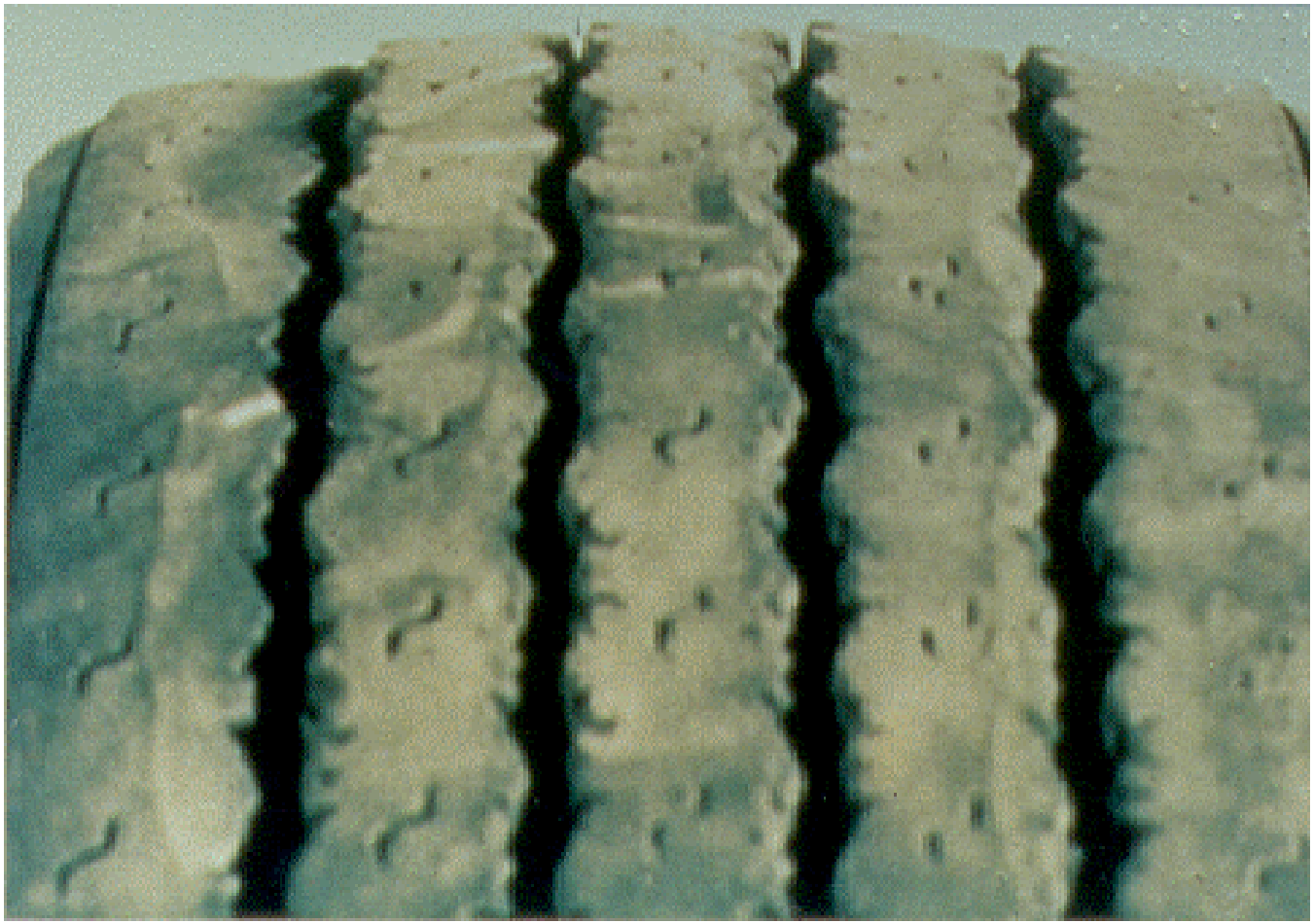


“Blowout”

- When sudden deflation is noticed, step down on accelerator
- Do not brake !
- Steer straight ahead
- When control is maintained, slow down and pull over

One Sided Wear

Feathering Wear



Pinch Shock

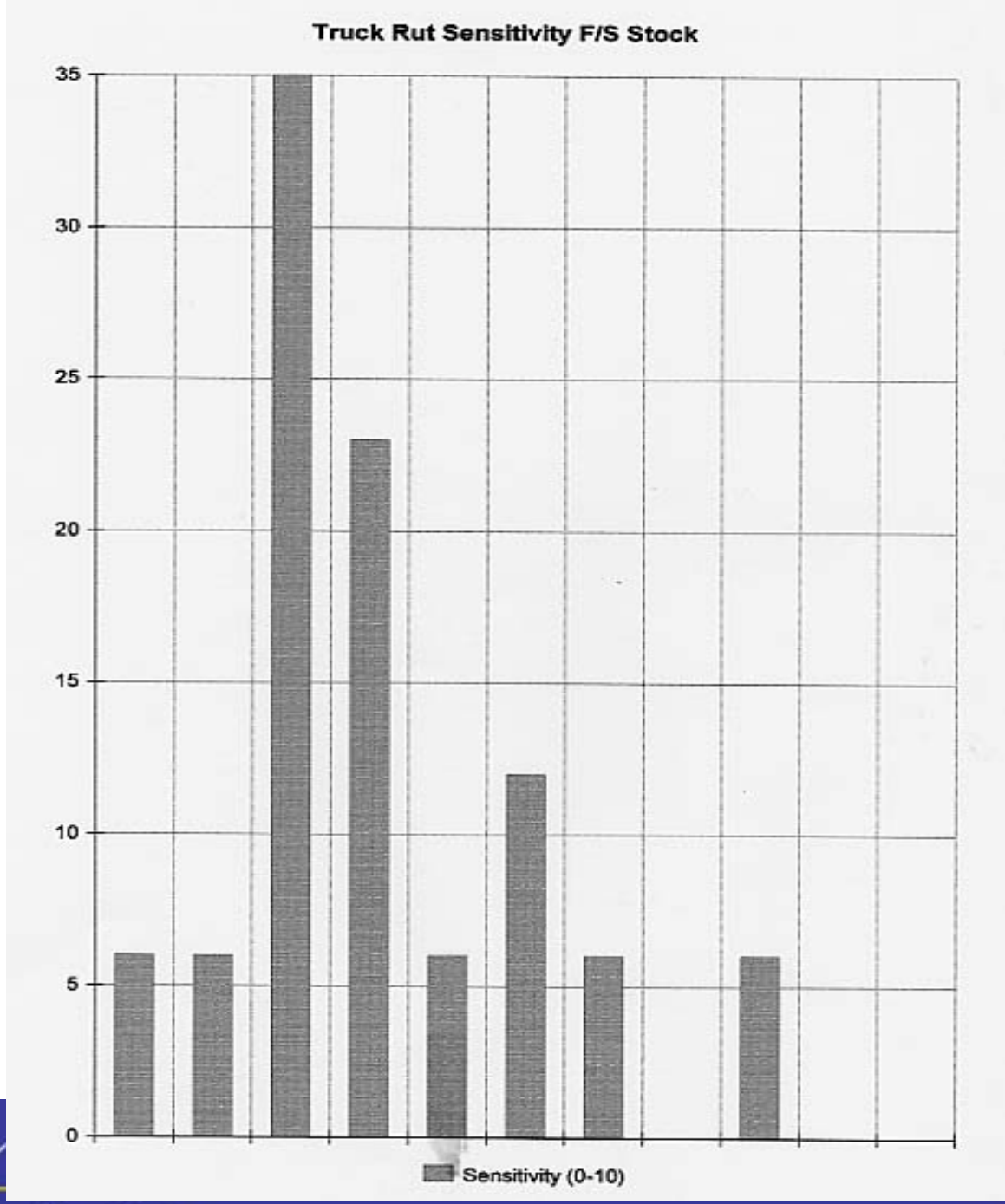
Multiple Flat Spot Wear

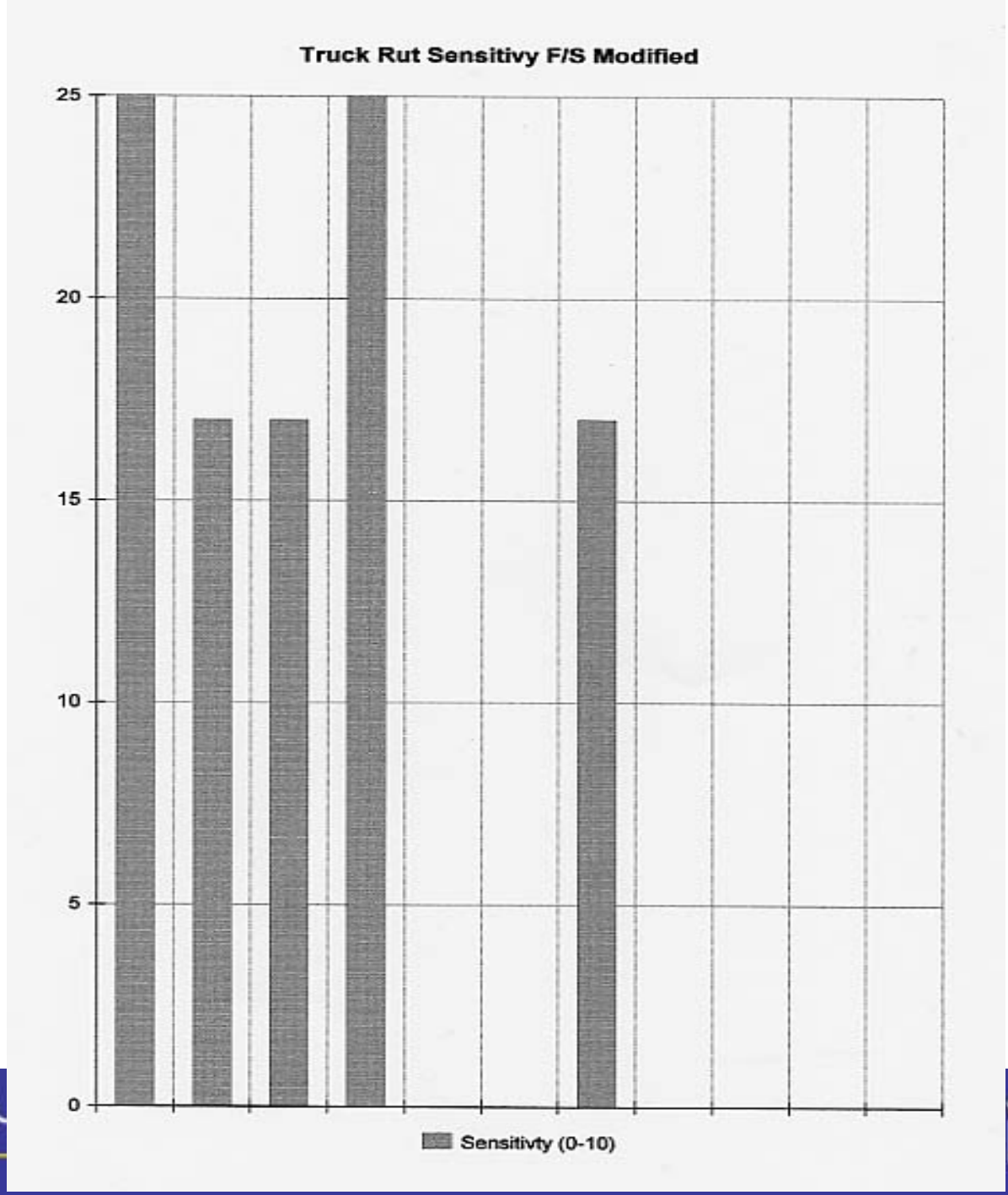
(Radial Wear)

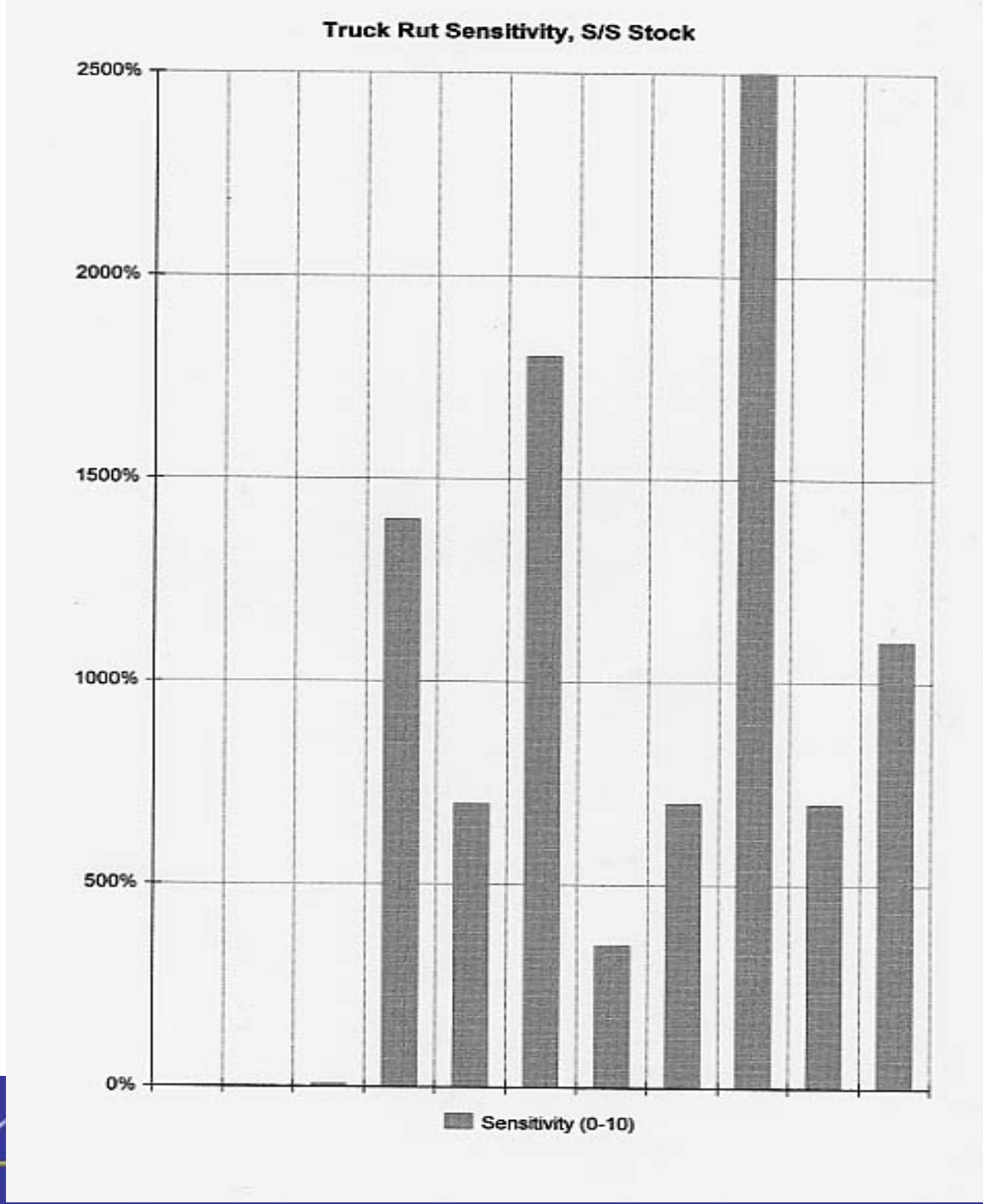
Weathering
Bead Area cracking

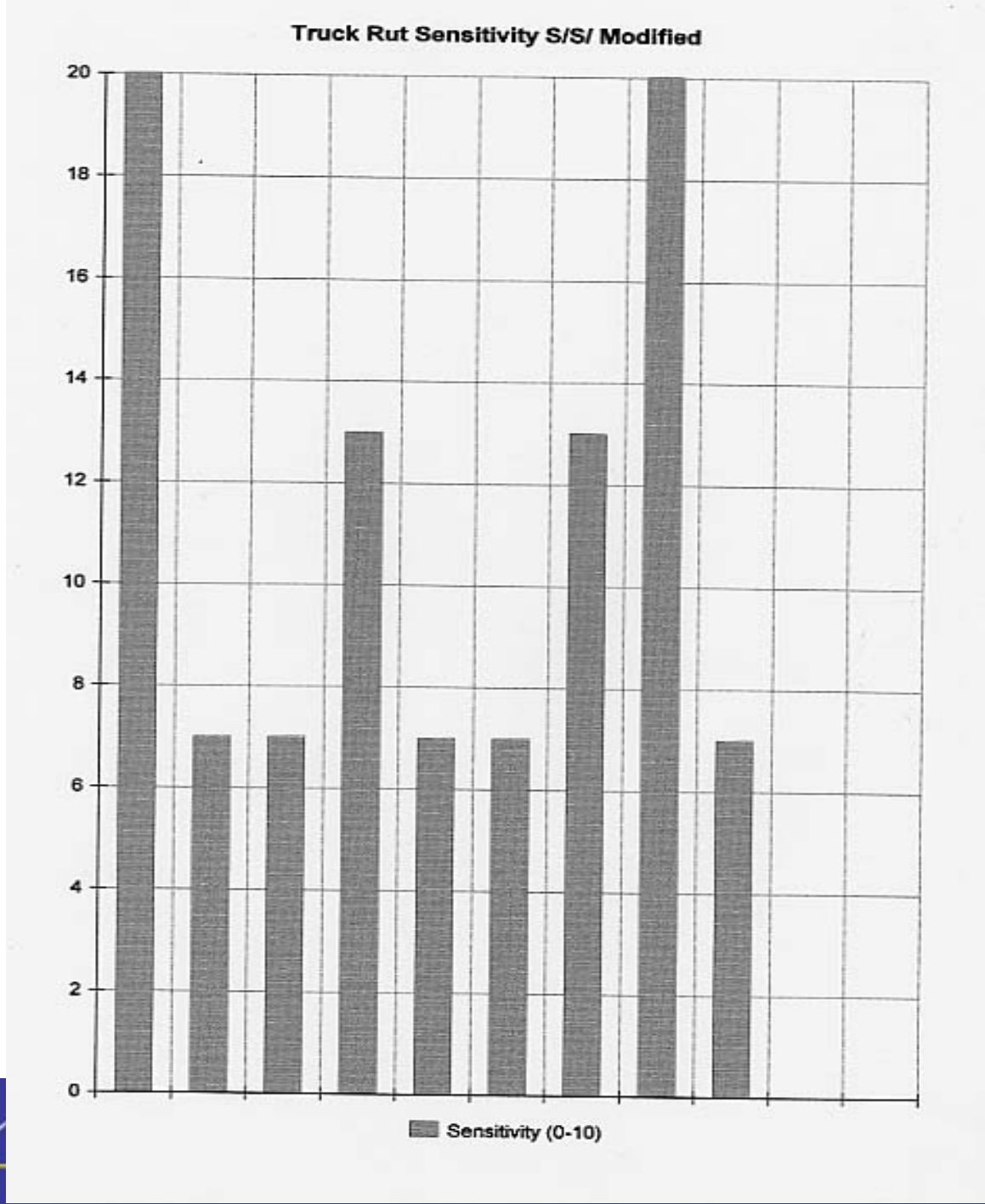
Torn Beads - Deterioration of the bead rubber and/or internal plies at mounting or dismounting.

Rut Sensitivity


Truck Rut Sensitivity F/S Stock
35
30
25
20
15
10
5
0
Sensitivity (0-10)


Truck Rut Sensitivy F/S Modified
25
20
15
10
5
0
Sensitivty (0-10)


Truck Rut Sensitivity, S/S Stock
2500%
2000%
1500%
1000%
500%
0%
Sensitivity (0-10)


Truck Rut Sensitivity S/S/ Modified
20
18
16
14
12
10
8
6
4
2
0
Sensitivity (0-10)

Rut Sensitivity

- Subject to individual sensitivity
- Road inputs
- Vehicle modifications
- Steel vs Fabric
- Air pressure
- Tread designs: Rib vs block

Summary

- Size, Dot Designation
- Load / psi recommendations
- Tire conditions
- Rut sensitivity

Thank you