TRS Series Day Tank

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TRS Series Day Tanks: Quality, reliability and advanced technology

The Tramont TRS Series is the industry standard in Day Tank systems. In addition to the precision engineering and quality construction that go into all of our systems, the TRS Series features the exclusive Tramont System 2000PLUS™ Electronic Control Module (ECM).

Tramont TRS-Series Day Tank with optional open-top rupture basin and fuel-in-basin alarm.

Standard Features

TRS Series Day Tanks include the following standard features:

- 1/3 HP, 1 phase, 115 VAC, 60 Hz thermally protected motor.
- 2 GPM, high lift gear pump with 3/8" NPT inlet and discharge.
- System 2000PLUS Electronic Control Module (see following page for description).
- Heavy gauge steel construction.
- Gray painted exterior, rust-inhibitor coated interior.
- Removable, nonconductive cover.
- Tank 1" NPT fittings are engine supply, engine return, overflow and alternate engine return. Other fittings include 2" NPT for normal vent, NPT sized as appropriate for emergency vent, and one 3/8" NPT basin drain for tanks through 275 gallons, 1" NPT for larger tanks. (If tank includes containment basin, alternate engine fitting omitted and drain provided on basin only).
- Square 4-1/2" inspection port located below electrical controls.

TRS Series Day Tanks include the System 2000PLUS ECM, 1/3 HP motor and 2 GPM pump as standard. A full line of optional features, like the 1/2 HP motor pictured here, are also available.

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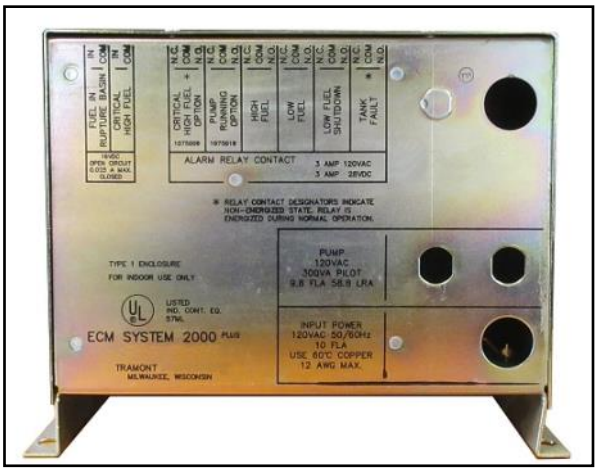
TRS Series Day Tank

The System 2000PLUS ECM: The leading performer in Day Tank monitoring and control

The System 2000PLUS™ Electronic Control Module (ECM) gives you state-of-the-art control of your Day Tank system. The System 2000PLUS is standardly included on all Tramont TRS Series day tanks. This UL Listed, microprocessor-based ECM represents a significant advance in fuel system control. Old-style controllers utilize individual, electro-mechanical float switches for each monitoring function. A malfunction can go undetected for months or years until there is a crisis. The System 2000PLUS is self-diagnostic, and features a single sensor for main monitoring functions. It lets you know immediately if there is a problem. You have time to react, avoiding a costly disruption. The System 2000PLUS gives you fast, accurate, comprehensive monitoring, and is available exclusively from Tramont.

ECM Single Supply Pump.

ECM Duplex Supply Pumps.



ECM Rear.

Standard Features

The System 2000PLUS ECM offers the following standard features:

- UL 508 Listed.
- Operates on standard 120 VAC, 1 phase system, 50/60 Hz.
- LED indicators for all functions.
- Fuel level sensor.
- Motor control relay with LED signal, rated up to 1/2 HP.
- High and low fuel level warnings.
- Critical low fuel level warning for engine shutoff.
- Fuel-in-rupture-basin warning interface.
- ECM functional signal.
- Manual control with On, Off and Test buttons.
- Secure internal test button for testing warning LEDs and remote annunciation of warnings.

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Fuel Containment Basins

While containment basins for Day Tanks are optional, most Day Tank users include them with their systems because they substantially reduce the risk of fuel leaking into the surrounding environment due to a tank rupture. Tramont strongly recommends the use of a containment basin. Local codes frequently require a containment basin. There are two types of containment, a rupture basin and double wall.

Rupture Basin

A rupture basin is open-top. The Day Tank is placed in the basin. Because water and debris can collect in the containment area, rupture basins are used only for indoor applications.

Double Wall

A double wall basin is similar to the rupture basin, except the top is sealed and welded into place around the tank. An additional pressure relief vent cap is required to vent the containment area. Double wall tanks typically are used in outdoor applications. Depending upon local codes, they also may be required for indoor applications. Other options may be required to fully weatherproof the tank.

Basin Capacity

Basins are available in standard sizes of 150% and 200% of the tank capacity. A 150% capacity basin is adequate for most applications; however, some jurisdictions require a 200% capacity basin. Check with your local fire marshal or other code-enforcement authorities to verify basin requirements.

Underwriters Laboratories Listing

All Tramont standard day tank models are available with Underwriters Laboratories listing. UL listed tanks include heavy duty stiffeners required per UL-142 standards. All primary and secondary tank sections are pressurized at 3 -5 psi and leak-checked to ensure integrity of weld seams per UL-142 standards. The Tramont System 2000PLUS Electronic Control Module, standard on all Tramont TRS Series tanks, is UL508 listed. Tramont day tanks also are built in accordance with The Standard of Installation and Use of Combustible Engine and Gas Turbines, NFPA 37.

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TRS Series Day Tank

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Day Tank Control Specification: System 2000PLUS™ ECM

GENERAL
This section covers the electrical description and installation of the Tramont standard System 2000PLUS™ electronic control module (ECM). Installation of the ECM should be performed by a qualified electrician. These specifications provide information on standard System 2000PLUS features.

DESCRIPTION
The heart of the "SYSTEM 2000" ECM is an electrical analog float gauge providing signals to the ECM for:

Fuel level indication	Pump control	High fuel level warning
Low fuel level warning	Low fuel level shut off	ECM functional signal

All signals and warnings are provided with N.O. and N.C. contacts for remote annunciation. The ECM can be manually controlled by ON, OFF, and TEST push buttons. In addition, an internal test button allows for a periodic test of all warning LEDs and remote annunciation relays.

FUNCTIONS
The purpose of the ECM is to maintain the fuel level of the Day Tank by controlling a pump/motor. The pump is off at the normal fuel level and is activated at 87% full. A "pump running" indicator LED is on when the pump is activated. Motor relay is prewired to pump motor.

WARNING: When ECM "OFF" push button is engaged the unit is disabled, however, 120 VAC power is still present within the ECM, indicated by the "power on" LED.

OPTIONS
1920 Duplex pumping system. Adds 2nd pump and motor for safety redundancy. Control alternates lead pump.
1930 Controls are available for 12 VDC operation. Single or duplex. Consult factory for specifications.
3240 Pump running contacts for remote annunciation.
3250 Critical high shutdown. Separate float switch senses critical high fuel level, disengaging motor and optional solenoid valve. Warning relay supplied for remote annunciation.

INCOMING POWER
The ECM is powered by a customer-supplied 120 VAC line. Power terminals are accessible by removing four cover screws on the ECM and removing the ECM cover exposing the terminal strip. Wires should be run through knockout provided.

LEVEL SENSOR
The day tank's level is determined by an electrical analog float sender located below the ECM on the inspection plate cover. The sensor provides a 0 – 90-ohm signal to the ECM, which converts it to a precise fuel level. Fuel level is indicated by nine incremental LEDs on the ECM from EMPTY to FULL.

ALARMS
The ECM has five standard alarm conditions. Each alarm is indicated locally by an LED and remotely by wiring to supplied relays. A normally open and normally closed contact is provided for customer connections. Contacts are rated at 3 amps, 120 VAC or 24 VDC.

High fuel: Activates at 106% of normal fuel level with a two second change of state time delay.
Low fuel: Activates at 62% of normal fuel level. This enables user time to react to a potential problem before low fuel shutdown occurs.
Low fuel shutdown: Activates at 6% of normal fuel level. This enables user to shut down engine generator before fuel runs out, preventing loss of prime or engine damage.
Fuel in rupture basin: With a rupture basin float switch, (option #2930) the ECM will signal if fuel is in the rupture basin.
ECM functional: The ECM performs many internal checks (including float gauge) to ensure proper operation. If a fault occurs, this LED will go from constant to flashing and de-energize the relay. It is suggested that the customer wire to the normally closed contact thereby providing a signal if a fault does occur.

MODE
There are four modes of operation on the ECM:
Off: This pushbutton disables the ECM for routine maintenance to the tank system.
Caution: ECM functional de-energizes, which can activate a customer alarm wired to this relay.
On: This pushbutton activates the ECM after the Off pushbutton has been depressed. On any initial power-up condition, after a power outage, the ECM will automatically turn on.
Test: This pushbutton will test all front panel LEDs and activate pump/motor for as long as the button is depressed. All alarm relays will not activate, but will maintain their original state.
Internal test: This pushbutton, located inside the ECM, will test each LED and remote annunciation relay in sequential order for three seconds, high fuel to ECM functional.

NOTE: It is recommended that both the external and internal test switch be activated as part of a periodic maintenance program to ensure reliable operation of the Day Tank.

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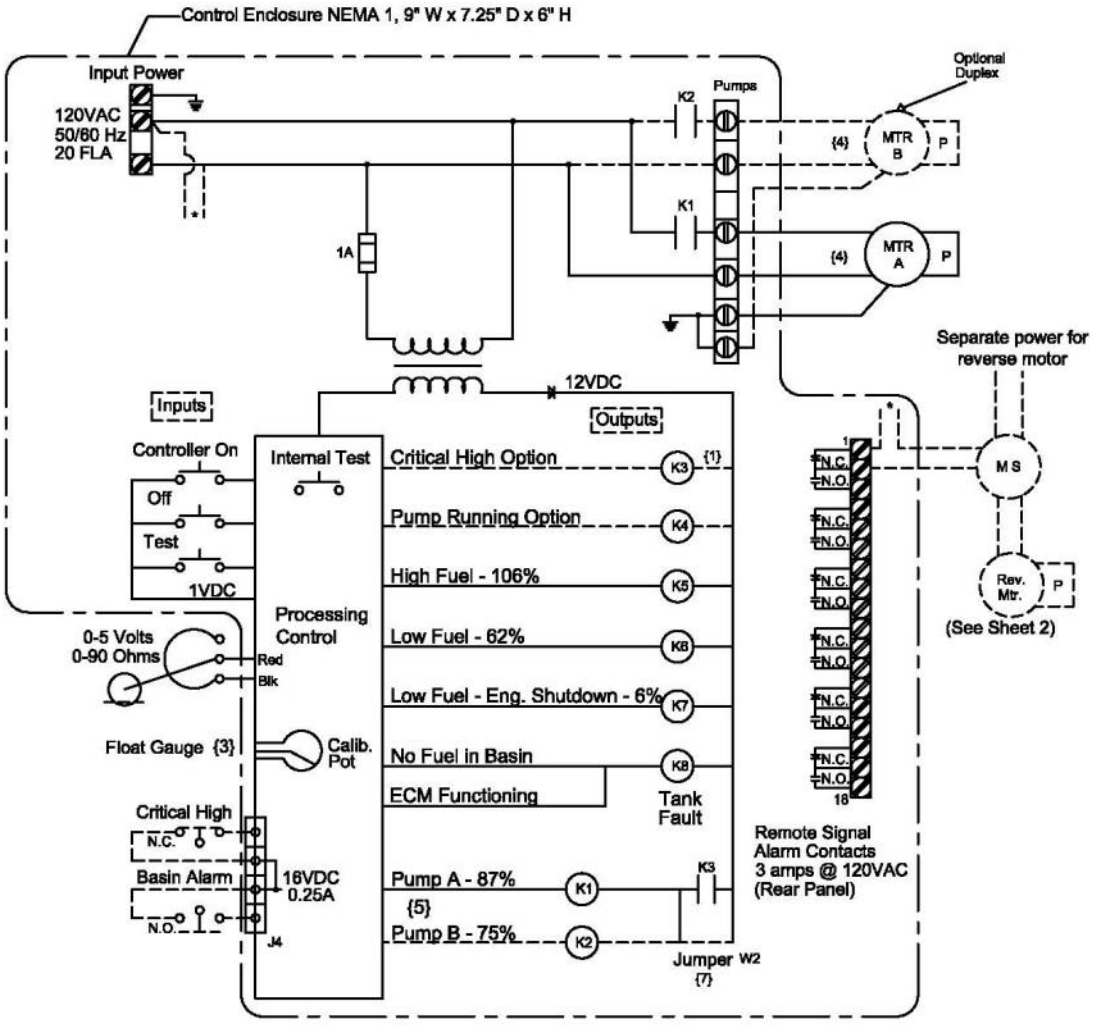
"SYSTEM 2000 Plus"
Electrical Control Module

This ECM has been designed to supply the customer with all the necessary options in a standard package. By following these installation guidelines a qualified electrician should be able to wire this unit into a generator control system providing the customer with complete monitoring and control over the day tank fuel transfer system.



NOTES:

1. Relay is energized during normal operation.
2. Dashed line indicates optional controls.
3. The controller is normally mounted above the gauge, sitting on the day tank. However, the controller can be mounted up to 50' away from the tank and gauge using #16 gauge shielded twisted wire.
4. Motor starter is required above 1/2 HP.
5. Pumps A and B alternate lead positions.
6. Warning: An inlet fuel strainer (#2330) is highly recommended to prevent fuel contamination, maintain fuel gauge integrity, and prolong the life of the pump.
7. Remove jumper with Critical High Option.

F	07/25/12	Add reverse motor and reverse motor starter	GBH
E	12/16/10	"SHEET" was: 1of1	JCK
D	12/07/10	Corrected spelling mistakes in notes	CRT
C	10/05/10	Dwg corrected to show Basin Alarm Normally Open	JDM
B	04/02/10	Changed notes, and diagram size	SJD
A	04/02/10	Start	SJD
S. Rev	Date	Description	Name
		Change Block	

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DESCRIPTION: Electrical Control Module

FOR: System 2000 Plus

SHEET: 1of2

DRAWING NO.: 6000-22354

DRAWN BY: SJD | DATE: 04/02/10

CHK'D: | DATE:

APPROVED: | DATE:

SCALE: NTS

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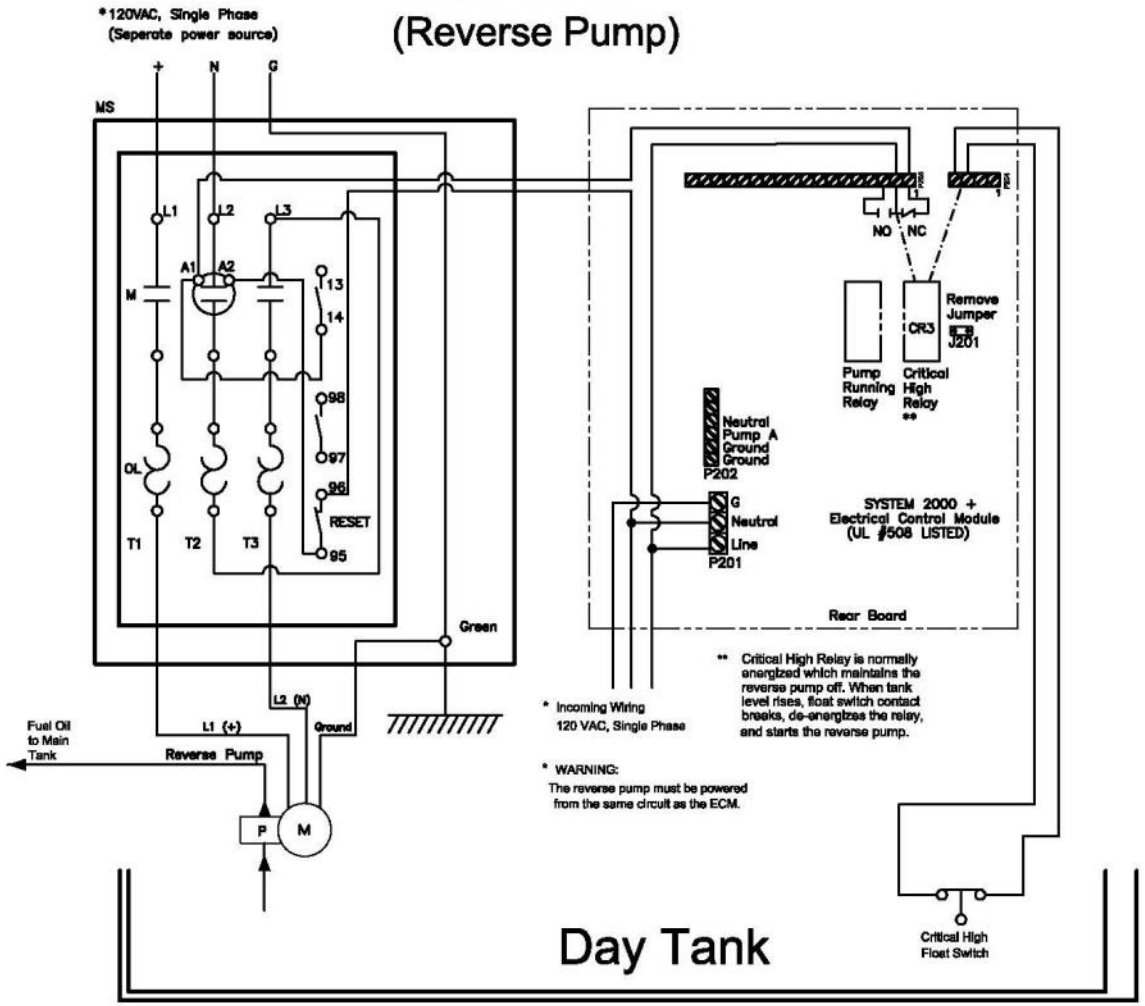
Motor Starter
(Reverse Pump)



16.

S. Rev	Date	Description	Name
F	07/25/12	Add reverse motor and reverse motor starter	GBH
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B	04/02/10	Changed notes, and diagram size	SJD
A	04/02/10	Start	SJD

Change Block

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DRAWN BY:	DATE:
SJD	04/02/10
CHK'D:	DATE:
APPROVED:	DATE:
SCALE:	NTS

DESCRIPTION: Electrical Control Module

FOR: System 2000 Plus

SHEET: 2of2

DRAWING NO.: 6000-22354

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TRS Series Day Tank

Sequence of Operation – TRS Day Tank

Fuel Level Increasing

- Tank empty condition
- Pump “A” is pumping fuel from main tank into Day Tank
- Pump “B” is pumping fuel from main tank into Day Tank (duplex system only)
- At 6% full the low fuel engine shutdown alarm is deactivated, dry contacts resume normal condition
- At 62% full the low fuel alarm is deactivated, dry contacts resume normal condition
- At 100% full pump stops running (duplex systems both pumps stop at 100%)
- At 106% full high fuel alarm is activated, dry contacts are actuated
- If Fuel level continues to increase, optional critical high fuel level shutdown is activated, dry contacts are actuated, fuel supply pumps shutdown

Fuel Level Decreasing

- Tank full condition
- Fuel level in tank decreases
- At 87% lead pump starts pumping fuel from main tank into Day Tank
- At 75% lag pump starts pumping fuel from main tank into Day Tank (duplex systems only)
- At 62% full the low fuel alarm is activated, dry contacts are actuated
- At 50% full the 75% led will turn off.
- At 6% full the low fuel engine shutdown alarm is activated, dry contacts are actuated

Standard Operation as tank re-fills

- Engine consumes fuel, fuel level in tank decreases
- At 87% pump “A” starts filling tank (duplex systems “lead pump” starts running)

  Duplex operation only:

  ◊ First run pump “A” is lead pump, second run pump “B” is lead pump

  ◊ If fuel decreases to 75% both lag and lead pumps run until full (100%)

  ◊ Lead pump alternates each run. Upon a loss of power pump “A” becomes lead pump
- At 100% pump(s) stops running

Tank Rupture Condition

- Fuel in rupture basin
- Option #2930 fuel in basin float switch is activated, dry contacts are actuated, fuel supply pumps shutdown

Overfill Condition

- Option #3250 critical high alarm (optional), separate float switch activates high level alarm, dry contact actuated, fuel supply pumps shutdown, can activate optional solenoid valve or optional reverse pump.

IMPORTANT: For applications with main tank at same level or above day tank, a reverse pump of greater capacity than both supply pumps is required.

Level LED Indication

- As fuel level increases each percent light will turn on when that level is reached
- As fuel level decreases each percent light will remain on until next level is reached

Mode

There are four modes of operation on the ECM:

A. Off - This pushbutton disables the ECM for routine maintenance to the tank system. Caution: ECM functional de-energizes, which can activate a customer alarm wired to this relay.

B. On - This pushbutton activates the ECM after the Off pushbutton has been depressed. On any initial power up condition, after a power outage, the ECM will automatically turn on.

C. Test - This pushbutton will test all front panel LEDs for three seconds and activate pump/motor for as long as the button is depressed. All alarm relays will not activate but will maintain their original state.

D. Internal test - This pushbutton, located inside the ECM, will test each LED and remote annunciation relay in sequential order – High fuel to ECM functional.

NOTE: It is recommended that both the external and internal test switch be activated as part of a periodic maintenance program to ensure reliable operation of the Day Tank.

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DAY TANKS

Design Considerations of a Day Tank Fuel Transfer System

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OVERVIEW

This guide is designed to assist in specification of a Day Tank fuel transfer system, including pump lift, head and prime.

- **The information included in this document is meant as a general reference only.** Frictional head loss, lift, discharge pressure and other considerations may vary depending upon your physical location and system design.
- Consult an experienced hydraulic engineer when working with critical or borderline applications.

PUMP LIFT

A pump lifts fuel by displacing air from suction to the discharge line. This creates low pressure in the suction line, which allows the higher atmospheric pressure (14.7 psi at sea level) to lift liquid into this vacuum. If a perfect vacuum could be created and maintained, fuel could theoretically be lifted to 34 feet. Since a perfect vacuum is not possible, the lift a pump can actually achieve is approximately 50 percent of theoretical lift, or 17 feet at sea level (7.64 psi). To determine the total available lift, the following factors need to be considered:

1. **Vertical distance the pump needs to lift fuel.** This measurement is taken from the bottom of the main tank to the pump's inlet port.
2. **Total length and diameter of piping.** As piping gets longer and narrower lift is decreased due to friction (see Table One). All calculations are based on 60° F temperature. Frictional resistance increases as temperature decreases.
3. **Fittings in the line.** Fittings disrupt flow and create friction. These include elbows, tees and unions (see Table Two). Valves also need to be checked for possible pressure drops.
4. **Elevation above sea level**. As height above sea level increases, atmospheric pressure acting against the pump's vacuum is reduced, thereby reducing lift (see Table Three).

Example

Vertical distance	12 feet	Pump size	2 GPM
Total length of pipe	100 feet	Fittings in line	3 elbows, no valves
Pipe size	1 inch in diameter	Elevation (above sea level)	3,000 feet

Solution: Referring to Table Two, an elbow equals 2.6 feet of pipe (2.6 x 3 elbows = 7.8 feet). The corrected length of pipe is now 107.8 feet. Referring to Table One, the 107.8 feet is divided by 100 and multiplied by 0.5. Actual head loss is 0.54 feet. Therefore, the total lift needed for this system is the vertical distance plus 0.54 feet, or 12.54 feet. **Since the pump is safely capable of lifting 15 feet at 3,000 feet of elevation (see Table Three), this example will perform satisfactorily.** However, if a 3/8-inch diameter pipe had been used, the head loss would have been 15.8 feet. Adding the vertical distance to this figure equals 27.8 feet. The pump would not be able to lift the fuel. If the plumbing system cannot be built under a 17-foot lift limitation (at sea level), a remote pumping station must be used. This will be placed between the main tank and the Day Tank. The proper placement is determined by the pump lift calculation and the following pump head calculations.

PUMP HEAD

The pump's head is the theoretical vertical distance a pump will push fuel. Day Tank standard pumps (2 GPM; 1/3 HP) have 231 feet of head (100 psi). Refer to Table Four for larger pump and motor discharge rates. The pump is normally located on the Day Tank, but when pump lift demands are exceeded, a remote pumping station is required. This allows the use of the head (pushing) capabilities of the pump, which are significantly greater than lift. Factors that must be taken into consideration to determine total pump head are similar to pump lift calculations, with the following exceptions:

1. **Vertical distance the pump needs to push fuel:** This measurement is taken from the output port on the pump to the day tank's uppermost piping connection.
2. **Elevation is not a factor, but motor horsepower is taken into account.**

Example Two

Vertical distance	150 feet	Fittings	2 elbows, 1 check valve
Total length of pipe	175 feet	Pump	7 GPM
Pipe size	3/4 inch in diameter	Motor	1 HP

Solution: Referring to Table Two, a 3/4 inch elbow equals 2.1 feet of pipe (2.1 x 2 elbows = 4.2 feet), while the check valve equals 5.3 feet of pipe. The total adjusted length of pipe is 184.5 feet (175+4.2+5.31). Referring to Table 1, 184.5 feet of 3/4 inch pipe with a 7 GPM pump with 1 HP motor results in head loss of 28.3 feet (1.85 x 15.3). Total required head capacity calculates to 178.3 feet (150 + 28.3). With a pump discharge pressure of 100 psi available pump head is 231 feet (100x 2.31). **Available pump head exceeds required pump head capacity (231-178.3= 52.7). Therefore, this system will work.**

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PUMP PRIME

Maintaining the prime on a pump is critical. Fuel must be maintained in the suction side pipe with no air pockets. Foot valves at the main tank or check valves at the Day Tank can be used to prevent fuel flowing back to the main tank and losing prime.

Pump cavitation can occur when a pump is unable to properly discharge fuel. There are multiple causes, including:

Total equivalent lift too high for pump	Improperly plumbed systems	Air leaks
Total equivalent head too high for pump	Restrictions in lines	

Cavitation can occur gradually and will eventually ruin a pump. Vertical piping loops or "traps" should be avoided when designing a pumping system. Air pockets can become trapped in the high point of the vertical loop, resulting in pump cavitation. A hand pump is recommended for initial priming to avoid undue wear on the fuel pump. If the fuel pump must be used for initial priming, do not run for more than 60 seconds. Fuel should be flowing within that time. A fuel strainer is also recommended on the inlet side of the pump. Foreign particles entering the pump chamber will diminish its life expectancy. The strainer should be checked periodically to avoid particle build-up, which limits pumping capabilities.

SUMMARY

Proper engineering practices should always be used when calculating pump head and especially pump lift. By following these guidelines, costly repairs due to improper installations can be avoided.

Notes:

1. 1 psi=2.31 feet of head is the conversion for water. As a general rule, this is a safe conversion for #2 diesel fuel.
2. For more precise calculations, refer to the following formulas and conversions:
   - A. Head in Feet = PSI x 2.31/Specific Gravity
   - B. PSI = Head x Specific Gravity/2.31
   - C. Specific Gravity of #2 diesel fuel is 0.88 at 60° F
   - D. Weight of #2 diesel fuel: 7.3 pounds/gallon
3. All calculations are based on 60° F. Allowances must be made for extreme temperature variances.
   - A. Viscosity of #2 diesel fuel: 35 at 100° F; 40 at 70° F; 50 at 20° F; 80 at 0° F; 200 at -30° F
   - B. An immersion heater is recommended for applications below 32° F

TABLE ONE: Frictional head loss in feet for 100 feet of standard weight pipe at 60° F at sea level, diesel fuel.

	Pipe Size						
GPM	3/8	1/2	3/4	1	1-1/4	1-1/2	2
2	15.2	5.5	1.1	.5	.2		
4	55.5	20.3	5.1	1.4	.5	.2	
7		61.0	15.3	4.6	1.2	.5	
10			26.3	8.5	2.5	.9	.2
19				28.5	7.5	3.5	1.2

TABLE TWO: Frictional loss in pipe fittings in terms of equivalent feet of straight pipe. For other types of valves and fittings consult manufacturer.

Pipe Size (in)	Ball Valve	45° Elbow	Std. Elbow	Std. Tee	Check Valve	Angle Valve	Globe Valve
3/8	.28	.70	1.4	2.6	3.6	8.6	16.5
1/2	.35	.78	1.7	3.3	4.3	9.3	18.6
3/4	.44	.97	2.1	4.2	5.3	11.5	23.1
1	.56	1.23	2.6	5.3	6.8	14.7	29.4
1-1/4	.74	1.6	3.5	7.0	8.9	19.3	38.6
1-1/2	.86	1.9	4.1	8.1	10.4	22.6	45.2
2	1.1	2.4	5.2	10.4	13.4	29.0	58.0

TABLE THREE: Lifting capacities at various elevations

Elevation (feet)	Available Lift (feet)
0 (Sea Level)	17
1000	16
2000	15.5
3000	15
4000	14.5
5000	14
6000	13.5

TABLE FOUR: Pump discharge pressure (psi)

	Nominal pump size (GPM) at 1725 RPM					
Motor HP	2	4	7	10	19	23
1/3	100	60	2			
1/2		100	20	2		
3/4			40	20		
1			100	40	20	2
1-1/2				80	40	40
2				125	60	60
3				150	100	125

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DAY TANKS

Pump lift and head worksheets

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REFER TO TABLES ON P. 2 OF TRAMONT DESIGN CONSIDERATIONS OF A DAY TANK FUEL TRANSFER SYSTEM

Gather the following information before beginning the pump lift and head worksheets below.

Vertical pipe length (FT)		Pipe diam. (IN)	
Horizontal pipe length (FT)		Pump (GPM)	
Elev. above sea level		Motor (HP)	

Elevation above sea level applies to pump lift only.

Motor HP applies to pump head only.

In-line fittings	Qty.	Value from Table 2	Qty. X size	In-line fittings	Size from Table 2	Qty. X size
Ball valve				Angle valve		
45° elbow				Globe valve		
Std. elbow				Other		
Std. tee				Other		
Check valve				Other		
		Total A			Total B	

Total A + Total B = _____ Enter this amount in Step 3 in the charts below.

Pump **ABOVE** main tank: Total **LIFT** required for Day Tank installation

1. Total vertical length of pipe (pump inlet to main tank bottom)		FT
2. Total length of pipe veritical and horizontal		FT
3. Additional length as a result of in-line fittings (See Table Two)		FT
4. Add results of #2 and #3		FT
5. Divide result of #4 by 100		CU. FT
6. Pipe size (diameter)		IN
7. Pump capacity		GPM
8. Frictional head loss (See Table One)		PER 100 FT
9. Additional head loss - Multiply results of #5 by #8		FT
10. Repeat steps in #2 thru #9 for each pipe size used in line		FT
11. Total lifting capacity needed (Add results of #1, #9 and #10)		FT
12. Elevation above sea level		FT
13. Available pump lift		FT
14. Subtract results of #11 from #13 (Step #13 - Step #11)		FT

IMPORTANT: Each pipe size in line must be calculated individually, then combined.

- If #14 is positive, **system is properly sized.**
- If #14 is negative, **system is beyond a safe lifting capacity.**
- If #1 is less than #13, **increase pipe size.**
- If #1 is more than #13, a **remote pumping unit is required.**

Pump **BELOW** main tank: Total **HEAD** required for day tank installation

1. Total vertical length of pipe (pump inlet to Day Tank inlet)		FT
2. Total length of pipe veritical and horizontal		FT
3. Additional length as a result of in-line fittings (See Table Two)		FT
4. Add results of #2 and #3		FT
5. Divide result of #4 by 100		CU. FT
6. Pipe size (diameter)		IN
7. Pump capacity		GPM
8. Frictional head loss (See Table One)		PER 100 FT (HORIZONTAL)
9. Additional head loss - Multiply results of #5 by #8		FT
10. Repeat steps in #2 thru #9 for each pipe size used in line		FT
11. Total head capacity needed (Add results of #1, #9 and #10)		FT
12. Pump discharge pressure (See Table Four)		PSI
13. Available pump head (Multiply results of #12 by 2.31)		FT
14. Subtract results of #11 from #13 (Step #13 - Step #11)		FT

IMPORTANT: Each pipe size in line must be calculated individually, then combined.

- If #14 is positive, **system is properly sized.**
- If #14 is negative, **system is beyond safe head capacity.**

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Day Tank

Mechanical and Plumbing Guide: Day Tank Systems

MECHANICAL INSTALLATION

This guide covers the mechanical installation of a standard Tramont Day Tank system. Installation should be performed by a qualified mechanical installer or plumber experienced in black iron piping, valves and connections. This guide primarily covers "standard" tanks; that is, tanks without optional accessories or equipment. Certain optional devices may require special consideration during installation. For TRE-Series tanks also see "Electrical installation guide: TRE-Series Day Tanks." For TRS-Series tanks also see "System 2000PLUS" specification.

!WARNING!
THIS TANK IS DESIGNED AND CONSTRUCTED TO HOLD DIESEL FUEL ONLY.

TANK PLACEMENT

Upon receipt of the Tramont Day Tank, inspect for obvious signs of shipment damage. If damage is visible (dents, waterlogging, etc.), notify the freight company and file a claim for damages with them. This step must take place on the receiving end of the shipment; Tramont cannot do this for the purchaser or end user. Unpack the unit and inspect closely. The Tramont day tank can withstand normal stresses of shipping. However, rough handling, such as dropping the unit, may result in scratches, dents and damage to tank components and weld seams. Again, if you detect any signs of damage notify the freight company immediately.

Place the tank as close to the gen-set as practical. It should be fully accessible from all sides. The front of the unit must be visible and accessible. Position the tank so that fittings and vents can be easily connected and checked. Make sure that there is room to access the basin/tank drain. Generally a minimum of 6" - 8" from any wall is required for piping installation. Allowing adequate space for piping will make future repair and maintenance much easier.

Complete all piping before bolting the tank to any surface. This will make it much easier to correct any misalignment of piping. **The day tank is not designed to absorb force exerted by improperly aligned pipe. "Forcing" pipes to line up with fittings may damage the tank.**

PLUMBING CONNECTIONS

Day Tanks typically are installed with three 90° elbows in the fuel line between the tank and the point where the line is firmly fixed to a wall or floor. This will facilitate minor adjustments when leading the piping to the tank. Pipe unions should be installed as needed to allow for future breakdown or maintenance of pipes. All threaded connections shall be covered with Teflon™ tape, thread sealant or comparable material. DO NOT use any sealant that is not compatible with #2 diesel oil. All threaded connections must be tightened leak-tight.

IMPORTANT: Gen-set installations generally are not set up so that high pressure can form in piping lines, and **the Tramont Day Tank is not a pressure vessel.** However, all connections still should be tightened so that the piping can withstand considerable pressure if necessary. Use only clean, new pipe connections. Rust, dirt, tars and other contaminants can prevent proper operation of tank components such as pumps, and may result in damage or destruction of these components.

ENGINE SUPPLY

The engine supply fitting (1" NPT) is located on the left hand side at the bottom rear of tanks without a basin. On tanks with a basin the supply fitting is located on the top rear of the tank, and a dip tube extends to the bottom of the tank. Follow the gen-set supplier's requirements for pipe size, flex hose and connections to the engine.

FUEL RETURN

On tanks without a basin there are two 1" NPT fuel return fittings on the back of the tank. One is located at the lower right-hand side of the tank, the other is located near the top of the tank. On tanks with a basin there is a single fuel return fitting on the back of the tank near the top. The fuel return fittings are for excess hot fuel returned from the engine. If your tank does not include a basin Tramont recommends using the bottom fuel return fitting. Seal the unused fuel return fitting with a 1" NPT black iron pipe plug. Another option is to pipe the fuel return line directly to the main tank, thereby eliminating a possible fuel temperature increase in the day tank.

OVERFLOW

The 1" NPT overflow fitting is located at the upper rear of the tank. It prevents overfilling of the day tank by routing excess fuel directly back to a main tank.

Main tank below Day Tank (TRE & TRS)

In instances where the main tank is located *below* the day tank, the overflow line must be piped in a continuous downward path to the main tank.

!WARNING!
BECAUSE THE OVERFLOW LINE OPERATES VIA GRAVITY, THERE CAN BE NO UPFLOW OR TRAPS IN THE LINE. DO NOT RESTRICT OR DOWNSIZE THE DIAMETER OF THE PIPE.

Tramont recommends overfilling the day tank initially to make sure that the overflow line is working properly.

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Main tank above Day Tank (TRS only)

In instances where the main tank is above the Day Tank, the overflow line cannot be piped via gravity. The overflow line should not be plugged. Instead, **Tramont strongly recommends the use of a reverse pumping system to return excess fuel to the main tank.** Failure to use a reverse pumping system may result in a fuel spill should the Day Tank become overfilled. Reverse pumping systems are available on Tramont TRS Series Day Tanks. See Tramont specification "Diesel Fuel Day Tank with Supply Pump and Motor," or contact Tramont Sales and Service for more information.

VENTS

There is a 2" NPT normal vent fitting at the top rear of tank. This is an atmospheric vent and must be piped in a continuous upward path with no traps. In installations with a main tank the normal vent must be piped higher than the main tank fuel level. The normal vent should be vented outside any enclosed spaces. The appropriate vent cap is available from Tramont Manufacturing, or users may provide their own.

!WARNING!

DO NOT PLUG THE NORMAL VENT. THIS IS AN ATMOSPHERIC TANK ONLY AND IS NOT TO BE OPERATED UNDER PRESSURE.

The tank also includes an NPT fitting for an emergency vent. The fitting will range in size from 2" to 5". Tanks with a sealed rupture basin also will include an emergency vent fitting on the containment area. The emergency vent fittings may not be plugged. The appropriate vent cap is available from Tramont Manufacturing, or users may provide their own. This vent is designed to open should the tank become suddenly pressurized (in a fire, for example). Requirements for piping the emergency vent may vary by location. Consult local codes on piping, vent caps, vent location and other requirements.

DRAIN

Day Tanks less than 300 gallons include a 3/8" NPT drain fitting. Tanks 300 gallons or larger include a 1" NPT drain fitting. On day tanks without a basin the drain fitting connects directly to the tank. On tanks with a basin the drain is connected to the containment area only. The tank is shipped with the drain fitting plugged. This plug may become loose during shipping. *It is the installer's responsibility to verify the integrity of the drain and all other connections.* In installations with a main tank the drain may be plumbed back to the main tank. An optional drain petcock or ball valve is available from Tramont.

FUEL INLET: TRE & TRS ONLY

The fuel inlet to the Day Tank is located on the pump. The standard Tramont Day Tank pump includes a 3/8" NPT female threaded fitting. This fitting size may vary on optional pumps. Plumb the fuel supply line from the main tank to the Day Tank pump suction port. Properly align the piping so that stress is not exerted on the pump. **IMPORTANT NOTE**: Fuel contamination can decrease pump life, cause leaking valves and erratic gauge readings. Tramont strongly recommends the installation of a 100 mesh fuel strainer on the pump inlet.

PIPING (TRE & TRS)

Tramont Day Tank pumps are rated for 17' of vertical lift at sea level. Long horizontal runs, small diameter pipe and restrictions such as elbows and valves can reduce lift. (See worksheet in "Design Considerations", p.18). Leaks in the pipe line will reduce or eliminate lift. Running the pump/motor with no fuel in the line may damage or destroy the pump and motor. Tramont strongly recommends that manifold fuel lines be avoided. Tramont also strongly recommends that the incoming fuel line be primed as close to the pump as possible prior to start-up.

TESTING

The tank has been factory leak-tested at 3 - 5 PSIG per UL-142 requirements. All lines to and from the day tank should be pressure tested for leaks. If they are available, close shutoff valves at both ends of the piping and apply pressure to desired levels. Lines that have only gravity flow should be tested to twice the head pressure that would exist if the lower end of the line were plugged and the line was filled with oil. **Note**: 2.68' of head = 1 PSIG.

!WARNING!

WHEN TESTING THE FUEL LINES DO NOT ALLOW THE TANK ITSELF TO BECOME PRESSURIZED IN EXCESS OF 5 PSIG. EXCESS PRESSURE MAY DAMAGE THE TANK.

MECHANICAL INSPECTION

Verify that all valves are open and all lines are pressure tested and clear. Verify that the installation is in accordance with mechanical specifications and all local building codes. Day Tank users, installers and specifying engineers should be familiar with NFPA 30 and 37, UL-142, local codes and any other applicable codes.

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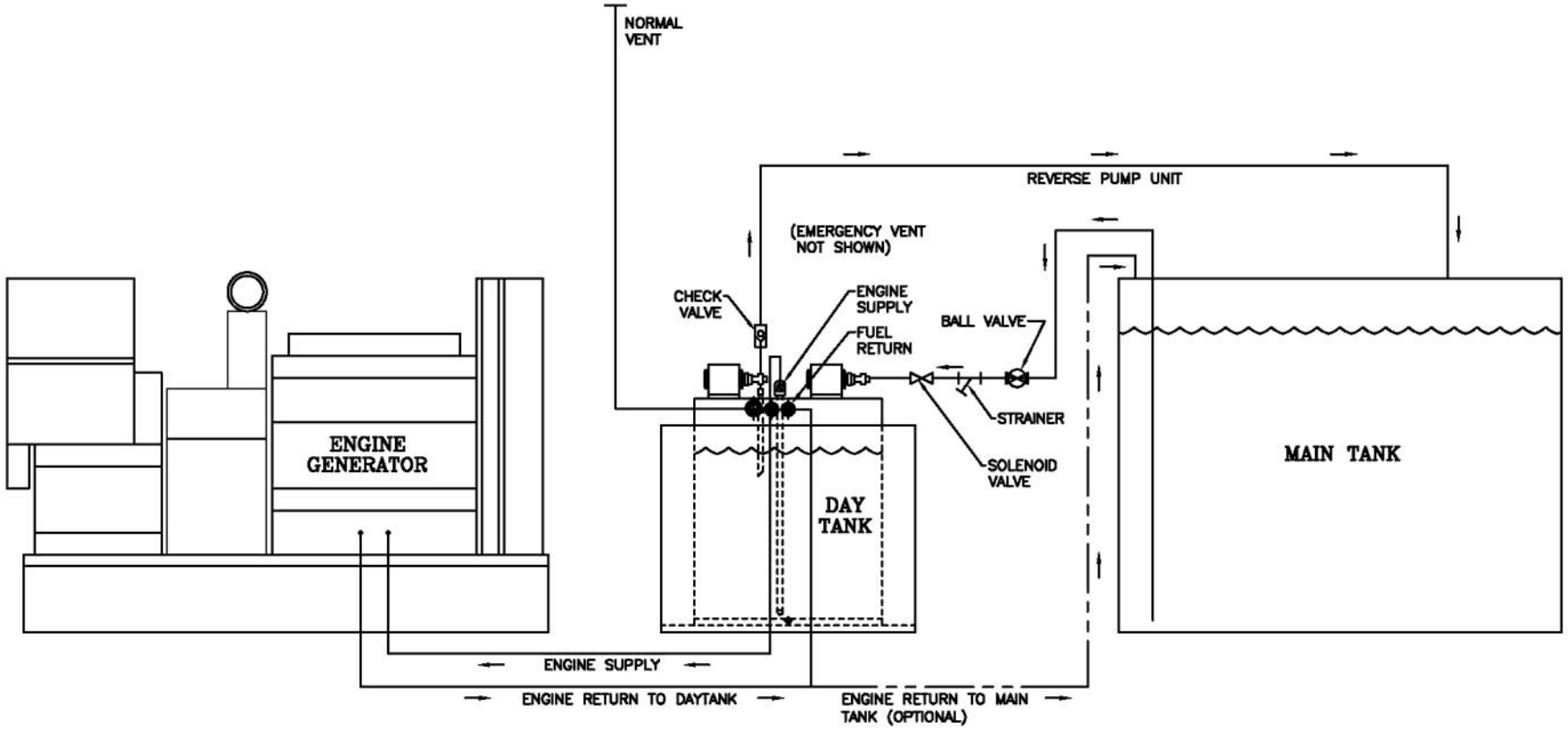

LETTER	DATE	DESCRIPTION	NAME
B	07/02/98	CHANGED THE FUEL RETURN PATH	DAK
A	05/29/98	START	DAK

CHANGE BLOCK (B)

Tramont Manufacturing LLC

SCALE: NTS
DATE: 05/29/98

FRACTIONS = +/-.5 .XX =+/- .125
.X = +/- .250 .XXX =+/- .062

DRAWN BY: DAK
SALES
ENG

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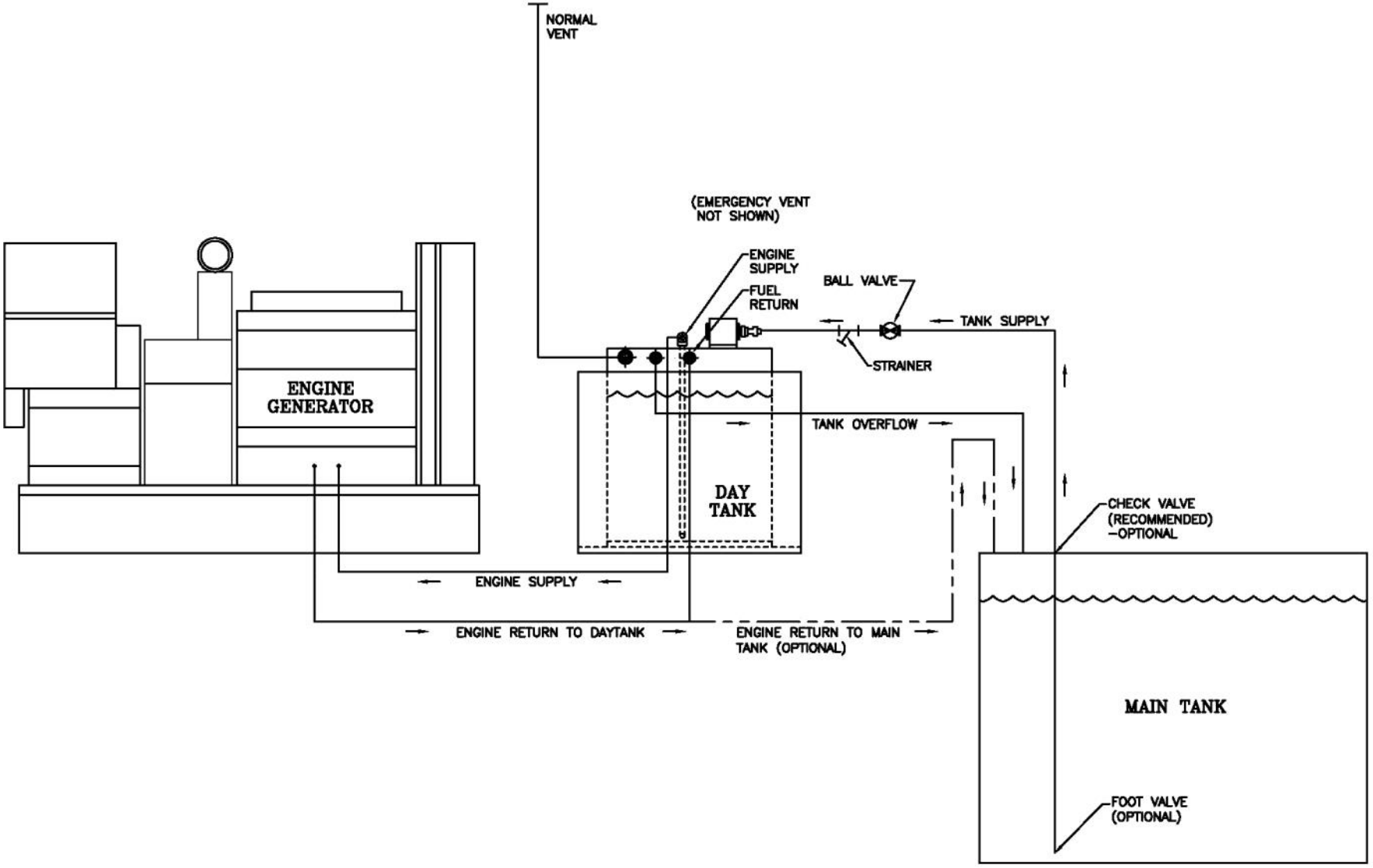
DESCRIPTION: DAYTANK INSTALLATION/ MAIN TANK ABOVE GROUND

FILE:

DRAWING NO. 119-1199



LETTER	DATE	DESCRIPTION	NAME
B	08/06/98	ADDED OPTIONS	DAK
A	07/09/98	START (FROM 119-1199)	DAK

CHANGE BLOCK (B)

Tramont Manufacturing LLC

SCALE: NTS
DATE: 07/09/98

FRACTIONS = +/-.5 .XX =+/- .125
.X = +/- .250 .XXX =+/- .062

DRAWN BY: DAK
SALES ENG

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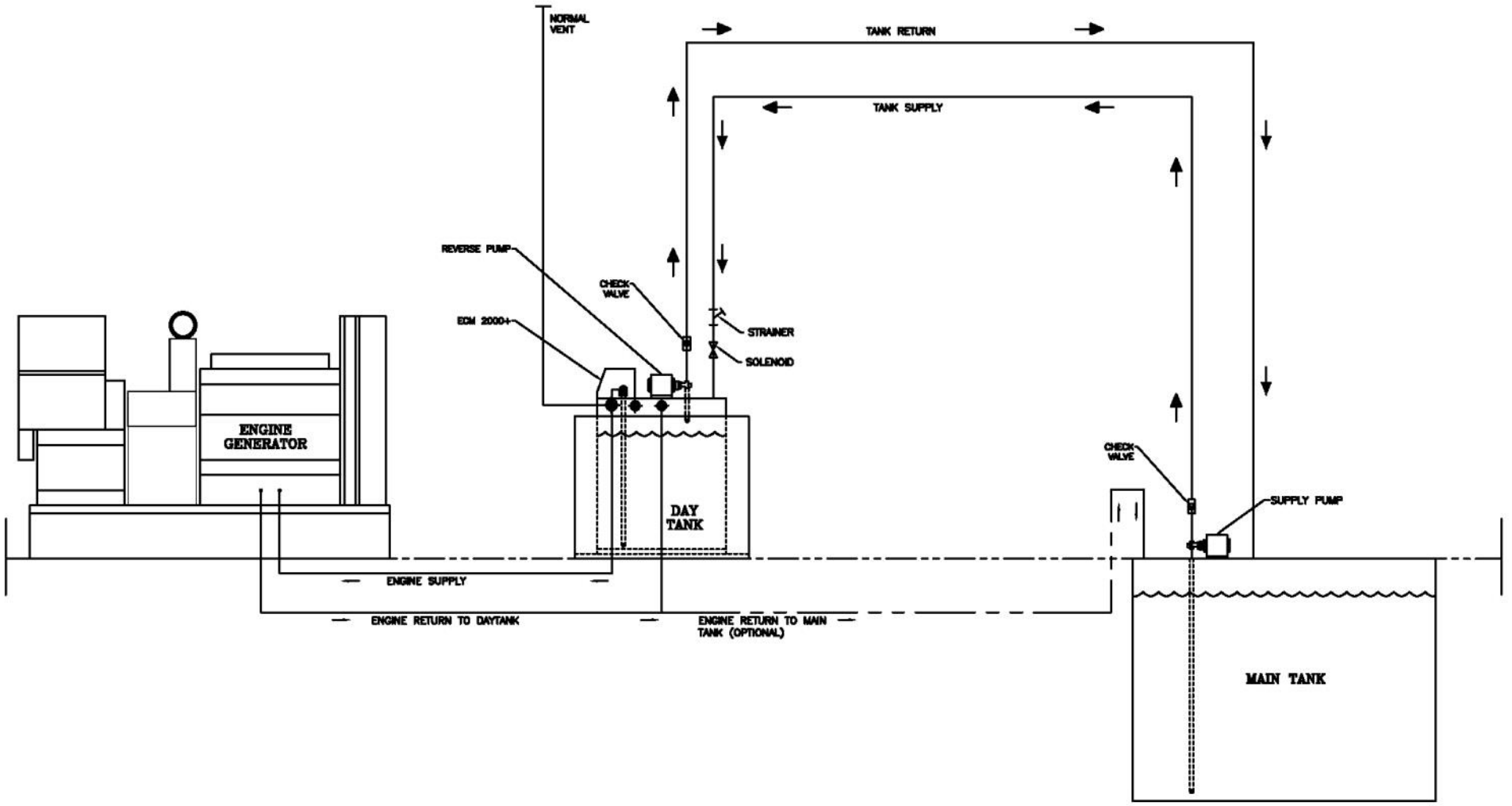
DESCRIPTION: DAYTANK INSTALLATION/ MAIN TANK BELOW GROUND

FOR:

DRAWING NO. 119-1372



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LETTER	DATE	DESCRIPTION	NAME
A	02/25/04	START (FROM 119-1372)	EAF

CHANGE BLOCK (8)

Tramont Manufacturing LLC

SCALE: NTS
DWG: 02/25/04

FRACTIONS = +/-.5 .XX =+/- .125
.X = +/- .250 .XXX =+/- .062

DRAWN BY: EAF
CHECKED:
ENG:

DESCRIPTION: DAYTANK INSTALLATION/ MAIN TANK BELOW GROUND

DRAWING NO. 1119-4644