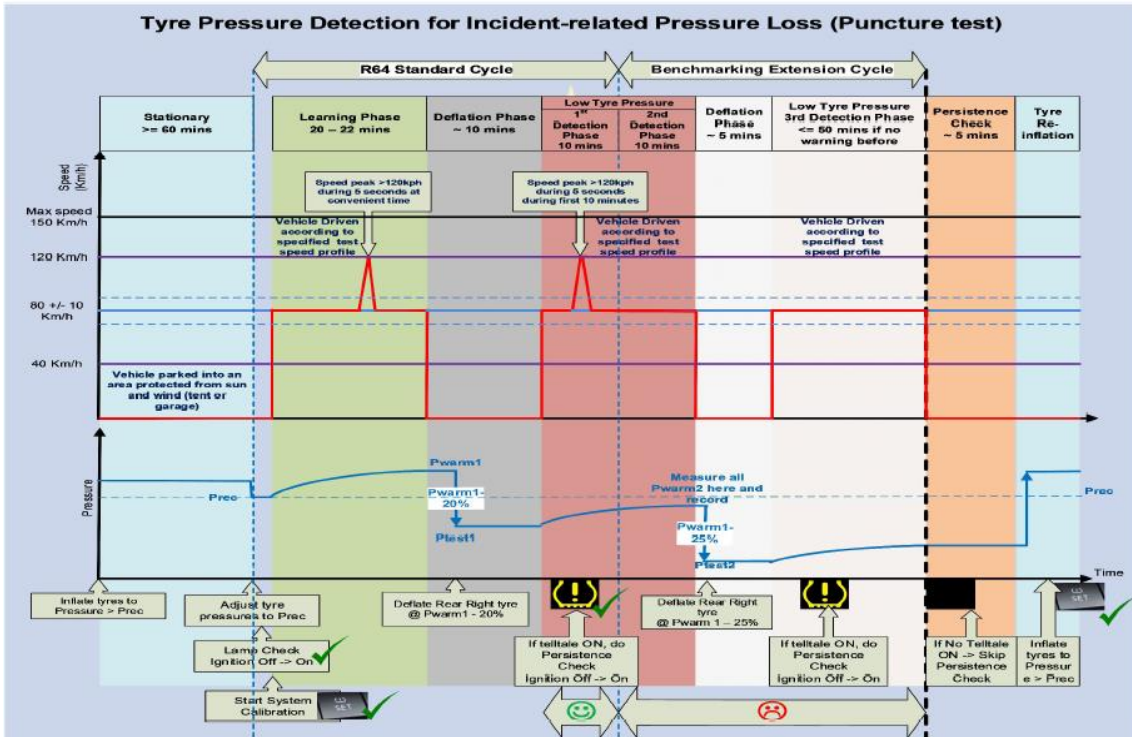


# UNECE R64 BENCHMARKING TEST SPECIFICATION

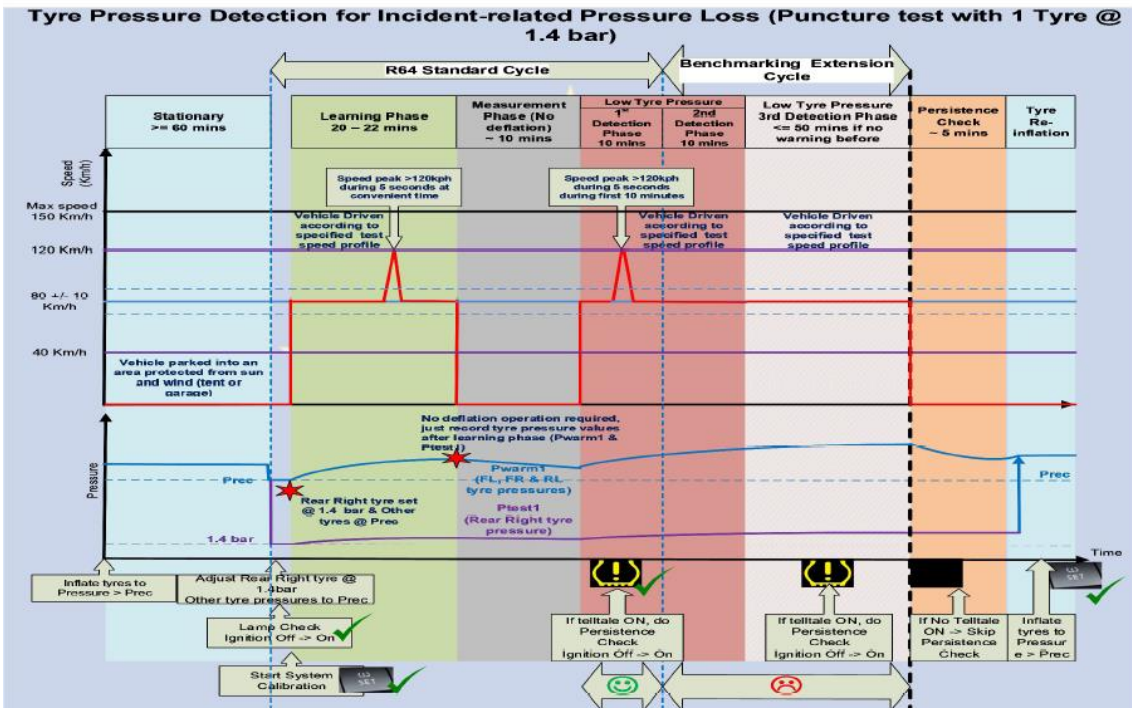
## a. Test List

Test ID	Number of Iterations	Test Profile	Speed profile of Learning Phase	Speed profile of Detection Phases	Characteristics of Detection Phases	Tyre(s) to Deflate	Test Sequence
P-00	2	R64 Homologation cycle	20 mins @ 80 km/h constant with 1x speed peak above 120 km/h (5s)	Constant speed @ 80 km/h 1x speed peak above 120km/h (5s) during first 10 mins	1 <sup>st</sup> : 10mins @ -20% 2 <sup>nd</sup> : 10mins @ -20% 3 <sup>rd</sup> : 50mins @ -25%	Rear Right	A
P-01	2	Calibration with 1 Tyre @ 1.4 bar	20 mins @ 80 km/h constant with 1x speed peak above 120 km/h (5s)	Constant speed @ 80km/h 1x speed peak above 120km/h (5s) during first 10 mins	70 mins	Rear Right	B
D-00	2	R64 Homologation cycle	20 mins @ 80 km/h constant with 1x speed peak above 100 km/h (5s)	Constant speed @ 80 km/h 1x speed peak above 100km/h (5s) after 1-3 mins pause	1 <sup>st</sup> : 60mins @ -20% - 7 kPa 2 <sup>nd</sup> : 60mins @ -20% - 7 kPa 3 <sup>rd</sup> : 60mins @ -25% - 7kPa	ALL	C
D-01	2	R64 calibration LSL / detection USL	20min @ 45 km/h constant with 1x speed peak above 100km/h (5s)	Constant speed @ 95 km/h 1x speed peak above 100km/h (5s) after 1-3 mins pause	1 <sup>st</sup> : 60mins @ -20% - 7 kPa 2 <sup>nd</sup> : 60mins @ -20% - 7 kPa 3 <sup>rd</sup> : 60mins @ -25% - 7kPa	ALL	C
D-02	2	R64 calibration city / detection USL	20min @ 0-50km/h with 1x speed peak above 100km/h (5s)	Constant speed @ 95 km/h 1x speed peak above 100km/h (5s) after 1-3 mins pause	1 <sup>st</sup> : 60mins @ -20% - 7 kPa 2 <sup>nd</sup> : 60mins @ -20% - 7 kPa 3 <sup>rd</sup> : 60mins @ -25% - 7kPa	ALL	C
D-03	2	R64 average calibration Speed / Detection Max Speed	20 mins @ 80 km/h constant with 1x speed peak above 100 km/h (5s)	Constant speed Drive @ 140-150 km/h	1 <sup>st</sup> : 60mins @ -20% - 7 kPa 2 <sup>nd</sup> : 60mins @ -20% - 7 kPa 3 <sup>rd</sup> : 60mins @ -25% - 7kPa	ALL	C
D-04	1	R64 Homologation cycle with short mileage ageing (+400 kms)	20 mins @ 80 km/h constant with 1x speed peak above 100 km/h (5s)	Constant speed @ 80 km/h 1x speed peak above 100km/h (5s) after 1-3 mins pause	1 <sup>st</sup> : 60mins @ -20% - 7 kPa 2 <sup>nd</sup> : 60mins @ -20% - 7 kPa 3 <sup>rd</sup> : 60mins @ -25% - 7kPa	ALL	D
D-05	1	R64 Homologation cycle with medium mileage ageing (+800 kms)	20 mins @ 80 km/h constant with 1x speed peak above 100 km/h (5s)	Constant speed @ 80 km/h 1x speed peak above 100km/h (5s) after 1-3 mins pause	1 <sup>st</sup> : 60mins @ -20% - 7 kPa 2 <sup>nd</sup> : 60mins @ -20% - 7 kPa 3 <sup>rd</sup> : 60mins @ -25% - 7kPa	ALL	D
D-06	2	Calibration with 4 Tyres @ 1.4 bar	20 mins @ 80 km/h constant with 1x speed peak above 100 km/h (5s)	Constant speed @ 80 km/h 1x speed peak above 100km/h (5s) after 1-3 mins pause	1 <sup>st</sup> : 60mins 2 <sup>nd</sup> : 60mins 3 <sup>rd</sup> : 60mins	ALL	E
M-01	2	Calibration set with 1 Tyre @ 1.4 bar and Drive	No Learning Phase	Drive car between 40 km/h and 100 km/h	1 <sup>st</sup> : 10 mins 2 <sup>nd</sup> : 20 mins	Rear right	F
M-02	2	Calibration set with 4 Tyres @ 1.4 bar and Drive	No Learning phase	Drive car between 40 km/h and 100 km/h	1 <sup>st</sup> : 10 mins 2 <sup>nd</sup> : 20 mins	ALL	G

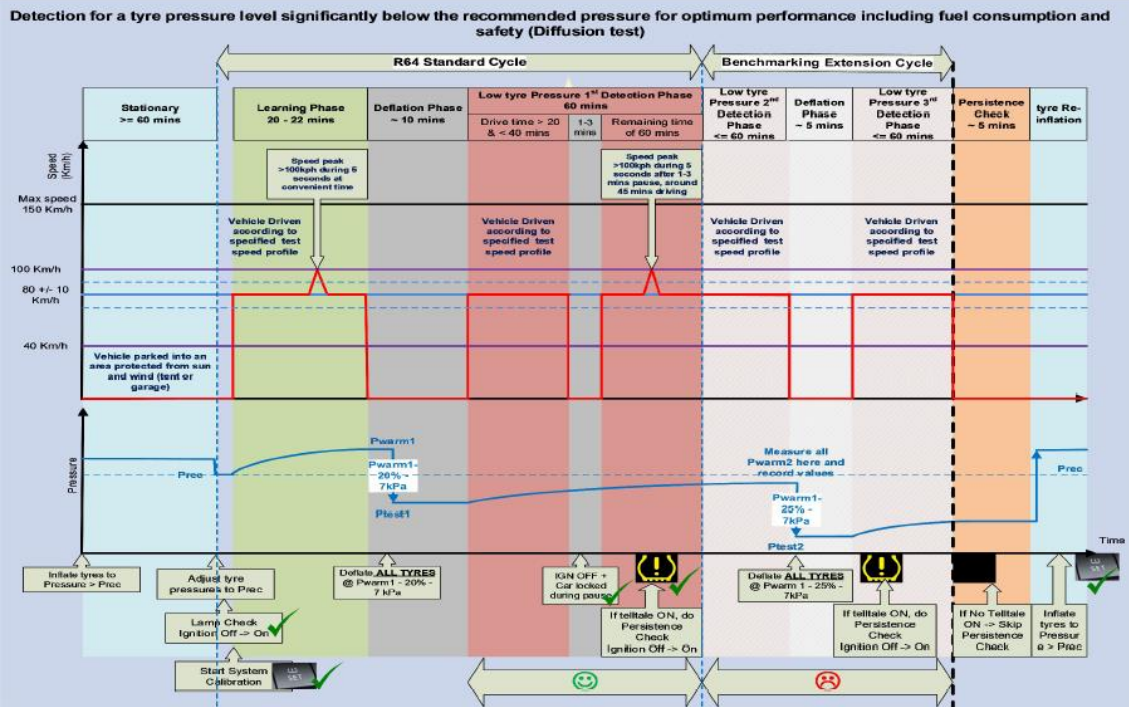
b. Single Tyre Under-Inflation Test Profile (Test Sequence A)



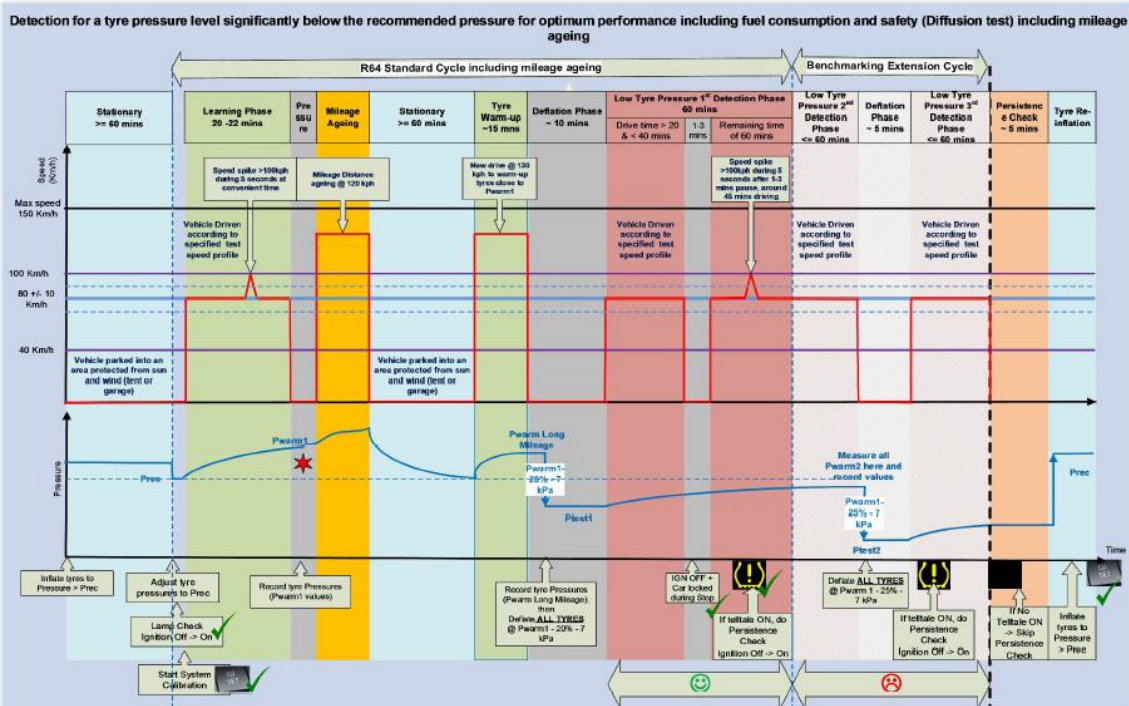
c. Single Tyre Under-Inflation Test Profile with 1 Tyre @ 1.4 bar (Test Sequence B)



d. Multi Tyre Under-Inflation Test Profile (Test Sequence C)

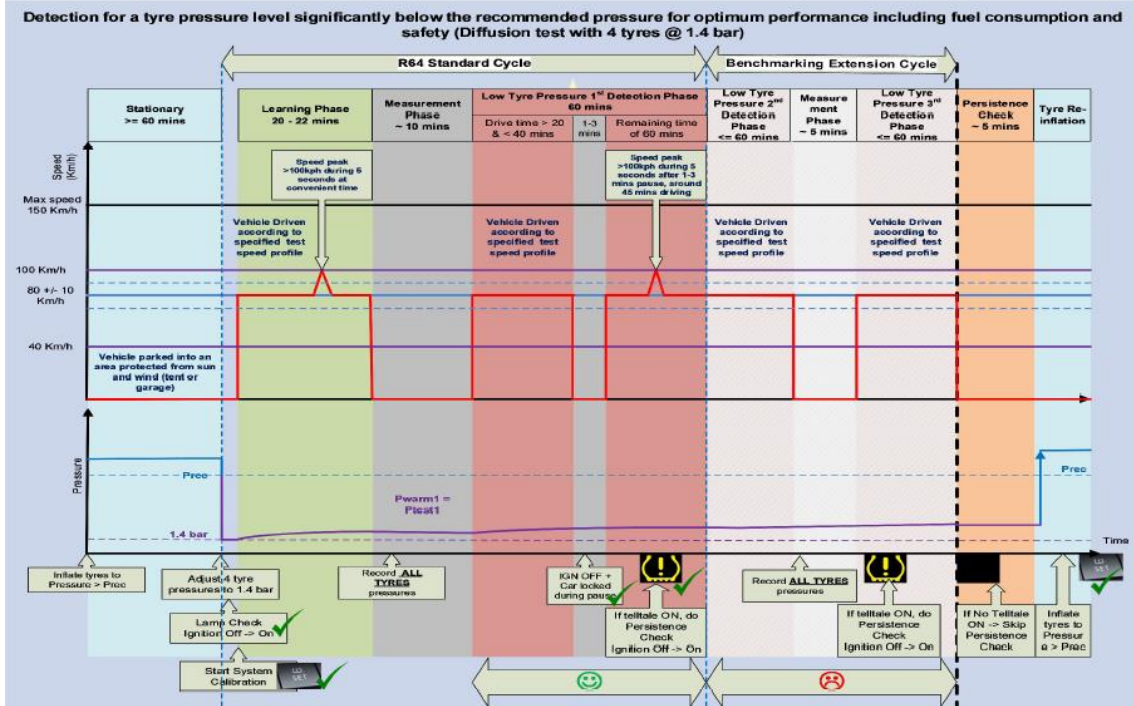


e. Multi Tyre Under-Inflation + Mileage Ageing Test Profile (Test Sequence D)

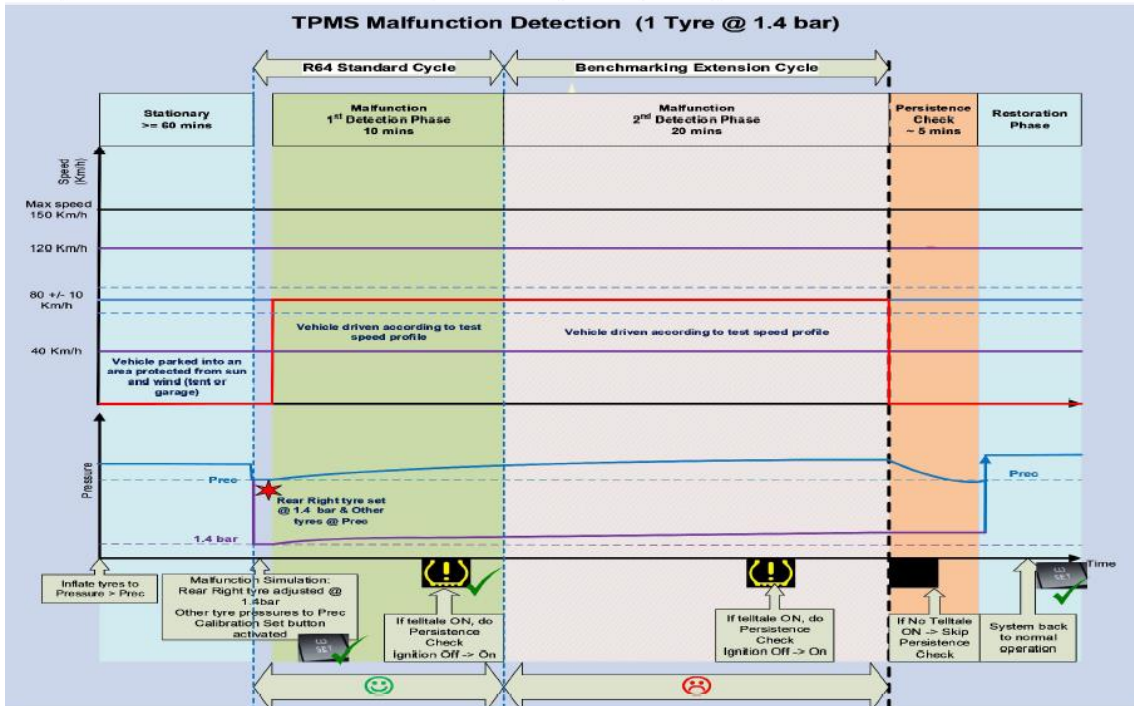




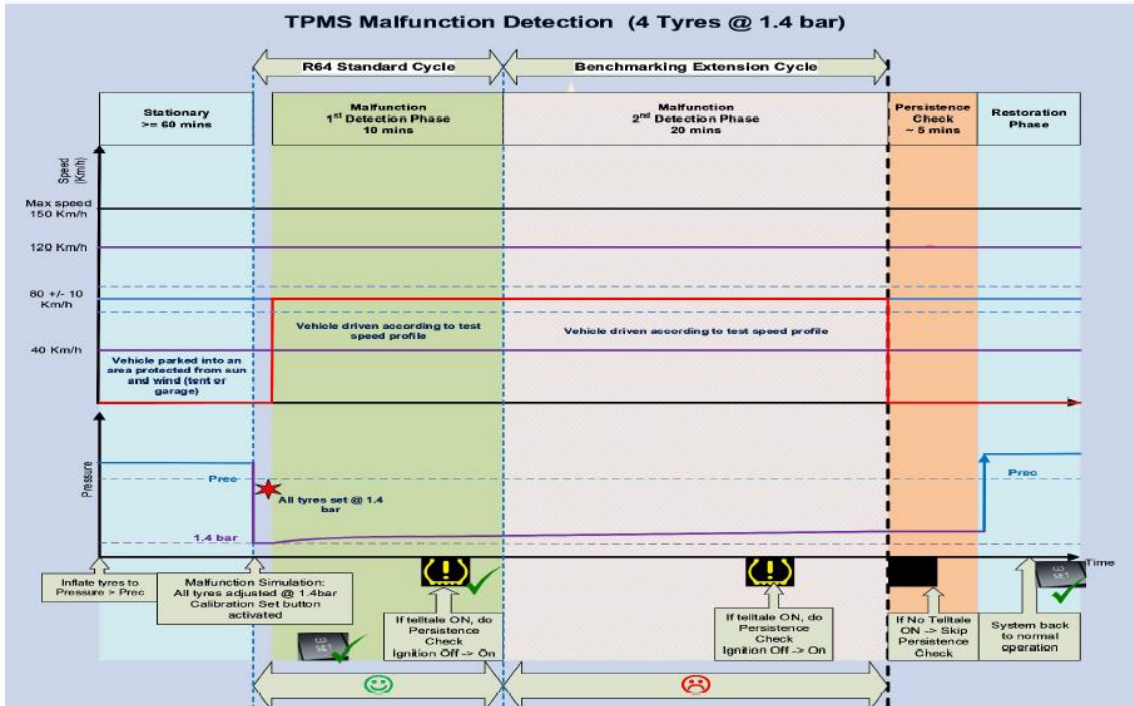
f. Multi Tyre Under-Inflation Test Profile with 4 Tyres @ 1.4 bar (Test Sequence E)



g. TPMS Malfunction Detection with 1 Tyre @ 1.4 bar (Test Sequence F)



h. TPMS Malfunction Detection with 4 Tyres @ 1.4 bar (Test Sequence G)



## TEST RESULTS SUMMARY VW GOLF 7

Test ID	Test Profile	Tyre deflation Detection Phases	Deflated Tyre(s)	RESULTS			
				Iteration	Warning Time [min.]	Total Driving Time (if No Warning) [min.]	Tyre Deflation [bar]
P-00	R64 Homologation cycle	1st: 10mins @ -20% 2nd: 10mins @ -20% 3rd: 50mins @ -25%	Rear Right	#1	1	-	1,87
				#2	2	-	1,83
P-01	Calibration with 1 Tyre @ 1.4 bar	70 mins	Rear Right	#1	-	70	1,54
				#2	-	70	1,51
D-00	R64 Homologation cycle	1st: 60mins @ -20% - 7kPa 2nd: 60mins @ -20% - 7kPa 3rd: 60mins @ -25% - 7kPa	ALL	#1	8	-	1,86
				#2	7	-	1,83
D-01	R64 calibration LSL / detection USL	1st: 60mins @ -20% - 7kPa 2nd: 60mins @ -20% - 7kPa 3rd: 60mins @ -25% - 7kPa	ALL	#1	18	-	1,79
				#2	9	-	1,77
D-02	R64 calibration city / detection USL	1st: 60mins @ -20% - 7kPa 2nd: 60mins @ -20% - 7kPa 3rd: 60mins @ -25% - 7kPa	ALL	#1	-	180	1,77/1,66
				#2	-	180	1,80/1,68
D-03	R64 average calibration Speed / Detection Max Speed	1st: 60mins @ -20% - 7kPa 2nd: 60mins @ -20% - 7kPa 3rd: 60mins @ -25% - 7kPa	ALL	#1	-	180	1,84/1,72
				#2	-	180	1,79/1,68
D-04	R64 Homologation cycle with short mileage ageing (+400 kms)	1st: 60mins @ -20% - 7kPa 2nd: 60mins @ -20% - 7kPa 3rd: 60mins @ -25% - 7kPa	ALL	#1	78	-	1,79
D-05	R64 Homologation cycle with medium mileage ageing (+800 kms)	1st: 60mins @ -20% - 7kPa 2nd: 60mins @ -20% - 7kPa 3rd: 60mins @ -25% - 7kPa	ALL	#1	71	-	1,79
D-06	Calibration with 4 Tyres @ 1.4 bar	1st: 60mins 2nd: 60mins 3rd: 60mins	ALL	#1	-	180	-
				#2	-	180	-
M-01	Calibration with 1 Tyre @ 1.4 bar and Drive	1st: 10 mins 2nd: 20 mins	Rear Right	#1	-	30	-
				#2	-	30	-
M-02	Calibration with 4 Tyres @ 1.4 bar and Drive	1st: 10 mins 2nd: 20 mins	ALL	#1	-	30	-
				#2	-	30	-

## TEST RESULTS SUMMARY FIAT 500L

Test ID	Test Profile	Tyre deflation Detection Phases	Deflated Tyre(s)	RESULTS			
				Iteration	Warning Time [min.]	Total Driving Time (if No Warning) [min.]	Tyre Deflation [bar]
P-00	R64 Homologation cycle	1st: 10mins @ -20% 2nd: 10mins @ -20% 3rd: 50mins @ -25%	Rear Right	#1	4	-	1,72
				#2	3	-	1,72
P-01	Calibration with 1 Tyre @ 1.4 bar	70 mins	Rear Right	#1	-	70	1,52
				#2	-	70	1,50
D-00	R64 Homologation cycle	1st: 60mins @ -20% - 7kPa 2nd: 60mins @ -20% - 7kPa 3rd: 60mins @ -25% - 7kPa	ALL	#1	10	-	1,81/1,63
				#2	9	-	1,78/1,64
D-01	R64 calibration LSL / detection USL	1st: 60mins @ -20% - 7kPa 2nd: 60mins @ -20% - 7kPa 3rd: 60mins @ -25% - 7kPa	ALL	#1	-	180	1,66/1,53
				#2	-	180	1,68/1,53
D-02	R64 calibration city / detection USL	1st: 60mins @ -20% - 7kPa 2nd: 60mins @ -20% - 7kPa 3rd: 60mins @ -25% - 7kPa	ALL	#1	-	180	1,67/1,54
				#2	-	180	1,68/1,54
D-03	R64 average calibration Speed / Detection Max Speed	1st: 60mins @ -20% - 7kPa 2nd: 60mins @ -20% - 7kPa 3rd: 60mins @ -25% - 7kPa	ALL	#1	-	180	1,68/1,56
				#2	-	180	1,66/1,51
D-04	R64 Homologation cycle with short mileage ageing (+400 kms)	1st: 60mins @ -20% - 7kPa 2nd: 60mins @ -20% - 7kPa 3rd: 60mins @ -25% - 7kPa	ALL	#1	151	-	1,68/1,56
D-05	R64 Homologation cycle with medium mileage ageing (+800 kms)	1st: 60mins @ -20% - 7kPa 2nd: 60mins @ -20% - 7kPa 3rd: 60mins @ -25% - 7kPa	ALL	#1	137	-	1,67/1,52
D-06	Calibration with 4 Tyres @ 1.4 bar	1st: 60mins 2nd: 60mins 3rd: 60mins	ALL	#1	-	180	-
				#2	-	180	-
M-01	Calibration with 1 Tyre @ 1.4 bar and Drive	1st: 10 mins 2nd: 20 mins	Rear Right	#1	-	30	-
				#2	-	30	-
M-02	Calibration with 4 Tyres @ 1.4 bar and Drive	1st: 10 mins 2nd: 20 mins	ALL	#1	-	30	-
				#2	-	30	-