U.S. Department of Transportation
National Highway Traffic Safety Administration

Laboratory Test Procedure for Dynamic Rollover

The Fishhook Maneuver Test Procedure

New Car Assessment Program (NCAP)

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U.S. Department of Transportation
National Highway Traffic Safety Administration
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LABORATORY TEST PROCEDURE
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FISHHOOK MANEUVER TEST PROCEDURE

1.0   INTRODUCTION

1.1   General

This document describes the test procedure used by the National Highway Traffic Safety Administration's (NHTSA) New Car Assessment Program (NCAP) to evaluate light vehicle dynamic rollover propensity. The procedure is comprised of one characterization maneuver and one rollover resistance maneuver.

1.2   Rollover Resistance Requirements of the TREAD Act

Section 12 of the "Transportation Recall, Enhancement, Accountability and Documentation (TREAD) Act of November 2000" reflects the desire of Congress to supplement SSF [Static Stability Factor] with a dynamic stability test using vehicle maneuvers. Congress directed NHTSA to "develop a dynamic test on rollovers by motor vehicles for a consumer information program; and carry out a program conducting such tests." NHTSA's NCAP Light Vehicle Dynamic Rollover Propensity Test Procedure described in this document was developed as part of NHTSA's effort to fulfill the requirements of the TREAD Act.

1.3   Recent NHTSA Light Vehicle Dynamic Rollover Propensity Research

During the spring through fall of 2001 NHTSA performed an extensive assessment of many test track maneuvers potentially capable of quantifying on-road, non-tripped vehicle rollover propensity. In brief, five vehicle characterization and nine dynamic rollover propensity maneuvers were studied. Each maneuver was either discarded or retained for subsequent program phases. The 2001 research project is documented in [1].

During the spring through fall of 2002 NHTSA performed a comprehensive evaluation of rollover resistance for a broad spectrum of twenty-six light vehicles. The test vehicles were evaluated with one Characterization maneuver and two Rollover Resistance maneuvers. Up to two load configurations per vehicle were used. The 2002 research project is documented in [2].

2.0   TEST EQUIPMENT

2.1   Vehicle Load Configurations

NHTSA's dynamic rollover propensity test procedure uses one of two loading configurations: Nominal or Multi-Passenger. A description of each configuration is provided below.

Both vehicle load configurations include instrumentation, a steering machine, and outriggers. Test vehicle bumper assemblies are removed for outrigger installation. The reduction in vehicle weight due to the removal of the bumpers is offset by the additional weight of the outriggers and their mounting system. The outrigger system typically outweighs the bumper assemblies.

2.1.1 Nominal Load Configuration

The Nominal Load Configuration consists of the driver, instrumentation, steering machine, outriggers, and full tank of fuel. Weight and location specifications for the data acquisition system and steering machine are presented in Table A.1 and Fig A.1.

Non-pickup truck vehicles with only front designated seating positions use the Nominal Load Configuration.

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