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ISO/IEC 17020 Accredited inspection body - Accreditation certificate BELAC No. 016-INSP

1. **SUBJECT : Standardized On Road Tests Cycles (SORT)**

2. **REF. :** Report number : **H2060644219/102-TR** No. of pages : 1 of 7 No. of annexes : 01
Update : 00

3. **GENERALITIES :**

Make of Vehicle : ISUZU
Category(ies) : M3
Commercial Name : Citiport E5
Hand of drive : LHD
Type : B120

Name and address of the manufacturer :
Anadolu Isuzu Otomotiv Sanayi ve Ticaret A.Ş.
Şekerpınar Mahallesi Otomotiv Caddesi
No:2 41435 Çayırova-Kocaeli
TURKEY

4. **TESTS :** Date and place : 2020.08.18 KAYNARCA – SAKARYA – TURKEY

Applied document(s) : -

Inspector : Mr. O. OZGOREN
Mr. E. ZENIT
Mr. S. APAYDIN
Manufacturer's representative : Mr. A. O. KOSE

5. **CONCLUSIONS :**

The tests were carried out according to the specifications of SORT (Standard On-Road Test Cycles for measuring the fuel consumption of buses).

Name of test standard: Standardised On-road Test Cycles 2014 – Union Internationale des Transport Publics (UITP)

ANADOLU ISUZU OTOMOTİV SANAYİ VE TİCARET A.Ş.

Date : 2020.08.19

Signature :

VINÇOTTE nv/sa
Okan Özgoren
Automotive Certification

TEST PROTOCOL

Vehicle submitted for test :

Type : B120
Identification number : NNAM0BDLB02000154

A. TEST EXTERNAL CONDITIONS (for information) :

1. Road conditions

N°	Item	Value	Unit
1.1	State of track surface	Asphalt, dry	
1.2	Max.longitudinal gradient	1	%
1.3	Track altitude	44,20 up to 51,11	m
1.4	Min.radius	-	m
1.5	Track length	2200	m

2. Weather conditions

N°	Item	Value		Unit
		Test start	Test end	
2.1	Wind speed	1	1,5	m / s
2.2	Temperature	23	30	° C
2.3	Humidity	59	60	%
2.4	Atmospheric pressure	1,0118	1,0113	bar

B. VEHICLE SET-UP :

1. Vehicle characteristics

1.1. Type and dimensions

N°	Item	Value	Unit
1.1.1	Vehicle type	M3 Citiport (12 meters)	
1.1.2	Length (L)	12,03	m
1.1.3	Width (W)	2,55	m
1.1.4	Height (H)	3,14	m
1.1.5	Empty weight	11307,3	kg
1.1.6	Mileage	1242	km

1.2. Thermal engine

N°	Item	Value	Unit	at (rpm)
1.2.1	Manufacturer and type	CUMMINS ISB e6.7 E5 300B E11- 49RG - 052343		
1.2.2	Engine capacity	6700	cc	Non. Relev.
1.2.3	Maximum power	300	kW	2300
1.2.4	Maximum torque	1100	Nm	1200-1800
1.2.5	Driving mode of the engine ventilator	Hydraulic		

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1.3. Gearbox

N°	Item	Value
1.3.1	Manufacturer and type	ZF 6AP 1200 B Ecolife
1.3.2	Program used	ZF 6070.203.464

1.4. Tyres

N°	Item	Value	Unit
1.4.1	Manufacturer and type	Pirelli MC-01	
1.4.2	Dimensions (front axle tyres)	275/70 R22.5	
1.4.3	Dimensions (central axle tyres)	N.A.	
1.4.4	Dimensions (rear axle tyres)	275/70 R22.5	
1.4.5	Front axle nominal pressure	10,34	bar
1.4.6	Middle axle nominal pressure	-	bar
1.4.7	Rear axle nominal pressure	10,34	bar
1.4.8	Pattern depth of new tyres	17	mm
1.4.9	Actual pattern depth measured	15,5	mm

1.5. Motor axle

N°	Item	
1.5.1	Manufacturer and type	ZF AV 132/80
1.5.2	Reduction ratio	5,74

1.6. Engine lubricant

N°	Item	Value
1.6.1	Type	Castrol Vecton CJ 4/E9
1.6.2	SAE grade	SAE 15W-40
1.6.3	Other features	n.a

1.7. Gearbox lubricant

N°	Item	Value
1.7.1	Type	ZF – TE – ML 20.110.20F
1.7.2	SAE grade	No SAE Grade
1.7.3	Other features	n.a

1.8. Chassis Batteries 24 Volt

N°	Item	Value	Unit
1.8.1	Type	Mutlu, water type heavy duty battery	
1.8.2	Number	2	Pieces
1.8.3	Nominal unit voltage	12	V
1.8.4	Unit weight	64	kg

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1.9. Miscellaneous equipment

N°	Item	Value
1.9.1	Number of doors	3
1.9.2	Retarder	ZF Intarder Accumulated in transmission, Hydraulic
1.9.3	Air conditioning	KONVEKTA
1.9.4	Other	n.a

1.10. Calculation of the load characteristics CL, of the tested vehicle

N°	Item	Formula	Calculated value	
1.10.1	Load factor CL (load)	CL = 116.19 x (L – 1.20) x W		kg
CL	Lump load	**3208,76 kg**		

1.11. Optional equipment

N°	Item	Weight to deduct from lump load	
1.11.1	Air-conditioning	225	kg
1.11.3	Ticketing equipment (excl.supporting devices)	0	kg
1.11.4	Automatic vehicle monitoring system (AVM)	0	kg
1.11.5	Information equipment (2 pieces monitor)	0	kg
1.11.7	Security driver cabin	0	kg
1.11.8	Overload due to double glazing	0	kg
1.11.10	Lubrimatic equipment	0	kg
(1)	**Total weight of optional equipment**	**225**	kg

1.12. Other factors to take into account

N°	Item	Actual weight (A)	Reference weight (B)	Difference (A-B)
1.12.1	Seats	31		
	Load factor CS (seats)	CS = the integer of {1.09 x (L – 1.20) x W}=19		
	N : actual number of seats in tested vehicle	N x 10 kg	CS x 10 kg	(CS – N) x 10 kg
	Calculated values	310 kg	301 kg	9 kg
1.12.2	Load factor CF(fuel volume)	CF = 7,26 x (L – 1.20) x W		
	V : actual volume of fuel tank tested vehicle	V x 0,840	CF x 0,840	(CF-V) x 0,840
	Calculated values	252 kg	168,42 kg	83,58 kg
1.12.3	On-board people (#4) excl.driver	180 kg	Real weight measured	180 kg
1.12.4	Measuring equipment	150 kg	None	150 kg
(2)	**Total weight of other factors**			**422,56 kg**

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1.13. Final value of the load and the weight of the complete vehicle

N°	Item	See section	Value	
1.13.1	Empty weight	1.1.5	11307,3	kg
1.13.2	Lump load (CL)	1.10	3208,76	kg
1.13.3	Optional equipment (1)	1.11	225,00	kg
1.13.4	Other factors (2)	1.12	422,56	kg
1.13.5	Load (3) = CL – (1) – (2)		2561,20	kg
1.13.6	Final weight = Empty weight + Load (3)	Calculated	**13868,50**	kg
		Measured	**13964,00**	kg

2. Fuel

2.1. Fuel and fluids :

N°	Item	Value	
2.1.1	EC Standard	-	
2.1.2	Sulphur rate	3,5	ppm
2.1.3	Fuel temperature at test start [1]	36	° C
2.1.4	Fuel temperature at test end [1]	47	° C
2.1.5	AdBlue		
	Quantity at the beginning of the test [1]	47,5	l
	Quantity at the end of the test [1]	45	l
	Difference [1]	2,5	l

[1] Gravimetric test method :
the density of the fuel is 0.840 kg/dm³ measured at 20°C, the density of the AdBlue is 1.085 kg/dm³ at temperature of 20°C

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C – Test Instrumentation and Equipment

N°	Instrument Name	Make / Type	Serial No	Calibration due date	Description
1	VBOX	VBOX3i	023259	24.10.2020	Measures velocity simultaneously at the test and collects consumption data.
2	Kistler	436474 / CDS-DFL-3X	047-19527	25.11.2020	Measures fuel consumption.

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D - TEST RESULTS

1. Consuption measures (related to 20 °C fuel temperature)

N°	Item	Fuel			
		Fuel Consumption (l)	Average temperature of the test (°C)	Corresponding density in (kg/l)	Unit (l/100km)
1.1	SORT 1	0,472	40,8	0,806	44,41
1.2	SORT 2	0,337	37,50	0,808	36,02
1.3	SORT 3	0,482	43,90	0,803	32,48

2. Average speeds

N°	Item	Length	Average time elapsed (sec)	Average speed (km/h)
2.1	SORT 1	1043,63 m	285,3	13,17
2.2	SORT 2	921,75 m	166,90	19,88
2.3	SORT 3	1452,38 m	185,20	28,23

3. Performance measurements (for information)

N°	Item	Time elapsed (sec)			
		Urban bus		Mixed bus	Suburban bus
		Direction 1	Direction 2		
3.1	From 0 to 50 metres	9,3	9,32	-	-
3.2	From 0 to 100 metres	13,43	13,50	-	-
3.3	From 0 to 200 metres	19,72	19,87	-	-
3.4	From 0 to 300 metres	24,91	25,11	-	-
3.5	From 0 to 400 metres	29,58	29,84	-	-
3.6	From 0 to 500 metres	33,87	34,21	-	-
3.7	From 0 to 30 km/h	7,65	7,69	-	-
3.8	From 0 to 50 km/h	13,51	13,81	-	-
3.9	From 30 to 50 km/h	5,86	6,12	-	-

4. Test date and time conditions

Date : 2020.08.18; Time at the start 07:45 ; time at the end 13:23

5. List of Annexes

Annex consists of:

1. Photo of test vehicle
2. Photos of test equipment

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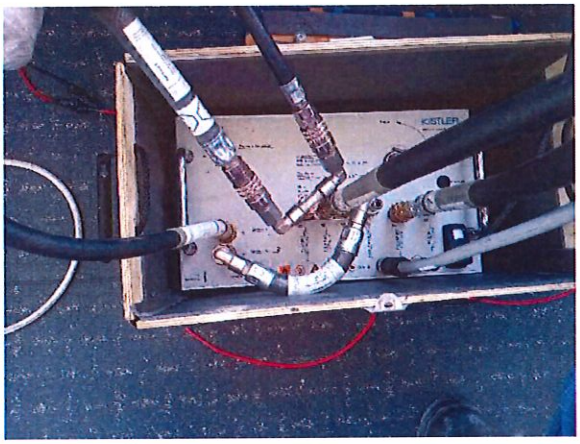
1 -Photo of Test Vehicle

2 - Photos of test equipment

1 – VBOX 3i



2 – Kistler Fuel Flow Meter

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