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Nemko Italy S.p.A., Via del Carroccio 4, 20853, Biassono, Italy.

Report number: 272549TRFMPE

Apparatus: VS4000 806-870

Applicant: Selex ES S.p.A.

Piazza Monte Grappa,4 -00195 Roma- Italy

FCC ID: X5YVS4000-806-870

Test specification:

MPE ASSESSMENT

Federal Communications Commission Office of Engineering & Technology Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

Reviewed by: <u>2014-11-12</u>

Signature Guinis Date

G. Curioni, Wireless/EMC Specialist

Tested by: 2014/11/12

Signature Date

D. Guarnone, Wireless/EMC Specialist

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Section 1: Report summary
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Section 1: Report summary

This report contains an assessment of apparatus against specifications based upon tests carried out on samples submitted at Nemko Italy SpA.

Test specification:

Federal Communications Commission Office of Engineering & Technology Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

Compliance status:	Complies
Exclusions:	None
Non-compliances:	None
Report release history:	Original release
Test location:	SELEX ES Via Albert Einstein, 35 Campi di Bisenzio Firenze, Italy.
Registration number:	481407 (10 m Semi anechoic chamber)

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Italy's ISO/IEC 17025 accreditation.

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Section 2: Equipment under test

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Section 2: Equipment under test

Identification of equipment under test (EUT) 2.1 The following information identifies the EUT under test: Mobile Radio Unit Type of equipment: Product marketing name: VS4000 Model: VS4000 806-870 Code: 774-1052/01 Serial number: A0001 X5YVS4000-806-870 FCC ID: Date of receipt: 2014-11-03 Label FVT OK FCC ID: X5YVS4000-806-870



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2.2 Accessories an	d support equipment						
The following information identifies accessories used to exercise the EUT during testing:							
Item # 1	0						
Type of equipment:	Digital Radio Test Set						
Brand name:	IFR						
Model name or number:	3901						
Serial number:	297001035						
Nemko sample number:							
Connection port:	RF						
Cable length and type:							
Item # 2							
Type of equipment:	Portable Field Meter + Electric Field Probe						
Brand name:	PMM						
Model name or number:	8053 + EP330						
Serial number:	298001223						
Nemko sample number:	0220J00421 + 1010J91224						
Connection port:	RF						
Cable length and type:							

Antenna: 31 cm



Section 2: Equipment under test

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Section 2: Equipment under test, continued

2.3 EUT description

- Mobile Radio Unit: with the following accessories:

FPG3 vehicular console 972-0562/03.01 HPI-0127/01 Vehicular Radio FPG3 Cable Vehicular multiple accessories cable HPI-0128/01 FPG3 Vehicular Environmental Microphone HPI-0191/01 FPG3 Gooseneck PTT Button HPI-0186/01 Hand-held PTT microphone IP54 HPI-0103/01 Vehicular Speaker 774-0139/02 Vehicular Speaker cable HPI-1315/01 ANTENNA: 68720-42/023

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2.4 Technical specifications of the EUT

Operating frequency:	809- 824/854 - 869 MHz
Modulation type:	Π/4DQPSK
Occupied bandwidth:	25 kHz
Emission designator:	21K0D1E, 21K0D1W, 21K0D1D
Antenna type:	Equipment that has an external 50 Ω RF connector
Power source	Battery operated
Temperature range:	-25 to + 55°C

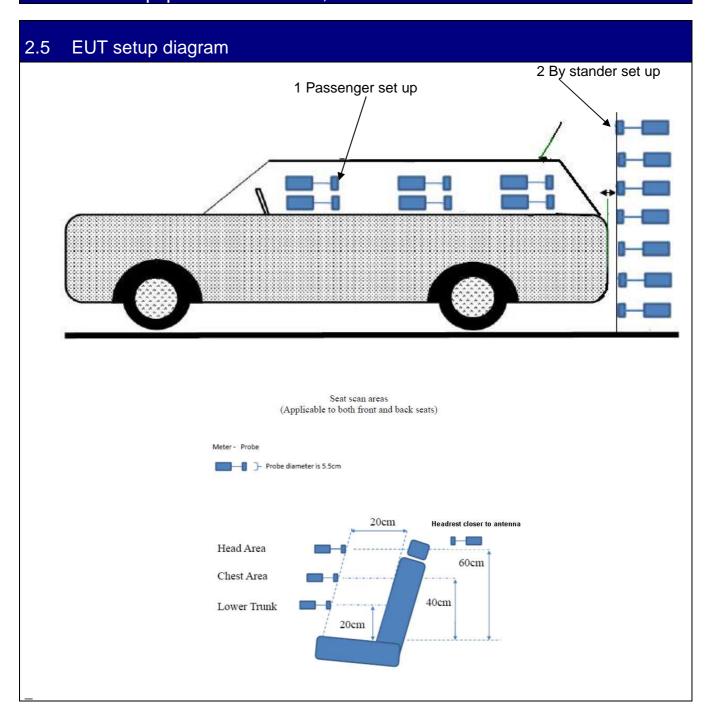


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Section 2: Equipment under test, continued





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2.6 Operation of the EUT during testing

Transmitting at maximum power and normal modulation to:

- 1) 809.0125 MHz
- 2) 823.9875 MHz
- 3) 854.0125 MHz
- 4) 868.9875 MHz

2.7 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.



Section 3: Test conditions

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Section 3: Test conditions

3.1 Deviations from laboratory tests procedures

No deviations were made from laboratory test procedures.

3.2 Test condit										
Normal temperature, humidity and air pressure test conditions	Temperature: 15–30 °C Relative humidity: 20–75 % Air pressure: 860–1060 hPa									
	When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.									
Power supply range:	The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.									

3.3 Measurement uncertainty

Nemko S.p.A. measurement uncertainty has been calculated using the standard CISPR 16-4-2 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modeling – Uncertainty in EMC measurements". All calculations have been performed to provide a confidence level of 95 % and can be found in Nemko S.p.A. document WML1002.

3.4	Test equipment				
	Equipment	Manufacturer	Model No.	Asset/Serial No.	Next cal.
	Portable Field Meter	PMM	8053	0220J00421	2016/10
	Electric Field Probe	PMM	EP330	1010J91224	2016/10

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use (*) Equipment supplied by manufacturer's



Section 4: Results Summary
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Section 4: Result summary

4.1 MI	4.1 MPE: Test results									
Part	Test method	Test description	Required	Result						
§	§	MPE calculation	Υ	Pass						
Note:										



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Appendix A: Test results

MPE CALCULATION

(a) Mobile Devices

This section describes the requirements of Section 2.1091 of the FCC's Rules (47 CFR § 2.1091) that apply to "mobile" devices. For purposes of these requirements mobile devices are defined as transmitters designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimetres is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimetres separation requirement.

A fundamental aspect of the exposure guidelines is that they apply to power densities or the squares of the electric and magnetic field strengths that are spatially averaged over the body dimensions. Spatially averaged RF field levels most accurately relate to estimating the whole body averaged SAR that will result from the exposure and the MPEs specified in Table 1 of Appendix A are based on this concept. This means that local values of exposures that exceed the stated MPEs may not be related to non-compliance if the spatial average of RF fields over the body does not exceed the MPEs. Further discussion of spatial averaging as it relates to field measurements can be found in Section 3 of this bulletin and in the ANSI/IEEE and NCRP reference documents noted there.

Assessment was performed with mobile radio installed inside the vehicle at test specified distance and test locations.

1) External bystander MPE measurements:

Antenna is located in the rear side of roof.

Mpe measurement for by stander conditions are determined by taking the average of 10 measurements in a 2 m vertical line for each of three by stander test locations with 20 cm height increment with antenna to probe separation distances of 72 cm directly behind the vehicle, 110 cm (45 radial),102 cm (90 radial).

The measuring probe is positioned orthogonal to antenna (typically parallel to ground with a vertically mounted antenna) and aimed directly at antenna axis.

These measurements are representative of person other than the operator standing next to the vehicle.

2) Internal Passenger vehicle MPE measurements

Antenna is located in the rear side of roof at a minimum distance of Backseats passenger.

User are instructed, per installation manual to mount antenna on the roof only if a minimum distance of can't be achieved.

MPE measurements for passenger front seat and backseat conditions are determined by taking the average of three measurements (Head, Chest, and lower Trunk) inside the vehicle for both the front and back seats.

The probe handle is oriented parallel to the ground and pointed towards to the back of vehicle.

The probe is scanned continuously along three test axis which are parallel to seat angle and are 20 cm from seat surface. One test axis is at the head height, another is at the chest height and another is at lower Trunk height.

The MPE is determined by averaging these three maximum values



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MPE CALCULATION, continue..

MPE limits:

Frequency	FCC OET Bulletin 65 Supplement C	IEEE C95.1 1992/1999	RSS 102 issue 4 – 2010
Range (MHz)	mW/cm^2	mW/cm^2	• W/m^2
30 – 300	0.2		*2.0
10 - 400			
100 - 300		0.2	
100 – 400			
300 - 1,500	f/1,500		f/150
400 - 2,000			
300 - 15,000		f/1,500	
1,500 - 15,000			10.0
1,500 - 100,000	1.0		
2,000 - 100,000			
2,000 - 300,000			

^{*}Power density limit is applicable at frequencies greater than 100MH

Test date: 2014-11-11

Test results: Pass



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Specification: --

Test data

Bystander, test position 1

Roof	Test position	E/H Field	Angle (degree)	Antenna model	Max PWR (W)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculation P.D. (mW/cm²)	FCC Limit (mWcm2)	% to specific Limit
		E Field	E Field	68720-42/023	11.7	10	809.0125	0.002	0.539	0.419
				68720-42/023	11.9	10	823.9875	0.002	0.549	0.373
Roof	1			68720-42/023	11.7	10	854.0125	0.003	0.569	0.461
				68720-42/023	11.3	10	868.9875	0.003	0.579	0.593

Bystander, test position 2

Roof	Test position	E/H Field	Angle (degree)	Anten na mode I	Max PWR (W)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculation P.D. (mW/cm2)	FCC Limit (mW/cm2)	% to specific Limit
				68720- 42/023	11.7	10	809.0125	0.002	0.539	0.461
Doof	2	E Eiold		68720- 42/023	11.9	10	823.9875	0.003	0.549	0.513
Roof	2	E Field		68720- 42/023	11.7	10	854.0125	0.002	0.569	0.366
				68720- 42/023	11.3	10	868.9875	0.004	0.579	0.769

Bystander, test position 3

Roof	Test position	E/H Field	Angle (degree)	Antenna model	Max PWR (W)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculation P.D. (mW/cm²)	FCC Limit (mW/cm	% to specific Limit
Roof		3 E Field	Field	68720-42/023	11.7	10	809.0125	0.002	0.539	0.405
	2			68720-42/023	11.9	10	823.9875	0.002	0.549	0.407
	3			68720-42/023	11.7	10	854.0125	0.003	0.569	0.466
				68720-42/023	11.3	10	868.9875	0.004	0.579	0.688



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Specification: --

Test data

Passenger, front seat, left

Roof	Test position	E/H Field	Angle (degree)	Antenna model	Max PWR (W)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculation P.D. (mW/cm²)	FCC Limit (mW/cm 2)	% to specific Limit
				68720- 42/023	11.7	10	809.0125	0.001	0.539	0.153
Doof	Passenger,	Е		68720- 42/023	11.9	10	854.0125	0.002	0.569	0.421
Roof	front seat, left	Field	Field	68720- 42/023	11.7	10	823.9875	0.000	0.549	0.070
				68720- 42/023	11.3	10	868.9875	0.000	0.579	0.068

Passenger, front seat, right

Roof	Test position	E/H Field	Angle (degree)	Antenna	Max PWR (W)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculati on P.D. (mW/cm 2))	FCC Limit (mW/c m2)	% to specific Limit
				68720-42/023	11.7	10	809.0125	0.001	0.539	0.138
Roof	Passenger,	assenger, ront seat, E Field right	ld	68720-42/023	11.9	10	823.9875	0.000	0.549	0.082
Rooi				68720-42/023	11.7	10	854.0125	0.003	0.569	0.493
	ngik			68720-42/023	11.3	10	868.9875	0.001	0.579	0.209



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Specification: --

Test data

Passenger, back seat right

Roof	Test position	E/H Field	Angle (degree)	Antenna model	Max PWR (W)	Nominal Pwr (W)	Test Frequenc y (MHz)	Max calculati on P.D. (mW/cm	FCC Limit (mW/cm 2)	% to specific Limit
				68720-42/023	11.7	10	809.0125	0.001	0.539	0.151
Boof	Passenger back seat	E Elala		68720-42/023	11.9	10	823.9875	0.000	0.549	0.082
Roof	right	E Field		68720-42/023	11.7	10	854.0125	0.001	0.569	0.104
				68720-42/023	11.3	10	868.9875	0.003	0.579	0.578

Passenger, back seat, left

Roof	Test position	E/H Field	Angle (degree)	Antenna model	Max PWR (W)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculati on P.D. (mW/cm ²)	FCC Limit (mW/cm 2)	% to specific Limit
				68720-42/023	11.7	10	809.0125	0.001	0.539	0.193
Poof	Passeng	E Eiold		68720-42/023	11.9	10	823.9875	0.006	0.549	1.015
	er back seat left			68720-42/023	11.7	10	854.0125	0.001	0.569	0.195
				68720-42/023	11.3	10	868.9875	0.001	0.579	0.221

Remarks: Calculation P.D.= Average over body x Probe calibration factor x Duty Cycle Max calculation P.D.= Average over body x Probe calibration factor x Duty Cycle x Max PWR/Nominal Pwr Probe calibration factor=1 Duty Cycle=0.25



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Test data

Bystander, position 1

								Byztandor (BS) P	aritian mW/cm2					E.U.T. Max TX factor	Average averthe bady (mWfcm ²⁾	CalcP.D. (mW/cm ²⁾	Max Calc. P.D. (mWfcm ²⁾	FCCLimit (mW/cm2)
TEFREQUENCY	Mexpur	Initial pawer	PROBECAL FACTOR	20 cm									200 cm					
809.0125	11.7	10	1.0152	0.0000									0.027	0.25	0.009	0.002	0.003	0.539
823.9875	11.9	10	1.0135	0.0000	0.0000	0.0000	0.0000	0.0050	0.0050	0.005	0.018	0.024	0.02	0.25	0.008	0.002	0.002	0.549
854.0125	11.7	10	1.0100	0.0000	0.0000	0.0000	0.0010	0.0020	0.0120	0.022	0.032	0.024	0.009	0.25	0.010	0.003	0.003	0.569
868,9875	11.3	10	1.0082	0.0000	0.0000	0.0000	0.0000	0.0020	0.0100	0.021	0.04	0.032	0.026	0.25	0.013	0.003	0.004	0.579

Bystander, position 2

								Byztandor (BS)	Paritian mW/cm2					E.U.T. MaxTXfactor	Average averthe bady (mW/cm ²⁾	Calc P.D. (mW/cm ²⁾	Max Calc. P.D. (mW/cm ²⁾	FCCLimit (mW/cm2)
TXFREQUENCY	Maxpur	Initial power	PROBECAL FACTOR	20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm					
809.0125	11.7	10	1.0152	0	0	0	0.003	0.001	0.012	0.021	0.031	0.014	0.016	0.25	0.010	0.002	0.003	0.539
023.9075	11.9	10	1.0135	0	0	0	0.001	0.003	0.005	0.02	0.033	0.024	0.02	0.25	0.011	0.003	0.003	0.549
854.0125	11.7	10	1.0100	0	0	0.001	0.004	0.006	0.006	0.016	0.014	0.02	0.014	0.25	0.008	0.002	0.002	0.569
868.9875	11.3	10	1.0082	0	0	0	0.003	0.010	0.011	0.012	0.02	0.027	0.08	0.25	0.017	0.004	0.005	0.579

Bystander, position 3

									Bystander (BS)	Paritian mW/cm2					E.U.T. Max TX factor	Average averthe bady (mW/cm ²⁾	Calc P.D. (mW/cm ²⁾	Max Calc. P.D. (mlil/cm ²⁾	FCCLimit (mW/cm2)
T	XFREQUENCY	Maxpur	Initial power	PROBECAL FACTOR	20 cm	em 40 cm 60 cm 00 cm 100 cm 120 cm 140 cm 160 cm 110 cm 20								200 cm					
	809.0125	11.7	10	1.0152		0 0 0 0 0 0.004 0.004 0.025 0.023 0.02							0.02	0.25	0.009	0.002	0.003	0.539	
	023.9075	11.9	10	1.0135		۰	۰	0	0.002	0.004	0.006	0.02	0.022	0.03	0.25	0.008	0.002	0.003	0.549
	854.0125	11.7	10	1.0100	0		0	0	0.001	0.008	0.012	0.03	0.03	0.022	0.25	0.010	0.003	0.003	0.569
	868,9875	11.3	10	1.0082		0 0 0 0.001 0.006 0.009 0.022 0.042 0.042							0.042	0.03	0.25	0.015	0.004	0.004	0.579



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Test data

Passenger front seat right

					Parsongo	rparitions		E.U.T. Max TX factor	Average overthe body (mW/cm²l		Max Calc. P.D. (mW/cm ²⁾	FCCLimit (mW/cm2)
TXFREQUENCY	Maxpur	Initial pawer	PROBECAL FACTOR	Head	Chart	Lawer Trunck	Hoadrostroar					
809.0125	11.7	10	1.0152	0.002	0.002	0.003	0.003	0.25	0.003	0.001	0.001	0.539
823.9875	11.9	10	1.0135	0.002	0.002	0.001	0.001	0.25	0.002	0.000	0.000	0.549
854.0125	11.7	10	1.0100	0.02	0.004	200.0	0.012	0.25	0.010	0.002	0.003	0.569
868.9875	11.3	10	1.0082	0.011	0.001	0.002	0.003	0.25	0.004	0.001	0.001	0.579

Passenger back seat right

					Passon	qorparitians		E.U.T. MaxTXFactor	Average over the body (mW/cm²l	CalcP.D. (mW/cm ²⁾	Max Calc. P.D. (mW/cm ²⁾	FCCLimit (mW/cm2)
TXFREQUENCY	Махрыг	Initial pawer	PROBECAL FACTOR	Head	Chart	Lawer Trunck	Hoadrostroar					
809.0125	11.7	10	1.0152	0.003	0.002	0.002	0.004	0.25	0.003	0.001	0.001	0.539
\$23.9875	11.9	10	1.0135	0.001	0.001	0.001	0.003	0.25	0.002	0.000	0.000	0.549
854.0125	11.7	10	1.0100	0.004	0.002	0.001	0.001	0.25	0.002	0.001	0.001	0.569
868,9875	11.3	10	1.0082	0.04	0.001	0.001	0.005	0.25	0.012	0.003	0.003	0.579

Passenger back seat left

					Pazzongo	or paritians		E.U.T. MaxTXfactor	Avorago avortho bady (mW/cm ²⁾	CalcP.D. (mWłam ²⁾	Max Calc. P.D. (mW/cm ²)	FCCLimit (mW/cm2)
TXFREQUENCY	Махриг	Initial power	PROBECAL FACTOR	Head	Chart	Lawer Trunck	Hoadrostroar					
809.0125	11.7	10	1.0152	0.005	0.005	0.001	0.003	0.25	0.004	0.001	0.001	0.539
823.9875	11.9	10	1.0135	0.006	0.06	0.003	0.005	0.25	0.019	0.005	0.006	0.549
854.0125	11.7	10	1.0100	0.006	0.002	0.001	0.006	0.25	0.004	0.001	0.001	0.569
868.9875	11.3	10	1.0082	0.003	0.006	0.002	0.007	0.25	0.005	0.001	0.001	0.579

Passenger front seat left

					Passonqu	orparitians		E.U.T. Max TX factor	Avorago avortho bady (mWłcm ²	CalcP.D. (mWłcm²l	Max Calc. P.D. (mW/cm ²⁾	FCCLimit (mWfcm2)
TXFREQUENCY	Maxpur	Initial power	PROBECAL FACTOR	Hoad	Chart	Lower Trunck	Headrestrear	Trux Titroccus				
809.0125	11.7	10	1.0152	0.005	0.005	0.001	0.003	0.25	0.004	0.001	0.001	0.539
823.9875	11.9	10	1.0135	0.006	0.06	0.003	0.005	0.25	0.019	0.005	0.006	0.549
854.0125	11.7	10	1.0100	0.006	0.002	0.001	0.006	0.25	0.004	0.001	0.001	0.569
868.9875	11.3	10	1.0082	0.003	0.006	0.002	0.007	0.25	0.005	0.001	0.001	0.579



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Specification: --



80 cm + 13=93 cm (position 1)



80 cm + 37=117 cm (position 3)

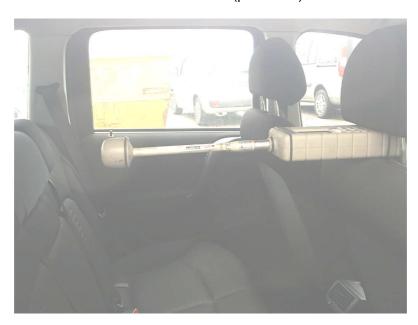


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Specification: --



60 cm +27=87cm (position 2)





Report Number: 272549TRFMPE

Specification: --



Front seat left



Front seat right

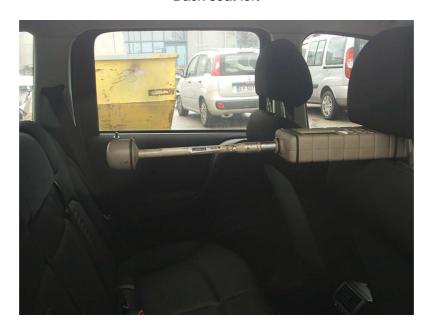


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Specification: --



Back seat left



Back seat right



Report Number: 272549TRFMPE

Specification: --





Radio Equipment



Report Number: 272549TRFMPE

Specification: --



Radio Equipment