



U.S. Department
of Transportation
**Federal Highway
Administration**

1200 New Jersey Ave., SE
Washington, D.C. 20590

March 14, 2016

In Reply Refer To:
HSST/WZ- 339

Mr. Jeremy Britton
Unipart Dorman
Wennington Road
Southport, England PR9 7TN

Dear Mr. Britton:

This letter is in response to your January 18, 2016 request for the Federal Highway Administration (FHWA) to review a roadside safety device, hardware, or system for eligibility for reimbursement under the Federal-aid highway program. This FHWA letter of eligibility is assigned FHWA control number WZ-339 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

Decision

The following devices are eligible, with details provided in the form which is attached as an integral part of this letter:

- ConeLITE Synchro Lamp

Scope of this Letter

To be found eligible for Federal-aid funding, new roadside safety devices should meet the crash test and evaluation criteria contained in the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH). However, the FHWA, the Department of Transportation, and the United States Government do not regulate the manufacture of roadside safety devices. Eligibility for reimbursement under the Federal-aid highway program does not establish approval, certification or endorsement of the device for any particular purpose or use.

This letter is not a determination by the FHWA, the Department of Transportation, or the United States Government that a vehicle crash involving the device will result in any particular outcome, nor is it a guarantee of the in-service performance of this device. Proper manufacturing, installation, and maintenance are required in order for this device to function as tested.

This finding of eligibility is limited to the crashworthiness of the system and does not cover other structural features, nor conformity with the Manual on Uniform Traffic Control Devices.

Eligibility for Reimbursement

Based solely on a review of crash test results and certifications submitted by the manufacturer, and the crash test laboratory, FHWA agrees that the device described herein meets the crash test and evaluation criteria of the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH). Therefore, the device is eligible for reimbursement under the Federal-aid highway program if installed under the range of tested conditions.

Name of system: ConeLITE Synchro Lamp
Type of system: Work Zone Traffic Control Device
Test Level: MASH Test Level 3
Testing conducted by: KARCO Engineering, INC.
Date of request: January 18, 2016
Date initially acknowledged: January 19, 2016
Date of completed package: February 23, 2016

FHWA concurs with the recommendation of the accredited crash testing laboratory as stated within the attached form.

Full Description of the Eligible Device

The device and supporting documentation, including reports of the crash tests or other testing done, videos of any crash testing, and/or drawings of the device, are described in the attached form.

Notice

If a manufacturer makes any modification to any of their roadside safety hardware that has an existing eligibility letter from FHWA, the manufacturer must notify FHWA of such modification with a request for continued eligibility for reimbursement. The notice of all modifications to a device must be accompanied by:

- Significant modifications – For these modifications, crash test results must be submitted with accompanying documentation and videos.
- Non-signification modifications – For these modifications, a statement from the crash test laboratory on the potential effect of the modification on the ability of the device to meet the relevant crash test criteria.

FHWA's determination of continued eligibility for the modified hardware will be based on whether the modified hardware will continue to meet the relevant crash test criteria.

You are expected to supply potential users with sufficient information on design, installation and maintenance requirements to ensure proper performance.

You are expected to certify to potential users that the hardware furnished has the same chemistry, mechanical properties, and geometry as that submitted for review, and that it will meet the test and evaluation criteria of the MASH.

Issuance of this letter does not convey property rights of any sort or any exclusive privilege. This letter is based on the premise that information and reports submitted by you are accurate and correct. We reserve the right to modify or revoke this letter if: (1) there are any inaccuracies in the information submitted in support of your request for this letter, (2) the qualification testing was flawed, (3) in-service performance or other information reveals safety problems, (4) the system is significantly different from the version that was crash tested, or (5) any other information indicates that the letter was issued in error or otherwise does not reflect full and complete information about the crashworthiness of the system.

Standard Provisions

- To prevent misunderstanding by others, this letter of eligibility designated as FHWA control number WZ-339 shall not be reproduced except in full. This letter and the test documentation upon which it is based are public information. All such letters and documentation may be reviewed upon request.
- This letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented system for which the applicant is not the patent holder.
- If the subject device is a patented product it may be considered to be proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects: (a) they must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.

Sincerely yours,



Michael S. Griffith
Director, Office of Safety Technologies
Office of Safety

Enclosure

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter	Date of Request:	February 22, 2016	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Jeremy Britton	
	Company:	Unipart Dorman	
	Address:	Wennington Road, Southport, England PR9 7TN	
	Country:	United Kingdom	
	To:	Michael S. Griffith, Director FHWA, Office of Safety Technologies	

I request the following devices be considered eligible for reimbursement under the Federal-aid highway program.

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'WZ': Crash Worthy Work Zone Traffic Control Devices	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> Engineering Analysis	Cone LITE Synchro lamp mounted on 36" cone	AASHTO MASH	TL3

By submitting this request for review and evaluation by the Federal Highway Administration, I certify that the product(s) was (were) tested in conformity with the AASHTO Manual for Assessing Safety Hardware and that the evaluation results meet the appropriate evaluation criteria in the MASH.

Identification of the individual or organization responsible for the product:

Contact Name:	Jeremy Britton	Same as Submitter <input checked="" type="checkbox"/>
Company Name:	Unipart Dorman	Same as Submitter <input checked="" type="checkbox"/>
Address:	Wennington Road, Southport, England PR9 7TN	Same as Submitter <input checked="" type="checkbox"/>
Country:	United Kingdom	Same as Submitter <input checked="" type="checkbox"/>
Enter below all disclosures of financial interests as required by the FHWA 'Federal-Aid Reimbursement Eligibility Process for Safety Hardware Devices' document.		
No third party financial interests exist. Karco Engineering Inc were paid a one time fee to conduct the tests.		

PRODUCT DESCRIPTION

<input checked="" type="radio"/> New Hardware or Significant Modification	<input type="radio"/> Modification to Existing Hardware	
<p>The test article comprised of a Unipart Dorman Cone LITE Synchro lamp mounted onto a 36" PVC traffic cone supplied by JBC Safety Plastics Inc. . Cone LITE Synchro is a lightweight (552g/1.21lbs- without battery) wireless sequential LED lamp, height 209mm(8.2"), length 242mm(9.5"), external diameter 195mm (7.6"),that can be deployed in a cone taper to improve driver recognition of the taper. The lamp body is designed to fold in on itself to present a carry handle and a compartment to hold the single 6-volt ANSI 908 / 4R25X lantern battery required to power the unit. The lamp body design allows it to slide down the collar of the cone when placed on top of the cone, presenting the lens on front side of cone and battery compartment on the rear. The lamp sits on the cone with no additional mounting fixtures. The cone used for the test was 36" tall with a total weight of 12.32 lbs.</p>		

CRASH TESTING

A brief description of each crash test and its result:

Required Test Number	Narrative Description	Evaluation Results
3-70 (1100C)	Test not conducted based on test article being below 220lbs (110kg) in weight as per MASH 2009 para 3 of clause 2.2.4.2 Description of Tests	Non-Critical, not conducted
3-71 (1100C)	<p>Test 3-71 was conducted using a 2010 Kia Rio weighing 2,627.2lbs (1,192.0kg). The test article did not show any potential to penetrate the vehicles windshield or any other part of the occupant compartment. and the test vehicle's trajectory remained stable during and after impact event. Three (3) MASH 3-71 tests were performed on three (3) test articles by the same test vehicle.</p> <p>test1- Impact speed 61.16mph (98.42km/h), 0 deg, zero offset. test2- Impact speed 62.19mph (100.09km/h), 90 deg,zero offset test3 -Impact speed 62.35mph (100.34km/h), 90 deg, 1/4 offset of vehicle width.</p> <p>The test article yielded as a result of each impact , the lamp separated from cone during each test and traveled over the vehicle, minor dent to front of hood was noted. The third impact damaged the oil filter causing it to leak. Debris from the test articles did not cause a hazard to the drivers vision. The test vehicle's occupant compartment was not deformed or penetrated by the test article during the tests . The vehicle remained upright and did not exceed the 75 deg roll angle throughout the tests and did not lose control as a result of any of the impacts . Because the test article weights were less than 220Lbs (100kg) , it is deemed incapable of causing the OIV and ride down acceleration values to exceed its limits.</p> <p>For all 3 tests the Unipart Dorman ConeLITE Synchro was mounted on a 36" traffic cone manufactured by JBC Safety Plastics Inc. Based on the tests performed, Karco's opinion is that the Cone LITE Synchro can be installed on other cones of similar size or smaller and composed of the same materials without affecting its impact performance.</p>	PASS

Required Test Number	Narrative Description	Evaluation Results
3-72 (2270P)	Test 3-72 is performed using a Dodge RAM 4 door pick up truck. Because of the Kia Rio's lower hood height and overall smaller size, Karco determined that the test article was more likely to fail with an impact by the Kia Rio, due to its lower hood height and overall smaller size, therefore test 3-72 was not performed.	Non-Critical, not conducted

Full Scale Crash Testing was done in compliance with MASH by the following accredited crash test laboratory (cite the laboratory's accreditation status as noted in the crash test reports.):

Laboratory Name:	KARCO Engineering, INC	
Laboratory Signature:	Steven Matsusaka <small>Digitally signed by Steven Matsusaka DN: cn=Steven Matsusaka, o=KARCO Engineering, LLC, ou, email=smatsusaka@karco.com, c=US Date: 2016.02.22 16:02:47 -0800</small>	
Address:	9270 Holy Road, Adelanto, CA	Same as Submitter <input type="checkbox"/>
Country:	United States of America	Same as Submitter <input type="checkbox"/>
Accreditation Certificate Number and Dates of current Accreditation period :	TL-371, current certificate commencing Dec 18, 2015	

Submitter Signature*:



Submit Form

ATTACHMENTS

Attach to this form:

- 1) Additional disclosures of related financial interest as indicated above.
- 2) A copy of the full test report, video, and a Test Data Summary Sheet for each test conducted in support of this request.
- 3) A drawing or drawings of the device(s) that conform to the Task Force-13 Drawing Specifications [[Hardware Guide Drawing Standards](#)]. For proprietary products, a single isometric line drawing is usually acceptable to illustrate the product, with detailed specifications, intended use, and contact information provided on the reverse. Additional drawings (not in TF-13 format) showing details that are relevant to understanding the dimensions and performance of the device should also be submitted to facilitate our review.

FHWA Official Business Only:

Eligibility Letter		AASHTO TF13	
Number	Date	Designator	Key Words



Unipart Dorman
Wennington Road
Southport, Merseyside PR9 7TN

Attention: Mr. Jerry Britton

Date: January 22, 2016

Mr. Britton,

On November 24, 2015, a series of tests was performed to evaluate the impact performance of the Unipart Dorman ConeLITE Synchro Lamp Kit installed on a 36" Traffic Cone manufactured by JBC Safety Plastic Inc. The tests were performed per the *Manual for Assessing Safety Hardware* (MASH) Test 3-71.

The test was performed to evaluate the test article against three categories: structural adequacy, occupant risk, and vehicle trajectory. The test article was tested at various impact angles and locations to maximize the likelihood of a test failure. The ConeLITE Synchro Lamp Kit and 36" Traffic Cone met all of the required evaluation criteria.

Test 3-71 was conducted using a 2010 Kia Rio. The test article did not show potential to penetrate the vehicle's windshield or any other part of the occupant compartment, and the test vehicle's trajectory remained stable during and after the impact event. Test 3-72 of the MASH test procedure is performed using a Dodge Ram 4-door pickup truck. Because of the Kia Rio's lower hood height and overall smaller size, KARCO determined that the test article was more likely to fail with an impact by the Kia Rio, due to its lower hood height and overall smaller size. Therefore, Test 3-72 was not performed.

The tested Unipart Dorman ConeLITE Synchro was installed on a 36" Traffic Cone manufactured by JBC Safety Plastic Inc. Based on the tests performed, KARCO's opinion is that the ConeLITE Synchro can be installed on other cones of similar size or smaller and composed of similar materials without affecting its impact performance.

Furthermore, KARCO is aware of the issue of the varying and often out of tolerance hood height of the Kia Rio test vehicle. The specified hood height dimension measurement as outlined in the MASH test procedure is 24.0 in. +/- 4 in. (610 mm +/- 102 mm). The hood height of the vehicle used for this test was 27.3 in. (693 mm), which is within the specified tolerance.

Sincerely yours,

A handwritten signature in blue ink that reads "Frank D. Richardson".

Frank D. Richardson
President
KARCO Engineering, LLC.

SECTION 4

MASH TEST 3-71 0°, ZERO OFFSET SUMMARY

Client: Unipart Dorman
Test Program: MASH 3-71
Vehicle: 2010 Kia Rio 4-Door Sedan

Project No. P35056-01
Test Date: 11/24/15

SEQUENTIAL PHOTOGRAPHS



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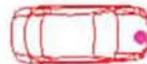
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PLAN VIEW

-15 ft 0 ft 15 ft 30 ft 45 ft 60 ft 75 ft 90 ft 105 ft 120 ft 135 ft



Pre-Test
● Article
● Vehicle
Post-Test
● Article
● Vehicle

SECTION 4 ... (CONTINUED)
MASH TEST 3-71 0°, ZERO OFFSET SUMMARY

Client:	Unipart Dorman	Project No.	P35056-01
Test Program:	MASH 3-71	Test Date:	11/24/15
Vehicle:	2010 Kia Rio 4-Door Sedan		

SUMMARY TABLE

GENERAL INFORMATION		IMPACT CONDITIONS	
TEST AGENCY	KARCO Engineering, LLC	VELOCITY	61.16 mph (98.42 km/h)
TEST DESIGNATION	3-71	ANGLE (°)	0°
TEST DATE	11/24/15	LOCATION	Centerline
TEST ARTICLE		IMPACT SEVERITY	
NAME / MODEL	36" Traffic Cone with ConeLITE Synchro lamp kits	EXIT CONDITIONS	
TYPE	PVC Traffic Cone	VELOCITY	59.89 mph (96.38 km/h)
INSTALLATION DETAILS	On Asphalt	ANGLE (°)	0°
DESCRIPTION	36" traffic cone with detachable light	POST-IMPACT TRAJECTORY	
LENGTH	36 in. (900 mm)	VEHICLE STABILITY	Satisfactory
WIDTH	14.75 in. (375 mm)	STOPPING DISTANCE	
ROAD SURFACE	Asphalt	OCCUPANT RISK VALUES	
TEST VEHICLE		FLAIL SPACE VELOCITY (ft/sec)	
TYPE / DESIGNATION	1100C	X DIRECTION	
YEAR, MAKE AND MODEL	2010 Kia Rio	Y DIRECTION	
CURB MASS	2481 lbs (1125.5 kg)	RIDEDOWN ACCELERATION (g's)	
TEST INERTIAL MASS	2473 lbs (1122.0 kg)	X DIRECTION	
GROSS STATIC MASS	2627 lbs (1192.0 kg)	Y DIRECTION	

¹Values not calculated due to test article weight being less than 220 lbs (100 kg)

SECTION 5

MASH TEST 3-71 90°, ZERO OFFSET SUMMARY

Client: Unipart Dorman
Test Program: MASH 3-71
Vehicle: 2010 Kia Rio 4-Door Sedan

Project No. P35056-01
Test Date: 11/24/15

SEQUENTIAL PHOTOGRAPHS



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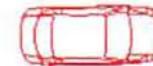
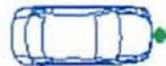
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PLAN VIEW

-15 ft 0 ft 15 ft 30 ft 45 ft 60 ft 75 ft 90 ft 105 ft 120 ft 135 ft



Pre-Test
● Article
● Vehicle
Post-Test
● Article
● Vehicle

SECTION 5 ... (CONTINUED)

MASH TEST 3-71 90°, ZERO OFFSET SUMMARY

Client: Unipart Dorman Project No. P35056-01
 Test Program: MASH 3-71 Test Date: 11/24/15
 Vehicle: 2010 Kia Rio 4-Door Sedan

SUMMARY TABLE

GENERAL INFORMATION		IMPACT CONDITIONS	
TEST AGENCY	KARCO Engineering, LLC	VELOCITY	62.19 mph (100.09 km/h)
TEST DESIGNATION	3-71	ANGLE (°)	0°
TEST DATE	11/24/15	LOCATION	Centerline
TEST ARTICLE		IMPACT SEVERITY	
NAME / MODEL	36" Traffic Cone with ConeLITE Synchro lamp kits	EXIT CONDITIONS	
TYPE	PVC Traffic Cone	VELOCITY	61.71 mph (99.31 km/h)
INSTALLATION DETAILS	On Asphalt	ANGLE (°)	0°
DESCRIPTION	36" traffic cone with detachable light	POST-IMPACT TRAJECTORY	
LENGTH	36 in. (900 mm)	VEHICLE STABILITY	Satisfactory
WIDTH	14.75 in. (375 mm)	STOPPING DISTANCE	
ROAD SURFACE	Asphalt	OCCUPANT RISK VALUES	
TEST VEHICLE		FLAIL SPACE VELOCITY (ft/sec)	
TYPE / DESIGNATION	1100C	X DIRECTION	
YEAR, MAKE AND MODEL	2010 Kia Rio	Y DIRECTION	
CURB MASS	2481 lbs (1125.5 kg)	RIDEDOWN ACCELERATION (gs)	
TEST INERTIAL MASS	2473 lbs (1122.0 kg)	X DIRECTION	
GROSS STATIC MASS	2627 lbs (1192.0 kg)	Y DIRECTION	

¹Values not calculated due to test article weight being less than 220 lbs (100 kg)

SECTION 6

MASH TEST 3-71 0°, ¼ OFFSET SUMMARY

Client: Unipart Dorman
Test Program: MASH 3-71
Vehicle: 2010 Kia Rio 4-Door Sedan

Project No. P35056-01
Test Date: 11/24/15

SEQUENTIAL PHOTOGRAPHS



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0.020 s

0.060 s

0.120 s

0.250 s

PLAN VIEW



Pre-Test
● Article
● Vehicle
Post-Test
● Article
● Vehicle

SECTION 6 ... (CONTINUED)
MASH TEST 3-71 0°, ¼ OFFSET SUMMARY

Client: Unipart Dorman Project No. P35056-01
 Test Program: MASH 3-71 Test Date: 11/24/15
 Vehicle: 2010 Kia Rio 4-Door Sedan

SUMMARY TABLE

GENERAL INFORMATION		IMPACT CONDITIONS	
TEST AGENCY	KARCO Engineering, LLC	VELOCITY	62.35 mph (100.34 km/h)
TEST DESIGNATION	3-71	ANGLE (°)	0°
TEST DATE	11/24/15	LOCATION	1/4-W offset towards the passenger side
TEST ARTICLE		IMPACT SEVERITY	
NAME / MODEL	36" Traffic Cone with ConeLITE Synchro lamp kits	EXIT CONDITIONS	
TYPE	PVC Traffic Cone	VELOCITY	60.85 mph (97.93 km/h)
INSTALLATION DETAILS	On Asphalt	ANGLE (°)	0°
DESCRIPTION	36" traffic cone with detachable light	POST-IMPACT TRAJECTORY	
LENGTH	36 in. (900 mm)	VEHICLE STABILITY	Satisfactory
WIDTH	14.75 in. (375 mm)	STOPPING DISTANCE	
ROAD SURFACE	Asphalt	OCCUPANT RISK VALUES	
TEST VEHICLE		FLAIL SPACE VELOCITY (ft/sec)	
TYPE / DESIGNATION	1100C	X DIRECTION	1
YEAR, MAKE AND MODEL	2010 Kia Rio	Y DIRECTION	1
CURB MASS	2481 lbs (1125.5 kg)	RIDEDOWN ACCELERATION (gs)	
TEST INERTIAL MASS	2473 lbs (1122.0 kg)	X DIRECTION	1
GROSS STATIC MASS	2627 lbs (1192.0 kg)	Y DIRECTION	1

¹Values not calculated due to test article weight being less than 220 lbs (100 kg)