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TEST REPORT 210304-4228863

Report Date: March 3, 2021
Test Component: ABC 4228863 36 LED Backup Lamp
Devices Tested: Three (3) each submitted February 23, 2021

Test Summary (FMVSS-108)

Photometric Tests – Backup Lamp

FMVSS 108 – Table XII – Backup PASSED

Mechanical Tests per SAE J575e

| | |
|----------------------------|----------------|
| Vibration | PASSED |
| Moisture | PASSED |
| Thermal | PASSED |
| Impact | PASSED |
| Durability | PASSED |
| LED Life | PASSED |
| Color (SAE J578c) | PASSED |
| Dimensional Tests | PASSED |
| Socket Tests per SAE J567b | Not Applicable |

Signature of responsible engineer:

Gary I. Robin

DESCRIPTION SHEET

Test Component: ABC 4228863 36 LED Backup Lamp

Markings:

Lens: DOT SAE R 20
Housing: None

Lens Information:

Material: Polycarbonate (clear transparent)
Coating: None
Shape/Dimensions: 12-inch long strip
Method of attachment to housing: Vibration weld
Gasket: None

Housing:

Material: Polycarbonate (black)
Shape/Dimensions: 12-inch long strip
Method of attachment to lens: Vibration weld
Gasket: None

| SOURCE | FUNCTION | QUANTITY | VOLTAGE |
|--------|----------|----------|----------|
| LED | R | 36 | 12.8/14V |

Note: lens complies with SAE J576 JUL 91 requirements as specified in FMVSS 108.

TEST RESULT SHEET

Test Component: ABC 4228863 36 LED Backup Lamp

MECHANICAL TESTS: SAE J575e

Sample: 2

Vibration test (Shock test).

There was no evidence of material physical weakness,
lens rotation, displacement or rupture of components.

LEDs were not damaged.

PASSED

Moisture Test:

Lamp had 0cc of moisture accumulation inside of its cavity
(≤ 2 cc required).

PASSED

Dust Test:

No dust was found on the interior surfaces of the device.

The maximum candlepower after external cleaning was
at least 100% of the HV candlepower prior to exposure.

NOT REQUIRED

Corrosion Test:

There was no evidence of excessive corrosion which
would affect the proper functioning of the device.

NOT REQUIRED

Thermal Test:

There was no evidence of reduced function from
temperature or humidity.

PASSED

PASSED

Durability Test:

PASSED

Color Test:

PASSED

Impact Test:

PASSED

LED Life Test:

Lamp is not blinking, blackening or shutting off after
1000 hrs.

PASSED

FMVSS 108 – Table VII – Rear Turn Lamp

PASSED

FMVSS 108 – Table VI-a – Front Turn Lamp

PASSED

FMVSS 108 – Table XIV – Parking

PASSED

Tests reviewed by: Gary I. Robin

TEST RESULT SHEET

Test Component: ABC 4228863 36 LED Backup Lamp

PHOTOMETRIC TESTS

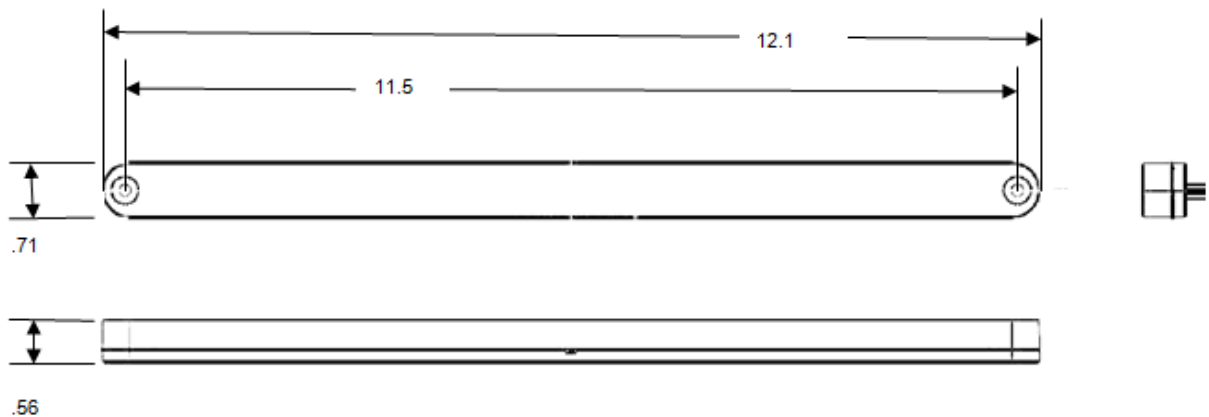
Specification(s): FMVSS 108 – Table XII – Backup
SAE J578C chroma test.

Tests reviewed by: Gary I. Robin

Results: Meets requirements at all points and passes chroma test.

Note: The bulb socket requirements are not applicable because the lamp is a sealed unit.

OUTLINE DRAWING



PHOTOMETRIC TEST DATA SHEET

Test Component: ABC 4228863 36 LED Backup Lamp
 Sample: 2
 Specification: FMVSS 108 -Table XII, Backuip
 Test Distance: 3.16M
 Units: cd
 Test Voltage: 12.8 Volts
 Test Current: 0.28 mAmps
 Test Power: 3.58 Watts
 Aim: Lamp mounted perpendicular to HV

LUMINOUS INTENSITY, CANDELLA

| <u>TEST POINT</u> | <u>MIN</u> | <u>MAX</u> | <u>MEASURED</u> |
|-------------------|------------|------------|-----------------|
| 10U-10L | 10 | 300 | 139.275 |
| 10U-V | 15 | 300 | 133.277 |
| 10U-10R | 10 | 300 | 134.216 |
| 5U-45L | 15 | 300 | 113.17 |
| 5U-10L | 20 | 300 | 167.591 |
| 5U-V | 25 | 300 | 142.495 |
| 5U-10R | 20 | 300 | 159.122 |
| 5U-45R | 15 | 300 | 105.711 |
| H-45L | 15 | 300 | 114.21 |
| H-30L | 25 | 300 | 82.523 |
| H-10L | 50 | 300 | 205.854 |
| H-V | 80 | 300 | 160.032 |
| H-10R | 50 | 300 | 193.716 |
| H-30R | 25 | 300 | 83.952 |
| H-45R | 15 | 300 | 111.8 |
| 5D-45L | 15 | | 111.56 |
| 5D-30L | 25 | | 80.486 |
| 5D-10L | 50 | | 188.597 |
| 5D-V | 80 | | 153.423 |
| 5D-10R | 50 | | 183.948 |
| 5D-30R | 25 | | 81.421 |
| 5D-45R | 15 | | 110.241 |
| group1 | 45 | | 338.94 |
| group2 | 50 | | 163.009 |
| group3 | 100 | | 875.976 |
| group4 | 360 | | 1085.569 |
| group6 | 45 | | 327.752 |
| group5 | 50 | | 165.373 |

Device meets requirements at all points.

Reviewed and approved for submittal by:

A handwritten signature in black ink that reads "Gary I. Robin". The signature is written in a cursive style with a prominent initial "G".

Gary I. Robin
Responsible Engineer

March 3, 2021