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	LABORATORY TEST REPORT	April 17 th , 2018
	ATR 3366 - Scapa 2759 FORD ES-AC3T- 1A303-AA Let.R specification (issue January 2017)	

1. OBJECTIVE Scapa 2759 in class B towards Ford ES-AC3T-1A303 AA LET R specification.

2. REFERENCE, DIMENSIONS AND BATCH NUMBER : 2759 black 33m x 19mm.

3. TYPE OF ASSEMBLY : 50% overlap.

4. PART IDENTIFICATION : ES-AC3T-1A303-AA (B10 Y 00).

5. EQUIPMENTS

Abrasion test machine according to ISO 6722-1 SCAPA N°1379.

Dynamometer MTS 2/M N° 1201 with sensor 100N N° 1217.

Sound dampening machine n°1309

Ventilated oven Climats XU250 N°1350 for fluid resistance tests.

Ventilated oven Climats XU250 n°1393 for heat ageing test.

Climatic chamber Excal 2213-HE N°1330.

0011 Fog – Test hart scientific VA-04

6. TEST CONDITIONS : 23 ± 2°C, and 50±5% of relative humidity.

7. REMARKS

Fluid resistance test: The liquid C is replaced by “SP95” unleaded petrol.

All the tests “ Bundling performance and material compatibility” are realised with

- Harness of 7 PVC FLRY-B (LF) 2.50 BR T2 COFICAB
- Harness of 7 PVC FLRY T2 LEONI Poland 2,5²

Fluids resistance, cold flexibility and flammability only with Harness of 7 PVC FLRY T2 LEONI Poland 2,5².

Cold flexibility: 0,5kg weight not used because harness is too stiff and replaced by the hand; The rate of wrapping is not specified, the rate of wrapping used is the rate specified in the Ford ED 1509 specification, 1 turn per 10s.

8. PERSONN IN CHARGE OF TEST AND FUNCTION Pierre Tissot, Senior Testing Specialist – Automotive.

9. RESULTS



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Test procedure	Tape criteria	units	Requirements	Roll	Measures	Result	Approval	Observation
ASTM D 1000	Tensile strength	N/cm	> 15	1	22	Min 22 Average 24N/cm	OK	
				2	22			
				3	25			
				4	26			
				5	25			
ASTM D 1000	Elongation at break	%	> 125	1	170	Min 163 Average 202%	OK	
				2	163			
				3	228			
				4	228			
				5	222			
ASTM D1000	Adhesion to steel after 20min	N/cm	≥1,0	1	1,9	Min 1,8 Average 1,9N/cm	OK	
				2	2,0			
				3	1,8			
				4	1,8			
				5	1,9			
ASTM D1000	Adhesion to backing after 20min	N/cm	≥1,0	1	2,3	Min 2,1 Average 2,3N/cm	OK	
				2	2,1			
				3	2,3			
				4	2,5			
				5	2,3			
§ 7.11 ISO 6722-1	Abrasion resistance 10mm diameter mandrel	Cycles	Report class	1		< 15cycles	Class 0	< 100 : Class 0 100 – 499 : Class 1 500 – 999 : Class 2 1000 – 4999 : Class 3 5000 -14999 : Class 4 15000-29999: Class 5 >29999 : Class 6
				2				
§ 7.10	Noise dampening (A)	dB	Report class	1		A = <0,5dB	Class 0	≤ 2 : Class 0 >2 to ≤ 5 : Class 1 >5 to ≤ 10 : Class 2 >10 to ≤ 15 : Class 3 > 15 : Class 4
				2				
				3				
				4				
				5				



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Test procedure	Performance criteria	Requirements	Sample	Measures	Result	Approval	Observation
Bundling performance and compatibility : Harness with 7 T2 2,5² wires PVC FLRY from Coficab							
§ 7.3.1	Initial testing	No cracking or flagging after bending around a 40mm diameter mandrel	1	No cracking or flagging	In accordance with the requirements	OK	
			2				
§ 7.3.2 7.3.5 6.1	Environmental cycling	Bundling No cracking, melting, or degradation after bending around a 40mm diameter mandrel Flagging < 10mm Noticeable discoloration is not allowed Compatibility One wire from each specimen is then wrapped 2 times around a 2mm diameter mandrel.	1	Bundling Pass all the requirements without flagging Compatibility Pass all the requirements Adhesion performance Pass all the requirements	In accordance with the requirements	OK	
			2				
			3				
			4				
			5				
§ 7.3.4 7.3.5 6.1	Thermal overload 6h at 150°C (service t° + 50°C)	The wire shall not exhibit any cracks, fractures or brittleness and shall not be swollen or shrunken. Discoloration of the line is not permitted. The original color shall still be visible. Adhesion performance Reduced adhesiveness is permitted. Total loss of adhesion is not permitted. Adhesive transfer to clean fingers is not permitted.	1	Bundling Pass all the requirements without flagging Compatibility Pass all the requirements Adhesion performance Pass all the requirements	In accordance with the requirements	OK	
			2				
			3				
			4				
			5				



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Test procedure	Performance criteria	Requirements	Sample	Measures	Result	Approval	Observation
Bundling performance and compatibility : Harness with 7 T2 2,5² wires PVC FLRY from Leoni							
§ 7.3.1	Initial testing	No cracking or flagging after bending around a 40mm diameter mandrel	1	No cracking or flagging	In accordance with the requirements	OK	
			2				
§ 7.3.2 7.3.5 6.1	Environmental cycling	Bundling No cracking, melting, or degradation after bending around a 40mm diameter mandrel Flagging < 10mm Noticeable discoloration is not allowed Compatibility One wire from each specimen is then wrapped 2 times around a 2mm diameter mandrel.	1	Bundling Pass all the requirements without flagging Compatibility Pass all the requirements Adhesion performance Pass all the requirements	In accordance with the requirements	OK	
			2				
			3				
			4				
			5				
§ 7.3.4 7.3.5 6.1	Thermal overload 6h at 150°C (service t° + 50°C)	The wire shall not exhibit any cracks, fractures or brittleness and shall not be swollen or shrunken. Discoloration of the line is not permitted. The original color shall still be visible. Adhesion performance Reduced adhesiveness is permitted. Total loss of adhesion is not permitted. Adhesive transfer to clean fingers is not permitted.	1	Bundling Pass all the requirements without flagging Compatibility Pass all the requirements Adhesion performance Pass all the requirements	In accordance with the requirements	OK	
			2				
			3				
			4				
			5				



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Test procedure	Performance criteria	Requirements	Time	Measures	Result	Approval	Observation
Harness with 7 T2 2,5² wires PVC FLRY from Coficab							
§ 7.3.3 7.3.5 6.1	Heat ageing after 3000h at 100°C (service t°)	<p>Bundling No cracking, melting, or degradation after bending around a 80mm diameter mandrel Flagging < 10mm Noticeable discoloration is not allowed</p> <p>Compatibility One wire from each specimen is then wrapped 2 times around a 2mm diameter mandrel. The wire shall not exhibit any cracks, fractures or brittleness and shall not be swollen or shrunken. Discoloration of the line is not permitted. The original color shall still be visible.</p> <p>Adhesion performance Reduced adhesiveness is permitted. Total loss of adhesion is not permitted. Adhesive transfer to clean fingers is not permitted.</p>	1500h	<p>Bundling Pass all the requirements without flagging Compatibility Pass all the requirements Adhesion performance Pass all the requirements</p>	In accordance with the requirements	Class B	
			2000h	<p>Bundling Pass all the requirements without flagging Compatibility Pass all the requirements Adhesion performance Pass all the requirements</p>	In accordance with the requirements		
			2500h	<p>Bundling Pass all the requirements without flagging Compatibility Pass all the requirements Adhesion performance Pass all the requirements</p>	In accordance with the requirements		
			3000h	<p>Bundling Pass all the requirements without flagging Compatibility Pass all the requirements Adhesion performance Pass all the requirements</p>	In accordance with the requirements		



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Test procedure	Performance criteria	Requirements	Time	Measures	Result	Approval	Observation
Harness with 7 T2 2,5² wires PVC FLRY from Leoni							
§ 7.3.3 7.3.5 6.1	Heat ageing after 3000h at 100°C (service t°)	<p>Bundling No cracking, melting, or degradation after bending around a 80mm diameter mandrel Flagging < 10mm Noticeable discoloration is not allowed</p> <p>Compatibility One wire from each specimen is then wrapped 2 times around a 2mm diameter mandrel. The wire shall not exhibit any cracks, fractures or brittleness and shall not be swollen or shrunken. Discoloration of the line is not permitted. The original color shall still be visible.</p> <p>Adhesion performance Reduced adhesiveness is permitted. Total loss of adhesion is not permitted. Adhesive transfer to clean fingers is not permitted.</p>	1500h	<p>Bundling Pass all the requirements without flagging Compatibility Pass all the requirements Adhesion performance Pass all the requirements</p>	In accordance with the requirements	Class B	
			2000h	<p>Bundling Pass all the requirements without flagging Compatibility Pass all the requirements Adhesion performance Pass all the requirements</p>	In accordance with the requirements		
			2500h	<p>Bundling Pass all the requirements without flagging Compatibility Pass all the requirements Adhesion performance Pass all the requirements</p>	In accordance with the requirements		
			3000h	<p>Bundling Pass all the requirements without flagging Compatibility Pass all the requirements Adhesion performance Pass all the requirements</p>	In accordance with the requirements		



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Test procedure	Tape criteria	units	Requirements	Sample	Measures	Result	Approval	Observation
§ 7.5	Cold flexibility after 4h at -25°C (<i>diameter mandrel 20mm</i>) Unwind speed 1 turn per 10 seconds	/	No cracking or degradation	1	No cracking or degradation	In accordance with the requirements	OK	Harness with 7 T2 2,5 ² wires PVC FLRY from Leoni
				2				
				3				
				4				
				5				
§ 7.6 SAE J1756	Fogging 3h at 100°C	/	> 20	5	37,9	>20	OK	
§ 7.7 ISO 3795 SAE J369	Flammability	mm/min	< 100	1	On the 5 samples the flame stops as soon as the Bunsen burner is removed	Burn rate 0mm/min Non combustible type A	OK	Harness with 7 T2 2,5 ² wires PVC FLRY from Leoni
				2				
				3				
				4				
				5				
§ 7.8 SAE J1351	Odor Dry Test on harness after 1h at 65°C	/	Maxi 2 for all interior applications	P1	1	Maxi 1	OK	SAE Classification 1: No noticeable odor 2: Slight, but noticeable odor 3: Definite odor, but no strong enough to be offensive 4: Strong offensive odor 5: Very strong offensive odor
				P2	1			
				P3	1			
§ 7.8 SAE J1351	Odor Wet Test on harness after 1h at 65°C	/	Maxi 2 for all interior applications	P1	1	Maxi 2	OK	
				P2	2			
				P3	1			
§ 7.12 SAE J2192 §7.15 SAE J2302	Thermal effectiveness		Only required for tapes being used for thermal insulation		N/A		/	<i>Tape not used for thermal insulation</i>



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Test procedure	Performance criteria	Requirements	Time	Measures	Result	Approval	Observation
§ 7.4 Note: Tapes used in the interior of the vehicle or in designated "dry" areas are exempt from this test	Fluid resistance Battery acid at 23°C	Bundling No cracking, melting, or degradation. Flagging < 10mm Adhesion performance Reduced adhesiveness is permitted. Total loss of adhesion is not permitted. Adhesive transfer to clean fingers is not permitted.	Harness with 7 T2 2,5² wires PVC FLRY from Leoni				
			24h at 23°C	Pass all the requirements without flagging	In accordance with the requirements	OK	
			48h at 23°C	Pass all the requirements without flagging			
	72h at 23°C		Pass all the requirements without flagging				
	Windshield washer at 23°C		24h at 23°C	Pass all the requirements without flagging	In accordance with the requirements	OK	
			48h at 23°C	Pass all the requirements without flagging			
			72h at 23°C	Pass all the requirements without flagging			
	Engine coolant at 90°C		24h at 23°C	Pass all the requirements without flagging	In accordance with the requirements	OK	
			48h at 23°C	Pass all the requirements without flagging			
72h at 23°C		Pass all the requirements without flagging					



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Test procedure	Performance criteria	Requirements	Time	Measures	Result	Approval	Observation
§ 7.4 Note: Tapes used in the interior of the vehicle or in designated "dry" areas are exempt from this test	Fluid resistance Brake fluid at 23°C	Bundling No cracking, melting, or degradation. Flagging < 10mm Adhesion performance Reduced adhesiveness is permitted. Total loss of adhesion is not permitted. Adhesive transfer to clean fingers is not permitted.	Harness with 7 T2 2,5² wires PVC FLRY from Leoni				
			24h at 23°C	Pass all the requirements without flagging	In accordance with the requirements	OK	
			48h at 23°C	Pass all the requirements without flagging			
	72h at 23°C		Pass all the requirements without flagging				
	Unleaded petrol "SP95" at 23°C		24h at 23°C	Pass all the requirements without flagging	In accordance with the requirements	OK	
			48h at 23°C	Pass all the requirements without flagging			
			72h at 23°C	Pass all the requirements without flagging			
	Diesel at 23°C		24h at 23°C	Pass all the requirements without flagging	In accordance with the requirements	OK	
			48h at 23°C	Pass all the requirements without flagging			
72h at 23°C		Pass all the requirements without flagging					



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Test procedure	Performance criteria	Requirements	Time	Measures	Result	Approval	Observation
§ 7.4 Note: Tapes used in the interior of the vehicle or in designated "dry" areas are exempt from this test	Fluid resistance Ethanol 85 at 23°C	Bundling No cracking, melting, or degradation. Flagging < 10mm Adhesion performance Reduced adhesiveness is permitted. Total loss of adhesion is not permitted. Adhesive transfer to clean fingers is not permitted.	Harness with 7 T2 2,5² wires PVC FLRY from Leoni				
			24h at 23°C	Pass all the requirements without flagging	In accordance with the requirements	OK	
			48h at 23°C	Pass all the requirements without flagging			
			72h at 23°C	Pass all the requirements without flagging			
	Transmission fluid at 90°C		24h at 23°C	Pass all the requirements without flagging	In accordance with the requirements	OK	
			48h at 23°C	Pass all the requirements without flagging			
			72h at 23°C	Pass all the requirements without flagging			
	Power steering fluid at 90°C		24h at 23°C	Pass all the requirements without flagging	In accordance with the requirements	OK	
			48h at 23°C	Pass all the requirements without flagging			
	72h at 23°C	Pass all the requirements without flagging					



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Test procedure	Performance criteria	Requirements	Time	Measures	Result	Approval	Observation
§ 7.4 Note: Tapes used in the interior of the vehicle or in designated "dry" areas are exempt from this test	Fluid resistance (except type A) Engine oil at 90°C	Bundling No cracking, melting, or degradation. Flagging < 10mm Adhesion performance Reduced adhesiveness is permitted. Total loss of adhesion is not permitted. Adhesive transfer to clean fingers is not permitted.	Harness with 7 T2 2,5² wires PVC FLRY from Leoni				
			24h at 23°C	Pass all the requirements without flagging	In accordance with the requirements	OK	
			48h at 23°C	Pass all the requirements without flagging			
	72h at 23°C		Pass all the requirements without flagging				
	Engine cleaner at 23°C		24h at 23°C	Pass all the requirements without flagging	In accordance with the requirements	OK	
			48h at 23°C	Pass all the requirements without flagging			
			72h at 23°C	Pass all the requirements without flagging			
	Salt spray at 23°C		24h at 23°C	Pass all the requirements without flagging	In accordance with the requirements	OK	
			48h at 23°C	Pass all the requirements without flagging			
72h at 23°C		Pass all the requirements without flagging					