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TEST REPORT 210212-0180393-1

Report Date: February 12, 2022

Test Component: ABC Marketing 0180393-1, 90 mm Round Bi Halogen
Headlamp

Description:	Technology:	Halogen
	Bulbs:	H9 12V 65W (x2)
	Mounting:	4-adjuster system - cloverleaf mount
	Nominal Voltage:	12V
	Design Voltage:	13.2V
	Material:	Lens- Polycarbonate Body-Aluminum + plastic mounting frame
	Required Connection:	3-wire Weather Pack H9 2-wire Weather Pack for shutter control

Test Results Summary (FMVSS-108)

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen
Headlamp

Photometric test:	14.2.1	UB2 – Upper Beam	Passed
	14.2.1	LB2 – Lower Beam	Passed
Chromaticity test:	14.4.1		Passed
Abrasion test:	14.6.1		Passed
Chemical resistance test:	14.6.2		Passed
Corrosion test:	14.6.3		Passed
Dust test:	14.6.5		Passed
Temperature cycle test:	14.6.6		Passed
Internal heat test:	14.6.6		Passed
Humidity test:	14.6.7		Passed
Vibration test:	14.6.8		Passed

DESCRIPTION

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen Headlamp

LENS:	Markings:	"DOT SAE HR 15 H9 VOR NS-4317"
	Material:	Polycarbonate (clear) with UVHC 3000 external coating

HOUSING:	Markings:	"H9 12V/65W NS-4317"
	Material:	Aluminum + plastic mounting frame

LIGHT SOURCE:	Upper:	H9
	Lower:	H9

TEST RESULTS

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen
Headlamp

PHOTOMETRIC TESTS

Specification: FMVSS-108 (UB2 – Upper Beam)
(LB2V – Lower Beam)

Tests reviewed by: Gary I. Robin

Results: Meets requirements at all points for:
(UB2 – Upper Beam)
(LB2V – Lower Beam)

Photometry tests performed at 13.2 volts

LENS AREA REQUIREMENTS

None

BULB SOCKET REQUIREMENTS

Lamp is a sealed unit.

The bulb socket requirements are not applicable.

TEST RESULTS

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen
Headlamp

Tests reviewed by: Gary I. Robin
Sample: 2

Mechanical tests:

Abrasion test (14.6.1): Passed

After completion of the abrasion test the sample headlamp must meet the requirements of the applicable photometry tests. See post test photometry data.

Chemical resistance test (14.6.2): Passed

After completion of the chemical resistance test, the sample headlamp must have no surface deterioration, coating delamination, fractures, deterioration of bonding or sealing materials, color bleeding, or color pickup visible without magnification and the headlamp must meet the requirements of the applicable photometry tests. See post test photometry data.

Corrosion Test (14.6.3): Passed

After completion of the corrosion test, the sample headlamp must not have any observed corrosion which would result in the failure of any other applicable tests contained in S14.6 and no corrosion of the headlamp mounting and aiming mechanism that would result in the failure of the aiming adjustment tests, inward force test, or torque deflection test of 14.6.

TEST RESULTS (continued)

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen Headlamp

Dust Test (14.6.5): Passed

After completion of the dust test, the sample headlamp must meet the requirements of the applicable photometry tests. See post test photometry data.

Temperature cycle and internal heat test (14.6.6): Passed

After completion of the temperature cycle test, the sample headlamp must: (a) show no evidence of delamination, fractures, entry of moisture, or deterioration of bonding material, color bleeding, warp or deformation visible without magnification; (b) show no lens warpage greater than 3 mm when measured parallel to the optical axis at the point of intersection of the axis of each light source with the exterior surface of the lens; and (c) meet the requirements of the applicable photometry tests. See post test photometry data.

Humidity test (14.6.7): Passed

After completion of the humidity test, the sample headlamp must show no evidence of interior delamination or moisture, fogging or condensation visible without magnification. See post test photometry data.

Vibration test (14.6.8): Passed

After completion of the vibration test, there must be no evidence of Loose or broken parts, other than filaments, visible without magnification.

CHROMATICITY TEST

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen Headlamp

Sample : #2

Test Item	Chromaticity Test
Test Date	2/12/2021
Equipment	power supply, chromaticity meter

Test Conditions:

1. Normal ambient (25~30 °C)
2. Voltage: 13.2 V.

Required:

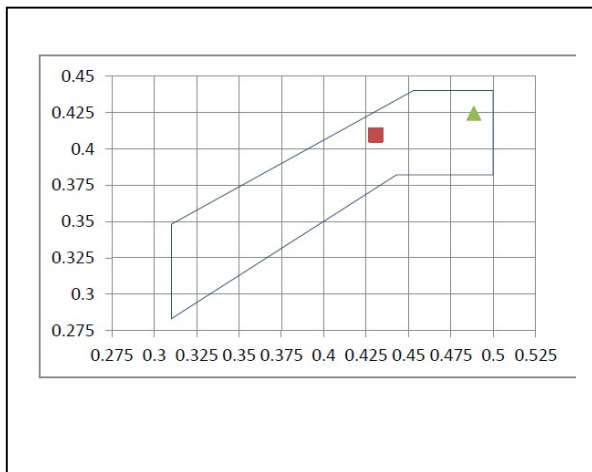
$$0.31 \leq x \leq 0.50, 0.38 \leq y \leq 0.44, y \geq 0.75x + 0.05, y \leq 0.64x + 0.15$$

Test Results:

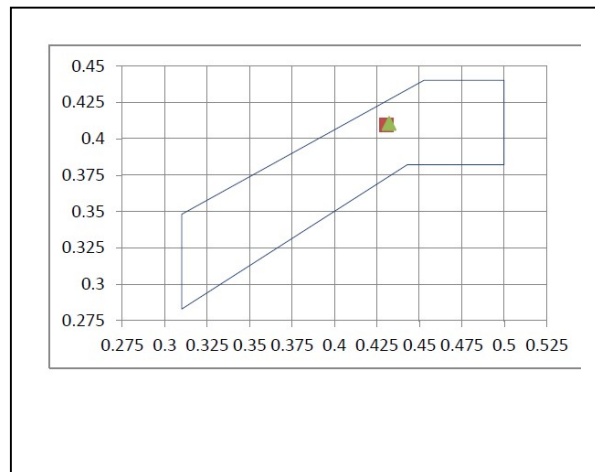
	Left	Right
Upper beam x	0.4308	0.4887
Upper beam y	0.4094	0.4242
Lower beam x	0.4308	0.4323
Lower beam y	0.4094	0.4104

Note: red = left
green = right

UPPER



LOWER



Result: Passed color test

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PHOTOMETRIC TEST DATA

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen Headlamp

INITIAL PHOTOMETRIC TEST

UB2 - Upper Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1 (LH)	S2 (RH)
2U-V	1,500	-	26460	21590
1U-3L	5,000	-	13370	15550
1U-3R	5,000	-	16940	13990
H-V	40,000	75,000	41050	43890
H-3L	15,000	-	15990	18600
H-3R	15,000	-	17000	15990
H-6L	5,000	-	8510	9140
H-6R	5,000	-	9800	8740
H-9L	3,000	-	5829	6876
H-9R	3,000	-	7011	6504
H-12L	1,500	-	5034	5140
H-12R	1,500	-	5425	5231
1.5D-V	5,000	-	24150	38940
1.5D-9L	2,000	-	3009	3830
1.5D-9R	2,000	-	3546	3792
2.5D-V	2,500	-	13830	21630
2.5D-12L	1,000	-	1806	2062
2.5D-12R	1,000	-	1854	1997
4D-V	0	12,000	7546	10710

LB2V - Lower Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1 (LH)	S2 (RH)
10U to 90U	0	125	92.545	54.411
4U-8L	64	-	68.3	125.6
4U-8R	64	-	110.6	112.2
2U-4L	135	-	191.3	280.8
1.5U-1R to 3R	200	-	229.426	452.168
1.5U-1R to R	0	1,400	310.764	522.68
1U-1.5L to L	0	700	255.464	482.18
0.5U-1.5L to L	0	1,000	273.116	636.205
0.5U-1R to 3R	500	2,700	(585.176)855.542	(729.471)1247.103
H-4L	135	-	305.3	724.9
H-8L	64	-	318.9	737.7
0.6D-1.3R	10,000	-	30050	32150
0.86D-V	4,500	-	37190	43830
0.86D-3.5L	1,800	12,000	3041	3088
1.5D-2R	15,000	-	16930	20330
2D-9L	1,250	-	2923	3172
2D-9R	1,250	-	3269	3252
2D-15L	1,000	-	2017	2853
2D-15R	1,000	-	2403	3102
4D-4R	0	12,500	7189	6802
4D-20L	300	-	641.5	744.7
4D-20R	300	-	770.6	756.5

PHOTOMETRIC TEST DATA

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen Headlamp

POST ABRASION TEST PHOTOMETRY DATA

UB2 - Upper Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1
2U-V	1,500	-	21100
1U-3L	5,000	-	15320
1U-3R	5,000	-	13620
H-V	40,000	75,000	43300
H-3L	15,000	-	18320
H-3R	15,000	-	15560
H-6L	5,000	-	8890
H-6R	5,000	-	8430
H-9L	3,000	-	6700
H-9R	3,000	-	6312
H-12L	1,500	-	4936
H-12R	1,500	-	4839
1.5D-V	5,000	-	37023
1.5D-9L	2,000	-	3687
1.5D-9R	2,000	-	3553
2.5D-V	2,500	-	21020
2.5D-12L	1,000	-	1998
2.5D-12R	1,000	-	2003
4D-V	0	12,000	10583

LB2V - Lower Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1
10U to 90U	0	125	45.62
4U-8L	64	-	71.8
4U-8R	64	-	93
2U-4L	135	-	173.1
1.5U-1R to 3R	200	-	324.692
1.5U-1R to R	0	1400	370.298
1U-1.5L to L	0	700	254.158
0.5U-1.5L to L	0	1000	313.22
0.5U-1R to 3R	500	2700	(548.707)711.885
H-4L	135	-	330.4
H-8L	64	-	239.8
0.6D-1.3R	10000	-	35120
0.86D-V	4500	-	39000
0.86D-3.5L	1800	12000	2132
1.5D-2R	15000	-	17470
2D-9L	1250	-	2448
2D-9R	1250	-	2218
2D-15L	1000	-	3657
2D-15R	1000	-	1688
4D-4R	0	12500	5415
4D-20L	300	-	481
4D-20R	300	-	512.1

Device passes photometric requirements at all test points



PHOTOMETRIC TEST DATA

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen Headlamp

POST CHEMICAL TEST PHOTOMETRY DATA

UB2 - Upper Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1
2U-V	1,500	-	21500
1U-3L	5,000	-	15480
1U-3R	5,000	-	13940
H-V	40,000	75,000	43590
H-3L	15,000	-	18550
H-3R	15,000	-	15900
H-6L	5,000	-	9163
H-6R	5,000	-	8685
H-9L	3,000	-	6873
H-9R	3,000	-	6534
H-12L	1,500	-	5123
H-12R	1,500	-	5126
1.5D-V	5,000	-	38964
1.5D-9L	2,000	-	3770
1.5D-9R	2,000	-	3686
2.5D-V	2,500	-	21410
2.5D-12L	1,000	-	2113
2.5D-12R	1,000	-	2125
4D-V	0	12,000	10806

LB2V - Lower Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1
10U to 90U	0	125	91.65
4U-8L	64	-	67.9
4U-8R	64	-	109.3
2U-4L	135	-	492
1.5U-1R to 3R	200	-	228.6
1.5U-1R to R	0	1400	309.83
1U-1.5L to L	0	700	254.158
0.5U-1.5L to L	0	1000	273.06
0.5U-1R to 3R	500	2700	(548.707)836.885
H-4L	135	-	303.3
H-8L	64	-	309.8
0.6D-1.3R	10000	-	30030
0.86D-V	4500	-	36534
0.86D-3.5L	1800	12000	3030
1.5D-2R	15000	-	15470
2D-9L	1250	-	2848
2D-9R	1250	-	2618
2D-15L	1000	-	2009
2D-15R	1000	-	2301
4D-4R	0	12500	6983
4D-20L	300	-	559
4D-20R	300	-	684

Device passes photometric requirements at all test points

PHOTOMETRIC TEST DATA

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen Headlamp

POST DUST TEST PHOTOMETRY DATA

UB2 - Upper Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1
2U-V	1,500	-	21550
1U-3L	5,000	-	15540
1U-3R	5,000	-	13880
H-V	40,000	75,000	43620
H-3L	15,000	-	18590
H-3R	15,000	-	15890
H-6L	5,000	-	9100
H-6R	5,000	-	8680
H-9L	3,000	-	6866
H-9R	3,000	-	6498
H-12L	1,500	-	5030
H-12R	1,500	-	5000
1.5D-V	5,000	-	37246
1.5D-9L	2,000	-	3740
1.5D-9R	2,000	-	3673
2.5D-V	2,500	-	21330
2.5D-12L	1,000	-	2012
2.5D-12R	1,000	-	2079
4D-V	0	12,000	10610

LB2V - Lower Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1
10U to 90U	0	125	48.969
4U-8L	64	-	113.04
4U-8R	64	-	100.98
2U-4L	135	-	252.72
1.5U-1R to 3R	200	-	406.951
1.5U-1R to R	0	1,400	470.41
1U-1.5L to L	0	700	433.962
0.5U-1.5L to L	0	1,000	572.58
0.5U-1R to 3R	500	2,700	(656.520)1122.390
H-4L	135	-	652.4
H-8L	64	-	663.9
0.6D-1.3R	10,000	-	28935
0.86D-V	4,500	-	39447
0.86D-3.5L	1,800	12,000	2779.2
1.5D-2R	15,000	-	18297
2D-9L	1,250	-	2854.8
2D-9R	1,250	-	2926.8
2D-15L	1,000	-	2567.7
2D-15R	1,000	-	2791.8
4D-4R	0	12,500	5941.8
4D-20L	300	-	670.23
4D-20R	300	-	680.85

Device passes photometric requirements at all test points

PHOTOMETRIC TEST DATA

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen
Headlamp

POST TEMPERATURE CYCLE TEST PHOTOMETRY DATA

UB2 - Upper Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1
2U-V	1,500	-	21560
1U-3L	5,000	-	15510
1U-3R	5,000	-	13830
H-V	40,000	75,000	43590
H-3L	15,000	-	18550
H-3R	15,000	-	15780
H-6L	5,000	-	9065
H-6R	5,000	-	8665
H-9L	3,000	-	6853
H-9R	3,000	-	6489
H-12L	1,500	-	5010
H-12R	1,500	-	5003
1.5D-V	5,000	-	37243
1.5D-9L	2,000	-	3703
1.5D-9R	2,000	-	3668
2.5D-V	2,500	-	21319
2.5D-12L	1,000	-	2018
2.5D-12R	1,000	-	2086
4D-V	0	12,000	10689

LB2V - Lower Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1
10U to 90U	0	125	46.52
4U-8L	64	-	107.388
4U-8R	64	-	95.931
2U-4L	135	-	240.08
1.5U-1R to 3R	200	-	386.6
1.5U-1R to R	0	1400	446.88
1U-1.5L to L	0	700	412.26
0.5U-1.5L to L	0	1000	543.95
0.5U-1R to 3R	500	2700	(623.694)1066.390
H-4L	135	-	619.78
H-8L	64	-	630.7
0.6D-1.3R	10000	-	27488
0.86D-V	4500	-	37474
0.86D-3.5L	1800	12000	2640
1.5D-2R	15000	-	17382
2D-9L	1250	-	2712.06
2D-9R	1250	-	2780.46
2D-15L	1000	-	2439.31
2D-15R	1000	-	2652.21
4D-4R	0	12500	5644.71
4D-20L	300	-	636.71
4D-20R	300	-	646.8

Device passes photometric requirements at all test points

PHOTOMETRIC TEST DATA

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen Headlamp

POST INTERNAL HEAT TEST PHOTOMETRY DATA

UB2 - Upper Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1
2U-V	1,500	-	35100
1U-3L	5,000	-	17060
1U-3R	5,000	-	18070
H-V	40,000	75,000	44310
H-3L	15,000	-	18190
H-3R	15,000	-	17720
H-6L	5,000	-	9840
H-6R	5,000	-	9530
H-9L	3,000	-	7317
H-9R	3,000	-	6858
H-12L	1,500	-	5849
H-12R	1,500	-	5184
1.5D-V	5,000	-	25420
1.5D-9L	2,000	-	3636
1.5D-9R	2,000	-	3763
2.5D-V	2,500	-	13960
2.5D-12L	1,000	-	1954
2.5D-12R	1,000	-	2039
4D-V	0	12,000	7587

LB2V - Lower Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1
10U to 90U	0	125	41.89
4U-8L	64	-	81.3
4U-8R	64	-	93.6
2U-4L	135	-	210.5
1.5U-1R to 3R	200	-	395.837
1.5U-1R to R	0	1400	566.108
1U-1.5L to L	0	700	410.332
0.5U-1.5L to L	0	1000	523.977
0.5U-1R to 3R	500	2700	(720.532)1090.249
H-4L	135	-	519.8
H-8L	64	-	435.5
0.6D-1.3R	10000	-	30670
0.86D-V	4500	-	37520
0.86D-3.5L	1800	12000	2488
1.5D-2R	15000	-	16420
2D-9L	1250	-	3346
2D-9R	1250	-	3544
2D-15L	1000	-	3219
2D-15R	1000	-	2439
4D-4R	0	12500	7615
4D-20L	300	-	833
4D-20R	300	-	678.9

Device passes photometric requirements at all test points



PHOTOMETRIC TEST DATA

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen Headlamp

POST HUMIDITY TEST PHOTOMETRY DATA

UB2 - Upper Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1
2U-V	1,500	-	21420
1U-3L	5,000	-	15483
1U-3R	5,000	-	13680
H-V	40,000	75,000	43100
H-3L	15,000	-	18340
H-3R	15,000	-	15880
H-6L	5,000	-	9055
H-6R	5,000	-	8660
H-9L	3,000	-	6845
H-9R	3,000	-	6433
H-12L	1,500	-	5008
H-12R	1,500	-	5013
1.5D-V	5,000	-	37144
1.5D-9L	2,000	-	3726
1.5D-9R	2,000	-	3660
2.5D-V	2,500	-	21309
2.5D-12L	1,000	-	2020
2.5D-12R	1,000	-	2090
4D-V	0	12,000	10789

LB2V - Lower Beam Photometric Test Point Values

Test Points	Minimum (cd)	Maximum (cd)	S1
10U to 90U	0	125	44.194
4U-8L	64	-	102.018
4U-8R	64	-	91.13
2U-4L	135	-	228.07
1.5U-1R to 3R	200	-	367.27
1.5U-1R to R	0	1400	424.536
1U-1.5L to L	0	700	391.64
0.5U-1.5L to L	0	1000	516.752
0.5U-1R to 3R	500	2700	(592.500)1013.070
H-4L	135	-	588.791
H-8L	64	-	599.165
0.6D-1.3R	10000	-	26113.6
0.86D-V	4500	-	35600
0.86D-3.5L	1800	12000	2508
1.5D-2R	15000	-	16512.9
2D-9L	1250	-	2576.4
2D-9R	1250	-	2641.43
2D-15L	1000	-	2317.34
2D-15R	1000	-	2519.6
4D-4R	0	12500	5362.47
4D-20L	300	-	604.87
4D-20R	300	-	614.46

Device passes photometric requirements at all test points

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen
Headlamp

Additional observations:

Lamp was tested at 13.5 volts for 24 hours at an ambient temperature of $25 \pm 3^{\circ} \text{C}$. Resulting lens temperature was 109.7°C . Resulting housing temperature was 98.4°C . After testing, no abnormal phenomena or condensation were found inside the lamp. The bulb remained operational.

Lamp was cycled between -34.4°C for 1 hour and 48.9°C for 1 hour for a duration of 100 hours while operated at 13.5 volts at a relative humidity of 30 percent. Operation remained normal. No condensation was present within the lamp.

Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen Headlamp

Images



Device Name: ABC Marketing 0180393-1, 90 mm Round Bi Halogen
Headlamp

Reviewed and approved for submittal by:



Gary I. Robin

Responsible Engineer

February 12, 2021