Automated Roadway Pavement Marker Placement System

Highways for LIFE Technology Partnerships 2009 Award $405,560

U.S. Department of Transportation
Federal Highway Administration
HIGHWAYS FOR LIFE
Accelerating Innovation for the American Driving Experience.

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Need for Innovation

Manual installation of raised roadway pavement markers is time-consuming and one of the most dangerous activities in the industry. Traffic delays and vehicle crashes at work zones have resulted in significant economic consequences. Automating the process can reduce congestion by requiring less stoppage on roadways and achieve cost savings from reduced labor and accelerated installation time.

Project Overview

Stay Alert Safety Services refined the four sub-systems of the automated roadway pavement marker placement system which automates the installation of raised pavement markers on roadways. Field tests demonstrated that the system reduced labor hours, installation time and risk of worker injury. Field tests also showed that the number of markers placed equals or is better than the manual placement method. The final report and a video is available at www.fhwa.dot.gov/hfl/partnerships/marker.cfm

Project Team

Stay Alert Safety Services
Detail Technologies
North Carolina DOT

1

Versatile

This unit will fit on most flat bed stake trucks and has the ability to be adjusted to different heights of the bed.

2

Travel Position

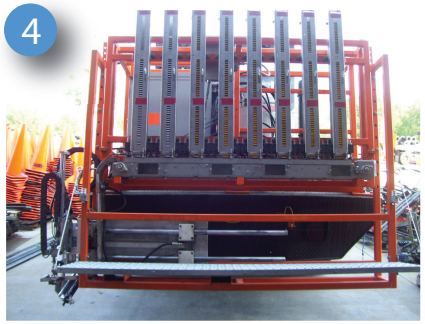
To assure safe travel, the unit has a hinge system that allows for it to be winched upward to a safe ground clearance position for mobilization purposes.

3

The Brains

The Allen Bradley control is the brain for all the sensors, valves and motions for the machine. It is very user friendly and allows for a visual aid in testing and trouble shooting.

4



Magazine Racks

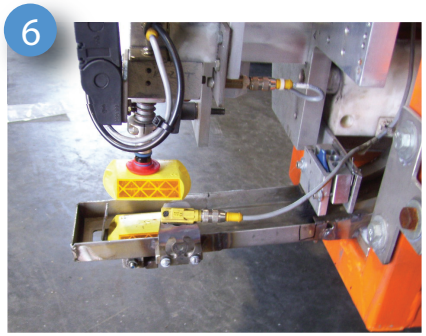
There are eight magazines with the ability to hold over 500 RPM'S. It allows for two different type/color markers that can be switched by the operator. Each has a different sensor to indicate if markers are present. Once empty the sensor tells the system to move to the next one.

5

Hydraulic System

Each magazine has a hydraulic cylinder that actuates back and forth to allow for one marker at a time to drop from the magazine. It is controlled by a series of electronic valves that interface with the Allen Bradley control.

6



Marker Chute and Nest

After the marker has landed in the "Nest" a suction cup driven by a sensor is ready to be moved to the installation position.

7

Pendant

This pendant is a wireless control panel that is operated by the driver from inside of the applicator or a secondary vehicle and is powered by the cigarette lighter. It comes with a automatic and manual mode.

8

Installation

As the applicator vehicle nears the point of installation the operator engages the system and as the suction cup lifts the marker into place the bituminous is placed onto the surface seconds before the RPM is placed. Once installed it returns back to the nest.

Turn over to see more details.