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Compliance Assurance Monitoring Plan
Motiva Enterprises LLC – North Terminal
FDEP Facility ID 0110048
Fort Lauderdale, FL

Prepared for:

MOTIVA
ENTERPRISES LLC
1717, 61st Avenue North
Nashville, Tennessee 37209

Facility Location:
909 SE 24th Street
Fort Lauderdale, Florida

Prepared by:
Earth Tech, Inc.
1455 Old Alabama Road
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Roswell, Georgia 30076

May 2003

Earth Tech Project No. 55755

MOTIVA
ENTERPRISES LLC

VIA OVERNIGHT MAIL
AIRBORNE EXPRESS AIRBILL NO. 7205124662

June 4, 2003

Mr. Seree Jairam
Department of Planning and Environmental Protection
Broward County
218 S.W. 1st Avenue
Fort Lauderdale, FL 33301

Subject: ***Compliance Assurance Monitoring Plan – FDEP Facility ID 0110048***
Motiva Enterprises LLC
909 S.E. 24th Street, Ft. Lauderdale, Florida

Dear Mr. Jairam:

In June 2002, Motiva Enterprises LLC located at 909 SE 24th Street, Fort Lauderdale, Broward County, Florida (Motiva), had submitted a Title V Renewal Application to the Broward County Department of Planning and Environmental Protection (DPEP). Following this submittal, our consultant Ms. Reshmi Butala of Earth Tech received a request from you for a CAM plan in November 2002. A draft CAM monitoring approach was submitted for your approval in February 2003. Testing of the Pollutant Specific Emission Unit (PSEU) that is subject to the CAM plan, in February and March 2003, followed this. A variance issued by DPEP grants a waiver for submission of the CAM plan until June 30, 2003.

Please find enclosed 2 copies of the proposed CAM plan. The plan incorporates discussions between DPEP, Motiva and Earth Tech. We have made every effort to address specific items that were brought up by you and Mr. Paul Shelton. Specifically, the CAM plan is proposed such that it complies with the requirements of 40 CFR Part 64; it relies on presumptively acceptable monitoring. The use of presumptively acceptable monitoring for inclusion in a CAM plan is consistent with the requirements of 40 CFR 64.4(b). The proposed CAM plan is based on the monitoring approach in "USEPA CAM Technical Guidance Document, A.24 Carbon Adsorber for VOC Control - Facility EE," dated 9/00.

The PSEU at this Motiva facility is a Vapor Recovery Unit (VRU). The VRU collects VOC emissions from the loading rack while loading petroleum products from storage tanks into tanker trucks. Vapors from the loading rack can be routed either to the VRU or a bladder tank. It should be noted that for protection of the mechanical components, two emergency relief valves are provided in the vapor conveyance system – one for the vapor line, and one for the bladder tank. These valves are not considered Air Pollution Control Device bypasses, although their outlets are routed to the atmosphere, for the following reasons:

- They are normally closed and cannot be manually opened by the facility operators
- There are system design features (such as the bladder high level alarm and automatic system shutdown) that minimize the chance of high-pressure conditions leading to relief valve lifting.
- They have been installed solely to prevent damage to piping and the bladder tank during extremely unusual conditions (such as high system pressure).

- They have no history of failure, and they undergo routine maintenance to assure intended performance and mechanical integrity.
- The valves' proper status is observed at least daily when operators are on duty.
- The monthly leak checks as currently proposed in the CAM plan would successfully detect a relief valve that was starting to deteriorate and allow vapors to leak by its seat.
- The opening of these valves would constitute a situation related to emergency/malfunction and would not be representative of normal operating conditions.

The bladder tank is provided with a manually-operated isolation valve. This valve remains open during normal operations except during emergencies related to the bladder tank. The isolation valve is checked during routine inspections to confirm that it is open. Should the valve be closed to isolate the bladder tank, vapors from the loading rack will continue to be routed to the VRU. The VRU will be operated subject to the provisions as described in the proposed CAM plan. Again, it should be reiterated that the bladder tank isolation is not representative of normal operations and is indicative of emergency/malfunction related situations.

Should you have any questions or comments regarding this CAM plan, please contact me at (615) 350-8180 or via email at JJNorman@Motivaenterprises.com. Ms. Butala may be reached at (770) 990-1417 or via email at Reshmi.Butala@earthtech.com. In lieu of Ms. Butala, Mr. Matt Kupcak of Earth Tech may be contacted at Matt.Kupcak@earthtech.com.

Sincerely,

Motiva Enterprises LLC

Jil J. Norman
Environmental Engineer, III

cc: Mr. Paul Shelton, Broward County DPEP
Mr. Jonathan Holtom, FDEP, Tallahassee, FL (w/ attachments)
Mr. Tom Ledbetter, Motiva Enterprises (w/attachments)

1717 – 61st Avenue, North Nashville, Tennessee 37209-1354 Phone: (615) 350-8180 Fax: (615) 350-7087

VIA CERTIFIED MAIL WITH RETURN RECEIPT

May 30, 2003

Mr. Seree Jairam
Department of Planning and Environmental Protection
Broward County
218 S.W. 1st Avenue
Fort Lauderdale, FL 33301

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Motiva Enterprises LLC
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Motiva Enterprises LLC

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cc: Mr. Paul Shelton, Broward County DPEP
Mr. Jonathan Holtom, FDEP, Tallahassee, FL (w/ attachments)

TABLE OF CONTENTS

Section **Page No.**

LIST OF APPENDICES

LIST OF FIGURES

EXECUTIVE SUMMARY – COMPLIANCE ASSURANCE MONITORING PLAN

Motiva Enterprises LLC owns and operates a petroleum bulk terminal at 909 SE 24th Street, Fort Lauderdale, Florida (Motiva/Motiva North Terminal). The facility is a major source for Volatile Organic Compounds (VOCs) and was issued a Title V Operating permit by the Broward County Department of Planning and Environmental Protection (DPEP) on December 18, 1997. The pollutant-specific emissions unit (PSEU) of concern at Motiva is not a "Large PSEU" and is therefore classified as an "Other PSEU" per 40 CFR 64.5(b). Facilities with "other PSEUs" are required to submit a Compliance Assurance Monitoring (CAM) plan with the Title V renewal application. Motiva submitted a Title V renewal application to DPEP in June 2002; this document constitutes the CAM plan.

The PSEU that this CAM plan addresses is a dual-bed vacuum regenerative carbon adsorption vapor recovery unit (VRU). The VRU is used to reduce VOC emissions during the loading of petroleum products into trucks. The VRU is currently permitted as Emissions Unit ID No. 014 (Vapor Recovery System), in the facility's Title V permit (Permit No. 0110048-001-AV). Between the loading rack and the VRU, VOC vapors may collect in a bladder tank, which serves as an intermediate storage/routing unit between the loading rack and the VRU. The loading rack's vapor collection system (and subsequently the VRU) is subject to an emission limitation standard that restricts emissions to 35 mg of total organic compounds per liter of gasoline loaded, under 40 CFR 60.502(b).

The monitoring approach described in this CAM plan relies on presumptively acceptable monitoring as allowed under 40 CFR 64.4(b). The guidance used for the proposed monitoring is "USEPA CAM Technical Guidance Document, A.24 Carbon Adsorber for VOC Control - Facility EE," dated September 2000. Based on the USEPA guidance document and tests conducted at the facility, three compliance indicators have been selected to monitor the performance of the VRU. These indicators are discussed below. It should be noted that an existing system that monitors some of the indicators partially, is already in place and in operation. However, not all compliance indicators are currently being monitored.

This document is organized as follows: the section titled "Compliance Assurance Monitoring Rationale and Justification" includes a detailed background, discusses each compliance indicator in detail and the rationales for selecting such indicators, monitoring frequencies, and action and excursion levels triggering various operator responses. Appendix A contains the CAM plan approach criteria in a tabular format, and is based on the table in the EPA guidance document. Appendices B through F contain samples of operator logs, inspection forms, and maintenance and malfunction reports that the facility maintains/will maintain. Appendix G contains copies of results of tests conducted in February 2002, and February and March 2003.

According to the convention followed at the facility, and therefore in this CAM plan, a greater vacuum refers to a value closer towards absolute vacuum, whereas less vacuum refers to a value closer towards atmospheric pressure. Thus a vacuum greater than (or above) 25.5 in. Hg indicates a vacuum closer toward absolute vacuum.

Compliance Indicators

Monitoring Vacuum profile of VRU

Engineering emission testing analyses performed during normal loading conditions in February and March 2003 demonstrated that if the regenerating carbon bed stays at or above 25.5 inches of mercury

vacuum (in. Hg vacuum), the bed is properly regenerated and will have the capacity to meet the permit-specified VOC emission limits under all loading conditions. Hence this plan proposes to monitor the vacuum on the regenerating bed continuously to confirm that it remains at or above 25.5 in. Hg vacuum during each regeneration cycle. Failure to maintain the regenerating bed at or above 25.5 in. Hg vacuum during a regeneration cycle may cause an excursion. If such an event should occur, vapors from the loading rack will continue to be routed to the bladder tank; however, vapor flow to the VRU will cease until the VRU regenerating bed reaches a reaches a vacuum of 25.5 in. Hg vacuum – either via operator/maintenance intervention or through continued regeneration. In the event the VRU does not reach its designated vacuum level of 25.5 in. Hg and the bladder tank reaches 96% of its holding capacity, an automatic alarm is triggered wherein the loading rack is shut down and no further loading operations can take place until corrective actions are taken. An excursion will trigger an investigation, corrective action, and an external (agency) reporting requirement. However such reporting may not necessarily be indicative of an emission of non methanogenic organic carbon (NMOC) above permitted levels.

As a backup mechanism that may warn operators of a potential impending excursion level vacuum, Motiva proposes to install a visual alarm that will be triggered when the regenerating bed decreases to 26.5 in. Hg vacuum. The visual alarm can be turned off only via operator intervention and thus may allow internal corrective action to be taken even before a potential excursion can occur.

Inspection, Maintenance, Operator Training and Biennial Carbon Bed Testing

An inspection, maintenance and operator training program will be implemented and documented by Motiva. Biennial testing of carbon in carbon beds will also be performed. The terminal operator on duty currently performs VRU operational checks each day during normal working days. Biennial carbon bed testing and quarterly maintenance is performed by a contracted maintenance company. An external reportable incident (although not necessarily indicative of an emission of non methanogenic organic carbon (NMOC) above permitted levels) occurs if the periodic inspections, scheduled maintenance, or carbon bed tests are not performed or documented, or if corrective actions are not initiated within 24 hours of detection of problems.

Monthly Leak Detection and Repair Program

A monthly leak detection and repair program of the vapor recovery system will be implemented. The vapor recovery system will be inspected for leaks using sight, sound, smell and a handheld Lower Explosive Limit (LEL) monitor per 40 CFR 60.502(j). A reportable incident (although not necessarily indicative of an emission of NMOC above permitted levels) is defined as a detection of a leak greater than or equal to 20% of the LEL during normal loading operations. A reportable incident will trigger an investigation, corrective action and an external reporting requirement. Leaks will be repaired within 15 calendar days.

Justification for Monitoring Approach, Selection of Indicators and Indicator Range

Tests conducted on the VRU in February 2002, February 2003 and March 2003, and the USEPA CAM guidance document were the bases for the proposed monitoring approach, selection of the above compliance indicators and their ranges.

EXECUTIVE SUMMARY – TEST RESULTS

Three tests were conducted on the VRU during the period February 2002 through March 2003. Results of these tests are summarized below.

Performance Test, February 2002

This test showed VOC emissions of 1.33 mg/l of product loaded. Comparing the mass of VOC flowing into the VRU with the mass of VOC flowing out, the removal efficiency is calculated as 99.89%. The actual (test) emissions represent 3.8% of the allowable emissions limit of 35 mg/l.

Engineering Emission Test Analysis, February 2003

This test showed VOC emissions of 8.77 mg/l and a VOC removal efficiency of 99.27%, with a vacuum of 25.5 in. Hg. At a vacuum of 26.5 in. Hg, the VOC emissions were 1.08 mg/l and the VOC removal efficiency was 99.92%. The test emissions of 8.77 and 1.08 mg/l represent 25.1% and 3.1% respectively, of the allowable emissions limit. The testing demonstrated that if the regenerating carbon bed stays above or at 25.5 in. Hg vacuum the bed will be properly regenerated and will have the capacity to meet the VOC emissions limit under all loading conditions

Continuous Emission Monitoring (CEM) Test Analysis, March 2003

The CEM testing performed continuously over a duration of 24 hours showed that at a vacuum of 25.5 in. of Hg, VOC mass removal efficiency was 99.95%. This data demonstrates that the carbon adsorber is operating well below the VOC emission limit and that the current preventative maintenance (PM) and operational program for the VRU is maintaining the VRU in an excellent working condition. This test confirmed that at a vacuum of 25.5 in. of Hg, the regenerating bed regenerates adequately and that VOC emissions are well below the emission limits.

Appendix G contains a copy of the test results.

1.0 COMPLIANCE ASSURANCE MONITORING – RATIONALE AND JUSTIFICATION

1.1 BACKGROUND

The pollutant-specific emissions unit (PSEU) at the Motiva terminal is subject to compliance assurance monitoring (CAM) requirements under 40 CFR Part 64 due to the following reasons:

- it is located at a major source that is required to obtain a Title V permit;
- it is subject to an emission limitation of 35 mg of Total Organic Carbon per liter of gasoline loaded, as specified in 40 CFR 60.502(b);
- it uses a control device to achieve compliance with the above emission limit;
- its potential pre-control emissions of volatile organic compounds (VOCs) from the PSEU are at least 100 tons per year (which is the major source threshold for Broward County); and
- it is not otherwise exempt from 40 CFR Part 64.

The monitoring approach described in this CAM plan relies on presumptively acceptable monitoring identified in guidance from EPA and is therefore consistent with the requirements of 40 CFR 64.4(b). Specifically, 40 CFR 64.4(b)(5) allows the use of presumptively acceptable monitoring identified in guidance from the EPA. The guidance used for the proposed monitoring is "USEPA CAM Technical Guidance Document, A.24 Carbon Adsorber for VOC Control - Facility EE," dated September 2000. Where the facility varies from presumptively acceptable monitoring, the facility proposes to use monitoring recommended by the manufacturer and valid engineering assessments and test data, consistent with 40 CFR 64.4(c)(1).

1.1.1 Pollutant-Specific Emissions Unit

The PSEU addressed in this CAM plan is a vacuum regenerative carbon adsorber used to reduce VOC emissions from the loading of petroleum products into trucks at the Motiva North Terminal. The petroleum products loaded are gasoline, diesel and additives. The PSEU is a John Zink© carbon vapor recovery unit (VRU). The VRU is currently permitted as Emissions Unit ID No. 014 (Vapor Recovery System), in Permit No. 0110048-001-AV. The carbon adsorber has two identical beds, one adsorbing while the other is desorbing, with each bed on a 15-minute cycle. Carbon bed regeneration is accomplished by a combination of high vacuum and purge air stripping, which removes previously adsorbed petroleum vapor from the carbon and restores the carbon's ability to adsorb vapor during the next cycle. The vacuum pump extracts concentrated petroleum vapor from the carbon bed and discharges into a separator. Non-condensed hydrocarbon vapor and hydrocarbon condensate flow from the separator to an absorber column, which functions as the recovery device for the system. In the absorber, the hydrocarbon vapor flows up through the absorber packing, where it gets liquefied and is subsequently recovered by absorption. Gasoline product from a storage tank is used as the absorbent fluid. The recovered product is returned along with the circulating gasoline back to the product storage tank. A small stream of air and residual vapor exits the top of the absorber column and is recycled to the on-stream carbon bed where the residual petroleum vapor is re-adsorbed.

Three loading bays are equipped to load petroleum products onto trucks. Each bay is equipped with vapor recovery hoses positioned at the truck loading areas for hook-up to the vapor control system. The vapor hoses and associated piping transport vapors to the VRU, which may also collect in a vapor holding

tank (also known as the bladder tank). Figure CAM-1 shows the vapor flow from the loading rack to the VRU/holding tank. The holding tank is designed to allow a controlled feed of vapors to the VRU. The tank is equipped with a high-level shut-off alarm and has the capacity to contain continuous vapor loading from the loading bays for 14 hours without having the VRU in operation.

Appendix A contains key elements of the CAM plan approach criteria in a tabular format, and is based on the table in the EPA guidance document.

1.2 RATIONALE FOR SELECTION OF PERFORMANCE INDICATORS

The carbon adsorption system was designed and engineered specifically for this facility based on the products loaded and the maximum expected loading rates. The vacuum profile during regeneration is an important variable in the performance of the VRU. If the carbon bed is overloaded, the time to achieve certain vacuum levels will be longer, and the bed will not be fully regenerated during the 15-minute cycle. Most VRU systems directly pipe the vapors from the loading racks to the VRU. However, as described previously, Motiva utilizes a holding tank so that the VRU carbon beds are not overloaded. The holding tank is equipped with a high-level alarm that is triggered when it reaches 96% of its holding capacity. The alarm triggers an automatic interlock to the loading system and automatically shuts down the loading rack.

Monitoring of the vacuum profile during regeneration, coupled with regular inspection and maintenance activities, operator training and biennial testing of the carbon sample from each bed, serve to verify that the VRU is operating properly. In addition, a monthly leak inspection program is performed to confirm that the vapors released during loading are captured and conveyed to the VRU. A handheld monitor is used to detect leaks in the vapor collection system.

1.3 RATIONALE FOR SELECTION OF INDICATOR RANGES

1.3.1 Compliance Indicator No. 1 - Monitoring Vacuum profile of VRU

Compliance Indicator No. 1 will include monitoring the vacuum cycle of the regeneration bed. An engineering emission test analysis was performed during normal loading conditions in February 2003. (Even during peak operating conditions the VRU is not overloaded because the holding tank regulates vapor loading to the VRU and is sized to accommodate up to 14 hours of continuous loading without using the VRU.) The test demonstrated that if the regenerating carbon bed stays at or above 25.5 inches of mercury vacuum (in. Hg vacuum) the bed will be properly regenerated and will have the capacity to meet the VOC emission limits under all loading conditions. This test was followed by a test in March 2003, where a Continuous Emissions Monitoring (CEM) unit was used to monitor emissions for 24 hours; this test confirmed that at a vacuum of 25.5 in. Hg, the regenerating bed regenerates adequately and that VOC emissions are well below the emission limits. ***Appendix G*** contains a copy of the test results. Based on the test results, an excursion occurs when the regenerating bed decreases to 25.5 in. Hg vacuum. Vacuum readings will be monitored continuously via a pressure transmitter to verify that the regenerating bed remains at or above 25.5 in. Hg vacuum. This excludes periods when the monitoring system is under repair, maintenance, or QA/QC procedures. These vacuum readings will be relayed to the control panel. Operators will observe and record at least one complete regeneration cycle during each 24-hour period during normal working days. When an excursion occurs, vapors are no longer sent to the VRU and a visual alarm is triggered; vapor flow to the VRU does not resume until the VRU regeneration cycle

reaches a vacuum of 25.5 in. Hg – either via operator intervention or through self-adjusting means. However normal loading operations will continue until the holding tank has reached its high-level capacity limit. At this point the high-level alarm in the holding tank will automatically shut down the loading rack. All instances of loading rack shut down are recorded. ***Appendix B*** contains the VRU Daily Operation Log, which contains the pressure profile records.

The most recent performance test conducted in February 2002, showed VOC emissions of 1.33 mg/liter of product loaded. This tested emission value represents 3.8% of the allowable VOC emissions limit of 35 mg/l. The engineering emission test analysis that was performed in February 2003 showed VOC emissions of 8.77 mg/l and a VOC removal efficiency of 99.27%, with a vacuum of 25.5 in. Hg. At a vacuum of 26.5 in. Hg, the VOC emissions were 1.08 mg/l and the VOC removal efficiency was 99.92%. The CEM test that was performed in March 2003, showed that at a vacuum of 25.5 in. Hg, VOC removal efficiency was 99.95%. This data demonstrates that the carbon adsorber is operating well below the VOC emission limit and that the current preventative maintenance (PM) and operational program for the VRU is maintaining the VRU in an excellent working condition.

According to the convention followed at the facility, and therefore in this CAM plan, a greater vacuum refers to a value closer towards absolute vacuum, whereas less vacuum refers to a value closer towards atmospheric pressure. Thus a vacuum greater than (or above) 25.5 in. Hg indicates a vacuum closer toward absolute vacuum.

1.3.1.1 Action Level

In order to provide a high level of assurance that the excursion level is not reached for Compliance Indicator No. 1, the facility proposes an action level set above the excursion level. The action level will be set at 26.5 in. Hg vacuum. If the vacuum decreases to 26.5 in. Hg during a regeneration bed cycle, a visual alarm is triggered on the control panel, which can be turned off only by operator intervention. Following the acknowledgement of the alarm by an on-duty operator, an investigation and subsequent corrective action(s) will be initiated so that the cause of the problem may be corrected before an excursion occurs.

1.3.1.2 Excursion Level/Reportable Incident Level

As indicated above, an excursion occurs when the regenerating bed decreases to 25.5 in. Hg vacuum. When an excursion occurs, vapors are no longer sent to the VRU and a visual alarm indicating the discontinuation of vapor flow to the VRU is triggered. Under such circumstances, vapors are routed completely to the bladder tank. Normal loading operations will continue until the holding tank has reached its high-level capacity. At this point the high-level alarm in the holding tank will activate and automatically shut down the loading rack. A reportable incident (although not necessarily indicative of an emission of NMOC above permitted levels) occurs when the vapor flow to the VRU is shut off. Excursion level incidents will be documented in the Monthly VRU Maintenance and Malfunction Report, in ***Appendix D***.

1.3.2 Compliance Indicator No. 2- Inspection, Maintenance, Operator Training and Biennial Carbon Bed Testing

Compliance Indicator No. 2 will include a documented inspection, maintenance and operator-training program, and biennial carbon bed testing. VRU operational checks will be performed each day that an operator is on duty during normal working days. Routine maintenance activities are also conducted. Results of daily inspections and routine maintenance are recorded in the VRU Weekly Inspection Report, included in ***Appendix C***. Results of monthly maintenance as well as malfunctions resulting in VRU shut down are recorded in the Monthly VRU Maintenance and Malfunction Report, included in ***Appendix D***. Quarterly maintenance and biennial carbon bed testing is performed by a contracted maintenance company. Results of quarterly maintenance activities are recorded and a file copy is maintained on-site. A copy of the quarterly maintenance activities performed is shown in ***Appendix E***. Documentation of operator training is also maintained in ***Appendix E.***

1.3.2.1 Reportable Incident Level

An external reportable incident (although not necessarily indicative of an emission of NMOC above permitted levels) occurs if the periodic inspections, scheduled maintenance, or biennial carbon bed tests are not performed or documented, or if corrective actions are not initiated within 24 hours of detection of problems.

1.3.3 Compliance Indicator No. 3 – Monthly Leak Detection And Repair Program

Compliance indicator No. 3 will include a monthly leak detection and repair program. The vapor collection and recovery system will be inspected for leaks using sight, sound, smell and a handheld Lower Explosive Limit (LEL) monitor. Results of the leak inspections are recorded in the Monthly Leak Inspection Form, included in ***Appendix F***.

1.3.3.1 Action Level

In order to verify that corrective actions are taken on leaking piping, hoses, etc., before they lead to reportable incidents, Motiva proposes an action level as a detection of a leak greater than or equal to 10% and less than 20% of the LEL during normal loading operations. If a detection of leaks triggering an LEL reading in the action level range occurs, a corrective action will be initiated, the cause of the problem will be identified and repairs will be made within 30 calendar days.

1.3.3.2 Reportable Incident Level

An external reportable incident (although not necessarily indicative of an emission of NMOC above permitted levels) is defined as a detection of a leak greater than or equal to 20% of the LEL during normal loading operations. If a detection of leaks triggering an LEL reading in the reportable level range occurs, a corrective action will be initiated, the cause of the problem will be identified and repairs will be made within 15 calendar days.

1.4 RESPONSE TO COMPLIANCE INDICATORS

The key to demonstrating compliance with permitted emission limits on a long-term basis is the proper operation and maintenance of the PSEU. The above monitoring parameters and indicator ranges were identified to provide verification that the PSEU is operating properly, thereby providing a reasonable assurance of compliance. However, it is equally important that proper action be taken in response to the action and excursion levels of the selected monitoring parameters. These responses are descried below.

1.4.1 Compliance Indicator No. 1

1.4.1.1 Action Level

Exceeding the action level range will trigger an investigation, corrective action and an internal reporting requirement. Upon an action level alarm being acknowledged by an operator, a corrective action will be initiated within 24 hours. If onsite personnel cannot conduct the required corrective action, the contracted maintenance group will be notified of the incident within the next 24 hours and will be brought onsite as soon as possible.

1.4.1.2 Excursion Level/Reportable Incident Level

An excursion will trigger an investigation, corrective action, and an external reporting requirement. Upon the discontinuation of the vapor flow to the VRU a visual alarm is triggered and a corrective action will be initiated within 24 hours of acknowledgement of the alarm. If onsite personnel cannot conduct the required corrective action, the contracted maintenance group will be notified of the incident within 24 hours and will be brought onsite as soon as possible.

1.4.2 Compliance Indicator No. 2

1.4.2.1 Action Level

Not applicable.

1.4.2.2 Incident Level

A reportable incident will trigger an investigation, corrective action, and an external reporting requirement. Corrective actions will be initiated within 24 hours of the detection of the reportable incident.

1.4.3 Compliance Indicator No. 3

1.4.3.1 Action Level

Exceeding the action level range will trigger an investigation, corrective action and an internal reporting requirement. Leaks will be repaired within 30 calendar days.

1.4.3.2 Incident Level

A reportable incident will trigger an investigation, corrective action and an external reporting requirement. Leaks will be repaired within 15 calendar days.

1.5 APCD BYPASS MONITORING

Under normal operating conditions, bypass of the APCD (i.e., the VRU) cannot occur based on the design of the PSEU. Specifically, all vapors collected at the loading rack flow through a single header to the bladder tank and/or the VRU. If the vapor flow rate from the loading rack exceeds the processing rate of the VRU, the excess vapors will collect in the bladder tank. Should the bladder tank become full enough to trip the high level alarm, an interlock will automatically shut down the loading rack; the VRU will continue to process the vapors in the bladder tank. When the loading rack vapor flow rate decreases below the VRU processing rate, the vapors held in the bladder tank will be processed by the VRU. There are no other lines coming from the loading rack or the bladder tank; thus there are no alternate pathways for vapors to bypass the VRU during normal operation. Refer to Figure CAM-1 for a diagram that shows vapor flow from the loading rack to the PSEU.

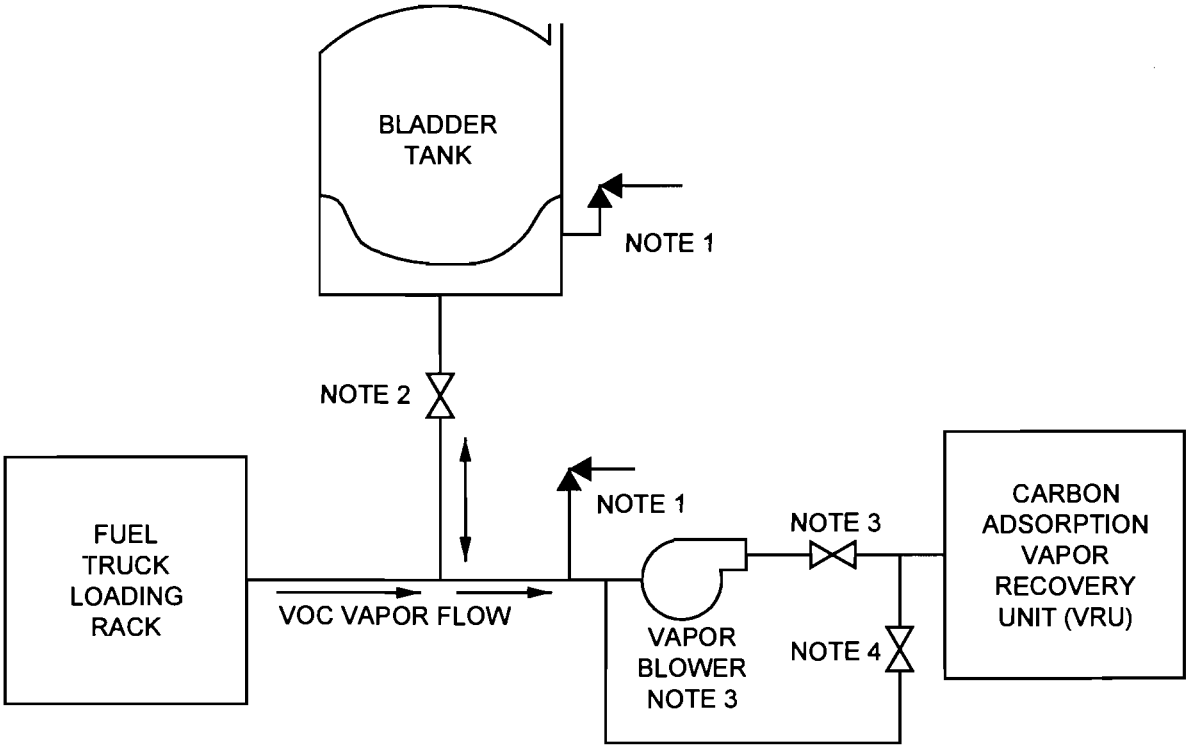
1.6 IMPLEMENTATION PLAN AND SCHEDULE

As per 40 CFR 64.4(e), Motiva proposes to install and implement the elements of this proposed CAM plan within 180 days after approval of the Federal Operating Permit. This schedule is contingent upon approval of the CAM plan.

must be in place when final permit is issued

Figures

F



NOTES:

1- RELIEF VALVES REMAIN CLOSED DURING NORMAL OPERATION.

2- BLADDER TANK ISOLATION VALVE (MANUAL VALVE) REMAINS OPEN DURING NORMAL OPERATION.

3- VRU INLET VALVE IS OPEN & BLOWER IS RUNNING DURING NORMAL OPERATION. ONE OR BOTH WILL BE MODIFIED TO AUTOMATICALLY ACTUATE PER CAM PLAN DURING EXCURSION CONDITIONS.

4- BLOWER PYPASS IS NORMALLY CLOSED & IS TO BE OPENED WHEN BLOWER IS UNAVAILABLE FOR OPERATION DURING EMERGENCIES/MALFUNCTIONS.

NOT TO SCALE

E A R T H T E C H

FIGURE CAM-1
FDEP FACILITY ID 0110048
VOC VAPOR FLOW DIAGRAM
MOTIVA ENTERPRISES LLC, 909 SE 24th STREET
FT. LAUDERDALE, FLORIDA

MAY 2003 55755

DATE: 29 May, 2003 TIME: 1139

...\55755005.dgn

APPENDIX A

CAM PLAN APPROACH CRITERIA

Appendix A
Motiva Enterprises LLC
Port Everglades, FL North Terminal
FDEP Facility ID 0110048
Summary Table - Compliance Assurance Monitoring Approach Criteria

	Compliance Indicator 1	Compliance Indicator 2	Compliance Indicator 3
Parameter	Regeneration cycle vacuum. Specifically, monitoring the vacuum on the regenerating bed to confirm that it remains at or above 25.5 inches of mercury (in. Hg) vacuum.	Documentation of inspection, maintenance and operator training program and biennial carbon bed testing.	Documentation of inspection, maintenance and leak checks of vapor recovery system.
Measurement Approach	Pressure transmitter, relayed to system PLC.	Proper VRU operation is verified by performing periodic inspections and maintenance by properly trained personnel. Daily operator checks include regenerating bed operating temperature profile, cycle time, operating pressures, operating temperatures, and verification of relevant fluid levels. Daily operator checks are performed each day that an operator is on duty during normal working days. A copy of the VRU Weekly Inspection Report is included in Appendix C. Quarterly maintenance is performed by maintenance contractor. Biennial testing of the carbon in each bed will also be performed. A copy of the quarterly maintenance activities as well as the biennial tests conducted at the facility is included in Appendix E.	Monthly leak check of vapor collection system.
Indicator Range Action Level Range*	A corrective action is triggered when the regenerating carbon bed decreases to 26.5 in. Hg vacuum during regeneration. When the action level range is breached, a visual alarm is triggered on the control panel. This alarm must be acknowledged by an operator to turn off.	NA	A corrective action is triggered if an LEL reading of 10% - <20% is detected during an inspection.
Excursion Level/Reportable Incident Range*	An excursion occurs when the regenerating carbon bed decreases to 25.5 in. Hg vacuum during regeneration. A visual alarm is triggered and vapors are no longer sent to the VRU. Normal loading operations will continue until the holding tank has reached its high-level capacity. At this point the high-level alarm in the holding tank will activate and automatically shut down the loading rack.	A reportable incident (although not necessarily indicative of an emission of NMOC above permitted levels) occurs if the periodic inspections, scheduled preventative maintenance, or biennial carbon test is not performed or documented, or if corrective action is not initiated within 24 hours of detection to correct any problems identified during the inspection, maintenance of the unit or carbon testing.	A reportable incident (although not necessarily an emission of NMOC above permitted levels) occurs if an LEL reading equal to or above 20% is detected during an inspection.

Appendix A
Motiva Enterprises LLC
Port Everglades, FL North Terminal
FDEP Facility ID 0110048
Summary Table - Compliance Assurance Monitoring Approach Criteria

	Compliance Indicator 1	Compliance Indicator 2	Compliance Indicator 3
Response to Indicators Action Level Range	Breach of the action level range will trigger an investigation, corrective action and an internal reporting requirement. Upon an action level alarm being acknowledged by the facility, a corrective action will be initiated within 24 hours. If the required corrective action cannot be conducted by onsite personnel, the contracted maintenance group will be notified of the incident within 24 hours and will be brought onsite as soon as possible.	NA	Exceeding the action level range will trigger an investigation, corrective action and an internal reporting requirement. Leaks will be repaired within 30 calendar days. 1 Business
Excursion Level/Reportable Incident Range	An excursion will trigger an investigation, corrective action, and an external reporting requirement. It should be noted that such external reporting may not necessarily be indicative of emissions of NMOC above permitted levels. Upon the discontinuation of vapor flow from the holding tank to the VRU, a visual alarm is triggered and a corrective action will be initiated within 24 hours of acknowledgement of the alarm. If the required corrective action cannot be conducted by onsite personnel, the contracted maintenance group will be notified of the incident within 24 hours and will be brought onsite as soon as possible. 48 hrs to Notify - Show up ?	A reportable incident will trigger an investigation, corrective action, and an external reporting requirement. Corrective actions will be initiated within 24 hours of the detection of the reportable incident.	A reportable incident will trigger an investigation, corrective action and an external reporting requirement. Leaks will be repaired within 15 calendar days. 1 Business
Performance Criteria Data Representativeness	The pressure cycle is measured in the vacuum pump suction line. The minimum accuracy of the pressure transmitter is +/- 1.0 percent. The pressure transmitter is equipped with a visual alarm that is triggered when the regenerating carbon bed vacuum decreases to the Action Level. The alarm has to be acknowledged by an operator to turn off. The pressure transmitter is also equipped with an additional visual alarm that is triggered when the carbon bed vacuum decreases to the excursion level.	VRU operation will be verified by trained personnel using documented inspection and maintenance procedures. Carbon samples will be properly taken using representative samples taken from both beds.	As required by 40 CFR 60.502(j), leaks are inspected using sight, sound and smell. Additionally, a handheld monitor is used to check for leaks in the vapor collection system bladder tank.
Verification of Operational Status	NA	NA	NA

Appendix A
Motiva Enterprises LLC
Port Everglades, FL North Terminal
FDEP Facility ID 0110048
Summary Table - Compliance Assurance Monitoring Approach Criteria

	Compliance Indicator 1	Compliance Indicator 2	Compliance Indicator 3
QA/QC Practices and Criteria	Pressure transmitter is calibrated annually. Alarm light operation is visually checked each day that an operator is on duty during normal working days. New operators are given 40 hours of hands-on training by a qualified operator, prior to working independently.	New operators are given 40 hours of hands-on training with a qualified operator, prior to working alone. Each operator is given one day of hands-on training annually with the VRU maintenance contractor on proper maintenance, operation and repair of the VRU. Quarterly maintenance is performed by licensed contractor with extensive knowledge of VRU operation and maintenance.	Procedures are followed according to 40 CFR 60.502(j), NSPS for Bulk Gasoline Terminals. In addition, the bladder tank is inspected for leaks using a handheld monitor.
Monitoring Frequency	Pressure profile is monitored and recorded continuously during each regeneration cycle and visual alarms are triggered when the action level/excursion level is breached. Regeneration cycle is monitored visually, once per 24 hour shift when operator is on duty during normal working days. Alarm light is checked daily when operator is on duty.	Periodic operation and maintenance checks conducted by onsite trained operators. Contract maintenance group performs quarterly scheduled maintenance. Carbon bed testing is performed biennially.	Monthly leak check of vapor collection system. A copy of the monthly leak inspection form is included in Appendix F.
Data Collection Procedures	The operator records the pressure profile during one regeneration cycle per 24 hour shift, except when operator is not on duty (weekends, holidays, etc.) Copies of these pressure profile records are maintained in Appendix B. Alarm light and status are checked and recorded once per day except when operator is not on duty (i.e., weekends, holidays). Alarm lights will not turn off until acknowledged. After the period when an operator is not on duty, the first, shift operator on duty will initiate VRU operation inspection as soon as possible after beginning shift. Excursion level alarm triggers shutdown of vapor flow to VRU. Periods of system shut down on the loading racks are recorded in Appendix D.	Results of daily inspections are recorded in the VRU Weekly Inspection Report. Incidents when the VRU is taken out of service for routine maintenance by plant personnel are recorded in a Monthly Maintenance and Malfunction Report. A copy of this report is included in Appendix D. Quarterly maintenance report is prepared by the maintenance service company and a copy is left at the terminal prior to their departure. Results of the biennial carbon bed testing are maintained onsite. Documentation of operator training along with the quarterly maintenance report and carbon bed test results are maintained in Appendix E.	Records of leak checks, leaks found, and corrective actions taken are kept on file at the facility.
Averaging Period	None.	None.	None.
APCD Bypass Monitoring	Under normal operating conditions, bypass of the APCD (i.e., the VRU) cannot occur based on the design of the PSEU. Specifically, all vapors collected at the loading rack flow through a single header to the bladder tank and/or the VRU. If the vapor flow rate from the loading rack exceeds the processing rate of the VRU, the excess vapors will collect in the bladder tank. Should the bladder tank become full enough to trip the high level alarm, an interlock will automatically shut down the loading rack; the VRU will continue to process the vapors in the bladder tank. When the loading rack vapor flow rate decreases below the VRU processing rate, the vapors held in the bladder tank will be processed by the VRU. There are no other lines coming from the loading rack or the bladder tank; thus there are no alternate pathways for vapors to bypass the VRU during normal operation. Refer to Figure CAM-1 for a diagram that shows vapor flow from the loading rack to the PSEU.		

Indicator ranges for Compliance Indicator No. 1 were developed by conducting engineering emission test analyses in February and March 2003. Results of these tests are included in Appendix G.

APPENDIX B

VRU DAILY OPERATION LOG

Appendix B
Motiva Enterprises LLC
Port Everglades, FL North Terminal
FDEP Facility ID 0110048
VRU Daily Operation Log - John Zink© Vapor Recovery Unit

Monitor adsorber temperatures and vacuum levels during one regeneration cycle per 24-hour day, during normal working days.
Indicate with (*) when purge air trips SV101 or SV102.
Normal bed temperatures, 20-200 F.

Date: _____ Operator Name: _____

		V-1 Regeneration	V-2 Regeneration
Start Temperatures (F):	TI101:		
	TI102:		
	TI103:		

Regeneration Time (minutes)	Vacuum, inches Hg. PI101 (V-1)	PI501 (C-1)	Vacuum, inches Hg. PI201 (V-2)	PI501 (C-1)
0				
1				
2				
4				
6				
8				
10				
12				
14				
15				
16				

End Temperatures (F):	TI101:		
	TI102:		
	TI103:		

APPENDIX C

VRU WEEKLY INSPECTION REPORT

Appendix C
Motiva Enterprises LLC
Port Everglades, FL North Terminal
FDEP Facility ID 0110048
VRU Weekly Inspection Report - John Zink© Vapor Recovery Unit

		MON	TUE	WED	THU	FRI	SAT/ SUN
	DATE:						
Gasoline Supply Pressure	PI701						
Gasoline Return Pressure	PI601						
Temp. Gasoline Supply	TI701						
Gas. to Absorber Pressure	PI301						
Gasoline Return Pressure	PI302						
Gas. Level in Separator	LG302						
Temp. Heat Exchanger Out	TI303						
Temp. Gasoline in Separator	TI302						
Temp. Glycol in Separator	TI301						
Temp. Seal Fluid Inlet	TI401						
Temp. Vacuum Pump Inlet	TI402						
Glycol Level in Separator	LG301						
Seal Fluid Inlet Pressure	PI402						
Vacuum on Pump Gauge	PI401						
Fluid Leaks (Remarks*)							
Abnormal Noises (Remarks*)							
General System Alarm Check							
Bed Pressure Visual Alarm Check for 26.5 in. Hg Vacuum (Off/On)							
Bed Pressure Visual Alarm Check for 25.5 in. Hg Vacuum (Off/On)							
Oil Level/Supply Pump							
Oil Level/Return Pump							
Bladder Tank Level							
Bladder Tank Isolation Valve (Open/Close)							
Vacuum Pump Change to #							
Supply Strainer Last Cleaned:							
Vacuum Pumps and Motors Last Lubed:							
Glycol Last Added:							

Remarks:

APPENDIX D

MONTHLY VRU MAINTENANCE & MALFUNCTION REPORT

*PLANT VAPOR RECOVERY SYSTEM MALFUNCTION REPORT

MONTH ____________ PLANT ____________

OUT-OF-SERVICE DATE/TIME	RET'D TO SERVICE DATE/TIME	TIME OUT OF SERVICE	SIGNED BY	DESCRIBE MALFUNCTION	GOVERNMENT AGENCY AND PERSON NOTIFIED
DID MALFUNCTION RESULT IN EMISSIONS THAT REQUIRED REPORTING TO A GOVERNMENTAL AGENCY? ( ) NO ( ) YES		ELECTIVE ( ) NON ELECTIVE ( )			
DID MALFUNCTION RESULT IN EMISSIONS THAT REQUIRED REPORTING TO A GOVERNMENTAL AGENCY? ( ) NO ( ) YES		ELECTIVE ( ) NON ELECTIVE ( )			
DID MALFUNCTION RESULT IN EMISSIONS THAT REQUIRED REPORTING TO A GOVERNMENTAL AGENCY? ( ) NO ( ) YES		ELECTIVE ( ) NON ELECTIVE ( )			
DID MALFUNCTION RESULT IN EMISSIONS THAT REQUIRED REPORTING TO A GOVERNMENTAL AGENCY? ( ) NO ( ) YES		ELECTIVE ( ) NON ELECTIVE ( )			

ELECTIVE MEANS YOU CHOSE TO TAKE THE UNIT OUT OF SERVICE, NON ELECTIVE MEANS YOU HAD TO TAKE THE UNIT OUT OF SERVICE

*SYSTEM INCLUDES VAPOR PROCESSING UNIT, VENTS (INCLUDING TANKS IF CONNECTED), VAPOR HOLDER, VAPOR PIPING, T/T RACK LOADING ASSEMBLIES AND VAPOR HOSES. REPORT ALL INCIDENTS RESULTING IN EMISSIONS REQUIRING NOTIFICATION TO AN AGENCY ANY MAJOR EQUIPMENT/COMPONENT FAILURE AND ALL EQUIPMENT FAILURES/PROBLEMS OF A REPETITIVE NATURE.

TAL8808202 - 0001.0.0

APPENDIX E

QUARTERLY PREVENTATIVE MAINTENANCE CHECKLIST, OPERATOR TRAINING FORMS, BIENNIAL CARBON BED TEST RESULTS

JORDAN TECHNOLOGIES, INC.

(Z)

PREVENTATIVE MAINTENANCE CHECK LIST

TERMINAL NAME: _____

ADDRESS: _____

_____

_____

SERVICE TECHNICIAN: _____

DATE THIS INSPECTION: _____

ARRIVAL TIME: _____ DEPARTURE TIME: _____

**TERMINAL WAS NOTIFIED PRIOR TO THIS SCHEDULED INSPECTION AND ALL PROBLEMS WERE DISCUSSED WITH TERMINAL MANAGER BEFORE INSPECTION STARTED.

COMMENTS _____

_____

_____

_____

OPERATING SET POINT FROM THE ZINK MANUAL

		BOOK	FIELD
1.	Gas pressure to top of absorber PI-301	_____	_____
2.	Gas pressure to bottom of absorber PI-302	_____	_____
3.	Purge air pressure switch	_____	_____
4.	Minimum flow pressure switch	_____	_____
5.	Seal fluid setting to vacuum pump PI-402	_____	_____

ANNUAL CHECK #1

1. Check carbon levels. _____
2. Grease all pumps and motors. _____
3. Pull and inspect Phillips float assembly. Rebuild if needed. _____
4. Pull and calibrate carbon bed thermometers. _____

SEMI ANNUAL CHECK #2

1. Grease all pumps and motors. _____
2. Rebuild level & flow control valves. _____
3. Change "O" rings in Hydraulic shut off valves. _____
4. Pull and calibrate carbon bed temperature switches. _____

#3

1. Inspect motors starters. _____

COMMENTS _____

		BED 1	BED 2
1.	Purge air setting in. Hg vac	_____	_____
2.	Are fumes visible from exhaust vent stacks?	_____	_____
3.	Minimum flow setting in. Hg vac	_____	_____
4.	Total vacuum time (regen crack to regen start to close)	_____	_____
5.	Total equalization time (regen fully closed to regen crack)	_____	_____

6. VESSEL 1 - Drop on vacuum pump on the 2 stages of opening the MOV-102 valve. (Make certain the vacuum gauge does not drop below 10")

   STAGE 1 _____ STAGE 2 _____

7. VESSEL 2 - Drop on vacuum pump on the 2 stages of opening the MOV-202 valve. (Make certain the vacuum gauge does not drop below 10")

   STAGE 1 _____ STAGE 2 _____

8. With both regeneration valves closed, give deepest vacuum observed on the vacuum pump gauge. _____

9. When VESSEL 1 equalizes, make certain MOV-101 opens slowly and dusting is not observed. Time required. _____

10. When VESSEL 2 equalizes, make certain MOV-201 opens slowly and dusting is not observed. Time required. _____

11. Check all indicator lights and lenses and replace faulty ones. _____

11A. Check area light. _____

12. Calibrate temperature probes. _____

13. Temperature of gasoline from heat exchanger. _____
    NOTE: For temperature readings use 1 probe.

14. Temperature of gasoline to heat exchanger. _____

15. Gasoline heat gain through heat exchanger. _____

16. Discharge temperature of Glycol at the vacuum pump. _____

COMMENTS_____

17. Temperature of Glycol to the vacuum pump. _____

18. Heat gain through the vacuum pump. _____

19. Temperature differential between gasoline from heat exchanger and glycol from heat exchanger. IF NUMBER IS GREATER THAN FIVE, BRING TO TERMINAL MANAGER'S ATTENTION. IF AT TEN (10) DEGREES, FURTHER INVESTIGATION IS REQUIRED. ** _____

SHUTDOWNS

20. Pull drain plug on vapor tee before shut down and after shut downs. Insure glycol not present. If it is, pull vacuum suction check valve and inspect. _____

21. High level gasoline _____

22. Low level gasoline _____

23. Seal fluid circulation (S) _____

24. Emergency Shutdown _____

25. Return pump. _____

26. Supply pump. _____

27. Seal pump (S) _____

28. Vacuum pump (S) _____

29. Check temperature switches TSH 101, 201, 202, 102, tripping any of these switches will close all absorber motor operated valves. _____

30. Turn control power off. Insure Failsafe closes and return line check valve is holding. _____

31. Insure gas level in the separator or absorber does not change during a shutdown. _____

32. On re-establishment of power, make sure that a level 3 shutdown has occurred; all indicator lights will be on, all valves closed, and all motors stopped. _____

COMMENTS _____

_____

_____

33. On Auto shutdown, insure that system works properly. _____

34. Clean Glycol strainer and/or replace filter element. _____

35. Clean gasoline strainer if gasoline supply pressure or flow rate is low. _____

36. Clean Brooks strainer. _____

37. Record supply/return tank level. _____

38. Gas pressure to top of gas absorber PI-301 _____ Corrected To _____

39. Gas pressure to bottom absorber PI-302 _____ Corrected To _____

40. Seal fluid pressure pump PI-402 _____

41. Supply pump PI-701 4A discharge pressure _____

42. Return pump PI-601 discharge pressure _____

43. Leak check VESSEL 1 _____

44. Leak check VESSEL 2 _____

45. Are all gauges working properly? _____

46. Remove the Covers from all actuators. _____
Check all wiring, brakes, micro switches, cam heaters, thermostats.
Clean and remove moisture and corrosion. Lubricate and reseal.

A. MOV-201 VENT _____ E. MOV-102 REGEN _____

B. MOV-202 REGEN _____ F. MOV-103 INLET _____

C. MOV-203 INLET _____ G. MOV-701 GAS SUP _____

D. MOV-101 VENT _____ H. MOV-601 GAS RET _____

47. Observe the valves for proper operation and switching and see that they are seated properly. _____

COMMENTS _____

_____

48. Open main control panel, tighten all wiring, clean box, check all switches and record timers:

PROCESS TIMERS

VENT VALVE RUN TR 101_____ TR 201_____

REGEN VALVE RUN TR 102_____ TR 202_____

49. Insure control panel thermostat and heater are working. Set at 75 degrees _____

50. Open all pump and breaker boxes. Tighten all wiring, clean box, clean and lubricate the switches and reset buttons. Check heat tape.

A. Supply pump box _____

_____ _____

B. Return pump box _____

_____ _____

C. Vacuum pump box _____

_____ _____

D. Seal pump box _____

_____ _____

E. Sump pump box _____

_____ _____

51. L1 to ground_____ L2 to ground_____ L3 to ground_____

L1 to L2 _____ L2 to L3 _____ L1 to L3 _____

COMMENTS_____

_____

_____

_____

52. Rated amps to supply pump _____ Running amps _____

53. Rated amps to return pump _____ Running amps _____

54. Rated amps to seal pump _____ Running amps _____

55. Rated amps vacuum pump _____ Running amps _____

56. **Meg ohm Motors**

	L1 to GR	L2 to GR	L3 to GR
Supply Pump			
Return Pump			
Seal Pump			
Vacuum Pump			

COMMENTS _____

57. Check condition of all pump coupling and belts visually. _____

58. Supply pump and coupling OK. _____

_____ _____

Return pump and coupling OK. _____

_____ _____

Seal pump and coupling OK. _____

_____ _____

Vacuum pump and coupling OK. _____

_____ _____

59. Check Glycol concentration and pH. _____

60. Install biocide in unit and leave enough for monthly treatment. _____

61. Check gauge glasses, clean, lubricate and check for proper operation. _____

62. Level control valve has smooth operation. _____

63. Gas level in separator is stable. Record fluctuation. _____

64. Inches of Glycol is sight glass. _____

65. Inches of Gasoline in sight glass. _____

66. Check for any fluid leaks. _____

67. Check for adnormal noises. _____

68. How many drums of VR coolant does terminal have on hand? _____

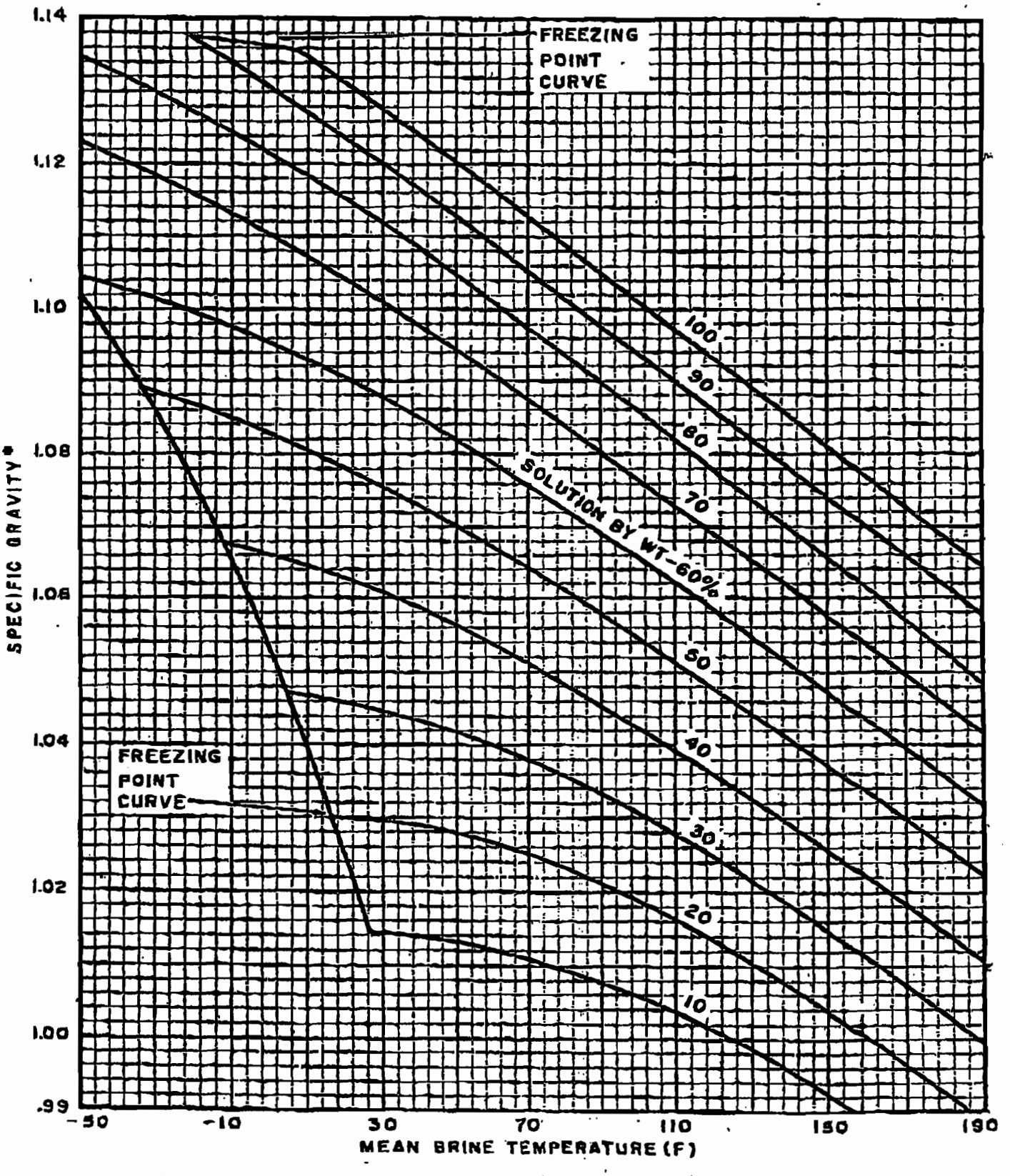
COMMENTS _____

_____

_____

_____

CHART 19—ETHYLENE GLYCOL—SPECIFIC GRAVITY



*With reference to 60 F water.

From *Glycols, Properties and Uses*, Dow Chemical Co. 1961

1. Ambient Temp._____

2. BED PULL DOWN DATA

VESSEL 1		VESSEL 2	
TEMP AT START: TOP_____°F MID_____°F BOT_____°F		TOP_____°F MID_____°F BOT_____°F	
MINUTE	-in.Hg VAC	MINUTE	-in.Hg VAC
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14		14	
15		15	
16		16	
TEMP AT END: TOP_____°F MID_____°F BOT_____°F		TOP_____°F MID_____°F BOT_____°F	

Go through inspection with customer and explain completely.

Customer's Signature_____

DATE: _____

TERMINAL LOCATION: _____

COMMENTS: (Location of where parts are to be installed next P.M.I.)

_____

_____

_____

PARTS TO BE SHIPPED FOR THE NEXT INSPECTION:

TECHNICIAN: _____

QTY	COMPUTER #	DESCRIPTION	BIN #	DATE SHIPPED

For any parts or equipment to be ordered or shipped, a signature and purchase order number is required

Signature: _____ P.O.# _____

COMMENTS: _____

_____

_____

OPTIONAL DETAILED INSPECTION

LOADING RACK CHECK LIST

1. BACK PRESSURE CHECK:

RACK #1
NUMBER OF LOADING ARMS_____ BACK PRESSURE IN W/C INCHES_____

RACK #2
NUMBER OF LOADING ARMS_____ BACK PRESSURE IN W/C INCHES_____

RACK #3
NUMBER OF LOADING ARMS_____ BACK PRESSURE IN W/C INCHES_____

RACK #4
NUMBER OF LOADING ARMS_____ BACK PRESSURE IN W/C INCHES_____

RACK #5
NUMBER OF LOADING ARMS_____ BACK PRESSURE IN W/C INCHES_____

RACK #6
NUMBER OF LOADING ARMS_____ BACK PRESSURE IN W/C INCHES_____

RACK #7
NUMBER OF LOADING ARMS_____ BACK PRESSURE IN W/C INCHES_____

RACK #8
NUMBER OF LOADING ARMS_____ BACK PRESSURE IN W/C INCHES_____

2. LEAK CHECK ENTIRE VAPOR SYSTEM FOR HYDROCARBON LEAKS._____

3. PULL AND CLEAN ALL FLAME ARRESTORS:

RACK #1_____ RACK #5_____
RACK #2_____ RACK #6_____
RACK #3_____ RACK #7_____
RACK #4_____ RACK #8_____

FLAME ARRESTORS BETWEEN LOADING RACK AND VAPOR CONTROL UNIT. _____

4. CHECK OPERATION OF THE AUTOMATIC DRAIN VALVES ON THE HOSES DRAIN POTS. _____

COMMENTS:_____

_____

(CONTINUED NEXT PAGE)

BEST AVAILABLE COPY

5. PULL AND CLEAN ONE WAY CHECK VALVES BETWEEN VAPOR LINE TRAP AND VAPOR HOSE DRAIN POT. TEST TO 18" W/C. _____

6. CHECK VAPOR TANK HIGH LEVEL ALARM. _____

7. CHECK SUMP TANK FLOAT SWITCHES:
   HIGH LEVEL ALARM _____
   PUMP ON _____
   PUMP OFF _____

8. CHECK AND CALIBRATE PRESSURE VACUUM VENT VALVES:

   VENT SIZE _____
   VACUUM SET-POINT _____ TEST RESULTS _____
   PRESSURE SET-POINT _____ TEST RESULTS _____

   VENT SIZE _____
   VACUUM SET-POINT _____ TEST RESULTS _____
   PRESSURE SET-POINT _____ TEST RESULTS _____

   VENT SIZE _____
   VACUUM SET-POINT _____ TEST RESULTS _____
   PRESSURE SET-POINT _____ TEST RESULTS _____

9. CHECK LOADING RACK VAPOR CHECK VALVES:

RACK #1	_____	RACK #5	_____
RACK #2	_____	RACK #6	_____
RACK #3	_____	RACK #7	_____
RACK #4	_____	RACK #8	_____

COMMENTS: _____

NOTE: IF THERE IS A PROBLEM WITH THE LOADING RACK, YOU MUST NOTIFY THE TERMINAL MANAGER AT THIS TIME. THE PROBLEM MUST NOT BE FIXED UNLESS YOU ARE FINISHED WITH THE PMI ON THE VAPOR RECOVERY UNIT. IF THE TERMINAL WANTS PROBLEM FIXED, THIS MUST BE WRITTEN UP ON A SEPARATE INVOICE, TO BE BILLED SEPARATE. THE CLEANING OF FLAME ARRESTOR, ETC., WILL BE BILLED AT OUR HOURLY RATE PLUS EXPENSES.

THIS HAS BEEN APPROVED BY TERMINAL PERSONNEL AND TIME HAS BEEN APPROVED.

HAVE CUSTOMER SIGN: _____

APPENDIX F

MONTHLY LEAK INSPECTION FORM

Motiva Enterprises, LLC South Florida Complex
Fort Lauderdale. Florida 33316

The South Florida Complex, consists of three terminals.

The North Terminal, the South Terminal, and the East Terminal.

Use this form to check and document the annual tests for vapor leaks. I.E. internal floating roofs, external floating roofs, and vapor lines from the vapor unit to the loading racks, I.E., vapor combustor, vapor bladder tank.

Tank number: Terminal: Date:

Vapor lines checked: Terminal: Date:

Comments:

Date: Signed:_____

APPENDIX G

ENGINEERING EMISSION ANALYSIS TEST RESULTS

24 HOUR CEM TEST RESULTS

Motiva Enterprises LLC
Port Everglades, FL North Terminal
FDEP Facility ID 0110048
24 Hour CEM Test Results*

As provided by Jordan Technologies

cem003.wk4

VRU Emissions and Efficiency from CEM Data
Estimated Calculations

input
calcs.
alternate

Use One Truck Load as the Basis for all Calculations

Truck Volume =	9,000	gals	
HC vol% in =	30	vol %	359.088576
HC vol% out =	0.02	vol %	379.4308943
Purge Air Volume Fraction =	0.1	NOTE: this is variable	
Propane Calibration Gas Density =	7	gm/gal	6.946560792
Butane Calibration Gas Density =	9.2	gm/gal	9.156221499

HC Mass In = 9000 gal x 30 % HC x 7 gm/gal
= 18,900 gm

HC Mass Out = ((9000 gal x (1-30%HC)) + (9000 x 0.1)) x 0.02%HC x 7 gm/gal
= 10 gm

mg/liter unit conversion = HC mass out x 1000 mg/gm x 1/9000 gal x 1/3.785 liter/gal
= 0.30 mg/liter

Efficiency calculation = (HC mass in - HC Mass out)/HC Mass in x 100%
= 99.95 %

% volume to % weight

HC =	65	lb/lb-mole
	65	% vol
	80.63	% wt
Air =	29	lb/lb-mole
	35.00	% vol
	19.37	% wt

% weight to % volume

HC =	65	lb/lb-mole
	80.63	% wt
	65.00	% vol
Air =	29	lb/lb-mole
	19.37	% wt
	35.00	% vol

HC In vol %
HC out vol %

20	efficiency	mg/liter	25	efficiency	mg/liter	30	efficiency	mg/liter	35	efficiency	mg/liter
0.1	99.55	1.66	0.1	99.66	1.57	0.1	99.73	1.48	0.1	99.79	1.39
0.2	99.10	3.33	0.2	99.32	3.14	0.2	99.47	2.96	0.2	99.57	2.77
0.3	98.65	4.99	0.3	98.98	4.72	0.3	99.20	4.44	0.3	99.36	4.16
0.4	98.20	6.66	0.4	98.64	6.29	0.4	98.93	5.92	0.4	99.14	5.55
0.5	97.75	8.32	0.5	98.30	7.86	0.5	98.67	7.40	0.5	98.93	6.94
0.6	97.30	9.99	0.6	97.96	9.43	0.6	98.40	8.88	0.6	98.71	8.32
0.7	96.85	11.65	0.7	97.62	11.00	0.7	98.13	10.36	0.7	98.50	9.71
0.8	96.40	13.32	0.8	97.28	12.58	0.8	97.87	11.84	0.8	98.29	11.10
0.9	95.95	14.98	0.9	96.94	14.15	0.9	97.60	13.32	0.9	98.07	12.48
1	95.50	16.64	1	96.60	15.72	1	97.33	14.80	1	97.86	13.87
1.1	95.05	18.31	1.1	96.26	17.29	1.1	97.07	16.27	1.1	97.64	15.26
1.2	94.60	19.97	1.2	95.92	18.86	1.2	96.80	17.75	1.2	97.43	16.64
1.3	94.15	21.64	1.3	95.58	20.44	1.3	96.53	19.23	1.3	97.21	18.03
1.4	93.70	23.30	1.4	95.24	22.01	1.4	96.27	20.71	1.4	97.00	19.42
1.5	93.25	24.97	1.5	94.90	23.58	1.5	96.00	22.19	1.5	96.79	20.81
1.6	92.80	26.63	1.6	94.56	25.15	1.6	95.73	23.67	1.6	96.57	22.19
1.7	92.35	28.30	1.7	94.22	26.72	1.7	95.47	25.15	1.7	96.36	23.58
1.8	91.90	29.96	1.8	93.88	28.30	1.8	95.20	26.63	1.8	96.14	24.97
1.9	91.45	31.62	1.9	93.54	29.87	1.9	94.93	28.11	1.9	95.93	26.35
2	91.00	33.29	2	93.20	31.44	2	94.67	29.59	2	95.71	27.74
2.5	88.75	41.61	2.5	91.50	39.30	2.5	93.33	36.99	2.5	94.64	34.68
3	86.50	49.93	3	89.80	47.16	3	92.00	44.39	3	93.57	41.61
3.5	84.25	58.26	3.5	88.10	55.02	3.5	90.67	51.78	3.5	92.50	48.55
4	82.00	66.58	4	86.40	62.88	4	89.33	59.18	4	91.43	55.48
4.5	79.75	74.90	4.5	84.70	70.74	4.5	88.00	66.58	4.5	90.36	62.42
5	77.50	83.22	5	83.00	78.60	5	86.67	73.98	5	89.29	69.35

Motiva Enterprises LLC
Port Everglades, FL North Terminal
FDEP Facility ID 0110048
24 Hour CEM Test Results*

40	efficiency	mg/liter
0.1	99.83	1.29
0.2	99.65	2.59
0.3	99.48	3.88
0.4	99.30	5.18
0.5	99.13	6.47
0.6	98.95	7.77
0.7	98.78	9.06
0.8	98.60	10.36
0.9	98.43	11.65
1	98.25	12.95
1.1	98.08	14.24
1.2	97.90	15.54
1.3	97.73	16.83
1.4	97.55	18.12
1.5	97.38	19.42
1.6	97.20	20.71
1.7	97.03	22.01
1.8	96.85	23.30
1.9	96.68	24.60
2	96.50	25.89
2.5	95.63	32.36
3	94.75	38.84
3.5	93.88	45.31
4	93.00	51.78
4.5	92.13	58.26
5	91.25	64.73

45	efficiency	mg/liter
0.1	99.86	1.20
0.2	99.71	2.40
0.3	99.57	3.61
0.4	99.42	4.81
0.5	99.28	6.01
0.6	99.13	7.21
0.7	98.99	8.41
0.8	98.84	9.62
0.9	98.70	10.82
1	98.56	12.02
1.1	98.41	13.22
1.2	98.27	14.43
1.3	98.12	15.63
1.4	97.98	16.83
1.5	97.83	18.03
1.6	97.69	19.23
1.7	97.54	20.44
1.8	97.40	21.64
1.9	97.26	22.84
2	97.11	24.04
2.5	96.39	30.05
3	95.67	36.06
3.5	94.94	42.07
4	94.22	48.08
4.5	93.50	54.10
5	92.78	60.11

50	efficiency	mg/liter
0.1	99.88	1.11
0.2	99.76	2.22
0.3	99.64	3.33
0.4	99.52	4.44
0.5	99.40	5.55
0.6	99.28	6.66
0.7	99.16	7.77
0.8	99.04	8.88
0.9	98.92	9.99
1	98.80	11.10
1.1	98.68	12.21
1.2	98.56	13.32
1.3	98.44	14.43
1.4	98.32	15.54
1.5	98.20	16.64
1.6	98.08	17.75
1.7	97.96	18.86
1.8	97.84	19.97
1.9	97.72	21.08
2	97.60	22.19
2.5	97.00	27.74
3	96.40	33.29
3.5	95.80	38.84
4	95.20	44.39
4.5	94.60	49.93
5	94.00	55.48

55	efficiency	mg/liter
0.1	99.90	1.02
0.2	99.80	2.03
0.3	99.70	3.05
0.4	99.60	4.07
0.5	99.50	5.09
0.6	99.40	6.10
0.7	99.30	7.12
0.8	99.20	8.14
0.9	99.10	9.15
1	99.00	10.17
1.1	98.90	11.19
1.2	98.80	12.21
1.3	98.70	13.22
1.4	98.60	14.24
1.5	98.50	15.26
1.6	98.40	16.27
1.7	98.30	17.29
1.8	98.20	18.31
1.9	98.10	19.33
2	98.00	20.34
2.5	97.50	25.43
3	97.00	30.52
3.5	96.50	35.60
4	96.00	40.69
4.5	95.50	45.77
5	95.00	50.86

60	efficiency	mg/liter
0.1	99.92	0.92
0.2	99.83	1.85
0.3	99.75	2.77
0.4	99.67	3.70
0.5	99.58	4.62
0.6	99.50	5.55
0.7	99.42	6.47
0.8	99.33	7.40
0.9	99.25	8.32
1	99.17	9.25
1.1	99.08	10.17
1.2	99.00	11.10
1.3	98.92	12.02
1.4	98.83	12.95
1.5	98.75	13.87
1.6	98.67	14.80
1.7	98.58	15.72
1.8	98.50	16.64
1.9	98.42	17.57
2	98.33	18.49
2.5	97.92	23.12
3	97.50	27.74
3.5	97.08	32.36
4	96.67	36.99
4.5	96.25	41.61
5	95.83	46.24

* Test performed by Jordan Technologies during 3/12/03 - 3/13/03

FEBRUARY 2003 TEST RESULTS

John Jordan Service Company
Technical Services Group
502 267-8344

Vapor Recovery Performance Test

Test Id: 000694123-00133

Test for: Motiva Enterprise LLC North TEST ONE 25.5 VAC.
Fort Lauderdale, FL

Unit Tested: John Zink

Test Date: 02/20/2003

Test Personnel: Tony Fenton
Will Keeling

Strip Chart Recorder Speed: 150

All data fields are rounded 2 places following the decimal for display purposes. Internal to the program all data fields are 8 digits following the decimal.

Outlet Calibration Information

Allowable range is +/- 5% of actual span gas Concentration

Low range span gas concentration	1.51 %, Cylinder # FF-40430
Mid range span gas concentration	2.50 %, Cylinder # FF-40413
High range span gas concentration	4.54 %, Cylinder # FF-35671
Zero span analyzer reading	0.00 %
Zero range analyzer error	0.00 %
Low range analyzer reading	0.00 %
Low range analyzer error	-100.00 %
Mid range analyzer reading	2.48 %
Mid range analyzer error	-0.80 %
High range analyzer reading	0.00 %
High range analyzer error	-100.00 %

Inlet Calibration Information

Allowable range is +/- 5% of actual span gas Concentration

Low range span gas concentration	25.23 %, Cylinder # LL-36177
Mid range span gas concentration	49.90 %, Cylinder # LL-23993
High range span gas concentration	84.09 %, Cylinder # LL-36143
Zero span analyzer reading	0.00 %
Zero range analyzer error	0.00 %
Low range analyzer reading	0.00 %
Low range analyzer error	-100.00 %
Mid range analyzer reading	49.41 %
Mid range analyzer error	-0.98 %
High range analyzer reading	0.00 %
High range analyzer error	-100.00 %

Time	Baro-P mm Hg	Exhaust-P mm Hg	Ambient-T Deg C	Exhaust-T Deg C	HCIn %	HCOut %	VE mtr^3	VES mtr^3	ME mg
10:38	765.72	0.05	26.00	26.44	37.92	1.16	13.30	13.11	254366.87
10:43	765.70	0.05	27.85	27.87	65.72	0.77	15.63	15.34	252579.61
10:48	765.70	0.05	27.58	28.59	68.28	0.23	9.86	9.65	39814.10
10:53	765.71	0.05	27.42	28.42	68.41	0.17	10.46	10.24	32795.99
10:58	765.62	0.05	27.43	28.51	68.54	0.21	14.79	14.47	55526.56
11:03	765.61	0.05	27.50	29.24	68.44	0.88	11.15	10.88	170080.33
11:08	765.52	0.05	27.74	29.16	68.15	2.36	10.14	9.89	434189.90
11:13	765.42	0.05	27.74	29.57	68.38	3.34	10.48	10.22	659196.09
11:18	765.37	0.05	27.50	30.14	68.41	0.96	14.60	14.21	280228.35
11:23	765.32	0.05	27.40	30.21	68.13	0.36	9.74	9.47	62302.98
11:28	765.27	0.05	27.29	30.56	68.08	0.33	10.27	9.98	60351.56
11:33	765.25	0.05	28.01	30.76	67.90	0.34	14.64	14.21	90968.24
11:38	765.22	0.05	27.33	30.72	67.45	1.43	10.80	10.49	262928.47

Post Test HC Outlet Span Check

Span Check performed at:	11:43
Zero range analyzer reading:	0.02 %
Zero range allowable readings:	-0.15 thru 0.15
Mid range analyzer reading:	2.47 %
Mid range allowable readings:	2.33 thru 2.63

Post Test HC Inlet Span Check

Span Check performed at:	11:46
Zero range analyzer reading:	0.83 %
Zero range allowable readings:	-3.00 thru 3.00
Mid range analyzer reading:	49.15 %
Mid range allowable readings:	46.41 thru 52.41

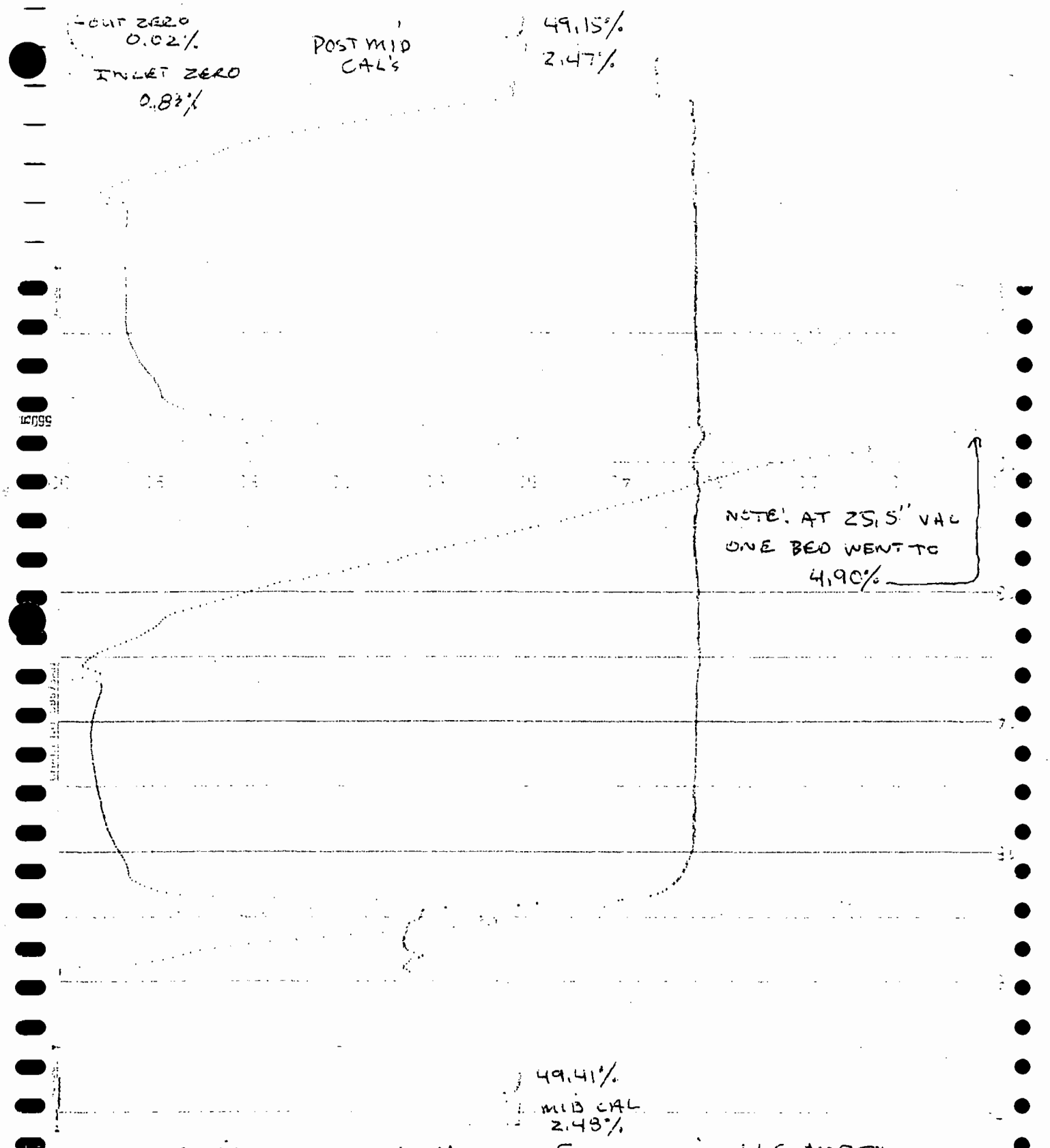
Preliminary Test Results

The test Id is 000694123-00133

There were 13 test intervals, 13 of which had flow.

Average Barometric Pressure:	765.50 mm Hg
Average Flow Pressure:	0.05 mm Hg
Average Ambient Temperature:	27.44 celcius
Average Exhaust Temperature:	29.24 celcius
Average Inlet Concentration:	65.68 %
Average Outlet Concentration:	0.97 %
Total Volume Emitted:	155.87 cubic meters
Total Standardized Volume Emitted:	152.15 cubic meters
Total milli-grams Emitted:	2655329.05
Accountable Gallons Loaded:	79999.0
Total Gallons Loaded:	79999.0
Accountable Liters Loaded:	302829.01
Total Liters Loaded:	302829.01
Accountable milli-grams Emitted per Liter Loaded:	8.77
Total milli-grams Emitted per Liter Loaded:	8.77
Unit Efficiency for Accountable Gas Loaded:	99.27
Unit Efficiency for Total Gas Loaded:	99.27

BEST AVAILABLE COPY



STRIP CHART FOR: MOTIVA ENTERPRISES LLC NORTH
PORT EVERGLADES, FL 2/20/19
VACUUM TEST 25.5"

John Jordan Service Company
Technical Services Group
502 267-8344

Vapor Recovery Performance Test

Test Id: 000694123-00132

Test for: Motiva Enterprise LLC North TEST ONE 26.5 VAC.
Fort Lauderdale, FL

Unit Tested: John Zink

Test Date: 02/20/2003

Test Personnel: Tony Fenton
Will Keeling

Strip Chart Recorder Speed: 150

All data fields are rounded 2 places following the decimal for display purposes. Internal to the program all data fields are 8 digits following the decimal.

Outlet Calibration Information

Allowable range is +/- 5% of actual span gas Concentration

Low range span gas concentration	1.51 %, Cylinder # FF-40430
Mid range span gas concentration	2.50 %, Cylinder # FF-40413
High range span gas concentration	4.54 %, Cylinder # FF-35671
Zero span analyzer reading	0.00 %
Zero range analyzer error	0.00 %
Low range analyzer reading	1.54 %
Low range analyzer error	1.99 %
Mid range analyzer reading	2.47 %
Mid range analyzer error	-1.20 %
High range analyzer reading	4.48 %
High range analyzer error	-1.32 %

Inlet Calibration Information

Allowable range is +/- 5% of actual span gas Concentration

Low range span gas concentration	25.23 %, Cylinder # LL-36177
Mid range span gas concentration	49.90 %, Cylinder # LL-23993
High range span gas concentration	84.09 %, Cylinder # LL-36143
Zero span analyzer reading	0.01 %
Zero range analyzer error	0.00 %
Low range analyzer reading	25.62 %
Low range analyzer error	1.55 %
Mid range analyzer reading	49.48 %
Mid range analyzer error	-0.84 %
High range analyzer reading	84.15 %
High range analyzer error	0.07 %

Time	Baro-P mm Hg	Exhaust-P mm Hg	Ambient-T Deg C	Exhaust-T Deg C	HCIn %	HCOut %	VE mtr^3	VES mtr^3	ME mg
08:45	765.66	0.05	21.38	23.74	74.44	0.15	7.29	7.25	20311.34
08:50	765.73	0.06	21.41	23.33	73.79	0.13	11.11	11.06	25959.25
08:55	765.78	0.06	21.62	23.26	73.34	0.09	13.33	13.28	18645.21
09:00	765.88	0.06	21.72	23.30	72.68	0.11	9.91	9.87	19323.42
09:05	765.96	0.06	21.99	23.40	72.12	0.12	9.68	9.64	20458.42
09:10	765.99	0.06	22.45	23.68	71.42	0.13	10.89	10.83	22672.23

Post Test HC Outlet Span Check

Span Check performed at:	09:18
Zero range analyzer reading:	0.01 %
Zero range allowable readings:	-0.15 thru 0.15
Mid range analyzer reading:	2.48 %
Mid range allowable readings:	2.32 thru 2.62

Post Test HC Inlet Span Check

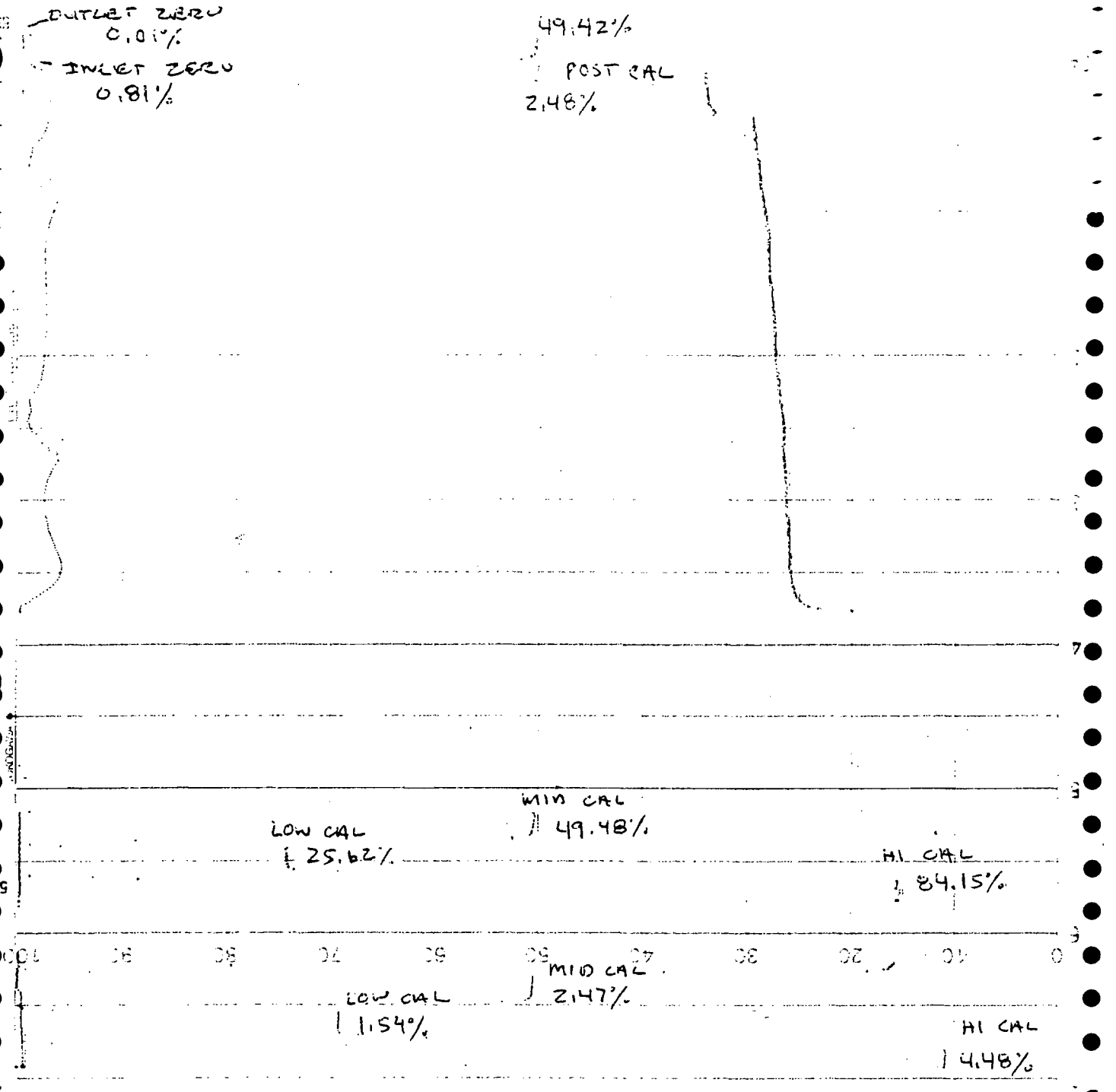
Span Check performed at:	09:20
Zero range analyzer reading:	0.81 %
Zero range allowable readings:	-2.99 thru 3.01
Mid range analyzer reading:	49.42 %
Mid range allowable readings:	46.48 thru 52.48

Preliminary Test Results

The test Id is 000694123-00132

There were 6 test intervals, 6 of which had flow.

Average Barometric Pressure:	765.83 mm Hg
Average Flow Pressure:	0.06 mm Hg
Average Ambient Temperature:	21.76 celcius
Average Exhaust Temperature:	23.45 celcius
Average Inlet Concentration:	72.97 %
Average Outlet Concentration:	0.12 %
Total Volume Emitted:	62.21 cubic meters
Total Standardized Volume Emitted:	61.94 cubic meters
Total milli-grams Emitted:	127369.87
Accountable Gallons Loaded:	31025.0
Total Gallons Loaded:	31025.0
Accountable Liters Loaded:	117442.35
Total Liters Loaded:	117442.35
Accountable milli-grams Emitted per Liter Loaded:	1.08
Total milli-grams Emitted per Liter Loaded:	1.08
Unit Efficiency for Accountable Gas Loaded:	99.92
Unit Efficiency for Total Gas Loaded:	99.92



STRIP CHART FOR: MOTIVA ENTERPRISES LLC NORTH PORT EVERGLADES, FL. 2/20/03

VACUUM TEST 26.5"

FEBRUARY 2002 (ANNUAL) TEST RESULTS

PTE NORTH

VOLATILE ORGANIC COMPOUND EMISSION TEST REPORT

OF THE

MOTIVA ENTERPRISES LLC
NORTH TERMINAL

PORT EVERGLADES, FLORIDA TRANSPORT LOADING TERMINAL

ON THE

JOHN ZINK CARBON VAPOR RECOVERY UNIT

ON

FEBRUARY 21, 2002

REPORTED BY: The Jordan Service Company
2820 South English Station Road
Louisville, Kentucky 40299
Office: (502) 267-8344
Fax: (502) 267-8379
Email: gtoloczko@jordantech.com

TEST PERSONNEL: GLEN TOLOCZKO
TONY FENTON

APPROVAL: _____
GLEN D. TOLOCZKO
ENVIRONMENTAL TESTING MANAGER
TECHNICAL SERVICE GROUP

In reference to the Motiva Enterprises LLC Air Emission Source Test conducted at the Port Everglades, Florida North Transport Loading Facility on February 21, 2002 and described in the following report;

I certify under penalty of law that the information provided in this document is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including fines or imprisonment or both, for submitting false, inaccurate or incomplete information.

by: Glen D. Toloczko

Glen D. Toloczko
Technical Service Group
John Jordan Service Co. Inc.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Motiva Enterprises LLC North terminal in Port Everglades, Florida is a bulk transport loading facility for Gasoline Products.

The products are bottom loaded into transport tankers and the displaced hydrocarbon vapors are piped to a vapor holding tank and then to a JOHN ZINK CARBON ADSORPTION / ABSORPTION VAPOR RECOVERY UNIT (VRU).

The VRU at this facility was source tested for air emissions on February 21, 2002. The purpose of this test was to confirm proper operation of the VRU and verify compliance with applicable VOC (Volatile Organic Compound) air emission requirements.

The Gasoline Terminal Air Emission Source Test was conducted in accordance with procedures established, and the test methods referenced, in the Code of Federal Regulations; CFR 40, Part 60, Subpart XX. Specific procedures used include:

EPA TEST METHOD	MEASUREMENT
Method 2A	Exhaust Vapor Volume
Method 25B	Inlet and Outlet VOC Concentrations
Method 21	Potential Leak Sources
40 CFR 60 Subsection 60.503 (d)	Transport Loading Maximum Backpressure

The results of this air emission test demonstrate that this source is in compliance with all applicable Federal and Local requirements. A summary of the data is presented below:

TEST PARAMETER	MEASURED VALUE	REQUIRED VALUE
VOC Emissions	1.33 mg/liter	35 mg/liter

The vapor piping connecting the tanker trucks to the Vapor Recovery Units was tested for leaks above 10,000 PPMVOL as Methane prior to beginning the test. A portable hydrocarbon analyzer was used for this testing. It was calibrated prior to its use with a certified 10,000 PPM Methane calibration gas. No leaks above 10,000 PPM Methane were found.

TERMINAL OPERATION AND DESCRIPTION

There are three loading bays equipped to load Regular, Midgrade, and Premium Unleaded Gasoline onto transports.

Each bay is equipped with vapor recovery hoses positioned at the transport loading positions for hook up to the Vapor Control System. The vapor hoses and associated piping transports the vapors to a vapor holding tank and then to the VRU. The vapor piping system also employs a liquid knock-out tank and pressure / vacuum relief vent upstream from the VRU.

A general overview of the loading rack layout is shown on page 9.

JOHN ZINK VAPOR RECOVERY UNIT

The terminal is equipped with a John Zink Adsorption / Absorption Gasoline Vapor Recovery Units. Hydrocarbon vapors enter the John Zink VRU into one of two Carbon Adsorbers. The Hydrocarbon - air mixture flows up through the absorber where the bulk of the hydrocarbons are absorbed. The air continues through the Carbon Adsorber and is vented to the atmosphere. The saturated carbon is then desorbed by employing vacuum regeneration at 27.5" Hg Vacuum, while the second Carbon Adsorber is receiving the hydrocarbon - air mixture generated in transport loading activity. The purpose of regeneration is to restore the carbon to a level where it will effectively adsorb hydrocarbons again. The two carbon adsorbers alternate between adsorption and regeneration at 15 minute intervals.

When a Carbon Adsorber is in the regeneration mode, a liquid ring vacuum pump pulls the hydrocarbon from the carbon. The rich hydrocarbon vapors from the Carbon Adsorber are mixed with the vacuum pump seal fluid and are discharged to an Absorber / Separator.

The liquid hydrocarbons are condensed and separated from the seal fluid in the separator compartment and are discharged back to a holding tank. Any remaining hydrocarbons pass up through the packed Absorber tower and are contacted by a fresh stream of gasoline which absorbs most of the remaining hydrocarbons. The small amount of hydrocarbons that is left then leaves the top of the absorber and is directed back to the Carbon Adsorber where the whole process is repeated.

A typical John Zink Vapor Recovery Unit is illustrated schematically on page 10.

MEASUREMENT AND DATA ANALYSIS

The NonDispersive InfraRed (NDIR) analyzer, turbine flow meter, exhaust vapor thermistor and exhaust pressure transducer are connected to the VRU exhaust stack in order to acquire their respective data. A quad check valve assembly is employed to provide for proper VRU regeneration air flow and allow one turbine meter to satisfy both carbon vessel measurement requirements.

The barometric pressure transducer and ambient thermistor are located in close proximity to the VRU in order to acquire ambient atmospheric conditions for use in subsequent standardization equations. A test schematic depicting general test equipment configuration is included as Figure 3.

Each transducer data channel is scaled and connected to the computer input board. Using an operations code program each input channel is read 25 times in a 5 second interval and mass, flow, concentration, temperature, and pressure values are averaged and stored in an array for subsequent use.

After sixty 5 second intervals (5 minutes) the hard disk array is polled and average values are determined for concentration, pressure, and temperature. These values along with the flow for the 5 minute period are used to compute the mass emitted for that 5 minute period. These averaged and summed values are then printed out as the 5 minute interval data and are again stored on hard disk until the six hour test period is completed.

Upon completion of the test, the 5 minute interval data is polled to determine test averages for Inlet and Outlet VOC concentration, pressure and temperature data for all test intervals during which VRU exhaust flow was greater than zero and volume and milligram emission data is summed for all 5 minute periods to arrive at a final test period total.

This data acquisition methodology essentially represents a series of very short (5 second) intervals during which VRU operation is measured, averaged and standardized. This effectively removes all judgmental decisions from data reduction processes and provides a technically unbiased analysis of VRU operation.

Additionally, pretest and post test vapor analyzer calibrations are conducted, along with an hourly analyzer calibration drift check verification. Following the conclusion of the six hour test the loading rack volumes are calculated and final mass emission values are determined.

Copies of the transport loading rack sheets, hydrocarbon analyzer strip charts and computer print outs are attached as Appendices to this test report.

TEST EQUIPMENT

Quantity	Item
2	Thermistor Temperature Probes
1	IBM Compatible Computer with 16 Channel, 12 bit A/D Input Card
1	GasTech Model GT Series Portable Hydrocarbon Analyzer
1	Setra Model #261 (or #264) Variable Differential Pressure Transducer
1	Setraceram Model #361 (or #304) Digital Barometer
1	American Meter Co. 8" Turbine Flow Meter
1 (or 2)	Strip Chart Recorder, either: Yokogawa uR 1800 Six Channel Chart Recorder
2	NonDispersive InfraRed Analyzers (NDIR), either: 1 Horiba PIR-2000 – Inlet VOC Analyzer 1 Summit Industries Model 703D – Outlet VOC Analyzer

All equipment specifications are shown in Appendix B along with available calibration and accuracy information.

EXAMPLE CALCULATIONS

A. Terminology:

T_a = Ambient Temperature (° Celsius).
P_b = Barometric Pressure (mm Hg).
L_t = Total volume of liquid dispensed from all controlled racks during the test period (Liters).
V_e = Volume of air-hydrocarbon mixture exhausted from the processing unit (cubic meters).
V_{es} = Normalized volume of air-hydrocarbon mixture exhausted (Cubic meters at 20° Celsius, 760 mm Hg).
C_e = Volume fraction of hydrocarbons in exhausted mixture (Volume % as C_3H_8/100, corrected for methane content, if required).
T_e = Temperature at process unit exhaust (° Celsius).
P_e = Pressure at processing unit exhaust (mm Hg. absolute).
M_e = Mass of VOC emitted (milligrams).
$(M/L)_e$ = Mass of hydrocarbons exhausted from the processing unit per volume of liquid loaded (mg/liter).
$(M/T)_e$ = Mass of hydrocarbons exhausted from the processing unit per unit time (lb/hour).

Constants:

0.3858 = (273.2° C + 20° C) / (760 mm Hg) Normalization Factor.
1.83×10^6 mg/m^3 = Standard Density of Propane (C^3H^8).
454,000 = Conversion Factor mg/lb.
3.785 = Conversion Factor Liter/Gallon.
264.2 = Conversion Factor gallons / meter^3

B. Calculate the Following Results for Each Period of the Vapor Control System Operation:

(1.) Volume of air-hydrocarbon mixture exhausted from the vapor control system:

$$V_e = (V_{ef} - V_{ei}) \quad \text{(meters}^3\text{)}$$

(where subscript $_f$ refers to final and subscript $_i$ refers to initial)

V_e = Totalized volume from flow rate and time records.

(2.) Normalized volume of exhausted mixture:

$$V_{es} = \frac{(0.3858^\circ \text{ Kelvin/mm Hg}) \times V_e \times P_e}{(T_e + 273.2)} \qquad \text{(meter}^3\text{)}$$

(3.) Mass of hydrocarbons exhausted from the vapor control system:

$$M_e = \frac{(1.83 \times 10^6 \text{ mg } C^3H^8)}{\text{meter3}} \times (V_{es}) \times (C_e) \qquad \text{(mg) (equation B)}$$

C. Calculate the Average Mass of Hydrocarbons Emitted Per Volume of Gasoline Loaded:

$$(M/L)_e = M_e/L_t \qquad \textbf{(mg/liter)}$$

D. Calculate the Average Mass of Hydrocarbons Emitted Per Unit Time:

$$(M/T)_e = (M/L)_e \times \frac{1 \text{ lb}}{454{,}000 \text{ mg}} \times \frac{3.785 \text{ liter}}{1 \text{ gal}} \times \frac{\text{Acct. Gal}}{\text{Test Time}} \qquad \textbf{(lb/hr)}$$

E. Calculation for Efficiency (if used):

Unit Efficiency = [1-(outlet mg / inlet mg)] x 100%

Where inlet milligrams is derived using inlet concentration and volume of liquid loaded onto transports, assuming a vapor growth ratio of 1:1 and no gross leaks.

F. Example ME Calculation For a Typical Five Minute Interval:

This is an example calculation only, and not an interval from this test. This is intended to clarify the computer method for arriving at the VOC mass emitted data for each test interval.

Barometric Pressure (Baro-P) = 768.4 mm Hg
Exhaust Pressure (Exhaust-P) = 1.0 mm Hg
Ambient Temperature (Ambient-T) = 16.8° C
Exhaust Temperate (Exhaust-T) = 18.3° C
Volume Emitted Standardized (VES) = 43.6 m^3

Volume Emitted (VE) = 42.9 m3
Milligrams Emitted (ME) = 436931.5 mg
Outlet VOC Concentration = 0.55 %
Inlet VOC Concentration = 34.0 %

Please Note: All data fields are rounded to two places following the decimal point for display purposes only.

1.) Therefore, for this calculation:

0.545 % lowest possible value before rounding for display
HCout = 0.55 % value displayed (after rounding)
0.554 % highest possible value before rounding for display

43.55 m^3 lowest possible value before rounding for display
VES = 43.6 m^3 value displayed (after rounding)
43.64 m^3 highest possible value before rounding for display

2.) Using the above values in the previous equation B we have:

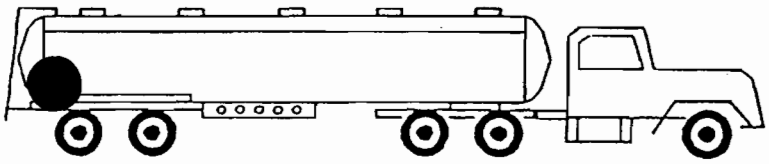
(1.83 x 106) x (0.00545) x (43.55) = 434,345.9 mg
436,931.5 mg
(1.83 x 106) x (0.0055) x (43.6) = 438,834.0 mg
(1.83 x 106) x (0.00554) x (43.64) = 442,431.0 mg

Note: The value for ME printed by the computer for this interval is **436,931.5 mg.** While this is not the result produced from entering the printed values for HCout and VES into Equation B, it is the result produced by the calculation carried out on the stored computer data, prior to rounding for display.

DATA SUMMARY

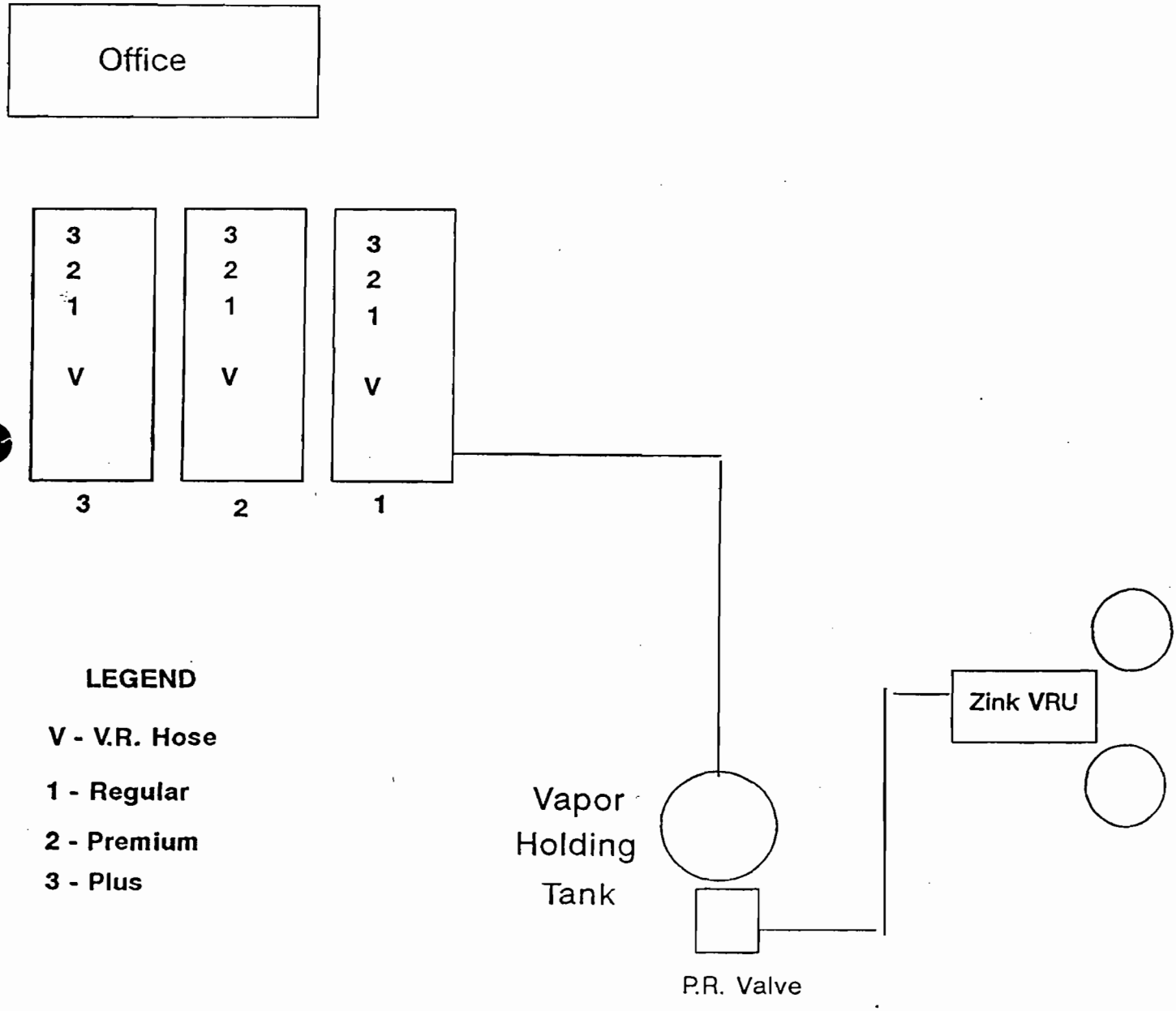
TERMINAL DESCRIPTION	Motiva Enterprises LLC Port Everglades, FL
VAPOR CONTROL UNIT TYPE	John Zink VRU
TEST DATE	February 21, 2002
TEST PERIOD	08:16 – 14:16
AVERAGE AMBIENT TEMPERATURE	79.2° F
AVERAGE OUTLET CONCENTRATION (as Propane)	0.21 % by Volume
AVERAGE INLET CONCENTRATION (as Propane)	60.84 % by Volume
TOTAL PETROLEUM LOADED	193,295 gallons
ACCOUNTABLE PETROLEUM LOADED	184,590 gallons
AVERAGE HYDROCARBON EMISSIONS (Calculated with Total Loaded Product)	1.27 mg/liter 0.34 lb/hr
AVERAGE HYDROCARBON EMISSIONS (Calculated with Accountable Product Loaded)	1.33 mg/liter 0.34 lb/hr
NUMBER OF TRUCKS LOADED	26
NUMBER OF LEAKING TRUCKS	1
VOLUME OF LEAKING TRUCKS	8,800 gallons
MAXIMUM PRESSURE AT TRUCK VAPOR HOSE	10.0" H_20
STRIP CHART RECORDER SPEED	150 mm/hour
UNIT EFFICIENCY	99.89 %

Figure 1



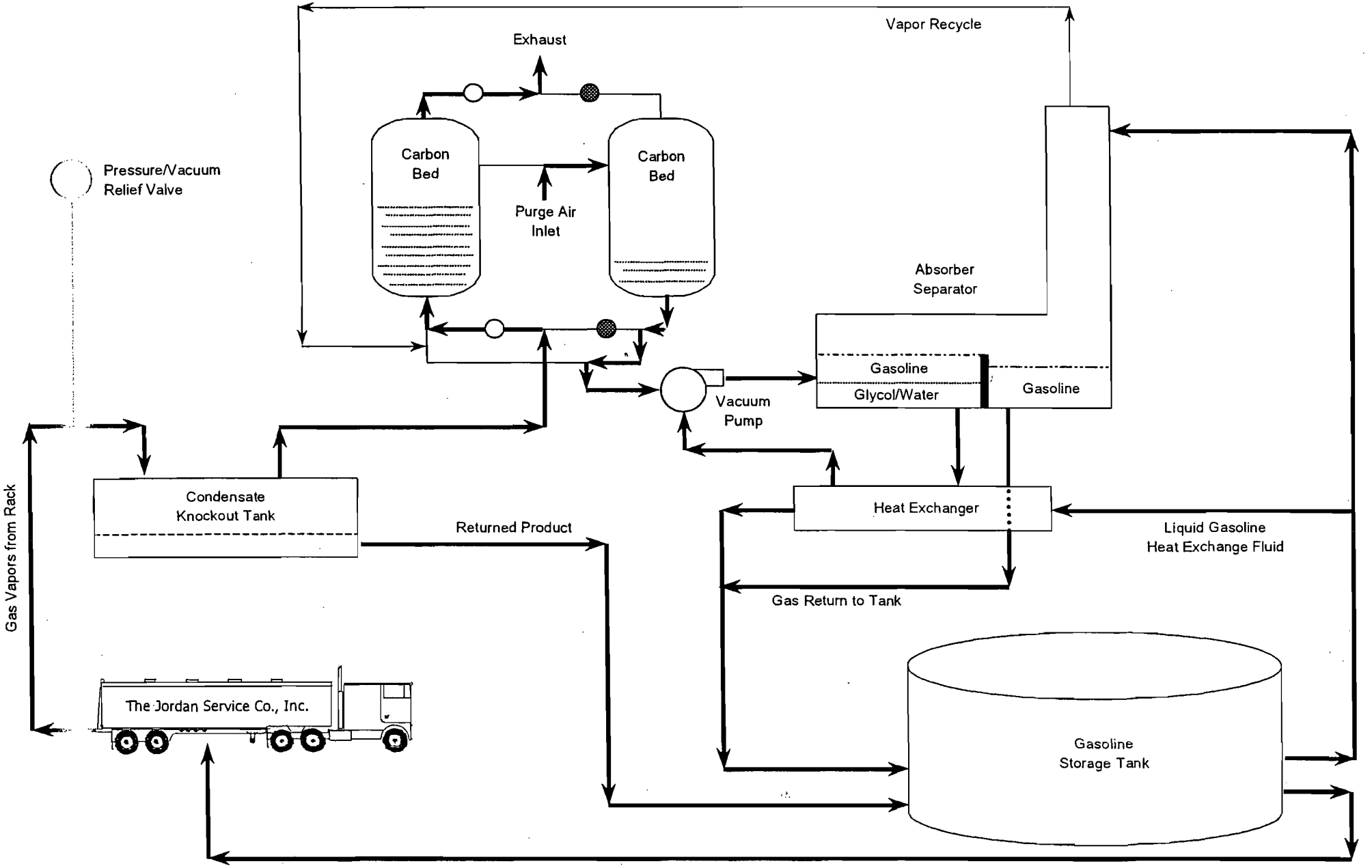
MOTIVA ENTERPRISES LLC

FORT LAUDERDALE, FL



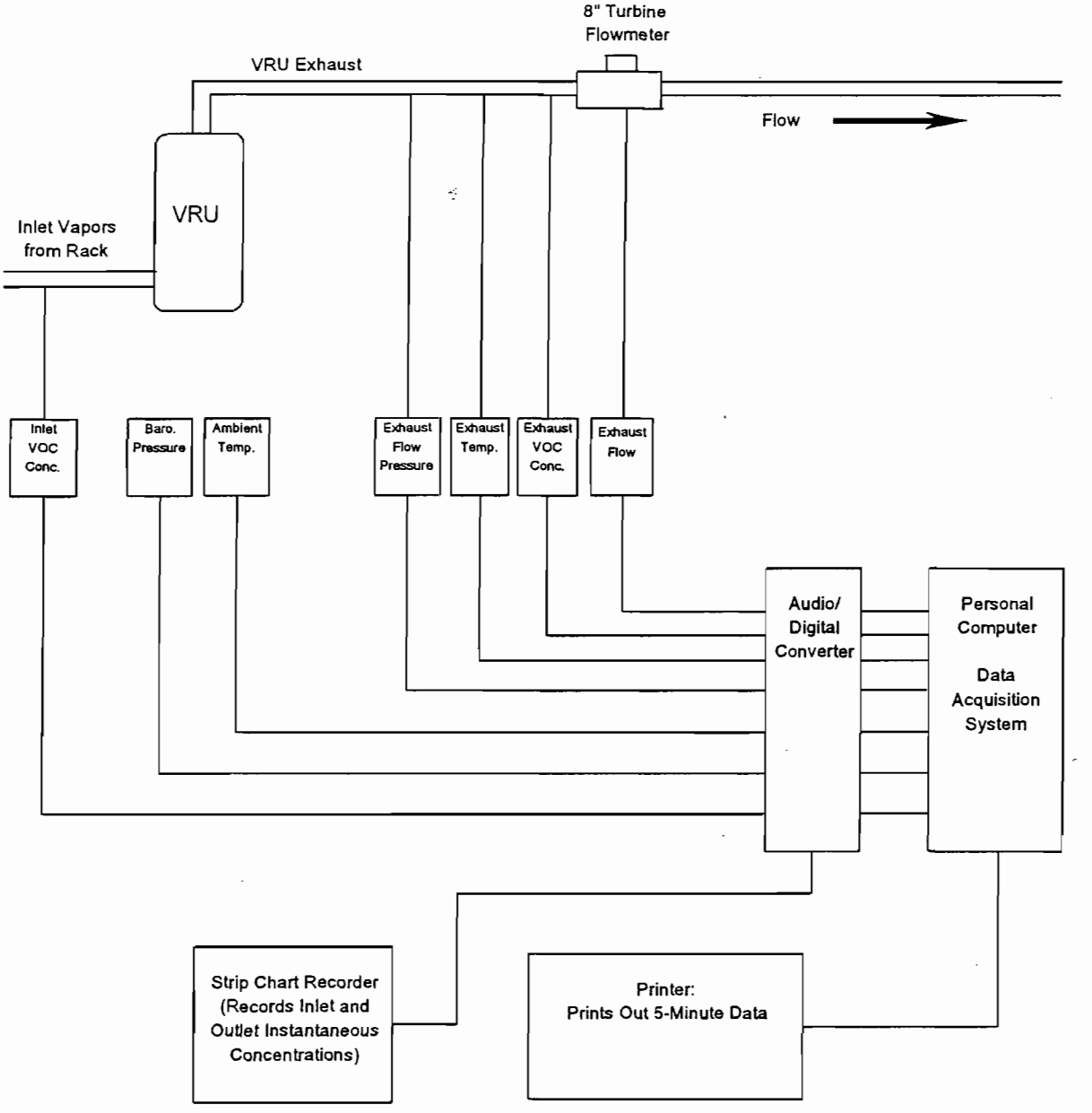
NOTE: Not Drawn to Scale

ACTIVATED CARBON VAPOR RECOVERY UNIT SCHEMATIC



VAPOR RECOVERY UNIT TEST SCHEMATIC

Test Equipment Diagram
Note: Not to Scale



APPENDIX A

Terminal Location PORT MOTIVA NORTH, EVERGLADES Date 2/21/02 Page Number 1

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
1	MOTIVA	8:30	1	44040	8:39	GAS	GAS	✓	9000	

Max. Back Pressure: Reading 1 9" Reading 2 8" Reading 3 9" Reading 4 9" Highest 9"

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
2	MOTIVA	9:14	1	44039	9:27	GAS	GAS	✓	9000	

Max. Back Pressure: Reading 1 9" Reading 2 9" Reading 3 10" Reading 4 9" Highest 10"

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
3	MOTIVA	9:17	2	02851	9:29	GAS	GAS	"	9000	

Max. Back Pressure: Reading 1 5" Reading 2 7" Reading 3 6" Reading 4 6" Highest 7"

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
4	Young Oil Co.	9:18	3	292	9:29	GAS	DIESEL	✓	2600	

Max. Back Pressure: Reading 1 9" Reading 2 9" Reading 3 8" Reading 4 9" Highest 9"

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
5	STAR FLEET TEXACO	9:35	1	98213	9:55	GAS	DIESEL		7200	

Max. Back Pressure: Reading 1 ____ Reading 2 ____ Reading 3 ____ Reading 4 ____ Highest ____

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
6	KENAN	9:42	3	5725	9:55	GAS	GAS	✓	8900	

Max. Back Pressure: Reading 1 9" Reading 2 8" Reading 3 7" Reading 4 7" Highest 9"

Accountable Gallons Load 1	9000	Total Gallons Load 1	9000
Accountable Gallons Load 2	9000	Total Gallons Load 2	9000
Accountable Gallons Load 3	9000	Total Gallons Load 3	9000
Accountable Gallons Load 4	2600	Total Gallons Load 4	2600
Accountable Gallons Load 5	7200	Total Gallons Load 5	7200
Accountable Gallons Load 6	8900	Total Gallons Load 6	8900
otal Accountable Gallons This Page	45700	otal Gallons This Page	45700
Acct. Total From Previous Page +		otal Gallons Prev. Page +	
Accountable Gallons Total =		Total Gallons =	

Terminal Location PORT MOTIVA NORTH, EVERGLADES Date 2/21/02 Page Number 2

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
7	MOTIVA	9:46	2	02848	10:01	GAS	GAS	✓	9000	
Max. Back Pressure: Reading 1 ___ Reading 2 ___ Reading 3 ___ Reading 4 ___ Highest ___										
8	PENN TRANS LINES	10:02	3	794	10:20	GAS	GAS	✓	6800	
Max. Back Pressure: Reading 1 5" Reading 2 7" Reading 3 7" Reading 4 7" Highest 7"										
9	MOTIVA	10:02	1	44038	10:14	GAS	GAS	✓	9000	
Max. Back Pressure: Reading 1 8" Reading 2 7" Reading 3 6" Reading 4 6" Highest 8"										
10	KENAN	10:07	2	5724	10:20	GAS	GAS	REAR DOME LID	~~8800~~	8800
Max. Back Pressure: Reading 1 ___ Reading 2 ___ Reading 3 ___ Reading 4 ___ Highest ___										
11	KENAN	10:19	1	5726	10:32	GAS	GAS	✓	7100	
Max. Back Pressure: Reading 1 ___ Reading 2 ___ Reading 3 ___ Reading 4 ___ Highest ___										
12	KENAN	10:26	2	5133	10:48	GAS	GAS	✓	8795	
Max. Back Pressure: Reading 1 ___ Reading 2 ___ Reading 3 ___ Reading 4 ___ Highest ___										

Accountable Gallons Load 1	9000	Total Gallons Load 1	9000
Accountable Gallons Load 2	6800	Total Gallons Load 2	6800
Accountable Gallons Load 3	9000	Total Gallons Load 3	9000
Accountable Gallons Load 4	0	Total Gallons Load 4	8800
Accountable Gallons Load 5	7100	Total Gallons Load 5	7100
Accountable Gallons Load 6	8795	Total Gallons Load 6	8795
otal Accountable Gallons This Page	40695	otal Gallons This Page	49495
Acct. Total From Previous Page	+ 45700	otal Gallons Prev. Page	+ 45700
Accountable Gallons Total	= 86395	Total Gallons	= 95195

Terminal Location MOTIVA NORTH, PORT EVERGLADES Date 2/21/02 Page Number 3

Seq. No.	Bay No.	Tanker Name	Trailer Number	Load Start Time	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Acct. Gallons
13	1	MOTIVA	02850	10:41	10:53	GAS	GAS	✓	9000	

Max. Back Pressure: Reading 1 7" Reading 2 9" Reading 3 8" Reading 4 8" Highest 7"

Seq. No.	Bay No.	Tanker Name	Trailer Number	Load Start Time	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Acct. Gallons
14	2	MOTIVA	44039	10:52	11:07	GAS	GAS	✓	9000	

Max. Back Pressure: Reading 1 Reading 2 Reading 3 Reading 4 Highest

Seq. No.	Bay No.	Tanker Name	Trailer Number	Load Start Time	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Acct. Gallons
15	1	KENAN	5725	11:02	11:15	GAS	GAS	✓	8900	

Max. Back Pressure: Reading 1 Reading 2 Reading 3 Reading 4 Highest

Seq. No.	Bay No.	Tanker Name	Trailer Number	Load Start Time	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Acct. Gallons
16	2	STAR FLEET TEXACO	95-211	11:11	11:18	GAS	DIESEL	✓	1000	

Max. Back Pressure: Reading 1 Reading 2 Reading 3 Reading 4 Highest

Seq. No.	Bay No.	Tanker Name	Trailer Number	Load Start Time	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Acct. Gallons
17	2	KENAN	5089	11:35	11:45	GAS	DIESEL	✓	1200	

Max. Back Pressure: Reading 1 Reading 2 Reading 3 Reading 4 Highest

Seq. No.	Bay No.	Tanker Name	Trailer Number	Load Start Time	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Acct. Gallons
18	3	MOTIVA	02851	11:33	11:47	GAS	GAS	✓	9000	

Max. Back Pressure: Reading 1 Reading 2 Reading 3 Reading 4 Highest

	Accountable Gallons		Total Gallons
Accountable Gallons Load 1	9000	Total Gallons Load 1	9000
Accountable Gallons Load 2	9000	Total Gallons Load 2	9000
Accountable Gallons Load 3	8900	Total Gallons Load 3	8900
Accountable Gallons Load 4	1000	Total Gallons Load 4	1000
Accountable Gallons Load 5	1200	Total Gallons Load 5	1200
Accountable Gallons Load 6	9000	Total Gallons Load 6	9000
otal Accountable Gallons This Page	38100	otal Gallons This Page	38100
Acct. Total From Previous Page	+ 86395	otal Gallons Prev. Page	+ 95195
Accountable Gallons Total	- 124495	Total Gallons	- 133295

Terminal Location PORT MOTIVA NORTH, EVERGLADES Date 2/21/02 Page Number 4

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
19	MOTIVA	11:36	1	44040	11:45	GAS	GAS	✓	9000	

Max. Back Pressure: Reading 1 ____ Reading 2 ____ Reading 3 ____ Reading 4 ____ Highest ____

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
20	MOTIVA	11:50	1	44038	12:04	GAS	GAS	✓	9000	

Max. Back Pressure: Reading 1 10" Reading 2 8" Reading 3 9" Reading 4 5" Highest 10"

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
21	PENN TANK	12:06	2	794	12:09	GAS	GAS	✓	1000	

Max. Back Pressure: Reading 1 ____ Reading 2 ____ Reading 3 ____ Reading 4 ____ Highest ____

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
22	KENAN	12:54	1	5133	1:06	GAS	GAS	✓	8795	

Max. Back Pressure: Reading 1 ____ Reading 2 ____ Reading 3 ____ Reading 4 ____ Highest ____

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
23	KENAN	12:56	2	5089	1:12	GAS	GAS	✓	8900	

Max. Back Pressure: Reading 1 ____ Reading 2 ____ Reading 3 ____ Reading 4 ____ Highest ____

Seq. No.	Tanker Name	Load Start Time	Bay No.	Trailer Number	Load Stop Time	Products Loading	Previous Product	Leak	Accountable Gallons	Non-Accr. Gallons
24	KENAN	1:04	3	5725	1:13	GAS	GAS	✓	8900	

Max. Back Pressure: Reading 1 ____ Reading 2 ____ Reading 3 ____ Reading 4 ____ Highest ____

Accountable Gallons Load 1	9000	Total Gallons Load 1	9000
Accountable Gallons Load 2	9000	Total Gallons Load 2	9000
Accountable Gallons Load 3	1000	Total Gallons Load 3	1000
Accountable Gallons Load 4	8795	Total Gallons Load 4	8795
Accountable Gallons Load 5	8900	Total Gallons Load 5	8900
Accountable Gallons Load 6	8900	Total Gallons Load 6	8900
otal Accountable Gallons This Page	45595	otal Gallons This Page	45595
Acct. Total From Previous Page	+ 124495	otal Gallons Prev. Page	+ 133295
Accountable Gallons Total	- 170090	Total Gallons	- 178890

Terminal Location MOTIVA NORTH, PORT EVERGLADES Date 2/21/02 Page Number 5

Seq. No.	Tanker Name	Load Start Time
25	KENAN	1:32
Bay No.	**Trailer Number**	**Load Stop Time**
1	5723	1:41

Products Loading	Previous Product	Leak	Accountable Gallons	Non-Acct. Gallons
GAS	GAS DIESEL	✓	8900	

Max. Back Pressure: Reading 1 ____ Reading 2 ____ Reading 3 ____ Reading 4 ____ Highest ____

Seq. No.	Tanker Name	Load Start Time
26	EAGLE	1:34
Bay No.	**Trailer Number**	**Load Stop Time**
2	2384	1:43

Products Loading	Previous Product	Leak	Accountable Gallons	Non-Acct. Gallons
GAS	GAS DIESEL	✓	5600	

Max. Back Pressure: Reading 1 ____ Reading 2 ____ Reading 3 ____ Reading 4 ____ Highest ____

Seq. No.	Tanker Name	Load Start Time
27		
Bay No.	**Trailer Number**	**Load Stop Time**

Products Loading	Previous Product	Leak	Accountable Gallons	Non-Acct. Gallons

Max. Back Pressure: Reading 1 ____ Reading 2 ____ Reading 3 ____ Reading 4 ____ Highest ____

Seq. No.	Tanker Name	Load Start Time
28		
Bay No.	**Trailer Number**	**Load Stop Time**

Products Loading	Previous Product	Leak	Accountable Gallons	Non-Acct. Gallons

Max. Back Pressure: Reading 1 ____ Reading 2 ____ Reading 3 ____ Reading 4 ____ Highest ____

Seq. No.	Tanker Name	Load Start Time
29		
Bay No.	**Trailer Number**	**Load Stop Time**

Products Loading	Previous Product	Leak	Accountable Gallons	Non-Acct. Gallons

Max. Back Pressure: Reading 1 ____ Reading 2 ____ Reading 3 ____ Reading 4 ____ Highest ____

Seq. No.	Tanker Name	Load Start Time
30		
Bay No.	**Trailer Number**	**Load Stop Time**

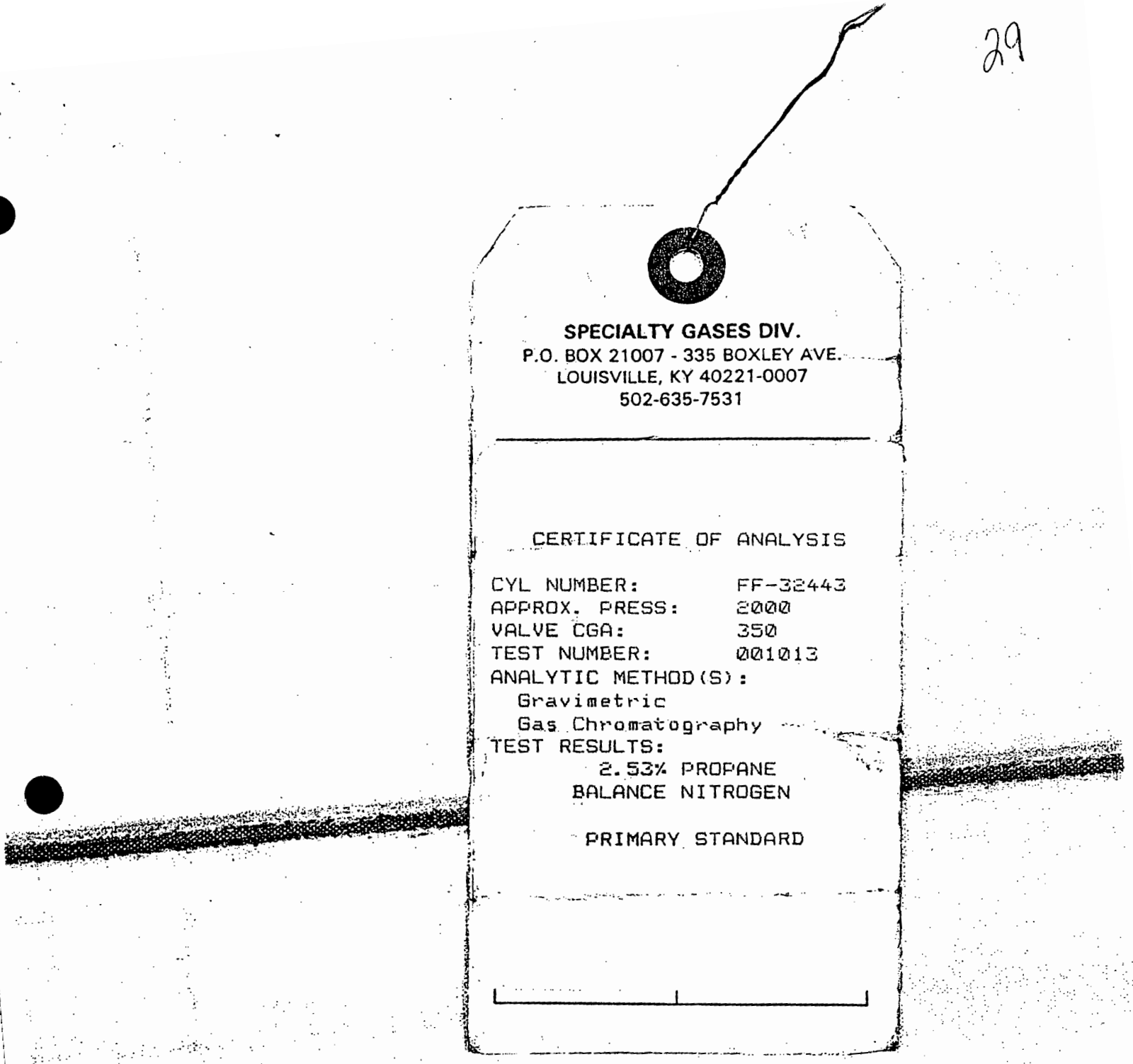
Products Loading	Previous Product	Leak	Accountable Gallons	Non-Acct. Gallons

Max. Back Pressure: Reading 1 ____ Reading 2 ____ Reading 3 ____ Reading 4 ____ Highest ____

Accountable Gallons Load 1	8900	Total Gallons Load 1	8900
Accountable Gallons Load 2	5600	Total Gallons Load 2	5600
Accountable Gallons Load 3		Total Gallons Load 3	
Accountable Gallons Load 4		Total Gallons Load 4	
Accountable Gallons Load 5		Total Gallons Load 5	
Accountable Gallons Load 6		Total Gallons Load 6	
otal Accountable Gallons This Page	14500	otal Gallons This Page	14500
Acct. Total From Previous Page	+ 170090	otal Gallons Prev. Page	+ 178890
Accountable Gallons Total	- 184590	Total Gallons	- 193390

APPENDIX B

29



SPECIALTY GASES DIV.
P.O. BOX 21007 - 335 BOXLEY AVE.
LOUISVILLE, KY 40221-0007
502-635-7531

CERTIFICATE OF ANALYSIS

CYL NUMBER: FF-32443
APPROX. PRESS: 2000
VALVE CGA: 350
TEST NUMBER: 001013
ANALYTIC METHOD(S):
Gravimetric
Gas Chromatography
TEST RESULTS:
2.53% PROPANE
BALANCE NITROGEN

PRIMARY STANDARD

24

Specialty Gases

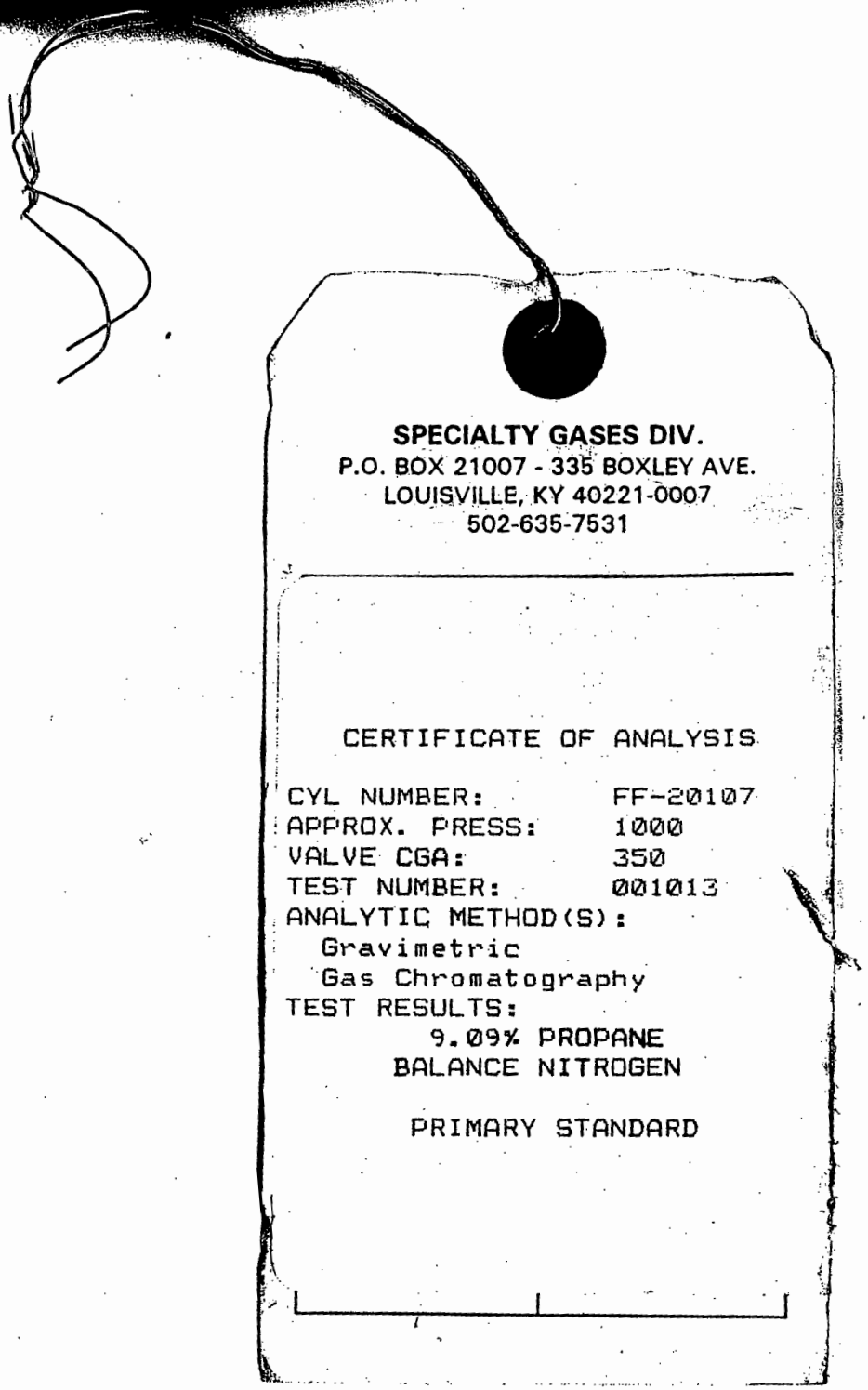
Division

Welders Supply Co. P. O. Box 21007 Louisville, Ky. 40221-0007 (502) 635-7531

CERTIFICATION OF CYLINDER CONTENT ANALYSIS

Cylinder Number	FF-34566
Component Requested	PROPANE
Concentration	4.5 %
Analytic Results	4.50 %
Method of Measure	GRAVIMETRIC
Unit of Measure	Molar PPM
Balance Gas	NITROGEN
Date of analysis	04/02/2001
Certification Period	04/02/2003

Frank Fogarty



SPECIALTY GASES DIV.
P.O. BOX 21007 - 335 BOXLEY AVE.
LOUISVILLE, KY 40221-0007
502-635-7531

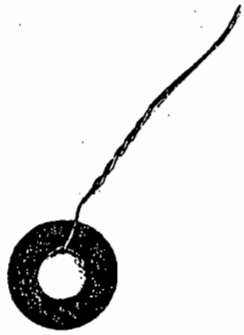
CERTIFICATE OF ANALYSIS

CYL NUMBER:	FF-20107
APPROX. PRESS:	1000
VALVE CGA:	350
TEST NUMBER:	001013

ANALYTIC METHOD(S):
Gravimetric
Gas Chromatography

TEST RESULTS:
9.09% PROPANE
BALANCE NITROGEN

PRIMARY STANDARD



SPECIALTY GASES DIV.
P.O. BOX 21007 - 335 BOXLEY AVE.
LOUISVILLE, KY 40221-0007
502-635-7531

CERTIFICATE OF ANALYSIS

CYL NUMBER:	LL-36178
APPROX. PRESS:	475
VALVE CGA:	350
TEST NUMBER:	000830

ANALYTIC METHOD(S):
Gravimetric
Gas Chromatography

TEST RESULTS:
25.11% PROPANE
BALANCE NITROGEN

PRIMARY STANDARD

45

Specialty Gases

Division

Welders Supply Co. P. O. Box 21007 Louisville, Ky. 40221-0007 (502) 635-7531

October 17, 2001

The following cylinder was prepared on High Load Balances which are calibrated with Class S Weights traceable to the NIST.

CERTIFICATION OF CYLINDER CONTENT
PRIMARY STANDARD

CYLINDER NUMBER	:	LL-25095
REQUESTED AMOUNT	:	50% PROPANE
ACTUAL AMOUNT	:	49.84% PROPANE
BALANCE GAS	:	NITROGEN
METHOD OF PREPARATION	:	GRAVIMETRIC
ANALYTIC CROSS CHECK	:	GAS CHROMATOGRAPHY
VALVE CGA	:	350
TEST NUMBER	:	011017
EXPIRATION DATE	:	10/17/2004

Frank Fogarty

29192
17696

SPECIALTY GASES DIV.
P.O. BOX 21007 - 335 BOXLEY AVE.
LOUISVILLE, KY 40221-0007
502-635-7531

CERTIFICATE OF ANALYSIS

CYL NUMBER:	LL-36180
APPROX. PRESS:	115
VALVE CGA:	350
TEST NUMBER:	001012

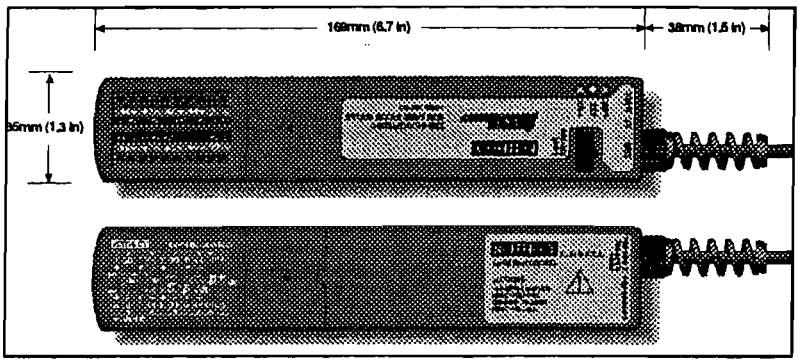
ANALYTIC METHOD(S):
Gravimetric
Gas Chromatography

TEST RESULTS:
84.08% PROPANE
BALANCE NITROGEN

PRIMARY STANDARD

SmartLink Instruments

Compact Miniaturized Instruments



Our compact SmartLink instruments make lab-grade measurements possible in the field or on the factory floor. These instruments connect directly to complex signals and sensors; collect, process, and store sensor input data; and link directly to your computer or network.

SmartLink Instruments Selector Guide

Model (single/multi ch)	Sensors Measured/ Signals Accommodated	Applications	Key Attributes	Accuracy & Resolution	Analog & Digital I/O
KNM-DCV11, 12 High-speed DCV & ohms measurement system	• DCV, DCI, 4–20mA • RTDs, thermistors, ohms • Pressure, flow, & weight transducers • Humidity, RPM • Counter/timer	• Process monitoring • Production test • Transient analysis • Frequency, event, pulse width, vibration analysis	• 31k readings/s burst • External trigger	0.1% 16 bits	AI: 1/4 DIO: 2/4 Recorder output
KNM-DCV31/32 Precision DCV & ohms measurement system	• DCV, DCI, 4–20mA • RTDs, thermistors, ohms • Pressure, flow, and weight transducers	• Product reliability testing • High accuracy data acquisition • Production test	• 15 readings/s • High accuracy	0.005% 20 bits	AI: 1/6 DO: 2/2
KNM-DCV41/42 Precision isolated (1500V) DCV & ohms measurement system	• DCV, DCI, 4–20mA • RTDs, thermistors, thermocouples, ohms • Pressure, flow, and weight transducers	• Product reliability testing • High accuracy data acquisition • Production test in hostile environments	• 15 readings/s • 1500V isolation to com • 400V inputs	0.005% 20 bits	AI: 1/6 DO: 1/1
KNM-RTD31/32 Precision RTD interface	• RTDs • Ohms	• High accuracy temperature monitoring	• 7 readings/s • High accuracy	0.02°C 20 bits	AI: 1/8 DO: 2/2
KNM-TC41/42 Isolated thermocouple interface	• Thermocouples • Millivolts	• High accuracy, high temperature monitoring	• 15 readings/s • 1500V isolation to com • 400V inputs	0.5°C 20 bits	AI: 1/6 DO: 1/1
KNM-THD01/02 Temperature, humidity, & dew point system	• Temperature • Humidity • Calculated dew point	• Environmental monitoring • HVAC verification • ISO 9000 verification	• 7 readings/s • Onboard sensors	0.5°C 0.01°C	AI: 2/4 DIO: 0/4
KNM-THM31, 32 Precision thermistor	• Thermistors • Ohms	• High accuracy temperature monitoring	• 7 readings/s • High accuracy	0.03°C 20 bits	AI: 1/8 DO: 2/2

Calibration Certificate

Technician: af
Part No: 350100-01
Model: 2270

Transducer SN: 1154671
Meter SN: 1154671
Work Order: 38043-1
Date: 02/10/2000

Range: 800 to 1100 HPA/MB
Nom. Output: 0 to 5 VDC
Supply: 24 VDC

CALIBRATION DATA

APPLIED PRESSURE (HPA/MB)	TRANSDUCER OUTPUT (VDC)	METER OUTPUT (HPA/MB)	NONLINEARITY ERRORS (% FS)	EXTRAPOLATED ERRORS (% FS)
800.0000	0.0007	800.0	0.000	Zero 0.000
900.0000	1.6677	900.0	0.000	
1000.0000	3.3325	1000.0	0.000	Span 0.000
1100.0000	4.9990	1100.0	0.000	

SPECIFICATIONS

1. Nonlinearity: +/- 0.05 %FS, END POINT method, ISA.#S-37.1
2. Zero pressure output: 0 VDC +/- 0.1 %FS
3. Full Scale output: 5 VDC +/- 0.1 %FS
4. This unit meets the specifications defined above.

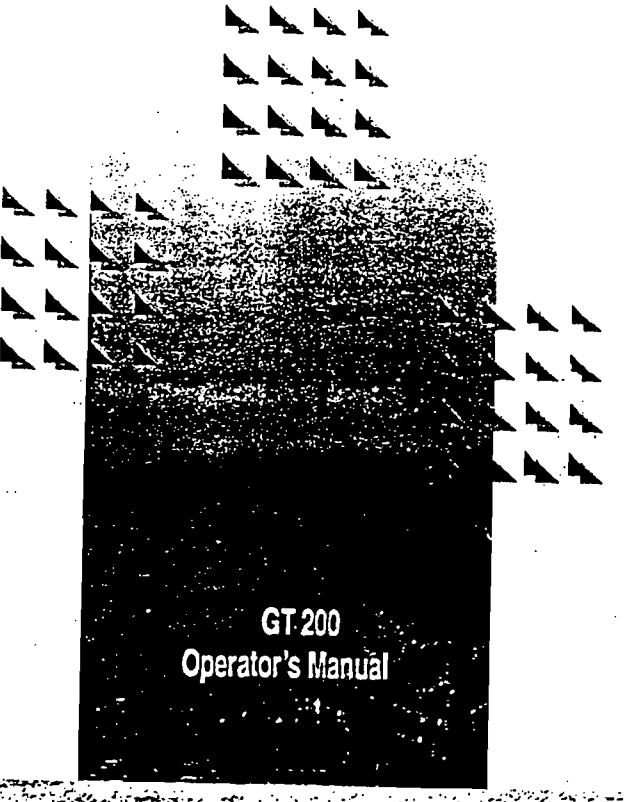
NOTES

1. All errors are expressed as: Percent Full-Scale output.
2. Consult specification sheet for additional specifications.
3. This calibration is certified per N.I.S.T. traceable primary standards.
   Primary standard: P2-325/C2-319, NIST# 838/258930-97/DH9195
   Primary standard cal. date: 8/26/99
   Location of cal.: PCCTR1
4. This part uses spec. record number: 350100-01.9
5. This certificate cannot be reproduced except in full, without the written approval of Setra Systems, Inc.

159 Swanson Road, Boxborough, MA 01719/Telephone 1-800-257-3872, (978) 263-1400

GAS TECH

The Trusted Name in Gas Detection



GT 200
Operator's Manual

Chapter 1

INTRODUCTION

This Operator's Manual provides information on the proper set-up, use and maintenance of the GT 200 Series Gas Monitors. Included are complete physical and functional descriptions, with procedures to calibrate and place the monitor in operation. Troubleshooting and maintenance information is also provided.

This chapter contains an overview of the GT Series gas monitors (GT), and information on typical applications, key features, and listings of standard and optional accessories. Complete descriptions appear in later chapters.

DESCRIPTION

GT Series Gas Monitor General Description

The GT 200 Series (shown in Figure 1-1) is a line of portable gas monitors capable of detecting from one to two gases. The GT displays up to two current gas levels simultaneously.

The GT 200 Series is used to monitor an environment for combustible gas, hydrocarbons (LEL/ppm) and oxygen (O_2). The monitor detects gas by a sample-drawing method, utilizing two internal sensors that plug straight into assigned molded flow block receptacles (one receptacle per sensor type).

During operation, the GT alerts you with visual and audible alarms whenever a monitored gas level is significantly different from the preset normal level.

The GT has an internal pump that continually draws the atmosphere sample into the external probe and hose, then into the monitor to the sensor(s).

The GT is powered by four "D" size alkaline or nickel-cadmium (Ni-Cd) batteries. A jack is provided on the GT for connection of the external Ni-Cd battery charger.

The 200 Series

The 200 Series GT gas monitors include two sensors. The following are the current models in the 200 Series, and the gases detected by each. Part numbers for each model are listed in Appendix A, Parts List.

- GT 201: Combustible gas (LEL/ppm) and oxygen (O_2).
- GT 202: Combustible gas (LEL/ppm) and oxygen (O_2) with float-probe.

Standard and optional accessories for the GT 200 Series of instruments are listed at the end of this chapter.

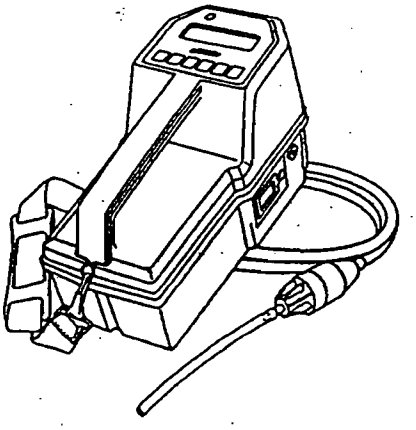


Figure 1-1 GT Series Gas Monitor

TABLE 1-3 Specifications for the GT 200 Series Monitor

Power Source	Four "D" size alkaline or Ni-Cd batteries.
Battery life	10 hours (20° C) (Due to the nature of alkaline cells, battery life is greatly reduced at low temperatures, and may be less than 2 hours at -15° C. Ni-Cd batteries are recommended for low temperature applications.)
Controls	ON/OFF (power) button, RESET button, FUNC/+ display option button, BACK LITE/- display option button, ADJUST/ENTER button, and LEL/PPM readout button.
Dimensions	10 in. L x 5 in. W x 6 in. H.
Weight	Approximately 5 pounds.
Case	High-impact, chemical resistant polycarbonate-polyester plastic with RF-resistant coating.
Standard Accessories	Carrying strap, hose, probe (with hydrophobic filter), dedicated sample hose with float-probe (GT 202 only), operator's manual(s)/quick reference card.
Optional Accessories	Confined space kit (CSK), dilution fitting, carrying case, extra length hose, 30 in. probe, battery chargers (220V AC, 115V AC), remote buzzer, auxiliary hydrophobic filter, and data retrieval package (5.25 and 3.50 in. diskettes, operator's manual, and associated cable).

Chapter 2

PHYSICAL DESCRIPTION

This chapter contains a description of your GT Series gas monitor. For purposes of this discussion, the GT is described as having an upper and a lower half.

EXTERNAL DESCRIPTION

All components located or typically accessed on the exterior of the GT Series gas monitor during operation are described in the following paragraphs. Figure 2-1 is an exterior view of the GT Series gas monitor.

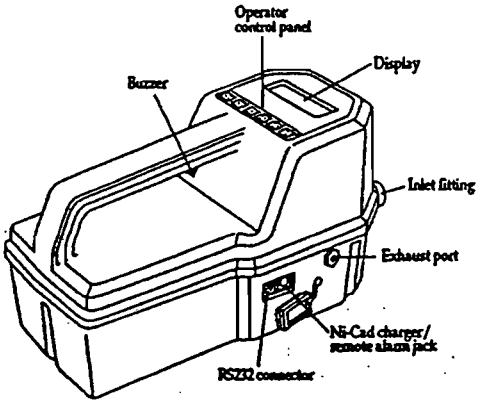


Figure 2-1 Exterior of the GT Series Gas Monitor

INSTRUCTION MANUAL

for

HORIBA MODEL PIR-2000
GENERAL PURPOSE INFRARED GAS ANALYZER

PIR-2000

HORIBA MANUAL NO. 090652 4-87

HORIBA INSTRUMENTS INCORPORATED

HORIBA INSTRUMENTS INC.
1021 DURYEA AVENUE
IRVINE INDUSTRIAL COMPLEX
IRVINE, CALIFORNIA 92714
TELEPHONE 714/250-4811

SECTION ONE	GENERAL DESCRIPTION

The Horiba Model PIR-2000 General Purpose Infrared Gas Analyzer is a precision gas analyzer based on nondispersive infrared ray absorption for continuously determining the concentration of a given component in a gaseous stream.

It is designed to effectively perform continuous monitoring and component analysis in the process control industry and in various other fields such as ambient air, stationary source and vehicle exhaust emissions monitoring. It is also utilized for monitoring the simulated environment used in agricultural studies for plant growth control.

Before operating this instrument, it is recommended that the user read through this instruction manual to insure efficient operation and accurate results.

SPECIAL ORDER RANGES:***

GAS		MEASURING RANGE (Full Scale Concentration)		
		Minimum * Possible	Minimum ** Recommended	Maximum
C_2H_2	Acetylene	250 ppm	1000 ppm	100%
C_2H_4	Ethylene	250 ppm	1000 ppm	100%
C_2H_6	Ethane	200 ppm	500 ppm	100%
C_2H_6O	Ethyl/alcohol	200 ppm	500 ppm	1%
C_4H_8	Butylene	200 ppm	500 ppm	100%
C_4H_{10}	Butane	200 ppm	500 ppm	100%
C_5H_{12}	Pentane	200 ppm	500 ppm	20%
C_7H_8	Toluene	200 ppm	500 ppm	10%
C_8H_{10}	Ethyl/benzene	200 ppm	500 ppm	0.2%
CH_3OH	Methanol	200 ppm	1000 ppm	3%
C_2H_3Cl	Vinyl Chloride	200 ppm	500 ppm	100%
N_2O	Nitrous Oxide	200 ppm	500 ppm	1.3%

Consult a factory engineer for specific analysis capabilities at your desired response time and noise specification.

*Minimum possible measuring range is the full scale concentration which may be measured with a signal noise of up to 2% of full scale at 5 second response time.

**Minimum Recommended Measuring Range is the full scale concentration which may be measured with a 200mm sample cell response time of 0.5 seconds full scale and a noise level of less than 0.5% of full scale.

***Instruments to measure these gases are available on special factory order only. The minimum and maximum ranges and the instrument performance specifications stated herein may be different for instruments measuring these gases depending on the specific application and other gases co-existing in the sample gas.

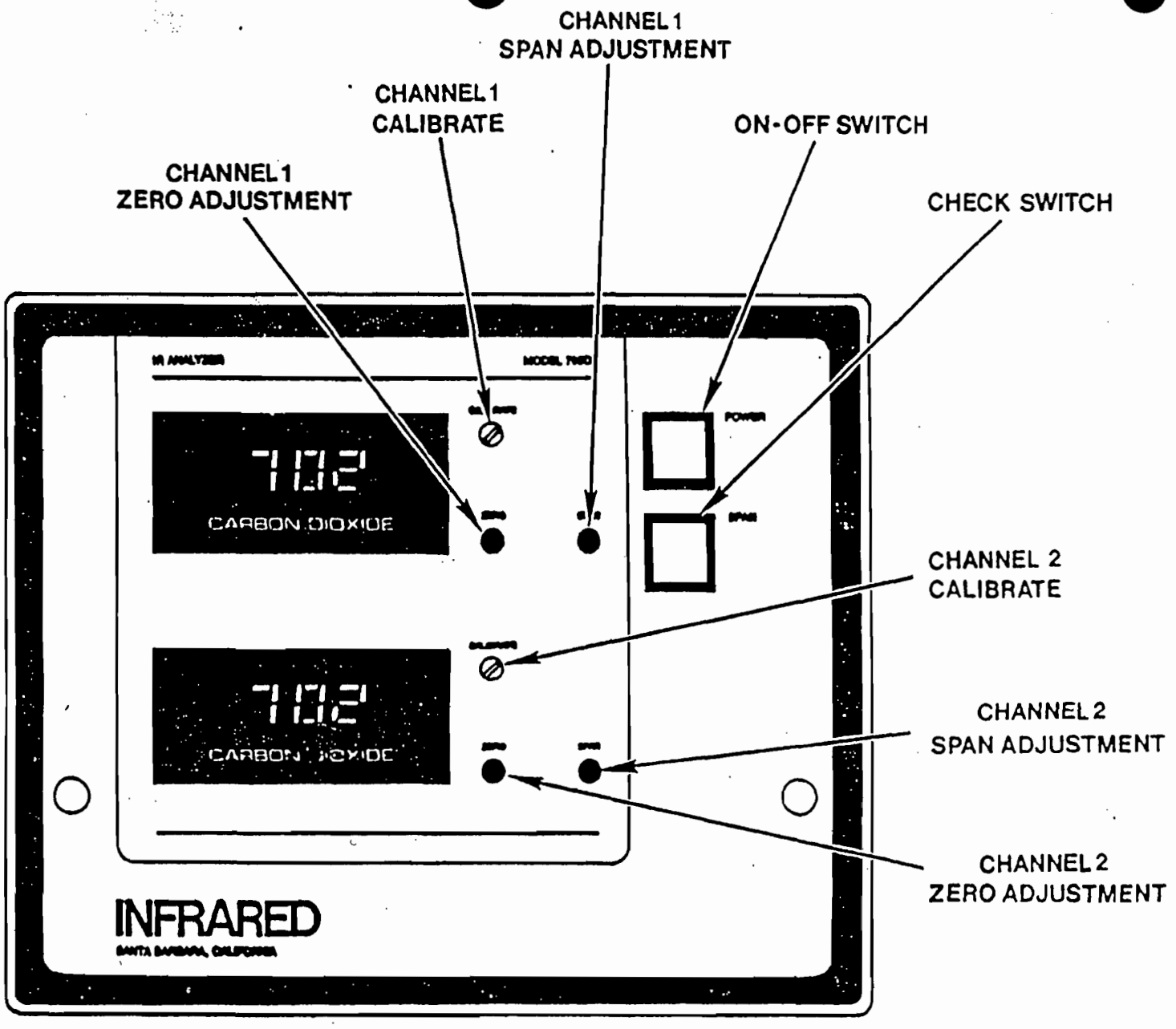


Figure 1-2

Front Panel Arrangement

SECTION II

ELECTRICAL SPECIFICATIONS

The following specifications apply to both the Model IR-702 and Model IR-703 Gas Analyzers.

Detectors	PbSe
Repeatability/accuracy[1]	± 1% of full scale
Linearity	± 0.5% of full scale
Noise Level	< 1% of full scale
Zero Drift[2]	± 1% of full scale/24 hours
Span Drift[2]	± 1% of full scale/24 hours
Standard Speed of Response	
Analog	90% of reading in 5 seconds (faster response optional)
Digital	90% of reading in 1 second
Recorder Output	0-100 mv standard 0-1 v optional others available
Power Required	100/117/220/240 ± 10% vac, 50-60 Hz, 80 watts maximum
Operating Temperature Range	32° to 120°F (0° to 49°C)
Warm-up Time	15 minutes

Notes:

(1) Accuracy is dependent on absolute accuracy of the certified calibration gas.

(2) Based on stable ambient conditions and a clean, dry sample stream regulated to a flow rate of 2-6 SCFH.

INSTRUMENT IDENTIFICATION SHEET

MODEL NUMBER: IR 2200-3052.5

SERIAL NUMBER: 4156

GAS: O_2

FULL SCALE VALUE: 1.000 10.00 25.0 %

RECORDER OUTPUT: R_2 = 100 mV

SPECIAL DATA: INTERNAL PUMP ASS'Y PER 53472

ORIGINAL PURCHASER - TO WHICH THE ATTACHED WARRANTY IS EXTENDED:

FISHER SUPPLY CO

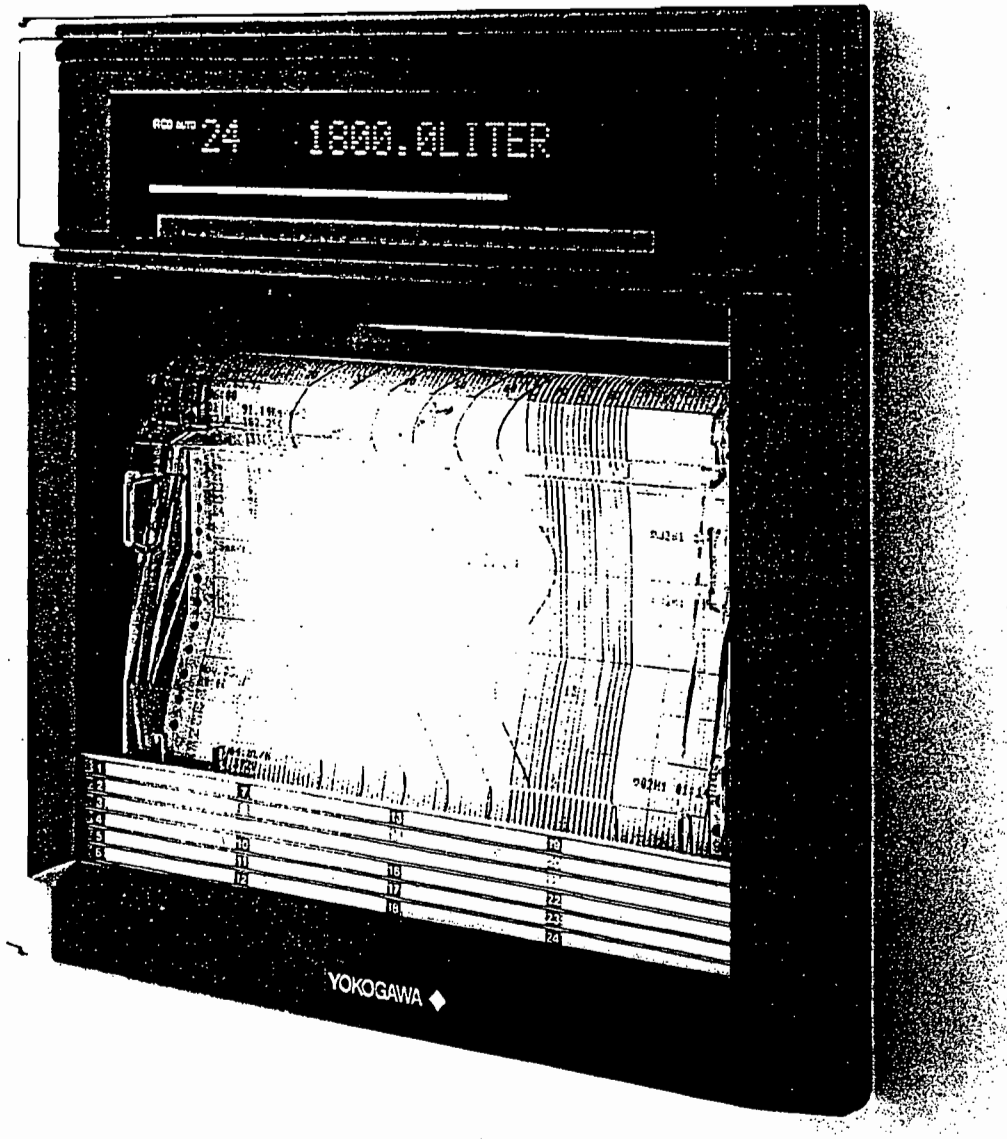
DATE OF ORIGINAL SHIPMENT: 12 JUNE 91

Temp (ambient)	40° to 105°F
Input Pressure	1 to 10 psig - standard limits
Flow Rate	0.3 to 3.0 scfh (Factory set at 1 scfh)
Moisture	0-100% (avoid condensation)
PERFORMANCE -	
Accuracy	±2%fs is at 72°F - all ranges
Response Time	30 sec. for 90% response, 10 sec. typical for small step change
Stability	±2%fs over 30 days typical
ELECTRICAL	
Power Input	100/120/220/240 Vac 50/60 Hz - standard
Output Signal	0 to 100 mV range - standard. Also available 0 to 10 mV, 0 to 1V, 0 to 5V
Visual	3 1/2 digital display
GAS FLOW SYSTEM -	
Gas Connection	Stainless Steel, Polypropylene, Polyethylene 1/4" tube fittings
Cell Life	6 month min, for ambient O_2 levels longer for lower O_2 concentrations
Shelf Life	6 months storage, off load, refrigerated in airtight package
STANDARD RANGES	
	Percent Analyzers 0 to 1/10/25%

YOKOGAWA

μR1800

RECORDERS



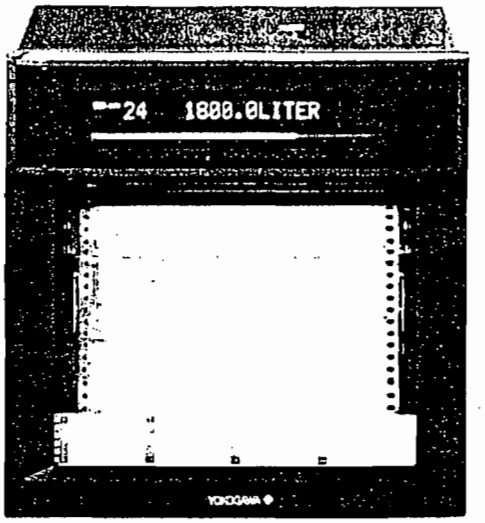
Bulletin 4H3B1-01E

General Specifications

μR1800
Recorder

μR1800

The μR1800 is a compact recorder with a recording width of 180mm. The model family consists of 1, 2, 3, 4 pen and 6, 12, 18, 24 dot model. Pen models realize continuous recording for each channel, whereas the dot-printing model realizes a high recording speed of 6dot / 10sec., 12dot / 15sec., 18dot / 20sec., 24dot / 30sec. Its input is universal, which means that it is freely selectable to use inputs like direct voltage, Thermo-couple, Resistance Temperature Detector, contact input, etc. In addition to analog recording, digital data like date & time, measured values, tags, units, scale values, chart speed, alarms, calculated values, etc. can also be printed. High reliability is realized by in house developed contact free technology, such as high breakdown voltage semiconductor relays, and DC brushless servomotors. Furthermore the μR1800 has a short case of only 220mm. Good readability is realized by using 5×7 VFD display and its setting is made easy because of the interactive program menu. Real time data is also displayed as a bargraph. The μR1800 can be used as a monitoring device and as a quality control instrument in many applications (such as process temperature monitoring, pollution, construction, furnaces, field of medical diagnosis, field of refrigerating, etc.).



μR1800
(24-dot model)

STANDARD SPECIFICATIONS

General Specifications

Construction

Mounting:

Flush Panel Mounting (vertical)

Mounting may be inclined up to 30°, rear below front (with horizontal base).

Allowable panel thickness: 2 to 26mm

Material:

Case: drawn steel, front door: aluminium die casting.

Finish:

Case and door-frame: lamp black (Mansell 0.8Y2.5 / 0.4 or equivalent)

Door:

Splash and dust-proof (in accordance with DIN 40050-IP54).

Dimensions:

288×288×220mm (see dimensional drawings)

Weight (approx.):

1 pen	8.9kg	6 dot	9.1kg
2 pen	9.0kg	12 dot	9.4kg
3 pen	9.2kg	18 dot	9.5kg
4 pen	9.4kg	24 dot	9.6kg

Model

1, 2, 3, and 4 pen, 6, 12, 18, and 24 dot-model.

Input

Inputs: DCV: Direct Current Voltage input 20mV to 20V range.

TC: Thermo couple.

RTD: Resistance Temperature Detector.

DI: Digital Input (contact or DC Voltage, TTL level).

DCA: Direct Current Input (using external shunt resistor (10Ω, 100Ω, 250Ω))

Measuring range: selectable per channel

Input type	Range	Measuring Range
DC V	20mV	−20.00 to 20.00mV
	60mV	−60.00 to 60.00mV
	200mV	−200.0 to 200.0mV
	2V	−2.000 to 2.000V
	6V	−6.000 to 6.000V
	20V	−20.00 to 20.00V

YOKOGAWA
2-9-32, Nakacho, Musasino-shi, Tokyo, 180 Japan
Tel.: 0422-52-5586 Telex : 02822-3237 YEW MTJ Fax.: 0422-52-9802

GS 4H3B1-01E

Input Type	Range	Measuring Range °C	Measuring Range °F
TC	R*1	0.0 to 1760.0°C	32 to 3200°F
	S*1	0.0 to 1760.0°C	32 to 3200°F
	B*1	0.0 to 1820.0°C	32 to 3308°F
	K*1	−200.0 to 1370.0°C	−328 to 2498°F
	E*1	−200.0 to 800.0°C	−328.0 to 1472.0°F
	J*1	−200.0 to 1100.0°C	−328.0 to 2012.0°F
	T*1	−200.0 to 400.0°C	−328.0 to 752.0°F
	N*2	0.0 to 1300.0°C	32 to 2372°F
	W*3	0.0 to 2315.0°C	32 to 4199°F
	L*4	−200.0 to 900.0°C	−328.0 to 1652.0°F
	U*4	−200.0 to 400.0°C	−328.0 to 752.0°F

Input Type	Range	Measuring Range °C	Measuring Range °F
RTD	Pt100*5	−200.0 to 600.0°C	−328.0 to 1112.0°F
	JPt100*5	−200.0 to 550.0°C	−328.0 to 1022.0°F

Input Type	Range	Measuring Range
DI (Digital Input)	Voltage Input	less than 2.4V : OFF ; more than 2.4V : ON (TTL)
	Contact Input	contact ON / OFF

*1 R, S, B, K, E, J, T: ANSI, IEC 584, DIN IEC 584, JIS C 1602-1981
*2 N: Nicrosil-Nisil, IEC 584, DIN IEC 584
*3 W:W-5%Re-W-26%Re (Hoskins Mfg Co)
*4 L:Fe-CuNi, DIN43710 U:Cu-CuNi, DIN43710
*5 Pt100: JIS C 1604-1989, JIS C 1606-1989, IEC 751, DIN IEC 751
JPt100: JIS C 1604-1981, JIS C 1606-1989

Measurement Interval:
Pen model: 125ms / channel.
Dot printing model: 2.5s / 6-, 12-, 18-, 24dot
In case of 100ms integration:
2.5s / 6 dot, 5s / 12 dot, 10s / 18dot, 10s / 24dot

A/D Integration Time:
AUTO / FIX selectable
AUTO: 20ms (50Hz) or 16.7ms (60Hz), automatically selected depending on the power supply frequency.
FIX: 20ms (50Hz), 16.7ms (60Hz) or 100ms (50 / 60Hz) can be set.
100ms integration time for dot printing model only

TC Burnout:
ON / OFF selectable (per channel).
Burnout upscale / downscale selectable (common for all channels)
Normal: less than 2kΩ, burnout: more than 10MΩ.
Measuring current: approx. 100nA.

Filter:
Pen model:
Signal damping (ON / OFF selectable per channel; in case of ON: time constant from 2, 5, 10sec).
Dot printing model:
Moving average (ON / OFF selectable per channel; in case of ON: averaging times from 2 to 16 scans).

Calculation:
Differential computation:
Between any two channels, however reference channel number. must be less than measuring channel number.
Available for DCV, TC, and RTD range.
Both channels must have same range.
Linear scaling:
Available for DCV, TC and RTD range.
Scaling limits: −20000 to 20000
Data display & printout range: −19999 to 20000
Decimal point: user selectable (should be specified when entering scale value)
Unit: user settable, up to 6 characters (alphanumerical & special characters).
Square root:
Available for DCV range.
Scaling limits: −20000 to 20000
Data display & printout range: −19999 to 20000
Decimal point: user selectable
Unit: user settable, up to 6 characters (alphanumerical & special characters).

Recording and Printing

Recording Method:
Pen model: Disposable felt pens, Plotter pen
Dot printing model: 6 color wire dot.

Pen Offset Compensation:
ON / OFF selectable (Pen model only)

Effective Recording Width: 180mm

Chart:
Plain-paper Z-fold chart (20m)

Step Response Time (pen):
Less than 1.5sec (acc. to IEC TC85 method).

Recording Period:
Pen model:
Continuous for each channel.
Dot printing model:
. Max. 6 dot / 10sec, 12 dot / 15sec, 18 dot / 20sec, 24 dot / 30sec, AUTO / FIX selectable
AUTO: Analog recording interval is depending on the chart speed
FIX: Analog recording interval is set to shortest period

Chart Speed:
Pen model: 5 to 12000mm/h (82 increments)
Dot printing model: 1 to 1500mm/h (1mm step)

Chart Speed Change:
speed 1, speed 2 change by remote control signals (option).

Chart Speed Accuracy:
within ±0.1% (for recordings longer than 1000mm, excluding paper expansion and [illegible]

Relation between Chart Speed and Printout:

(Pen-model)

Chart Speed	• Periodic Printout	• Alarm Printout • Message Printout • Chart Speed Change Time Printout
5 to 9mm/h	No printout	Printout
10 to 1500mm/h	Printout	Printout
1600 to 12000mm/h	No printout	No printout

(6-, 12-dot model)

Chart Speed	• Channel No. or Tag No.	• Periodic Printout	• Alarm Printout • Message Printout • Chart Speed Change Time Printout
1 to 9mm/h	Printout	No printout	Printout
10 to 100mm/h	Printout	Printout	Printout
101 to 1500mm/h	No printout	No printout	No printout

(18-, 24-dot model)

Chart Speed	• Channel No. or Tag No.	• Periodic Printout	• Alarm Printout • Message Printout • Chart Speed Change Time Printout
1 to 9mm/h	Printout	No printout	Printout
10 to 50mm/h	Printout	Printout	Printout
51 to 1500mm/h	No printout	No printout	No printout

Relation between chart speed and printing intervals of periodic printouts:

(Pen-model)

Chart Speed	Printing Interval of Periodic Printout
5 to 9mm/h	No printout
10 to 18mm/h	Every 8 hours
20 to 36mm/h	Every 4 hours
40 to 72mm/h	Every 2 hours
75 to 135mm/h	Every hour
150 to 180mm/h	Every 30 minutes
200 to 320mm/h	Every 20 minutes
360 to 1500mm/h	Every 10 minutes
more than 1600mm/h	No printout

(Dot-printing model)

Cart Speed	Printing Interval of Periodic Printout			
	6-dot model	12-dot model	18-dot model	24-dot model
1 to 9mm/h	No printout	No printout	No printout	No printout
10 to 19mm/h	Every 8 hours	Every 12 hours	Every 12 hours	Every 24 hours
20 to 39mm/h	Every 4 hours	Every 8 hours	Every 8 hours	Every 12 hours
40 to 50mm/h	Every 2 hours	Every 4 hours	Every 4 hours	Every 8 hours
51 to 79mm/h	Every 2 hours	Every 4 hours	No printout	No printout
80 to 100mm/h	Every hour	Every 2 hours	No printout	No printout

Recording Colors:

Pen model:

pen1 = red, pen2 = green, pen3 = blue,
pen4 = violet, plotter pen = purple

Dot printing model:

ch1, 7, 13, 19 = purple, ch2, 8, 14, 20 = red,
ch3, 9, 15, 21 = green, ch4, 10, 16, 22 = blue,
ch5, 11, 17, 23 = brown, ch6, 12, 18, 24 = black
(color can be assigned to any channel)

Recording Format:

1. Analog recording:

Zone recording:

Span: More than 5mm, In 1mm steps

Partial expanded recording:

Boundary position: 1 to 99%

Boundary value: Within recording span

2. Digital printout:

Channel (dot model only):

Channel number or TAG will be printed during analog recording. Approx. every 25mm this print will occur.

Alarm:

At the right side of the chart, CH. No. or TAG, Type of alarm, ON / OFF time (h/m) will be printed. It is selectable to get ON / OFF time of alarms, or ON time, or no alarms (common for all channels).

Periodic printout:

At the left side of the chart, date (m/d), time (h/m) chart speed, and measured data of every channel will be printed.

Printing interval is INT / EXT selectable.

INT: Using internal timer. Depending on chart speed or on interval which is selectable (up to 24 hours).

EXT: Using remote control option

Channel No. or TAG printout:

Selectable, common for all channels.

Measuring printout:

ON / OFF selectable for each channel.

Scale printout:

Recording span more than 40mm, at 0% and 100% values will be printed. (When using partial expanded recording, boundary value will also be printed). ON / OFF selectable (common for all channels)

Printout of recording colors (pen model only)

Date, time and chart speed

Message printout:

Using panel key or remote control option. Up to 5 messages.

Contents: time (h/m) and message (up to 16 characters).

Record start time:

Time (h/m) will be printed when recording starts, ON / OFF selectable

Chart speed printout:

List printout:
Listings of range and alarm setting, etc. will be printed.
Manual printout:
Using panel key or remote control option. Measured values of that moment will be printed, while trend recording will be interrupted.
SET UP List printout:
Listings of settings in SET UP Mode will be printed.

Display

Display Method:
VFD (5×7 dot matrix, 20 characters).
Digitial Display:

AUTO	Channel No. or TAG No., kind of alarm, measured values, unit (when TAG No. is displayed, front 3 characters), for each channel alternately
MANUAL	Channel No., kind of alarm, measured values, unit (when TAG No. is displayed, front 3 characters), for one specific channel
CLOCK	Year / month / date and hour / min / sec will be displayed
VIEW	Operating status of IC memory card will be displayed

Bargraph Display:

Measured data	Left-referenced (%) bargraph and center zero bargraph (selectable for each channel).
Alarm	Setting level of alarm, in case of alarm flashing display.

Alarm status display:
Channel No. will be displayed in case of alarm (dot model only)
Other Displays:
RCD: Recording in progress, POC: Pen offset compensation (pen model only), SET: Set mode, ALM: Shared alarm (not corresponding to any channel), CHT: Chart end indicator (optional), BAT: Low battery. AUTO, MAN, CLK: Display status of operation mode

Power Supply

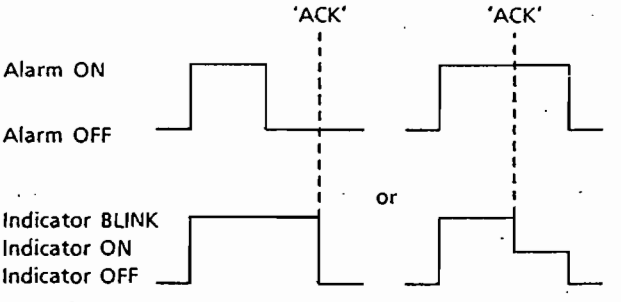
Rated Power Voltage:
100 to 240VAC, automatically selected depending on the power supply voltage
Usable power voltage ranges:
90 to 132, 180 to 250VAC
Rated Power Frequency:
50/60 Hz, automatically selected
Power Consumption: (approx.)

	100VAC Power Source	240VAC Power Source	Maximum
4 pen	29VA*	32VA*	70VA
		33VA*	

Alarm

Number of levels:
Up to four levels for every channel (High, Low, Delta high, Delta low, High-rate-of-change, Low-rate-of change selectable).
Interval time of rate-of-change alarm is the measuring interval times 1 to 15 (selectable, and common for both rate-of-change alarms).
Display:
Set value:
It is indicated as a point on the bargraph.
In case of an alarm:
This point will start flashing on the bargraph and the digital display will show the kind of alarm and alarm indicator in different display will show alarm
For the dot model, the channel No. where the alarm occurred will also be displayed.
Hysteresis:
Approx. 0.5% of recording span (only High, Low alarm) and 0%, selectable (common for all channels and all levels).
Alarm indication when ALARM ACK-key is pressed:
Non-hold-type:
Alarm display is not affected when the ALARM ACK-key is pressed.
Hold-type:
When alarm occurs, alarm indicator will start flashing. After ALARM ACK-key is pressed, indicator will show status of the alarm.

Hold-type:



Non-hold-type:
No action will occur when ACK-key is pressed.
ALM indicator depends on alarm status.

Other Specifications

Clock:
With Calendar function
Clock Accuracy:
100 PPM, however not including error due to turning ON/OFF power
Panel Key Lock:
By actual key
Internal illumination:

Memory backup:

Lithium battery to protect setting parameters. Life is approx. ten years (at room temperature, and for standard model) and is installed inside the recorder. If the battery runs down, it will be indicated on the front panel indicator.

Insulation Resistance:

Each terminal to ground terminal: more than 20MΩ (measured at 500VDC).

Dielectric Strength:

Power supply to ground terminal:
1500V AC (50/60Hz), 1 min

Contact output terminal to ground:
1500V AC (50/60Hz), 1 min

Measuring input terminal to ground:
1000V AC (50/60Hz), 1 min

Between measuring input terminals:
1000V AC (50/60Hz), 1 min
(except for RTD, since b-terminal is common).

Between remote control terminal to ground:
500V DC, 1min.

Safety Standards

In compliance to CSA 142
IEC 348

EMI Standards

In compliance to EN55011 Group 1 Class A

Normal Operating Conditions

Power voltage: 90 to 132, 180 to 250VAC
Power frequency: 50Hz ±2%, 60Hz ±2%
Ambient temperature: 0 to 50°C
Ambient humidity: 20 to 80% RH (at 5 to 40°C)
Vibration: 10 to 60Hz, less than 0.02G
Shock: not permissible

Magnetic field:
less than 400AT/m (DC and 50, 60Hz)

Noise:

Normal Mode (50/60Hz)

DCV — Peak value including signal must be less than 1.2 times the measuring range.

TC — Peak value including signal must be less than 1.2 times the measuring thermal electromotive force.

RTD — less than 50mV.

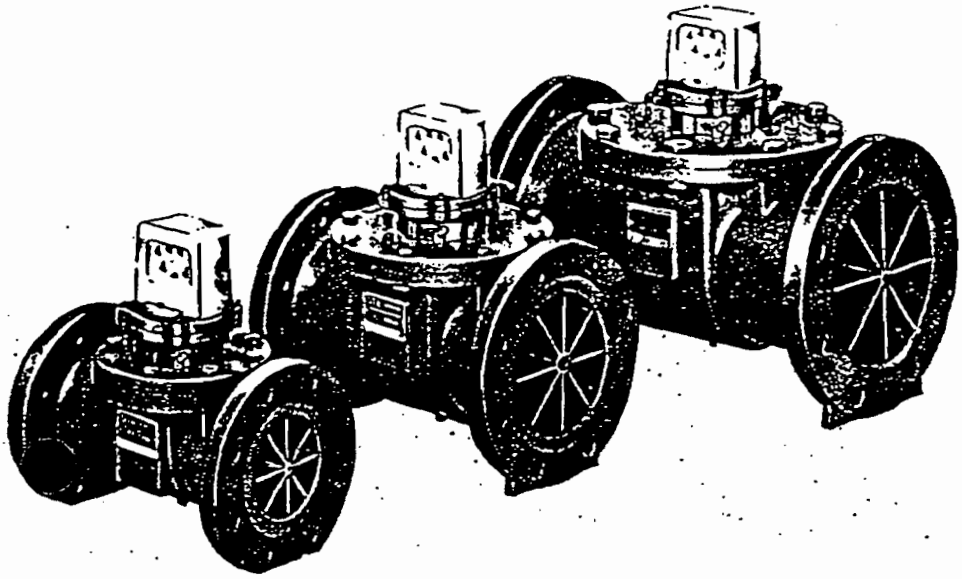
Common Mode (50/60Hz)
less than 250VAC rms. for the whole range

Operating Position:
Frontwards: 0° Backwards: within 30° from horizontal

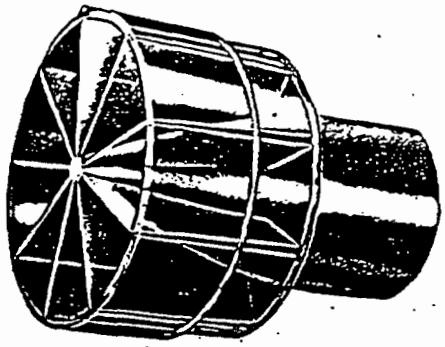
Warm-up Time:
Min 30 minutes after power has been turned ON.

THE AMERICAN GAS TURBINE METER

The American Gas Turbine Meter is an accurate, compact, ruggedly built, high volume measurement device with a variety of features to suit many applications.



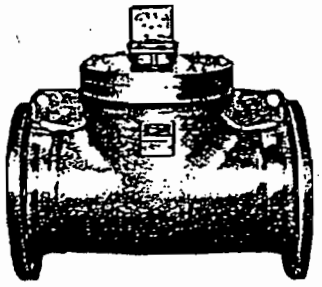
4", 6", and 8" GT



FLO-GUIDE *

Smaller station space requirements
Improved meter characteristics

A. F. BROCK & CO., INC.
4429 Hamann Parkway
Wiloughby (Cleve.), Ohio 44094
(216) 951-5959
Fax: (216) 951-1520



12" GT

See Bulletin 330T for complete details

CAPACITIES

For gases and flowing conditions other than those shown in the table use the following equations to calculate capacities:

$$Q_{max.} = Q_{max.\ @\ .25\ psig} \times \frac{P_f}{P_b}$$

$$Q_{min.} = \frac{Q_{max.\ @\ .25\ psig}}{Rangeability\ @\ .25\ psig} \times \sqrt{\frac{P_f}{P_b}} \times \frac{0.6}{Sp.\ gr.}$$

Q = Flow Rate—thousands of cubic feet per hour

P_f = Flowing Pressure—psia

P_b = Base Pressure—psia

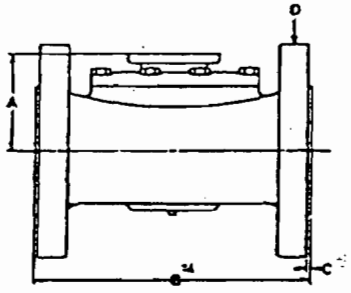
Sp. gr. = Specific gravity of gas (air = 1.0)

Maximum rated capacity at operating pressure for continuous load. Based on .6 SP. GR. Gas @ 60°F. and 14.73 Base Pressure.

Line Pressure PSIG	Maximum 6CFH 4GT-100	Rangeability	Maximum 6CFH 6GT-80	Rangeability	Maximum 6CFH 6GT-60	Rangeability
.25	16	13.5:1	20	19 to 1	60	27 to 1
5	24	13.6	28	17.2	88	23.5
10	38	17.4	55	19.2	100	26.5
15	38	19.1	68	20.8	120	31.3
20	52	20.7	71	23.0	130	33.8
25	44	22.1	81	24.5	160	36.1
30	78	20.2	130	31.5	260	46.1
75	108	33.3	188	37.0	370	54.3
100	160	37.8	248	42.0	480	61.4
125	190	41.5	298	46.6	540	67.8
150	201	45.1	348	50.0	680	73.6
175	231	46.4	398	54.0	760	79.0
200	262	51.5	448	57.0	880	84.0
300	361	62.3	658	71.0	1300	101.7
400	504	71.4	858	80.0	1700	116.1
500	626	79.6	1108	89.0	2200	130.0
600	751	87.2	1308	98.0	2600	142.1
700	873	94.0	1458	105.0	3000	153.2
800	995	100.0	1658	112.0	3400	163.6
900	1128	106.0	1858	118.0	3800	173.4
1000	1240	112.0	2108	124.0	4200	182.6
1100	1360	117.0	2308	130.0	4600	191.4
1200	1480	123.0	2508	136.0	5000	199.8
1300	1610	126.0	2708	142.0	5400	207.8
1400	1730	132.0	2908	146.0	5800	215.6

The above table is based on approximately constant index rates. Supercompressibility is not included.

TURBINE METER DIMENSIONS

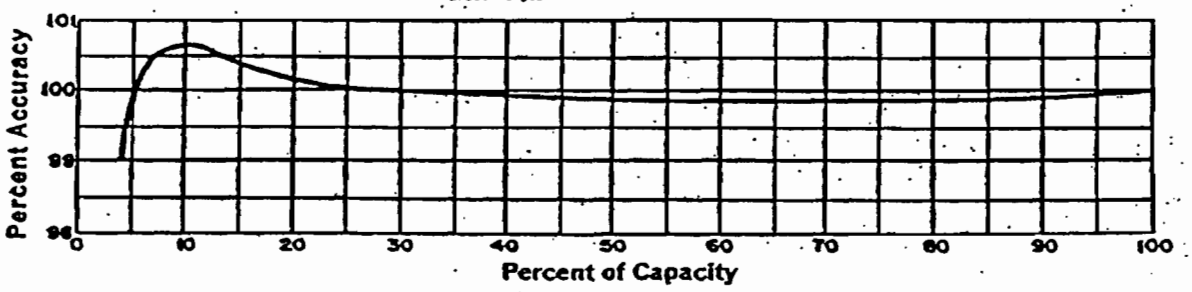


Size	Working Pressure	Shipping Weights in lbs. (approx.)	A	B	C	D - FLANGE DIAMETER O.D.	D - FLANGE DIAMETER B.C.	Bolt Holes No.	Bolt Holes Size
4-inch (100 m. m.) Steel	175	22	8	11	None	10	7 1/2	8	5/8
	300*	86	8	11	5/16	10	7 1/2	8	5/8
	575*	86	8	11	5/16	10	7 1/2	8	5/8
	720*	150	8	11	5/16	10	7 1/2	8	5/8
	1440*	150	8	11	5/16	10	7 1/2	8	5/8
6-inch (150 m. m.) Steel	175	54	11	16	None	12	9 1/2	8	3/4
	300*	160	11	16	5/16	12	9 1/2	8	3/4
	575*	215	11	16	5/16	12	9 1/2	8	3/4
	720*	275	11	16	5/16	12	9 1/2	8	3/4
	1440*	275	11	16	5/16	12	9 1/2	8	3/4
8-inch (200 m. m.) Steel	175	98	13	22	None	15	11 3/4	12	3/4
	300*	290	13	22	5/16	15	11 3/4	12	3/4
	575*	290	13	22	5/16	15	11 3/4	12	3/4
	720*	450	13	22	5/16	15	11 3/4	12	3/4
	1440*	450	13	22	5/16	16 1/2	13	12	1

* ANSI 300 Flanges
— ANSI 600 Flanges

CHARACTERISTIC PERFORMANCE CURVE

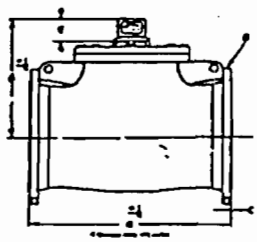
ACCURACY VERSUS FLOW RATE



RATED CAPACITY AT OPERATING PRESSURE, 14.73 psia BASE PRESSURE, 14.73 psia ATMOSPHERIC PRESSURE

Line Pressure (psig)	12 GT-125 Flow MSCFH Maximum	12 GT-125 Flow MSCFH Minimum	12 GT-125 Rangeability Ratio	12 GT-720 Flow MSCFH Maximum	12 GT-720 Flow MSCFH Minimum	12 GT-720 Rangeability Ratio	12 GT-1440 Flow MSCFH Maximum	12 GT-1440 Flow MSCFH Minimum	12 GT-1440 Rangeability Ratio
0.25 (4oz)	150	6.0	25:1	150	6.0	25:1	150	8.3	18:1
50	652	12.5	52:1	652	12.5	52:1	652	17.4	37:1
100	1153	16.6	69:1	1153	16.6	69:1	1153	23.2	50:1
125	1313	18.4	71:1	1313	18.4	71:1	1313	25.3	52:1
250	—	—	—	2658	25.3	104:1	2658	35.2	75:1
500	—	—	—	5167	35.4	146:1	5167	49.3	106:1
720	—	—	—	7492	42.1	177:1	7492	64.0	117:1
1000	—	—	—	—	—	—	10333	69.3	149:1
1440	—	—	—	—	—	—	14814	82.9	178:1

The above table is based on approximately constant index rates. Supercompressibility is not included.
RANGEABILITY is the ratio of the maximum rated capacity to the minimum capacity within ±1% of 100% accuracy.
Rangeability ratios in the table above are based on natural gas — 0.60 sp. gr.



F, Standard Index 4¼-Inches

Model Maximum Working Pressure (psig)	Body Dimensions - Inches A*	B	C	Flange Dimensions Inches D OD	D BC	Bolts No.	Bolts Size Inches
175	19¾	29	1/16	19	17	12	¾
720	20¾	30¾	1/16	20¾	17¾	16	1¼
1440	20¾	32¾	1/4	22	19¼	20	1¼

12 GT METER DIMENSIONS

OD - Outside Diameter BC - Bolt Circle Diameter
* Indicates Standard Index

AMERICAN METER COMPANY

Measurement Engineers Since 1836

AMERICAN METER CANADIAN METER IDR INTERNATIONAL GAS APPARATUS

Meter Designation

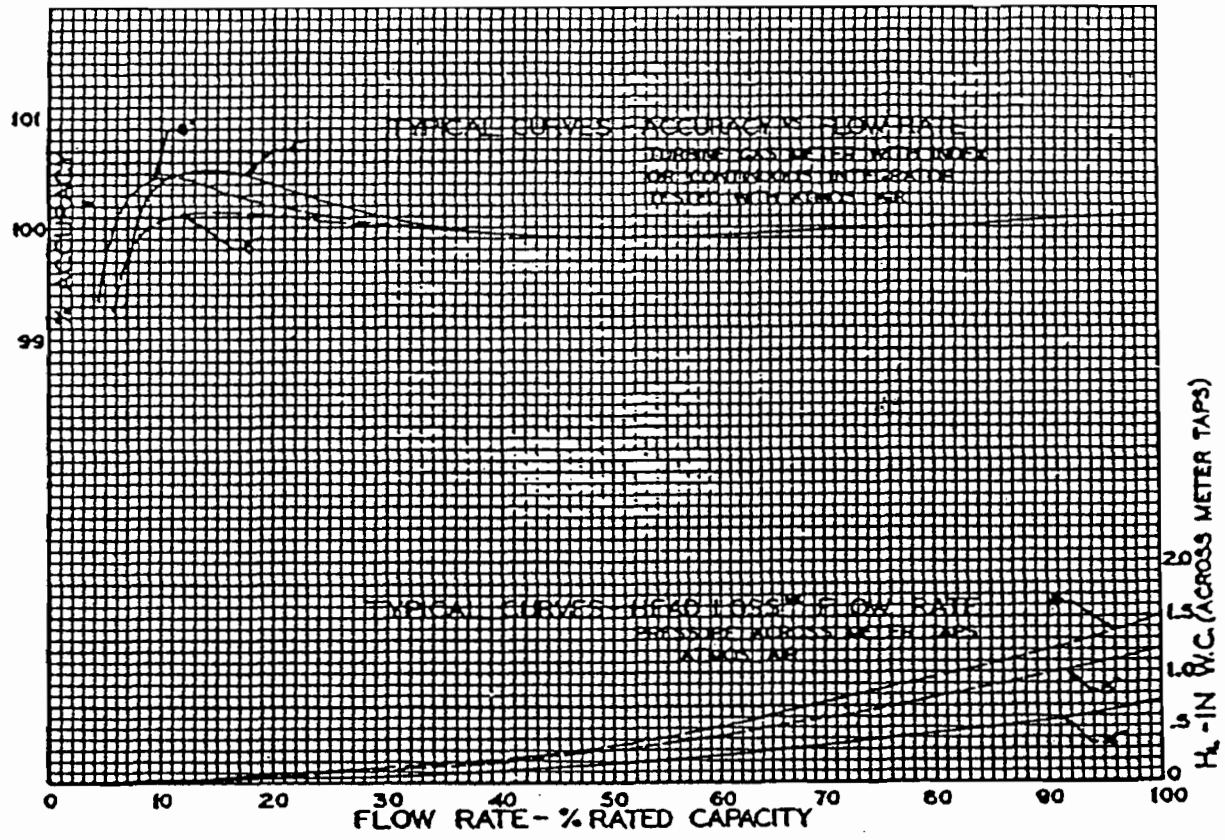
8" GT 175#

AMERICAN METER COMPANY

Manufacturer's Number
90-52587

Cartridge Number
P-40426

AMERICAN GAS TURBINE METER



Chge. gears: 47/63 (54548G005)

FLOW RATE (AIR) SCFH	% ACCURACY	DIFFERENTIAL (inches H_2O) Tested on air
38,500	99.9	0.2
8,000	100.9	.0
3,000	100.6	.0

Customer: A.F. B[illegible]

2-30854-2

Date: 6-28-90

Tested by: 568

Test Trailer Turbine Meter Calibration

CALCULATE: The Test Meter Calibration Coefficeint.

$$Ym = \frac{Qsd}{Qsd_{act}} \qquad \text{Eq. 2A-1}$$

Ym = **0.97946953** **0.987433** **0.96241981** All meter coefficients must be between 0.95 and 1.05.

DETERMINE: The Minumum and Maximum Coefficients.

Maximum Value: 0.987433
Minimum Value: 0.96241981

Difference: **0.02501319** Must not exceed 0.030

CALCULATE: The Average Test Meter Calibration Coefficient Value:

Avg Y_m = Sum of three Ym Values / 3

Avg Y_m = **0.97644078** This value gets entered into computer program for test trailer constants.

CALIBRATE: The Test Trailer Temperature Thermistors

Reference Thermometer:
Fisher: 885-250
ID 15041D

	Actual Reading (Deg. C)	Reference Reading (Deg. C)	Percent Difference	Allowable
Flow Temperature Thermistor	22.3	22.2	0.44843049	+/- 2.0 %
Ambiant Temperature Thermistor	22.1	22.2	-0.45248869	+/- 2.0 %

CALIBRATE: The Test Trailer Barometer

Trailer Barometer: Setra: Model 2270 Manometer
Reference Barometer: Princo - NOVA

	Actual Reading (mm Hg)	Reference Reading (mm Hg)	Difference	Allowable
Barometric Reading	763.5	764.2	-0.7	+/- 2.5 mm Hg

CALIBRATE: Flow Pressure Transducer

Trailer Flow Transducer: Setra Model: 264
Reference: Water Slack Tube Monometer

	Actual Reading (mm Hg)	Reference Reading (mm Hg)	Difference	Allowable
Flow Pressure Reading	2.4	2.5	-0.1	+/- 2.5 mm Hg
	9.9	10	-0.1	+/- 2.5 mm Hg

Test Trailer Turbine Meter Calibration

September 4, 2001 Trailer 1 Meter: 40426

40 CFR 60 METHOD 2A
PITOT TUBE VELOCITY AND FLOW RATE CALIBRATION FOR 8" TURBINE
SIX MONTH FULL CALIBRATION CHECK

DEFINITIONS:

M_a =Mol. wt. of Air (lb/lb-mole)
vs =Duct gas velocity (ft/sec)
Qsd =Std. dry volumetric duct flow rate (dscf/hr)
K_p =Pitot tube constant
C_p =Pitot tube coeffient (dimensionless)
Del p =Velocity head of stack gas (in H_2O)
T_s =Absolute avg. stack gas temperature (°R)
T_{std} =Standard temperature (20°C or 68°F)
P_s =Absolute duct pressure (in Hg.)
P_{std} =Standard pressure (in Hg.)
P_{bar} =Barometric pressure (mm Hg.)
A =Cross sectional area of duct (ft^2)

DATA INPUT: please enter the following data using correct units;

		30 % Flow	60 % Flow	90 % Flow	
	Del p=	0.064	0.21	0.38	in. H_2O (from pitot tube)
	T_s =	22.3	22.3	22.4	°C (from thermister/thermometer)
	P_g =	0.9	2	2.4	in H_2O (from trailer pressure transducer)
**********	P_g =	1.681488	3.73664	4.483968	mm Hg (calculated)
	P_{bar}=	763.5	763.5	763.5	mm Hg (from barometer)
	Dia =	7.875	7.875	7.875	in I.D.
**********	A =	0.33824248	0.33824248	0.33824248	ft^2 (calculated from above)

CORRECTED DATA/CONSTANTS USED IN FORMULAS:

	30 % Flow	60 % Flow	90 % Flow	
T_{std} =	528	528	528	°R
T_s =	532.14	532.14	532.32	°R
P_{std} =	29.92	29.92	29.92	in. Hg
P_{bar} =	30.0590551	30.0590551	30.0590551	in. Hg
P_s =	30.1252554	30.2061669	30.2355893	in. Hg
M_a =	28.9644	28.9644	28.9644	lb/lb-mole (from Mark's M.E. Handbook)
C_p =	0.99	0.99	0.99	Dimensionless
K_p =	85.49	85.49	85.49	$\frac{ft[(lb/lb\text{-}mole)(in.\ Hg)]^{1/2}}{sec[(°R)(in.\ H_2O)]^{1/2}}$

CALCULATE: Average duct gas velocity

$$vs = K_p * C_p * [(Del\ p)^{1/2}] * [(T_s/(P_s * M_a))^{1/2}] \quad \text{Eq. 2.9}$$

	30 % Flow	60 % Flow	90 % Flow	
vs =	16.7207523	30.2477472	40.6759041	(ft/sec)
=	1003.24514	1814.86483	2440.55425	(ft/min)
=	305.867421	553.312448	744.071417	(m/min)

CALCULATE: Average duct gas volumetric flow rate

$$Qsd = 3600 * vs * A * [(Tstd * Ps)/(Ts * Pstd)] \quad \text{Eq. 2.10}$$

	30 % Flow	60 % Flow	90 % Flow	
Qsd =	20340.5939	36894.8483	49646.1814	(scf/hr)
=	339.009898	614.914138	827.436357	(scf/min)
=	2535.97032	4599.87751	6189.65422	(gal/min)
=	9.6007603	17.4143684	23.4329976	(meters3/min)
=	**48.0038015**	**87.0718419**	**117.164988**	**(meter3/5 min.)**

INPUT: Average Ves Values from 5-minute Test Data Printouts.

APPENDIX C

COMPUTER PRINTOUT LEGEND

AMBIENT-T.....Ambient Temperature.....° Celsius

EXHAUST-T..... Exhaust Temperature.....° Celsius

EXHAUST-P.....Exhaust Pressure.....mm Hg

BARO-P.....Barometric Pressure.....mm Hg

HCin.....Inlet VOC Concentration (when used).....% by volume

HCout.....Exhaust VOC Concentration.....Vol. Fraction

VES.....Flow Through Turbine Meter.....m^3 std.

ME.....Total Milligrams Emitted.....mg of VOC

VE.....Flow Through Turbine Meter.....m^3

John Jordan Service Company
Technical Services Group
502 267-8344

Vapor Recovery Performance Test

Test Id: 000694123-00057

Test for: Motiva Enterprise LLC North
Fort Lauderdale, FL

Unit Tested: John Zink VRU

Test Date: 02/21/2002

Test Personnel: Tony Fenton
Glen Toloczko

Strip Chart Recorder Speed: 150

All data fields are rounded 2 places following the decimal for display purposes. Internal to the program all data fields are 8 digits following the decimal.

Outlet Calibration Information

Allowable range is +/- 5% of actual span gas Concentration

Low range span gas concentration	2.53 %, Cylinder # FF-32443
Mid range span gas concentration	4.50 %, Cylinder # FF-34566
High range span gas concentration	9.09 %, Cylinder # FF-20107
Zero span analyzer reading	0.00 %
Zero range analyzer error	0.00 %
Low range analyzer reading	2.56 %
Low range analyzer error	1.19 %
Mid range analyzer reading	4.42 %
Mid range analyzer error	-1.78 %
High range analyzer reading	9.07 %
High range analyzer error	-0.22 %

Inlet Calibration Information

Allowable range is +/- 5% of actual span gas Concentration

Low range span gas concentration	25.11 %, Cylinder # LL-36178
Mid range span gas concentration	49.84 %, Cylinder # LL-25095
High range span gas concentration	84.08 %, Cylinder # LL-36180
Zero span analyzer reading	0.01 %
Zero range analyzer error	0.00 %
Low range analyzer reading	24.63 %
Low range analyzer error	-1.91 %
Mid range analyzer reading	49.05 %
Mid range analyzer error	-1.59 %
High range analyzer reading	83.97 %
High range analyzer error	-0.13 %

Time	Baro-P mm Hg	Exhaust-P mm Hg	Ambient-T Deg C	Exhaust-T Deg C	HCIn %	HCOut %	VE mtr³	VES mtr³	ME mg
08:21	763.18	0.00	23.31	24.12	68.66	1.67	0.02	0.02	556.03
[illegible]26	763.13	0.00	23.58	24.21	80.20	0.40	1.80	1.78	11334.91
08:31	763.15	0.00	24.04	24.33	86.31	0.52	0.01	0.01	120.08
08:36	763.23	0.00	24.62	24.24	75.99	0.60	0.00	0.00	6.12
08:41	763.35	0.03	24.82	24.32	69.07	0.67	0.00	0.00	2.23
08:46	763.41	0.08	24.62	24.53	79.21	0.08	2.51	2.48	3174.49
08:51	763.47	0.00	24.33	24.42	79.62	0.10	0.00	0.00	0.78
08:56	763.54	0.00	24.58	24.35	70.42	0.11	0.00	0.00	1.02
09:01	763.51	0.05	24.85	24.53	78.20	0.04	2.10	2.07	1203.59
09:06	763.51	0.12	24.89	24.78	80.75	0.05	0.51	0.50	490.37
09:11	763.54	0.08	24.81	24.55	73.30	0.06	0.00	0.00	0.33
09:16	763.72	0.00	24.89	24.55	70.73	0.08	0.00	0.00	0.14
09:21	763.89	0.00	24.98	25.01	79.55	0.02	3.10	3.06	1099.02
09:26	763.87	0.00	25.05	24.89	75.99	0.02	0.00	0.00	0.12

Outlet Span check completed at 09:27 the reading is: 4.39 % Allowable: 4.12 thru 4.72

Outlet Zero check completed at 09:29 the reading is: 0.00 % Allowable: -0.30 thru 0.30

Inlet Span check completed at 09:30 the reading is: 48.88 % Allowable: 46.05 thru 52.05

Inlet Zero check completed at 09:31 the reading is: 0.49 % Allowable: -2.99 thru 3.01

[illegible]31	763.93	0.00	25.19	24.84	50.20	0.05	0.00	0.00	0.08
09:36	763.89	0.04	25.28	25.07	76.61	0.01	2.48	2.45	267.43
09:41	763.92	0.00	25.44	25.37	81.84	0.01	0.56	0.55	113.46
09:46	763.88	0.00	25.75	25.16	52.12	0.02	0.00	0.00	0.06
09:51	763.90	0.03	26.21	26.43	60.50	0.14	7.31	7.18	18976.82
09:56	763.95	0.12	26.34	27.00	65.33	0.06	10.89	10.68	9613.72
10:01	763.94	0.12	26.30	26.92	71.13	0.18	7.47	7.33	24263.62
10:06	764.00	0.12	26.26	26.97	64.46	0.41	7.54	7.40	57266.46
10:11	764.09	0.12	26.41	27.47	67.46	0.31	9.28	9.09	47195.90
10:16	764.20	0.12	26.55	27.52	59.94	0.21	6.71	6.57	25764.94
10:21	764.27	0.12	26.49	27.31	68.92	0.35	5.94	5.83	36519.31
10:26	764.26	0.12	26.13	26.98	74.44	0.54	5.48	5.38	51382.63
10:31	764.30	0.12	25.96	27.15	75.63	0.20	8.11	7.96	23938.47
10:36	764.26	0.02	25.92	27.02	47.78	0.67	1.59	1.56	19840.86

Outlet Span check completed at 10:38 the reading is: 4.40 % Allowable: 4.12 thru 4.72

Inlet Span check completed at 10:40 the reading is: 49.48 % Allowable: 46.05 thru 52.05

Outlet Zero check completed at 10:40 the reading is: 0.02 % Allowable: -0.30 thru 0.30

Inlet Zero check completed at 10:41 the reading is: 0.72 % Allowable: -2.99 thru 3.01

10:41	764.18	0.00	26.05	27.23	80.03	1.37	4.88	4.78	119812.58

Time	Baro-P mm Hg	Exhaust-P mm Hg	Ambient-T Deg C	Exhaust-T Deg C	HCIn %	HCOut %	VE mtr³	VES mtr³	ME mg
10:46	764.15	0.10	26.58	27.92	75.95	0.70	8.08	7.91	60025.18
[illegible]51	764.09	0.11	26.68	27.83	73.55	0.51	9.43	9.23	84729.35
10:56	763.99	0.12	26.42	27.55	72.34	1.05	8.14	7.97	149810.39
11:01	763.93	0.09	26.28	27.18	76.57	0.79	0.24	0.24	454.03
11:06	763.90	0.00	26.54	27.40	83.22	0.12	1.77	1.74	3461.81
11:11	763.89	0.00	26.91	26.97	0.00	0.00	0.00	0.00	0.00
Outlet Span check completed at 11:16 the reading is: 4.43 % Allowable: 4.12 thru 4.72									
11:16	763.87	0.00	27.11	26.82	58.93	0.14	0.00	0.00	0.70
Inlet Span check completed at 11:18 the reading is: 49.33 % Allowable: 46.05 thru 52.05									
utlet Zero check completed at 11:18 the reading is: 0.01 % Allowable: -0.30 thru 0.30									
Inlet Zero check completed at 11:19 the reading is: 0.67 % Allowable: -2.99 thru 3.01									
11:21	763.91	0.04	27.16	27.05	79.05	0.09	2.45	2.40	3533.46
11:26	763.90	0.02	26.84	27.08	82.10	0.13	0.17	0.16	379.71
11:31	763.85	0.00	26.71	26.76	70.31	0.14	0.00	0.00	0.30
11:36	763.78	0.00	26.63	26.77	77.13	0.05	0.61	0.59	278.99
11:41	763.75	0.06	26.42	27.07	82.94	0.04	2.06	2.02	1508.69
11:46	763.64	0.00	26.24	26.72	76.85	0.05	0.00	0.00	0.49
11:51	763.57	0.00	26.16	26.62	77.34	0.05	0.00	0.00	0.35
11:56	763.55	0.07	26.56	27.24	81.64	0.03	2.85	2.79	1368.83
12:01	763.51	0.09	26.94	27.84	81.05	0.08	2.48	2.42	3926.39
12:06	763.47	0.12	27.00	28.24	76.82	0.23	4.57	4.47	18696.79
12:11	763.38	0.12	26.85	28.15	76.16	0.28	5.73	5.60	24342.03
12:16	763.30	0.10	26.62	28.24	75.75	0.08	6.01	5.87	6651.68
12:21	763.26	0.05	26.56	28.21	48.86	0.02	0.10	0.10	33.69
utlet Span check completed at 12:26 the reading is: 4.42 % Allowable: 4.12 thru 4.72									
12:26	763.19	0.11	26.71	28.79	0.00	0.00	0.00	0.00	0.00
nlet Span check completed at 12:29 the reading is: 48.84 % Allowable: 46.05 thru 52.05									
Outlet Zero check completed at 12:29 the reading is: 0.03 % Allowable: -0.30 thru 0.30									
Inlet Zero check completed at 12:30 the reading is: ~~48.95~~ 0.64% % Allowable: -2.99 thru 3.01									
12:31	763.19	0.01	26.75	28.66	0.00	0.00	0.00	0.00	0.00
12:36	763.12	0.00	26.59	28.03	0.00	0.00	0.00	0.00	0.00
12:41	763.02	0.00	26.51	27.51	0.00	0.00	0.00	0.00	0.00
12:46	762.95	0.00	26.47	27.28	0.00	0.00	0.00	0.00	0.00
12:51	762.90	0.00	26.51	27.78	0.00	0.00	0.00	0.00	0.00
[illegible]56	762.84	0.00	26.48	27.47	0.00	0.00	0.00	0.00	0.00
13:01	762.77	0.00	26.60	27.30	0.00	0.00	0.00	0.00	0.00
13:06	762.74	0.06	26.92	27.72	85.57	0.02	0.48	0.47	213.80

Time	Baro-P mm Hg	Exhaust-P mm Hg	Ambient-T Deg C	Exhaust-T Deg C	HCIn %	HCOut %	VE mtr³	VES mtr³	ME mg
13:11	762.65	0.12	27.33	27.96	85.67	0.03	0.18	0.18	84.81
[redacted]16	762.59	0.10	27.54	27.58	0.54	0.03	0.00	0.00	0.02

~~[redacted]let Span check completed at 13:18 the reading is: 85.26 % Allowable: 46.05 thru 52.05~~

~~[redacted]let Zero check completed at 13:18 the reading is: 85.26 % Allowable: -2.99 thru 3.01~~

Outlet Span check completed at 13:21 the reading is: 4.40 % Allowable: 4.12 thru 4.72

13:21	762.50	0.00	27.34	27.52	69.24	0.03	0.27	0.26	75.54

Inlet Span check completed at 13:23 the reading is: 49.76 % Allowable: 46.05 thru 52.05

Outlet Zero check completed at 13:23 the reading is: 0.02 % Allowable: -0.30 thru 0.30

Inlet Zero check completed at 13:24 the reading is: 0.54 % Allowable: -2.99 thru 3.01

13:26	762.49	0.00	27.33	28.53	82.38	0.03	2.90	2.83	1486.00
13:31	762.45	0.00	27.38	29.03	64.65	0.15	3.94	3.83	10347.25
13:36	762.41	0.10	27.35	29.48	69.58	0.17	5.97	5.80	17481.85
13:41	762.38	0.12	27.36	29.74	69.66	0.10	7.70	7.47	10277.04
13:46	762.36	0.12	27.34	29.31	69.47	0.13	5.94	5.77	13855.52
13:51	762.36	0.03	27.17	28.89	69.45	0.18	5.00	4.87	15709.28
13:56	762.35	0.05	27.13	28.86	68.91	0.29	7.26	7.06	36106.53
14:01	762.27	0.12	27.14	29.35	74.31	0.10	6.35	6.17	8420.57
14:06	762.24	0.02	27.27	28.78	79.96	0.15	0.00	0.00	9.82
[redacted]11	762.23	0.00	27.42	28.58	0.21	0.01	0.00	0.00	0.04
14:16	762.15	0.00	27.42	28.58	0.08	0.01	0.01	0.01	2.33

Inlet Span check completed at 14:22 the reading is: 48.97 % Allowable: 46.05 thru 52.05

Inlet Zero check completed at 14:25 the reading is: 0.21 % Allowable: -2.99 thru 3.01

Outlet Span check completed at 14:26 the reading is: 4.39 % Allowable: 4.12 thru 4.72

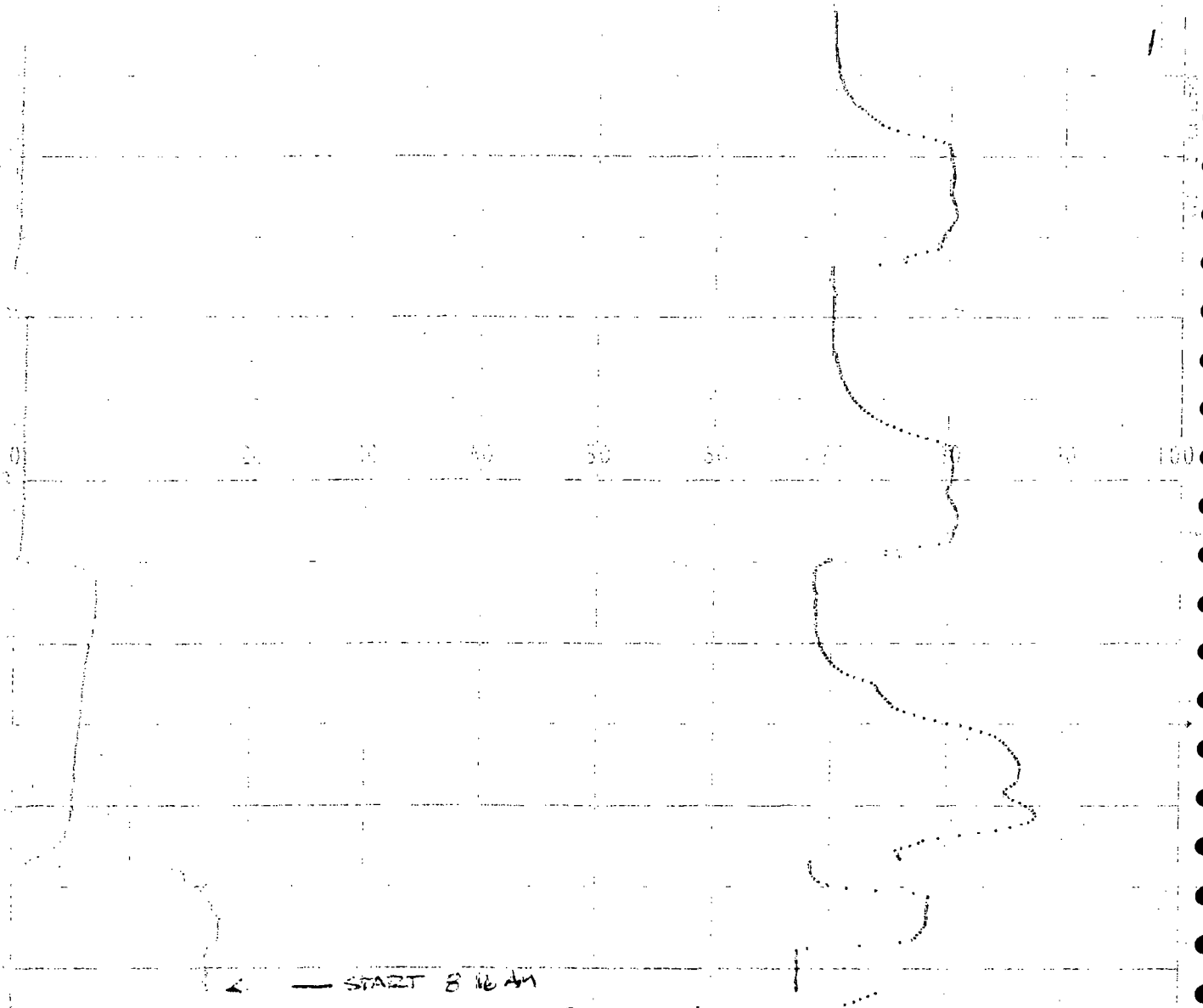
Outlet Zero check completed at 14:30 the reading is: 0.01 % Allowable: -0.30 thru 0.30

Preliminary Test Results

The test Id is 000694123-00057

There were 72 test intervals, 63 of which had flow.

Average Barometric Pressure:	763.39 mm Hg
Average Flow Pressure:	0.05 mm Hg
Average Ambient Temperature:	26.24 celcius
Average Exhaust Temperature:	26.97 celcius
Average Inlet Concentration:	60.84 %
Average Outlet Concentration:	0.21 %
Total Volume Emitted:	188.97 cubic meters
Total Standardized Volume Emitted:	184.92 cubic meters
Total milli-grams Emitted:	926218.78
Accountable Gallons Loaded:	184590.0
Total Gallons Loaded:	193295.0
Accountable Liters Loaded:	698748.83
Total Liters Loaded:	731700.83
Accountable milli-grams Emitted per Liter Loaded:	1.33
Total milli-grams Emitted per Liter Loaded:	1.27
Unit Efficiency for Accountable Gas Loaded:	99.88
Unit Efficiency for Total Gas Loaded:	99.89



Motiva Enterprise LLC Ft. Everglades, FL 2/21/02