

LT- C Tyres

Roadmap for Harmonization

30 Jan 09

Background

- During the evolution of the gtr-tyres, CPs decided that light truck and C-type tyres should be included in the scope.
- To allow timely introduction of the initial version, LT & C tyres are addressed by including existing regulation requirements from UNECE Reg 54 and FMVSS 139 in an annex.
- Industry committed to providing a roadmap to fully incorporate LT & C tyres in a subsequent release of the gtr.

Difference from Passenger Tyres

- In developing the gtr for passenger car tyres, the principle effort was to harmonize test conditions.
- Passenger car tyres are typically categorized as either standard load or extra load. Differences in load capacity, as defined by Load Index value, are readily accommodated.
- LT & C tyres are much different....

Differences (cont)

- As described in the Tyre Industry informal document “Complexity of including Light Truck and C tyres in the GTR for Tyres” (TYREgtr-06-01), presented in Sep 08 to GRRF, there is no existing consistent way to simultaneously categorize LT and C tyres:
 - Not by Load Range
 - Not by Ply Rating
 - Not even by Load Index, without specifying the reference inflation pressure.

How to characterize a light truck tyre?

- Three parameters are necessary to characterize any given LT or C tyre size:
 - Load Capacity
 - Speed Rating
 - Reference Inflation Pressure
- Internationally accepted methodologies address load & speed
 - the service description:
 - Load index & Speed Symbol
- How to address reference inflation pressure???

Reference Inflation Pressure

- Why is it so complex?
 - Due to the various load carrying capabilities required by the vehicle manufacturers due to different market requirements.
 - For Example: Tyre Size 225/75R16

Reference Inflation Pressure (cont)

<u>Tire Size</u>	<u>Inflation</u>		<u>ETRTO</u>			<u>JATMA</u>			<u>TRA</u>		
	<u>LT or C</u>	<u>Press.</u>	<u>LI</u>	<u>LR</u>	<u>Load</u>	<u>LI</u>	<u>LR</u>	<u>Load</u>	<u>LI</u>	<u>LR</u>	<u>Load</u>
225/75R16	LT	350							103	C	880
	LT	450							110	D	1060
	C	475	116		1250						
	C	525	118		1320						
	LT	550							115	E	1215
	C	575	121		1450						
	LT	600				118		1320			
	LT	650							119	F	1360



For different vehicle and market applications

Reference Inflation Pressure

- Rationale:
 - The Reference Inflation pressure could be used to characterize tyres for test purposes.
 - Similar to passenger car tyre situation:
 - Light Load & Standard load tyres are tested to one protocol
 - Reinforced (extra load) tyres are tested to a different protocol
 - The reference inflation pressure therefore categorizes tyres for regulatory test purposes

Reference Inflation Pressure (cont)

- Long Term Solution
 - Harmonize on discreet inflation pressure increments for LT & C tyres
 - Possible scenario: 350, 450, 550 kPa
 - Industry load formulae will determine the load (shown as Load Index value) for each inflation pressure
 - Harmonized load formula is envisioned for metric tyres

Reference Inflation Pressure (cont)

- Immediate Solution for GTR
 - Must allow for current products with various reference inflation pressures (for example: 500, 525, 550, 575 kPa)
 - Changing marking (inflation or loads) on existing products is problematic for replacement tyres to remain compliant with vehicle homologation.
 - Possible solution follows:

Reference Inflation Pressure (cont)

Immediate Solution for GTR

Actual Tyre Reference Pressure (kPa)	“Assumed” Reference Pressure (kPa)
300 - 399	350
400 - 499	450
500 - 599	550
600 - 699	650

LT and C Harmonization

- Harmonized requirements for LT and C tyres with speed symbol Q and above
 - Requires harmonization of high speed test
 - Regulation 54 and FMVSS 139
 - Adopt existing FMVSS 139 endurance and low-pressure test
 - Establish test conditions for bead unseat and plunger energy
- Harmonize requirements for tread depths less than 18/32 in. (14.28mm) as per scope of FMVSS 139

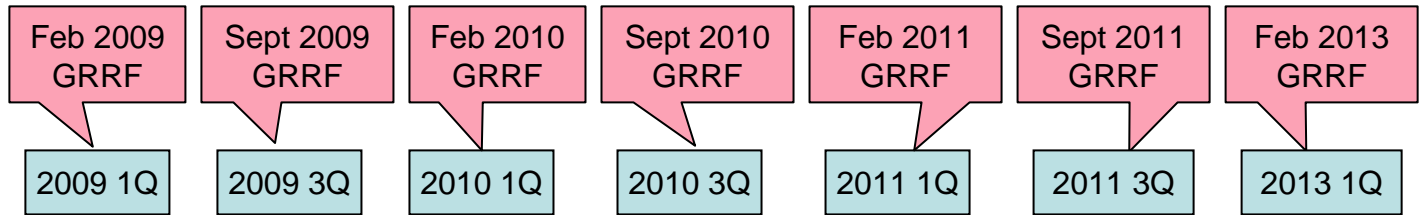
Test Harmonization Efforts

		Specified inflation pressure for harmonized regulatory tests			
Actual Tyre Ref. Pres (kPa)	"Assumed" Reference Pressure (kPa)	Endurance	High Speed	Other test 'a'	Other test 'b'
300 - 399	350	TBD	TBD	TBD	TBD
400 - 499	450	"	"	"	"
500 - 599	550	"	"	"	"
600 - 699	650	"	"	"	"

Tyre Load Capacity

- Tyre maximum load is determined by Load Index value marked on sidewall.
- Harmonized regulatory test loads will be a % of Load Index value.
- Existing differences in load capacities (i.e. ETRTO, JATMA, TRA) are not critical because tyre load index will be referenced.
- Future load capacity harmonization is envisioned, but not a current priority.

Road Map for LT and C Tyres



Step 1:



LT and C Modules (ongoing)

Step 2:



Inflation Pressure (9 months)

Step 3:



Load (12 months)

Step 4:



Testing (36 months)

Step 5:



Administrative Procedures for certification marks (ongoing)

