Motorcoach
Tire & Weight Issues

…who is riding your bus?
…and what are they carrying?...

2012 Litchfield IL
Left Steer Tire

Litchfield
Right Steer Tire

Motorcoach Safety Advisory Bulletin August 2012

Result of Summer motorcoach tire incidents

- Extreme summer heat
  - Pavement temperatures 50-90 F hotter
- Tire pressure maintenance issues
- Heavy passenger/cargo loads
- Leads to potential violation of tire load carrying capacity

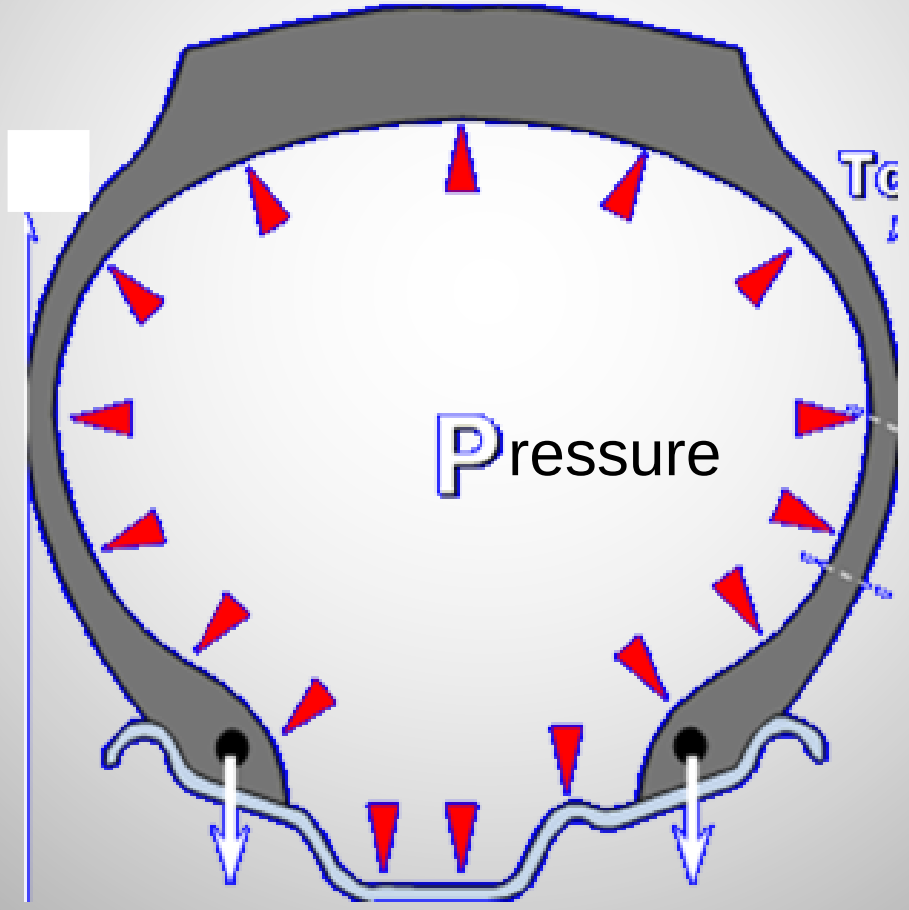
Advisory Informs industry of FMCSA concerns

*** Re-issued Alert in July 2013***

Air is what carries the load

Typical truck tire spec 100 PSI

Typical car tire spec 35 PSI



Tire air pressure specification based on worst case load scenario

Air Pressure & Temperature

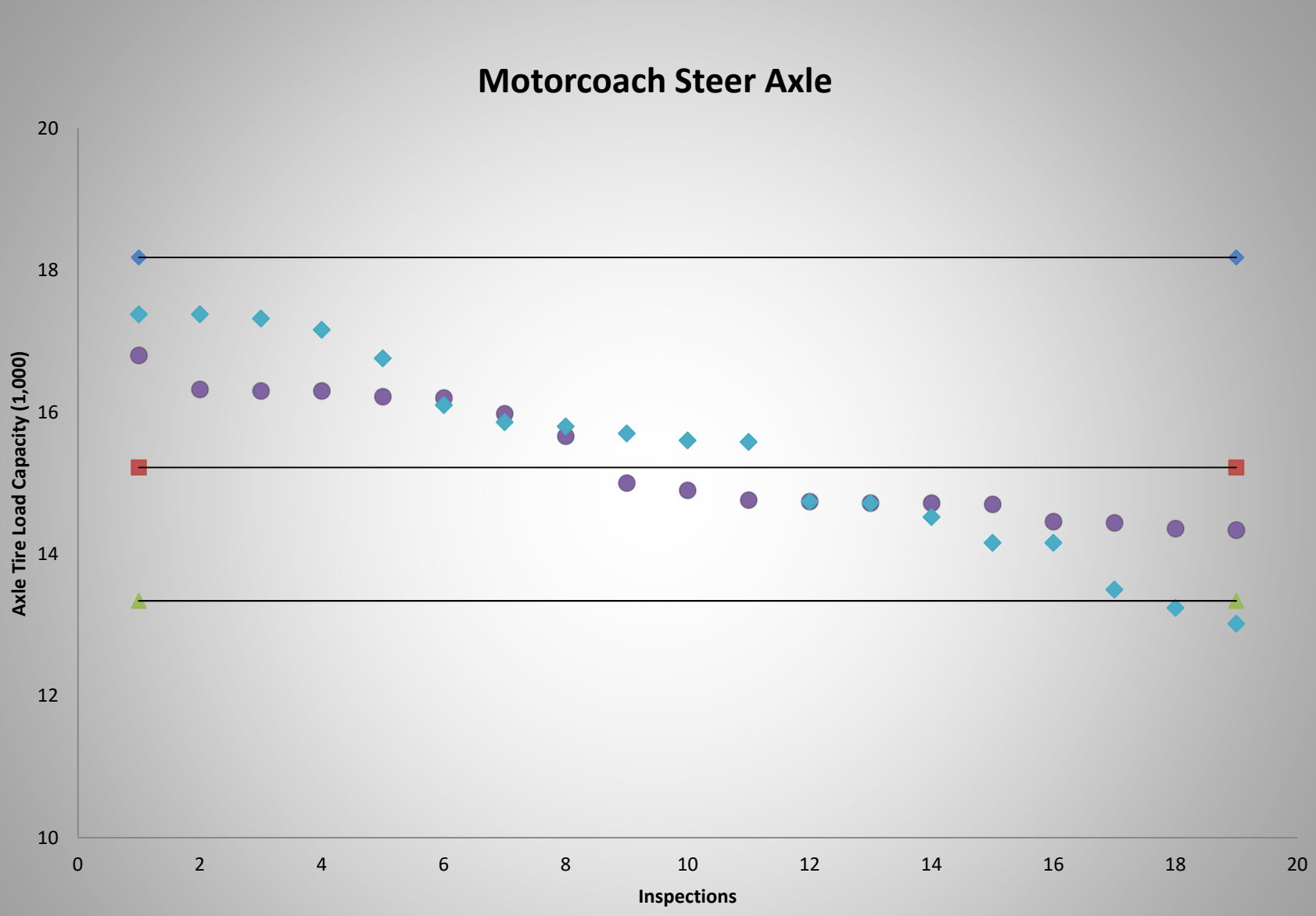
- Bus & Truck Tires
  - Every 10 F = 2 PSI
- At 70 F, Tire Pressure = 100 PSI
- At 20 F, Tire Pressure = 90 PSI

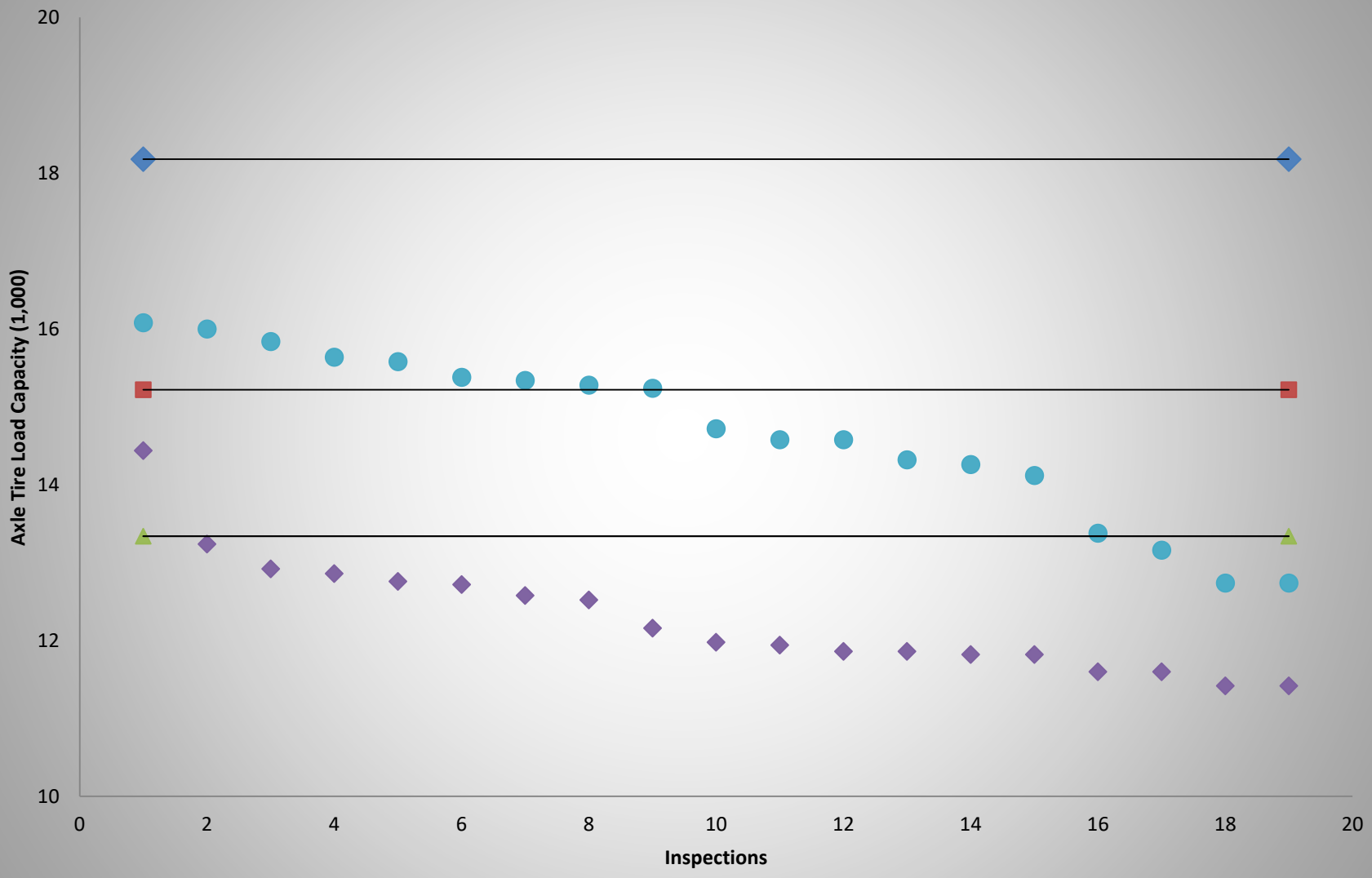
Air Pressure & Speed

- Hotter the tire, the higher the air pressure
  - Steady State
- Truck Tire Example:
  - 100 PSI at 70 F
  - After Driving 65 mph for 20 minutes
    - 115 PSI (at 70 F)
      - Pressure Equilibrium
  - After Driving 70 mph for 20 minutes
    - 120 PSI (at 70 F)

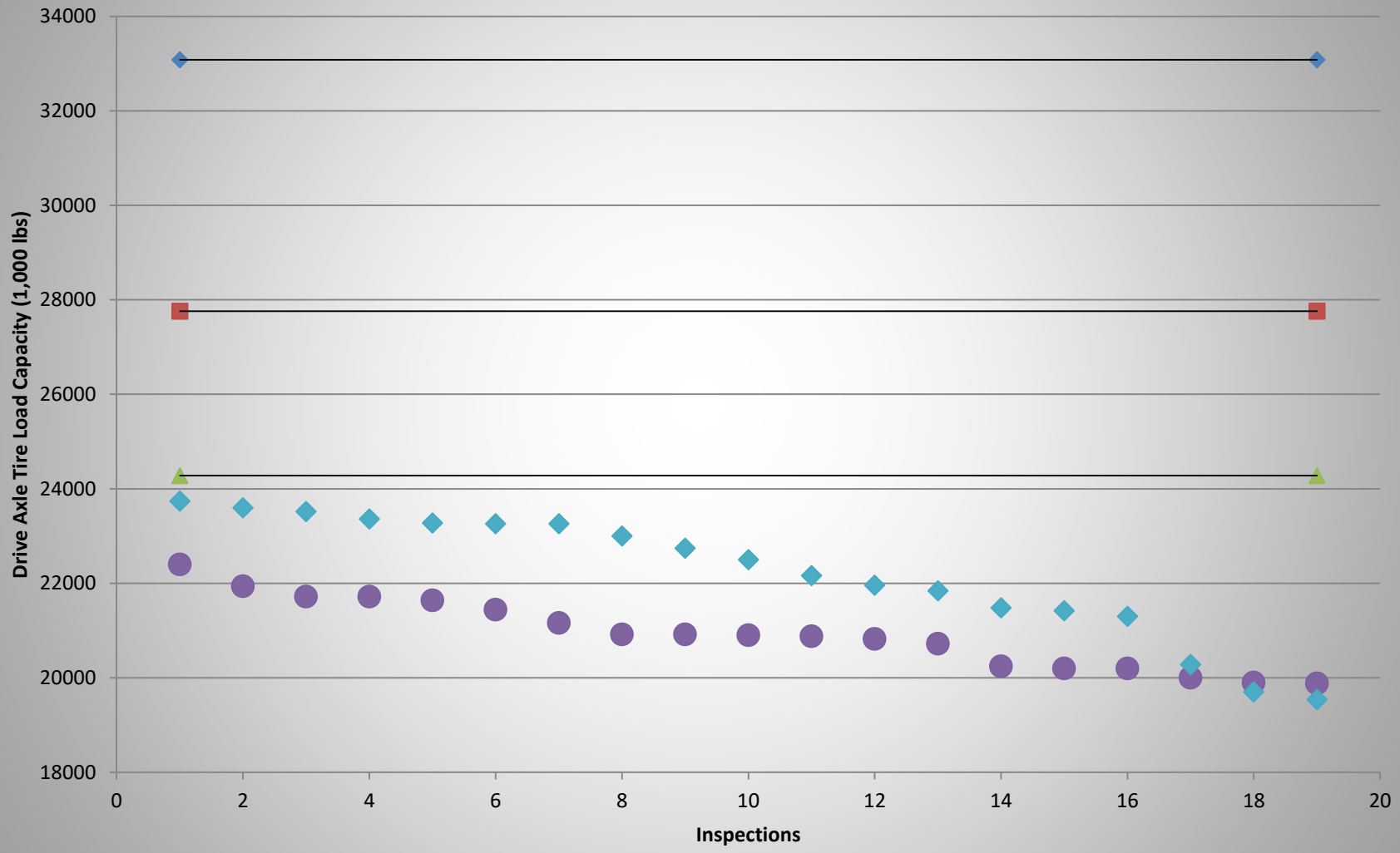
Motorcoach Strike Force
(September 2012)

- Several states weighed passenger loaded motorcoaches
- Tire load carrying capacity issues
  - Minimal safety margin, some axles overloaded
  - Steer axle worst offender
  - Even with less than full passenger load
  - Both single deck and double deck affected
  - Steer and tag axle most significant concern


Motorcoach Steer Axle
Axle Tire Load Capacity (1,000)
20
18
16
14
12
10
0
2
4
6
8
10
12
14
16
18
20
Inspections


Motorcoach Tag Axle
Axle Tire Load Capacity (1,000)
20
18
16
14
12
10
0
2
4
6
8
10
12
14
16
18
20
Inspections

Motorcoach Drive Axle



49 CFR 567

- Defines “Gross Vehicle Weight Rating” or “GVWR” followed by the appropriate value in pounds, which shall not be less than the sum of the unloaded vehicle weight, rated cargo load, and 150 pounds times the number of the vehicle's designated seating positions.

(…is this a DESIGN problem…)

Tires

- Tire Capacity
- Tires need to be designed into the motorcoach
- Work with manufacturers to build what you need.
- 49 CFR 567 GVWR – 150# per passenger
  - Minimum acceptable
  - Not realistic

What's NHTSA Doing About Tires

- NHTSA 2010 NPRM to upgrade FMVSS 119

  proposed upgraded endurance test

  (DOCKET – NHTSA-2010-0132)

  MAP-21 - requires DOT to conduct testing on endurance of motorcoach tires

Why Do Tires Lose Air?

- Osmosis through the casing
  - (1 to 4 PSI/Month)
    - Depends on tire construction/compounds
- Tread punctures
- Sidewall damage
- Leaking valve stems (*Note use good quality caps)

Most Common tire Pressure Gauge

Pressure Gauge Accuracy
"Stick Gauge"

- Not very good
- +/- 3 percent is the magic number when the gauge is brand new
- Drop it a few times and the gauge accuracy drops significantly
- Temperature affects accuracy
  - Metal spring property changes (spring constant)

Pressure Gauge Accuracy

- How do many tire dealers & fleets check for pressure gauge accuracy?
  - Comparative gauge test
    - 3 gauges checked against each other, if 2 are close and the 3rd is different, throw the 3rd gauge away
  - Check versus a master gauge

Are Digital or Dial-Type More Accurate vs Stick Gauges?

- Heavy duty dial tire pressure gauge with hose
- Dial: 2"
- Steel case and ring, acrylic window, heavy duty zinc alloy dual chuck, pressure holding-bleeding button, flexible hose
- Range: 0-60psi, 0-75psi, 0-100psi, available for bar, kg/cm^2, kpa etc
- **Accuracy: ANSI B40.1 Grade B**
- Rubber gauge protector for option

(DON'T RELY ON HARBOR FREIGHT QUALITY GAUGES)

Tire Pressure Monitoring Systems (TPMS)

- Do you have it?
- Warning set points?
- Does warning tolerance put vehicle over load capacity?
- What do you do with data – telematics?
- Documenting “saves” “alerts” “resolution”

How do you determine what it does for you?

Previous FMCSA Tire Pressure Monitoring System (TPMS) work

- FMCSA (MC-PSV) has conducted research on tire pressure monitoring systems (3)
- Motorcoach and tractor – semitrailer
- Systems (can?)work well, accurate to 2-3 psi
- Smarttire 4 has temperature compensation
- New vendors (Schraeder, etc.)

Tire Issue Recommendations

- Need more tire load capacity safety margin
- Tires need to be designed into the motorcoach
- Carriers need to work with manufacturers to build what you need.
- 49 CFR 567 GVWR – 150# per passenger
  - Minimum acceptable design criteria
  - Not realistic to design to minimum criteria

Recommendations for Industry

- Tire Management (plan)
- Pressure management, tread depth management, alignment/toe issues
- Don’t wait for regulation
- Lead by example.
- If you don’t fix it, we’ll be pressured to regulate it.
- Safety is “our only business”

Other passenger carrier tire issues -

- Shuttle buses
- Mini-buses

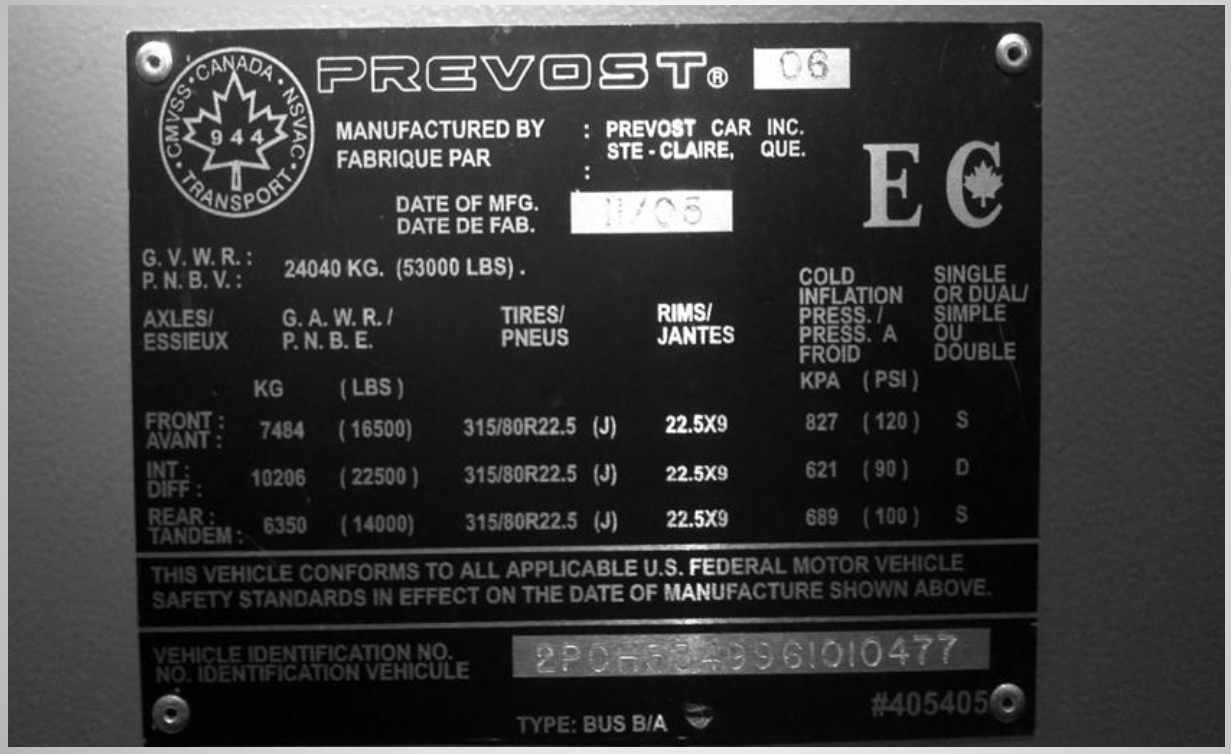
Where we can go?

- Mandate TPMS?
- Tire inspection (250 miles/4 hours)?
- Semi-annual inspection?
  - Require documented mfr maintenance intervals?
- OOSC for not running high speed rated tires?
- Retread – must be maintained properly.
- Increase tread depth minimum requirements?

FMCSA Challenges you:

- Carriers – evaluate your tire maintenance program
- Motorcoach Mfrs – work with tire mfrs to develop adequate tires
- Tire mfrs – “help” the carriers develop good tire maintenance programs
  - As simple as wall charts and tire pressure gauges
  - As complex as ???

Tire Information Label



Other Considerations

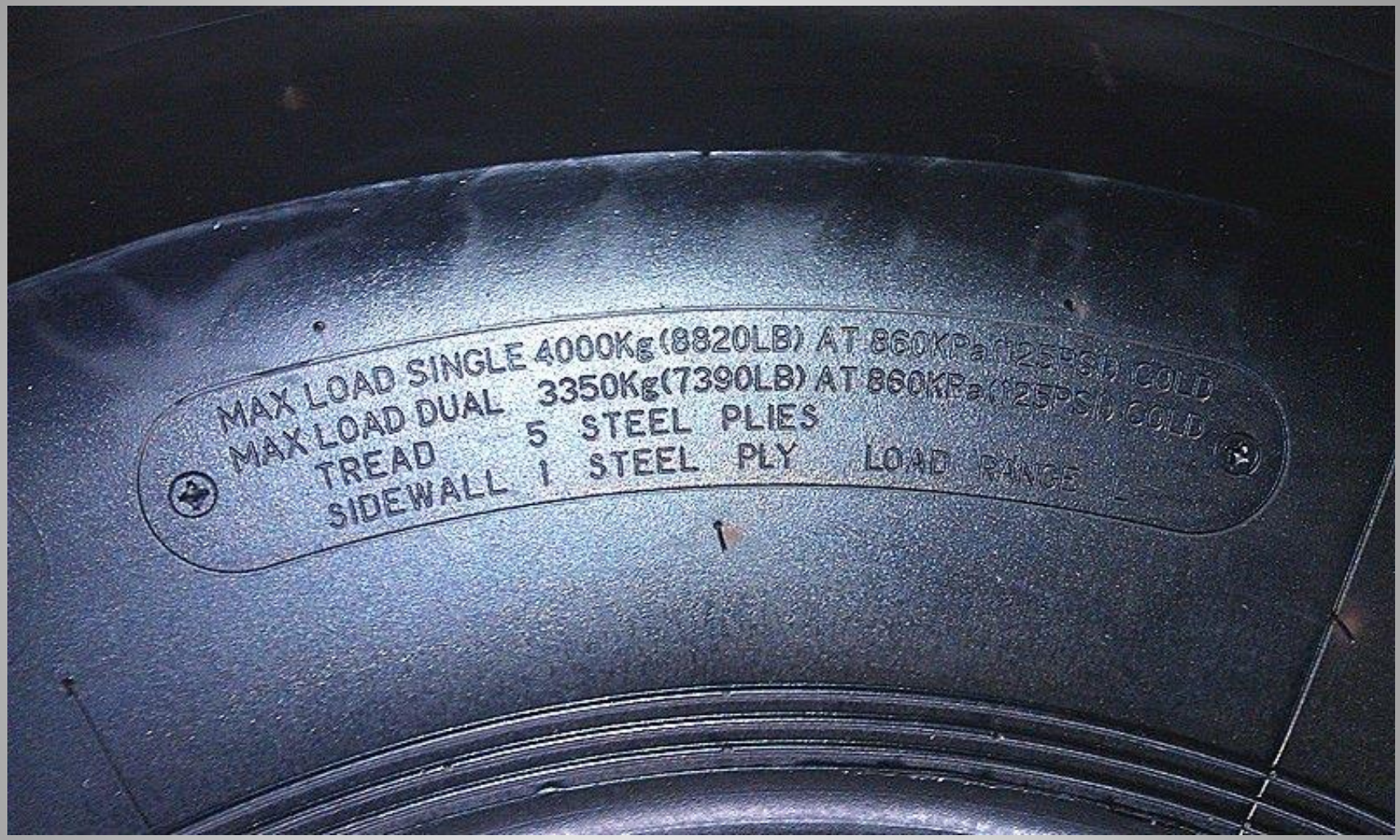
Motorcoach Length

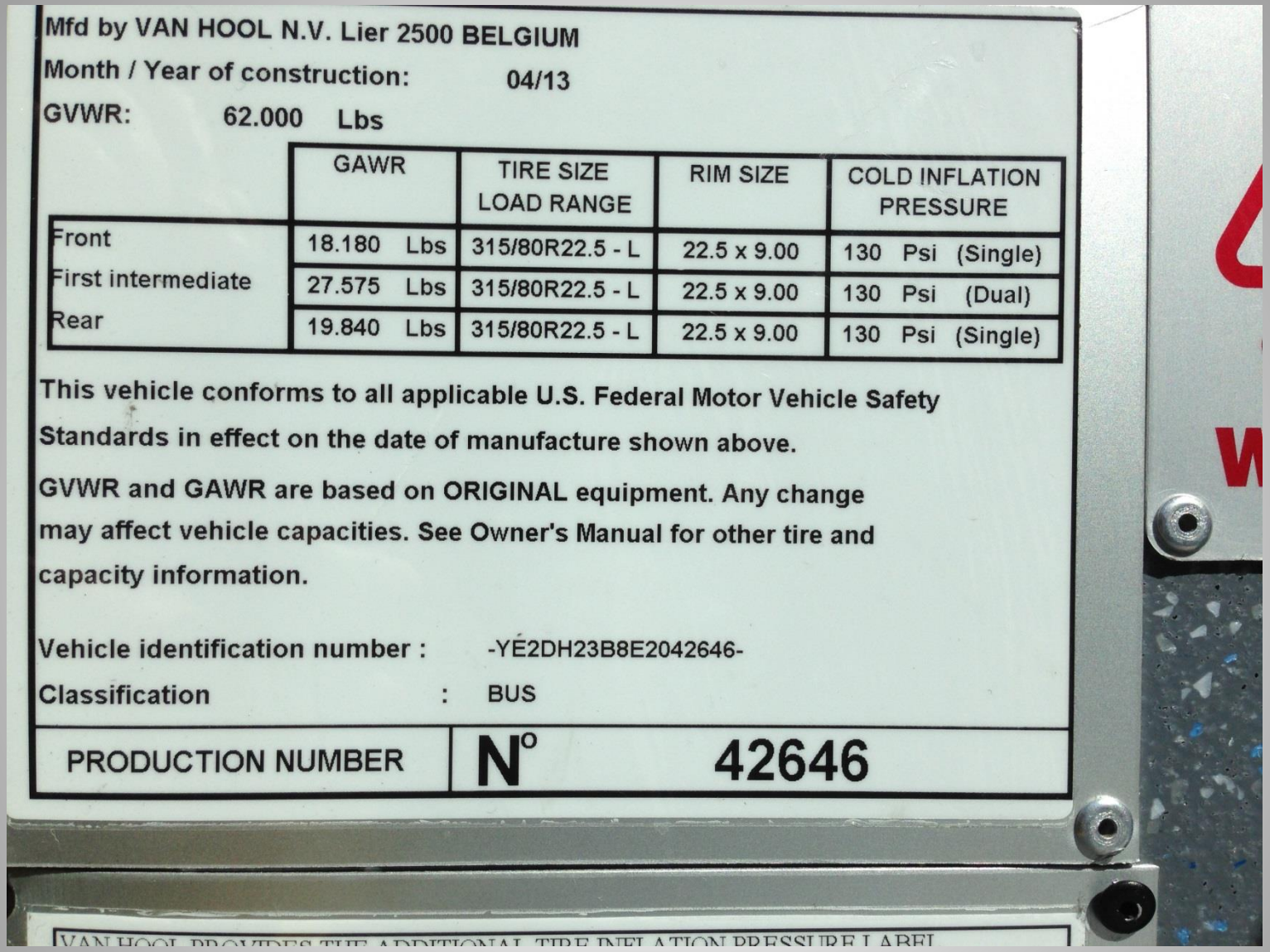
Federal

- 23 CFR 658.13 (d) No State shall impose a limit of less than 45 feet on the length of any bus on the NN.

State

- States impose maximum limit of 45 feet for buses.


MAX LOAD SINGLE 4000Kg(8820LB) AT 860KPa(125PSI) COLD
MAX LOAD DUAL 3350Kg(7390LB) AT 860KPa(125PSI) COLD
TREAD 5 STEEL PLIES
SIDEWALL 1 STEEL PLY LOAD RANGE



Mfd by VAN HOOL N.V. Lier 2500 BELGIUM

Month / Year of construction: 04/13

GVWR: 62.000 Lbs

	GAWR	TIRE SIZE LOAD RANGE	RIM SIZE	COLD INFLATION PRESSURE
Front	18.180 Lbs	315/80R22.5 - L	22.5 x 9.00	130 Psi (Single)
First intermediate	27.575 Lbs	315/80R22.5 - L	22.5 x 9.00	130 Psi (Dual)
Rear	19.840 Lbs	315/80R22.5 - L	22.5 x 9.00	130 Psi (Single)

This vehicle conforms to all applicable U.S. Federal Motor Vehicle Safety Standards in effect on the date of manufacture shown above.

GVWR and GAWR are based on ORIGINAL equipment. Any change may affect vehicle capacities. See Owner's Manual for other tire and capacity information.

Vehicle identification number : -YE2DH23B8E2042646-

Classification : BUS

PRODUCTION NUMBER	N° 42646

VAN HOOL PROVIDES THE ADDITIONAL TIRE INFLATION PRESSURE LABEL

Questions?

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