



## Informational Bulletin

## ENHANCED VAPOR RECOVERY

### Minimizing Wintertime In-Station Diagnostic System Overpressure Alarms

December 4, 2017

### NEW RECOMMENDATIONS TO MINIMIZE WINTERTIME IN-STATION DIAGNOSTIC (ISD) SYSTEM OVERPRESSURE ALARMS FOR ASSIST PHASE II SYSTEMS

This informational bulletin is intended for gasoline dispensing facilities (GDF) equipped with the [Assist Phase II Enhanced Vapor Recovery System](#) (assist system) which experience wintertime ISD overpressure alarms, which are not attributed to an identifiable equipment problem. Recent advancements in assist system nozzle design now provide GDF operators with a new means of minimizing the severity and frequency of overpressure conditions, which occur when winter blend gasoline is permitted for distribution throughout California.<sup>1</sup> **These recommendations are intended for GDF with a monthly throughput of less than 400,000 gallons.**

Although [Advisory 405-D](#) currently allows GDF operators to self-clear wintertime ISD overpressure alarms, California Air Resources Board (CARB) staff is aware that many operators require an authorized service provider response, which results in additional expense. Because Advisory 405-D is expected to remain in place until a regulatory solution is adopted and appropriate equipment is certified, this document contains recommendations, which have proven effective in reducing alarm frequency, thereby reducing costs.

## I. INTRODUCTION

Over the last several years, CARB staff has conducted a number of field studies to identify the causes and develop solutions to address the overpressure phenomena. Two key findings have surfaced: 1) the volatility of winter blend gasoline is the primary contributor and 2) facilities that experience the greatest frequency of overpressure alarms also exhibit higher volumes of air ingestion through the nozzle. In January 2015, CARB staff conducted a vehicle refueling survey at six retail GDFs in San Diego County and found that air ingestion of the Healy Model 900 nozzle (assist nozzle) occurs for approximately 30% of motor vehicles produced after the 2003 model year. The survey also found that air is ingested when the assist nozzle is not fully engaged (latched) into the vehicle fill pipe but is still able to refuel the vehicle. Additionally, within the last decade, vehicle manufacturers have introduced new fill pipes designs that contribute to overpressure. CARB staff is working with vehicle and nozzle manufacturers to standardize the vapor recovery nozzle and fill pipe interface to ensure compatibility.

## II. CARB EVALUATION & APPROVAL OF NEW SPOUT ASSEMBLY

In response to these findings in 2015, Franklin Fueling Systems (FFS), manufacturer of the assist system, made design enhancements to the spout assembly of the assist nozzle. These improvements enable a better seal between the nozzle's vapor collection boot and the vehicle fill pipe, thereby reducing excess air ingestion. The new spout assembly, referred to as Enhanced ORVR-Vehicle Recognition (EOR), is depicted in Figures 1 and 2 and can be field retrofitted onto existing nozzle bodies. During the winter of 2016/2017, CARB staff evaluated the performance of the EOR spout assembly at eight GDFs, each with

<sup>1</sup> CARB regulations limit the Reid Vapor Pressure (RVP) of gasoline to 7 psi during the summer season, but these limits do not apply from November 1 through March 31. Higher RVP during wintertime months is considered the primary contributing factor to increased overpressure occurrences at GDF.

differing operating conditions. On August 23, 2017, the new spout assembly was certified by CARB per "Revision V" of Executive Orders [VR-201](#) and [VR-202](#). Although CARB certified the EOR spout assemblies, either field retrofitted or factory new nozzles, CARB staff determined that the factory new nozzles outperformed field retrofitted nozzles and therefore, suggest installation of factory new nozzles.

In addition to EOR spout assembly installation, steps were taken to minimize air ingestion by lowering the vapor to liquid ratio, ensuring proper fuel dispensing rates and dispenser vapor return line plumbing is free of leaks. This is referred to as vapor recovery system optimization.

### **III. VOLUNTARY ACTIONS TO MINIMIZE ISD OVERPRESSURE ALARM OCCURRENCES**

The following steps are recommended to minimize the frequency of wintertime ISD overpressure alarms and to reduce associated emissions. As previously stated, these recommendations are intended for GDF with a monthly gasoline throughput of less than 400,000 gallons. These steps should only be conducted by a factory trained service technician/service provider.

1. Replace existing assist nozzles with the new (factory assembled) nozzles equipped with the EOR spout assembly according to Section 2 of the CARB Approved Installation, Operation and Maintenance Manual (IOM) for the assist system. The new EOR nozzles are anticipated to be available from FFS in January 2018.
2. Adjust the vapor-to-liquid (V/L) ratio setting of each nozzle between 0.95 and 1.0 according to Section 2 of the CARB Approved Installation, Operation and Maintenance Manual (IOM) for the assist system. Per Exhibit 2 of the assist system Executive Order, the allowable V/L range of the nozzle is 0.95 to 1.15. Lowering the V/L ratio to the lower end of the allowable range is effective in reducing excess air ingestion.
3. Perform dispenser vapor line integrity testing according to Section 8 of the CARB Approved Installation, Operation and Maintenance Manual (IOM) for the assist system. If dispenser vapor line leaks are present, make appropriate repairs and retest. Small leaks within the dispenser vapor plumbing may contribute to excess air ingestion.
4. Ensure that the gasoline dispensing rate at each nozzle is maintained between 6.0 and 10 gallons per minute per Exhibit 2 of the assist system Executive Order. When flow rates drop below this range, the assist nozzle will collect excess air and the nozzle primary shut off is compromised.
5. Unless recently performed within the last twelve months, conduct [TP-201.1E](#) to determine that the pressure vacuum (P/V) vent valve is operating within the appropriate leak rate and cracking pressure ranges. Replace the P/V vent valve if failures are observed.

### **IV. INCENTIVE PROGRAM FOR NOZZLE REPLACEMENT**

To encourage voluntary early replacement of existing assist nozzles with EOR nozzles, FFS will offer eligible station owners with a 'Double Core Credit' incentive program until December 31, 2018.

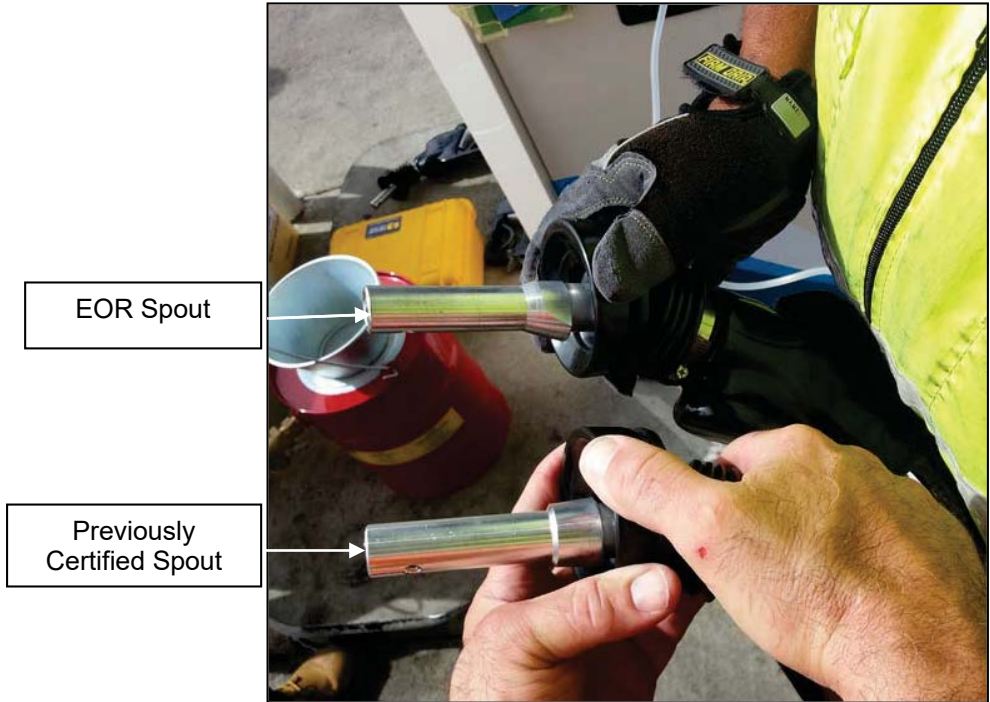
### **V. CONTACT INFORMATION**

If you have questions regarding this informational bulletin, please contact your local air district (list of air district contacts is available at <http://www.arb.ca.gov/vapor/EVRDistrictContacts.pdf>) or CARB vapor

recovery program staff at (916) 327-0900 or via email at [vapor@arb.ca.gov](mailto:vapor@arb.ca.gov). Additional information is available at CARB's vapor recovery program webpage at: <http://www.arb.ca.gov/vapor/vapor.htm>.

For questions regarding the Incentive Program, please contact Mr. Jeff Strey of Franklin Fueling Systems. Mr. Strey's phone number and email address are (608) 838-5692 and [strey@franklinfueling.com](mailto:strey@franklinfueling.com), respectively.

**Figure 1: EOR and Previously Certified Spout Assembly (horizontal view)**



**Figure 2: EOR and Previously Certified Spout Assembly (vertical view)**

