Winston H. Hickox
Agency Secretary

Air Resources Board

Alan C. Lloyd, Ph.D.
Chairman
1001 I Street • P.O. Box 2815 • Sacramento, California 95812 • www.arb.ca.gov

Gray Davis
Governor

March 2, 2001

Dear Swivel Adapter Manufacturer:

During January and February 2001, the California Air Resources Board (CARB) staff has been performing an analysis to determine the behavior of swivel adapters when used in conjunction with cargo tank vapor recovery elbows and hoses at service stations. The objective is to better understand the interaction of these fittings and to observe any unusual behaviors.

CARB staff has assembled several pieces of test equipment including a torque wrench, several vapor recovery elbows, a 3-inch vapor return hose (20ft.), test cap, and a socket-adapter used to take torque measurements.

Several stations have been tested including sites where swivel adapters may or may not be undergoing operational testing. The following observations have been noted. We are withholding specific manufacturer information due to confidentiality.

GENERAL VAPOR SWIVEL ADAPTER OBSERVATIONS

> Static torque values range between 36 and 180 inch/pounds. This is the amount of torque required to start the swivel movement.

Most important is the interaction between the vapor recovery elbow and swiveling vapor adapter. With use of the test equipment, we observed that a standard vapor recovery elbow slips on the face of a vapor swivel adapter in some instances where the static torque value of the adapter is quite high. This effect is similar to the interaction of a vapor recovery elbow and non-swiveling vapor adapter.

CARB CP-201 (Air Resources Board Certification and Test Procedures for Vapor Recovery Systems) requires swivel adapters to swivel through a full 360-degree rotation when used under normal operating conditions, to prevent over-tightening or loosening of the adapters (i.e., when used in conjunction with a standard cargo tank vapor recovery elbow and vapor return hose).

We performed several tests in the laboratory and at service stations to determine the average amount of torque a hose-elbow assembly produces on a swiveling vapor adapter. The hose-elbow combination was used because it includes the side load that

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our Website: http://www.arb.ca.gov.

California Environmental Protection Agency

Printed on Recycled Paper

is created from the weight of a vapor return hose when the two components are connected.

HOSE-ELBOW TORQUE MEASUREMENTS

Average amount of torque exerted on a vapor swivel adapter by vapor recovery elbow and hose assembly = 92 inch/pounds

We are considering a static torque requirement for vapor swivel adapters. Vapor swivel adapters must have a static torque less than 108-inch/pounds to start the swivel movement. This will be determined by averaging three consecutive static torque measurements.

PROPOSED TORQUE REQUIREMENT

Amount of torque needed to start swivel movement $\leq$ 108 inch/pounds

This requirement, set slightly higher than actual elbow-slip observations, is intended to allow for a margin of error that may develop under field conditions. Several manufacturers have also requested clarification of this requirement.

CARB is seeking information from manufacturers regarding the proposed torque requirement. Should you wish to share test information or would like to provide written suggestions regarding the proposed torque requirement, please provide comments no later than March 30, 2001. Written comments, test data, and CARB responses will be posted on the CARB Vapor Recovery web site at www.arb.ca.gov/vapor/vapor.htm.

If you have further questions regarding the swivel adapter torque requirement, please feel free to contact Joseph Fischer or Laura McKinney at (916) 327-0900.

Sincerely,

George Lew, Chief
Engineering and Certification Branch
Monitoring and Laboratory Division

Enclosure