California Environmental Protection Agency
AIR RESOURCES BOARD

Executive Order G-70-164-AA

Modification to Certification of the
Hasstech VCP-3A Vacuum Assist
Phase II Vapor Recovery System

WHEREAS, the California Air Resources Board ("the Board" or "CARB") has established, pursuant to California Health and Safety Code sections 39600, 39601 and 41954, certification procedures for systems designed for the control of gasoline vapor emissions during motor vehicle fueling operations (Phase II vapor recovery systems) in its "CP-201 Certification Procedure for Vapor Recovery Systems of Dispensing Facilities" (the "Certification Procedures") as last amended April 12, 1996, incorporated by reference into Title 17, California Code of Regulations, Section 94011;

WHEREAS, the Board has established, pursuant to California Health and Safety Code sections 39600, 39601 and 41954, test procedures for determining the compliance of Phase II vapor recovery systems with emission standards in its "Certification and Test Procedures for Vapor Recovery Systems," CP-201.1 through CP-201.6 ("the Test Procedures") as adopted April 12, 1996, incorporated by reference into Title 17, California Code of Regulations, Section 94011;

WHEREAS, Executive Order G-70-164, issued April 11, 1995, certified Hasstech VCP-3A Phase II vapor recovery system, with “bootless” nozzles, to be at least 95 percent effective in self-serve or attendant use;

WHEREAS, Hasstech Inc. ("Hasstech") requested modification to the certification of the Hasstech VCP-3A bootless nozzle vapor recovery system (the "VCP-3A system") to incorporate the Husky V3 6201 Nozzle and VCP-3A-UL version of the system, for which Hasstech obtained Underwriters' Laboratories listing;

WHEREAS, the VCP-3A-UL system differs from the original VCP-3A in that flame arrestors at the dispensers and at the collection unit, which are required in the VCP-3A system, are optional with the VCP-3A-UL system (Figures 3 and 7). A flame arrestor is still required on the inlet of the VCP-3A-UL Processing Unit burner;

WHEREAS, the VCP-3A-UL system has been evaluated pursuant to the Board's Certification Procedures;

WHEREAS, the Certification Procedures (CP-201) provides that the Executive Officer shall issue an order of certification if he or she determines that the vapor recovery system conforms to all of the applicable requirements set forth in the Certification Procedures;

WHEREAS, I, Michael P. Kenny, Air Resources Board Executive Officer, find that the VCP-3A system conforms with all the requirements set forth in the Certification Procedures, and results in a vapor recovery system which is at least 95 percent effective for attendant and/or self-serve use at gasoline service stations when used in conjunction with a Phase I vapor recovery system which has been certified by the Board and meets the requirements contained in Exhibit 2 of this Order.

NOW, THEREFORE, IT IS HEREBY ORDERED that the Hasstech VCP-3A system when used with a CARB-certified Phase I system, as specified in Exhibits 1 and 2 of this Order, is certified to be at least 95 percent effective in attended and/or self-serve mode. **Compatibility of this system with the onboard vapor recovery systems ("ORVR") has not been evaluated. Fugitive emissions which may occur when the underground storage tanks are under positive pressure have not been quantified and were not included in the calculation of system effectiveness.** Exhibit 1 contains a list of the equipment certified for use with the Hasstech VCP-3A system. Exhibit 2 contains installation and performance specifications for the system. Exhibit 3 contains a procedure for testing the static pressure integrity of the underground storage tank. Exhibit 4 contains a procedure for verifying dispensing rate.

IT IS FURTHER ORDERED that the dispensing rate for installations of the VCP-3A system shall not exceed ten (10.0) gallons per minute when only one nozzle associated with the product supply pump is operating. This is consistent with the flowrate limitation imposed by United States Environmental Protection Agency as specified in the Federal Register, Volume 58, Number 55, page 16019. Dispensing rate shall be verified as specified in Exhibit 4.

IT IS FURTHER ORDERED that compliance with the certification requirements and rules and regulations of the Division of Measurement Standards of the Department of Food and Agriculture, the State Fire Marshal's Office, and the Division of Occupational Safety and Health of the Department of Industrial Relations is made a condition of this certification.

IT IS FURTHER ORDERED that the following requirements are made a condition of certification. The VCP-3A system shall be installed only in facilities which are capable of demonstrating on-going compliance with the vapor integrity requirements contained in Exhibit 3 of this Order. The owner or operator of the installation shall conduct, and pass, a Static Pressure Decay test as specified in Exhibit 3, no later than 60 days after startup and at least once in each twelve month period. The owner or operator of the installation shall conduct, and pass, an Air-to-Liquid Ratio test as specified in TP-201.5 no later than 60 days after startup and at least once in each twelve month period thereafter. The test results shall be made available to the district upon request within fifteen days after the tests are conducted, or within fifteen days of the request. Alternative test procedures may be used if determined by the Executive Officer, in writing, to yield comparable results.

IT IS FURTHER ORDERED that the VCP-3A system, as installed, shall comply with the procedures and performance standards the test installation was required to meet during certification testing. If, in the judgment of the Executive Officer, a significant fraction of installations fail to meet the specifications of this certification, or if a significant portion of the vehicle population is found to have configurations which significantly impair the system's

IT IS FURTHER ORDERED that the certified VCP-3A system shall, at a minimum, be operated in accordance with the manufacturer's recommended maintenance intervals and shall use the manufacturer's recommended operation, installation, and maintenance procedures.

IT IS FURTHER ORDERED that all nozzles approved for use with the VCP-3A system shall be 100 percent performance checked at the factory, including checks of the integrity of the vapor and liquid path, as specified in Exhibit 2 of this Order, and of the proper functioning of all automatic shut-off mechanisms.

IT IS FURTHER ORDERED that each vapor pump shall be adjusted and 100 percent performance checked at the factory, including verification that the pump performance is within the range specified in Exhibit 2 of this Order.

IT IS FURTHER ORDERED that the certified VCP-3A system shall be performance tested during installation for ability to dispense gasoline and collect vapors without difficulty, in the presence of the station manager or other responsible individual. Hasstech shall provide CARB-approved manuals to the station manager, owner or operator shall also be provided with instructions in the proper use of the VCP-3A system, its repair and maintenance, where system and/or component replacements can be readily obtained, and shall be provided with copies of the installation and maintenance manuals for the VCP-3A system to be maintained at the station. Revisions to the manual are subject to approval by CARB.

IT IS FURTHER ORDERED that the certified VCP-3A system shall be warranted by Hasstech, in writing, for at least one year, to the ultimate purchaser and each subsequent purchaser, that the vapor recovery system is designed, built and equipped so as to conform at the time of original installation or sale with the applicable regulations and is free from defects in materials and workmanship which would cause the vapor recovery system to fail to conform with applicable regulations. Hasstech shall provide copies of the manufacturer's warranty and the operating and maintenance manuals for the Hasstech VCP-3A system to the station manager, owner or operator. Hoses, nozzles and breakaway couplings shall be warranted to the ultimate purchaser as specified above for at least one year, or for the expected useful life, whichever is longer.

IT IS FURTHER ORDERED that any alteration of the equipment, parts, design, or operation of the systems certified hereby is prohibited, and deemed inconsistent with this certification, unless such alteration has been approved by the Executive Officer or his/her designee.

IT IS FURTHER ORDERED that the Hasstech VCP-3A certification, Executive Order G-70-164 issued April 11, 1995, is hereby superseded by this Executive Order.

Executed at Sacramento, California, this 10th day of December, 1996.

Michael P. Kenny
Executive Officer

Attachments

Executive Order G-70-164-AA

Exhibit 1

Hasstech VCP-3A System Equipment List

The following components are certified for use with either the VCP-3A, or the VCP-3A-UL system:

Component	Manufacturer/Model	State Fire Marshal Identification Number
Nozzles with Vapor Valve	OPW 11VAI-XX (Figure 13) where XX = 29 (unleaded, hold-open clip) 49 (unleaded, no hold-open clip)	005:008:050 005:001:001
	Husky V34 6200-8 (Figure 15)	005:021:008 005:008:049
	OR Any bootless nozzle which has been CARB certified for use with the VCP-3A system.	
Nozzles without Vapor Valve	OPW 11VAI-XX (Figure 14) where XX = 22 (leaded, hold-open clip) 27 (unleaded, hold-open clip) 42 (leaded, no-hold-open clip) 47 (unleaded, no hold-open clip)	005:008:050 005:001:001
	Husky V3 6201 (Figure 16)	005:021:011
	Emco Wheaton A4500-002 (Figure 17)	005:007:042
Inverted Coaxial Hoses	Catlow VaporMate	005:033:005
	Dayco 7282 Superflex 2000	005:033:005
	Dayco 7292 Superflex 4000	005:033:006
	Goodyear Flexsteel	005:036:002
	GT Sales/Hewitt Superflex 2000	005:033:005
	Thermoid Hi-Vac	005:037:003
	Thermoid Hi-Vac S	005:037:004
	VST VSTalflex	005:052:001
	OR Any inverted coaxial hose CARB-certified for use with the Hasstech VCP-3A system.	

Component	Manufacturer/Model	State Fire Marshal Identification Number
Flow Actuated Vapor Valve	Nozzles without vapor valves shall be used only with the Hasstech CFC-1 coaxial flow actuated vapor valve.	005:001:002
Breakaway Couplings (optional component)	**Couplings with vapor valves:**	
	Catlow AV2001	005:031:006
	OPW 66CIP	005:008:056
	Richards Industries VA-60	005:031:009
	Richards Industries VA-50	005:031:007
	Husky 4034	005:021:009
Breakaway Couplings (optional component)	**Couplings without a vapor valves:** (To be used only with a remote vapor valve i.e., a CFC-1 Flow Control Valve)	
	Catlow AV200	005:030:005
	Catlow AV200-1	005:030:005
	OPW 66CIP	005:008:047
	Richards Industries VA-51	005:031:007
	Richards Industries VA-61	005:031:009
	OR Any breakaway coupling has been CARB-certified for use with the VCP-3A system	
Tank Pressure Switch	Hasstech Part No. 14-18235 (Figure 9).	004:001:002
Vapor Plumbing Components (optional components)		
In-tank Drain Check	Hasstech 1044, 1016-31	004:001:001
Out-of-tank Drain Check	Hasstech 1042, 1016-32	004:001:001
Compact Out-of-Tank Drain Check	Hasstech 1042A, 1016-33	004:001:001
Tank Stick Correction Gauge (optional component)	Hasstech Model TSC **(**Figure 12)	004:001:002

The following components are certified for use only with the Model VCP-3A. (Originally certified under Executive Order G-70-164):

Component	Manufacturer/Model	State Fire Marshal Identification Number
Processor Unit		
	Hasstech 1016-PR-A with serial numbers PR-00908 and higher. (Figure 6).	004:001:001 1016-PRA
Vapor Pump		
(Collection Unit)	Rotron Regenerative Blower (1/2 hp) Model Number DR 313 AK4HA (Figure 7)	004:001:001 1016-7
Process Control Panel		
	Hasstech Electronic Control and Status Panel ECS-1 with Audible Alarm and Serial Numbers VR-00848 and higher, (Figure8).	005:001:003
Flame Arrestors		
Dispenser	Hasstech 1025-3/4"	1016-5
Process Unit	Hasstech 1025-1"	1016-6
Collection Unit	Hasstech 1025 - (1-1/4")	1016-8
Pressure/Vacuum Valves		
	OPW 523LP, 523LPS (settings as specified below)	005:008:051
	Varec Model No. 2010-811-2	004:001:001 1016-9
	Hazlett H-PVB-1 Gold label (settings as specified below)	005:017:004
	OR Any CARB-certified valve with the following pressure and vacuum settings, in inches water column (wc): Pressure: three plus or minus one-half inches (3.0 ± 0.5") wc. Vacuum: eight plus or minus two inches (8 ± 2") wc.	

The following components are certified for use only with the Model VCP-3A-UL:

Component	Manufacturer/Model	State Fire Marshal Identification Number
Processor Unit	Hasstech 1016-PR-A with Serial Numbers PR-01701-UL and higher. (Figure 6).	004:001:002 1016-PRA
Vapor Pump (Collection Unit)	Rotron Regenerative Blower (1/2 hp) Model Number DR 313 AK4HA, with Serial Numbers CU-01801-UL and higher. (Figure 7)	004:001:002 1016-7
Process Control Panel	Hasstech Electronic Control and Status Panel ECS-1 with Audible Alarm and Serial Numbers VR-01600-UL and higher. (Figure 8).	004:001:002
Flame Arrestors	A flame arrestor is required at the Process Unit, as shown in Figure 2B-1. Flame arrestors are not required but may be installed as an option as shown in Figures 3 and 7.	
Dispenser (Optional) Process Unit Collection Unit (Optional)	Hasstech 1025-3/4" Hasstech 1025-1" Hasstech 1025 - (1-1/4")	1016-5 1016-6 1016-8
Pressure/Vacuum Valves	OPW 523LP, 523LPS (settings as specified below) OR Any CARB-certified, UL-listed valve with the following pressure and vacuum settings, in inches water column (wc): Pressure: three plus or minus one-half inches (3.0 ± 0.5") wc. Vacuum: eight plus or minus two inches (8 ± 2") wc.	005:008:051

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Exhibit 2

Specifications for the Hasstech VCP-3A System

Typical installations of the Hasstech system are shown in Figures 1 through 5.

Nozzles

1. Failure mode testing has demonstrated that blockage of some of the vapor collection holes in the spout has negligible effect on the operation of the system. Any nozzle which has fewer unblocked holes than are required below is defective and shall be immediately removed from service.

Nozzle Type	Total Number of Holes per Nozzle	Minimum Number of ***Unblocked*** Vapor Holes Required
OPW 11VAI	18 (steel spout)	6
(Figures 13 and 14)	12 (aluminum spout)	4
Husky V34 6200-8 (Figure 15)	8	1
(6 holes encircle the spout, plus 1 higher, plus 1 for shutoff aspirator) (the unblocked hole must be among the 6 encircling the spout)		
Husky V3 6201 (Figure 16)	7	1
Emco Wheaton A4500 (Figure 17)	7	3

2. An Emco Wheaton A4500 nozzle (Figure 17) which has any visible puncture or tear of the vapor guard/vapor seal assembly is defective and shall be immediately removed from service.

3. A leaking vapor valve, whether in the nozzle or remotely located, may compromise the vapor recovery capabilities of the entire vapor recovery system; therefore, it is imperative that defective vapor valves be corrected expeditiously in order to minimize emissions.

   The Husky V34 6200-8 nozzle (Figure 15) has an integral vapor valve which prevents the loss of vapor from the underground storage tanks, ensures proper operation of the system and prevents the ingestion of air into the system. Any nozzle with a defective vapor valve shall be immediately removed from service. The integrity of the system shall be restored by replacing the nozzle or otherwise closing the vapor path as soon as practicable.

The OPW 11VAI nozzle (Figure 14), the Husky Model V3 6201 (Figure 16) and the Emco Wheaton A4500-002 nozzle (Figure 17) do not have an integral vapor valve. These nozzles shall be installed with a certified remote vapor valve (i.e., CFC-1 flow control vapor valve) as specified in Exhibit 1 of this Order. Any nozzle associated with a defective remote vapor valve shall be immediately removed from service. The integrity of the system shall be restored by replacing the remote vapor valve or otherwise closing the vapor path as soon as practicable.

4. Nozzles shall be 100 percent performance checked at the factory, including checks of all shutoff mechanisms and of the integrity of the vapor path. The maximum allowable leak rate for nozzles with internal vapor valves during this factory performance test shall not exceed the following:

   0.038 CFH at a pressure of at least two (2) inches water column
   0.005 CFH at a vacuum of at least forty (40) inches water column.

5. Leaded and unleaded spouts are interchangeable.

Flow Actuated Vapor Valves

1. A flow actuated vapor valve, as listed in Exhibit 1, shall be installed in conjunction with each nozzle which does not have an integral vapor valve. Vapor valves shall be 100 percent performance checked at the factory. The maximum allowable leak rate for vapor valves during this factory performance test shall not exceed the following:

   0.038 CFH at a pressure of at least two (2) inches water column
   0.005 CFH at a vacuum of at least forty (40) inches water column.

Breakaway Couplings

Breakaway couplings are optional. If they are installed, only certified breakaways with a valve which closes the vapor path when separated shall be used with nozzles which have internal vapor valves. Note: a breakaway with a vapor valve that closes upon separation is not required if the CFC-1 flow control valve (or any other remote vapor valve CARB certified with the VCP-3A system) is used to ensure that the vapor path remains closed unless there is gasoline flow.

Inverted Coaxial Hoses

1. The maximum length of the hose shall be 14 feet.

2. The length of hose which may be in contact with the island and/or ground when the nozzle is properly mounted on the dispenser is limited to six (6) inches.

Collection Unit (Vapor Pump)

1. The VCP-3A system shall operate with a certified collection unit (pump) specified in Exhibit 1 capable of meeting the air to liquid (A/L) ratio specified below. The A/L ratio of the system, measured at a flowrate of at least six gallons per minute (6 GPM), shall be within the values listed in the following table (linear interpolation may be used to

calculate intermediate values). Any fueling point not capable of demonstrating compliance with this performance standard shall be deemed defective and removed from service. The A/L ratio shall be determined as specified in TP-201.5. Alternative test procedures may be used if they are determined by the Executive Officer, in writing, to yield comparable results.

Air to Liquid Ratios

Flow Rate (GPM)	Minimum Ratio	Maximum Ratio
6	1.40	2.40
8	1.40	2.30
10	1.40	2.15

NOTES:

a. The Husky V34 6200-8 nozzle requires a special A/L adapter that will encompass all of the vapor recovery holes; however, test results have indicated that a special A/L adapter is not necessary if the single top hole is covered for the A/L test (refer to Figure 15).

b. This test procedure returns air rather than vapor to the storage tank, and may cause an increase in storage tank pressure and/or affect process unit operation. Temporary conditions which are attributable to the test are not to be considered an indication of malfunction or noncompliance.

2. The maximum number of fueling points which can be supported by one collection unit is sixteen (16). This is based on an in use factor of fifty percent (50%) and a demonstration of eight nozzles dispensing 7.5 gallons simultaneously with an A/L ratio greater than 1.4. Additional fueling points require an additional collection unit (one per every sixteen additional fueling points).

3. OSHA-approvable access to the collection unit shall be provided immediately upon request for maintenance, inspection and/or testing.

4. The vacuum level at the inlet of the collection unit can be adjusted by changing the size of the by-pass orifice. The normal operating level at this point shall be no less than 30 inches water column vacuum.

   Note: Modifications to the system, such as changing the length of the hoses or the number of installed nozzles, may affect the vacuum level and require adjustment of the by-pass orifice. Testing shall be conducted to verify that the system, after modification, operates within the specifications of this Order.

Processing Unit (burner)

1. The Hasstech VCP-3A processing unit consists of an in-line flame arrestor, an in-line pressure switch, a solenoid activated vapor valve, another flame arrestor, and a single stage burner assembly with electronic ignition and a flame detector (refer to Figure 6).
2. At no time shall emissions from the processing unit exceed Ringelmann one-half (1/2) or ten percent (10%) opacity. Note: visible emissions, except water vapor or heat

waves, may indicate improper burner operation unless caused by a Phase I fuel delivery problem.

3. The horizontal distance between the pressure/vacuum valve and the processing unit shall be not less than twenty (20) feet. The processing unit shall be installed in accordance with the manufacturer's installation manual and applicable fire code requirements.

4. Twenty (20) consecutive unsuccessful attempts to ignite the process unit shall cause the process unit to lock out and the alarm to be activated. When this condition has occurred, it shall be deemed a failure of the process unit.

   Note: This condition is most frequently caused by a broken flame sensor or a defective ignitor.

5. Twenty (20) non-consecutive unsuccessful attempts to ignite the process unit shall cause the alarm shall be activated do not lock out the process unit. The alarm indicates that the system may be defective and require service.

6. No dispensing shall be allowed when the process unit is disabled for maintenance or for any other reason unless the facility is operating under a district variance or upset/breakdown rule provision.

7. OSHA-approvable access to the process unit shall be provided immediately upon request for maintenance, inspection and/or testing.

8. The location of the process unit shall be subject to the approval of the local fire authority.

ECS-1 Electronic Control and Status Panel

1. The VCP-3A system shall have an operable ECS-1 control and status panel. (refer to Figure 8). The ECS-1 status panel shall have clearly labeled indicators, which light to indicate when the collection unit and process unit are operating. The VCP-3A and the VCP-3A-UL systems may be differentiated from previous versions of the VCP-2A by the ECS-1 control and status panel serial numbers. For the VCP-3A, the serial numbers will be greater than VR-00848 and process unit serial numbers greater than PR-00908. For the VCP-3A-UL, the serial numbers for the Processor Unit, the Vapor Pump and the ECS-1 Control and Status Panel will all have a **-UL** extension. No other versions of these components shall be used with the VCP-3A or the VCP-3A-UL systems.

   Note: This status panel has "YES" , "NO" and "Reset" buttons. Previous versions of the status panel, not for use with the VCP-3A system, do not have the "Reset" button.

2. The status panel shall record and store for 365 days the total number of minutes per day that the Process Unit ("PR") senses the presence of a flame and the total number of minutes per day that the solenoid valve to the burner ("SO") is open. This shall be determined on the basis of data points taken at least every 0.5 seconds. This

information shall be accessible by pressing the "YES" button on the status panel, The ratio of PR/SO time which indicates that the system is operating properly shall be not less than 0.90.

3. Each ECS-1 electronic and control status panel shall have instructions readily available to station personnel on how to operate the panel. These instructions shall include the service code numbers for the alarm mode and the normal mode (alarm light emitting diode not lit).

4. The ECS-1 panel shall display "CALL FOR SERVICE" when the number of unsuccessful attempts to ignite the burner in a twenty-four hour period reaches twenty.

5. The status panel shall also indicate the system status, either by displaying "SYSTEM NORMAL" (indicating that the FLAME/VALVE ratio is in the normal operating range as specified above) or by displaying the message "CALL FOR SERVICE".

Audible Alarm

1. The VCP-3A system shall include an audible alarm which shall sound if any of the following conditions have occurred:

   the submerged turbine pump has been activated for two seconds without causing activation of the collection unit; or

   the processing unit has made twenty (20) consecutive unsuccessful attempts to ignite; or

   the processing unit has made twenty (20) non-consecutive unsuccessful attempts to ignite in a 24 hour period.

   If the alarm sounds, the manual reset shall be used to restart the system. If the alarm sounds again within several hours, the unit is deemed to be malfunctioning and a call for service shall be made.

2. The audible alarm shall be located such that it can easily be heard by station personnel in the area most likely to be occupied during normal station operation.
   (i.e., at the cash register.)

3. Testing shall be conducted to demonstrate that the alarm system operates as specified above.

Tank Pressure Switch

1. The VCP-3A system contains two pressure switches designed to activate the system. The in-line pressure switch, located in the processing unit, shall be set to activate at a nominal inlet pressure of 1 inch water column. The second pressure switch (Part Number PST-1) shall be installed on the tank outlet of the collection unit. The purpose of the tank pressure switch is to monitor the storage tank pressure and o activate the system if the tank pressure exceeds plus 0.1 inches of water column. During normal operations, the VCP-3A system maintains storage tank pressures in the range of minus

0.5 to plus 1 inches of water column. Brief exceedances of this range may occasionally occur during peak activity periods or bulk fuel delivery operations. Pressures exceed this range for more than occasional brief periods indicate system malfunction.

Pressure/Vacuum Valves for Storage Tank Vents

1. A pressure/vacuum (P/V) valve shall be installed on each tank vent. Vent lines may be manifolded provided the manifold is installed at a height not less than 12 feet above the driveway surface used for Phase I tank truck filling operations. At least one P/V valve shall be installed on manifolded vents. If two P/V valves are desired, they shall be installed in parallel, so that each can serve as a backup for the other if one should fail to open properly. The P/V valve shall be CARB-certified as specified in Exhibit 1, and shall be installed so as to ensure that any venting from the system will occur only when the P/V valve settings are exceeded. The outlets shall vent upward and be located to eliminate the possibility of vapor accumulating or traveling to a source of ignition or entering adjacent buildings. The P/V valves used with the VCP-3A-UL systems must be CARB-certified and UL-listed, as specified in Exhibit 1.

Vapor Recovery Piping Configurations

1. All vapor return lines shall slope a minimum of 1/8 inch per foot. A slope of 1/4 inch or more per foot is recommended wherever feasible.

2. The dispenser shall be connected to the riser with either flexible or rigid material which is listed for use with gasoline. The dispenser-to-riser connection shall be installed so that any liquid in the lines will drain toward the storage tank. The internal diameter of the connector, including all fittings, shall not be less than five-eighths inch (5/8").

3. The nominal inside diameter of the underground vapor and vent lines shall be two inches (2"). The condensate drain line may be a minimum of one-half (0.5) inches internal diameter. All vapor lines shall allow unobstructed passage of vapor as appropriate in normal operation of the system. The vapor return lines shall be installed as indicated in the appropriate figures.

4. All vapor return and vent piping shall be, at a minimum, installed in accordance with the manufacturer's instructions and all applicable regulations. Local districts may impose additional requirements.

5. A tank stick correction gauge (optional) may be installed at the vent line. The gauge shall be installed on the vent line at least six and no more than ten feet (6' - 10') above grade, and shall be installed so that it allows no vapor emissions and so that any condensate will drain away from the gauge. The gauge is shown in Figure 12 and reads in inches of gasoline (pressure to the left of zero and vacuum to the right of zero).

Piping Configuration Using Out-of-Tank Drain Check (Figures 4 and 5)

1. The vapor piping shall have a natural drainage of condensate to the underground storage tanks to ensure that the intended path of vapors is not subjected to liquid blockage. Note: Local districts may require the introduction of liquid into vapor lines before conducting air to liquid ratio tests to verify natural drainage.

2. The drain check is designed to be normally flooded with product (Figure 5).

Piping Configuration Using a Condensate Trap

1. Vapor piping configurations using a condensate trap is not a recommended configuration. However, there are situations, such as a station's topography, that do not make it feasible nor practical to require the vapor piping to naturally drain to the underground storage tanks. The District shall explore all other approved piping configurations prior to approving the use of a condensate trap which is self-evacuating, vapor tight and accessible for inspection. If a district elects to allow a condensate trap which is not self evacuating, the district shall require the station operator to maintain a log documenting regular evacuation of the condensate trap to ensure that these devices do not block the vapor path to the underground storage tank.

Storage Tank and Phase I System

WARNING: Phase I fill caps should be opened with caution because the storage tank may be under pressure.

1. The Phase I system shall be a CARB-certified system which is in good working order and which demonstrates compliance with the static pressure decay test criteria contained in Exhibit 3 of this Order. Coaxial Phase I systems shall not be used with new installations of the system. Replacement of storage tanks at existing facilities, or modifications which cause the installation of new or replacement Phase I vapor recovery equipment, are considered new installations with regard to this prohibition. An exception to this prohibition may be made for coaxial Phase I systems CARB-certified after January 1, 1994, as compatible for use with Phase II systems which require pressure/vacuum vent valves.
   Note: Frequent venting (except when caused by air ingested into the system during the performance of the A/L ratio test or other activities outside of the normal operation of the Phase II system) may indicate system malfunction.

2. Where installation of the VCP-3A system is made by retrofitting previously installed equipment, local districts may elect to allow existing coaxial Phase I systems to remain in use for a specifically identified period of time provided the following conditions are met:

   the existing coaxial Phase I system is a poppeted, CARB-certified system capable of demonstrating compliance with the static pressure decay test as specified above; and

   installation of the Phase II system requires no modification of the UST(s) and/or connections.

3. Spill containment manholes which have drain valves shall demonstrate compliance with the static pressure decay criteria with the drain valves installed as in normal operation. Manholes with cover-actuated drain valves shall not be used in new installations (as defined above) after May 1, 1995. Manholes with cover-actuated drain valves may remain in use in facilities where installation of the Hasstech VCP-3A system does not require modification of the tank fittings provided the facility demonstrates compliance with static pressure decay test criteria both with the cover open and with the cover closed.

4. During Phase ! transfer operations, there shall be no more than two Phase I product hoses used with Phase I one vapor hose connected, and no more than three product hoses used with two vapor hoses connected.

5. The Phase I vapor recovery system shall be operated during product deliveries so as to minimize the loss of vapors from the facility storage tank which may be under pressure. Phase I deliveries shall be accomplished so as to ensure that there is at least one vapor connection between the cargo tank compartment headspace and the storage tank associated with the product delivery. Provided it is not in conflict with established safety procedures, this may be accomplished in the following manner:

   the Phase I vapor return hose is connected to the delivery tank and to the delivery elbow before the elbow is connected to the facility storage tank;

   the delivery tank is opened only after all vapor connections have been made, and is closed before disconnection of any vapor return hoses; and

   the existing coaxial Phase I equipment is in good working order and has demonstrated compliance with static pressure decay test criteria when tested with all fill caps removed; and

   the vapor return hose is disconnected from the facility storage tank before it is disconnected from the delivery tank.

6. Storage tank vent pipes shall be maintained white, silver or beige. Colors which will similarly prevent heating of the system due to solar gain may also be used, provided they are listed in the EPA AP-42 as having a factor the same as or better than that of the colors listed above.

7. Manholes shall be maintained a color which minimizes solar gain, as specified above. Manhole covers which are color coded for product identification are exempted from this requirement.