



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

May 13, 2020

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

In Reply Refer To:
HSST-1/WZ-391

Mr. John Pasakarnis
Dicke Safety Products
1201 Waren Ave.
Downers Grove, IL 60515

Dear Mr. Pasakarnis:

This letter is in response to your December 30, 2019 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-391 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

Decision

The following device is eligible within the length-of-need, with details provided in the form which is attached as an integral part of this letter:

- Dicke Safety Products T155 Sign Stand with 48"x48" MDF Sign

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' (AASHTO) 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 AASHTO's 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: Dicke Safety Products T155 Sign Stand with 48"x48" MDF Sign
Type of system: Work Zone
Test Level: MASH Test Level 3 (TL3)
Testing conducted by: Applus IDIADA KARCO Engineering, LLC.
Date of request: December 30, 2019

FHWA concurs with the recommendation of the accredited crash testing laboratory on 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

This eligibility letter is issued for the subject device as tested. Modifications made to the device are not covered by this letter. Any modifications to this device should be submitted to the user (i.e., state DOT) as per their requirements.

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 AASHTO's 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-391 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.
- This FHWA eligibility letter is not an expression of any Agency view, position, or determination of validity, scope, or ownership of any intellectual property rights to a specific device or design. Further, this letter does not impute any distribution or licensing rights to the requester. This FHWA eligibility letter determination is made based solely on the crash-testing information submitted by the requester. The FHWA reserves the right to review and revoke an earlier eligibility determination after receipt of subsequent information related to crash testing.

Sincerely,

A handwritten signature in cursive script that reads "Michael S. Griffith".

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

Enclosures

Request for Federal Aid Reimbursement Eligibility of Highway Safety Hardware

Submitter	Date of Request:	December 30, 2019	<input checked="" type="radio"/> New <input type="radio"/> Resubmission
	Name:	Steven Matsusaka	
	Company:	Applus IDIADA KARCO Engineering, LLC.	
	Address:	9270 Holly Rd, Adelanto, CA 92301	
	Country:	United States of America	
	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.

Device & Testing Criterion - Enter from right to left starting with Test Level

System Type	Submission Type	Device Name / Variant	Testing Criterion	Test Level
'WZ': Crash Worthy Work Zone	<input checked="" type="radio"/> Physical Crash Testing <input type="radio"/> Engineering Analysis	T155 Sign Stand with 48" x 48" MDF Sign	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.

Individual or Organization responsible for the product:

Contact Name:	John Pasakarnis	Same as Submitter <input type="checkbox"/>
Company Name:	DICKE Safety Products	Same as Submitter <input type="checkbox"/>
Address:	1201 Warren Ave., Downers Grove, IL 60515	Same as Submitter <input type="checkbox"/>
Country:	United States of America	Same as Submitter <input type="checkbox"/>

Enter below all disclosures of financial interests as required by the FHWA 'Federal-Aid Reimbursement Eligibility Process for Safety Hardware Devices' document.

DICKE Safety Products is the manufacturer and marketer of device.

Applus IDIADA KARCO Engineering, LLC (IDIADA KARCO) is an independent research and testing laboratory having no affiliation with any other entity. IDIADA KARCO is actively involved in data acquisition and compliance/certification testing for a variety of government agencies and equipment manufacturers. The principals and staff of IDIADA KARCO have no past or present financial, contractual or organizational interest in any company or entity directly or indirectly related to the products that KARCO tests. If any financial interest should arise, other than receiving fees for testing, reporting, etc., with respect to any project, the company will provide, in writing, a full and immediate disclosure to the FHWA.

PRODUCT DESCRIPTION

Help

- New Hardware or
 Significant Modification

 Modification to
 Existing Hardware

The DICKESafetyProducts T155 sign stand is a work-zone traffic control device. The as-tested device consisted of one 48.0 in. (1.2 m) square MDF rigid sign, one (1) steel mast, one (1) steel sign bracket, and one (1) stand assembly. The as-tested device weighed approximately 55.0 lbs (24.9 kg). The device had a height of 76.3 in. (1.9 m) measured to the top of the sign. The T155 sign stand was tested with one (1) 25.0 lb. (11.3 kg) sand bag hung on a sandbag hook.

The square medium density fiberboard (MDF) was supported by two (2) sign hooks of the stand assembly and secured at the top by the steel sign bracket. The mounting height of the sign was 13.9 in. (353 mm) measured to the bottom corner. The steel mast consisted of one (1) 1.0 in. (25 mm) square steel tube with the sign bracket attached at the top and secured at the stand with a steel screw handle.

The stand is composed of a hub assembly and three (3) 1.2 in. (30 mm) square steel tube legs. The front two (2) legs have one (1) sign hook each and the back leg has one (1) sandbag hook. In its deployed state, the stand assembly had a footprint measuring 53 in. (1.3 m) along the front by 38 in. (965 mm) perpendicularly towards the back leg.

CRASH TESTING

By signature below, the Engineer affiliated with the testing laboratory, agrees in support of this submission that all of the critical and relevant crash tests for this device listed above were conducted to meet the MASH test criteria. The Engineer has determined that no other crash tests are necessary to determine the device meets the MASH criteria.

Engineer Name:	Steven Matsusaka	
Engineer Signature:	Steven Matsusaka	Digitally signed by Steven Matsusaka DN: cn=Steven Matsusaka, email=steven.matsusaka@idiada.com, c=US Date: 2019.12.30 16:41:24 -08'00'
Address:	9270 Holly Rd, Adelanto, CA 92301	Same as Submitter <input type="checkbox"/>
Country:	United States of America	Same as Submitter <input checked="" type="checkbox"/>

A brief description of each crash test and its result: Help

Required Test Number	Narrative Description	Evaluation Results
3-70 (1100C)	Designed to evaluate the ability of a small vehicle to activate any breakaway, fracture, or yielding mechanism, Test 3-70 is considered optional for work-zone traffic control devices weighing less than 220 lb (100 kg). The T155 sign stand weighed approximately 55.0 lbs (24.9 kg) and therefore the test was non-relevant and not conducted.	Non-Relevant Test, not conducted

Required Test Number	Narrative Description	Evaluation Results
3-71 (1100C)	<p>Two (2) T155 sign stands were impacted on the same test run. The devices were spaced 60.0 ft. (18.3 m) apart and set at two (2) critical impact angles (CIA), 0° and 90°. The 1100C small car used for this test was a 2010 Kia Rio 4-door sedan with a test inertial weight of 2,428.3 lbs (1,101.5 kg).</p> <p>The test vehicle impacted the 0° test sign at a speed of 64.27 mph (103.44 km/h) and proceeded to impact the 90° test sign at a speed of 63.32 mph (101.90 km/h). Upon impact, the 0° CIA sign broke away from its stand. The 90° CIA remained intact after the impact but was deflected up and away from the vehicle. The occupant compartment was not penetrated and the deformation limits were not exceeded. The T155 sign stand broke away and yielded in a predictable manner. Debris from the test articles did not cause a hazard to the driver's vision. The vehicle remained stable and upright throughout the test. The T155 sign stand met all the requirements for MASH Test 3-71.</p>	PASS
3-72 (2270P)	<p>Two (2) T155 sign stands were impacted on the same test run. The devices were spaced 60.0 ft. (18.3 m) apart and set at two (2) critical impact angles (CIA), 0° and 90°. The 2270P vehicle used for this test was a 2014 RAM 1500 4-door pick-up truck with a test inertial weight of 5,052.9 lbs (2,292.0 kg).</p> <p>The test vehicle impacted the 0° test sign at a speed of 60.08 mph (96.69 km/h) and proceeded to impact the 90° test sign at a speed of 59.28 mph (95.40 km/h). Upon impact, both T155 signs broke away and the sign stands yielded. The occupant compartment was not penetrated and the deformation limits were not exceeded. The T155 sign stands broke away and yielded in a predictable manner. Debris from the test articles did not cause a hazard to the driver's vision. The vehicle remained stable and upright throughout the test. The vehicle did not leave its lane and its trajectory was stable after the sign stand was impacted. The T155 sign stand met all the requirements for MASH Test 3-72.</p>	PASS

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:	ApplusIDIADA KARCOEngineering, LLC.	
Laboratory Signature:	Steven Matsusaka <small>DN: cn=Steven Matsusaka, email=steven.matsusaka@idiada.com, c=US Digitally signed by Steven Matsusaka Date: 2019.12.30 16:41:31 -08'00'</small>	
Address:	9270 Holly Rd, Adelanto, CA 92301	Same as Submitter <input checked="" type="checkbox"/>
Country:	United States of America	Same as Submitter <input checked="" type="checkbox"/>
Accreditation Certificate Number and Dates of current Accreditation period :	TL371: July 1, 2019 - July 1, 2022	

Submitter Signature*: **Steven Matsusaka**

Digitally signed by Steven Matsusaka
DN: cn=Steven Matsusaka,
email=steven.matsusaka@idiada.com, c=US
Date: 2019.12.30 16:41:37 -08'00'

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		
Number	Date	Key Words

MASH 2016 Test 3-71 Summary

0° CIA

90° CIA



0.000 s

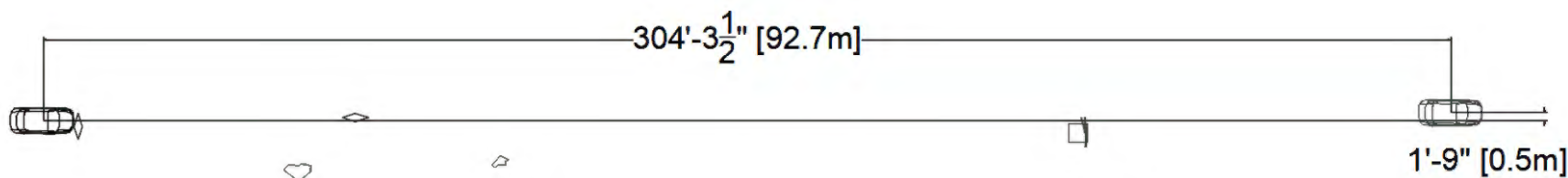
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GENERAL INFORMATION

Test Agency.....Applus.IDIADA KARCO
 Test No.....P39252-01
 Test Designation.....3-71
 Test Date.....8/29/19

TEST ARTICLE

Name / Model.....T155 sign stand with 48" x 48" MDF sign
 Type.....Work Zone Traffic Control Device
 Device Height.....6.4 ft. (1.9 m)
 Key Elements.....MDF and steel
 Road Surface.....Smooth, clean Concrete

Impact Conditions

Impact Velocity Device 1.....64.27 mph (103.44 km/h)
 Impact Velocity Device 2.....63.32 mph (101.90 km/h)
 Device 1 Angle.....0.0°
 Device 2 Angle.....90.0°
 Device 1 Kinetic Energy.....335.4 kip-ft (454.7 kJ)
 Device 2 Kinetic Energy.....325.5 kip-ft (441.3 kJ)

Exit Conditions

Device 1 Exit Velocity.....63.6 mph (102.30 km/h)
 Device 2 Exit Velocity.....63.9 mph (102.8 km/h)
 Vehicle Resting Position.....304.3 ft. (92.7 m) Downstream
 1.8 ft. (0.5 m) Left

Occupant Risk

Longitudinal OIV.....N/A*
 Lateral OIV.....N/A*
 Longitudinal RA.....N/A*
 Lateral RA.....N/A*
 THIV.....N/A*
 PHD.....N/A*
 ASI.....N/A*

Test Article Deflections

0° Sign Debris Field (longitudinal) ..137.5 ft. (41.9 m)
 0° Sign Debris Field (lateral).... 31.3 ft. (9.5 m)
 90° Sign Debris Field (longitudinal).. 156.3 ft. (47.6 m)
 90° Sign Debris Field (lateral)..... 2.7 ft. (0.8 m)

TEST VEHICLE

Type / Designation.....1100C
 Year, Make, and Model.....2010 Kia Rio
 Curb Mass.....2,436.1 lbs (1,105.0 kg)
 Test Inertial Mass.....2,428.4 lbs (1,101.5 kg)
 Gross Static Mass.....2,592.6 lbs (1,176.0 kg)

Vehicle Stability

Maximum Roll Angle.....N/A*
 Maximum Pitch Angle.....N/A*
 Maximum Yaw Angle.....N/A*
 * Not Applicable, device weighs less than 220 lbs (100 kg)

Vehicle Damage

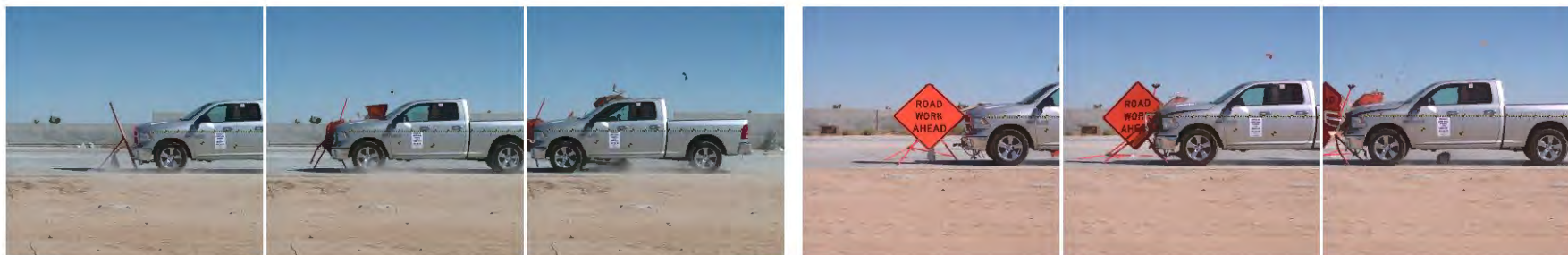
Vehicle Damage Scale.....12:FD-1 TR-P39252-01-NC
 CDC.....12FDGW1
 Maximum Deformation.....0.2 in. (5 mm) at floor pan

Figure 3 Summary of Test 3-71

MASH 2016 Test 3-72 Summary

0° CIA

90° CIA



0.000 s

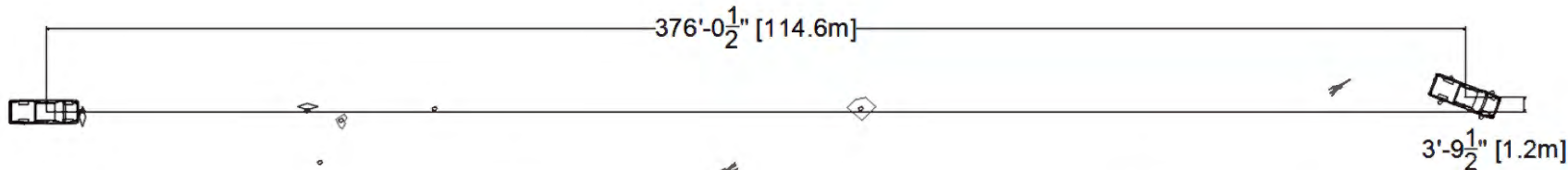
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GENERAL INFORMATION

Test Agency.....Applus.IDIADA KARCO
 Test No.....P39253-01
 Test Designation.....3-72
 Test Date.....8/29/19

TEST ARTICLE

Name / Model.....T155 sign stand with 48" x 48" MDF sign
 Type.....Work-Zone Traffic Control Device
 Device Height.....6.4 ft. (1.9 m)
 Key Elements.....MDF and steel
 Road Surface.....Smooth, clean Concrete

TEST VEHICLE

Type / Designation.....2270P.....
 Year, Make, and Model.....2014 RAM.1500...
 Curb Mass.....5,029.8.lbs (2,281.5 kg)
 Test Inertial Mass.....5,052.9.lbs (2,292.0 kg)
 Gross Static Mass.....5,052.9.lbs (2,292.0 kg)

Impact Conditions

Impact Velocity Device 1.....60.08.mph (96.69 km/h)
 Impact Velocity Device 2.....59.28.mph (95.40 km/h)
 Device 1 Angle.....0.0°.....
 Device 2 Angle.....90.0°.....
 Device 1 Kinetic Energy.....609.7.kip-ft (826.7 kJ)
 Device 2 Kinetic Energy.....593.6.kip-ft (804.8 kJ)

Exit Conditions

Device 1 Exit Velocity.....59.47.mph (95.7 km/h)
 Device 2 Exit Velocity.....59.74.mph (95.6 km/h)
 Vehicle Resting Position.....376.0.ft. (114.6 m) Downstream
 3.8 ft. (1.2 m) Left
 Vehicle Stability.....Satisfactory.....

* Not Applicable, device weighs less than 220 lbs (100 kg)

Occupant Risk

Longitudinal OIV.....N/A*
 Lateral OIV.....N/A*
 Longitudinal RA.....N/A*
 Lateral RA.....N/A*
 THIV.....N/A*
 PHD.....N/A*
 ASI.....N/A*

Test Article Deflections

0° Sign Debris Field (longitudinal) ..206.3 ft. (62.9 m)
 0° Sign Debris Field (lateral)... 15.7 ft. (4.8 m)
 90° Sign Debris Field (longitudinal).. 273.7 ft. (83.4 m)
 90° Sign Debris Field (lateral).....6.6 ft. (2.0 m)

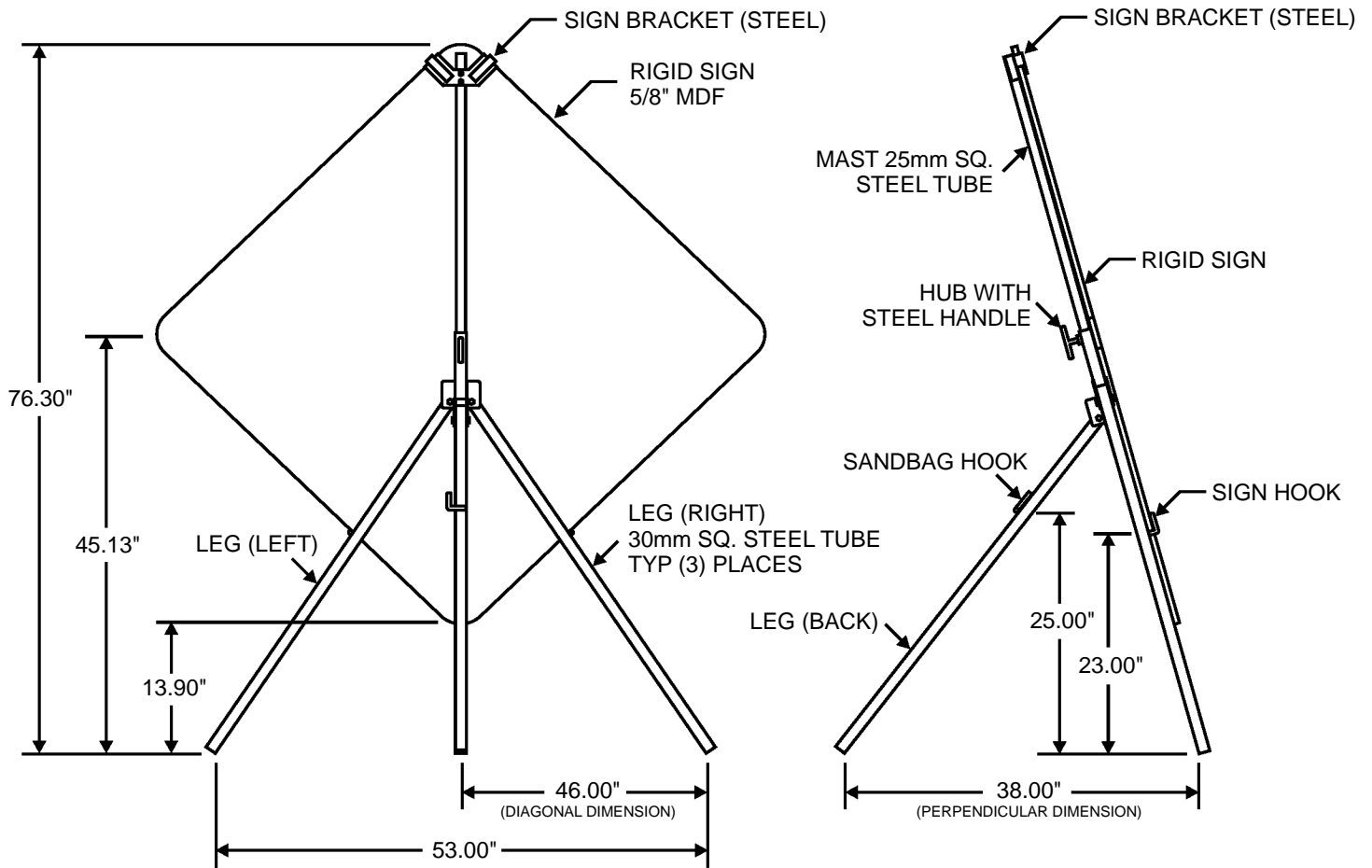
Vehicle Damage

Vehicle Damage Scale.....12:FD-1
 CDC.....12FDAW1...
 Maximum Deformation.....0.2 in. (.5 mm) at windshield

Figure 3 - Summary of Test 3-72

TR-P39253-01-NC

T155



Weight: T155 SYSTEM

Sign	36.8 lbs.
Sign Stand	18.2 lbs.
Total	55.0 lbs.

T155 STAND

- LEGS - 30mm X 30mm X 1.6mm STEEL TUBE
- MAST - 25mm X 25mm X 1.6mm STEEL TUBE

RIGID SIGN

- RIGID SIGN - 5/8" X 48" X 48" MDF



DICKE SAFETY PRODUCTS

Illinois - 1201 Warren Avenue • Downers Grove, IL 60515 • Ph: 630.969.0050 • Fax: 630.969.3973
 Oregon - 1845 Anunsen Street, N.E. • Salem, OR 97301 • Ph: 800.333.5641 • Fax: 503.364.0340

www.dicketool.com

T155 Sign Stand

PARTS LIST



	<i>Description (Quantity per Stand.)</i>	<i>Part Number</i>
1	Mast w/Sign Bracket (1)	T155-MAST
2	Hub Assembly(1)	T155-HUB
3	Left Leg (1)	T155-LLEG
4	Right Leg (1)	T155-RLEG
5	Back Leg (1)	T155-BLEG



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Oregon - 1845 Anunsen Street, N.E. • Salem, OR 97301 • Ph: 800.333.5641 • Fax: 503.364.0340