Appendix G(R1) – Equipment Information

Horizontal Cabling Specifications: Category 6

Contractor Qualifications

The contractor performing the data cabling installation shall have a structured cabling industry affiliation such as BICSI (Building Industry Consultants International) membership, RCDD (Registered Communications Distributor Designer) and/or a structured cabling vendor certification. All data cabling installers shall be licensed and insured.

The data cabling contractor shall provide references of similar projects.

Horizontal Cabling

1.1 Category 6 100 ohm 22-24 AWG four-pair unshielded twisted pair cabling certified to a minimum of 250 MHz shall be used for the data horizontal cabling. The Category 6 horizontal cabling shall meet the minimum technical specifications defined in the document ANSI/TIA/EIA-568-B.2-1 (“Transmission Performance Specifications for 4-pair 100? Category 6 Cabling”).

1.2 All data telecommunications jacks shall be of type RJ45 and shall be TIA/EIA certified Category 6. The RJ45 jack is an 8-position modular jack of the ISO 8877 type and wired as a T568A type.

1.3 One hundred percent of the installed cabling links must be tested and must pass the requirements of the standards mentioned in 1.1 above. Any failing link must be diagnosed and corrected. The corrective action shall be followed with a new test to prove that the corrected link meets the performance requirements. The final and passing result of the tests for all links shall be provided in the test results documentation in accordance with Section 3.5 below.

1.4 No installed cabling may be exposed to view outside of the telecommunications closet. It shall be within a raceway, behind a suspended ceiling or concealed with wire molding.

1.5 All horizontal cabling runs shall run from each work area in a star topology to a telecommunications closet. There shall be no connector in the cable run between the outlet in the work area and the closet.

1.6 No cabling run may exceed a length of 90 meters.

1.7 All category 6 cabling shall be terminated in the telecommunications closet on 19 inch rack mount modular RJ45 patch panels.

1.8 The category 6 cabling in the racks shall be installed with sufficient and appropriate mounting clips, brackets, and cable management to provide a secure and maintainable system. Care shall be taken to not cause the cables to be overly crimped.

1.9 The UTP Category 6 cable tail shall be terminated with a minimum of 14" of slack but not to exceed 18".

1.a After dressing cable to the final location, the sheath shall be removed to a point that allows the conductors to be splayed and terminated in a neat and uniform fashion. Every effort must be made to maintain sheath integrity by removing only as much as is practical to accomplish termination. Cable pair twist shall be maintained up to the point of termination. As stated in 568-B.2-1, the pairs in a cable should never be untwisted more than 0.5 inch from the point of termination. Under no circumstances shall cable pairs be untwisted or otherwise altered prior to termination.

1.b Any unused horizontal cabling shall be labeled and loosely coiled.

1.c Bidder shall specify cables proposed for use and submit documentation proving that the proposed cables meet these specifications.

Labelling

2.1 All cables shall be labelled with tag wraps or some other permanent marker capable of withstanding multiple pulling of cable through raceways. Labels shall be located 0.5 meter from the work area end.

2.2 All terminations shall be clearly identified on patch panel in telecommunications closet. All jacks in the patch panel must be in sequential order.

2.3 At each work area, faceplate outlet shall be professionally printed with jack numbers clearly visible without removing outlet faceplate. The labeling shall be metal or vinyl adhesive tape with embossed or indelible printing for each outlet.

2.4 An example of the alpha-numeric numbering scheme is as shown:

xx-yy-zzz, where

- xx = Level/Floor designator
- yy = Zone number on floor
- zzz = Workstation jack number

Consecutive numbering is acceptable if a floor plan identifying the location of the jacks is provided.

Field Test Quality

3.1 The Contractor shall visually inspect all cables, cable reels, and shipping cartons to detect cable damage incurred during shipping and transport. Visibly damaged items shall not be installed.

3.2 Cable testing is to be preformed only after installation is complete.

3.3 The test parameters for Cat 6 are defined in TIA Cat 6 standard, which refers to the ANSI/TIA/EIA-568-B.2 standard. In order to pass the test all measurements (at each frequency in the range from 1 MHz through 250 MHz) must meet or exceed the limit value determined in the above-mentioned standard.

3.4 The test equipment (tester) shall comply with the accuracy requirements for level III field testers as defined in the TIA Cat 6 Document. The tester including the appropriate interface adapter must meet the specified accuracy requirements. The accuracy requirements for the permanent link test configuration (baseline accuracy plus adapter contribution) are specified in Table B.2 of Annex B of the TIA Cat 6 Standard. (Table B.3 in this TIA document specifies the accuracy requirements for the Channel configuration.)

3.5 Test results shall be presented in electronic form as a comma separated values formatted file (CSV). If preferred the results may also be presented in the Microsoft Excel format.

Last update: June 18, 2007

PSECO

TRANSIT VEHICLE WASH SPECIALISTS

HEAVY DUTY BUS & TRUCK WASHES
FOUR BRUSH DRIVE THRU

Model DT412 **DRIVE THRU 4 Brush 12 ft. vehicle height**
Model DT414 **Same unit with 14 ft. vehicle height**

For the Fleet Manager who needs to wash a large number of vehicles, in a short time frame, with excellent cleaning results. This is a proven design with low operating and maintenance costs and has a galvanized frame for long life. Local service and maintenance available in all areas.

STANDARD EQUIPMENT INCLUDES

- Pre-rinse arch
- Stationary roof mop
- 4 wash brushes for front, sides and rear
- Final rinse arch
- Automatic soap metering
- Control panel
- Entrance traffic lights
- Electric eyes
- Guide rails

OPTIONS

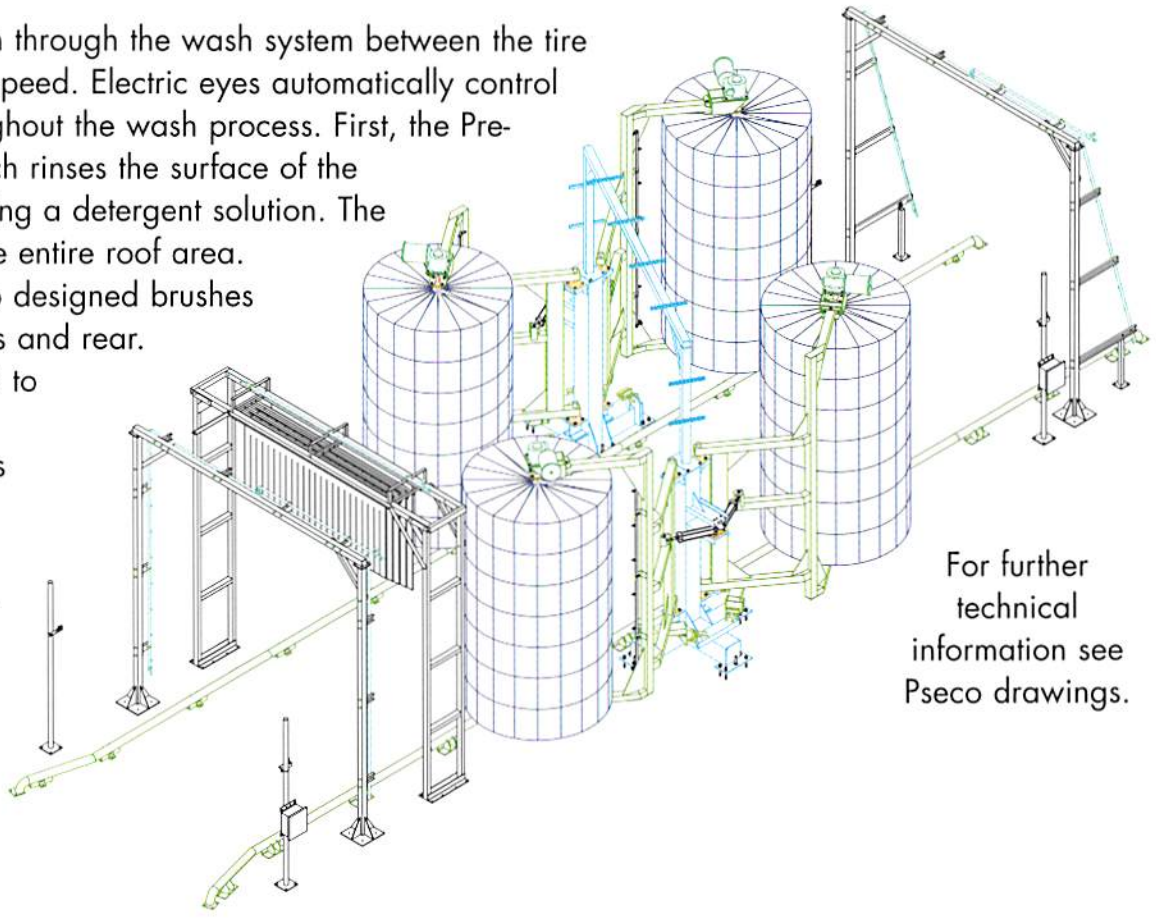
- Chassis wash
- Wheel wash
- Roof mop - Motorized
- Speed control
- Water reclaim
- Dryer
- Auto lube system
- Wax system
- Stainless steel skid plates
- Auto door control
- Splash walls

PSECO INC.
6201 Hwy 7, Unit 4, Woodbridge, Ontario L4H 0K7
Tel: (905) 850-1887 Fax: (905) 850-2192

HEAVY DUTY BUS & TRUCK WASHES
FOUR BRUSH DRIVE THRU

SEQUENCE OF OPERATION

The vehicle is driven through the wash system between the tire guide rails at slow speed. Electric eyes automatically control each function throughout the wash process. First, the Pre-Rinse/Detergent Arch rinses the surface of the vehicle while applying a detergent solution. The Roof Mop cleans the entire roof area. Next, the four Pseco designed brushes wash the front, sides and rear. Detergent is applied to loosen the dirt and lubricate the brushes for complete cleaning, and increased brush life. The Final Rinse Arch thoroughly rinses all dirt and detergent away, leaving vehicles completely clean.



For further technical information see Pseco drawings.

UTILITY REQUIREMENTS PROVIDED BY CUSTOMER:

Electrical Supply:

Provide 3 phase main service (voltage to suit) to Motor Control Panel
Provide conduit/wiring from Motor Control Panel to Arches & Brush Module

Water Supply:

Provide main 2 1/2" cold water line @ 50 psi
Provide piping from cold water line to Arches, Roof Mop & Brush Module

Compressed Air Supply:

Provide 1/2" air line @ 80 psi to Brush Module

Minimum Space Requirements:

- Length: 45′
- Width: 18′
- Height: 13′ 6" (Model DT412)
  17′ 6" (Model DT414)

eda MECHANICAL SERVICES LTD.
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50 Stevenson Road, Winnipeg
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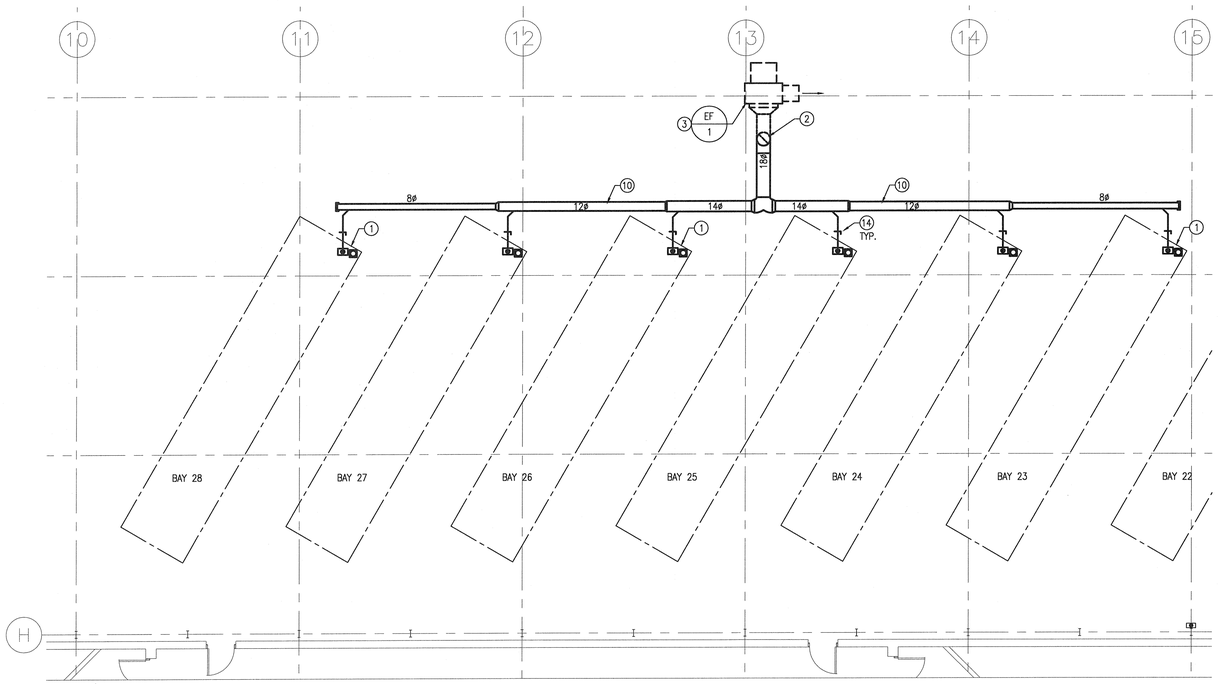


MAIN FLOOR REPAIR GARAGE PART PLAN
SCALE: 1/8"=1'-0"

EF-1/EF-2 SIZING CRITERIA:
-MAX NUMBER OF ACTIVE PICKUP POINTS: 6 PER SYSTEM AT 700 CFM PER POINT.

EF-3 SYSTEM SIZING CRITERIA:
-MAX NUMBER OF ACTIVE PICKUP POINTS: 3 TOTAL AT 700 CFM EACH.
-MAX NUMBER OF ACTIVE PICKUP POINTS PER RAIL: 2 AT 700 CFM EACH.

GENERAL NOTES:

A. CONTRACTOR TO VERIFY EXACT LOCATION AND DIMENSIONS OF NEW DUCTWORK ON SITE PRIOR TO INSTALLATION AND FABRICATION. REPORT ANY DISCREPANCY TO THE CONTRACT ADMINISTRATOR.

B. DO NOT SCALE OFF THIS DRAWING. THIS DRAWING ONLY SHOWS THE GENERAL SCHEMATIC OF NEW SYSTEM.

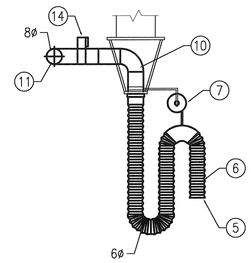
C. CONTRACTOR SHALL INCLUDE FOR AND PROVIDE ALL COORDINATION BETWEEN TRADES AND CONTRACT ADMINISTRATOR ON AND OFF SITE AS REQUIRED FOR INSTALLATION OF MECHANICAL SYSTEMS.

D. REFER TO SPECIFICATION ON THIS SHEET FOR PART NUMBERS OF NEDERMAN EXHAUST EXTRACTION SYSTEM COMPONENTS.

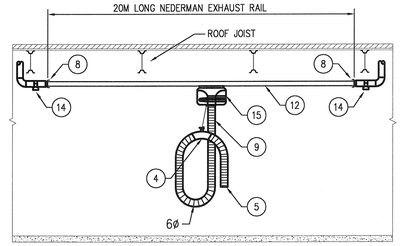
E. COORDINATE DUCT, RAIL, HOSE AND BALANCER LOCATIONS AND RANGE OF MOVEMENT WITH EXISTING SERVICES (OVERHEAD REELS FOR OILING/LUBRICATION), LIGHT FIXTURES, AND STRUCTURAL BUILDING MEMBERS.

DRAWING NOTES: (##)

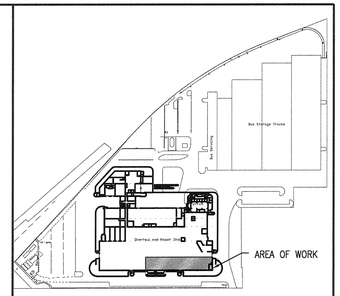
1. TAIL PIPE EXHAUST HOSE C/W BALANCER CONNECTED TO TRUNK DUCT. DUCT TO BE INSTALLED 16'-0" ABOVE FLOOR. (TYPICAL OF 12). AVERAGE EXHAUST RATE PER TAIL PIPE 700 CFM. REFER TO DETAIL 1/M1.1.
2. DUCT UP THROUGH ROOF.
3. TAIL PIPE EXHAUST FAN MOUNTED ON ROOF ABOVE. FAN SHALL OPERATE ON BMS SCHEDULE
4. METAL ELBOW SUPPORT CONNECT METAL ELBOW SUPPORT TO DAMPER AS PER MANUFACTURER'S GUIDELINES.
5. LEAVE EXTRACTION HOSE OPEN ENDED. THE CITY SHALL FABRICATE CUSTOM NOZZLE/CANOPY AND INSTALL IN FUTURE WITH OWN FORCES.
6. SINGLE HOSE EXTRACTOR, FOR BUS SERVICE STALLS. (TYPICAL OF 12).
7. HOSE BALANCER. (TYPICAL OF 12).
8. USE RAIL-END FITTING (NEDERMAN SIDE OUTLET) AND DUCT TRANSITION TO CONNECT TO 8ø SPIRAL DUCT.
9. FLEXIBLE EXHAUST HOSE CONNECTED TO TROLLEY ASSEMBLY. (TYPICAL OF 6).
10. SHEET METAL DUCT WORK BY DIVISION 15.
11. CONNECT TO TRUNK DUCT.
12. NEDERMAN EXHAUST EXTRACTION RAIL 20 METER LONG. CROSS-BRACE RAIL TO ROOF JOISTS TO ACHIEVE RIGID INSTALLATION. FOLLOW EXISTING INSTALLATION EXAMPLE OF NEDERMAN RAILS IN WELDING SHOP AREA OF THIS BUILDING. REVIEW THE PROPOSED CROSS-BRACING WITH CONTRACT ADMINISTRATOR PRIOR TO INSTALLATION. INSTALL RAIL AT HIGH LEVEL CLOSE TO U/S ROOF JOISTS.
13. TROLLEY C/W HOSE AND ACCESSORIES BY NEDERMAN. HOSE TERMINATION TO BE FABRICATED BY THE CITY OF WINNIPEG. EXHAUST RATE AT HOSE 700 CFM. REFER TO DETAIL 2/M1.1.
14. BLAST GATE BALANCING DAMPER. BLAST GATE SHALL BE FULL COLLAR, CAST ALUMINUM WITH GALVANIZED SIDES.
15. TROLLEY ASSEMBLY C/W BALANCER AND DAMPER MOUNTED TO EXHAUST EXTRACTION RAIL. (TYPICAL OF 6).
16. EXISTING OVERRIDE PUSH BUTTON AS DESCRIBED IN SPECIFICATION SECTION 15900. TIE-IN NEW EXHAUST FANS TO EXISTING BUTTON.



1 M1.1 HOSE AND BALANCER DETAIL
SCALE: NTS



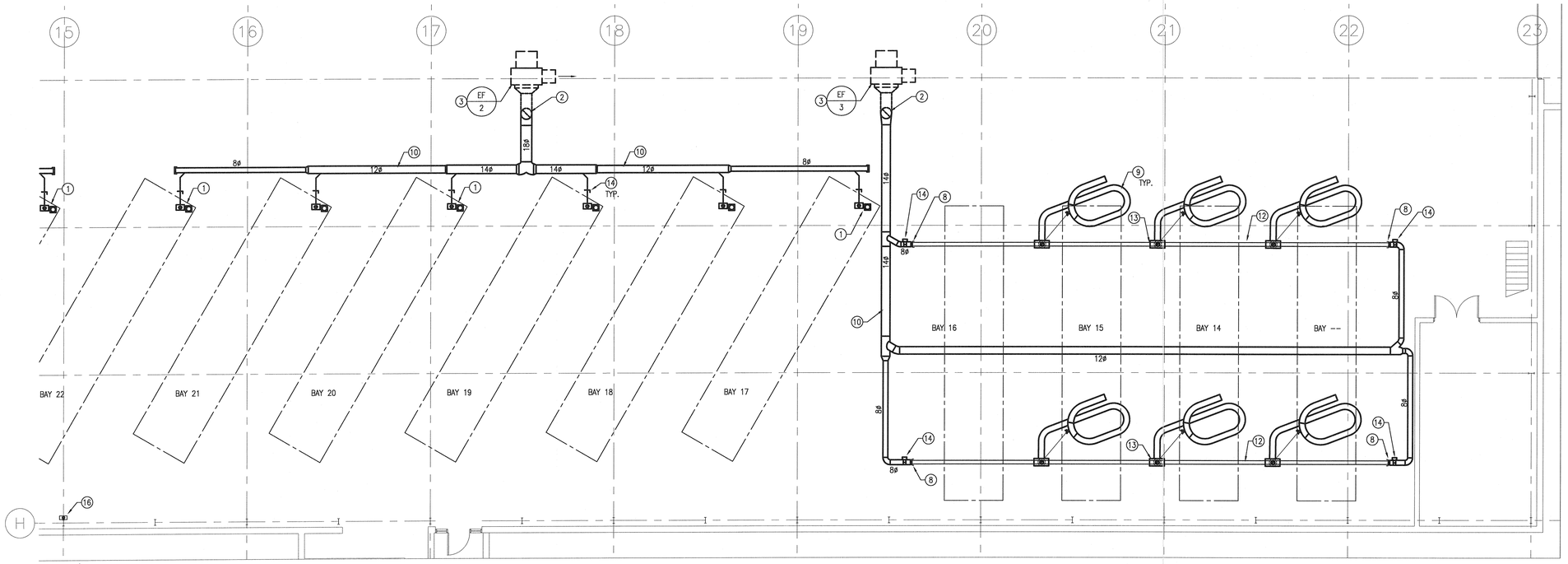
2 M1.1 TROLLEY AND RAIL EXHAUST DETAIL
SCALE: NTS



KEY PLAN
N.T.S

NEDERMAN EXHAUST SYSTEM - PART LIST

QTY	PART NO.	PART NO. DESCRIPTION
CAR AND TRUCK SERVICE STALLS		
6	20373796	ACCESSORY FOR EXTRACTION UNIT 920. DAMPER FOR 920/1500 ø160.
6	20823562	EXHAUST HOSE NFC(3), FABRIC, GREEN-GRAY WITH BLUE HELIX. FOR MAX 600°F. ø150MM, LENGTH 7.5M.
6	20373609	HOSE SUSPENSION ø150MM.
6	20374380	ACCESSORY FOR EXTRACTION UNIT 920. TROLLEY ø160MM FOR 920/1500 WITH BALANCER.
2	20916720	EXHAUST RAIL 920, HORIZONTAL UNIT. (COMPLETE WITH SUSPENSION PARTS). LENGTH 20M, C/W ACCESSORY FOR EXHAUST RAIL 920. SIDE OUTLET ø160.
BUS SERVICE STALLS		
12	20813463	SINGLE EXHAUST EXTRACTOR, WITH BALANCER. HOSE ø150MM, WITH 6M NFC(3) HOSE.



MAIN FLOOR REPAIR GARAGE PART PLAN
SCALE: 1/8"=1'-0"

NO.	Revisions	BY	DD/MM/YY
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1.	ISSUED FOR BID OPPORTUNITY	PG	19/11/09

APEGM Certificate of Authorization SMS Engineering Ltd. No. 166 Expiry: April 30, 2010

PROVINCE OF MANITOBA P. W. GRYC 19 NOV 09 REGISTERED PROFESSIONAL ENGINEER

SMS ENGINEERING

SMS Engineering Ltd. Consulting Engineers
770 Bradford Street Winnipeg MB Canada R3H 0N3
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sms@smseng.com

Project Title

CITY OF WINNIPEG - FORT ROUGE TRANSIT GARAGE VEHICLE EXHAUST

WINNIPEG MANITOBA

Drawing Title

MAIN FLOOR PART PLAN EXHAUST SYSTEM LAYOUT

Drawn By	Checked By	Approved By
PCO/RNS	JS/RE	PWG
Scale	**Date**	**Project No.**
AS NOTED	OCTOBER 2009	09-215-01
Revision Number	**Drawing Number**	**Sheet Order**
1	M1.1	1 OF 1

ROSS & WHITE COMPANY

1090 Alexander Court, Box 970, Cary, Illinois 60013
Tel: 847/516-3900 - Fax: 847/516-3989

Specification
Bus Wash System
Model BAR-1055-M

SECTION 1

The bus wash system shall be capable of effectively washing all vertical and horizontal surfaces of the bus when the vehicle is travelling through the system at a uniform speed of approximately 1'-0" per second. The system shall include the following basic components:

1.1 *PREWET / DETERGENT SPRAY TOWER with Roof Mops*

1.2 *BRUSH SYSTEM* consisting of (4) wrap-around brushes for front, sides and rear washing.

1.3 *FINAL RINSE SPRAY ASSEMBLY*

1.4 *TIRE GUIDES*

1.5 *CONTROLS FOR AUTOMATIC OPERATION*

SECTION II

STRUCTURAL AND TECHNICAL DETAILS

2.1 *PREWET / DETERGENT SPRAY ARCH* - The prewet detergent spray arch assembly shall be free standing frame constructed of 3"X3"X.250 structural steel. The roof mops are made of a minimum 5 (different lengths) rows of synthetic, dirt repellent, mildew resistant fiber curtains, mounted on the adequately brace support structure. The mop is designed to wash the full roof width of the buses.

2.2 *SUPPORT COLUMNS AND BRIDGE STRUCTURES* -

Primary Vertical Support Columns: Minimum of (2) columns. (2) Columns to be 10" square x .250 structural steel tubing with 3'-0" square x .750 thick base plate gussetted with (3) 3/8" gussets per column. Machines fabricated from aluminum are not acceptable.

Base Plate Anchorage: (4) 1-1/4"x9" Rawl-Studs each plate.
Main Support Column Bracing: The main support column shall be braced with (2) C6x8.2 pound structural channel. Columns, base plates, gussets and channel braces shall be firmly welded in

place.

Bridge Structure: The bridge structure for vertical brushes shall be designed to secure both side support structures, and shall be fabricated from C6x8.2 pound structural channel. Said structure to be cross braced by 2"x2"x.250 structural angle, secured to each column by means of (6) 1/2" diameter Grade 5 cadmium plated hex head cap screws.

2.3 *BRUSH YOKE ASSEMBLIES* - The brush arm shall be curved to allow clearance for the extreme corners of the bus during the washing motion. All structural members shall be designed and sized to withstand stresses encountered without deformation. The top and bottom brush yoke arm shall be 4"x3"x.250 structural tubing. Yoke arms to be cold formed with 12" radius bends to allow bus clearance. Pivot shaft shall run the full length of the brush and be fabricated from 4"x4"x.250 structural tubing with machined stub shafts welded at each end to accept 2-1/4" bore pillow block bearings. Additional supports to yoke arms shall be fabricated from 3"x3".250 structural tubing. Brush machines which do not support brushes at the top and bottom of the brush yoke are not acceptable. Brush machines with brushes which move by gravity alone are not acceptable. Brush machines that have no captured and defined pivot radius for the brush yokes are not acceptable.

2.4 *BRUSH SHAFT ASSEMBLIES* - Brush shafts shall be a minimum of 2-1/4" structural tubing. Keyed brush shafts shall be mounted on (2) heavy-duty, grease reservoir, self-aligning, pillow block ball bearings, mounted on brush arms. All brush shafts must be supported at the top and bottom of the brush yoke. Top only supported brush yokes are not acceptable.

2.5 *RINSE ARCH* - The rinse arch assembly shall be a canted free standing frame constructed of 1-1/2" diameter schedule 40 galvanized pipe with 150 pound galvanized fittings. It shall be supported by (2) floor anchored "A" braces with (8) 1/2" diameter plated cinch anchors.

2.6 *PIPE TYPE TIRE GUIDES* - The guides shall be fabricated from 4" diameter black pipe with welded, smooth ground, front flares to insure proper alignment into washer. The tire guides shall be anchored every 3'-3" with 3/4" diameter plated cinch anchor bolts. Tire guides shall run the full length of the wash system. Height of tire guide to be 6-1/2".

2.7 *FINISH* - All fabricated sections of washer frame, brush yokes and arms, spray arch frames, and miscellaneous structures, shall be hot-dipped galvanized after fabrication per ASTM A123 or A385. Metallic surfaces not suitable for galvanizing shall be coated with 95% zinc primer and covered with durable machine enamel. All erection bolts shall be plated Grade 5.

SECTION III

BRUSHES

3.1 *WRAP-AROUND BRUSHES* -

General Description: Provide (2) pair; (1) pair each side, electric motor driven brushes to continuously wash front, sides and rear of vehicles passing through washer, commencing washing at middle of vehicle front. As vehicle proceeds along line of travel, brushes will clean across front, down sides, and back across rear of vehicle. After vehicle has passed beyond brushes, they shall automatically cease operation and come to rest ready for next wash cycle. All

brush yokes shall retract when power is off, permitting unobstructed vehicle passage through wash lane. Brush systems which operate on gravity alone for positioning and washing are not acceptable.

3.2 *BRUSHES* - Each brush shall be made up of 18" long sections of extruded aluminum cylindrical cores split for easy replacement. The brush section shall be mounted at brush shafts by means of aluminum bolting collars. The brush fill shall be .044 (Circuleen) material, locked into steel backed brush strips which are locked into the brush cores. Minimum diameter brushes shall be 60". Brush fill material shall be hollow polypropylene filament of a type and style designed not to scratch SAR and Swedlow Acrivue plastic windows. Brushes shall be gripped in a 20-strip core brush. The bottom (3) sections of the brush shall be full loop, extra-heavy density, .044 (Circuleen), 110 to 120 tips per inch. The top (3) sections shall be .020 (Polylite), full loop, heavy density, 160 to 170 filaments per inch.

SECTION IV

SPRAY ASSEMBLIES

4.1 *PREWET / DETERGENT SPRAY ARCH* - The prewet / detergent spray arch shall be constructed of 1-1/4" diameter schedule 40 galvanized pipe with 150 pound galvanized fittings. A total of (22) brass spray nozzles shall be supplied applying 44 gallons per minute of detergent laden water. The nozzles shall be secured in tapped holes in the spray arch. The nozzles shall have a spray angle of 35 degree. An 8'-6" suspended length of 1-1/4" schedule 40 galvanized pipe shall be teed from the center of the prewet arch for location of a vehicle actuated dangle switch. The 8'-6" length of pipe shall be cap welded, ground, and threaded to prevent water from entering the dangle switch support. Water to prewet spray arch shall be controlled by a 110 volt, 1-1/4" slow closing water solenoid valve. (5) Drag mops shall be provided on this arch for cleaning vehicle roofs.

4.2 *DETERGENT SIPHON SYSTEM* - The detergent siphon system shall be fabricated from 150 pound galvanized, malleable iron fittings and schedule 40 galvanized pipe. The siphon shall be constructed in (3) tiers; (1) tier for the prewet/detergent arch and mop sprays, and (2) tiers for the machine brush sprays. All (3) tiers shall be solenoid controlled, ball valve regulated, pressure gauge monitored, and siphon operated. The siphon shall use the Venturi injection principle and shall be adjustable by threaded needle valve. The siphon system shall be pre-assembled and bracketed for field installation. All tiers of the siphon shall be 1-1/4" pipe size with a teed 3/4" pipe size siphon lines. Ground joint unions shall be supplied at all solenoid valves and siphon injectors. All ball valves and solenoid valves shall be bronze bodied and rated for 300 PSIG of water pressure. All siphon gauges shall be 2-1/2" dial face, 0-160 PSIG plastic bodied and glycerine filled.

4.3 *BRUSH SPRAY PIPES* - Provide entire height of each brush with overlapping spray pattern of water/detergent solution at 25 gallons per minute minimum. Pipes to be fabricated from 3/4" galvanized schedule 40 spray pipe with not fewer than (9) brass spray nozzles.

4.4 *RINSE ARCH* - The rinse arch shall be constructed of 1-1/2" diameter schedule 40 galvanized pipe with 150 pound galvanized fittings. A total of (22) brass spray nozzles shall provide a flow rate of 110 gallons per minute of rinse water. The spray angle of the nozzles shall be 35 degree, and the nozzles shall be secured to the rinse arch by means of 3/8" diameter

tapped holes. NOTE: All flow rates based on 40 PSIG of water pressure.

Operation of the rinse arch shall be controlled electrically by means of a 2" slow-closing water solenoid valve.

SECTION V

MOTOR AND DRIVES

5.1 *BRUSH DRIVES* - Brushes shall be driven by a 5 horsepower, totally enclosed fan cooled, NEMA design "B" electric motor, bolted to a right angle gearhead reducer, producing a 96 RPM brush speed. The output shaft of the gear reducer shall be coupled to the brush shaft with a flexible coupling with removable tapered bushings - all permitting brush shaft to be removed without disturbing gear motor assembly.

SECTION VI

BEARINGS

6.1 *BRUSH SHAFT BEARINGS* - The brush shaft shall be attached to the brush shaft yoke by a minimum of (2) 1-3/4" heavy duty, self-aligning, eccentric locking, single row, ball bearings.

6.2 *PIVOT SHAFT BEARINGS* - The brush yoke pivot shaft shall be attached to the main support column by a minimum of (2) 2-1/4" heavy duty, self-aligning, eccentric locking, single row, ball bearings.

6.3 *BEARING GUARD AND ANTI-WRAP DISC* - Each brush shall be equipped with a bearing guard and anti-wrap disc located above the bottom pillow block. Bearing guard to be fabricated from 1/8" steel plate and attached to brush shaft by means of (1) 2-1/4" locking collar. Above bearing guard shall have on 18" diameter anti-wrap disc fabricated from 3/8" thick neoprene impregnated nylon cord.

SECTION VII

CONTROLS

7.1 *PREWIRED CONTROL PANEL* -

Electric Control Panel: Control panel shall be housed in a NEMA #12 enclosure. A through the door, mainline, non-fused disconnect shall be located for shutdown of electrical functions. The control panel shall be supplied with individual starters and circuit breakers (no fuses) for all system motors. A machine tool transformer shall provide power reduction to 110 volt control circuit. The control panel wiring shall be color coded, and numbered for easy identification. The control panel shall be completely prewired, and internal wiring shall be terminated at numbered terminal strips. A programmable controller shall be used for all relay and timing control functions. Electro-mechanical relays are not acceptable. The programmable controller shall be pre-programmed in standard ladder logic. Its features shall include diagnostic capability, expandability to 112 inputs or outputs, 700 words of memory - expandable to 1700 words of memory (CMOS, RAM or Prom), modular plug- in construction,

snap-on handheld programming panel capable of monitoring logic, timer, counter values and input and output points - LED lights indicating input and output function. Selector switches shall be provided for various operational modes of wash system, as well as power on and emergency off switches mounted through the enclosure door.

Mode Selection Shall Be:

Wash -	Sides Only
Wash -	Sides Front
Wash -	Sides / Front and Rear
Wash -	Sides / Rear
Prewet -	Manual / Off / Auto
Rinse -	Manual / Off / Auto

7.2 *HIP AND DANGLE SWITCH ACTUATOR* - Automatic control of the bus washer equipment shall be designed so that each stage of the bus wash is switch activated ahead of the approaching bus and deactivated after the bus has passed. Controls for automatic operation shall consist of vehicle actuated hip and dangle switches. Each switch shall be gasketed and equipped with a cannon plug and receptacle. The switches shall be spring operated, with spring loaded silver contacts, and each switch shall be supplied with a vinyl covered fiberglass contact rod.

SECTION VIII

AIR CONTROLS

8.1 *AIR CONTROL PANEL* - Air control, each air cylinder shall have its own air control for adjustment of air. The air control shall consist of a 3/8" ball valve, combination filter, regulator, lubricator and air valve, all factory pre-assembled and mounted inside a NEMA #12 fiberglass enclosure. Both filter and lubricator sight bowls shall protrude through the bottom of the air control enclosure for maintenance inspection. The control plate shall be mounted to the outrigger of the main column assembly within easy reach of maintenance personnel. All air control components shall be 3/8" pipe size, rated to 150 PSIG maximum working pressure. All air hoses shall be rated to 250 PSIG, and shall be of the two braid type with swivel fittings one end. Fittings for air equipment shall be 150 pound galvanized malleable iron. All air controls shall include the following:

8.2 *3/8" BALL VALVE* - Bronze bodied, rated to 300 PSIG installed ahead of all air equipment.

8.3 *COMBINATION FILTER / REGULATOR* -

1. Baffle type
2. 40 Micron filter
3. Spring piston type
4. Fully adjustable with locking set
5. 0-160 PSIG Gauge monitored
6. Removable visual polycarbonate sight bowl
7. Push-n-Drain water blow off

8.4 *LUBRICATOR* -

1. Fully adjustable

2. Needle valve operated
3. Produce oil particles of 2 microns or smaller
4. Removable visual polycarbonate sight bowl
5. 360 degree Visual sight dome
6. Pet cock type oil drain

8.5 *AIR CONTROL VALVE* -

1. 4-Way
2. Inline mounted
3. 2-Position, 5-ported
4. Single solenoid - pilot operated
5. Maintained contact
6. Air and spring return
7. Recessed non-locking manual override
8. Capable of being serviced without disturbing piping or wiring

8.6 *AIR CONTROL MUFFLER* -

1. (2) per Cylinder
2. Fully adjustable with locking set
3. Screen baffled

8.7 *AIR HOSES* -

1. Plated screwed swivel fitting one end
2. Plated screwed fitting other end
3. 3'-0" Length of cylinder rod end
4. 4'-0" Length of cylinder blank end
5. 10" Length of valve to lubricator connection

8.8 *AIR CYLINDERS* - The movement of the brush arms shall be by means of air cylinders. The cylinders shall be of Class I, 4" diameter, with case hardened chrome plated shafts. Trunnion mounting shall be used on cylinders. Trunnion bearings shall be single row, 2-bolt, flange ball bearings, equipped with grease fittings. (2) Flange bearings shall be used per cylinder.

SECTION IX

DRAWINGS, OPERATION AND MAINTENANCE MANUALS, WARRANTY AND SERVICE REQUIREMENTS

9.1 Complete piping, wiring, assembly and foundation drawings shall be supplied by the wash system manufacturer. Such information to include (3) Sets of Operating and Maintenance Manuals.

9.2 Upon completion of equipment installation, a qualified representative of the manufacturer shall be present to check-out the equipment, place into initial operation, and instruct the owner's personnel in the operation and proper care of the equipment.

9.3 *WARRANTY* -

A. Warranty work specified herein is for one (1) year or 100,000 washes, whichever comes

first from acceptance against defects in materials and in labor and workmanship.

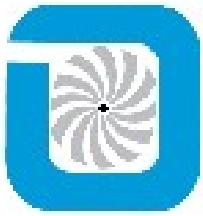
B. Defects shall include, but not be limited to:

1. Operation: Noisy, rough, or substandard operation.
2. Parts: Loose, damaged and or missing parts.
3. Finish: Abnormal deterioration.

C. This warranty shall not cover malfunctions of valves due to foreign objects in the supply lines, malfunctions due to freezing, malfunctions due to maladjustments of controls because of tampering by unauthorized personnel, or malfunctions due to misuse or abuse of the equipment.

9.4 *SERVICE REQUIREMENTS* -

Water -	2-1/2" Supply Line at 40 PSIG Minimum
Air -	1/2" Supply Line at 80 PSIG Minimum
Electric -	208/230/460 Volt, 3 Phase, 60 Hertz
Peak Load -	20 HP with 500VA Control Circuit
Drain -	6" Minimum
Overhead Clearance -	14’-0”



Ross and White Company
PO Box 970
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Donaldson
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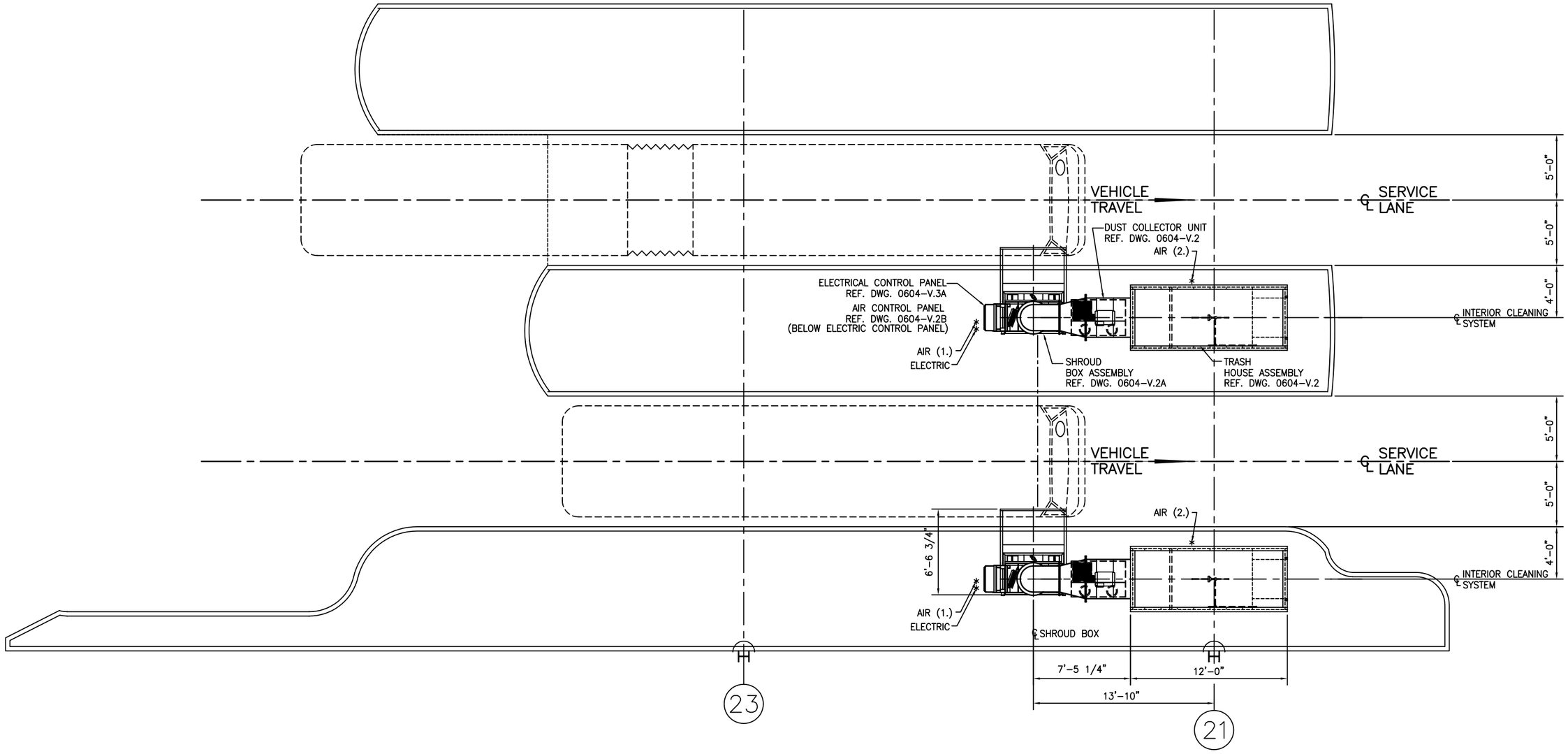
Donaldson



PLAN VIEW
LAYOUT OF EQUIPMENT

SERVICES REQUIRED PER SERVICE LANE

1. AIR. . . . . 1/2" SUPPLY LINE @ 80 PSI MIN.
2. AIR. . . . . 3/4" SUPPLY LINE @ 80 PSI MIN.

ELECTRIC. . . . 480V/3PH/60HZ/80A SERVICE
PEAK LOAD. . . 37.5 H.P.
CLEARANCE. . . 16'-10" MAXIMUM EQUIPMENT HEIGHT
*. . . . . INDICATES LOCATION WHERE SERVICES ARE TO BE BROUGHT AND CONNECTED BY GENERAL CONTRACTOR

INSTALLATION DRAWINGS:

DO NOT SCALE DRAWING

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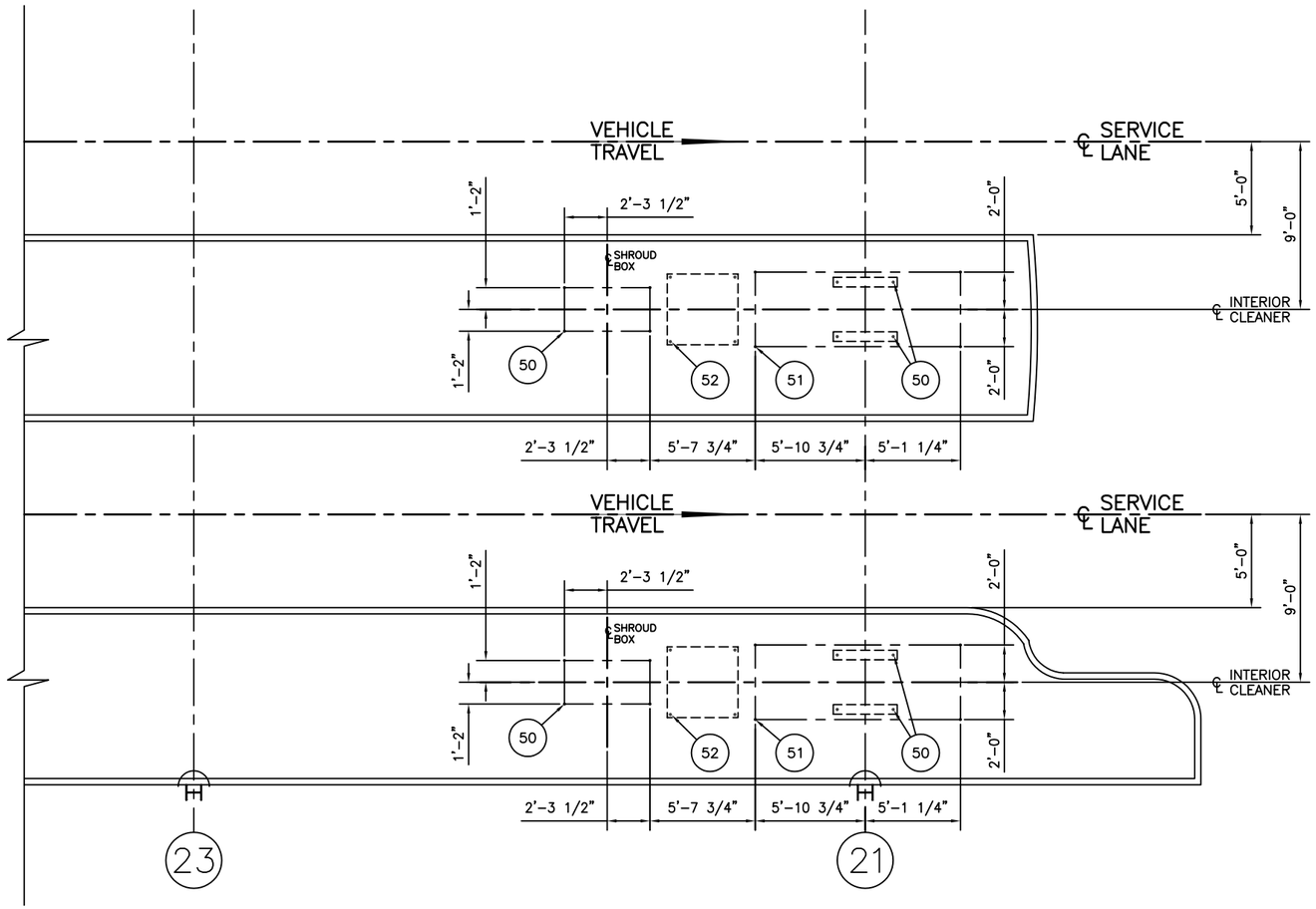
CHECKED BY: | DATE CHECKED:

ROSS WHITE COMPANY
1090 ALEXANDER COURT
CARY, ILLINOIS 60013
PHONE: (847) 516-3900
FAX.: (847) 516-3988

INTERIOR CLEANING SYSTEM LAYOUT OF EQUIPMENT
FOR INDIANAPOLIS PUBLIC TRANSPORTATION
INDIANAPOLIS, IN.
APPROVED:

0604-V.1

LIST OF EQUIPMENT BY ROSS & WHITE CO.			
ITEM	QUAN.	PART NO.	DESCRIPTION
50	16	RAW-7424	1/2" DIA. x 5 1/2" LG. RAWL-STUD ANCHOR BOLT
51	8	RAW-7442	3/4" DIA. x 5 1/2" LG. RAWL-STUD ANCHOR BOLT
52	8	RAW-7414	3/8" DIA. x 3 1/2" LG. RAWL-STUD ANCHOR BOLT



– DENOTES EQUIPMENT TO BE LOCATED BY INSTALLER

PLAN VIEW
FOUNDATION BOLT LOCATION
INTERIOR CLEANING SYSTEM

NOTES

1) Equipment to be plumb & level. Shim & grout base plates as required.
   a) Acceptable grout manufacturers:
      1. Euclid Chemical Company
      2. L & M Construction Chemicals
      3. Master Builders Div. of Martin Marietta Corporation
      4. Sonneborn Building Products Div. of Contech
      5. U.S. Grout Corporation
   b) Non–Shrinking Grout: Premixed compound consisting of non–metalic aggregate, cement, water reducing and plasticizing agents: capable of developing minimum compressive strength of 5000 psi in 7 days and 7500 psi in 28 days.
   c) Grout base plates with non–shrink grout. Follow manufacturer's directions for use of grout.
2) Use equipment base plates as templates for drilling cinch anchor bolt holes.
3) All major sub–assemblies shall be firmly bolted to the floor.

DO NOT SCALE DRAWING

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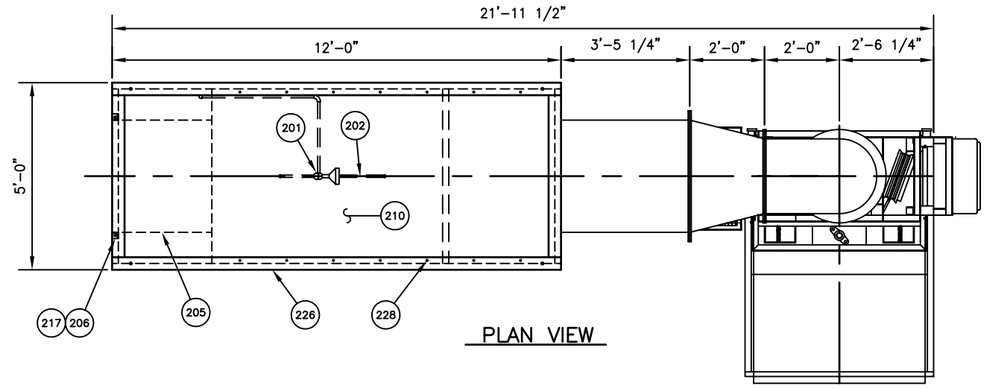
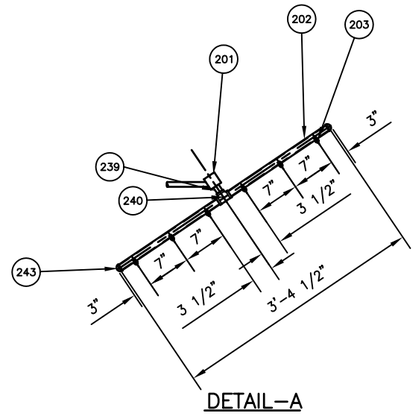
ROSS WHITE COMPANY
1090 ALEXANDER COURT
CARY, ILLINOIS 60013
PHONE: (847) 516-3700
FAX.: (847) 516-3989

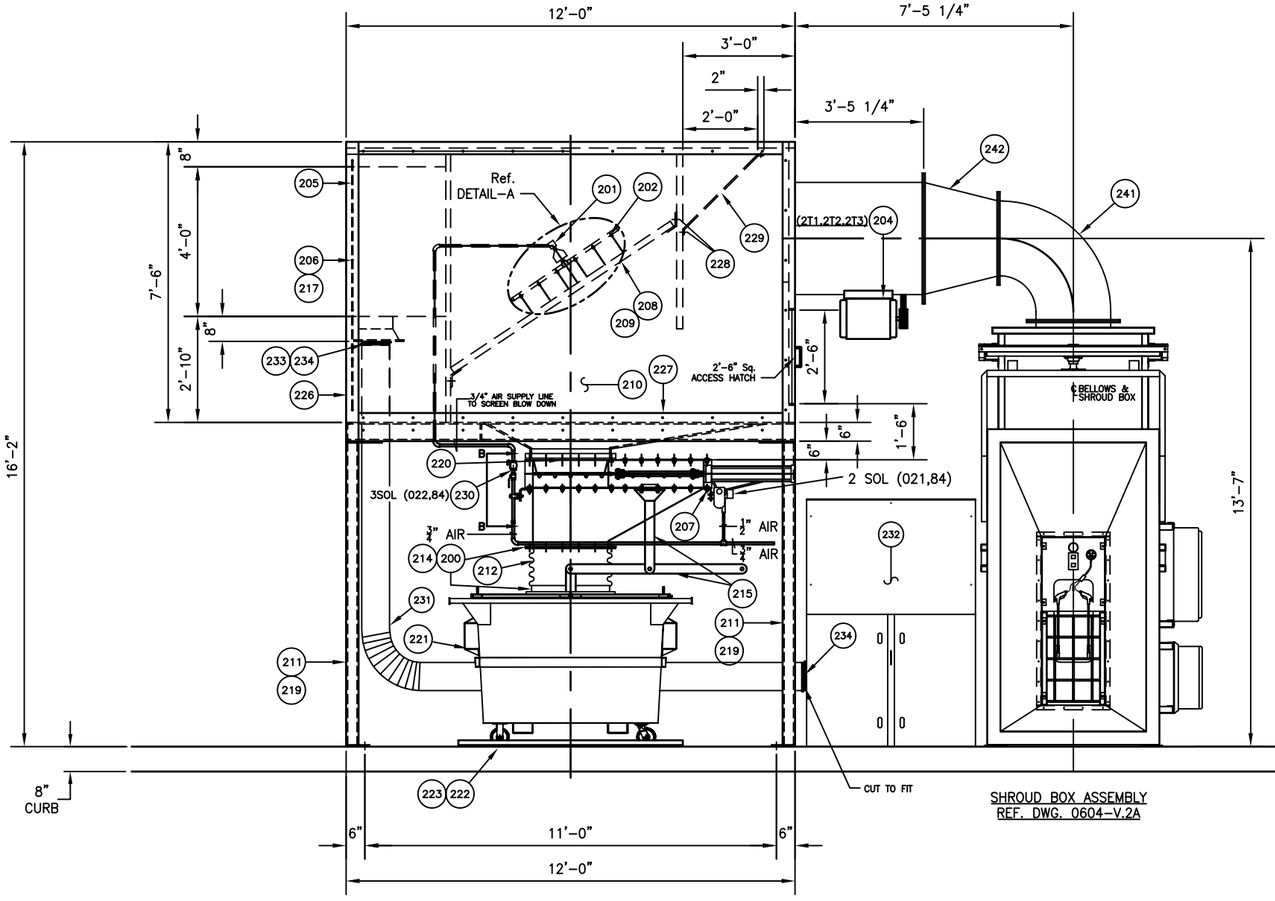
FOUNDATION BOLT LOCATION – INTERIOR CLEANING SYSTEM
FOR INDIANAPOLIS PUBLIC TRANSPORTATION
INDIANAPOLIS, IN.
APPROVED:
0604–V.1A



PLAN VIEW



DETAIL-A



ELEVATION

SHROUD BOX ASSEMBLY
REF. DWG. 0604-V.2A

SECTION B-B

LIST OF EQUIPMENT BY ROSS & WHITE CO.

	ITEM	QUAN.	PART NO.	DESCRIPTION
	200	100	FAS-MS1032X34FZ	10-32UNF MACHINE SCREWS x 3/4" w/L. W. , F. W. & NUTS
	201	1	BAR-BC320021204	ROTATING UNION
	202	1	CDL-GTC34	AIR BACK BLOW PIPE 3/4" x 3'-4-1/2" Lg.
	203	6	SPR-1/4TTR	1/4" TTR BRASS NOZZLE
	204	1	CHI-36. 5-D34/30	VANE AXIAL FAN ASS'Y. SIZE 36-1/2" DESIGN 34-30 H. P.
	205	1	FAR-045275010	FARR INERTIAL FILTER 10 CELL
*	206	2	FAB-XXX	FARR UNIT ANGLE SUPPORT LEGS
	207	1	MEY-24X24A05	SLIDE GATE SIZE 24" x 24" AIR OPERATED
	208	2	XXX-XXXX	REMOVABLE S. S. SCREEN 1/4" MESH
*	209	1	FAB-XXXX	SCREEN FRAME
	210	1	FAB-XXXX	LOT CLAD TUFF WALL & ROOF PANELS
*	211	1	FAB-XXXX	TRASH HOUSE SUPPORT LEGS
	212	1	RW-RTS-B200Z	NEOPRENE TRASH CHUTE
	213	100	FAS-HCS38112SSA	3/8-16 x 1-1/2" HEX HEAD BOLT w/ F. W. , L. W. , & NUT
*	214	8	FAB-XXXX	BACK-UP BARS
*	215	1	FAB-XXXX	TRASH CHUTE LEVER ASS'Y
	216	6	FAS-HCS38X1A	3/8-16x1" HEXHEAD BOLT w/F. W. , L. W. , & NUT
	217	58	FAS-HCS38X114A	3/8-16x1-1/4" HEXHEAD BOLT w/F. W. , L. W. , & NUT
	218	2	FAS-HCS38X414A	3/8-16x4-1/4" HEXHEAD BOLT w/F. W. , L. W. , & NUT
	219	32	FAS-HCS12X112A	1/2-13x1-1/2" HEXHEAD BOLT w/F. W. , L. W. , & NUT
	220	40	FAS-HCS58X112A	5/8-11x1-1/2" HEXHEAD BOLT w/F. W. , L. W. , & NUT
*	221	1	FAB-XXXX	3 CU. YD. TRASH CONTAINER 42" D x 72"L x 48"H
*	222	1	FAB-XXXX	L. H. ANGLE CONTAINER GUIDE
*	223	1	FAB-XXXX	R. H. ANGLE CONTAINER GUIDE
	224	1	PEF-RWCD	R. W. SIGN 8"x 8"
	225	1	ZZZ-SS-SIGN	R. W. S. S. CONTRACT SIGN
*	226	6	FAB-XXXX	GALVANIZED CORNER SUPPORTS
*	227	4	FAB-XXXX	GALVANIZED WALL SUPPORTS
	228	128	FAS-HCS38X2A	3/8-16x2" HEXHEAD w/ F. W, L. W. , & NUT
*	229	1	FAB-XXXX	10 GA. GALVANAIZED BAFFLE PWL
*	230	1	MAG-118A43	3/4" MAGNATROL SOLENOID VALVE #18A43
	231	20'	FIE-R2-10ID	FLEX HOSE, 10" I. D.
	232	1	TOR-VS-3000	DUST COLLECTOR, MODEL #VS3000, 7. 5 HP
	233	1	FAB-97-SG	FARR DYNAVANE DISCHARGE ADAPTER
	234	4	FIE-9IDCLAMP	CLAMP WORM DRIVE 10" S. S.
	235	1	MIL-34BA100	3/4" BALL VALVE THD. STD. PORT
*	236	1	FAB-XXXX	MOUNTING BRACKET
	237	1	BLI-XXXX	UNI-STRUT 2"x2"x4' Lg.
	238	1	BLI-2009	PIPE CLAMP - 3/4" PIPE
	239	1	IMP-24SA-12	HEX NIPPLE 3/4" STEEL
	240	1	CDL-GMT34	TEE 3/4" MAL GALV.
*	241	1	FAB-XXXX	ELBOW 24" FLANGED, GALV,
*	242	1	FAB-XXXX	REDUCER 24" X 36" FLANGED, GALV.
	243	2	CDL-GMCAP34	CAP 3/4" GALV. MAL.
	QUANTITY SHOWN FOR (1) ASSEMBLY, (2) ASSEMBLIES REQUIRED			

*- ITEMS TO BE HOT DIPPED GALVANIZED AFTER FABRICATION

INTERIOR CLEANING SYSTEM

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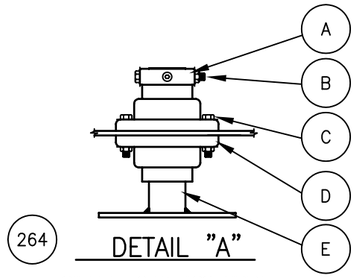
ROSS WHITE COMPANY
1090 ALEXANDER COURT
CARY, ILLINOIS 60013
PHONE: (847) 516-3900
FAX.: (847) 516-3989

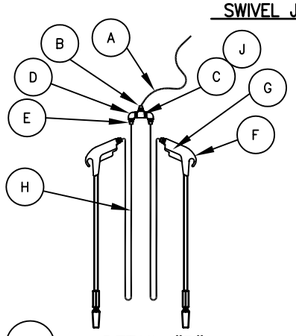
INTERIOR CLEANING SYSTEM ASSEMBLY
FOR INDIANAPOLIS PUBLIC TRANSPORTATION
INDIANAPOLIS, IN.
APPROVED:

0604-V.2



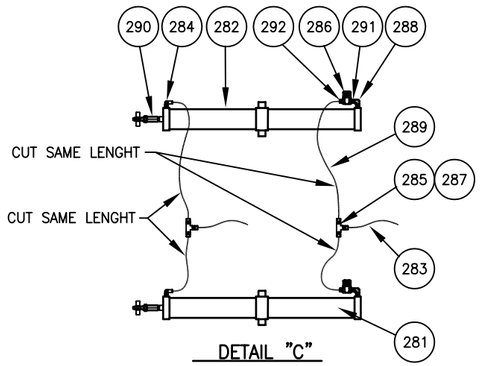
DETAIL "A"

SWIVEL JOINT ASSEMBLY



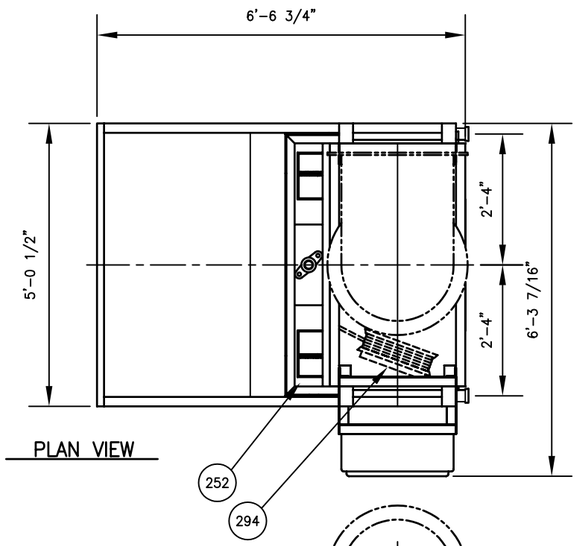
DETAIL "B"

DUAL BLOW GUN ASSEMBLY

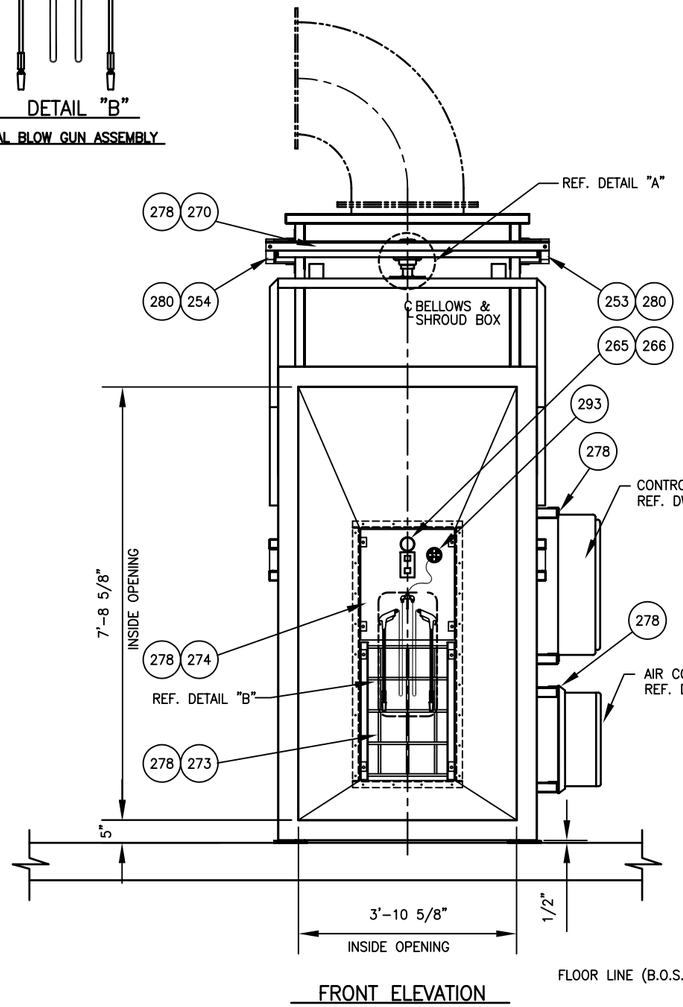


DETAIL "C"

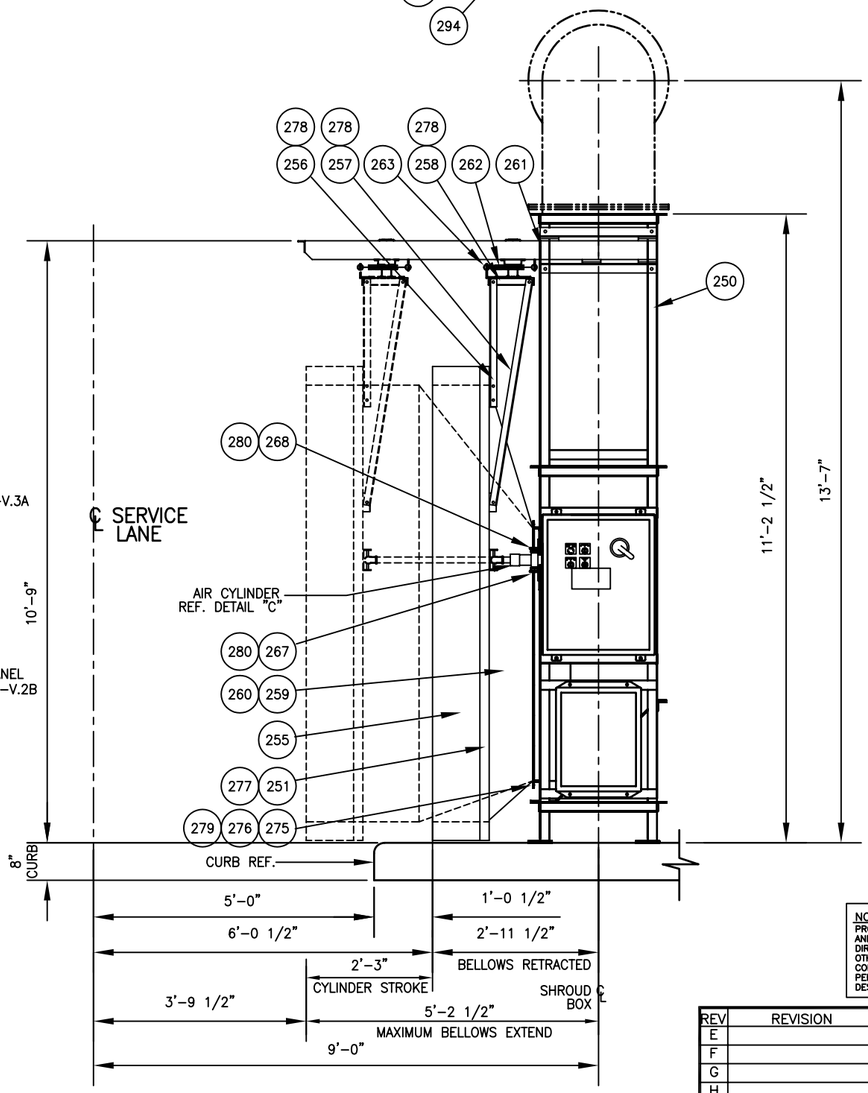
AIR CYLINDER ASSEMBLY



PLAN VIEW



FRONT ELEVATION



SIDE ELEVATION

LIST OF EQUIPMENT BY ROSS & WHITE CO.

	ITEM	QUAN.	PART NO.	DESCRIPTION
*	250	1	FAB-99-11A	SHROUD BOX ASSEMBLY (MODIFIED)
*	251	1	FAB-99-12-1	BELLOWS FRAME ASSEMBLY
*	252	1	FAB-99-11N-3	CARRIAGE FRAME ASSEMBLY
*	253	1	FAB-99-11N-1L	TROLLEY TRACK ASSEMBLY L.H. (4" CHANNEL)
*	254	1	FAB-99-11N-1R	TROLLEY TRACK ASSEMBLY R.H. (4" CHANNEL)
	255	4	FDA-4X12BEVA	BELLOWS PAD ASSEMBLY, 12"X4"X80"LG. BLACK
*	256	2	FAB-99-12-3	SWIVEL JOINT FRAME VERTICAL SUPPORT (MOD.)
*	257	2	FAB-99-12-4	SWIVEL JOINT FRAME ANGLE SUPPORT (MOD.)
*	258	1	FAB-99-12-2	SWIVEL JOINT MOUNTING FRAME
	259	1	FAB-99-12A	BELLOWS ASSEMBLY
	260	1	ZZZ-BBAS	ALUMINUM ANGLE BELLOWS OUTER REIN. FRAME
	261	4	SAG-4684	3 1/8" ø TROLLEY WHEEL
	262	2	MCM-V18-C	V18-C SPRINGS
	263	4	FAS-E3	1/4" x 2" LG. EYE TYPE
	264	1	ZZZ-74-15	SWIVEL JOINT ASSEMBLY
	A	1	DOD-040029	2" BORE SOLID STEEL COLLAR
	B	1	FAS-HCS38X4A	3/8-16 x 4" LG. BOLT W/F.W., L.W & NUTS
	C	4	FAS-HCS38X114A	3/8-16 x 1 1/4" LG. BOLT W/F.W., L.W & NUTS
	D	2	DOD-124270	2" BORE 2-BOLT FLANGE BEARING
*	E	1	ZZZ-74-15A	SWIVEL JOINT BASE BUCK-CLEANER
	265	1	MCG-606	LIGHT FIXTURE W/BASE
	266	1	GES-BULB150WC	LAMP 150W
*	267	2	FAB-99-11K	CYLINDER MOUNTING BRACKET
*	268	2	FAB-99-11K	CYLINDER MOUNTING BRACKET (OPP. HAND)
	269	1	ZZZ-DBGA	DUAL BLOW GUN ASSEMBLY
	A	1	GAT-6L0LA	3/8" ø x 50'-0" LG HOSE
	B	1	PAR-31382-6-8	3/8 PUSH-LOCK HOSE FITTING
	C	1	COL-GMT38	3/8" PIPE TEE
	D	2	COL-GMS9014	1/4" x 90° PIPE STREET ELBOW
	E	2	PAR-31382-4-4	1/4" PUSHOLOCK HOSE FITTING
	F	2	GUA-75LJ	GUN, AIR DUSTER w/ 24" EXT.
	G	2	PAR-30182-4-4	1/8" BARB HOSE 1/4" NPT x 1/4" HOSE
	H	2	GAT-4L0LB	1/4" ø x 4'-0" LG HOSE
	J	2	COL-GHB3814	3/8" X 1/4" HEX BUSHING
*	270	1	FAB-99-11N-2	TRACK TIE ANGLE
*	273	1	FAB-99-10K	FAN GUARD ASSEMBLY
*	274	1	FAB-99-10D	PUSHBUTTON COVER PLATE ASSEMBLY
*	275	2	FAB-99-10M	BELLOWS CLAMPING STRIP
*	276	2	FAB-99-10N	BELLOWS CLAMPING STRIP
	277	72	FAS-HCS14X34A	BOLT 1/4"-20x3/4" LG. w/FW, LW & NUT
	278	32	FAS-HCS38X114A	BOLT 3/8"-16x1 1/4" LG. w/FW, LW & NUT
	279	26	FAS-HCS14X1A	BOLT 1/4"-20x1" LG. w/FW, LW & NUT
	280	16	FAS-HCS12X114A	BOLT 1/2"-13x1 1/4" LG. w/FW, LW & NUT
	281	1	PAR-2DD2A1424	AIR CYLINDER, 2" BORE x 24" STROKE, XI=6.5"
	282	1	PAR-2DD2A1427	AIR CYLINDER, 2" BORE x 27" STROKE, XI=6.5"
	283	20'	PAR-E64	TUBE 3/8", CLEAR, POLYFLOW
	284	2	PAR-N4ME6	MALE ELBOW, 1/4" TUBE x 3/8" NPT
	285	2	PAR-N4TU4	TEE, 1/4" TUBE x 1/4" NPT, NYLON
	286	2	ARR-E192L	RELIEF VALVE 1/4"
	287	2	PAR-N6ME4	COUPLING 3/8" TUBE x 1/4" FNPT, NYLON
	288	2	PAR-2200P-6-6	ELBOW 3/8", 90°, STREET, BRASS
	289	20'	PAR-E43	TUBE 1/4", CLEAR, POLYFLOW
	290	2	AUR-CW-7Z	ROD END BEARING, 7/16"-20, FEMALE
	291	2	PAR-216P-6-4	NIPPLE REDUCING 3/8" x 1/4"
	292	2	PAR-68PL-4-4	CONNECTOR MALE, 1/4" TUBE x 1/4" NPT
	293	1	REE-HR-1057	HOSE ROLLER GUIDE ASS'Y
	294	1	REE-56500LP	COMPACT SPEED LATCH REEL

QUANTITIES SHOWN FOR (1) ASSEMBLY, (2) ASSEMBLIES REQUIRED

*- ITEMS TO BE HOT DIPPED GALVANIZED AFTER FABRICATION

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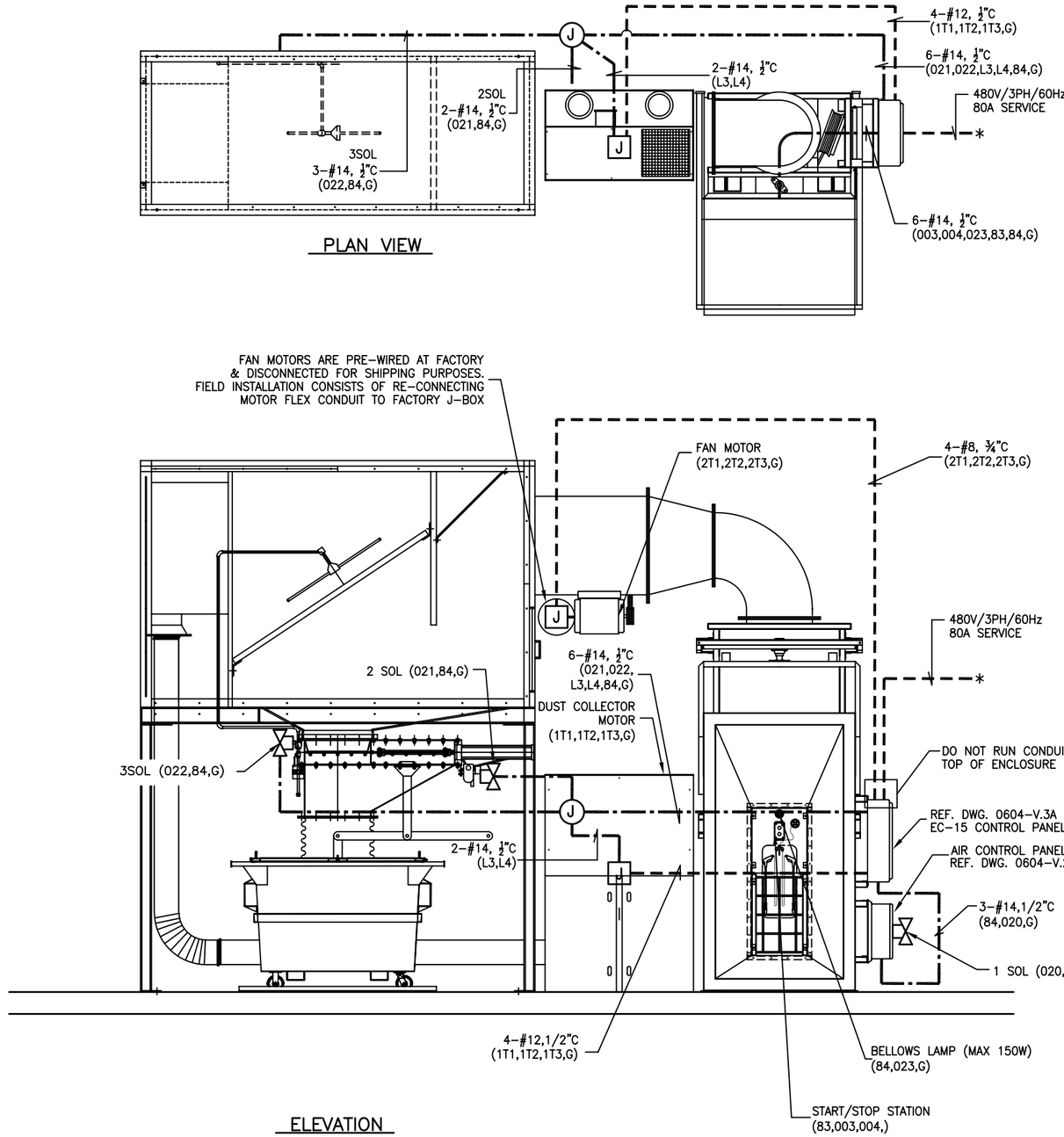
ROSS WHITE COMPANY
1090 ALEXANDER COURT
CARY, ILLINOIS 60013
PHONE: (847) 516-3000
FAX: (847) 516-3669

MODEL #EC-15 SHROUD BOX ASSEMBLY
FOR INDIANAPOLIS PUBLIC TRANSPORTATION

INDIANAPOLIS, IN.

APPROVED:

0604-V.2A



ELEVATION

EC–15 FIELD CONDUIT SCHEMATIC

ELECTRICAL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OF THE REQUIREMENTS STATED IN THE CONTRACT SPECIFICATIONS AND ON THE DRAWINGS. SPECIFICATIONS SHALL SUPERSEDE ANY DISCREPANCY WITH THESE NOTES.
2. THIS INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, AND ALL APPLICABLE LOCAL CODES.
3. ALL ENCLOSURES REQUIRED TO BE INSTALLED IN THE WASH TUNNEL AREAS SHALL BE NEMA 4 ENCLOSURE.
4. CONDUIT INSTALLATION:
   - A. ALL CONDUIT TO BE INSTALLED PARALLEL OR PERPENDICULAR TO BUILDING LINES.
   - B. CONDUIT TO SLOPE 1/8" PER FOOT TOWARD DRIP LEGS.
   - C. INSTALL CONDUIT WITH PROVISION FOR CONDENSATION OR WATER ACCUMULATION TO DRIP FROM VERTICAL DROPS AS LOCAL CODE PERMITS.
   - D. CONDUIT TO ENTER CONTROL STATIONS, JUNCTION BOXES AND TERMINAL BOXES FROM THE SIDE OR BOTTOM. CONDUIT SHALL NOT ENTER THE TOP OF A BOX.
   - E. ALL CONDUIT IN WASH AREA TO BE R. G. S. OR IF CODE ALLOWS P. V. C. ALL CONDUIT IN ELECTRICAL OR PUMP EQUIPMENT AREAS TO BE R. G. S.
   - F. USE SEALTITE FLEXIBLE CONDUIT CONNECTIONS AT ALL VALVES AND MOTORS. MINIMUM 2'-0" LG. AND MAXIMUM 4'-0" LG.
5. ALL PANELS AND COMPONENTS SHALL BE GROUNDED PER THE NEC AND LOCAL CODES.
6. IN GENERAL, ALL ELECTRICAL DEVICES SHALL BE IDENTIFIED. EVERY ELECTRICAL ENCLOSURE SUCH AS DRIVE PANEL, DISCONNECT SWITCH, ETC., SHALL HAVE AN IDENTIFICATION NAMEPLATE. EVERY DEVICE IN AN ELECTRICAL ENCLOSURE SUCH AS MOTOR STARTERS, RELAYS, FUSE BLOCKS, ETC., SHALL HAVE AN IDENTIFICATION NAMEPLATE.
7. ROSS & WHITE COMPANY TO FURNISH ITEMS LISTED IN MATERIAL LIST. INSTALLING CONTRACTOR TO MOUNT AND DO FINAL CONNECTIONS FOR PRE–INSTALLATION COMPONENTS FURNISHED BY ROSS & WHITE COMPANY. ELECTRICAL CONTRACTOR SHALL FURNISH ALL CONDUIT, FITTINGS, SUPPORTS, WIRE, ETC., REQUIRED FOR FIELD INSTALLATION OF EQUIPMENT.
8. ALL CONDUCTORS TO BE STRANDED TYPE MTW OR THHN INSULATION. WIRE SIZE TO BE 14 GAUGE MINIMUM. ALL CONDUCTORS TO BE UL LISTED. COLOR CODE CONDUCTORS AS FOLLOWS:

   480 VOLT 3–PHASE SYSTEM

PHASE A	–	BROWN
PHASE B	–	ORANGE
PHASE C	–	YELLOW
GROUND	–	GREEN

   120 VOLT SYSTEM

HOT	–	RED
NEUTRAL	–	WHITE

9. ALL FIELD WIRING TO BE LABELED AT ALL TERMINATIONS, SPLICES, ETC. ALL CONDUCTORS TO BE LABELED TO AGREE WITH TERMINAL STRIP IN WASHER CONTROL PANEL.

LEGEND

- –1ø FIELD CONDUIT
- –3ø FIELD CONDUIT
- (J) –FIELD JUNCTION BOX
- [J] –FACTORY JUNCTION BOX
- –SOLENOID VALVE

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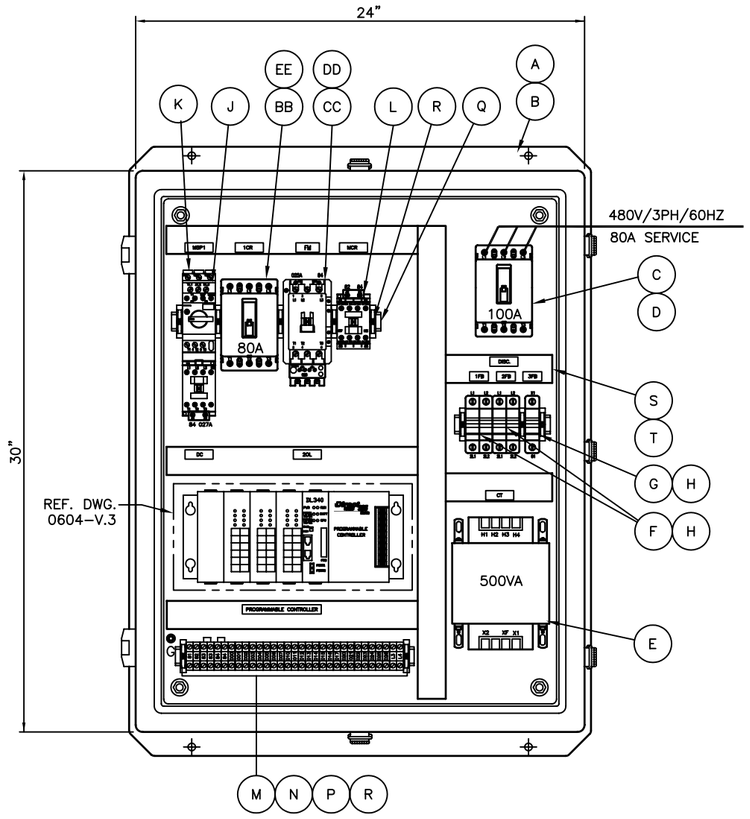
ROSS WHITE COMPANY
1090 ALEXANDER COURT
CARY, ILLINOIS 60013
PHONE: (847) 516–3900
FAX.: (847) 516–3989

TYPICAL EC–15 FIELD CONDUIT SCHEMATIC
FOR INDIANA PUBLIC TRANSPORTATION
INDIANAPOLIS, IN.
APPROVED:

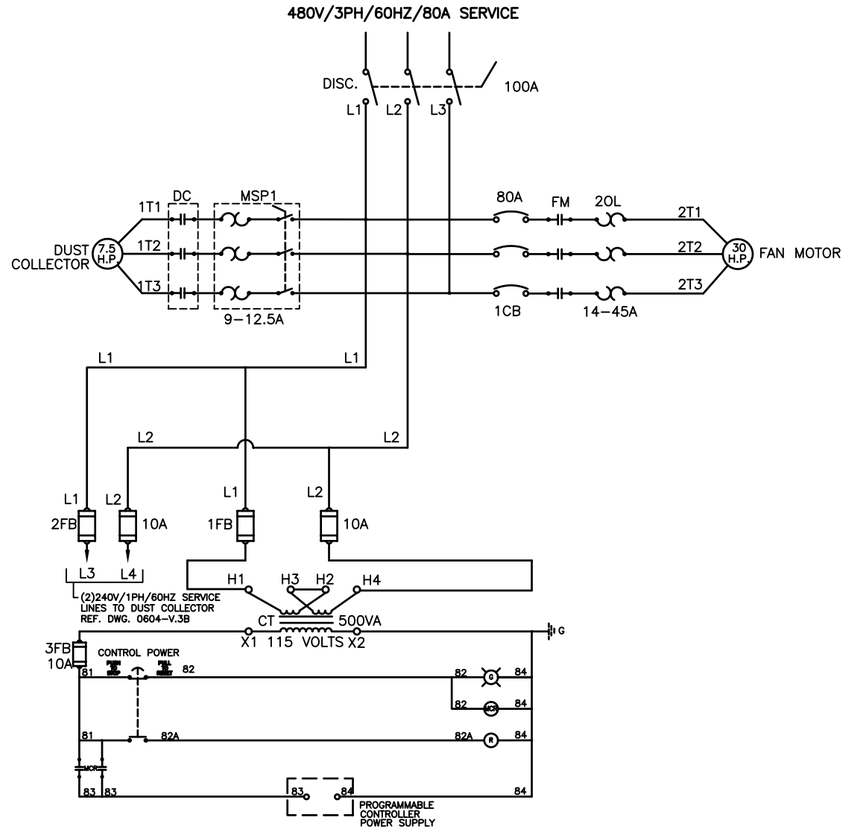
0604–V.3B

CAUTION: DO NOT RUN CONDUIT INTO TOP OF ENCLOSURE



ELEVATION

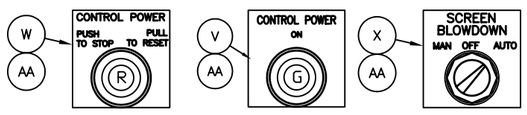
MOTOR CONTROL PANEL ASSEMBLY (302)



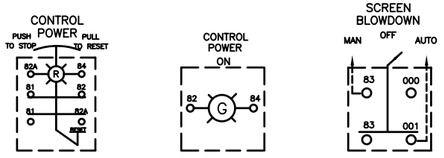
ELEMENTARY DIAGRAM

LIST OF EQUIPMENT BY ROSS & WHITE CO.			
ITEM	QUAN.	PART NO.	DESCRIPTION
302	1	R&W-0604-V. EC	CONTROL PANEL ASSEMBLY
A	1	HOF-A30H24BLP	ENCLOSURE 30"x24"x8" NEMA #4
B	1	HOF-A30P24	SUB-PANEL
C	1	CH-GD3100K	CASE SWITCH/480V/100A/3-POLE
** D	1	CH-HRGCV34L	TROUGH DOOR ROTARY ACTUATOR
E	1	CH-C0500A3C	TRANSFORMER 500VA, 480/120VAC
F	2	FER-USCC2I	FUSE BLOCK, 2-POLE W/ B.F. INDICATOR
G	1	FER-USCC1I	FUSE BLOCK, 1-POLE W/ B.F. INDICATOR
H	5	BUS-FNQR-10	FUSE, 600 VOLT, 10 AMP
J	1	CH-AE317WNS3-A	MOTOR STARTER PROTECTOR 9-12.5A w/AUX CONT.
K	1	CH-C320BUS20	THREE PHASE TERMINAL
L	1	CH-D15CR22AB	4 POLE RELAY 120 VAC COIL 2 N.O. 2 N.C.
M	31	V7-W4	TERMINALS, 30A.
N	2	V7-EB3	TERMINAL END BARRIERS
P	2	V7-CJ6-3	TERMINAL JUMPERS
Q	1	AUT-DN-R35S1	DIN RAIL, 35 x 75 x 1 -METER
R	25	IDE-BNL5	DIN RAIL STOPS
S	12'	PAN-F1.5X3WH6	WIRE DUCT BASE, 1-1/2" x 3'
T	12'	PAN-C1-1-1/2WH6	WIRE DUCT COVER 1-1/2"
** U	1	LEG-5X8BCL	LEGEND PLATE 5' X 8', CUSTOMER NAME
V	1	GE-CR104PLG32G	INDICATOR LIGHT - GREEN
W	1	GE-CR104PBT11R5	SWITCH ILLUM. PUSH/PULL w/RED LENS
X	1	GE-CR104PSK34A9	SWITCH 3-POS. KEY-OPERATED MAINTAINED
AA	3	LEG-225X225B	LEGEND PLATE 2-1/4" X 2-1/4"
BB	1	CH-GD3080	CIRCUIT BREAKER, 480V/80A/3-POLE
CC	1	CA7-43-10-120	CONTACTOR IEC, 30 AMP
DD	1	CEP7-M45-45-20	OVERLOAD RELAY 14-45A, TRIP CLASS 20
EE	1	CH-GDIN	DIN RAIL MOUNTING BRACKET
350	1	R&W-STST-PB	START STOP STATION NEMA 4X
FF	1	HOF-Q-2PBPCD	2 UNIT NEMA 4X P.B. ENCLOSURE
GG	2	GE-CR104PBG91U2	PUSHBUTTON EXT. HEAD MOMENTARY
HH	2	LEG-225X225B	LEGEND PLATE 2-1/4" x 2-1/4"
QUANTITY SHOWN FOR (1) LANE, (2) LANES REQUIRED			

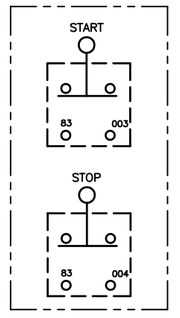
** - NOT SHOWN (LOCATED ON ENCLOSURE DOOR)



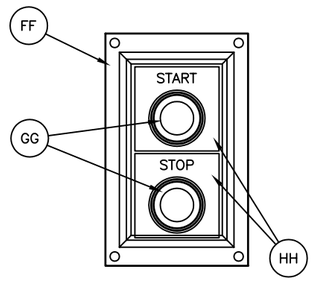
PUSHBUTTON & SELECTOR SWITCHES
(PREWIRED IN CONTROL PANEL DOOR)



PUSHBUTTON & SELECTOR SWITCHES
CONNECTION DIAGRAM



TYPICAL CONNECTION DIAGRAM



ELEVATION

EC-15 START/STOP STATION (350)

NOTE: THIS DRAWING IN DESIGN IS THE PROPERTY OF THE ROSS AND WHITE COMPANY AND MUST NOT BE COPIED OR USED EITHER DIRECTLY OR INDIRECTLY FOR ANY WORK OTHER THAN THAT OF THE ROSS AND WHITE COMPANY WITHOUT SAID COMPANY'S EXPRESSED PERMISSION. ALL RIGHTS OF INVENTION OR DESIGN ARE RESERVED.

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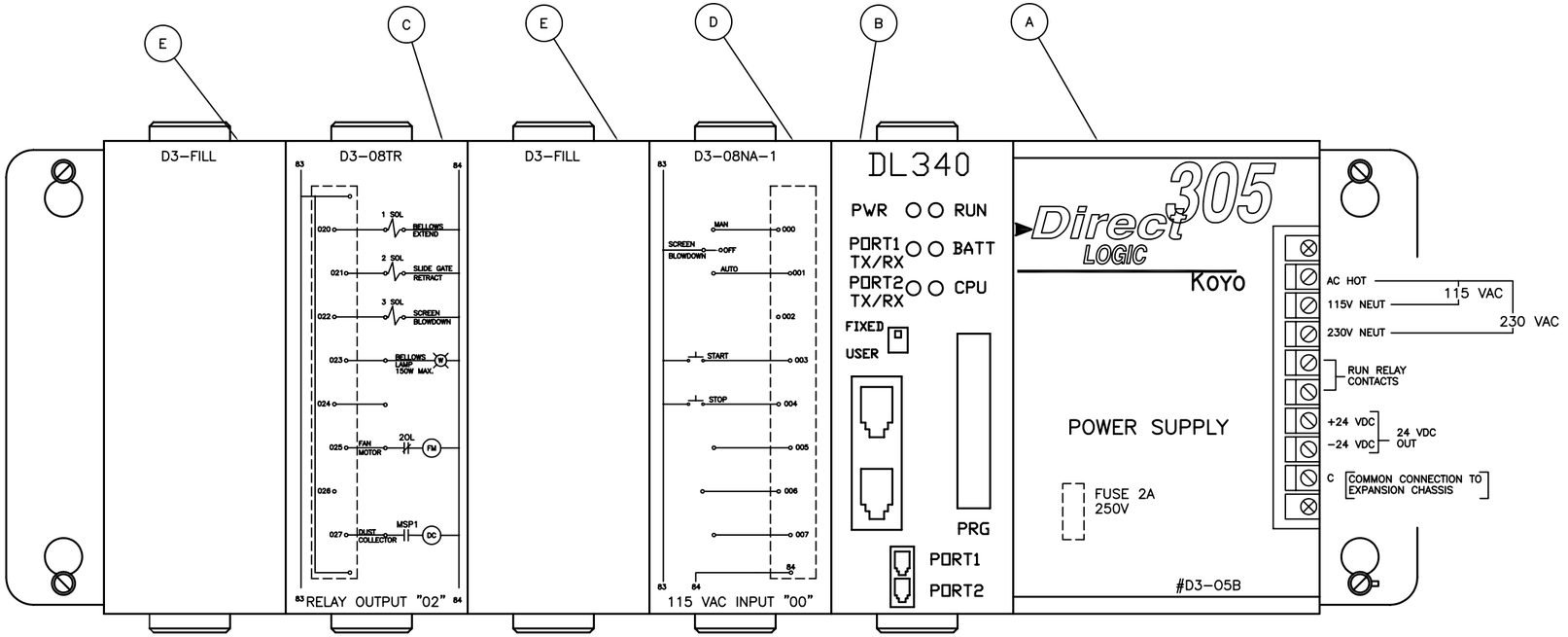
DRAWN BY: TMK | DATE DRAWN: 3/27/06
DATE PLOTTED: | SCALE: 3"=1'-0"
CHECKED BY: | DATE CHECKED:

ROSS WHITE COMPANY
1090 ALEXANDER COURT
CARY, ILLINOIS 60013
PHONE: (847) 516-3900
FAX.: (847) 516-3989

CONTROL PANEL ASSEMBLY
FOR INDIANAPOLIS PUBLIC TRANSPORTATION
INDIANAPOLIS, IN.
APPROVED:
0604-V.3A

LIST OF EQUIPMENT BY ROSS & WHITE CO.

ITEM	QUAN.	PART NO.	DESCRIPTION
301	1	R&W-0604-V.3	PROGRAMMABLE CONTROLLER ASSEMBLY
A	1	PLC-D305B	CONTROLLER RACK W/POWER SUPPLY
B	1	PLC-D3-340	CONTROL PROCESSING UNIT 3.7K RAM
C	1	PLC-D3-08TR	RELAY OUTPUT MODULE 115 VAC
D	1	PLC-D3-08NA-1	INPUT MODULE 115 VAC
E	2	PLC-D3-FILL	FILLER MODULE
QUANTITY SHOWN FOR (1) LANE, (2) LANES REQUIRED			



PROGRAMMABLE CONTROLLER ASS'Y (301)
REF. DWG 0604-V.3A FOR LOCATION

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DRAWN BY: TMK | DATE DRAWN: 4/3/06
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CHECKED BY: | DATE CHECKED:

ROSS WHITE COMPANY
1090 ALEXANDER COURT
CARY, ILLINOIS 60013
PHONE: (847) 516-3900
FAX.: (847) 516-3989

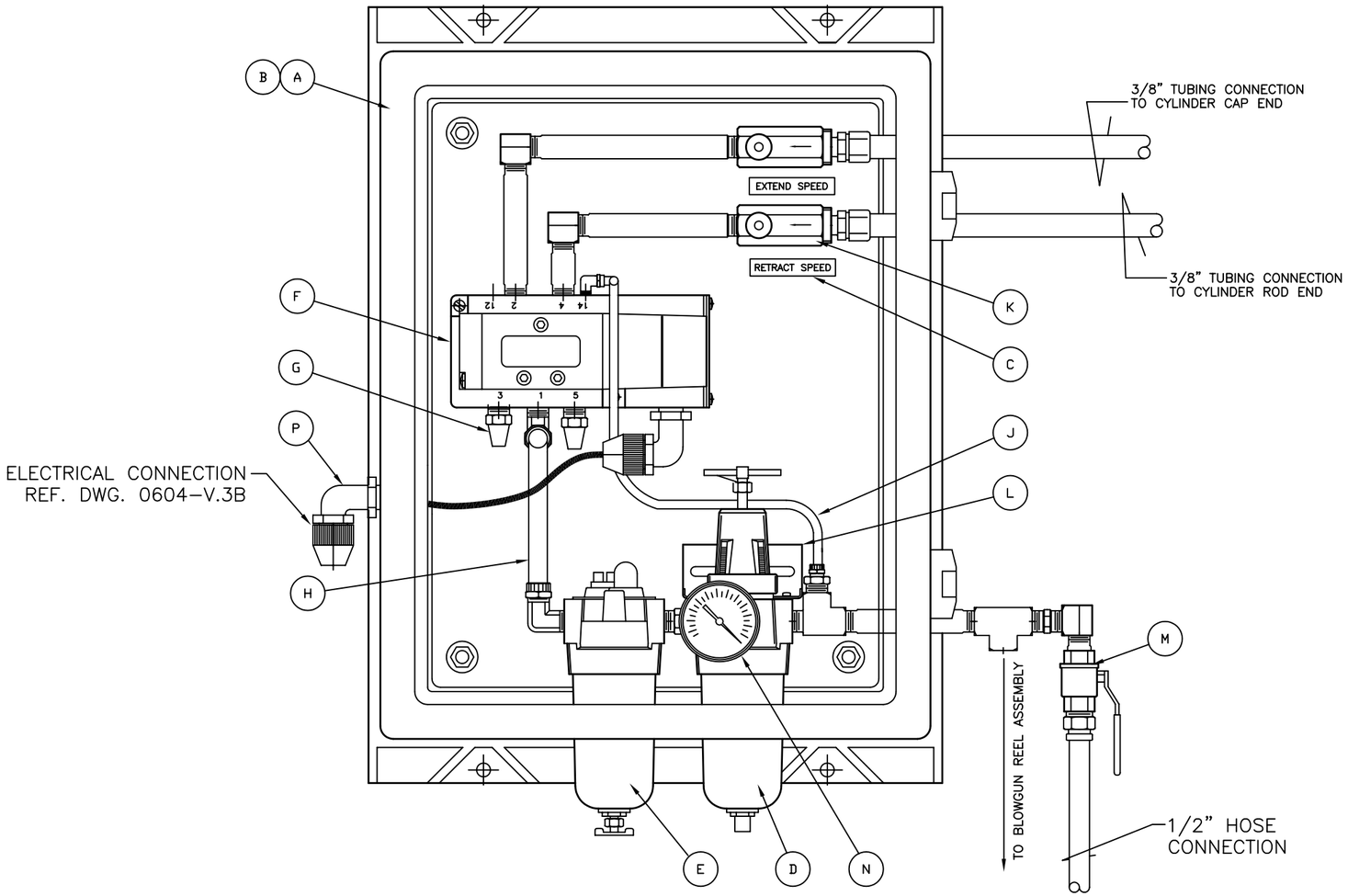
PROGRAMMABLE CONTROLLER CONNECTION DIAGRAM
FOR INDIANAPOLIS PUBLIC TRANSPORTATION
INDIANAPOLIS, IN.
APPROVED:

0604-V.3

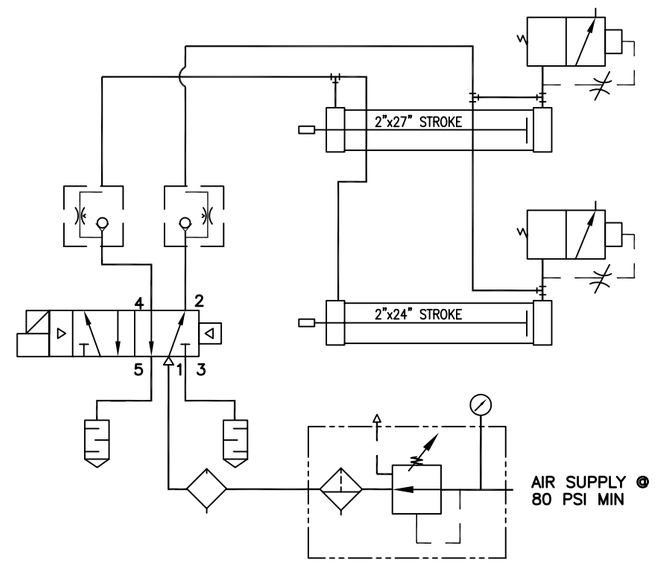
LIST OF EQUIPMENT BY ROSS & WHITE CO.

ITEM	QUAN.	PART NO.	DESCRIPTION
295	1	R&W-ACP20X16-R	AIR CONTROL PANEL ASSEMBLY 3/8" - RIGHT
A	1	HOF-A20H1606GQR	ENCLOSURE NEMA 4X FIBERGLASS
B	1	HOF-A20P16	ENCLOSURE SUB-PANEL
C	2	MAS-RW4	LEGEND PLATE 1/2" X 2-1/2"
D	1	PAR-06E21A13A	FILTER/REGULATOR 3/8"NPT
E	1	PAR-16L21B	LUBRICATOR 3/8" MICROMIST
F	1	PAR-F5115LJC23	VALVE 3/8" SOL. 4-WAY AIR 115V
G	2	PAR-CFP-3	MUFFLER 3/8" EXHAUST PORT
H	1	PAR-E86	TUBING POLYBLOW 1/2" CLEAR
J	1	PAR-NN-2-016	TUBING NYLON 1/8" O.D. CLEAR
K	2	PAR-PF600B	VALVE 3/8" FLOW CONTROL BRASS
L	1	PAR-PS-109	BRACKET MOUNTING 1/4" AIR PREP
M	1	MIL-12A100	VALVE 1/2" BALL STD. PORT
N	1	MAR-G-27431	GAUGE 0-60 PSI 1/4"NPT CTR BACK MT 2.5"FACE
P	1	T&B-2681	CORD GRIP 1/2", 90°, .25-.40

QUANTITIES SHOWN FOR (1) ASSEMBLY, (2) ASSEMBLIES REQUIRED



AIR CONTROL PANEL ASSEMBLY (295)



PNEUMATIC SCHEMATIC

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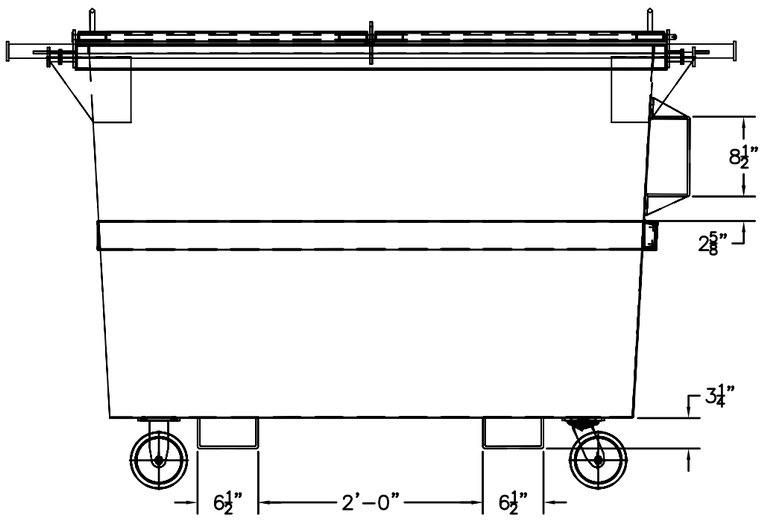
DRAWN BY: TMK | DATE DRAWN: 4/5/06
DATE PLOTTED: | SCALE: NONE
CHECKED BY: | DATE CHECKED:

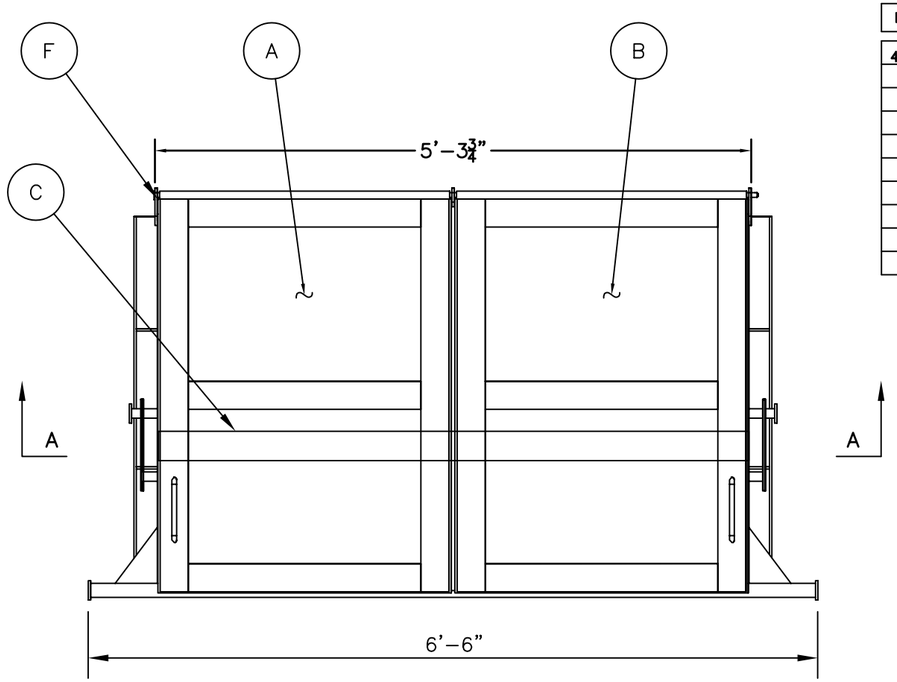
ROSS WHITE COMPANY
1090 ALEXANDER COURT
CARY, ILLINOIS 60013
PHONE: (847) 516-3900
FAX.: (847) 516-3989

AIR CONTROL PANEL ASSEMBLY
FOR INDIANAPOLIS PUBLIC TRANSPORTATION
INDIANAPOLIS, IN.
APPROVED:

0604-V.2B



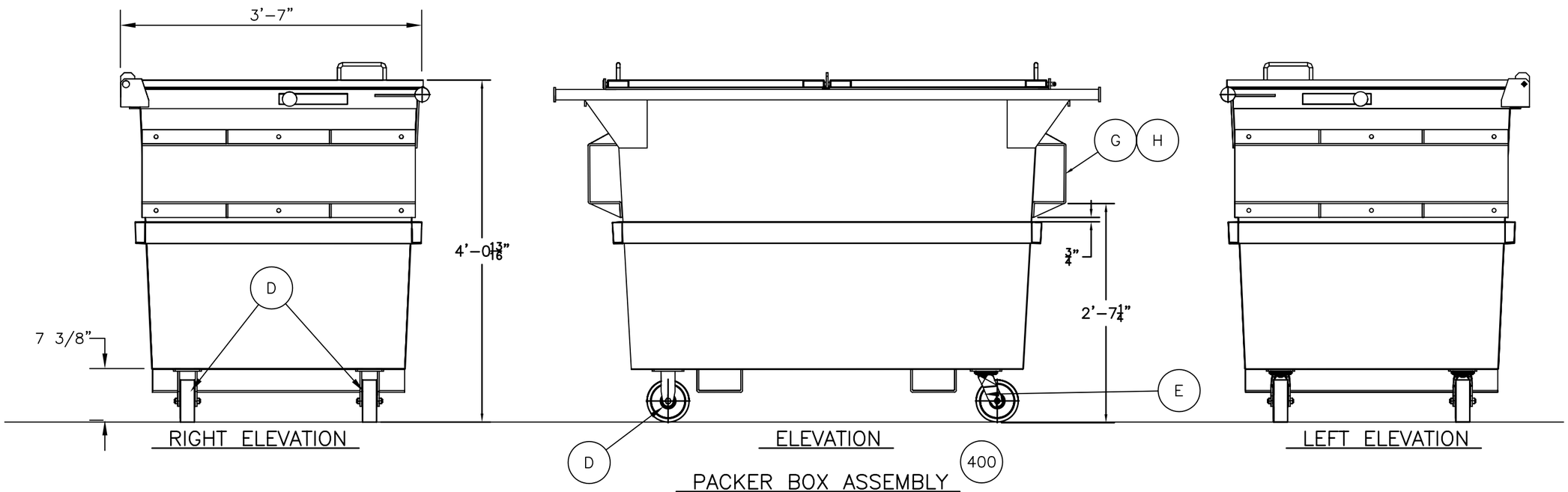
SECTION A – A



PLAN VIEW

LIST OF EQUIPMENT BY ROSS & WHITE CO.

ITEM	QUAN.	PART NO.	DESCRIPTION
400	1	ZZZ-91-1-100	TC-150 PACKER BOX ASSEMBLY
A	1	ZZZ-91-1-101	LEFT DOOR ASSEMBLY
B	1	ZZZ-91-1-102	RIGHT DOOR ASSEMBLY
C	1	ZZZ-91-1-103	CLAMPING BAR
D	2	REV-TSG150PU1G	CASTER SWIVEL 6" x 2" HARD RUBBER
E	2	REV-TFG150PU1G	CASTER RIGID 6" x 2" HARD RUBBER
F	1	ZZZ-91-1-107	DOOR HINGE PIN ASSEMBLY
G	2	FAB-03-03	FRONT LOAD MODIFICATION FORMED CHANNEL
H	12	FAS-HCS12X112A	BOLT 1/2"-13 x 1 1/2"LG. ASSEMBLY w/F.W.,L.W.,& NUT
QUANTITIES SHOWN FOR (1) ASSEMBLY, (3) ASSEMBLIES REQUIRED			



RIGHT ELEVATION

ELEVATION

LEFT ELEVATION

PACKER BOX ASSEMBLY 400

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DRAWN BY: TMK | DATE DRAWN: 4/5/06
DATE PLOTTED: | SCALE: 1"=1'-0"
CHECKED BY: | DATE CHECKED:

ROSS WHITE COMPANY
1090 ALEXANDER COURT
CARY, ILLINOIS 60013
PHONE: (847) 516-3900
FAX.: (847) 516-3989

MODEL #TC-150 PACKER BOX ASSEMBLY
FOR INDIANAPOLIS PUBLIC TRANSPORTATION
INDIANAPOLIS, IN.

APPROVED:

0604-V.4

ROSS & WHITE COMPANY

1090 Alexander Court, Box 970, Cary, Illinois 60013
Tel: 847/516-3900 - Fax: 847/516-3989

CYCLONE VACUUM SPECIFICATION
ICS-VA-30-23000

PART 2 – PRODUCTS

2.01 VACUUM SYSTEM, BUS INTERIOR
Equipment Mark Number: _____

A. General Description: The bus interior vacuum system shall provide a means for removal of dust and debris from the bus' interior while the bus in located in a service and fueling lane. A blower shall cause an air stream inside the bus when a retractable bellows unit seals the front door opening and the rear door or a rear window of the bus is opened. Dust and debris shall be captured in the air stream, aided by a person with a compressed air wand inside the bus, and carried through a separator that removes dirt and debris from the air stream and discharges clean air into the fuel lane area. The vacuum system bellows must comply with all applicable codes pertaining to the installation and operation in a Class 1, Division 2 area.

1. Sequence of operation: Operation of the vacuum system involves the following sequence of events:

a. Front door of the bus is aligned to bellows assembly. Bus driver pushes the start button and the bellows move against the side of the bus, sealing the perimeter of the door opening. The slide dump gate closes off the container from the debris collection chamber and after an adjustable time delay, the air moving fans and dust filter blower starts.

b. When the cleaning process is completed, the operator presses the stop button. The bellows retract and the fans remain long enough to clean the air system, moving all dust and debris into the collection chamber. When the fan stops, the dump gate opens, allowing the debris to fall into the container chute. The gate remains open until the unit is activated to clean the next bus interior. Each bus interior system shall be a self-contained installation and shall include: bellows assembly, pick up suction hood, fans and housing, air filter, receptacle, supporting structure, slide dump gate, compactor and container, electrical wiring, and piping.

2. Major components: Each vacuum system shall consist of, but not necessarily limited to, the following major components:

a. Bellows assembly.

b. Plenum assembly.

c. Duct work.

d. Refuse collection receptacle.

e. Dust collector.

f. Dumpster.

g. Controls.

B. Capacities and Dimensions:

1. Capacities:

a. Blower

1. Capacity: 23,000 CFM at 4 inches static pressure at bellow entrance, minimum.

2. Motor: 30 HP, 1800 RPM, TEFC, Hi-Efficiency.

3. Sound Level: Approximately 80 dbA

b. Dust collector: 7.5 HP

c. Air blowgun capacity: 100 SCFM at 100 PSIG.

2. Dimensions:

a. Overall dimensions:

1. Width: 60 inches, nominal.

2. Length: 300 inches, nominal.

3. Height: 188 inches, nominal.

b. Air blowgun hose: 3/8 inch diameter by 50 feet long.

C. Features and Construction:

1. Bellows assembly:

a. Performance: High efficient sealing and air flow bellows capable of sealing against current standard type transit buses and coaches with pantograph front doors. Riding on overhead rails, complete assembly shall be hung from a swivel suspension frame attached to overhead trolley carriage, riding overhead rails. Rails shall be an integral part of the plenum housing requiring no additional exterior support.

b. Seals: All seals shall be made of heavy neoprene impregnated nylon (sponge rubber is not acceptable) with aluminum stays and mounting straps to form an accordion-

type retractable assemble. Foam rubber padding covered by the same material as used for bellow framing shall be attached to the outer perimeter of the bellows to assure a snug fit to the front door of the Owner's buses. Providing a seal on the inner door opening, a second inner pad shall be provided.

c. Frame work: Bellow base shall be 3 inches at 5 pound channel, 1/4" x 3" x 3" tubing for vertical supports, 1/4" x 3" x 3" angle for fan plate supports, 1/4 inch thick fan plate, bellows track and support 4" x 4" at 13 pound WF-I beam. Bellow frame shall be 1/4" x 2 1/2" x 2 1/2" angle iron.

d. Air hose/reel: Accessory plate and grill shall be located in a moving portion of the bellows. The assembly shall be equipped with a control, a 150 watt floodlight for lighting the stepwell of the coach, and an air sweep hand gun. The hand gun equipment shall include a self retracting type hose reel with latching stops; 50 feet of 3/8 inch ID air hose, with removable hose pulley and stanchion clip; and two (2) air sweep guns. Hose reel shall be mounted on and supported by the plenum housing.

e. Bellows controls: Air cylinders and air controls shall be located and factory piped on the side of the plenum housing.

    1. Two air cylinders (1/2 inch bore x 24 inch stroke, 1/2 inch bore x 27 inch stroke) attached via trunnion on each side of the plenum housing shall be provided, and installed to ensure proper alignment of the bellows to the presentation angle of the vehicle front opening.

    2. Operation of air cylinders shall be controlled by in-line mounted valve. Valve shall be 4-way, 5 ported. Cylinder exhaust shall be throttled by the adjustable speed control orifice, and back pressure is developed that will control cylinder stroke speed.

    3. Air preparation shall include a filter regulator with gauge and micro mist lubricator.

2. Plenum assembly: A plenum connected to the bellows assembly shall be fabricated from minimum 12-gauge galvanized sheet steel, welded to structural framework of angles and channels, all of sufficient rigidity to support the cantilevered load of the extendable bellows assembly and the imposed load of the overhead duct work. Plenum to be within a frame fabricated from 2 inch square steel tubing mounted on angle legs with base plates drilled to receive anchor bolts.

3. Air cleaning equipment: Air cleaning equipment for the air being returned to the garage area shall be accomplished by special cellular inertial separators, each cell to consist of U-shaped blades arranged to present a circuitous path to the airflow and to redirect the air toward the clean air outlet.

a. Blades shall be fabricated from no less than 20-gauge, high strength, low alloy, corrosion resistant steel. The air passageway between adjacent blades shall be not less than 3/16".

b. The efficiency of the air cleaner shall not be less than 94% using Standardized Air Cleaner Dust Test, coarse, with inlet airflow of 1,000 CFM per single cell when using a bleed rate of 10%. Pressure loss from the inlet to the clean air outlet shall not exceed 0.8" water gauge at this airflow. The inertial separators shall be equipped with a bleed air duct, connected to a powered dust collector.

c. Dust collectors of the bag type, shall have a minimum 7.5 HP TEFC motor driven blower unit. Collector shall bleed a minimum of 10% of the air input to the refuse collection receptacle and shall have a cloth area of not less than 350 square feet. Collector shall have a capacity of not less than 15 cubic feet, and shall incorporate a bag shaker.

4. Ductwork: Duct from bellows plenum to collection receptacle shall be fabricated from minimum 12-gauge galvanized sheet steel, properly reinforced to withstand the negative pressures involved. Duct from the dust separator to the dust collector shall be a minimum 22-gauge galvanized steel flue ducting or plastic pipe or air duct hose.

5. Refuse collection receptacle: Refuse collection receptacle shall be double sealed chambered and fabricated from galvanized sheet steel panels. Receptacle shall be approximately 600 cubic feet mounted on a supporting structure of heavy 12 inch channel steel plate with structural steel I-beam legs. A hopper outlet shall be provided in the minimum 12-gauge galvanized steel floor of the support structure. Intake chamber shall be completely closed at the top and incorporate a system of interior screen baffles with automatic rotary air sweeps. The open top of the outlet chamber shall be fitted with screening of suitable meshed size for the purpose. Access to each chamber shall be provided via galvanized hatchways in the steel side walls. An air operated blast gate with two (2) air cylinders shall automatically dump refuse from hopper into dumpster. System shall include an air control panel enclosure for all air controls complete with an automatic moisture drain system.

6. Trash separation unit: Fan housing and fan (with electric motor) shall be located where it is accessible for easy maintenance. The design of the system must be such that debris thrown into bellow shall be shredded into pieces immediately after passing through the bellows.

a. Inlet of the fan housing shall be flanged and matched to discharge of plenum housing.

b. Fan must be 36 1/2 inches diameter machete type fan, 30 HP V-Belt drive, and guard, 1800 RPM TEFC motor, 24,300 CFM at 4 inches static pressure. The fan assembly shall be designed to handle material normally expected to come out of bus interior cleaning operations including newspapers. Fans (propeller type) designed only for gas handling are not allowed. Fan shall be mounted in housing fabricated from minimum 12-gauge galvanized steel. The actual performance shall be 23,000 CFM at the bellow (entrance) and must be verified by a certified testing agency before acceptance. Failure to meet the actual CFM performance criteria at the bellows shall be considered unacceptable.

7. Refuse container: Three (3) cubic yard dumpster with two swivel and two fixed casters shall be provided with receiving hopper to encompass sealed unit with vacuum system. Dumpster shall be capable of being lifted by forklift and by standard refuse/disposal truck.

8. Primary & secondary debris separators & air cleaners: Primary debris separation shall be by baffles and self cleaning screens. Secondary air cleaning for air being returned to the garage area shall be accomplished by replaceable air filters. The efficiency of the air filters shall not be less than OSHA regulations of TLV (Threshold Limit Value) of 15 mg/cubic meter of total dust.

D. Electrical Controls: A pre-wired 480 VAC, 3 phase, electrical and control panel shall be enclosed in a NEMA-12 enclosures along with necessary relays, transformers, numbered terminal strip and through-door non-fused disconnect. The panel shall be conveniently mounted on plenum housing. Panels shall contain electric heaters for moisture removal. Signal lights and push buttons for accessories shall be provided. All electrical and control devices shall comply with applicable local codes and shall meet National Electrical Code standards. Electrical wiring shall

be run within conduit or raceways.

E. Finish: All components of vacuum system shall be hot-dipped galvanized, and areas where galvanizing is not possible, shall be epoxy coated.

F. Utilities Available:

1. Electrical: 460 VAC, 3 phase, 37.5 HP, plus controls.

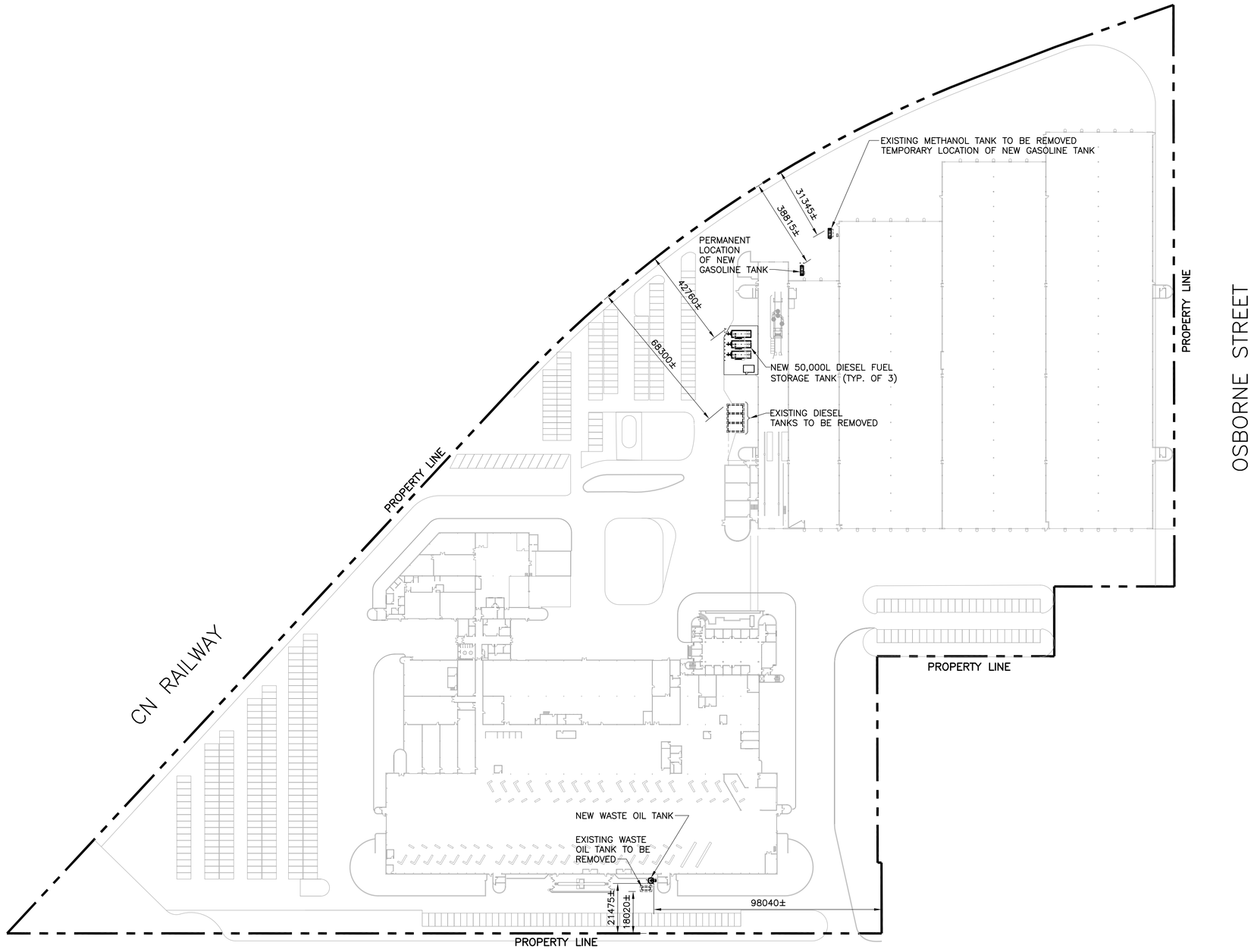
2. Compressed air: 1/2 inch, 100 CFM, 100 PSI

G. Manufacturers References:

1. Prime manufacturer: Specifications are based on equipment identified herein by manufacturer's name and model to establish acceptable standards of quality, performance, features, and construction.

    a. Ross & White Company
    1090 Alexander Court
    P.O. Box 970
    Cary, IL 60013-0970
    Phone: 847-516-3900
    Fax: 847-516-3989
    Website: www.rossandwhite.com

    b. Model: ICS-VA-30-23000 Automatic Bus/Train Interior Vacuum System as specified above.



1 SITE PLAN
1:1000

1:1000 10 0 10 20 30 40 50m

NO.	DESCRIPTION	DATE	ISSUED BY
A	ISSUED FOR BUILDING PERMIT	07.09.07	LWS

REVISIONS/ISSUE

CLIENT
CITY OF WINNIPEG
TRANSIT DEPARTMENT

WARDROP | Engineering Inc.

PROJECT NAME
PETROLEUM STORAGE AND HANDLING SYSTEMS REPLACEMENT

DRAWING DESCRIPTION
421 OSBORNE STREET GARAGE
SITE PLAN

PRELIMINARY DRAWING
NOT TO BE USED FOR CONSTRUCTION

DESIGNED BY:	DRAWN BY:	CHECKED BY:
L.S.	S.R.	

APPROVED BY:

SCALE:	DATE:
AS NOTED	07.09.06

DRAWING NO.	REV.
0729720101-DWG-G0001	A

A1 (594 x 841)

City of Winnipeg Transit Stores
421 Osborne St.

EQUIPMENT IDENTIFICATION INFORMATION

Tank #1
Westseel Fuel Vault
Diesel
- Model # FV500
- S/N # 63072445
- ULC # 5653

Anti-Syphon Valve Unit
- Model # SURE100-10CW
- S/N # 3261480101

Tank #2
Westeel Fuel Vault
Diesel
- Model # FV500
- S/N # 63072444
- ULS # 5653

Anti-Syphon Valve Unit
- Model # SURE100-10CW
- S/N # 3261420102

Tank #3
Westeel Fuel Vault
Diesel
- Model # FV500
- S/N # 63072443
- ULS # 5653

Anti-Syphon Valve Unit
- Model # SURE100-10CW
- S/N 3261480104

Pump #1
Pump ◦ Viking Pump
- Model # KK-124
- S/N # 027726

Motor ◦ 575V 3 HP
- Model # W182/4T
- S/N # 22AG007HN45442

Pump #2
Pump ◦ Viking Pump
- Model # KK-124
- S/N # 027724

Motor ◦ 575V 3 HP
- Model # W182-4T
- S/N # HM31412

Pump #3
Pump ◦ Viking Pump
- Model # KK-124
- S/N # 027725

Motor ◦ 575V 3HP
- Model # W182/4T
- S/N # HM31414

Tank #4
Westeel Fuel Vault
GAS
- Model # FV45
- S/N # 63072441
- ULC # 5653

Transfer Pump
GASBOY
Model # 725L
S/N # 2F07

Transfer Pump Meter
GASBOY
Model # 4860

TLS-300 Console
- EXISTING SYSTEM
- S/N # A1077766505001

Waste Oil Tank
Westeel Recycoil R4500
- S/N # 630724465
- ULC # 5652

Waste Oil Tank Gauge
Pneumeracator
- Model # P-5
- S/N # K4179-3

Waste Oil Pumps #1&2
Husky Graco
- Model # D73525
- NO SERIAL NUMBER

City of Winnipeg Transit Stores
421 Osborne St.

EQUIPMENT IDENTIFICATION INFORMATION
- CONTINUED

Fueling Position #1
Meter ◦ LC (Liquid Controls) 1 ½"
- Model # M-5-1
- S/N # 522870

Register ◦ Veeder Root
- Model # 0788700-064
- S/N # 0801427068

Strainer & Air Eliminator
- Model # A8197
- S/N # 97770

Pulsar ◦ Veeder Root
- Model # 769780-012
- S/N # 278176

Fueling Vault Position #2
Meter ◦ LC (Liquid Controls) 1 ½"
- Model # M-5-1
- S/N 522873

Register ◦ Veeder Root
- Model # 07880-00-064
- S/N # 9801427064

Strainer & Air Eliminator
- Model # A8197
- S/N 97769

Pulsar ◦ Veeder Root
- Model # 769780-012
- S/N # 278175

Fueling Position #3
Meter ◦ LC (Liquid Controls) 1 ½"
- Model # M-5-1
- S/N # 522869

Register ◦ Veeder Root
- Model # 07887-00-064
- S/N # 522869

Strainer & Air Eliminator
- Model # A8197
- S/N # 97771

Pulsar ◦ Veeder Root
- Model # 769780-012
- S/N # 277971

Fueling Position #4
Meter ◦ LC (Liquid Controls) 1 ½"
- Model # M-5-1
- S/N # 522870

Register ◦ Veeder Root
- Model # 0788700-064
- S/N # 0801427069

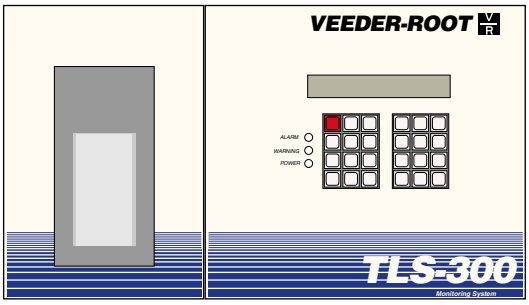
Strainer & Air Eliminator
- Model # A8197
- S/N # 97772

Pulsar ◦ Veeder Root
- Model # 769780-012
- S/N # 279175

Manual No: **576013-273** ● Revision: **L**
Software Version 419

TLS-300 Series Consoles

System Setup Manual



VEEDER-ROOT

Notice

Veeder-Root makes no warranty of any kind with regard to this publication, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Veeder-Root shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this publication.

Veeder-Root reserves the right to change system options or features, or the information contained in this publication.

For complete warranty, technical support, and additional product information, refer to your console's Operator Manual.

DAMAGE CLAIMS

1. Thoroughly examine all components and units as soon as they are received. If damaged, write a complete and detailed description of the damage on the face of the freight bill. The carrier's agent *must* verify the inspection and sign the description.
2. Immediately notify the delivering carrier of damage or loss. This notification may be given either in person or by telephone. Written confirmation must be mailed within 48 hours. Railroads and motor carriers are reluctant to make adjustments for damaged merchandise unless inspected and reported promptly.
3. Risk of loss, or damage to merchandise remains with the buyer. It is the buyer's responsibility to file a claim with the carrier involved. Immediately advise your Veeder-Root representative, distributor, or the factory so that we may assist you.

RETURN SHIPPING

All product returns, including warranty replacements, repairs, and core credits, must be returned on an RGA (Returned Goods Authorization) for proper processing. To return a product under this procedure:

1. Call Customer Service at (800) 873-3313 to obtain an RGA number.
2. Clearly print the RGA number on the packages being returned. No package can be received without this number.
3. All shipments of Veeder-Root products must be prepaid.
4. If the Magnetostrictive Probe is damaged, return it in the original shipping container with shock absorbing material provided. Veeder-Root will accept no liability for damage caused by improper packing.
5. Address the shipment to Veeder-Root Co., 6th Avenue at Burns Crossing, Altoona, Pennsylvania 16602.
6. All warranty returns must also include a legible WSR (warranty service report) with problem description and corrective action sections filled out in detail.

Contents

Communications Setup

In-Tank Setup

In-Tank Leak Tests

Liquid Sensors

External Inputs

Output Relays

Figures

Tables

Introduction

This manual describes how to set up the TLS-300 Series Underground Storage Tank (UST) Monitoring Systems. The instructions described herein assume that the console, as well as any probes and sensors for your site, have been installed.

Many of the operation enhancements contained in the 419 software upgrade are transparent to the user. See upgrade highlights in Table 1 below.

Table 1. Version 419 Upgrade Highlights

Feature	Description
TLS-300J - New	4 tank/8 sensor monitoring w/ CSLD and SiteFax Modem card.
Service Report - New	Added service log for technician to enter a service call. Added new system alarm: Service Warning, that alarms when a service call is entered.
Leak Tests - Periodic and Annual	New names for all tank periodic and annual alarms: Per Tst Needed Wrn Per Tst Needed Alm Ann Tst Needed Wrn Ann Tst Needed Alm

Contractor Certification Requirements

Veeder-Root requires the following minimum training certifications for contractors who will install and setup the equipment discussed in this manual:

Level 1 Contractors holding valid Level 1 Certification are approved to perform wiring and conduit routing, equipment mounting, probe and sensor installation, tank and line preparation, and line leak detector installation.

Level 2/3 Contractors holding valid Level 2 or 3 Certifications are approved to perform installation checkout, startup, programming and operations training, troubleshooting and servicing for all Veeder-Root Tank Monitoring Systems, including Line Leak Detection and associated accessories.

Warranty Registrations may only be submitted by selected Distributors.

Related Manuals

576013-274 TLS-300 Series Operator's Manual

Safety Symbols

The following safety symbols may be used throughout this manual to alert you to important safety hazards and precautions.

Explosive
Fuels and their vapors are extremely explosive if ignited.

Flammable
Fuels and their vapors are extremely flammable.

Electricity
High voltage exists in, and is supplied to, the device. Apotential shock hazard exists.

Turn Power Off
Live power to a device creates a potential shock hazard. Always turn power off to the device and associated accessories when servicing the unit.

No Smoking
Sparks and embers from burning cigarettes or pipes can ignite fuels and their vapors.

No Open Flames
Open flames from matches, lighters, welding torches, etc. can ignite fuels and their vapors.

No Power Tools
Sparks from power tools (such as drills) can ignite fuels and their vapors.

No Vehicles
Moving vehicles in the area during service can create a potential for personal injury to you or others. Sparks from starting vehicles can ignite fuels and their vapors.

No People in the Area
Unauthorized people in the area during service can create a potential for personal injury to you and them.

Use Safety Barricades
Unauthorized people or vehicles in the work area are dangerous. Always use safety cones or barricades, safety tape, and your vehicle to block the work area.

Wear Eye Protection
Fuel spray from residual pressure in the lines can cause serious eye injuries. Always wear eye protection.

Injury
Careless or improper handling of materials can result in bodily injury.

Hot Surface
Contact with hot surface can result in serious burns. Use appropriate precautions or body protection.

Gloves
Wear gloves to protect hands from irritation or injury.

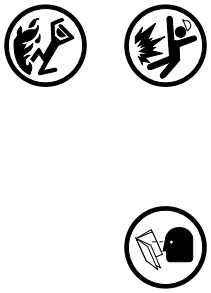
Clean Up Spills
Fuel spills in the work area are extremely dangerous. Clean up all spills promptly. Use an acceptable “fuel or gasoline absorbent” material. Dispose of hazardous absorbent as outlined by your local EPA, fire department, or state resources.

Collect Fuel In Approved Containers
NFPA-30A, Section 2, requires use of approved containers to collect, transport and dispose of fuel.

Read All Related Manuals
Knowledge of all related procedures before you begin work is important. Read and understand all manuals thoroughly. If you do not understand a procedure, ask someone who does.

Safety Warnings

⚠ WARNING



This system operates near highly combustible fuel storage tanks.

Fire or explosion resulting in serious injury or death could result if the equipment is improperly installed or modified or is used in any way other than its intended use. Serious contamination of the environment may also occur.

To ensure proper installation, operation, and continued safe use of this product:

1. **Read and follow all instructions in this manual, including all safety warnings.**
2. **Have equipment installed by a contractor trained in its proper installation and in compliance with all codes including: the National Electrical Code; federal, state, and local codes; and other applicable safety codes.**
3. **Do not modify or use service parts other than those provided by Veeder-Root.**

⚠ WARNING

This system operates near potentially hazardous fuel storage tanks.

Leaking tanks can create serious environmental and health hazards. Improper programming and operation may also result in equipment self-test failures and submersible pump shutdowns.

It is the owner's responsibility to:

1. **Ensure that this equipment is properly programmed.**
2. **Promptly investigate any alarm conditions.**
3. **Operate this equipment in accordance with the instructions in this manual.**

Product Description

Although the features of the TLS-300 Series Consoles vary, their setup and operation are very similar. The main features of each console are listed below:

Table 2. Console Features

Console	Features
TLS-300	Monitors up to 8 tanks. Provides inventory management with 0.2 or 0.1 gph in-tank leak detection.
TLS-300C	Monitors up to 2 tanks. Provides inventory management with 0.2 and 0.1 gph in-tank leak detection. Monitors up to 8 interstitial/liquid sensors.
TLS-300i	Monitors up to 4 tanks. Provides inventory management with optional 0.2 and 0.1 gph in-tank leak detection, or optional CSLD (Continuous Statistical Leak Detection). Monitors up to 8 interstitial/liquid sensors.
TLS-300J	Monitors up to 4 tanks and up to 8 interstitial/liquid sensors. Provides inventory management and CSLD (Continuous Statistical Leak Detection). Also features a SiteFax Modem card.

Console Front Panel Layout

You communicate with the system using keys and the display on the front panel of the monitor. The console includes the following features (see Figure 1):

- ❑ A display.
- ❑ A keypad with operating and data entry functions used to display information, print reports, and start and stop leak tests.
- ❑ Three lamps to indicate power-on, warning, and alarm conditions.
- ❑ An audible warning and alarm indicator.
- ❑ A printer to provide various reports.

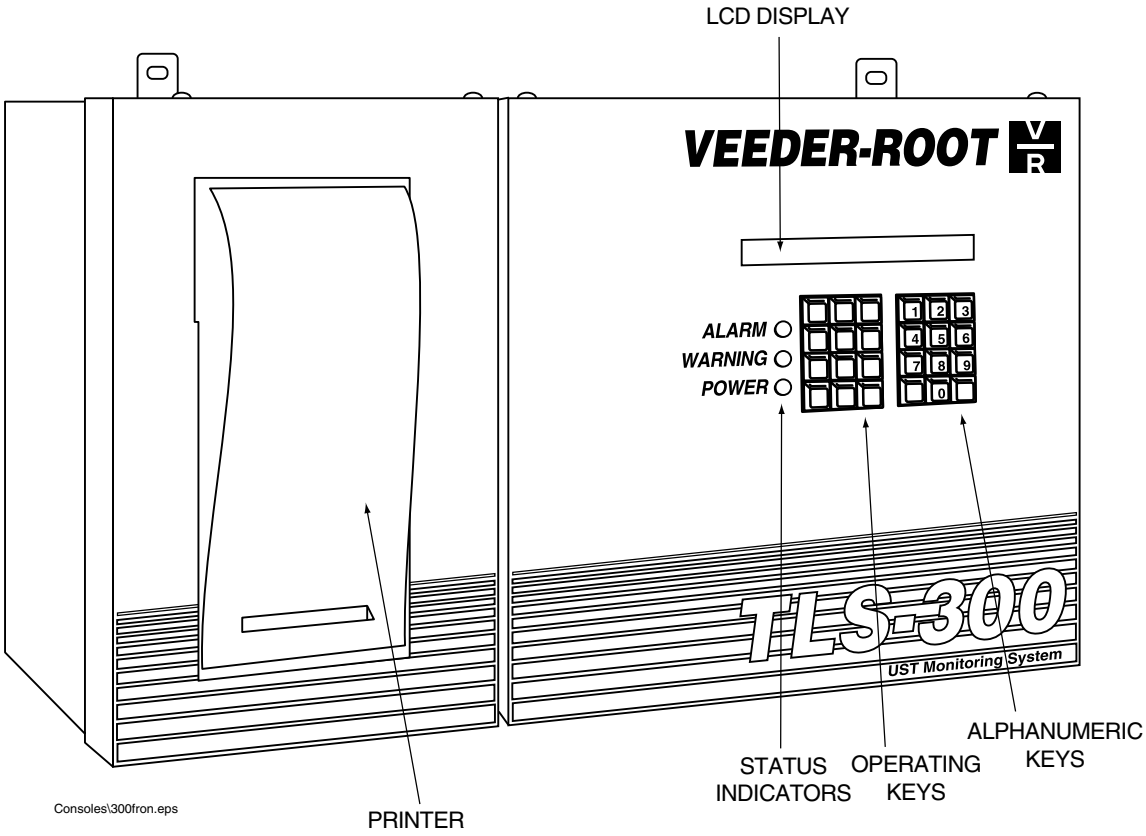


Figure 1. System Front Panel Features

Monitoring Functions

Depending on the console's configuration, monitoring functions, such as inventory control, in-tank leak detection, and interstitial leak sensing, are provided by:

- ❑ In-tank magnetostrictive probes
- ❑ Interstitial sensors between the walls of double-wall tanks
- ❑ Sensors in the sumps of double-wall piping systems
- ❑ Sensors in dispenser pans and containment sumps

Input/Output Functions

Input functions allow other devices or systems at your location to be connected to the system. Once connected, these devices are able to use the alarm, reporting and communications functions installed in the monitor.

Output functions are provided by relays installed in the system. They are able to trigger external alarm devices when an alarm condition is sensed by any of the monitoring functions installed in the system.

Communications Functions

An RS-232 port is provided that enables you to call into the console (via user-supplied external modem) or connect directly to the port using a computer. This feature allows you to poll the unit using the serial commands provided in the *Serial Interface Manual (VR part number 576013-635).*

The TLS-300J Console offers a SiteFax modem which can be set to autodial and autotransmit selected system reports and alarms to remote receivers.

Continuous Statistical Leak Detection - Option

CSLD (Continuous Statistical Leak Detection) collects information during each idle time to form a highly accurate leak detection database. Since the database is constantly being updated, leak test results are always current. Periodic leak tests are performed using the best data from up to the previous 28 days, and tests results are continuously updated as new data are gathered. Test results are provided automatically every 24 hours. In addition, up-to-the-minute leak test results are available at any time with the press of a key. Invalid data are thrown out so only the best data are used to ensure accurate leak test results and fewer false alarms.

Third-party testing confirmed that CSLD meets federal, state and local compliance requirements for monthly monitoring. Test results showed a 99% probability of detection and less than a 0.1% chance of false alarm. That far exceeds the U.S. E.P.A. performance standards of 95% probability of detection and 5% probability of false alarm.

Tanker Load Report - International Option

This optional feature allows you to store and print up to the last 40 tanker load reports. Tanker load report printouts can be set to manual or automatic (after every tanker load dispense).

Console Interface Compartments

Connections allowed in the intrinsically safe area of the console [see Figure 2]:

- ❑ Probe Interface

  The interface accepts inputs from in-tank digital sensing probes
- ❑ Liquid Sensor Interface (If equipped)

  The interface accepts up to eight inputs from interstitial, piping sump, and/or hydrostatic liquid sensors.

Connections allowed in the Power Area of the console:

- ❑ Two built-in inputs provide for solid-state or switch input from external devices, and two relay outputs to overfill alarms or external audible and visual warning devices.

Connections allowed in the System Printer and Communications Interface Area [see Figure 3]:

- ❑ RS-232 Port

  Provides a 25-pin D-connector for data transmission to a computer point-of-sale terminal or external modem.
- ❑ Auxiliary Port

  Provides connection for other RS-232 devices.
- ❑ SiteFax Module (If equipped)

  Provides 300/1200/2400-Baud modem interface with fax transmission capabilities.

IMPORTANT ☛ *Read the warning on p age1-4 of this manual regarding the use of this product!*

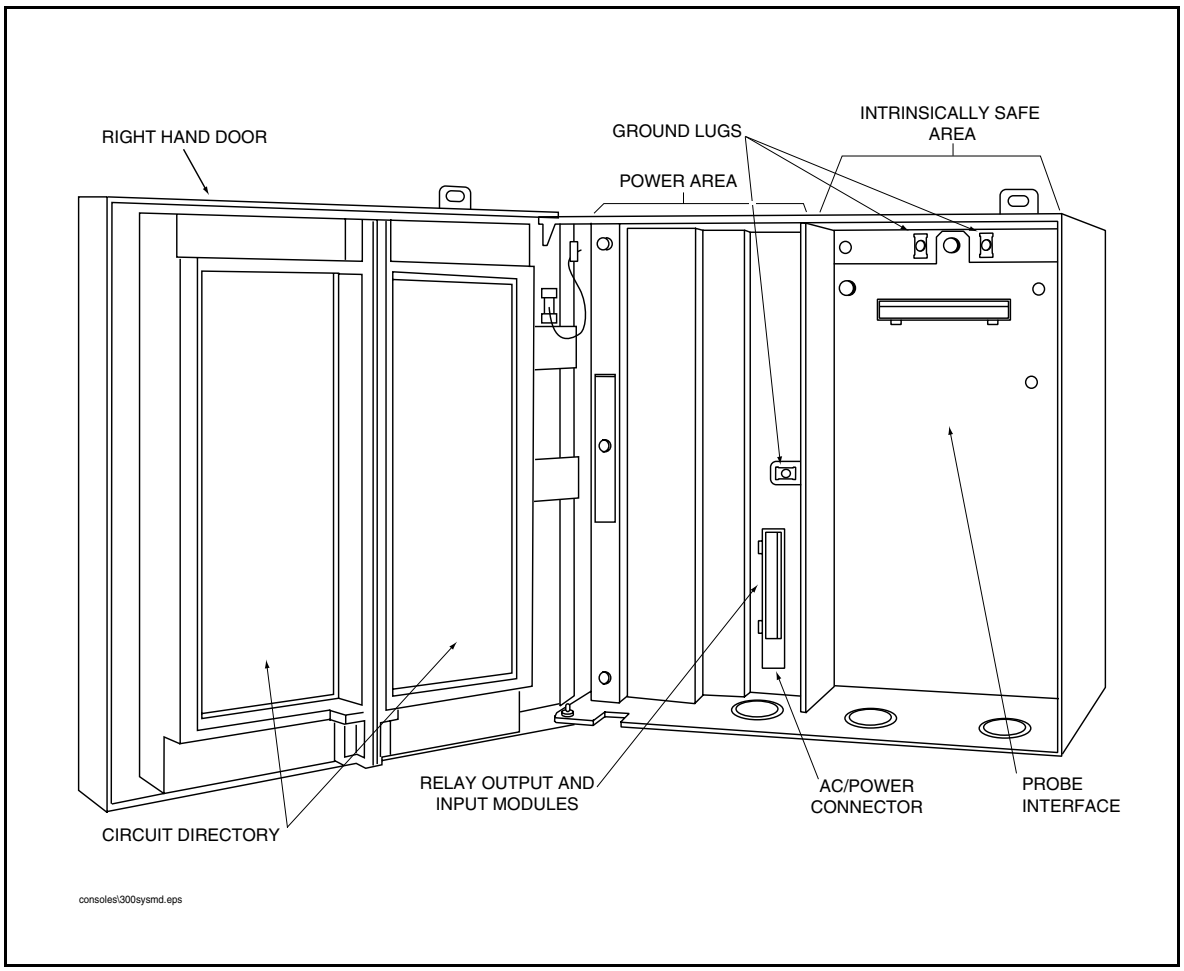


Figure 2. System Interface Module Area

A surface mount CPU board is shown in Figure 3. For an example of a through-hole mount CPU board, see Figure 7 on page 5-2.

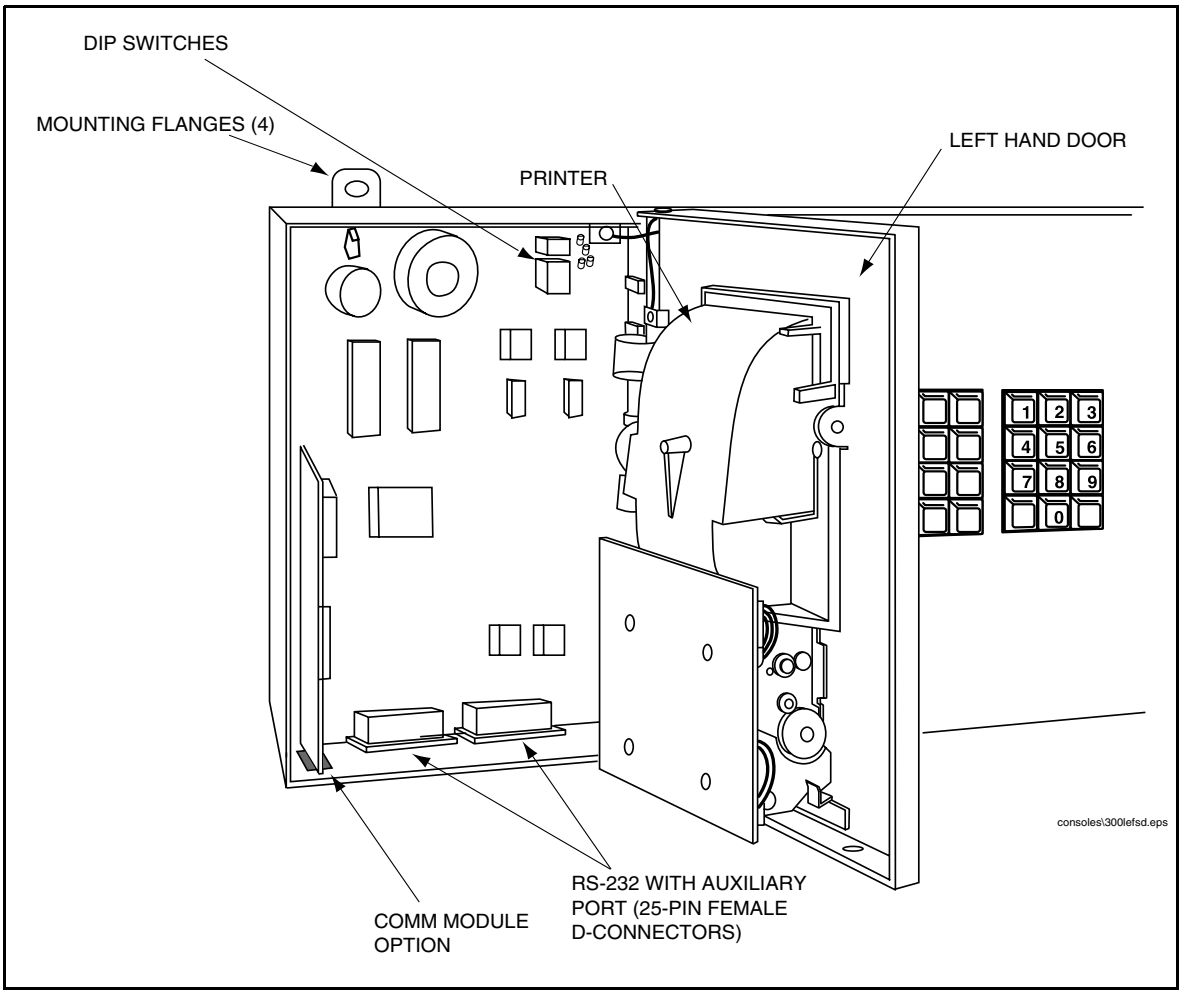


Figure 3. System Printer and Communications Interface Area

How To Use The Keypad

You use the keypad to enter information into the system.

Arrangement of Keys

The keypad (see Figure 4. “Console Keypad”) consists of 24 keys arranged in two groups. The functions for each key have been established to make movement within the setup mode, entry of setup data and selection of setup choices as simple as possible.

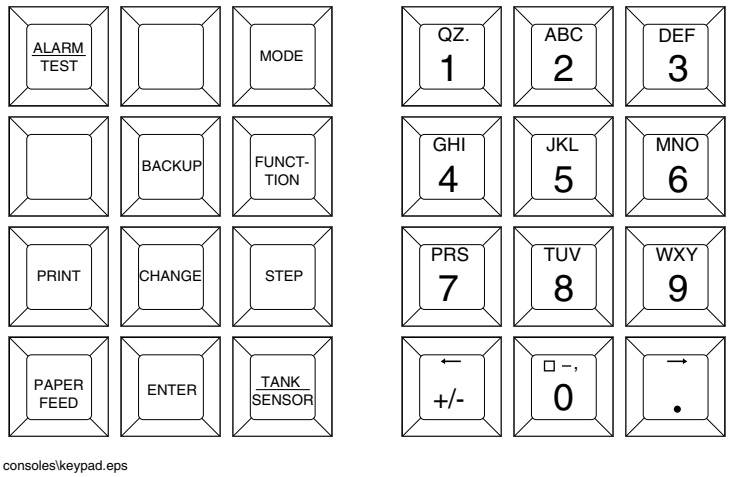


Figure 4. Console Keypad

Operating Keys

The 12 left-hand keys are operating keys. They allow you to access and print data, start and stop in-tank leak test procedures, program the system, test system operation and review diagnostic information. (See “Using the Operating Keys” on page 3-2.)

Alphanumeric Keys

The 12 right-hand keys have alphanumeric and cursor movement functions for entering setup information.

If a numeric value is required for entry of a particular setup parameter, the keys provide only numeric functions. If either alphabetic or numeric characters may

be entered, the keys provide both alphabetic and numeric functions. (See "Using the Alphanumeric Keys" on page 3-3).

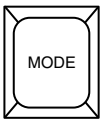
Using the Operating Keys

Use of operating keys is summarized below.

ALARM/TEST

Shuts off audible alarm and clears alarms that have returned to normal condition. Will not shut off display indicators or disable alarm function. If your system has a printer, it will print an alarm or warning report when this button is pressed.

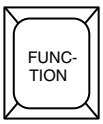
Used to activate and de-activate output relays when OUTPUT RELAY TEST function is used.



MODE

Select operating modes: Normal Mode, Setup Mode, Diagnostic Mode.

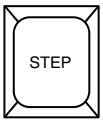
If MODE is pressed while in a Function or Step, the system will advance to the next MODE.



FUNCTION

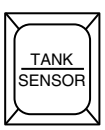
The FUNCTION key is used to scroll through and access functions within a MODE.

If FUNCTION is pressed while in a STEP, the system will advance to the next FUNCTION.



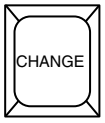
STEP

Use the STEP key to move from one procedure to the next within a FUNCTION.



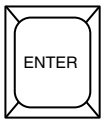
TANK/SENSOR

The TANK/SENSOR key is used to advance by tank or sensor through setup procedures or displayed data.



CHANGE

CHANGE is used in Normal and Setup modes to enter data, revise existing data or change an entry.



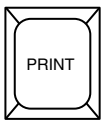
ENTER

ENTER completes a selection or enters data into a function. It is also used to start certain functions such as leak tests.

BACKUP

BACKUP lets you move back through STEPS, FUNCTIONS and MODES to access data or entries you have already passed in the normal progression. It eliminates the need to move completely through a function or mode to access a step recently passed.

BACKUP will move through the hierarchy of commands as follows: through STEPS within a FUNCTION to that FUNCTION; then back through FUNCTIONS to MODE; then back through MODES.



PRINT

Press PRINT to generate inventory, delivery, leak test, status, setup, diagnostic and alarm history reports.

Using the Alphanumeric Keys

You use alphanumeric keys to enter data during the setup process. When a numeric value is required (i.e. gallons, time, etc.), the keys provide only a numeric function. When you can enter either alphabetic or numeric characters (i.e. station headers, sensor locations, etc.), the keys provide both functions.

Entering Alphanumeric Data

Keys 0 through 9 provide both alphabetic and numeric capability by activating each character shown on the key with successive pushes of the key.

For example, to enter an “A” in a station header. which accepts either alphabetic or numeric characters, you press the 2 key once. Push the key again to change the character to a “B”, again to enter a “C”, and again to enter a “2”.

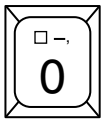
The decimal (.) is on key “1”.

When the correct selection is displayed, press the . key to move the cursor to the next position and enter the required character as described. When all the characters have been entered, press ENTER.

If you enter an incorrect character, you may use the arrow keys to move the cursor to the character, press CHANGE, and enter the correct character.

Special Characters and Cursor Movement

Some keys let you enter special characters and move the cursor as follows:

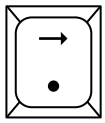


The Zero key has a comma (,) plus two special characters that can be used in making alphanumeric entries. They are:

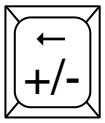
□ = Space (no character)

— = Dash

The “*” character is generated by pressing this key 5 times.



The Right-Arrow key lets you advance the cursor to the right when making alphanumeric entries such as station headers and when selecting certain parameters such as module configurations. The step-by-step setup instructions will identify when this function should be used. The **.** (decimal) is used in numeric entries as required. It is not used as a period for text entries.



The Left-Arrow key lets you move the cursor to the left.

The +/- is used to identify a positive or negative value.

Setup Mode Organization

The Setup Mode is used to enter information and operating parameters that govern the way your system monitors your installation. Setup data is entered via the front-panel keyboard. The section “How To Use The Keypad” describes in detail the functions of each key.

Functions

Functions are the major procedures in the Setup Mode of the TLS console.

The list below contains all of the available Setup Mode functions. However, only the functions purchased with your system will be accessible.

- ❑ System Setup Data
- ❑ Communications Setup Data
- ❑ In-Tank Setup Data
- ❑ In-Tank Leak Test Setup Data
- ❑ Liquid Sensor Setup Data (If Equipped)
- ❑ External Input Setup Data
- ❑ Output Relay Setup Data

Steps

Within each FUNCTION are STEPS at which you enter setup data.

Setup Mode Programming Chart

The system takes you through the setup procedure in a structured pattern, as illustrated in Figure 5. “Setup Mode Programming Chart for TLS-300” on page 4-2 and Figure 6. “Setup Mode Programming Chart for TLS-300C, TLS-300i, and TLS-300J” on page 4-4. Always press the ENTER key after entering data. If you press the STEP, FUNCTION, or MODE key without pressing ENTER, the data will not be saved. It is a good idea to print a setup report for record keeping purposes after completing your system’s setup. See “Printing a Setup Data Report” on page 6-2.

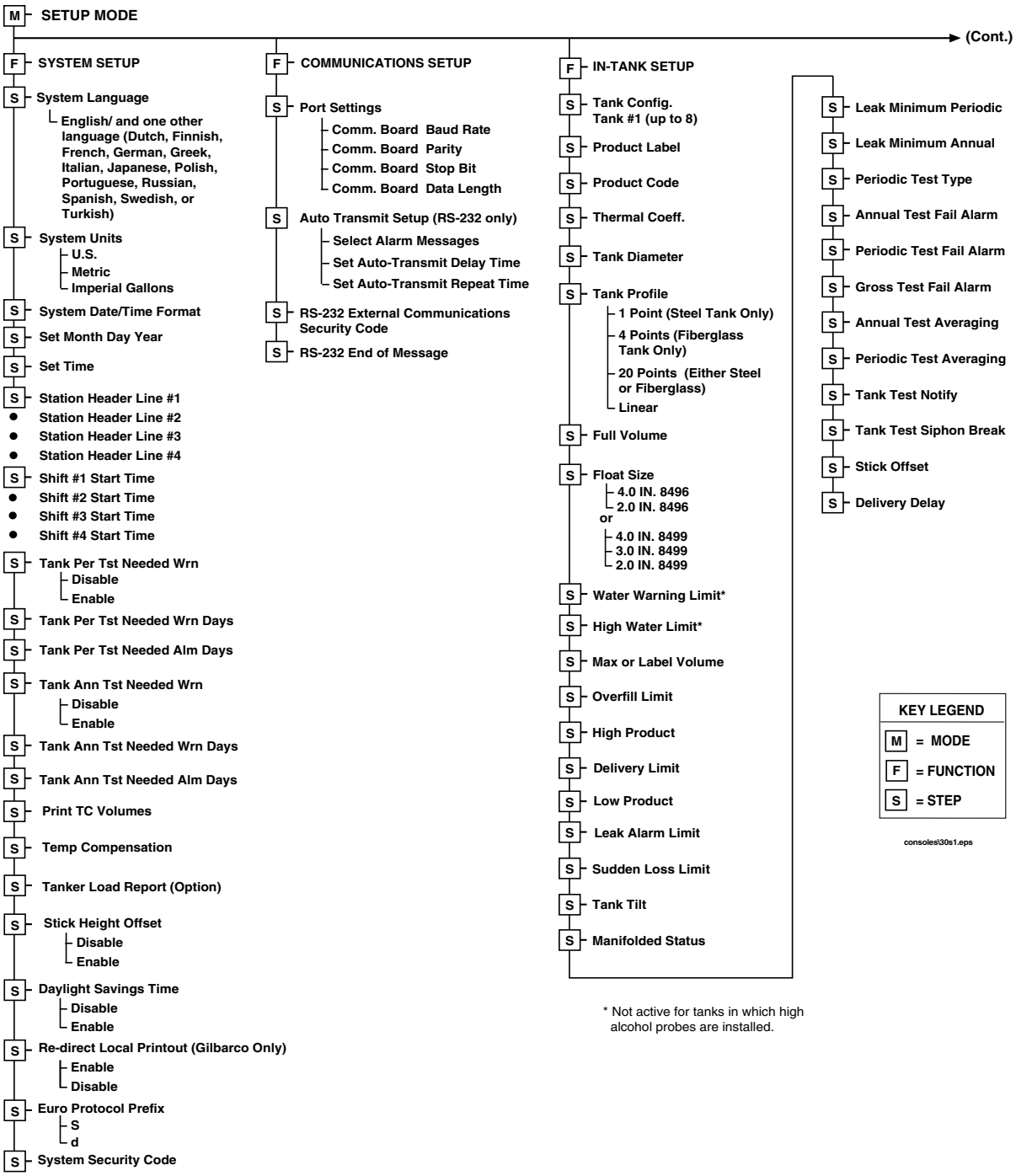


Figure 5. Setup Mode Programming Chart for TLS-300

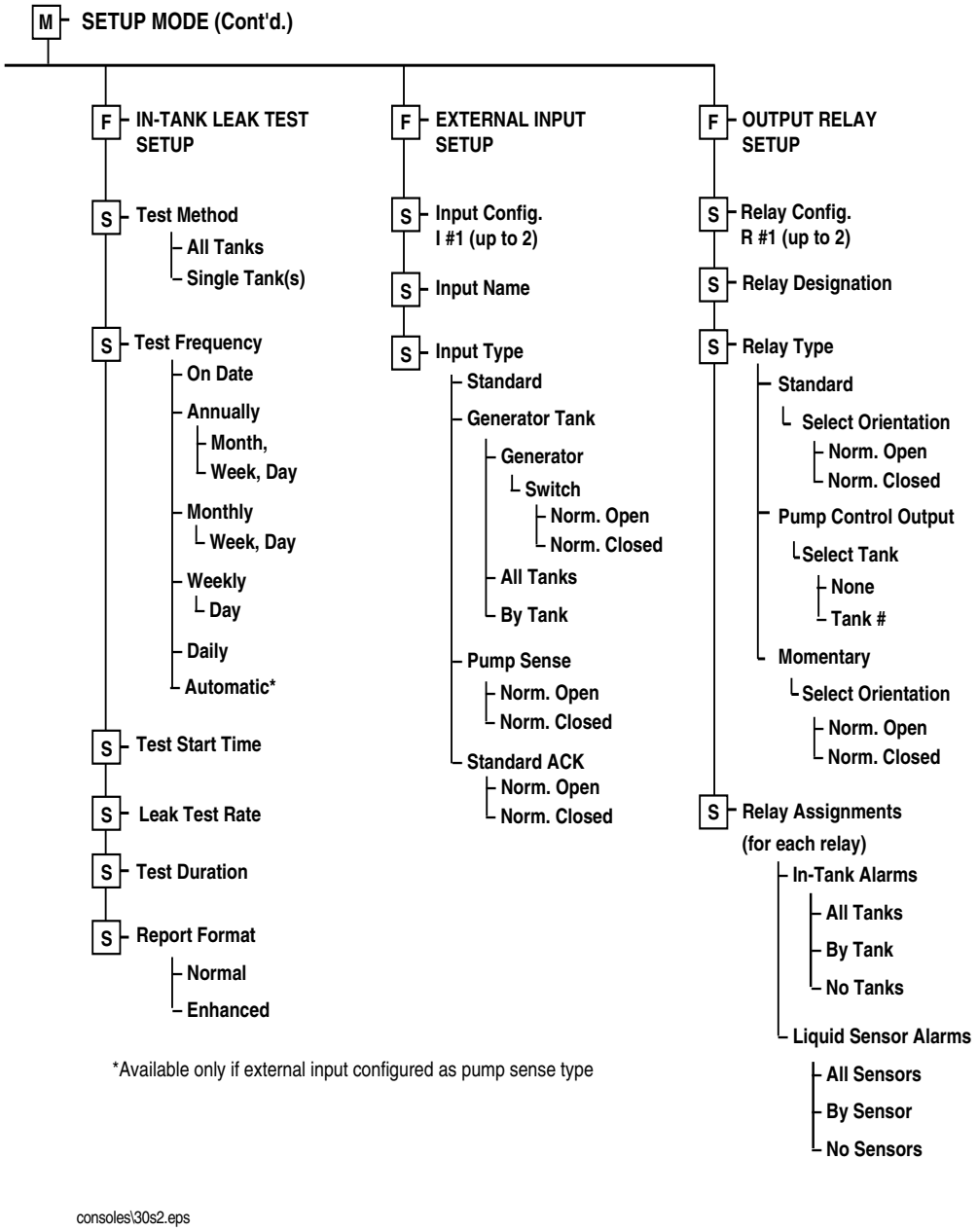


Figure 5. Setup Mode Programming Chart for TLS-300 (continued)

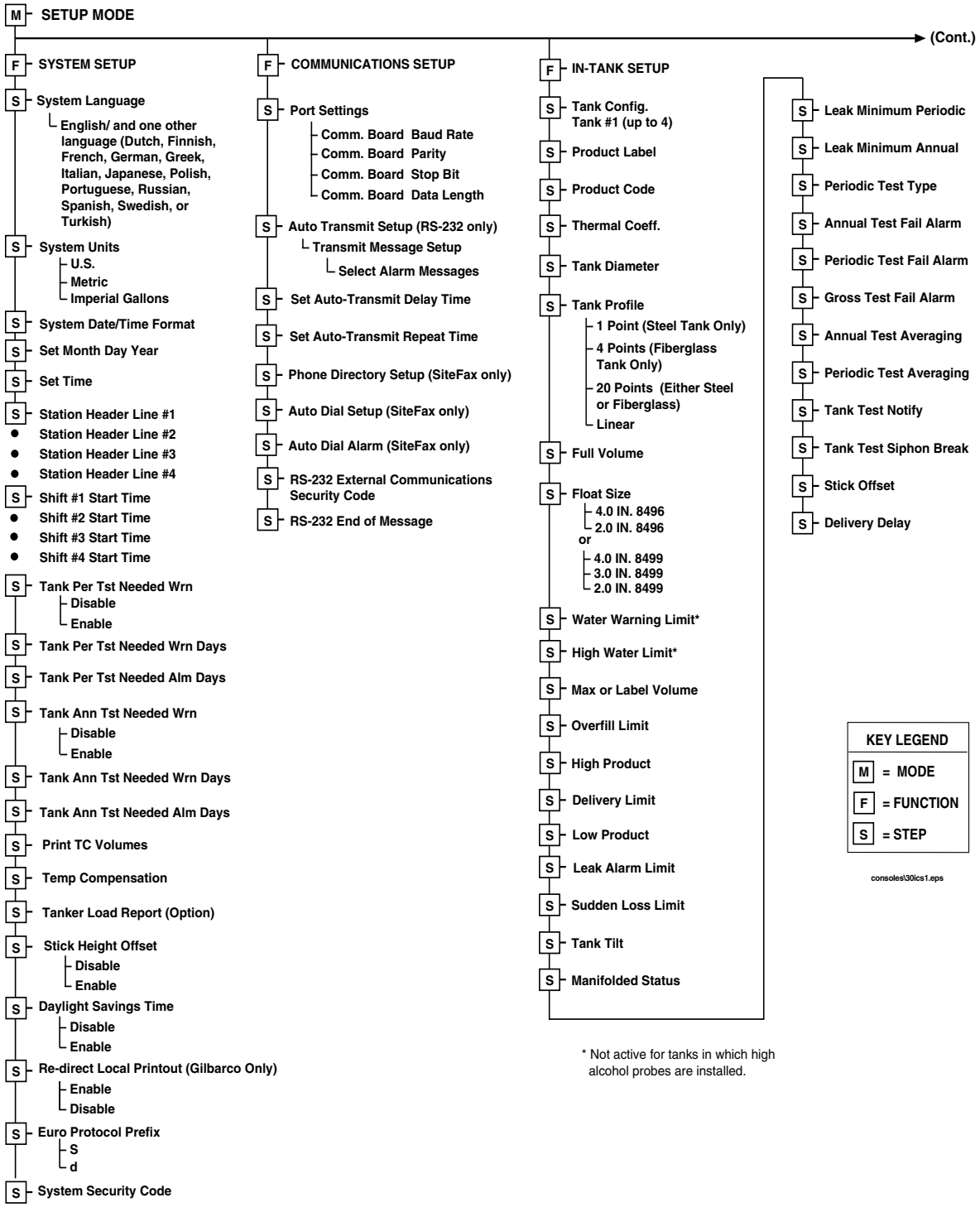


Figure 6. Setup Mode Programming Chart for TLS-300C, TLS-300i, and TLS-300J

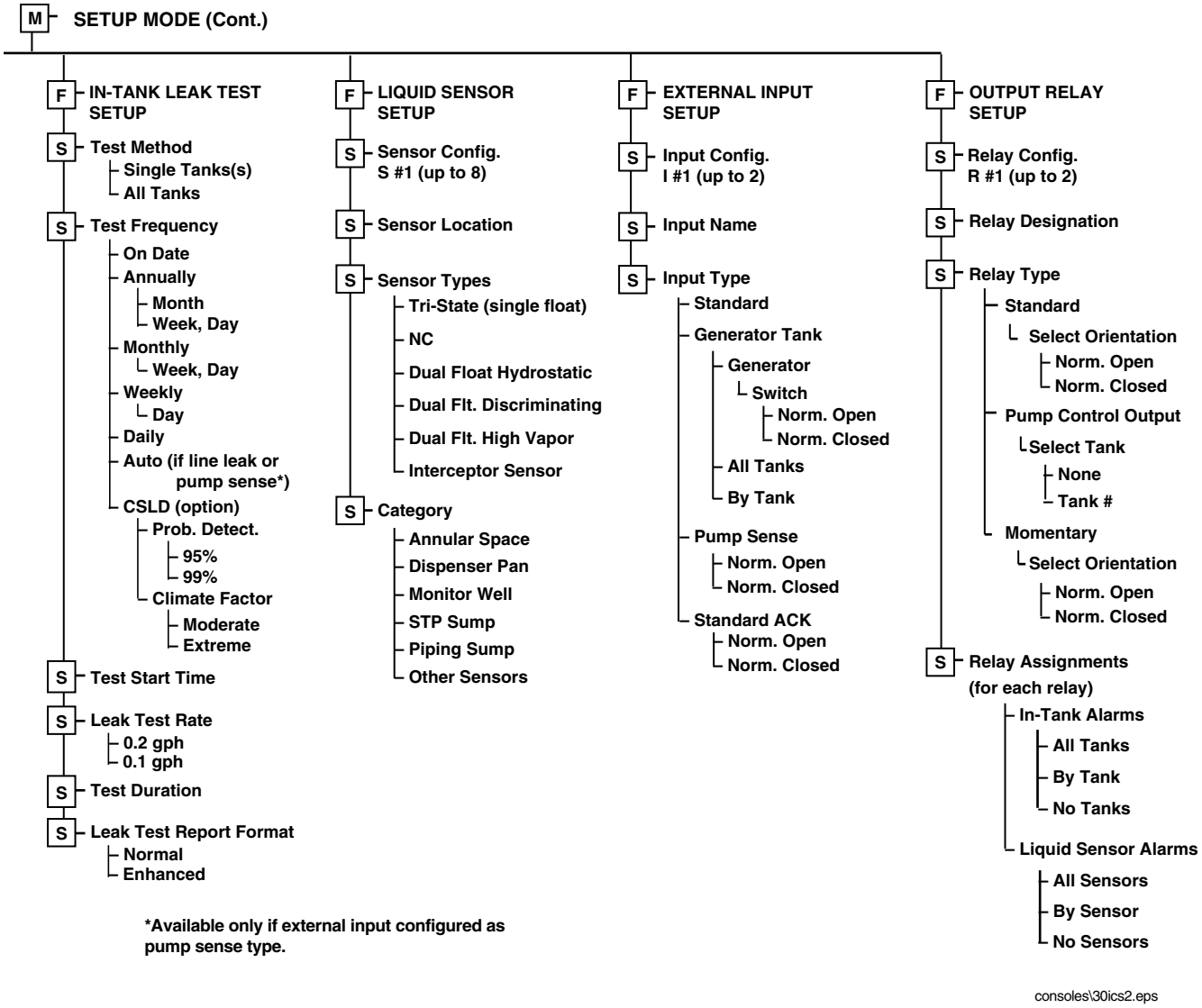


Figure 6. Setup Mode Programming Chart for TLS-300C, TLS-300i, and TLS-300J (continued)

Prior to Applying AC Power to the Console

Please read this section before applying AC power to the console.

Security Code Enable/Disable

Access to all setup functions through either the front panel and/or the RS-232 interface can be restricted by the use of security codes. Once this feature has been activated, only persons knowing the user-designated codes may enter or change any setup values.

This feature will prevent unauthorized persons from intentionally or accidentally entering or changing setup values.

Two separate Security Codes may be entered—one to restrict access to the Setup Mode from the front-panel keyboard and another to restrict remote access through the RS-232 interface module.

Open the left front panel door and locate slide switch S1 and DIP switch S2 [see Figure 7].

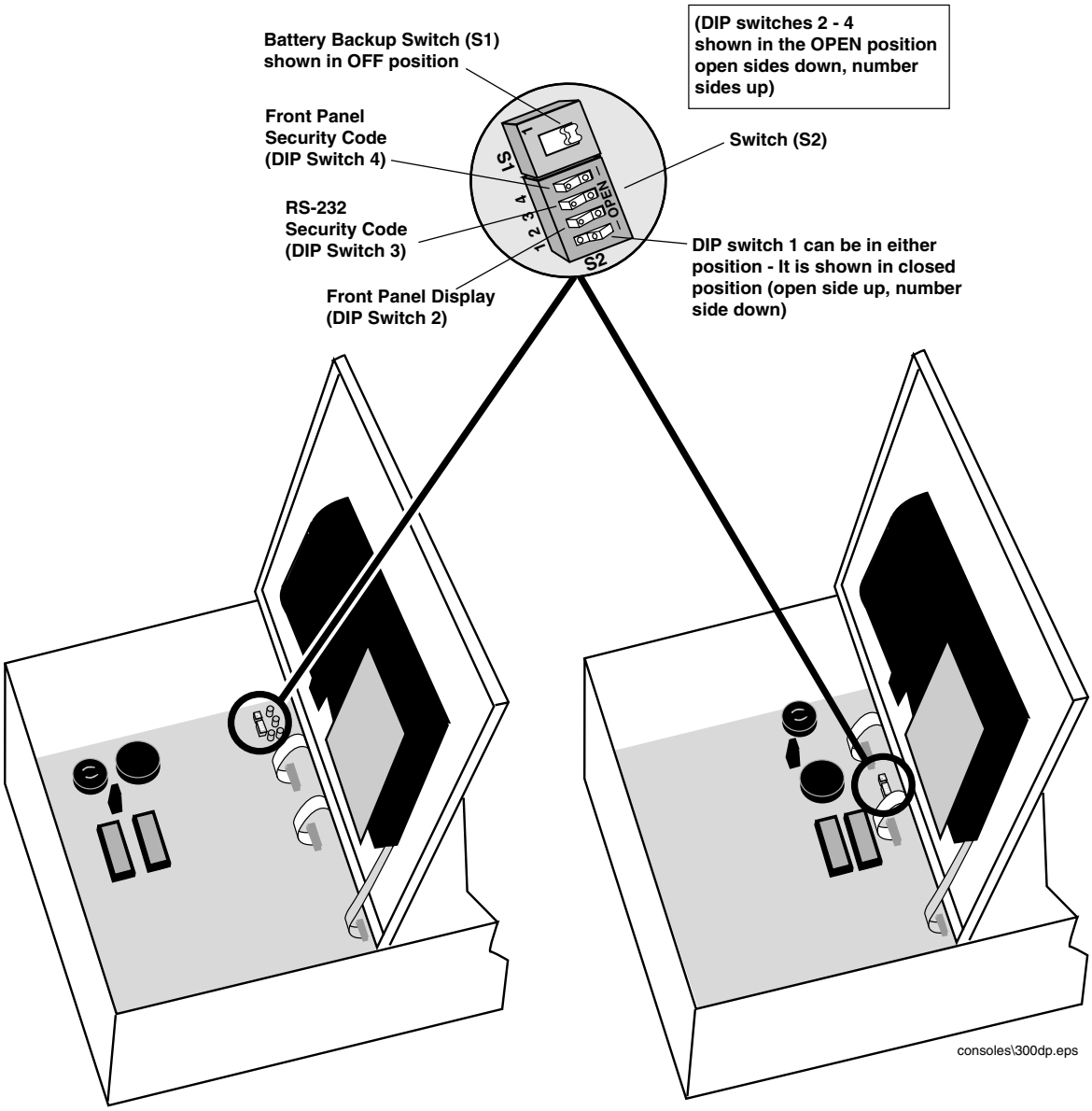


Figure 7. Locating Slide Switch S1 and DIP Switch S2

DIP switch #1 is not used at this time and may be in either position.

DIP switch #2 controls the power to the front-panel display and must be in the OPEN position!

If you want to *enable* the security code feature and require entering of the security code(s) for front-panel and/or RS-232 system setup access, make sure that switches #3 and/or #4 on DIP switch S2 are in the Closed position.

If you want to *disable* the security code feature and allow front panel and RS-232 system setup access, make sure that switches #3 and #4 on DIP switch S2 are both in the OPEN position (See Figure 7).

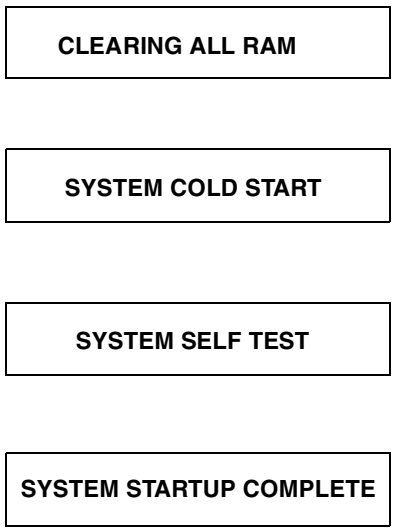
Battery Backup

The system is equipped with an internal backup battery to protect all setup and operating data in the event of an AC-power interruption.

The system is shipped from the factory with the Battery Backup slide switch S1 in the OFF position [see Figure 7]. Make sure this switch is in the OFF position before applying ac power to the console.

Applying AC Power to the Console

1. Open the left front door of the console. With the Battery Backup switch S1 in the OFF position [see Figure 7] turn on AC power to the console.
2. The console front panel display will cycle through the following screens.



At this point the ALARM audible beeper and front panel light will begin turning on and off, and the printer will printout:

```
**** SYSTEM RESET ****
MMM DD, YYYY HH:MM  XM
```

and the front panel display will read:

MMM DD, YYYY HH:MM:SS XM
BATTERY IS OFF

3. . Press the ALARM/TEST key to silence the audible alarm. Slide the Battery Backup switch S1 to the ON position. After a few seconds, the alarm light will go out and the front panel display will read:

MMM DD, YYYY HH:MM:SS XM
ALL FUNCTIONS NORMAL

4. You can now begin the System Setup procedure.

System Setup

Programming Guidelines

- **Programming Instructions.** All the programming instructions in this manual assume that this is a **first-time (cold-start) setup**.
- **Sample Screens.** The screens that are shown in these setup procedures display factory-set values or choices. If you change these settings as you set up the system for your application, your setup values or choices will appear in the display when the Setup Mode is re-entered.
- **Key Functions.** The keys used to revise any setting are the same as used during initial programming, although the key sequences may change.
- **Multiple Choice Entries.** The setup procedure mentioned in this manual instructs you to press the STEP key to accept a default value and move to the next setup parameter. When you are offered multiple choices, press the CHANGE key to display these alternate choices, and the ENTER key to confirm the choice you decide upon.

Automatic Return to Operating Mode

The system will automatically return to the Operating Mode status display in 15 minutes if no activity takes place while the system is in the Setup or Diagnostic Mode. Mark where you are in the setup sequence if you are going to be away for longer than this.

Setup Data Warning

When you exit the Setup Mode, a Setup Data Warning will appear in the Status Display and the yellow warning light will flash if insufficient or invalid setup data has been entered. In systems equipped with a printer, a Setup Data Warning report will also be printed.

The display and report will identify the source of the warning (i.e. Tank 1, Sensor 4, etc.), and the warning indicators will remain active until the cause has been corrected.

Printing a Setup Data Report

You should print and save a setup data report once all setup procedures are complete. This report will be a record of all setup values entered into this system and save valuable time if system memory is lost due to a simultaneous interruption of AC and battery power, or due to a problem within the system.

To print a Setup Data Report, press the MODE key to display the Setup Mode main screen. Then press the PRINT key.

Selecting the System Setup Function

To select System Setup, press FUNCTION until you see the message:

```
SYSTEM SETUP
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

System Language

If necessary, press STEP until you see the message:

```
SYSTEM LANGUAGE
ENGLISH
```

Once you choose a language, the system displays and prints all information in that language. Available language choices depend on the language set specified when the system was ordered. The available language sets are:

- ❑ English/Dutch
- ❑ English/French
- ❑ English/Finnish
- ❑ English/German
- ❑ English/Greek
- ❑ English/Italian
- ❑ English/Japanese
- ❑ English/Polish
- ❑ English/Portuguese
- ❑ English/Russian
- ❑ English/Spanish
- ❑ English/Swedish
- ❑ English/Turkish

To choose English, press STEP. (The system displays the SYSTEM UNITS message.) To choose an alternate language, press CHANGE, in response to the

SYSTEM LANGUAGE message, and press ENTER. The system displays the message:

```
[Selected Language]
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

System Units

If necessary, press STEP until you see the message:

```
SYSTEM UNITS
U.S.
```

You can set the system units to U.S. units (gallons, gal/hour, inches, °F), metric units (liters, liters/hour, millimeters, °C), or imperial gallons (imperial gallons, imp. gal/hour, inches, °F).

NOTE: If you change the System Units after entering other quantitative setup values, the system converts values to the new units. The Date format also changes according to your selection of System Units.

To choose U.S. units, press STEP. (The system displays the SET DATE message.)

To choose metric, press CHANGE in response to the SYSTEM UNITS message and press ENTER. To choose imperial gallons, press CHANGE twice in response to the SYSTEM UNITS message and press ENTER. The system confirms your choice with the message:

```
[Selected Units]
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Setting the Date and Time Format

If necessary, press STEP until you see the message:

```
SYSTEM DATE/TIME FORMAT
MON DD, YYYY HH:MM:SS xM
```

To accept the format shown, press STEP. (The system displays the SET TIME message).

Available date/time formats are:

- ❑ MON DD YYYY HH:MM:SS (APR 01 1997 10:02:30)
- ❑ MM-DD-YY HH:MM:SS xM (04-01-97 10:02:30 AM); xM is AM or PM
- ❑ MM-DD-YY HH:MM:SS (04-01-97 10:02:30)
- ❑ DD-MM-YY HH:MM:SS (01-04-97 10:02:30)
- ❑ YY-MM-DD HH:MM:SS (97-04-01 10:02:30)

Press CHANGE until the desired format is shown, then press ENTER. Press STEP to continue.

NOTE: You need to exit the Setup Mode to see your changes.

Current Date

If necessary, press STEP until you see the message:

```
SET: MONTH DAY YEAR
DATE: XX/XX/XXXX
```

To accept the date shown, press STEP. (The system displays the SET TIME message).

To change the date shown, press CHANGE, enter the correct date by first entering the month then the day then the year following the format shown on the display, then press ENTER. The system confirms your entry with the message:

```
DATE: XX/XX/XXXX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

NOTE: You need to exit the Setup Mode to see your changes.

Current Time

If necessary, press STEP until you see the message:

```
SET TIME
TIME: XX:XX AM PM
```

To accept the time shown, press STEP. (The system displays the ENTER STATION HEADER message.)

To set a different time, press CHANGE and enter the correct time from 12:00 to 11:59 then am or pm. (Press the Left or Right Arrow to select AM or PM). Press ENTER. The system confirms your entry with the message:

```
TIME: XX:XX XM
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

NOTE: You need to exit the Setup Mode to see your changes.

Report Headers

If necessary, press STEP until you see the message:

```
ENTER STATION HEADER
#1:
```

NOTE: The header can be up to four lines with 20 characters per line. Use the header to identify site location, telephone number, etc. (See "Using the Alphanumeric Keys" on page 3-3 for instructions on how to enter alphanumeric data.)

If you do not want a header for reports, press STEP. The system displays the SHIFT START TIME message.)

To create a header, press CHANGE in response to the ENTER STATION HEADER message. Enter up to 20 characters for the first line. Press ENTER. The system confirms your entry with the message:

```
#1: [1st Line Of Header]
PRESS <STEP> TO CONTINUE
```

To enter additional header lines, press STEP and repeat the above procedure up to three more times for lines 2, 3, and 4.When you finish entering the header, press STEP to continue.

Shift Start Times

If necessary, press STEP until you see the message:

```
SHIFT #1 START TIME
TIME: DISABLED
```

Setting shift start times can ease shift changes and improve fuel inventory management. At each programmed time, the system automatically prints a complete inventory report and stores it in memory.

NOTE: At least one Shift Start Time must be entered to activate the "Last Shift Inventory" feature. If you have fewer than three shifts and wish to receive a day-end inventory report at the end of the final shift, use the next shift start time as the day-end time. The system automatically prints a final inventory.

To leave a shift start time disabled, press STEP. (The system displays the SHIFT START TIME message for the next shift.)

To set a start time for shift 1, press CHANGE, and enter the shift 1 start time. Press the Left or Right Arrow to select AM or PM. Then press ENTER. The system confirms your entry with the message:

```
TIME: XX:XX:XM
PRESS <STEP> TO CONTINUE
```

Press STEP. The system displays the SHIFT START TIME message for the next shift:

```
SHIFT #2 START TIME
TIME: DISABLED
```

Repeat the above procedures to enter or disable start times for shifts 2, 3, and 4. When you have entered or disabled a start time for shift 4, the system displays the Tank Periodic Test Needed Warning message.

Tank Periodic Test Needed Warnings

If necessary, press STEP until you see the message:

```
TANK PER TST NEEDED WRN
DISABLED
```

The system monitors the amount of time since the last passed 0.2 gph tank test. By enabling the Tank Periodic Test Needed Warnings, you can have the system provide a warning when a tank test has not been passed, or conducted in a specified number of days (0 to 30), and activate an alarm if a test has not been passed after a warning, or a specified number of days.

Enable Tank Periodic Test Needed Warnings and Alarms

To enable Tank Test Needed Periodic Warnings, press STEP. The system displays the message:

```
TANK PER TST NEEDED WRN
DAYS = XX
```

Press CHANGE, and enter the number of days (0 to 30 days) after which you want the system to warn that a tank test has not been passed. Press ENTER. The system displays the message:

```
DAYS = XX
PRESS <STEP> TO CONTINUE
```

Press STEP. The system displays the message:

```
TANK PER TST NEEDED ALM
DAYS = XX
```

Press CHANGE, and enter the number of days (0 to 30) after which you want an alarm if a test has not been passed. This number should be higher than the number you set for the periodic warning. Press ENTER. The system displays the message:

```
DAYS = XX
PRESS <STEP> TO CONTINUE
```

Press STEP. (The system displays the Tank Annual Test Needed Warnings message.)

Disable Tank Periodic Test Needed Warnings

To disable Tank Periodic Test Needed Warnings, press CHANGE in response to the Tank Annual Test Needed Warnings Enabled message. The system now displays:

```
TANK PER TST NEEDED WRN
DISABLED
```

Press ENTER. The system confirms your choice with the message:

```
DISABLED
PRESS <STEP> TO CONTINUE
```

Press STEP to continue. (The system displays the Tank Annual Test Needed Warnings message.)

Tank Annual Test Needed Warnings

If necessary, press STEP until you see the message:

```
TANK ANN TST NEEDED WRN
DISABLED
```

The system monitors the amount of time since the last passed 0.1 gph tank test. By enabling Tank Annual Test Needed Warnings, you can have the system provide a warning when a 0.1 gph tank test has not been passed or conducted in a specified number of days (0 to 365) and activate an alarm if a test has not been passed after a warning, or a specified number of days.

To keep Tank Annual Test Needed Warnings disabled, press STEP. (The system displays the PRINT TC VOLUMES message.)

Enable Tank Annual Test Needed Warnings and Alarms

To enable Tank Annual Test Needed Warnings, press CHANGE. The system now displays:

```
TANK ANN TST NEEDED WRN
ENABLED
```

Press ENTER. The system confirms your choice with the message:

```
ENABLED
PRESS <STEP> TO CONTINUE
```

Press STEP. The system now displays:

```
TANK ANN TST NEEDED WRN
DAYS = XXX
```

Press CHANGE and enter the number of days after which you want the system to warn that a 0.1 gph tank test has not been passed (0 to 365). Press ENTER. The system displays the message:

```
DAYS = XXX
PRESS <STEP> TO CONTINUE
```

Press STEP. The system displays the message:

```
TANK ANN TST NEEDED ALM
DAYS = XXX
```

The default value is 355 days. If you do not want to accept the default, press CHANGE. Enter the number of days after which you want the system to alarm if a test has not been passed (0 to 365). This number should be higher than the number you set for periodic warning. Press ENTER. The system displays the message:

```
DAYS = XXX
PRESS <STEP> TO CONTINUE
```

Press STEP. (The system displays the PRINT TC VOLUMES message.)

Disable Tank Annual Test Needed Warnings and Alarms

To disable Tank Annual Test Needed Warnings that are already enabled, press CHANGE in response to the Tank Annual Test Needed Warnings Enabled message and press ENTER. The system confirms your choice with the message:

```
DISABLED
PRESS <STEP> TO CONTINUE
```

Press STEP continue. (The system displays the PRINT TC VOLUMES message.)

Print TC Volumes

If necessary, press STEP until you see the message:

```
PRINT TC VOLUMES
ENABLED
```

Use this display to enable or disable the display and printout of TC volumes. Press STEP to accept or CHANGE and ENTER to disable this feature. The system confirms your choice with the message:

```
DISABLED
PRESS <STEP> TO CONTINUE
```

Temperature Compensation Value

The system allows you to enter the temperature compensation (TC) value for all volume calculations.

Press STEP to display the message: NOTE: All leak calculations are based on

```
TEMP COMPENSATION
VALUE (DEG F): +060.0
```

the TC value you enter. This value is determined by your location. In the U.S., the TC value used is normally 60°F. In other countries, this value may differ. Canada, for example, uses a slightly lower value.

To accept the default value of 60°F, press STEP.

To enter a different TC value, press CHANGE. Enter a value between 0 to 120°F-. Press ENTER to confirm your entry. The system displays:

```
VALUE (DEG F): +(TC Value)
PRESS <STEP> TO CONTINUE
```

Tanker Load Report - International Option

The Tanker Load Report is an optional feature. In the ENABLE position, a report is printed after every tanker load is dispensed.

Press STEP to display the message:

```
TANKER LOAD REPORT
ENABLE
```

Press CHANGE to select DISABLE, then ENTER to not automatically print this report. See the Operating Mode chart (Figure 2) in the Operator's Manual to print out a report when you want it.

Stick Height Offset - International Option

The Stick Height Offset is a "reference only" height reading that allows a user programmable offset to be entered that makes the probe height reading "appear" to be the same as the stick height reading. Stick height offset will not be used for volume calculation. If this feature is enabled, you must enter the stick height offset for each tank in the In-Tank Setup section of this manual ("Stick Offset - International Option" on page 8-18).

Press STEP to display the message:

```
STICK HEIGHT OFFSET
DISABLED
```

Press CHANGE, ENTER, then STEP to enable this feature, or Press STEP to leave it disabled and continue.

Daylight Savings Time

This feature allows you to enter Daylight Savings Start and End Dates/Times. Once enabled, the console will automatically adjust for daylight savings time on the dates and times you enter here.

Press STEP to display the message:

```
DAYLIGHT SAVINGS TIME
DISABLED
```

To leave Daylight Savings Time disabled, press STEP. To enable Daylight Savings Time, press CHANGE, ENTER, then STEP to display the Start Date message:

```
START DATE
APR   WEEK1  SUN
```

Press CHANGE then ENTER to select another start date. Press ENTER to accept your selected Start Date. The Start Time message appears:

```
START TIME
TIME: 02:00 AM
```

Press CHANGE then ENTER to select another Start Time. Press ENTER to accept your selected Start Time. The End Date message appears:

```
END DATE
OCT   WEEK 6   SUN
```

Press CHANGE then ENTER to select another End Date. Press ENTER to accept your selected End Date. The End Time message appears:

```
END TIME
TIME:  02:00 AM
```

Press CHANGE then ENTER to select another End Time. Press ENTER to accept your selected End Time.

Re-direct Local Printout

This feature is available only if Gilbarco protocol is used.

Press STEP to display the message:

```
RE-DIRECT LOCAL PRINTOUT
DISABLED
```

This option allows you to send a printout to Gilbarco's printer instead of to the console's printer. The default for this feature is DISABLED. Press CHANGE, then ENTER to change the default to ENABLED. Accept the default if you are not using Gilbarco protocol.

Euro Protocol Prefix

This feature is for European applications only. Press STEP until you see the message:

```
EURO PROTOCOL PREFIX
S
```

Accept the default (S) for the standard Euro Protocol command response prefix. Press CHANGE, then ENTER, to select d which is a special Euro Protocol command prefix.

System Security Code

If necessary, press STEP until you see the message:

```
SYSTEM SECURITY
CODE: 000000
```

The System Security Code is a 6-digit alphanumeric code which should be known only to personnel responsible for the setup, management, and service of the system. If you enable the System Security Code, you will be required to enter this code before you can access any setup or diagnostic function.

If you do n**o**t want to enable the Security Code, the system setup is complete. Press FUNCTION to exit the System Setup function or press STEP to return to the SYSTEM SETUP message.

To enable the System Security Code:

1. Follow the Security Code Enable/Disable procedure in the previous section to make the required DIP switch enable settings,
2. Press CHANGE in response to the first SYSTEM SECURITY CODE message. Enter any six digits for your code and press ENTER. The system confirms your entry with the message:

```
CODE: XXXXXX
PRESS <FUNCTION> TO CONT
```

The system setup is complete. Press FUNCTION to exit System Setup Function.

Communications Setup

The Communications Setup function allows you to enter information for the RS-232 Auxiliary Port Interface Module or SiteFax Modem (if so equipped) in the console's Communications Interface Area.

Selecting the Communications Setup Function

To select Communications Setup, press FUNCTION until you see the message:

```
COMMUNICATIONS SETUP
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Port Settings

In response to the COMMUNICATIONS SETUP message, press STEP until you see the message:

```
PORT SETTINGS
PRESS <ENTER>
```

This display allows you to access the communications settings—Baud Rate, Parity, Stop Bit, etc.—for any board installed in the system communications area.

Baud Rate

Press ENTER in response to the PORT SETTINGS message. The system displays the message:

```
COMM BOARD: 1 (Type)
BAUD RATE: 1200
```

Choose the baud rate that matches the external device connected to the module. For an RS-232, the choices are 300, 1200, 2400, 4800, and 9600.

To accept the rate shown on the display, press STEP. (The PARITY message appears.) To choose another Baud Rate, press CHANGE until you see the

correct baud rate. Then press ENTER to confirm your choice. The system displays the message:

```
BAUD RATE: XXXX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Parity

After you set the baud rate, the system displays the message:

```
COMM BOARD: 1 (Type)
PARITY: ODD
```

Choose the parity that matches the external device connected to the module. The choices are NONE, ODD, and EVEN.To accept the parity shown on the message, press STEP. (The STOP BIT message appears.)To choose another parity setting, press CHANGE until you see the correct parity. Press ENTER to confirm your choice. The system displays the message:

```
PARITY: XXX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Stop Bit

After you set Parity, the system displays the message:

```
COMM BOARD: 1 (Type)
STOP BIT: 1 STOP
```

Choose the stop bit (1 or 2) that matches the external device connected to the module. To accept 1, press STEP. (The system displays the DATA LENGTH message.) To choose 2, press CHANGE and press ENTER. The system confirms your choice with the message:

```
STOP BIT: X STOP
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Data Length

After you set a stop bit, the system displays the message:

```
COMM BOARD: 1 (Type)
DATA LENGTH: 7 DATA
```

Choose the data length that matches the external device connected to the module. The choices are 7 or 8. To accept 7, press STEP. (The system displays the DIAL TYPE message.)To choose 8, press CHANGE and press ENTER. The system confirms your choice with the message:

```
DATA LENGTH: X DATA
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Dial Type (Fax/modem)

After you set the data length, the system displays the message:

```
COMM BOARD: 1 (FXMOD)
DIAL TYPE: TONE
```

NOTE: The above message appears only for systems equipped with a SiteFax Module.

Choose the Dial Type (Tone or Pulse) that matches the receiving device.To accept Tone, press STEP. (The system displays the ANSWER ON message.) To choose Pulse, press CHANGE and press ENTER. The system displays the message:

```
DIAL TYPE: PULSE
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Answer On (Fax/modem)

After you set the dial type, the system displays the message:

```
COMM BOARD: 1 (Type)
ANSWER ON: 1
```

NOTE: The above message appears only for systems equipped with a SiteFax Module.

Use this display to set the number of rings on which the system answers an incoming communication. You may enter 0 through 9 rings. To accept the system default of 1 ring, press STEP. (The system returns to the PORT SETTINGS message.) To choose another value you can toggle the CHANGE key (for 2 through 8 rings) or enter the desired value using the numeric keys. Press ENTER to confirm your entry. The system displays:

```
ANSWER ON: (Number)
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Auto-Transmit Setup

If necessary, press STEP until you see the message:

```
AUTO TRANSMIT SETUP
PRESS <ENTER>
```

The Auto-Transmit Setup feature allows you to set an Automatic Transmit or Transmit/Repeat of any of the following signals—in-tank alarm, sensor alarm, delivery start/stop, input on/off—to an external device via the RS-232 port.

If you enable this feature, the system provides three choices for each type of alarm, delivery, or input feature configured in the system. These choices are: Disable, Transmit, Transmit/Repeat. If you choose Transmit or Transmit/Repeat for any alarm, delivery, or input message, you must enter an Auto-Transmit Delay Time. If you choose Transmit/Repeat for any item, you must enter an Auto-Transmit Repeat Time.

NOTE: The entered Delay and Repeat times apply to all transmit and repeat choices.

Auto-Transmit Method

Press ENTER in response to the AUTO TRANSMIT SETUP message. The system displays the message:

```
TRANSMIT MESSAGE SETUP
PRESS <ENTER>
```

Press ENTER to continue. The system displays:

```
AUTO LEAK ALARM LIMIT
DISABLED
```

Use this display to choose the Auto Transmit setting for the Auto Leak Alarm Limit. To choose DISABLED, press STEP. (The next alarm, delivery, or input appears on the top line of the message.)

To choose Transmit, press CHANGE once in response to the AUTO LEAK ALARM LIMIT message. To choose TRANSMIT/REPEAT, press CHANGE twice. Press ENTER to confirm your choice. The system displays:

```
(Selected Setting)
PRESS <STEP> TO CONTINUE
```

Press STEP to continue. The next alarm, delivery, or input appears on the top line of the message (AUTO HIGHWATER LIMIT). Repeat the above steps to continue specifying the Auto Transmit setting for the remaining alarm, delivery, or input signals:

- ❑ AUTO HIGHWATER LIMIT
- ❑ AUTO OVERFILL LIMIT
- ❑ AUTO LOW PRODUCT
- ❑ AUTO THEFT LIMIT
- ❑ AUTO DELIVERY START
- ❑ AUTO DELIVERY END
- ❑ AUTO EXTERNAL INPUT ON
- ❑ AUTO EXTERNAL INPUT OFF
- ❑ AUTO SENSOR FUEL ALARM
- ❑ AUTO SENSOR WATER ALARM
- ❑ AUTO SENSOR OUT ALARM

When you have specified a Auto Transmit setting for the above items, press STEP. The system displays the TRANSMIT MESSAGE SETUP message. Press STEP to continue.

Auto Delay Time

Press STEP in response to the TRANSMIT MESSAGE SETUP message. The system displays the message:

```
AUTO TRANSMIT MESSAGE
AUTO DELAY TIME: 005
```

NOTE: The above message appears only if you chose Transmit for at least one of the items in the step described above.

Use this display to specify the time interval between any alarm, delivery, or input indication in the system and the time the system sends an Auto-Transmit message. To set the Auto Delay Time, press CHANGE and enter the delay time, in seconds, up to a maximum of 254 seconds. Press ENTER to confirm your entry. The system displays:

```
AUTO DELAY TIME: XXX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Auto Repeat Time

After you set the Auto Delay Time, the system displays the message:

```
AUTO TRANSMIT MESSAGE
AUTO REPEAT TIME: 060
```

NOTE: The above message appears only if you chose Transmit/Repeat for at least one of the items in the steps described above.

Use this display to specify the length of time the system waits before retransmitting a message. To set the Auto Repeat Time, press CHANGE and enter the repeat time, in seconds, up to a maximum of 240 seconds**.** Press ENTER to confirm your entry. The system displays:

```
AUTO REPEAT TIME: XXX
PRESS <STEP> TO CONTINUE
```

Press STEP to return to the AUTO TRANSMIT SETUP message. Press STEP again to continue to the next communications setup function.

Phone Directory Setup (Fax/modem)

If necessary, press STEP until you see the message:

```
PHONE DIRECTORY SETUP
PRESS <ENTER>
```

NOTE: This message appears only for systems equipped with a Site Fax/ Modem Module.

Through the Phone Directory feature, you can program up to 8 telephone numbers for automatic dialing to teletype, facsimile, or computer modems. The system sends specific reports to the programmed telephone numbers.

Receiver Configuration

Press ENTER in response to the PHONE DIRECTORY SETUP message. The system displays the message:

```
RCVR CONFIG
          X X X X X X X X
```

Use this display to tell the system how many phone numbers are to be entered. Press CHANGE twice to configure one receiver. To configure additional receivers, press the Right-Arrow key, then press CHANGE for up to seven more receivers.Press ENTER to confirm your entry. The system displays:

```
          X X X X X X X X
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Receiver Location

After you set the receiver configuration, the system displays the message:

```
ENTER RCVR LOCATION
D1:
```

Enter the location (e.g., MAIN OFFICEFAX) of the selected receiver.To enter the location, press CHANGE. Enter up to 20 alphanumeric characters for the location and press ENTER. The system confirms your entry:

```
D1: (Destination)
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Receiver Telephone Number

After you enter the receiver location, the system displays the message:

```
ENTER RCVR PHONE NO.
D1:
```

You can enter up to 20 numbers for each telephone number. Be sure to include the direct-dial long distance code and any numbers required to access outside lines. Use a comma (,) if the telephone system requires a pause during dialing. When entering receiver telephone numbers, the keypad defaults to numeric mode (e.g., you only press the keys once to enter a digit instead of the 3 or 4 times required in alphanumeric mode). To enter the phone number for the selected receiver, press CHANGE. Enter the number and press ENTER to confirm your entry. The system displays:

```
D1: (Phone #)
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Receiver Type

After you enter the receiver telephone number, the system displays the message:

```
D1:
RCVR TYPE: TELETYPE
```

The system provides three choices for the type of receiver: Teletype, Facsimile, or Computer. A description of each follows:
Teletype: the system calls the receiver telephone number and then transmits the programmed RS-232 reports.
Facsimile: the system calls the receiver telephone number then transmits the report in facsimile format.
Computer: the system calls the receiver telephone number and then waits 1-minute for a command from the computer (receiver).

To choose Teletype, press STEP. (The system displays the SELECT MODEM message.) To choose Facsimile, press CHANGE once. To choose Computer, press CHANGE twice. Press ENTER to confirm your choice:

```
RCVR TYPE: (Selected Setting)
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Dialing Modem

After you set the receiver type, the system displays the message:

```
D1:
SELECT MODEM: 3
```

Your system may have up to three SiteFax Fax/Modem modules in slots 1, 2, and/or 3 of the Communications Interface Area of the console. Enter the slot number in which the SiteFax Fax/Modem module that you are using as the modem for the specified telephone number is installed. To accept the slot number shown, press STEP, or press CHANGE until the correct slot number appears, then ENTER to confirm your choice. The system displays:

```
SELECT MODEM: [Selection]
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Retry Number

After you select the modem, the system displays the message:

```
D1:
RETRY NUMBER: 00
```

You can specify the number of times the system attempts to redial a telephone number if there is a busy signal, no answer, or incomplete connection. To enter the number, press CHANGE and enter a number between 3 and 99. Press ENTER to confirm your entry. The system displays:

```
DIAL RETRY NUMBER: XX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Retry Delay Time

After you set the retry dial number, the system displays the message:

```
D1:
DIAL RETRY DELAY: 00
```

You can specify the time interval the system waits to redial a telephone number if there is a busy signal, no answer, or incomplete connection.To enter the

interval, press CHANGE and enter the number of minutes between 1 and 60. Press ENTER to confirm your entry. The system displays:

```
DIAL RETRY DELAY: XX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Confirmation Report

After you set the dial retry delay, the system displays the message:

```
D1:
CONFIRMATION REPORT: OFF
```

This message allows you tell the system whether or not to confirm that specified reports have been transmitted successfully. To turn off this feature, so you do not receive confirmations, press STEP. (The system returns to the PHONE DIRECTORY SETUP message.) To turn on the feature, press CHANGE and press ENTER. The system confirms your choice with the message:

```
CONFIRMATION REPORT: OFF
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Setting Up Additional Phone Numbers

After you specify the confirmation report option and press STEP, the system returns to the PHONE DIRECTORY SETUP message. If you have additional receivers to set up, press ENTER until the system displays the RCVR CONFIG message. Press STEP, then press TANK/SENSOR to choose another receiver. Enter the setup data for this receiver by repeating the procedures described above, beginning with the section entitled “Receiver Location” on page 7-7.

Continue Communications Setup

When you have set up all the phone numbers/receivers, press STEP in response to the PHONE DIRECTORY SETUP message. (The system displays the AUTO DIAL SETUP message.)

Auto-Dial Setup (Fax/modem)

If necessary, press STEP until you see the message:

```
AUTO DIAL SETUP
PRESS <ENTER>
```

NOTE: This message appears only for systems equipped with a SiteFax module and only after Phone Directory Setup is complete.

Using Auto-Dial Setup, you can tell the system what reports to transmit, to whom to transmit, and when to transmit. You can also specify the intervals at which the system transmits this information. You must complete the Phone Directory Setup before proceeding through Auto Dial Setup.

Receiver Report List

Press ENTER in response to the AUTO DIAL SETUP message. The system displays the message:

```
D1: RCVR REPORT LIST
PRESS <ENTER>
```

Use this display to choose the types of status reports that you want to transmit to all programmed telephone numbers or to single telephone numbers. Press ENTER to display the message:

```
D1: RECEIVER NAME
SYSTEM STATUS: NO
```

To exclude System Status reports from transmission to the receiver specified in the first line of the message (D1, D2, etc.), press STEP. (The system displays the next type of report.)To include System Status reports for transmission to the selected receiver, press CHANGE and press ENTER. The system confirms you choice with the message:

```
SYSTEM STATUS: YES
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message for specifying whether or not to transmit the next type of report (PRIORITY HISTORY reports) to the selected receiver.

Repeat the steps described in the previous paragraph for each type of report. The list of reports may include:

- ❑ SYSTEM STATUS
- ❑ NONPRIORITY HISTORY
- ❑ INVENTORY
- ❑ LEAK DETECT
- ❑ CSLD REPORT
- ❑ PRIORITY HISTORY
- ❑ IN-TANK STATUS
- ❑ DELIVERY
- ❑ SHIFT INVENTORY
- ❑ LAST DELIVERY

When you have specified each type of report, press STEP to return to the RCVR REPORT LIST message. If you want to transmit reports to additional receivers, press ENTER to redisplay the message:

```
D1: RECEIVER NAME
SYSTEM STATUS: NO
```

Press TANK/SENSOR to select another receiver. Repeat the steps described above to select the types of reports to send to the selected receiver. When you have selected reports to transmit to all the receivers that you want, press STEP in response to the RCVR REPORT LIST message. (The system displays the AUTO DIAL METHOD message.)

Auto Dial Method: All Phones/Single Phone

When you press STEP in response to the RCVR REPORT LIST message, the system displays the message:

```
AUTO DIAL METHOD
ALL PHONES
```

You can send the selected reports using the same frequency for all phone numbers (receivers) or using different frequencies for phone numbers. To choose All Phones, press STEP. The system displays the ON DATE message for All Receivers:

```
ALL RCVRS
ON DATE
```

To transmit reports using different frequencies, press CHANGE in response to the AUTO DIAL METHOD message and press ENTER. The system confirms your choice with the message:

```
SINGLE PHONE
PRESS <STEP> TO CONTINUE
```

Press STEP. The system displays the message:

```
SINGLE RCVR: D1
ON DATE
```

NOTES: If you choose Single Phone, you must enter report transmission frequency information for each receiver individually. The screen examples shown in this procedure assume that you have selected All Phones. If you choose Single Phone, the phrase "ALL RCVR" is replaced on each screen by the selected receiver number (RCVR 1, RCVR 2, etc.).

Auto-Dial Frequency: Specific Date

When you press STEP in response to the AUTO DIAL METHOD message, the system displays the message:

```
ALL RCVRS
ON DATE
```

Use this display to select the Auto-Dial Frequency. You may choose among the following frequency options:

- ON DATE: Lets you enter a specific date and time to transmit the reports.
- ANNUALLY: Lets you select the month, week (1, 2, 3, or 4), and day you wish to transmit reports.
- MONTHLY: Lets you select the week (1, 2, 3, or 4) and day you wish to transmit reports.
- WEEKLY: Lets you select the day you wish to transmit weekly reports.
- DAILY: Lets you select the time of day you wish to transmit daily reports.

To set the Auto-Dial Frequency to On Date, press STEP. (To set the frequency to Annually, Monthly, Weekly, or Daily, follow the procedures described in the corresponding section below.) The system displays the message:

```
DIAL ON DATE: ALL RCVRS
DATE: XX/XX/XXXX
```

Press CHANGE, and enter the date on which you want the reports to be transmitted. Enter the date in the format MM/DD/YYYY. Press ENTER to confirm the date:

```
DATE: XX/XX/XXXX
PRESS <STEP> TO CONTINUE
```

Press STEP to enter the time you want the reports to transmit. The system displays the message:

```
DIAL TIME: ALL RCVRS
TIME: XX:XX AM PM
```

Press CHANGE, and enter the time. Press the Right Arrow key to choose AM or PM. Press ENTER to confirm your entry:

```
TIME: XX:XX AM PM
PRESS <STEP> TO CONTINUE
```

Press STEP to continue. If you are using the All Phones method or have set up all the receivers for Single Phone, refer to the section entitled "Continue Communications Setup" on page 7-18. If you are using the Single Phone method and have additional receivers to set up, refer to the section entitled "Setting Up the Frequency for Additional Receivers (Single Phone Only)" on page 7-17.

Auto-Dial Frequency: Annually

If necessary, press STEP until you see the message:

```
ALL RCVRS
ON DATE
```

To transmit the reports annually, press CHANGE and press ENTER. The system displays the message:

```
ANNUALLY
PRESS <STEP> TO CONTINUE
```

Press STEP to continue setting the annual transmission. The system displays the message:

```
ANNUALLY: ALL RCVRS
JAN WEEK1 MON
```

To set the date of the annual transmission, press CHANGE until the month during which you want to transmit the reports appears. Press the Right Arrow key. Press CHANGE until the week during which you want to transmit the reports appears, and press the Right Arrow key. Press CHANGE until the day

on which you want to transmit the reports appears. Press ENTER to confirm the date:

```
MONTH WEEK DAY
PRESS <STEP> TO CONTINUE
```

For example, if you chose to transmit the reports on the Friday of the first week of June, the system would display the message:

```
JUNE WEEK 1 FRI
PRESS <STEP> TO CONTINUE
```

Press STEP to continue. If you are using the All Phones method or have set up all the receivers for Single Phone, refer to the section entitled "Continue Communications Setup" on page 7-18. If you are using the Single Phone method and have additional receivers to set up, refer to the section entitled"Setting Up the Frequency for Additional Receivers (Single Phone Only)" on page 7-17.

Auto-Dial Frequency: Monthly

If necessary, press STEP until you see the message:

```
ALL RCVRS
ON DATE
```

Press CHANGE twice and press ENTER. The system displays the following message:

```
MONTHLY
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message:

```
MONTHLY: ALL RCVRS
WEEK1 MON
```

To set the date of the monthly transmission, press CHANGE until the week during which you want to transmit the reports appears and press the Right Arrow key. Press CHANGE until the day on which you want to transmit the reports appears. Press ENTER to confirm the date:

```
WEEK DAY
PRESS <STEP> TO CONTINUE
```

Press STEP to continue. If you are using the All Phones method or have set up all the receivers for Single Phone, refer to the section entitled "Continue Communications Setup" on page 7-18. If you are using the Single Phone method and have additional receivers to set up, refer to the section entitled "Setting Up the Frequency for Additional Receivers (Single Phone Only)" on page 7-17.

Auto-Dial Frequency: Weekly

If necessary, press STEP until you see the message:

```
ALL RCVRS
ON DATE
```

Press CHANGE three times and press ENTER. The system displays the message:

```
WEEKLY
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message:

```
WEEKLY: ALL RCVRS
MON
```

To set the date of the weekly transmission, press CHANGE until the day on which you want to transmit the reports appears. Press ENTER to confirm the date:

```
DAY
PRESS <STEP> TO CONTINUE
```

Press STEP to continue. If you are using the All Phones method or have set up all the receivers for Single Phone, refer to the section entitled "Continue Communications Setup" on page 7-18. If you are using the Single Phone method and have additional receivers to set up, refer to the section entitled "Setting Up the Frequency for Additional Receivers (Single Phone Only)" on page 7-17.

Auto-Dial Frequency: Daily

If necessary, press STEP until you see the message:

```
ALL RCVRS
ON DATE
```

Press CHANGE four times and press ENTER. The system displays the message:

```
DAILY
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message:

```
DAILY: ALL RCVRS
TIME: DISABLED
```

Press CHANGE and enter the time at which you want to transmit the reports. Press the Right Arrow key to choose AM or PM. Press ENTER to confirm your entry:

```
TIME: (Time)
PRESS <STEP> TO CONTINUE
```

Press STEP to continue. If you are using the All Phones method or have set up all the receivers for Single Phone, refer to the section entitled "Continue Communications Setup" on page 7-18. If you are using the Single Phone method and have additional receivers to set up, refer to the section entitled "Setting Up the Frequency for Additional Receivers (Single Phone Only)" below.

Setting Up the Frequency for Additional Receivers (Single Phone Only)

If necessary, press STEP until you see the message:

```
D1: RCVR REPORT LIST
PRESS <ENTER>
```

Press STEP until you see the message:

```
SINGLE RCVR: D1
ON DATE
```

Press TANK/SENSOR to choose the destination (D1, D2, etc.) you want to set up. Choose the frequency you want for this destination by following the appropriate Auto-Dial Frequency instructions, beginning on page 7-13.

NOTE: Do not press ENTER after changing the destination.You must choose the Auto-Dial Frequency, as described in the previous sections, before pressing ENTER.

Continue Communications Setup

If you are finished setting up the Auto-Dial Frequency, press STEP, if necessary, until you see the message:

```
AUTO DIAL SETUP
PRESS <ENTER>
```

Press STEP to continue. (The system displays the AUTO DIAL ALARM SETUP message.

Auto-Dial Alarm Setup (Fax/modem)

Note: *Before you set up this feature, you must enter information for the In-Tank Setup function and set up all the sensors in your system. If an alarm occurs while you are setting up this feature and you have not set up in-tank and sensor information yet, the system will try to send a report. This action may cause a system lockout.*

If necessary, press STEP until you see the message:

```
AUTO DIAL ALARM SETUP
PRESS <ENTER>
```

Through the Auto Dial Alarm Setup, you can tell the system to send reports of alarm conditions to the programmed destinations. Choose No if you do not wish to send a report for a particular alarm condition, or Yes if you do want the alarm reported.

In-Tank Alarms

Press ENTER in response to the AUTO DIAL ALARM SETUP message. The system displays the message:

```
D1: (Destination)
IN-TANK ALARMS: NO
```

To prevent the system from sending In-Tank Alarm reports to the selected destination (D1, D2, etc.), press STEP. (The system displays the alarm group message.)

To make the system send In-Tank Alarm reports to the selected destination, press CHANGE and press ENTER. The system confirms your choice with the message:

```
IN-TANK ALARMS: YES
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message:

```
D1: IN-TANK ALARMS
LEAK: NO TANKS
```

This message shows the first kind of alarm condition for In-Tank Alarms: Leak. You must tell the system whether to send reports about the displayed alarm condition for No Tanks, All Tanks, or Single Tanks. To choose No Tanks, press STEP. (The system displays the next In-Tank Alarm condition.)

To choose All Tanks, press CHANGE once. To choose Single Tanks, press CHANGE twice. Press ENTER to confirm your choice. If ALL TANKS is selected, the system displays:

```
LEAK: ALL TANKS
PRESS <STEP> TO CONTINUE
```

Press STEP to specify the tanks for the next In-Tank Alarm condition (HIGH WATER). Repeat the steps described above for each of the following In-Tank Alarm conditions:

- ❑ HIGH WATER
- ❑ LOW PRODUCT
- ❑ HI PRODUCT
- ❑ PROBE OUT
- ❑ DLVY NEEDED
- ❑ GROSS FAIL
- ❑ ANNUAL FAIL
- ❑ ANN NEED WN
- ❑ ANN NEED AL
- ❑ NoIDLE TIME
- ❑ CSLD INCR
- ❑ OVERFILL
- ❑ SUDDEN LOSS
- ❑ INVALID HGT
- ❑ WATER WARN
- ❑ MAX PRODUCT
- ❑ PERIOD FAIL
- ❑ PER NEED WN
- ❑ PER NEED AL
- ❑ TEST NOTIFY
- ❑ SIPHON BRK
- ❑ LOW TEMP

To choose Single Tanks, press CHANGE twice in response to the LEAK: NO TANKS message. Then press ENTER. The system displays the message:

```
LEAK: SINGLE TANKS
PRESS <STEP> TO CONTINUE
```

Press STEP. The system displays:

```
D1: (Destination)
T1: LEAK: NO
```

Press TANK/SENSOR to select the desired tank, then press CHANGE and press ENTER. The system displays the message:

```
R1: T1 LEAK: YES
PRESS <TANK> TO CONTINUE
```

Press TANK/SENSOR to select additional tanks for the In-Tank Leak alarm. When you have specified all tanks for the first In-Tank alarm, press STEP to advance to the next alarm. Repeat the steps described above to assign tanks for each In-Tank alarm. After you have specified tanks for each In-Tank alarm condition, press STEP to advance to the next alarm group. (The system displays the alarm group.)

Remaining Alarm Groups

Continue to step through all of the available alarm groups, selecting the various alarms from the groups that you want to send to the selected destination (D1 D2, etc.). The procedure for bypassing or selecting alarms from each group and then assigning them to a device in that group is the same as discussed for In-Tank alarms above.

The remaining alarm groups/alarms are shown below. Only installed components will display, so some of the alarm groups may not appear.

Liquid Sensor Alarms

If necessary, press STEP until you see the message:

```
D1: (Destination)
LIQUID SENSOR ALMS: NO
```

Select the Liquid Sensor Alarms:

- ❑ FUEL
- ❑ SHORT
- ❑ WATER OUT
- ❑ LOW LIQUID
- ❑ OPEN
- ❑ WATER
- ❑ HIGH LIQUID
- ❑ LIQ WARNING

External Inputs Alarms

If necessary, press STEP until you see the message:

```
D1: (Destination)
EXTERNAL INPUTS: NO
```

Select the External Inputs Alarm:

❑ CLOSED

Receiver Alarms

If necessary, press STEP until you see the message:

```
Q1: (Destination)
RECEIVER ALARMS: NO
```

Select Receiver Alarms:

❑ SERVICE REPORT WARN ❑ ALARM CLEAR WARNING

❑ DELIVERY REPORT WRN

Setting Up Auto-Dial Alarms for Additional Destinations

If necessary, press STEP until you see the message:

```
AUTO DIAL ALARM SETUP
PRESS <ENTER>
```

If you have additional destinations to which to send alarms, press ENTER. The system displays the message:

```
D1: (Destination)
IN-TANK ALARMS: NO
```

Press TANK/SENSOR to select another destination (D1, D2, etc.). Repeat the procedures described above beginning with the section entitled “In-Tank Alarms” on page 7-18.

Security Code

If necessary, press STEP until you see the message:

```
RS-232 SECURITY CODE
CODE: 000000
```

The Communication Security Code is a 6-digit numeric code that prevents unauthorized access through the RS-232 port or internal modem to the system.

NOTE: To activate the RS-232 Security Code feature, switch #3 on DIP switch S2, located on the right-hand side of the communications compartment, must be set in the "closed" position [Figure 7. "Locating Slide Switch S1 and DIP Switch S2" on page 5-2].

If you do not want to enter a security code, press STEP. (The system displays the RS-232 END OF MESSAGE message.)

To enter a code, press CHANGE in response to the RS-232 SECURITY CODE message. Enter a 6-digit code and press ENTER. The system confirms your entry with the message:

```
CODE: XXXXXX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

RS-232 End of Message

If necessary, press STEP until you see the message:

```
RS-232 END OF MESSAGE
DISABLED
```

This feature notifies the receiver that the message is complete. The default value is disabled. To enable the feature so that an end of message character is sent by the RS-232 command, press CHANGE and press ENTER. The system confirms your choice with the message:

```
ENABLED
PRESS <FUNCTION> TO CONTINUE
```

Press FUNCTION to exit.

In-Tank Setup

The In-Tank Setup function allows you to enter information about tanks and the liquid contained in these tanks. It also allows you to set up the monitoring, reporting, and alarm features provided by in-tank probes. You must enter data individually for each tank. The data you enter tells the system the number, location, and types of tanks, and establishes limits used to trigger alarms when the system identifies alarm conditions.

Selecting the In-Tank Setup Function

To select In-Tank Setup, press FUNCTION until you see the message:

```
IN-TANK SETUP
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Tank Configuration

If necessary, press STEP until you see the message:

```
TANK CONFIG - MODULE 1
SLOT #: XXXXXXXX
```

Use the message shown above to tell the system which of the four probe positions on a module are connected to probes.

How the System Configures In-Tank Probes

If in-tank probes are installed, the system recognizes the presence and module slot location of the Probe Interface Module.

As you specify which positions on a module are connected to probes, the system establishes a number for each probe that corresponds to the probe's position on the module. For example, if there is a probe connected to positions 2 and 3 of module 1, the probe for position 2 becomes T2 and the probe for position 3 becomes T3.

To indicate that a probe position on the module is connected to a probe, choose the number corresponding to that position. For example, if the position is 3,

choose 3 for the position. To indicate that a position is not connected to a probe, choose X for that position.

Note: On TLS-300C systems, only the first two probe positions are valid.

Specifying In-Tank Probe Positions

To specify whether position 1 is connected, press CHANGE until the correct choice appears (1 if the position is connected, X if it is not). Press the Right Arrow key to move to position 2 and press CHANGE again until the correct choice appears. Repeat these steps until you have correctly specified all eight probe positions. When you have entered a choice for all positions, press ENTER to confirm your entry The system displays the following message:

```
SLOT # - 1 2 3 4 5 6 7 8
PRESS <STEP> TO CONTINUE
```

Press STEP. The system displays the Enter Product Label message.

Product Labels

If necessary, press STEP until you see the message:

```
ENTER PRODUCT LABEL
T1:
```

Enter the type of fuel (e.g., Diesel, Unleaded, Avgas, etc.) in the selected tank, identified in the second line of the message. To enter the type of fuel in the tank, press CHANGE. Enter an alphanumeric label for any system-compatible fluid fuel. Press ENTER to confirm your entry. The system displays:

```
T1: (Product Label)
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Product Code

If necessary, press STEP until you see the message:

```
T1: (Product Label)
PRODUCT CODE: 1
```

Enter the alphanumeric code used by a point-of-sale terminal or other external device to identify product for inventory control purposes.

NOTE: Many point of sale and pump control devices use 4* to indicate “Four Star” premium grade petrol. The asterisk is entered by pressing the zero key 5 times.

To enter the product code for the selected tank, press CHANGE. Enter the alphanumeric code. Press ENTER to confirm your entry. The system displays:

```
PRODUCT CODE: X
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Coefficient of Thermal Expansion

If necessary, press STEP until you see the message:

```
T1: (Product Label)
THERMAL COEFF: 0.00000
```

To ensure proper leak test performance, you must enter the Coefficient of Thermal Expansion for the fuel in each tank. The system requires these values to establish proper temperature compensation factors during a leak test.

The following table lists the U.S. and Metric coefficients for approved fuels and liquids. NOTE: be careful to enter the correct number of zeros to the right of the decimal point. Incorrect entry can cause test failures and other problems.

Table 3. U.S. and Metric Thermal Coefficients

Product	Thermal Coefficient (U.S. Units)	Thermal Coefficient (Metric Units)
Alcohol	0.00063	0.00114
Aviation Gas	0.00075	0.00135
Diesel (fuel oil #2)	0.00045	0.00081
Ethylene Glycol	0.00037	0.00067
Fuel Oil #4	0.00047	0.00085
Gasohol	0.00069	0.00125

Table 3. U.S. and Metric Thermal Coefficients

Product	Thermal Coefficient (U.S. Units)	Thermal Coefficient (Metric Units)
Gear Oil, 90W	0.00047	0.00085
Hydraulic Oil	0.00047	0.00085
Jet Fuel	0.00047	0.00085
Kerosene (fuel oil #1)	0.00050	0.00090
Leaded	0.00070	0.00126
Motor Oil	0.00047	0.00085
Premium	0.00070	0.00126
Regular Unleaded	0.00070	0.00126
Transmission Fluid	0.00047	0.00085
Turbine Oil	0.00047	0.00085
Water	0.00012	0.00022
Washer Fluid	0.00047	0.00085
Used Oil	0.00044	0.00079

To enter the Thermal Coefficient, press CHANGE and enter the coefficient in U.S. or Metric units, depending on the units specified in System Setup. Press ENTER to confirm your entry. The system displays:

```
THERMAL COEFF: 0.000XX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Tank Diameter

If necessary, press STEP until you see the message:

```
T1: (Product Label)
TANK DIAMETER: 0000.00
```

Enter the inside diameter of the selected tank (for a linear tank, the tank height = tank diameter). You can find this dimension on the Tank Chart. To enter the

diameter, press CHANGE, enter the diameter, then press ENTER to confirm your entry. The system displays:

```
TANK DIAMETER: XXX.XX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Tank Profile

If necessary, press STEP until you see the message:

```
T1: (Product Label)
TANK PROFILE 1PT
```

Use this display to select the number of height/volume values you wish to enter for the tank. The system will use these values, along with the Tank Diameter, to calculate volume readings at heights along the entire length of the probe. Use the following guidelines to enter the Tank Profile:

Steel (flat-ended) tanks:	**1 point MANDATORY** **20 points OPTIONAL**
Fiberglass tanks:	**4 points MANDATORY** **20 points OPTIONAL**
Cylindrical tanks standing on end OR Rectangular tanks:	**Linear**

To accept the Tank Profile shown on the TANK PROFILE message, press STEP. (The system displays the FULL VOL message.)

To change the Tank Profile, press CHANGE until the correct profile appears. Press ENTER to confirm your choice. The system displays:

```
TANK PROFILE: XX PTS
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Full Volume

If necessary, press STEP until you see the message:

```
T1: (Product Label)
FULL VOL: 000000
```

You must enter volumes for the number of points selected in the Tank Profile step. Depending on the number of points you selected in Tank Profile, the system automatically asks for volumes at specific heights.

All tanks must have the volume at 100% height entered. Then, depending on the number of points selected, the system requires other volumes at specified heights. Calculate these values from the Tank Chart.

NOTE: The volumes are to be determined from percentages of height, not percentages of volume. For example, the 75%-Height Volume for a 96-inch 10,000-gallon tank is the volume at 72 inches, not 7500 gallons.

To enter the volume for the selected tank, press CHANGE. Enter the volume in gallons or litres, depending on the units established in System Setup. Press ENTER to confirm your entry. They system displays:

```
FULL VOL: XXXXXX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

If you selected 4 or 20 points for Tank Profile, the system requests a volume for each point. Repeat the procedure described above to enter a value for each volume requested. When all volumes are entered, press STEP.

Float Size

This display requires that you enter the installed mag probe float size.

Mag probe types 8473 have two float size options: 4.0'' 8496 and 2.0'' 8496. Mag probe types 8493 have three float size options: 8499, 8499, and 8499.

The system automatically recognizes which mag probe type you have installed and will display only the correct float options. Press CHANGE to display the float size you installed, then press ENTER to confirm your choice. Press STEP to continue.

Water Warning

If necessary, press STEP until you see the message:

```
T1: (Product Label)
WATER WARNING: 00:0
```

NOTE: This message does not appear for tanks in which high alcohol probes are installed.

Water Warning identifies a high water level in the bottom of the tank [see Figure 8]. It acts as a pre-warning to the High Water Limit. Set this value at a lower level than High Water Limit.

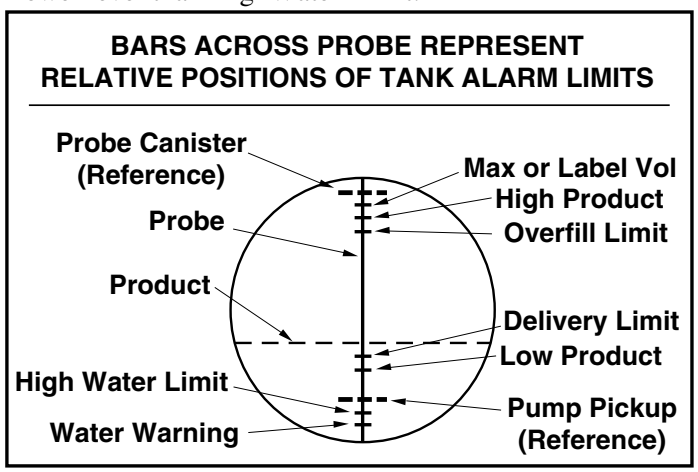


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Figure 8. Relative Positions of Tank Alarm Limits

To enter the Water Warning value for the selected tank, press CHANGE. Enter the limit in inches (5.0 maximum) or millimeters(199 maximum), depending on the units established in System Setup. Press ENTER to confirm your entry. The system displays:

```
WATER WARNING: XX.X
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

High Water Limit

If necessary, press STEP until you see the message:

```
T1: (Product Label)
HIGH WATER LIMIT: 0:0
```

NOTE: This message does not appear for tanks in which high alcohol probes are installed.

When water in the tank rises to this High Water Limit value, the system triggers an alarm. Set this value at a level lower than the pickup for the submersible pump or suction line [see Figure 8].

To enter the High Water Limit value for the selected tank, press CHANGE. Enter the limit in inches (5.0 maximum) or millimeters (199 maximum), depending on the units established in System Setup. Press ENTER to confirm your entry. The system displays:

```
HIGH WATER LIMIT: X.X
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Max or Label Vol

If necessary, press STEP until you see the message:

```
T1: (Product Label)
MAX OR LABEL VOL: 000000
```

Maximum or Label Volume alarm warns when the level of fluid in the tank exceeds the volume you enter here. Set this value at a level higher than the High Level Limit [see Figure 8].

Press CHANGE and enter the value. Press ENTER to confirm your entry. The system displays:

```
MAX OR LABEL VOL: XXXXXX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Overfill Limit

If necessary, press STEP until you see the message:

```
T1: (Product Label)
OVERFILL LIMIT: 000%
```

Overfill Limit warns of a potential overfill only during a bulk delivery. When the volume reaches this limit, the system can activate an on-site overfill alarm and trigger a printout showing the tank #, date, time, and product. Set this percentage no greater than 99% (of the tank's capacity) [see Figure 8].

Press CHANGE. Enter the percent limit and press ENTER to confirm your entry:

```
OVERFILL LIMIT: XXX%
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

High Product

If necessary, press STEP until you see the message:

```
T1: (Product Label)
HIGH PRODUCT: 000%
```

High Product warns when the volume of fluid in the tank exceeds the value you enter here. The High Product alarm occurs whenever this value is exceeded, whether or not a delivery is in progress. This is especially useful in applications such as used oil holding tanks, where the rate of fill can be too gradual for the system to recognize the increase as a delivery and activate the Overfill Limit. It can trigger the same alarm indications as Overfill Limit. Set this limit at a percentage that is between the Overfill Limit percentage and 95% (of the tank's capacity) [see Figure 8].

Press CHANGE. Enter the percent limit. Press ENTER to confirm your entry. The system displays:

```
HIGH PRODUCT: XXX%
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Delivery Limit

If necessary, press STEP until you see the message:

```
T1: (Product Label)
DELIVERY LIMIT: 000%
```

Delivery Limit warns when the level of fluid in the tank drops to a level at which the operator calls for a delivery. Set this percentage at a volume higher than that of the Low Product alarm [see Figure 8].

Press CHANGE. Enter the percent limit. Press ENTER to confirm your entry. The system displays:

Press STEP to continue.

Low Product

If necessary, press STEP until you see the message:

```
T1: (Product Label)
LOW PRODUCT: 000000
```

Low Product warns when volume in a tank recedes to the level you enter here [see Figure 8].

Press CHANGE. Enter the volume. Press ENTER to confirm your entry. The system displays:

```
LOW PRODUCT: XXXXXX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Leak Alarm Limit

If necessary, press STEP until you see the message:

```
T1: (Product Label)
LEAK ALARM LIMIT: 00
```

NOTE: This function appears only on systems equipped with in-tank leak detection.

During a leak test, Leak Alarm Limit warns when the cumulative temperature compensated product loss from a tank reaches the limit value. The system automatically interprets the limit you enter as a negative. It is not necessary to enter the minus (-) sign.

NOTE: The Leak Alarm Limit is intended to identify and warn of large losses of product during a leak test. Small changes in fuel conditions can cause temporary variations in fuel level reading that balance out over the duration of a test in a tight tank.

To prevent false reports and alarms from being triggered, do not set the limit value to identify losses of 0.2 gallons per hour or less during the test period. The Leak Limit should be set to identify losses of 1 gallon per hour or greater.

Consider the leak rate you wish to identify and the length of test when determining a limit value. A limit value of 8 gallons will warn of a 1 gph leak in 8 hours or a 2 gph leak in 4 hours. If you want to detect a leak rate of 1 gph in an 8-hour test, set the limit value at 8 gallons.

To enter the Leak Alarm Limit, press CHANGE. Enter the limit in gallons (from 1 to 99). Press ENTER to confirm your entry. The system displays:

```
LEAK ALARM LIMIT: XX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Sudden Loss Limit

If necessary, press STEP until you see the message:

```
T1: (Product Label)
SUDDEN LOSS LIMIT: 000000
```

NOTE: This function appears only on systems equipped with in-tank leak detection.

Sudden Loss Limit immediately warns of a sudden loss of fuel during a leak test. It is not based on temperature-compensated volume and is intended to identify losses larger than the Leak Alarm Limit. Typically, you should set this limit at 25 gallons, or higher.

To enter the Sudden Loss Limit for the selected tank, press CHANGE. Enter the limit in gallons or liters, depending on the units specified in System Setup. Press ENTER to confirm your entry. The system displays:

```
SUDDEN LOSS LIMIT: XXXXXX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Tank Tilt

If necessary, press STEP until you see the message:

```
T1: (Product Label)
TANK TILT: +000.00
```

Tank Tilt allows you to adjust for a difference between fuel height at the probe location and fuel height at the center of the tank caused by a tilt in the tank. You must enter a minus (-) if the Tank Tilt is a negative value. NOTE: A Tank Tilt value is not required if the probe is located in the center of the tank. Also, If the probe is installed in the center of the tank, the value is 000.00 U.S.; 0000.0 Metric.

Calculating Tank Tilt (H2)

Use the worksheet below to record measurements and perform Tank Tilt calculations for each of the tanks.

1. Stick the tank at the fill riser opening at least three times. Record the average reading in column A of the chart.
2. Before beginning this step, make sure the Tank Tilt in the display = 0. Record the probe's Fuel Height (In-Tank Inventory Function) reading in column B of the chart.
3. Subtract the value entered in column B from the value entered in column A. Record the result in column C.
4. Measure the distance in inches (or millimeters if you use Metric Units) between the probe and fill risers. Record the measurement in column D.
5. Divide the value in column C by column D to determine the pitch. Record the results in column E.
6. Measure the distance in inches or millimetres from the probe riser to the center of the tank. Record the distance in column F.
7. Multiply column E by column F to determine Tank Tilt (E X F = Tank Tilt Value). Record the value in column G.

Tank #	A Stick Gauge Avg. Height @ Fill Riser	B Probe's Fuel Height Reading (Probe Riser)	C (A-B = C)	D Distance Fill to Probe Risers	E Pitch (C / D = E)	F Distance from Probe Riser to Center of Tank	G Tank Tilt* (E x F = G)
1							
2							
3							
4							
5							
6							
7							
8							

*Tank Tilt may be a positive (+) or negative (-) value. If it is a negative value, BE SURE to change the value symbol to minus (-) when entering a negative Tank Tilt value.

Entering the Tank Tilt Value

To enter the Tank Tilt value for the selected tank, press CHANGE. If the value is negative, press the +/- key so a minus (-) sign appears on the display. Enter the value as calculated according to the above procedures (inches or millimeters depending on the units specified in System Setup). Press ENTER to confirm your entry. The system displays:

```
TANK TILT: ±XXX.XX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Manifolded Tank Status

If necessary, press STEP until you see the message:

```
T1: MANIFOLDED STATUS
T#: 00,00,00,00
```

This entry tells the system which tanks are manifolded together, allowing the system to provide cumulative volume information on product stored in a manifolded tank group. You only need to enter this information for one tank in

the group. The system automatically enters the information for the other tanks in the group. For example, if you are entering setup information for Tank #1 as in the display above, and it is manifolded with Tank #3 and Tank #4, you would enter "3" and "4" (Since you are connecting tanks 1, 3, and 4 here, you just STEP past this procedure when you are entering setup for tanks 3 and 4).

Press STEP to continue.

Leak Minimum Periodic

If necessary, press STEP until you see the message:

```
T1: (Product Label)
LEAK MIN PERIODIC: 000%
```

This value tells the system the minimum tank volume required to record a passed periodic test. The value reflects federal, state, and local requirements.

To enter a Leak Minimum Periodic value for the selected tank, press CHANGE. Enter the percent value and press ENTER to confirm your entry. The system displays:

```
LEAK MIN PERIODIC: XXX%
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Leak Minimum Annual

If necessary, press STEP until you see the message:

```
T1: (Product Label)
LEAK MIN ANNUAL: 000%
```

NOTE: This message appears only on systems equipped with in-tank leak detection.

This value tells the system the minimum tank volume required to record a passed annual test. The value reflects federal, state, and local requirements.

To enter a Leak Minimum Annual value for the selected tank, press CHANGE. Enter the percent value and press ENTER to confirm your entry. The system displays:

```
LEAK MIN ANNUAL: XXX%
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Periodic Test Type

If necessary, press STEP until you see the message:

```
T1: PERIODIC TEST TYPE
STANDARD
```

You can choose between Standard and Quick. Choose Standard to run a 2-hour periodic leak test. Choose Quick to perform a periodic test (0.2 gph) in one hour.

To choose Standard, press STEP. (The system displays the ANNUAL TEST FAIL message.) To choose Quick, press CHANGE, then press ENTER. The system displays the message:

```
QUICK
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Annual Test Fail

If necessary, press STEP until you see the message:

```
T1: ANNUAL TEST FAIL
ALARM DISABLED
```

NOTE: This message appears only on systems equipped with in-tank leak detection.

Annual Test Fail alarms when an annual leak test has not passed. You can enable or disable this alarm. To disable the alarm, press STEP. (The system displays the PERIODIC TEST FAIL message.) To enable the alarm for the selected tank, press CHANGE and press ENTER. The system displays the message:

```
ALARM ENABLED
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Periodic Test Fail

If necessary, press STEP until you see the message:

```
T1: PERIODIC TEST FAIL
ALARM DISABLED
```

NOTE: This message appears only on systems equipped with in-tank leak detection.

The Periodic Test Fail feature allows you to disable or enable an alarm that triggers if a 0.2 gph leak test fails. To disable the alarm, press STEP. (The system displays the GROSS TEST FAIL message.) To enable the alarm for the selected tank, press CHANGE and press ENTER. The system displays the message:

```
ALARM ENABLED
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Gross Test Fail

If necessary, press STEP until you see the message:

```
T1: GROSS TEST FAIL
ALARM DISABLED
```

NOTE: This message appears only on systems equipped with in-tank leak detection.

The Gross Test Fail feature allows you to disable or enable an alarm that triggers when a 3.0 gph leak test fails. To disable the alarm, press STEP. (The system displays the ANN TEST AVERAGING message.) To enable the alarm for the selected tank, press CHANGE and press ENTER. The system displays the message:

```
ALARM ENABLED
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Annual Test Averaging

If necessary, press STEP until you see the message:

```
T1: (product Label)
ANN TEST AVERAGING: OFF
```

NOTE: This message appears only on systems equipped with in-tank leak detection.

When on, Annual Test Averaging averages the last ten 0.1 gph in-tank leak tests. To leave the feature off, press STEP. (The system displays the PER TEST AVERAGING message.) To turn on the feature, press CHANGE and press ENTER. The system displays the message:

```
ANN TEST AVERAGING: ON
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Periodic Test Averaging

If necessary, press STEP until you see the message:

```
T1: (Product label)
PER TEST AVERAGING: OFF
```

NOTE: This message appears only on systems equipped with in-tank leak detection.

When on, Periodic Test Averaging activates averaging for the last five 0.2 gph in-tank leak tests. To leave the feature off, press STEP. (The system displays the TANK TEST NOTIFY message.) To turn on the feature, press CHANGE and press ENTER. The system displays the message:

```
PER TEST AVERAGING: ON
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Tank Test Notify

If necessary, press STEP until you see the message:

```
T1: (Product Label)
TANK TEST NOTIFY: OFF
```

NOTE: This message appears only on systems equipped with in-tank leak detection.

When on, the Tank Test Notify feature triggers a warning, allowing the operator to set a relay to shut down the submersible. To leave the feature off, press STEP. (The system displays the TNK TST SIPHON BREAK message.) To turn on the feature, press CHANGE and press ENTER. The system displays the message:

```
TANK TEST NOTIFY: ON
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Tank Test Siphon Break

If necessary, press STEP until you see the message:

```
T1: (Product Label)
TNK TST SIPHON BREAK: OFF
```

NOTE: This message appears only on systems equipped with in-tank leak detection.

NOTE: This option requires that the siphon break valve be installed and energized via alarm relay 1 or 2. Relay programming is required. See "Assignment Method" on page 12-4.

When on, Tank Test Siphon Break allows the operator to perform in-tank leak tests on siphon manifolded tanks. To leave the feature off, press STEP. (The system displays the DELIVERY DELAY message.) To turn on the feature, press CHANGE and press ENTER. The system displays the message:

```
TNK TST SIPHON BREAK: ON
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Stick Offset - International Option

The Stick Offset display appears only if Stick Height Offset was enabled in System Setup ("Stick Height Offset - International Option" on page 6-11). A Stick Offset can be entered for each tank so that the probe (product) height "appears" to be equal to a stick gauge reading of the product height - *This entry is for operator convenience only, and as such it has no bearing on product volume calculations.*

Press STEP to display the message:

```
T1: (Product Label)
STICK OFFSET:  XXXX.XX
```

To determine the value to enter for Stick Offset, refer to the Tank's Tilt Worksheet (if completed), or record the probe height reading and record a stick height reading from the tank. If the probe's fuel height reading is lower than the stick reading, enter the positive difference between the two. If the probe's reading is higher than the stick reading, enter the negative difference between the two. For example, if stick height = 52 and probe height = 48, you enter +4; if stick height = 52 and probe height = 54, you enter -2.

Stick offsets can range from +144 to -144 inches. Press CHANGE, enter the desired offset, then press ENTER.

Delivery Report Delay Time

If necessary, press STEP until you see the message:

```
T1: (Product Label)
DELIVERY DELAY: 01
```

Use this display to set a delay time between the completion of a bulk delivery and the Delivery Increase Report. This feature prevents generation of false reports during the intervals between multi-compartment drops to one tank. The feature also allows fuel to “settle out” after a delivery, which is especially important in manifolded tank groups.

To enter a delay time for the selected tank, press CHANGE. Enter the delay time in minutes (up to 99). Press ENTER to confirm your entry. The system displays:

```
DELIVERY DELAY: XX
PRESS <STEP> TO CONTINUE
```

Setting Up Additional Tanks

If you have additional tanks to set up, press STEP to return to the ENTER PRODUCT LABEL message. Then Press TANK/SENSOR to select another tank. Repeat the setup procedures for the new tank beginning with the section above entitled “Product Labels” on page 8-2 . If you have entered setup information for all tanks, press FUNCTION to exit.

In-Tank Leak Tests

The In-Tank Leak Test Setup function allows you to establish and enter the method, timing, and duration of automatic leak tests.

NOTE: In-Tank Leak tests may also be conducted, as needed, from the Operating mode.

Important!

This section describes procedures to establish and enter In-Tank Leak Test setup data.

If you are using the In-Tank Leak Test feature for underground storage tank regulatory compliance, be sure the leak test limits you establish and enter comply with the test type, accuracy, and frequency requirements as defined by local, county, state, federal and any other regulatory authority governing your site.

In addition, be sure to set the test time for a period when no fueling from or bulk delivery to the tank will occur. Such activity during a leak test procedure will result in inaccurate leak test results.

Selecting the In-Tank Leak Test Setup Function

To select In-Tank Leak Test Setup, press FUNCTION until you see the message:

```
IN-TANK LEAK TEST SETUP
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Leak Test Method: All Tank/Single Tank

If necessary, press STEP until you see the message:

```
LEAK TEST METHOD
ALL TANK
```

You can choose to run In-Tank Leak Tests for all tanks simultaneously, using the same setup information, or you can choose to set up and run leak tests for single tanks. If you choose Single Tank, you may run overlapping tests simultaneously, even though you must enter separate setup information for each tank individually.

For consoles with CSLD--If you choose ALL TANK and plan to choose CSLD as the test frequency, then all tanks in the system must be equipped with 0.1 gph magnetostrictive probes.

To run tests with the same setup information for all tanks, press STEP. The system displays the message:

```
TEST ALL TANK:
ON DATE
```

To run tests with different setup information for each tank, press CHANGE in response to the LEAK TEST METHOD message, so the system displays SINGLE TANK. Press ENTER and press STEP. The system now displays:

```
TEST SINGLE TANK: TANK 1
ON DATE
```

Whether you choose ALL TANK or SINGLE TANK, the procedure for specifying setup information is almost identical. The only difference is that the SINGLE TANK method requires you to specify multiple test setups, one for each tank.

NOTE: The screen examples shown in this procedure assume that you have selected the ALL TANK method. If you choose SINGLE TANK, the tank number (for example “TANK 1”) replaces the phrase “ALL TANK” on each screen.

Leak Test Frequency

As mentioned, when you select a leak test method—ALLTANK in this example—the system displays the message:

```
TEST ALL TANK:
ON DATE
```

NOTE: If you are entering setup information using the SINGLETANK method and have already set up the test for Tank 1, press TANK to choose the tank number you want to set up.

Do NOT press ENTER after changing the tank number. You must choose the Test Frequency, as described below, before pressing ENTER.

You may choose from among the following leak test frequency options:

- ON DATE
- ANNUALLY
- MONTHLY
- WEEKLY
- DAILY
- CSLD (runs leak tests automatically during idle tank times and stores data for leak test reports.)

NOTE: CSLD appears only when the tank is equipped with a 0.1 gph Mag probe, and the system has the **CSLD** software module key installed.

Test On Date

To run the test on a specific date, press STEP in response to the ON DATE message. (To run the test using other frequency options, follow the procedures described in the appropriate section below.) The system displays the message:

```
TEST ON DATES: ALL TANKS
DATE: XX/XX/XXXX
```

Press CHANGE, and enter the date on which you want the tests to run. Enter the date in the format MM/DD/YY. Press ENTER to confirm the date:

```
DATE: XX/XX/XXXX
PRESS <STEP> TO CONTINUE
```

Press STEP to continue. The system displays the START TIME message. Follow the procedure under "Leak Test Start Time" on page 9-9.

Annual Test

To run the tests annually, press CHANGE and press ENTER in response to the ON DATE message:

```
TEST ALL TANK:
ON DATE
```

The system displays the message:

```
ANNUALLY
PRESS <STEP> TO CONTINUE
```

Press STEP to continue setting the annual test. The system displays the message:

```
TEST ANNUALLY: ALL TANKS
JAN WEEK 1 MON
```

To set the date of the annual test, press CHANGE until the month during which you want to perform the test appears, and press the Right Arrow key. Press CHANGE until the week during which you want to perform the test appears and press the Right Arrow key. Press CHANGE until the day on which you want to perform the test appears. Press ENTER to confirm the date:

```
MONTH WEEK DAY
PRESS <STEP> TO CONTINUE
```

For example, if you chose to run the tests on the Friday of the first week of June, the system would display the message:

```
JUNE WEEK 1 FRI
PRESS <STEP> TO CONTINUE
```

Press STEP to continue. The system displays the START TIME message. Follow the procedure under "Leak Test Start Time" on page 9-9.

Monthly Test

To run the tests monthly, **press CHANGE twice**, then press ENTER in response to the ON DATE message:

```
TEST ALL TANK:
ON DATE
```

The system displays the message:

```
MONTHLY
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message:

```
TEST MONTHLY: ALL TANKS
WEEK 1 MON
```

To set the date of the monthly test, press CHANGE until the week during which you want to perform the test appears and press the Right Arrow key. Press CHANGE until the day on which you want to perform the test appears. Press ENTER to confirm the date:

```
WEEK DAY
PRESS <STEP> TO CONTINUE
```

Press STEP to continue. The system displays the START TIME message. Follow the procedure under "Leak Test Start Time" on page 9-9.

Weekly Test

To run the tests weekly, **press CHANGE three times**, then press ENTER in response to the ON DATE message:

```
TEST ALL TANK:
ON DATE
```

The system displays the message:

```
WEEKLY
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message:

```
TEST WEEKLY: ALL TANKS
MON
```

To set the date of the weekly test, press CHANGE until the day on which you want to perform the test appears. Press ENTER to confirm the date:

```
DAY
PRESS <STEP> TO CONTINUE
```

Press STEP to continue. The system displays the START TIME message. Follow the procedure under "Leak Test Start Time" on page 9-9.

Daily Test

To run the tests daily, **press CHANGE four times**, then press ENTER in response to the ON DATE message:

```
TEST ALL TANKS:
ON DATE
```

The system displays the message:

```
DAILY
PRESS <STEP> TO CONTINUE
```

Press STEP to continue. The system displays the START TIME message. Follow the procedure under "Leak Test Start Time" on page 9-9.

Automatic Test

NOTE: This option is available only if the External Input Type is configured as Pump Sense. (See section entitled "External Input Type" on page 11-2.)

To run the tests automatically when Pump Sense is installed, **press CHANGE five times** in response to the ON DATE message:

```
TEST ALL TANK:
ON DATE
```

Press ENTER to confirm your choice:

```
AUTOMATIC
PRESS <STEP> TO CONTINUE
```

If you are setting up the test for AllTanks, the setup is complete. Press FUNCTION to exit.

If you are setting up the test for SingleTanks, the setup is complete for the tank you are setting up. Press STEP and pressTANK to choose the next tank. Return to the beginning of the section "Leak Test Frequency" on page 9-3 and repeat the procedure for the next tank.

CSLD - option

NOTE: CSLD appears only when the tank is equipped with a 0.1 gph Mag probe, and the system has the **CSLD** software module key installed.

If necessary, press STEP until you see the message:

```
TEST ALL TANK:
ON DATE
```

To run the test using the CSLD frequency option, press CHANGE repeatedly until you see CSLD on the display.

Press ENTER to confirm your choice:

```
CSLD
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message:

```
CSLD Pd: ALL TANKS
Pd = 95%
```

You can set the Pd (Probability of Detection) to 95% or 99%. To accept the 95% value, press STEP. (The system displays the CLIMATE FACTOR message.) If "Custom" appears in this field, a special value has been entered remotely. Do not change the selection from Custom. This selection is used primarily for European operations.

To change the value to 99%, press CHANGE, then press ENTER to confirm your choice:

```
Pd = 99%
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message:

```
CLIMATE FACTOR: ALL TANKS
MODERATE
```

The default is Moderate and the other choice is Extreme.

Climate Factor - set to Moderate

Press STEP to display the message:

```
TEST ALL TANKS
CSLD
```

If you are setting up the CSLD test frequency for All Tanks, the setup is complete. Press FUNCTION to exit.

If you are setting up the CSLD test frequency for a Single Tank, the setup is complete for the tank you are setting up. Press TANK to choose the next tank. Return to the beginning of the "CSLD - option" on page 9-7 and repeat the procedure for the next tank.

Climate Factor - set to Extreme

To choose Extreme, press CHANGE, then press ENTER to confirm your choice:

```
EXTREME
PRESS <STEP> TO CONTINUE
```

The following message displays:

```
EVAP COMP: ALL TANK
EVAP COMP: NO
```

If you are setting up the CSLD test frequency for All Tanks, the setup is complete. Press FUNCTION to exit. If you are setting up the CSLD test frequency for a Single Tank, the setup is complete for the tank you are setting up. Press TANK to choose the next tank. Return to the beginning of the "CSLD - option" on page 9-7 and repeat the procedure for the next tank.

Changing Evaporation Compensation to YES should only be used on individual tanks which have exhibited evidence of consistent, extreme vapor loss due to fuel evaporation, and which interferes with normal CSLD leak detection monitoring causing false leak alarms.

If you want to activate CSLD evaporation compensation for a single tank, press CHANGE. Press ENTER to confirm your choice. The following message displays:

```
STAGE II VAPOR: TANK X
STAGE II VAPOR: YES
```

The default for Stage II Vapor is YES. To select No, press CHANGE and ENTER.

Next you must enter CSLD Evaporation Constants for the months of the year. Press FUNCTION until you see the message:

```
SYSTEM SETUP
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message:

```
CSLD EVAP CONSTANTS
PRESS <ENTER>
```

Press ENTER and the Reid Vapor Pressure entry for January displays:

```
REID VAPOR PRESSURE
JAN:  00.0
```

You will need to enter a Reid Vapor Pressure (RVP) value for at least 1 month of the year. The RVP monthly values for your geographical area can be obtained from your local Petroleum Distributor. The range of valid RVP entries is 0 to 15. The default value is 00.0.

Press CHANGE, enter the Reid Vapor Pressure for January, then press ENTER. If you are entering RVPs for selected months, Press STEP to display the month(s) for which you want to enter RVP values. For each month, Press CHANGE, enter the value, then press ENTER to confirm your choice. When you have finished entering the RVP values, press FUNCTION to exit.

Leak Test Start Time

If necessary, press STEP until you see the message:

```
START TIME: ALL TANK
TIME: DISABLED
```

You can enable the test by entering a start time or leave the test disabled.

To leave the test disabled, press STEP. (The system displays the TEST RATE message.)

To enter a start time, press CHANGE in response to the START TIME message. Enter the start time and press the Right Arrow key to select AM or PM. Press ENTER to confirm your entry:

```
TIME: XX:XX XM
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Leak Test Rate

If necessary, press STEP until you see the message:

```
TEST RATE: ALL TANK
0.10 GAL/HR
```

You can set the leak test rate at 0.2 or 0.1 gph. The default test rate is 0.2 gph. The system prints a leak report at the completion of the test.

NOTE: The 0.1 gph option appears only when a 0.1 gph Mag probe is installed.

To accept the default rate of 0.2 gph, press STEP. (The system displays the TEST DURATION message.)

To set the test rate to 0.1 gph, press CHANGE, then press ENTER to confirm your choice. The system displays the following message:

```
TEST RATE: 0.10 GAL/HR
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Leak Test Duration

If necessary, press STEP until you see the following message:

```
TEST DURATION: ALL TANK
DURATION: 02
```

To accept the displayed duration, press STEP. To set another test duration, press CHANGE. We recommend a duration of two hours for 0.2 gph (periodic) tests, and a duration of three hours for 0.1 gph (annual) tests. Enter the test duration in hours and press ENTER to confirm your choice:

```
DURATION: XX
PRESS <STEP> TO CONTINUE
```

Leak Test Report Format

The leak test report format can be set to Enhanced to comply with the California Code of Regulations. The enhanced report will have height, water, temperature, % volume, rate and threshold values in addition to the normal report format.

If necessary press STEP until you see the following message:

```
LEAK TEST REPORT FORMAT
NORMAL
```

To accept the displayed format, press STEP. To select the enhanced test format press CHANGE to toggle to enhanced, then press ENTER to confirm.

Setting Up Additional Tanks

If you are setting up the test for SingleTanks, the setup is complete for the selected tank. To set up additional tanks, press STEP to return to the TEST SINGLE TANK message:

```
TEST SINGLE TANK: TANK 1
ON DATE
```

Then pressTANK to choose the next tank. Repeat the setup procedures described above, beginning with the section titled “Leak Test Frequency” on page 9-3.

If you are setting up the test for AllTanks, or have completed setting up all individual tanks, the setup is complete. Press FUNCTION to exit.

Liquid Sensors

Sensors can be monitored by all consoles except the TLS-300. The Liquid Sensor Setup function allows you to enter information about liquid sensors installed in the interstitial space of double-wall tanks and the sumps of double-wall piping systems. You must enter data individually for each sensor. The information you enter tells the system the number, location, and types of sensors installed.

Selecting the Liquid Sensor Setup Function

To select Liquid Sensor Setup, press FUNCTION until you see the message:

```
LIQUID SENSOR SETUP
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Liquid Sensor Configuration

If necessary, press STEP until you see the message:

```
SENSOR CONFIG - MODULE 1
SLOT # - X X X X X X X X
```

Use this display to tell the system which liquid sense wire positions on a module are connected to liquid sensors.

NOTE: If no liquid sensors are installed, this function is not available.

How the System Configures Liquid Sensors

If liquid sensors are installed, the system will recognize the presence and module slot locations of Interstitial Sensor Interface Modules. (Refer to Figure 2 on page 2-5 to see the module and slot locations.)

As you specify which liquid sense wire positions on a module are connected to liquid sensors, the system establishes a number for each liquid sensor. For example, if there is a liquid sensor in positions 3 and 5 of module 1, the sensor in position 3 becomes L3 and the sensor in position 5 becomes L5.

To indicate that a liquid sensor position is connected, choose the number corresponding to that position. For example, if the position is 3, choose 3 for the position. To indicate that a position is not connected, choose X for that position.

Specifying Liquid Sensor Positions

To specify whether the first position is connected, press CHANGE until the correct choice appears (1 if the position is connected, X if it is not). Press the Right Arrow key to move to position 2 and press CHANGE again until the correct choice appears. Repeat these steps until you have correctly specified all sensor positions. When you have entered a choice for all positions, press ENTER to confirm your entry. The system displays the following message:

```
SLOT # - X X X X X X X X
PRESS <STEP> TO CONTINUE
```

Press STEP. The system displays the ENTER SENSOR LOCATION message.

Liquid Sensor Location

If necessary, press STEP until you see the message:

```
ENTER SENSOR LOCATION
L1:
```

To enter the location of a liquid sensor, pressTANK repeatedly until the sensor you want appears on the second line of the message (L1, L2, L3, etc.). Press CHANGE and enter the location (up to 20 alphanumeric characters) of the selected sensor. Typical entries would be: INTERSTITIALTANK 1; SUMP TANK 1, etc. (This information will appear on sensor status and sensor alarm reports to make it easier to identify the location of alarms.) Press ENTER to confirm your entry:

```
L1: (Sensor Location)
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Liquid Sensor Type

If necessary, press STEP until you see the message:

```
L1: ENTER SENSOR TYPE
TRI-STATE (SINGLE FLOAT)
```

Use this display to identify the selected liquid sensor's type, so the system can properly interpret and report sensor information. If the sensor indicated in the first line of the message is, in fact, a Tri-State (Single Float) type, press STEP. (The system displays the CATEGORY message.) To specify another sensor type:

- ❑ Press CHANGE once if the selected sensor is Normally Closed.
- ❑ Press CHANGE twice if the selected sensor type is Dual Float Hydrostatic.
- ❑ Press CHANGE three times if the selected sensor type is Dual Float Discriminating.
- ❑ Press CHANGE four times if the selected sensor type is Dual Float High Vapor.
- ❑ Press CHANGE five times if the selected sensor is Interceptor (This is an oil water separator sensor used primarily in Europe).

Press ENTER to confirm your choice:

```
(Sensor Type)
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Liquid Sensor Category

If necessary, press STEP until you see the message:

```
L1:(Sensor Location)
CATEGORY
```

To enter the location category of the selected sensor, press CHANGE until you see the correct category, then press ENTER. The category options are:

- ❑ Annular Space
- ❑ Monitor Well
- ❑ Piping Sump
- ❑ Dispenser Pan
- ❑ STP Sump
- ❑ Other Sensors

When you enter a category, the system confirms your choice with the message:

```
CATEGORY: (Sensor Location)
PRESS <STEP> TO CONTINUE
```

Setting Up Additional Liquid Sensors

If you have additional liquid sensors to configure, press STEP, if necessary, until you see the ENTER SENSOR LOCATION message. Press TANK to select another sensor and follow the procedures described above beginning with the section "Liquid Sensor Location" on page 10-2.

If you have entered setup information for all sensors, press FUNCTION to exit.

External Inputs

Input devices can be connected to the system monitor via Input/Output (I/O) Combination Interface Modules. You must enter data individually for each input device. The information you enter tells the system the number, location, type, and name of installed input devices.

Selecting the External Input Setup Function

To select External Input Setup, press FUNCTION until you see the message:

```
EXTERNAL INPUT SETUP
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

External Input Configuration

If necessary, press STEP until you see the message:

```
INPUT CONFIG - MODULE 1
SLOT # - X X
```

Use this display to tell the system which input positions on a module are connected to external devices.

How the System Configures Input Devices

If input devices are installed, the system recognizes the presence and module slot locations of I/O Combination Interface Modules. (Refer to Figure 2 on page 2-5 to see the module and slot locations).

As you specify which input positions on a module are connected to external devices, the system establishes a number for each input position. For example, if an external device is connected to positions 1 and 2 of module 1, input position 1 becomes I1 and input position 2 becomes I2.

To indicate that an input position on the module is connected, choose the number corresponding to that position. For example, if the position is 3, choose 3 for the position. To indicate that a position is not connected, choose X for that position.

Specifying Input Positions

To indicate whether position 1 is connected, press CHANGE until the correct choice appears (1 if the position is connected, X if it is not). Press the Right Arrow key to move to position 2 and press CHANGE again until the correct choice appears. When you have entered a choice for both positions, press ENTER to confirm your entry:

```
SLOT # - X X
PRESS <STEP> TO CONTINUE
```

Press STEP. The system displays the ENTER INPUT NAME message.

External Input Name

If necessary, press STEP until you see the message:

```
ENTER INPUT NAME
I1:
```

To enter the name of an external device, press TANK repeatedly until the input position that is connected to the external device you want appears on the second line of the message (I1, I2, etc.). Press CHANGE and enter the name (up to 20 alphanumeric characters) of the selected device. Typical entries are: GENERATOR 1, BURGLAR ALM, etc. (This information appears on reports to make it easier to identify the input. The name appears in the message when selecting Output Relay Assignments.) Press ENTER to confirm your entry:

```
I1: (Input Name)
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

External Input Type

If necessary, press STEP until you see the message:

```
I1: EXTERNAL INPUT TYPE
STANDARD
```

Use this display to define the type of input—Standard, Generator or Pump Sense, or Standard ACK—that is connected to the selected input location:

- ❑ Choose Standard for any input device connected for the purpose of using the system's reporting, alarm, and data communications features

- ❑ Choose Generator for applications where you monitor fuel tank(s) supplying an emergency generator and you receive GENERATOR ON and OFF signals from the generator. The system runs a continuous leak test in the generator's tank(s) until the generator turns On. When the generator shuts Off, the system returns to its Leak Test mode. GENERATOR ON and GENERATOR OFF messages and a full inventory report are printed whenever the generator turns on and off.
- ❑ Choose Pump Sense for an input that acts like a pump sensor input from a Pump Sense module.
- ❑ Choose Standard ACK when using an eternal input (e.g., remote push-button) as an ALARM/TEST key.

Press CHANGE until the correct choice appears, then press ENTER to confirm your choice:

```
I1: (Input Type)
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Switch Orientation

If necessary, press STEP until you see the message:

```
I1: SELECT ORIENTATION
NORMALLY OPEN
```

You must identify the input switch type as either normally open or normally closed so the system properly recognizes an ON or OFF condition. To choose Normally Open, press STEP. To choose Normally Closed, press CHANGE and press ENTER to confirm your choice:

```
NORMALLY CLOSED
PRESS <STEP> TO CONTINUE
```

If you chose Standard or Standard ACK for the External Input Type, you are finished entering setup data for the selected input position. To enter setup information for additional input positions, press STEP to return to the ENTER INPUT NAME message. Press TANK to choose another input. To exit the function, press FUNCTION.

If you chose Generator or Pump Sense for the External Input Type, press STEP to continue. Refer to the section below that corresponds to the input type you chose. (The system displays the SELECT TANK message for the Input Type you selected.)

External Input Emergency Generator Data

If necessary, press STEP until you see the message:

```
I1: SELECT TANK
TANK #: ALL TANKS
```

NOTE: This message appears only if you chose GENERATOR for the External Input Type.

You must identify which tanks supply fuel to the generator, so that the system will conduct a continuous leak test in these tanks while the generator is off. If all tanks connected to the system supply fuel to the generator wired to this input, select All Tanks. If only one or some of the tanks connected to the system supply fuel to this generator, enter the individual tank numbers.

If you want to choose All Tanks, do nothing. If you want to enter tank numbers, press CHANGE. Enter the tank numbers and press ENTER to confirm your entry:

```
TANK #: X, X
PRESS <STEP> TO CONTINUE
```

If you have additional input positions to configure, refer to the section below entitled “Setting Up Additional Inputs” on page 11-5.

If you have entered setup information for all input positions, press FUNCTION to exit.

Pump Sense Setup Data

If necessary, press STEP until you see the message:

```
I1: SELECT TANK
NONE
```

NOTE: This message appears only if you chose Pump Sense for the External Input Type.

You must identify the tank on which the Pump Sense feature is activated. If no tanks require the Pump Sense feature, select None. If only one or individual tanks require the Pump Sense feature, enter the specific tanks, identified by tank number and product type.

To choose None, press STEP. (The system displays the ENTER DISPENSE MODE message.) To enter one or more tank numbers, press CHANGE. Enter the tank numbers and press ENTER to confirm your entry:

```
TANK #: (Product Label)
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message:

```
I1: ENTER DISPENSE MODE
STANDARD
```

Choose the dispense mode of the tanks on which the line leak detector has been installed. You must select STANDARD, the default value. After choosing the dispense mode, press ENTER to confirm your choice:

```
MANIFOLDED: (Selection)
PRESS <STEP> TO CONTINUE
```

Setting Up Additional Inputs

If you have additional input positions to configure, press STEP. The system returns to the ENTER INPUT NAME message. Press TANK to select another input position and follow the procedures described in the preceding sections, beginning with “External Input Name” on page 11-2.

If you have entered setup information for all input positions, press FUNCTION to exit.

Output Relays

Your system has two output relays installed. Output relays allow you to assign alarm limits and inputs from external devices to specific relays.

Signals from an alarm limit or device triggers the output relay assigned to it. You must enter data individually for each output relay. The data you enter tells the system the number, location, and name of output relays installed.

Selecting the Output Relay Setup Function

To select Output Relay Setup, press FUNCTION until you see the message:

```
OUTPUT RELAY SETUP
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Relay Configuration

If necessary, press STEP until you see the message:

```
RELAY CONFIG - MODULE 1
SLOT #: X X
```

Use this display to tell the system which relay positions on a module are connected to external devices.

How the System Configures Output Relays

With output relays installed, the system recognizes the presence and module slot locations of each one. (Refer to Figure 2 on page 2-5 to see the Relay Output Interface location).

As you tell the system which relay positions on a module are connected to external devices, the system establishes a number for each relay. For example, if there are relays in positions 1and 2 of module 1, the relay in position 1 becomes R1 and the relay in position 2 becomes R2.

Specifying Output Relay Positions

To specify whether position 1 is connected, press CHANGE until the correct choice appears (1 if the position is connected, X if it is not). Press the Right Arrow key to move to position 2 and press CHANGE again until the correct choice appears. Repeat these steps until you have correctly specified all positions. When you have entered a choice for all positions, press ENTER to confirm you entry:

```
SLOT #: X X
PRESS <STEP> TO CONTINUE
```

Press STEP. The system displays the ENTER RELAY DESIGNATION message.

Relay Designation

If necessary, press STEP until you see the message:

```
ENTER RELAY DESIGNATION
R1:
```

Enter the name of the device connected to the selected output relay. Typical names are: OVERFILL ALARM; AUTO DIALER; etc. (This name appears on reports to make it easier to identify the external device. The name also appears on the display when in-tank or sensor alarms and external inputs are assigned to the relay).

To enter a designation for the selected relay, press CHANGE and enter up to 20 alphanumeric characters. Press ENTER to confirm your entry. The system displays:

```
R1: (Name)
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Relay Type

If necessary, press STEP until you see the message:

```
R1: SELECT RELAY TYPE
STANDARD
```

From this display, press CHANGE to display one of three output relay types:

- ❑ STANDARD. The ON/OFF state is determined by assigned alarms/ warnings.
- ❑ MOMENTARY. The ON/OFF state is determined by assigned alarms/ warnings. However, relay returns to the inactive state after the ALARM/ TEST key is pressed to acknowledge the alarm.
- ❑ PUMP CONTROL OUTPUT. Responds to a dispense (ON/OFF) request received from an assigned Pump Sense module or Line Leak module.

When the desired relay type appears on the display, press ENTER to confirm your choice.

If you select Standard or Momentary, the display reads:

```
RX: SELECT ORIENTATION
NORMALLY OPEN
```

To accept normally open (relay de-energized when alarm is inactive), press STEP. Press CHANGE to display normally closed (relay energized when alarm is inactive), then ENTER to accept.

If you select PUMP CONTROL OUTPUT, you must then specify a tank number.

To choose Pump Control Output, press CHANGE in response to the SELECT RELAY TYPE message. Press ENTER to confirm your choice. The system displays:

```
PUMP CONTROL OUTPUT
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message:

```
R1: SELECT TANK
NONE
```

Press CHANGE and enter the tank number of the assigned Pump Sense module or Line Leak module. Press ENTER to confirm your entry. The system displays:

```
TANK #: X
PRESS <STEP> TO CONTINUE
```

Press STEP to continue.

Assignment Method

If necessary, press STEP until you see the message:

```
R1:(Name)
IN-TANK ALARMS: NO
```

The remaining messages in this function allow you to assign alarms and external inputs for each relay. For the selected relay, you will first specify whether you want to assign an available alarm type (e.g., In-Tank, Liquid Sensor, etc.) or external input to that relay by choosing Yes or No for that type of alarm or input. If you choose Yes, you must then specify the method of assignment (none, all, or single) for each alarm condition.

For example, you will specify whether you want Relay 1 (R1) to be assigned to In-Tank Alarms. If you choose Yes, you must then specify No Tanks, All Tanks, or Single Tanks for each alarm condition (Leak, High Water, Overfill, etc.). If you choose Single Tanks, you must specify the tank number(s) to assign to Relay 1.

IMPORTANT: You may assign more than one in-tank alarm, sensor alarm (if available), and external input to the same relay. You may also assign an in-tank alarm, sensor alarm (if available), and external input to more than one relay.

As you step through possible relay assignments, the system automatically displays all in-tank alarms, sensor alarms, line leak alarms and external inputs that have been configured in the system.

Refer to the section below corresponding to the next available alarm or input group. If no other sensors or inputs are configured, the system returns to the RELAY DESIGNATION message. Refer to the section entitled “Setting Up Additional Relays” on page 12-7.)

In-Tank Alarms

If necessary, press STEP until you see the message:

```
R1:(Name)
IN-TANK ALARMS: NO
```

If you do not want to assign In-Tank Alarms to the relay displayed in the first line of the IN- TANK ALARMS message, press STEP. (The system displays the next available alarm or input assignment group.

To assign In-Tank Alarms to the selected relay, press CHANGE in response to the IN-TANK ALARMS: NO message. Press ENTER to confirm your choice. The system displays:

```
IN-TANK ALARMS: YES
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message:

```
R1: IN-TANK ALARMS
LEAK: NO TANKS
```

This message shows the first kind of alarm condition for In-Tank Alarms: LEAK. You must tell the system whether to assign the displayed alarm condition (in this case In-Tank Leak Alarms) to the selected relay for No Tanks, All Tanks, or Single Tanks. To choose No Tanks, press STEP. (The system displays the next In-Tank Alarm condition: HIGH WATER.)

To choose All Tanks, press CHANGE once. Press ENTER to confirm your choice. The system displays:

```
LEAK: ALL TANKS
PRESS <STEP> TO CONTINUE
```

Press STEP to specify the assignment method for the next In-Tank Alarm condition (HIGH WATER).

To choose Single Tanks, press CHANGE twice in response to the LEAK: NO TANKS message. Press ENTER to confirm your choice. The system displays:

```
LEAK: SINGLE TANK
PRESS <STEP> TO CONTINUE
```

Press STEP to display the message: The system displays:

```
R1: (Name)
T1 LEAK: NO
```

Use the above message to specify the tank number(s) that you want to assign to the relay. If you do not want to assign the tank number shown (T1, T2, etc.), press TANK until you see the tank number that you want to assign to the relay. When the correct tank number appears, press CHANGE and press ENTER. The system confirms your entry (for T1) with the message:

```
R1: T1 LEAK: YES
PRESS <TANK> TO CONTINUE
```

Continue to pressTANK to select additional tanks. For example, pressing TANK once would display the following message:

```
R1: (Name)
T2 LEAK: NO
```

Repeat the steps described above to assign additional tanks to the relay. When you have assigned all the tanks you want to the relay, press STEP. The system displays the assignment method message for the next In-Tank Alarm condition:

```
R1: IN-TANK ALARMS
HIGH WATER: NO TANKS
```

Repeat the procedures described for the LEAK alarm condition until you have specified an assignment method for the all remaining In-Tank Alarm conditions:

- ❑ HIGH WATER
- ❑ LOW PRODUCT
- ❑ HI PRODUCT
- ❑ PROBE OUT
- ❑ DLVY NEEDED
- ❑ GROSS FAIL
- ❑ ANNUAL FAIL
- ❑ ANN NEED WN
- ❑ ANN NEED AL
- ❑ NoIDLE TIME*
- ❑ CSLD INCR*
- ❑ OVERFILL
- ❑ SUDDEN LOSS
- ❑ INVALID HGT
- ❑ WATER WARN
- ❑ MAX PRODUCT
- ❑ PERIOD FAIL
- ❑ PER NEED WN
- ❑ PER NEED AL
- ❑ TEST NOTIFY
- ❑ SIPHON BRK
- ❑ LOW TEMP

*(only consoles with CSLD feature)

Press TANK/SENSOR to select additional tanks for the In-Tank Leak alarm. When you have specified all tanks for the first In-Tank alarm, press STEP to advance to the next alarm group. Repeat the steps described above to assign tanks for each In-Tank alarm. After you have specified tanks for each In-Tank alarm condition, press STEP to advance to the next alarm group.

Remaining Alarm Groups

Continue to step through all of the available alarm groups, selecting the various alarms from the groups that you want to assign to the selected relay (R1 or R2). The procedure for bypassing or selecting alarms from each group and then assigning them to a device in that group is the same as discussed for In-Tank alarms above.

The remaining alarm groups/alarms are shown below. Only installed components will display, so some of the alarm groups may not appear.

Liquid Sensor Alarms (If equipped)

If necessary, press STEP until you see the message:

```
R1: (Name)
LIQUID SENSOR ALMS: NO
```

Select the Liquid Sensor Alarms:

- ❑ FUEL
- ❑ SHORT
- ❑ WATER OUT
- ❑ LOW LIQUID
- ❑ OPEN
- ❑ WATER
- ❑ HIGH LIQUID
- ❑ LIQ WARNING

External Inputs Alarms

If necessary, press STEP until you see the message:

```
R1: (Name)
EXTERNAL INPUTS: NO
```

Select the External Inputs Alarm:

- ❑ CLOSED

Setting Up Additional Relays

After setting up the data for the selected relay (R1, R2), press STEP, if necessary, until the system returns to the message:

```
ENTER RELAY DESIGNATION
R1:
```

Press TANK/SENSOR to choose another relay. Set up the relay by repeating the procedures you followed for the previous relay. Refer to the previous sections beginning with “Relay Designation” on page 12-2.

If you have entered setup data for all relays, press FUNCTION to exit.

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