INSTALLATION INSTRUCTIONS

Original Issue Date: **6/89**
Model: **20–2000 kW Diesel-Powered Generator Sets**
Market: **Industrial**
Subject: **Day Tank Kits (see listing below for kit numbers)**

Kit Numbers	Tank Size, L (gal.)
274602, 274602-SD	37.8 (10)
274603, 274603-SD	
274604, 272604-SD	94.6 (25)
274605, 274605-SD	
274606, 274606-SD	189.2 (50)
274607, 274607-SD	
274717, 274717-SD	94.6 (25)
274718, 274718-SD	
274854, 274854-SD	378.5 (100)
274855, 274855-SD	
274856, 274856-SD	
274857, 274857-SD	
292242, 292242-SD	37.8 (10)
292243, 292243-SD	
292244, 292244-SD	
292245, 292245-SD	
292246, 292246-SD	
292247, 292247-SD	
292248, 292248-SD	94.6 (25)
292249, 292249-SD	
292250, 292250-SD	
292251, 292251-SD	
292252, 292252-SD	
292253, 292253-SD	
292254, 292254-SD	189.2 (50)

Kit Numbers	Tank Size, L (gal.)
292255, 292255-SD	189.2 (50)
292256, 292256-SD	
292257, 292257-SD	
292258, 292258-SD	
292259, 292259-SD	
336846 CLINS 8–10	37.9 (10)
336847 CLINS 14–19	189.3 (50)
336860 CLINS 20–23	227.1 (60)
336861 CLINS 24–27	283.9 (75)
347627 CLINS 34–37	567.8 (150)
347629 CLINS 38–39	1040.9 (275)
354711 CLINS 11–13	94.6 (25)
354713 CLINS 28–33	378.5 (100)
354715 CLINS 34–37	567.8 (150)
354716 CLINS 38–39	1040.9 (275)
GM15462 CLINS 38–39	1040.9 (275)
GM19964-KP1-C331	37.8 (10)
GM19964-KP2-C332	94.6 (25)
GM19964-KP3-C333	189.2 (50)
GM19964-KP4-C334	227.1 (60)
GM19964-KP5-C335	283.9 (75)
GM19964-KP6-C336	378.5 (100)
GM19964-KP7-C337	567.8 (150)
GM19964-KP8-C338	1040.9 (275)
GM19964-KP9-C339	1135.5 (300)

Introduction

These operation and installation instructions contain important safety, installation, and operating instructions for day tanks with electronic control modules (ECM) and day tanks without ECMs.

A day tank is a diesel fuel transfer system that provides fuel storage immediately adjacent to the engine. This allows the engine fuel transfer pump to easily draw fuel when starting and provides a convenient location to connect injector return lines. A properly installed day tank ensures a specified amount of fuel is readily available. The day tank is located between the engine and the main fuel storage tank.

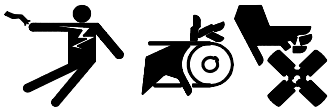
Note: A fuel cooler may be needed to lower the fuel temperature before the fuel from the engine is returned to the day tank.

Read through this manual and carefully follow all procedures and safety precautions to ensure proper operation and to avoid serious bodily injury. Keep this manual with the day tank for future reference.

Safety Precautions

Observe the following safety precautions while installing the kit.

⚠ WARNING



Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or connected equipment, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

⚠ WARNING

Fire.
Can cause severe injury or death.

Do not smoke or permit flames or sparks near fuels or the fuel system.

Servicing the fuel system. A flash fire can cause severe injury or death. Do not smoke or permit flames or sparks near the carburetor, fuel line, fuel filter, fuel pump, or other potential sources of spilled fuels or fuel vapors. Catch fuels in an approved container when removing the fuel line or carburetor.

⚠ WARNING

Explosive fuel vapors.
Can cause severe injury or death.

Use extreme care when handling, storing, and using fuels.

The fuel system. Explosive fuel vapors can cause severe injury or death. Vaporized fuels are highly explosive. Use extreme care when handling and storing fuels. Store fuels in a well-ventilated area away from spark-producing equipment and out of the reach of children. Never add fuel to the tank while the engine is running because spilled fuel may ignite on contact with hot parts or from sparks. Do not smoke or permit flames or sparks to occur near sources of spilled fuel or fuel vapors. Keep the fuel lines and connections tight and in good condition. Do not replace flexible fuel lines with rigid lines. Use flexible sections to avoid fuel line breakage caused by vibration. Do not operate the generator set in the presence of fuel leaks, fuel accumulation, or sparks. Repair fuel systems before resuming generator set operation.

Fuel tanks. Explosive fuel vapors can cause severe injury or death. Gasoline and other volatile fuels stored in day tanks or subbase fuel tanks can cause an explosion. Store only diesel fuel in tanks.

Draining the fuel system. Explosive fuel vapors can cause severe injury or death. Spilled fuel can cause an explosion. Use a container to catch fuel when draining the fuel system. Wipe up spilled fuel after draining the system.

Servicing the day tank. Hazardous voltage can cause severe injury or death. Service the day tank electrical control module (ECM) as prescribed in the equipment manual. Disconnect the power to the day tank before servicing. Press the day tank ECM OFF pushbutton to disconnect the power. Notice that line voltage is still present within the ECM when the POWER ON light is lit. Ensure that the generator set and day tank are electrically grounded. Do not operate the day tank when standing in water or on wet ground because these conditions increase the risk of electrocution.

Specifications

Kit No.	Tank Size, L (gal.)	Tank Material Gauge	Tank Dimensions, mm (in.)†			Input Voltage		Rupture Basin, L (gal.)	ECM Yes/No
			Length	Width	Height	Volts AC	Hz		
274602/274602-SD	37.8 (10)	14	610 (24)	304.8 (12)	466.9 (18.4)	110/120	60	N/A	Yes
274603/274603-SD	37.8 (10)	14	609.6 (25)	304.8 (12)	466.9 (18.4)	110/120	60	56.8 (15)	Yes
274604/274604-SD	94.6 (25)	12	610 (24)	304.8 (12)	771.7 (30.4)	110/120	60	N/A	No
274605/274605-SD	94.6 (25)	12	610 (24)	304.8 (12)	771.7 (30.4)	110/120	60	144 (38)	No
274606/274606-SD	189.2 (50)	12	610 (24)	457.2 (18)	990.6 (39.0)	110/120	60	N/A	No
274607/274607-SD	189.2 (50)	12	610 (24)	457.2 (18)	990.6 (39.0)	110/120	60	284 (75)	No
274717/274717-SD	94.6 (25)	12	610 (24)	304.8 (12)	90.8 (24.0)	110/120	60	N/A	Yes
274718/274718-SD	94.6 (25)	12	610 (24)	304.8 (12)	90.8 (24.0)	110/120	60	143.8 (38)	Yes
274854/274854-SD	378.5 (100)	12	610 (24)	610 (24)	1320.8 (52.0)	110/120	60	N/A	Yes
274855/274855-SD	378.5 (100)	12	610 (24)	610 (24)	1320.8 (52.0)	110/120	60	568 (150)	Yes
274856/274856-SD	378.5 (100)	12	610 (24)	610 (24)	1320.8 (52.0)	110/120	60	N/A	No
274857/274857-SD	378.5 (100)	12	610 (24)	610 (24)	1320.8 (52.0)	110/120	60	568 (150)	No
292242/292242-SD	37.8 (10)	14	610 (24)	304.8 (12)	508.0 (20.0)	110/120	60	N/A	Yes
292243/292243-SD	37.8 (10)	14	610 (24)	304.8 (12)	508.0 (20.0)	110/120	60	56.8 (15)	Yes
292244/292244-SD	37.8 (10)	14	610 (24)	304.8 (12)	508.0 (20.0)	230/460*	50	N/A	Yes
292245/292245-SD	37.8 (10)	14	610 (24)	304.8 (12)	508.0 (20.0)	230/460*	50	56.8 (15)	Yes
292246/292246-SD	37.8 (10)	14	610 (24)	304.8 (12)	508.0 (20.0)	240/480*	60	N/A	Yes
292247/292247-SD	37.8 (10)	14	610 (24)	304.8 (12)	508.0 (20.0)	240/480*	60	56.8 (15)	Yes
292248/292248-SD	94.6 (25)	12	610 (24)	304.8 (12)	812.8 (32.0)	110/120	60	N/A	Yes
292249/292249-SD	94.6 (25)	12	610 (24)	304.8 (12)	812.8 (32.0)	110/120	60	143.8 (38)	Yes
292250/292250-SD	94.6 (25)	12	610 (24)	304.8 (12)	812.8 (32.0)	230/460*	50	N/A	Yes
292251/292251-SD	94.6 (25)	12	610 (24)	304.8 (12)	812.8 (32.0)	230/460*	50	143.8 (38)	Yes
292252/292252-SD	94.6 (25)	12	610 (24)	304.8 (12)	812.8 (32.0)	240/480*	60	N/A	Yes
292253/292253-SD	94.6 (25)	12	610 (24)	304.8 (12)	812.8 (32.0)	240/480*	60	143.8 (38)	Yes
292254/292254-SD	189.2 (50)	12	610 (24)	457.2 (18)	990.6 (39.0)	110/120	60	N/A	Yes
292255/292255-SD	189.2 (50)	12	610 (24)	457.2 (18)	990.6 (39.0)	110/120	60	284 (75)	Yes
292256/292256-SD	189.2 (50)	12	610 (24)	457.2 (18)	990.6 (39.0)	230/460*	50	N/A	Yes
292257/292257-SD	189.2 (50)	12	610 (24)	457.2 (18)	990.6 (39.0)	230/460*	50	284 (75)	Yes
292258/292258-SD	189.2 (50)	12	610 (24)	457.2 (18)	990.6 (39.0)	240/480*	60	N/A	Yes
292259/292259-SD	189.2 (50)	12	610 (24)	457.2 (18)	990.6 (39.0)	240/480*	60	284 (75)	Yes
336846 CLINS 8-10‡	37.9 (10)	14	610 (24)	305 (12)	538.5 (21.2)	110/120	60	57 (15)	Yes
336847 CLINS 14-19‡	189.3 (50)	12	610 (24)	457 (18)	1021.1 (40.2)	110/120	60	284 (75)	Yes
336860 CLINS 20-23‡	227.1 (60)	12	610 (24)	508 (20)	1021.1 (40.2)	110/120	60	341 (90)	Yes
336861 CLINS 24-27‡	283.9 (75)	12	610 (24)	610 (24)	1021.1 (40.2)	110/120	60	428 (113)	Yes
347627 CLINS 34-37‡	567.8 (150)	12	610 (24)	914 (36)	1351.3 (53.2)	110/120	60	852 (225)	Yes
347629 CLINS 38-39‡	1040.9 (275)	12	610 (24)	1676 (66)	1351.3 (53.2)	110/120	60	1563 (413)	Yes
354711 CLINS 11-13‡	94.6 (25)	12	610 (24)	305 (12)	845.8 (33.3)	110/120	60	144 (38)	Yes
354713 CLINS 28-33‡	378.5 (100)	12	610 (24)	610 (24)	1023.6 (40.3)	110/120	60	568 (150)	Yes
354715 CLINS 34-37‡	567.8 (150)	12	610 (24)	914 (36)	1353.8 (53.3)	110/120	60	852 (225)	Yes
354716 CLINS 38-39‡	1040.9 (275)	12	610 (24)	1676 (66)	1353.8 (53.3)	110/120	60	1563 (413)	Yes
GM15462 CLINS 38-39‡	1040.9 (275)	12	610 (24)	1676 (66)	1353.8 (53.3)	110/120	60	1563 (413)	Yes
GM19964-KP1-C331‡	37.8 (10)	14	610 (24)	305 (12)	305 (12)	110/120	60	381 (15)	Yes
GM19964-KP2-C332‡	94.6 (25)	14	610 (24)	305 (12)	610 (24)	110/120	60	965 (38)	Yes
GM19964-KP3-C333‡	189.3 (50)	14	610 (24)	457.2 (18)	787.40 (31)	110/120	60	284 (75)	Yes
GM19964-KP4-C334‡	227.1 (60)	14	610 (24)	508.0 (20.0)	787.40 (31)	110/120	60	2286 (90)	Yes
GM19964-KP5-C335‡	283.9 (75)	14	610 (24)	609.6 (24.0)	787.40 (31)	110/120	60	2870 (113)	Yes
GM19964-KP6-C336‡	283.9 (75)	14	610 (24)	609.6 (24.0)	1117.60 (44)	110/120	60	568 (150)	Yes
GM19964-KP7-C337‡	567.8 (150)	14	610 (24)	914.4 (36.0)	1117.60 (44)	110/120	60	5715 (225)	Yes
GM19964-KP8-C338‡	1040.9 (275)	14	610 (24)	1676 (66)	1117.60 (44)	110/120	60	10490 (413)	Yes
GM19964-KP9-C339‡	7620 (300)	14	914 (36)	1016 (40)	189.2 (50)	110/120	60	11430 (450)	Yes

* Day tanks indicated are equipped with a 1/3 HP, 120 VAC, 1-phase, 50/60 Hz motor.
Voltages above 120 VAC have a stepdown transformer included for the ECM and motor.
† See dimension drawings following for rupture basin dimensions.
‡ Includes rupture basin alarm.
N/A Not Available

Figure 1 Day Tank Kit Numbers and Specifications

Day Tank Float Sensors

Float Sensor Kits	Float Sensor Part No.
292242 to 292247 274602 to 274603 292242-SD to 292247-SD 274602-SD to 274603-SD	274961
292248 to 292253 274604 to 274605 292248-SD to 292253-SD 274604-SD to 274605-SD	274827
292256 to 292259 274606 to 274607 292254-SD to 529229-SD 274606-SD to 274607-SD	274962

Features

Storage Tank

The day tank's heavy gauge steel construction is epoxy-coated inside and prime-coated and painted outside for rust prevention. Tank connections consist of four 1 in. NPT (fuel return, alternate fuel return, engine supply, and overflow), one 1 1/4 in. NPT (vent), and one 3/8 in. NPT (drain). ECM-equipped day tanks have a 114.3 mm (4 1/2 in.) square inspection port located below the electrical controls. For day tank part numbers and specifications, see Figure 1, Day Tank Kit Numbers and Specifications; for features, see Figure 2.

Motor

The standard day tank motor is a 1/3 HP, 120 VAC, 60 Hz, 1-phase, 20-amp maximum, thermally protected motor. A larger 1/2 HP motor is available.

Pump

- Heavy duty 7.6 Lpm (2 gpm) self-priming, positive displacement rotary gear pump. Larger capacity tanks have a 26.5 Lpm (7 gpm) pump. The 26.5 Lpm (7 gpm) pump is available as an option on tanks that have the 7.6 Lpm (2 gpm) pump standard.
- 3/8 in. NPT female threaded fitting fuel inlet.
- Corrosion-resistant bronze housing, gears with stainless steel shafts, and self-lubricating carbon bearings with lipseals.
- A carbonator style split-tang shaft coupling mounts the pump directly to the motor.

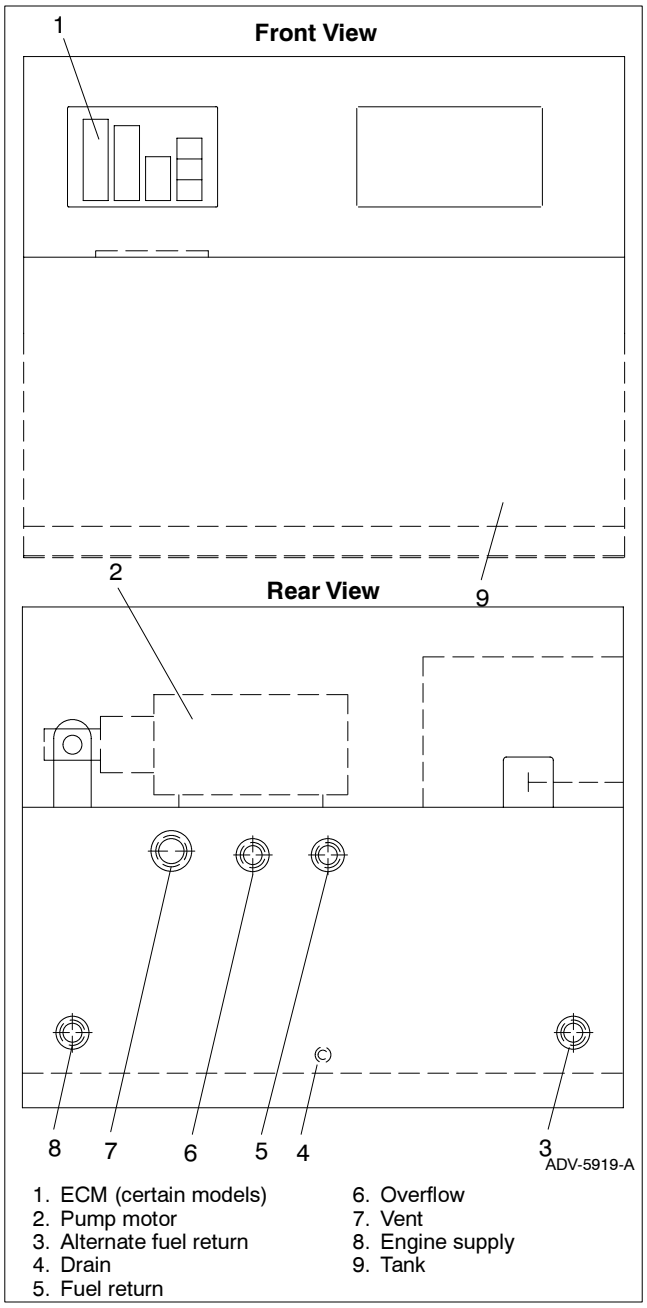


Figure 2 Common Day Tank Features (ECM model shown)

Controller (ECM Models)

Features of the ECM include:

- Fuel level gauge
- Pump control
- High fuel level warning
- Low fuel level warning
- Critical low level shutdown
- Fuel in rupture basin warning (requires float switch to monitor fuel in rupture basin)
- ECM functional signal

The ECM is standard on select day tanks. See Figure 1, Day Tank Kit Numbers and Specifications. The ECM manual controls include ON, OFF, and TEST pushbuttons. An internal test pushbutton allows for a periodic test of all indicator LEDs and remote annunciation relays. Each alarm is indicated locally by an LED and remotely by a relay. These relays provide normally open and normally closed contacts for customer connections. The ECM operates on a standard 120 VAC, 60 Hz, 1-phase system. See Figure 3 for ECM front panel layout.

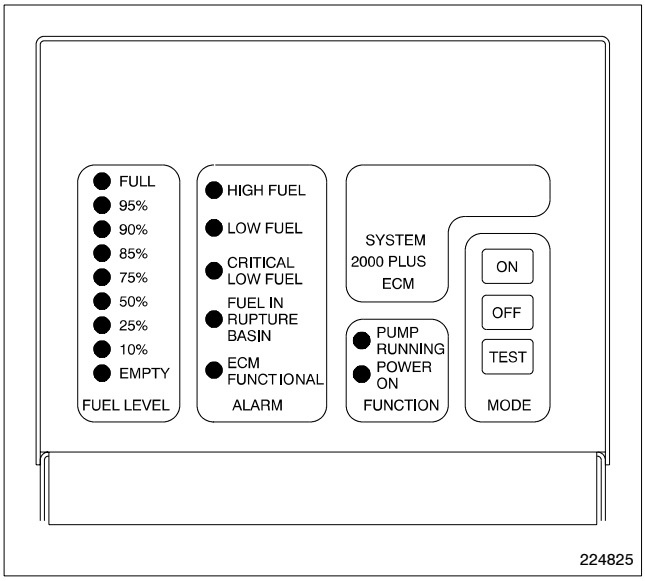


Figure 3 ECM Front Panel Layout

Installation Procedure

This section covers the mechanical installation of all day tank systems including placement and plumbing of the unit into the fuel system. Have a qualified technician install the day tank. The day tank installation must comply with the applicable articles of ANSI/NFPA70, National Electric Code and NFPA37 as well as state and local requirements.

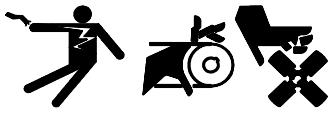
⚠ WARNING

Explosive fuel vapors.
Can cause severe injury or death.

Use extreme care when handling, storing, and using fuels.

Fuel tanks. Explosive fuel vapors can cause severe injury or death. Gasoline and other volatile fuels stored in day tanks or subbase fuel tanks can cause an explosion. Store only diesel fuel in tanks.

⚠ WARNING



Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery.

Pump Lift and Pump Head

The pump is self-priming and capable of lifting (suction) #2 diesel fuel up to 5.2 m (17 ft.) at sea level. Design the system with no more than 5.2 m (17 ft.) of vertical lift. See Figure 4, Figure 5, Figure 6, and Figure 7 to estimate frictional loss in pipe and fittings and for altitude deviations. If the site design requires more than 5.2 m (17 ft.) of vertical pipe between the main tank and day tank, place a remote pumping station at the main tank. The pumping station utilizes the head (pushing) capabilities of the pump. The pump's theoretical head is the vertical distance it will push fuel. Standard day tank pumps (7.6 Lpm [2 gpm] 1/3 HP) have 70.5 m (231 ft.) of head (690 kPa [100 psi]).

	Pipe Size, NPT (in.)						
Lpm (gpm)	**3/8**	**1/2**	**3/4**	**1**	**1 1/4**	**1 1/2**	**2**
8 (2)	4.6 (15.2)	1.7 (5.5)	0.3 (1.1)	0.2 (0.5)	0.1 (0.2)	—	—
15 (4)	16.9 (55.5)	6.2 (20.3)	1.6 (5.1)	0.4 (1.4)	0.2 (0.5)	0.1 (0.2)	—
26.5 (7)	—	18.6 (61.0)	4.7 (15.3)	1.4 (4.6)	0.4 (1.2)	0.2 (0.5)	—
37.9 (10)	—	—	8.0 (26.3)	2.6 (8.5)	0.8 (2.5)	0.3 (0.9)	0.1 (0.2)
71.9 (19)	—	—	—	8.7 (28.5)	2.3 (7.5)	1.1 (3.5)	0.4 (1.2)

Figure 4 Frictional Head Loss in m (ft.) for 100 (30.5 ft.) of Standard Weight Pipe at 16° C (60° F) at Sea Level

Pipe Size, in.	Ball Valve	45° D Elbow	Standard Elbow	Standard Tee	Check Valve	Angle Valve	Globe Valve	Diaphragm Valve
3/8	0.1 (0.28)	0.2 (0.70)	0.4 (1.4)	0.8 (2.6)	1.1 (3.6)	2.6 (8.6)	5.0 (16.5)	—
1/2	0.1 (0.35)	0.2 (0.78)	0.5 (1.7)	1.0 (3.3)	1.3 (4.3)	2.8 (9.3)	5.7 (18.6)	12.2 (40.0)
3/4	0.1 (0.44)	0.3 (0.97)	0.6 (2.1)	1.3 (4.2)	1.6 (5.3)	3.5 (11.5)	7.0 (23.1)	—
1	0.2 (0.56)	0.4 (1.23)	0.8 (2.6)	1.6 (5.3)	2.1 (6.8)	4.5 (14.7)	9.0 (29.4)	—
1 1/4	0.2 (0.74)	0.5 (1.60)	1.1 (3.5)	2.1 (7.0)	2.7 (8.9)	5.9 (19.3)	11.8 (38.6)	—
1 1/2	0.3 (0.86)	0.6 (1.90)	1.3 (4.1)	2.5 (8.1)	3.2 (10.4)	6.9 (22.6)	13.8 (45.2)	—
2	0.3 (1.10)	0.7 (2.40)	1.6 (5.2)	3.2 (10.4)	4.1 (13.4)	8.8 (29.0)	17.7 (58.0)	—

Figure 5 Frictional Loss in Pipe Fittings in Terms of Equivalent m (ft.) of Straight Pipe

	Elevation						
	Sea Level	305 m (1000 ft.)	610 m (2000 ft..)	915 m (3000 ft..)	1220 m (4000 ft.)	1525 m (5000 ft..)	1830 m (6000 ft..)
Atmospheric pressure, kPa (psi)	101.4 (14.7)	97.9 (14.2)	93.8 (13.6)	90.3 (13.1)	86.9 (12.6)	83.4 (12.1)	80.7 (11.7)
Available lift , m (ft.)	5.2 (17.0)	4.9 (16.0)	4.7 (15.5)	4.6 (15.0)	4.4 (14.5)	4.3 (14.0)	4.1 (13.5)

Figure 6 Lifting Capacities at Various Elevations

	Nominal Pump Size, Lpm (gpm) at 1725 rpm					
Motor HP	7.6 (4)	4 (15)	26 (7)	38 (10)	72 (19)	87 (23)
1/3	689 (100)	414 (60)	14 (2)	—	—	—
1/2	—	689 (100)	138 (20)	14 (2)	—	—
3/4	—	—	276 (40)	138 (20)	—	—
1	—	—	689 (100)	276 (40)	138 (20)	14 (2)
1 1/2	—	—	—	552 (80)	276 (40)	276 (40)
2	—	—	—	862 (125)	414 (60)	414 (60)
3	—	—	—	1034 (150)	689 (100)	862 (125)

Figure 7 Pump Discharge Pressure, kPa (psi)

Use supplied technical data when calculating pump head and especially pump lift to avoid costly repairs because of incorrect installation.

1. 1 kPa + 0.102 m (1 psi = 2.31 ft.) 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 formulas and conversions listed below:

   a. Head in Meters = $\frac{\text{kPa x 0.102}}{\text{Specific Gravity}}$

   Head in Feet = $\frac{\text{psi x 2.31}}{\text{Specific Gravity}}$

   b. kPa = $\frac{\text{Head x Specific Gravity}}{0.102}$

   psi = $\frac{\text{Head x Specific Gravity}}{2.31}$

   c. Specific Gravity of #2 diesel fuel = 0.88 at 16°C (60°F)

   d. Weight of #2 diesel fuel = 3.3 kg/L (7.3 lb./gal.)

3. All calculations are based on a 16°C (60°F) temperature. Make allowances for extreme temperature variances.

   a. Viscosity of #2 diesel fuel:

Viscosity	Temp. °C (°F)
35	38 (100)
40	21 (70)
60	-7 (20)
80	-18 (0)
200	-34 (-30)

   b. Use an immersion heater for below 0°C (32°F) applications.

Consider the following factors to determine the total available lift:

- Vertical distance from tank to pump
- Total length of pipe and size
- Type and number of fittings in the line
- Elevation above sea level

Read the following examples and complete the Pump Lift/Pump Head Worksheet on the last page of these instructions to determine pump lift and pump head.

Example One:

Given:

Vertical distance . . . . . 3.7 m (12 ft.)
Total length of pipe . . . . . 30.5 m (100 ft.)
Pipe size . . . . . 1 in. NPT
Pump size . . . . . 7.6 Lpm (2 gpm)
Fittings . . . . . 3 90° elbows
Elevation above sea level . 915 m (3000 ft.)

Solution: referring to Figure 5, a 1 in. 90° elbow equals 2.6 ft. of pipe.

0.8 m x 3 90° elbows = 2.4 m
(2.6 ft. x 3 90° elbows = 7.8 ft.)

The corrected length of pipe is now 32.9 m (107.8 ft.).

Referring to Figure 4, a 1 in. diameter pipe is equal to 0.2 m (0.5 ft.) of frictional head loss for 30.5 m (100 ft.) of pipe based on a 7.6 Lpm (2 gpm) pump.

32.9 m x 0.2/30.5 = 0.2 m
(107.8 ft. x 0.5/100 = 0.54 ft.)

The actual head loss is 0.2 m (0.54 ft.).

Therefore the total lift needed for this system is the vertical distance from the tank to the pump plus 0.2 m (0.54 ft.) (the head loss) or 3.8 m (12.5 ft.).

Because the pump is safely capable of lifting 4.6 m (15 ft.) at a 915 m (3000 ft.) elevation (see Figure 6), the equipment in this example will perform satisfactorily.

To determine the total available head, consider three factors:

- Vertical distance from pump to day tank
- Total length of pipe and size
- Fittings in the line

Note: Elevation is not considered in head calculations.

Example Two:

Given:

Vertical distance . . . . . 45.8 m (150 ft.)
Total length of pipe . . . 53.4 m (175 ft.)
Pipe size . . . . . 9.5 mm (0.38 in.) diameter
Pump size . . . . . 7.6 Lpm (2 gpm)
Fittings . . . . . Two 90° elbows
One check valve
One solenoid valve

Solution:
Referring to Figure 5, a 3/8 NPT 90° elbow equals 0.4 m (1.4 ft.) of pipe.

0.4 m x 2 90° elbows = 0.8 m
(1.4 ft. x 2 90° elbows = 2.8 ft.)

The check valve equals 1.1 m (3.6 ft.) of pipe.

The solenoid valve also has a 4.1 kPa (0.6 psi) drop (consult manufacturer) which calculates to 0.4 m (1.39 ft.) of pipe (0.6 x 2.31).

The total adjusted length of pipe is

53.4 m + 0.9 m + 1.1 m + 0.4 m = 55.8 m
(175 ft. + 2.8 ft. + 3.6 ft. +1.39 ft. = 183 ft.)

Referring to Figure 4, 55.8 m (183 ft.) of 3/8 NPT pipe with a 7.6 Lpm (2 gpm) pump interpolated to 8.5 m (27.8 ft.) of head loss.

55.8 m/30.5 m = 1.83 m
(183 ft./100 ft. = 1.83 ft.)

1.83 m x 4.6 m = 8.5 m
(1.83 ft. x 15.2 ft. = 27.8 ft.)

Therefore total equivalent height is

45.8 m + 8.5 m = 54.2 m
(150 ft. + 27.8 ft. = 177.8 ft.)

Note: The resulting pressure at the day tank is

70.5 m – 54.2 m) divided by 0.102 = 159 kPa
(231 ft.–177.8 ft.) divided by 2.31 = 23 psi)

The pump system will work and push fuel to a height of 70.5 m (231 ft.).

Tank Placement

Install the day tank as close to the engine as practical, making sure it is still serviceable from all sides. Position the tank to allow fuel and vent port service. Locate the tank a minimum of 153–204 mm (6–8 in.) from any wall for piping installation. Position day tanks equipped with the ECM so that the ECM can be easily seen and operated.

The base of each day tank has built-in bolt-down slots. Bolt down the day tank before installing any piping. Make sure to correct any pipe misalignment before fitting the pipe to the day tank. The day tank is not built to absorb pipe stress caused by installation misalignment.

Plumbing Connections

The factory ships the day tank with the drain port plugged by a 3/8 in. NPT pipe plug.

Avoid vertical piping loops or traps when designing a pumping system. Cavitation will eventually ruin a pump and can occur for many reasons:

- Total equivalent lift too high for pump
- Total equivalent head too high for pump
- Restrictions on lines
- Air leaks
- Incorrectly plumbed systems

Use 90° elbows to facilitate any minor adjustments to the plumbing of the day tank. Install pipe unions as needed to allow for future maintenance or breakdown of the piping. Clearly label all piping connections on the day tank for future reference.

Tighten all threaded connections using pipe sealant that is compatible with #2 diesel fuel. Connections should be able to hold twice the anticipated operating pressure; tighten connections accordingly.

Do not apply pressure above 34.5 kPa (5 psig) to the day tank. See the design drawing for plumbing connections.

Fuel Line Selection

Use schedule 40 black iron pipe or copper tubing for fuel lines. Never use galvanized pipe or fittings with diesel fuel systems. The fuel reacts chemically with the galvanized coating, causing it to peel and damage the pump. An inline fuel strainer on the inlet side of the pump is recommended to ensure pump life and proper valve seating. Check and clean the strainer periodically to remove particle buildup, which limits pumping capabilities.

Engine Supply

Pipe the engine supply port to the engine. Follow the engine manufacturer's recommendations for pipe size, flexible hose requirements, and final connection to the engine. The engine supply port is essentially a gravity feed from the day tank. Place the top of the day tank at least 152.4 mm (6 in.) below engine injectors.

Fuel Return

The fuel return ports return excess fuel from the engine to the day tank. Typically, only one port is required. Plug the unused port with a 1 in. NPT black iron pipe plug.

Overflow

Do not use the overflow port when the day tank is below the main tank because such an arrangement poses a potentially dangerous situation. In a normal application where the day tank is above the main fuel tank, the excess fuel will transfer back to the main tank by gravity. Add the reverse pumping option when the main tank is above the day tank. Do not reduce the 1 in. NPT overflow port.

Vent

Route the vent pipe immediately outside and upward to the highest point in the fuel system. Make sure there are no downflows or traps in this line. Consult local building codes on minimum heights, vent cap requirements, etc. Do not plug the vent.

Drain

It is not necessary to plumb the drain to any permanent drain line. Use an iron bronze body ball valve if a locally supplied valve is used.

Fuel Inlet

The fuel inlet to the day tank pump is a 3/8 in. NPT female threaded fitting. For models with an ECM, remove the plastic day tank cover by loosening the four screws on the sides of the cover. Plumb the fuel line from the main tank to the day tank pump. Pay particular attention to the pipe connection to the pump to avoid transmission of mechanical stresses to the pump. This connection is critical in order to maintain fuel pump priming. Maintain fuel in the suction side of the pipe with no air pockets. Use a foot valve at the main tank to prevent fuel from flowing back to the main tank and losing priming.

Use a hand pump for initial priming to avoid undue wear on the fuel pump. If the fuel pump must be used for initial priming, do not run fuel pump for more than 60 seconds. Fuel should be flowing within that time.

Gravity System

With the main tank above the day tank, a gravity feed may be sufficient. Gravity feed is dangerous because a 37,850 L (10,000 gal.) tank can be located above a 189 L (50 gal.) day tank. Because of the inherent danger of day tank overflow with a gravity feed system, use the following safety accessories:

- High level alarm.
- Rupture basin and fuel in rupture basin alarm. This is a tank that surrounds the day tank to allow time for corrective action to a problem before flooding occurs.
- Solenoid valve or float valve to stop flow of fuel to day tank.
- Filter or strainer to maintain clean fuel which will ensure seating of valves.
- Manual shutoff valve to stop flow of fuel.
- Reverse pumping system to pump the overflow fuel back to the main tank.

Electrical Connections

ECM Models

The electrical current requirement for the ECM and motor is 20 amps maximum, 120 VAC. The remote relay contacts are rated at 1 amp, 120 VAC. See Figure 8 for wiring diagram.

1. Access power terminals by loosening the four nuts securing the plastic cover to unit and removing the cover.
2. Remove the four top screws from the ECM and lift the ECM cover off, exposing the terminal strip located on the bottom left side. See Figure 9 for remote annunciation connections and Figure 10 for input power terminal layout.
3. Run wires through the knockouts provided. Have electrical connections performed by a qualified electrician.

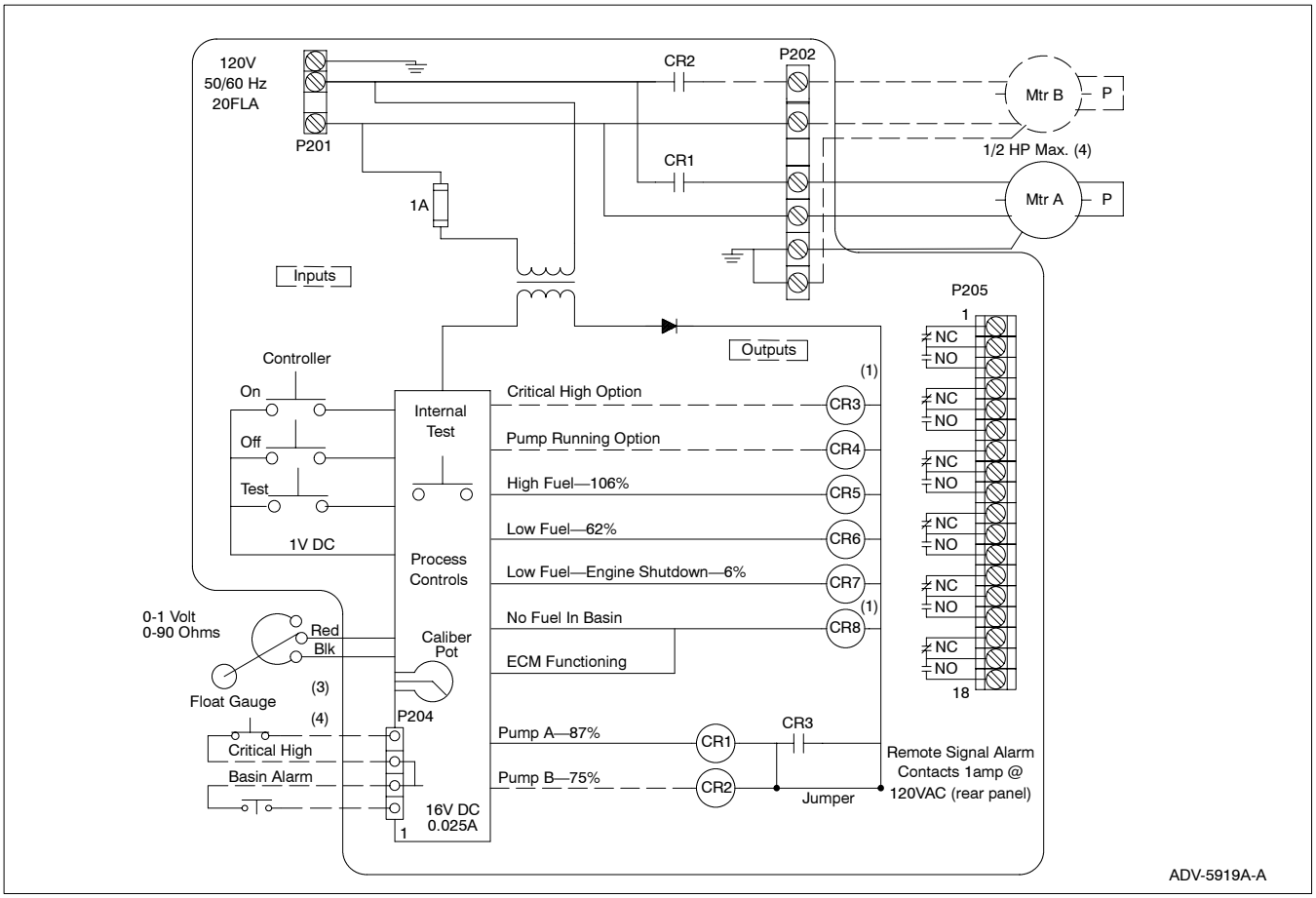


Figure 8 Day Tank Wiring Diagram

Non-ECM Models

The electrical current requirement for the non-ECM day tank motor is 20 amps maximum, 120 VAC.

1. Bring both power and common leads to float switch electrical box and connect to terminal strip marked LINE.
2. Ground electrical box to one of the bracket mounting screws inside box.

No power terminals for electrical warning accessories are available on non-ECM models. Have final electrical connections performed by a qualified electrician.

ECM Functional Alarm

The ECM functional alarm performs many internal checks to ensure proper operation. If a fault occurs, the relay deenergizes and the LED darkens. Wire alarm to the normally closed contact, thereby providing a signal if a fault does occur. See Figure 9 for remote annunciation connections.

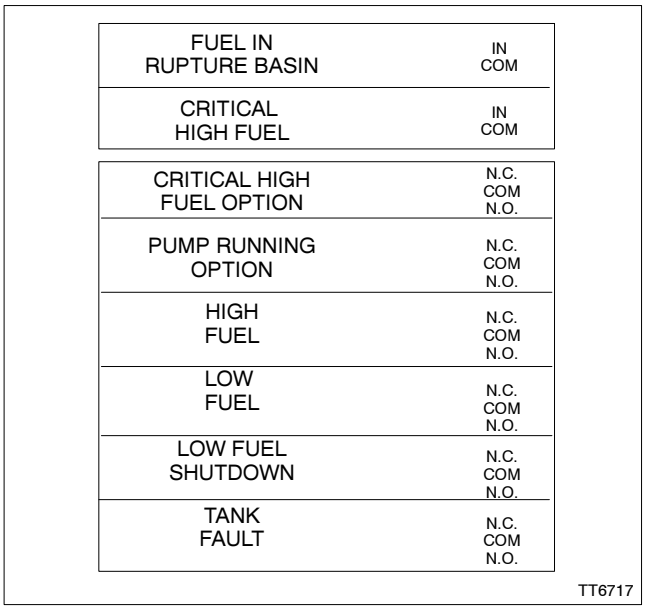


Figure 9 ECM Remote Annunciation Connections

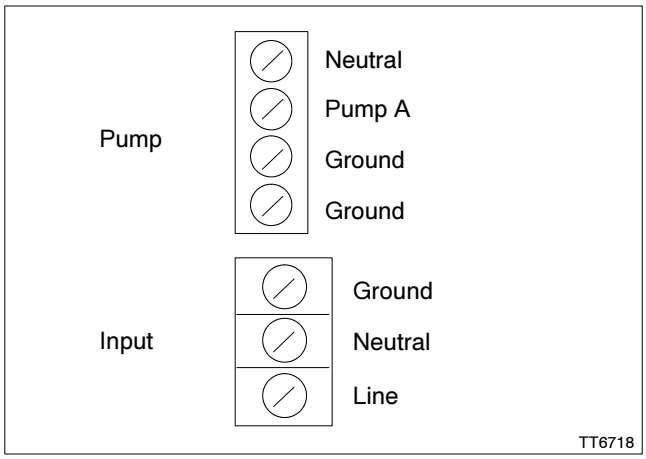


Figure 10 ECM Input Power Terminal Layout

Testing and Mechanical Inspection

Use this section as a guide to test the day tank for correct installation. All parts must be clean, all connections tight, and all components in working order for the day tank to operate correctly. Follow all safety precautions listed in front of this manual.

Note: Do not pressurize the day tank to more than 34.5 kPa (5 psig).

⚠ WARNING

Explosive fuel vapors.
Can cause severe injury or death.

Use extreme care when handling, storing, and using fuels.

The fuel system. Explosive fuel vapors can cause severe injury or death. Vaporized fuels are highly explosive. Use extreme care when handling and storing fuels. Store fuels in a well-ventilated area away from spark-producing equipment and out of the reach of children. Never add fuel to the tank while the engine is running because spilled fuel may ignite on contact with hot parts or from sparks. Do not smoke or permit flames or sparks to occur near sources of spilled fuel or fuel vapors. Keep the fuel lines and connections tight and in good condition. Do not replace flexible fuel lines with rigid lines. Use flexible sections to avoid fuel line breakage caused by vibration. Do not operate the generator set in the presence of fuel leaks, fuel accumulation, or sparks. Repair fuel systems before resuming generator set operation.

Draining the fuel system. Explosive fuel vapors can cause severe injury or death. Spilled fuel can cause an explosion. Use a container to catch fuel when draining the fuel system. Wipe up spilled fuel after draining the system.

Testing

Pressure test all lines leading to and from the day tank to twice the anticipated operating pressure.

The day tank has been factory tested to 5 psig. Do not pressurize day tank to more than 5 psig when pressure testing the lines. Day tanks are built with flat sides to minimize space requirements; over-pressure can severely distort the tank.

Note: 2.31 ft. fuel head = 1 psig

Air leaks in the lines will defeat the pump's lift and no fuel will be pumped. Continued operation of the pump without fuel can destroy the pump.

Pay particular attention to the condition of the fuel supply line from the main tank to the day tank.

Mechanical Inspection

Verify that all valves and lines are pressure-tested, clear and open. Confirm that installation is in accordance with the mechanical specifications and local building codes.

External and Internal Test (ECM Models)

Perform external and internal test when the mechanical inspection is complete. Prime the pump and fill the tank to capacity. The external test pushbutton will test all front panel LEDs for 3 seconds and activate the pump/motor for as long as the pushbutton is depressed. All alarm relays will maintain their original state, either open or closed. The internal test pushbutton located inside the ECM will test each LED and remote annunciation relay in sequential order (high fuel to ECM functional).

Activate both the external and internal test switch as a part of a periodic maintenance program to ensure reliable operation of the day tank.

External Test (Non-ECM Models)

Test the pump/motor by manually moving the adjustment disk. This will open and close contacts to operate the motor. When the day tank is full of fuel, a pliers may be needed to move the adjustment disk.

Operation (ECM)

General

The ECM maintains the fuel level of the day tank by controlling a pump/motor. The pump remains off at the normal fuel level and activates at 87% full. A pump running indicator LED lights when the pump activates. The motor relay is prewired to the pump/motor. The ECM panel also contains the power ON, which lights when the power is applied to the ECM. Follow all safety precautions listed in the front of this manual.

Servicing the day tank. Hazardous voltage can cause severe injury or death. Service the day tank electrical control module (ECM) as prescribed in the equipment manual. Disconnect the power to the day tank before servicing. Press the day tank ECM OFF pushbutton to disconnect the power. Notice that line voltage is still present within the ECM when the POWER ON light is lit. Ensure that the generator set and day tank are electrically grounded. Do not operate the day tank when standing in water or on wet ground because these conditions increase the risk of electrocution.

Level Sensor

An electronic analog float gauge located below the ECM on the mounting bracket determines the day tank fuel level. Nine LEDs on the ECM indicate the day tank fuel level from full to empty. See Figure 11 for front panel layout.

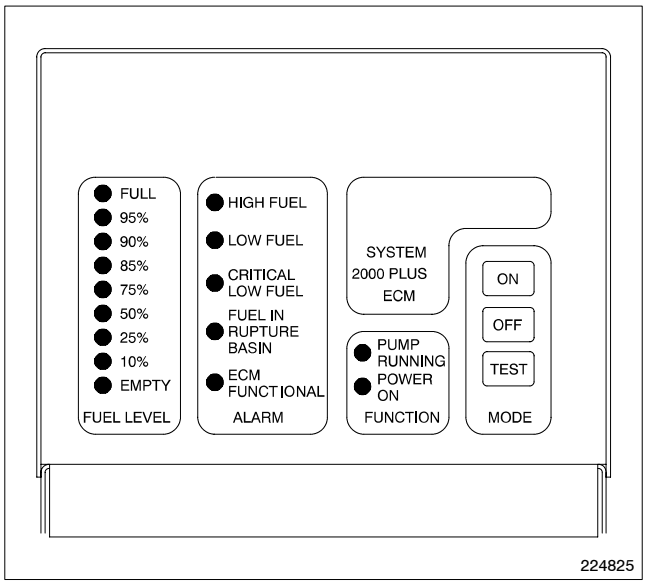


Figure 11 ECM Front Panel Layout

Alarms

The ECM has five standard alarm conditions indicated locally by an LED and remotely by a relay. Make customer connections to the normally open and normally closed relay contacts provided.

1. **High Fuel.** Alarm activates at 106% of normal fuel level.
2. **Low Fuel.** Alarm activates at 62% of normal fuel level. The alarm enables reaction time to a potential problem before low fuel shutdown occurs.
3. **Critical Low Fuel (engine shutdown).** Alarm activates at 6% of normal fuel level to enable the customer to shut down engine/generator before fuel runs out.
4. **Fuel In Rupture Basin.** If equipped with a rupture basin float switch, the ECM monitors for fuel leaked into the rupture basin.
5. **ECM Functional.** The ECM performs many internal checks to ensure proper operation.

Mode

The ECM has three modes of operation and one internal test button. See Figure 12 for descriptions of the modes.

Mode	Description
Off	Pushbutton disables the ECM for routine maintenance to the tank system without disrupting the ECM. When ECM functional alarm relay deenergizes, it can activate a customer-installed alarm wired to this relay.
On	Pushbutton activates the ECM after the OFF pushbutton is depressed. On any initial powerup after a power outage, the ECM will automatically turn on.
Test	Pushbutton tests all front panel LEDs for 3 seconds and activates pump/motor for as long as the pushbutton is depressed. All alarm relays maintain their original positions.
Internal Test	Pushbutton (located inside ECM) tests each LED and remote annunciation relay in sequential order (high fuel to ECM functional).

Figure 12 ECM Modes of Operation

Operation (Non-ECM)

Non-ECM day tanks include a float switch (side-mounted) that directly controls the pump/motor, pump, and motor.

Level Sensor

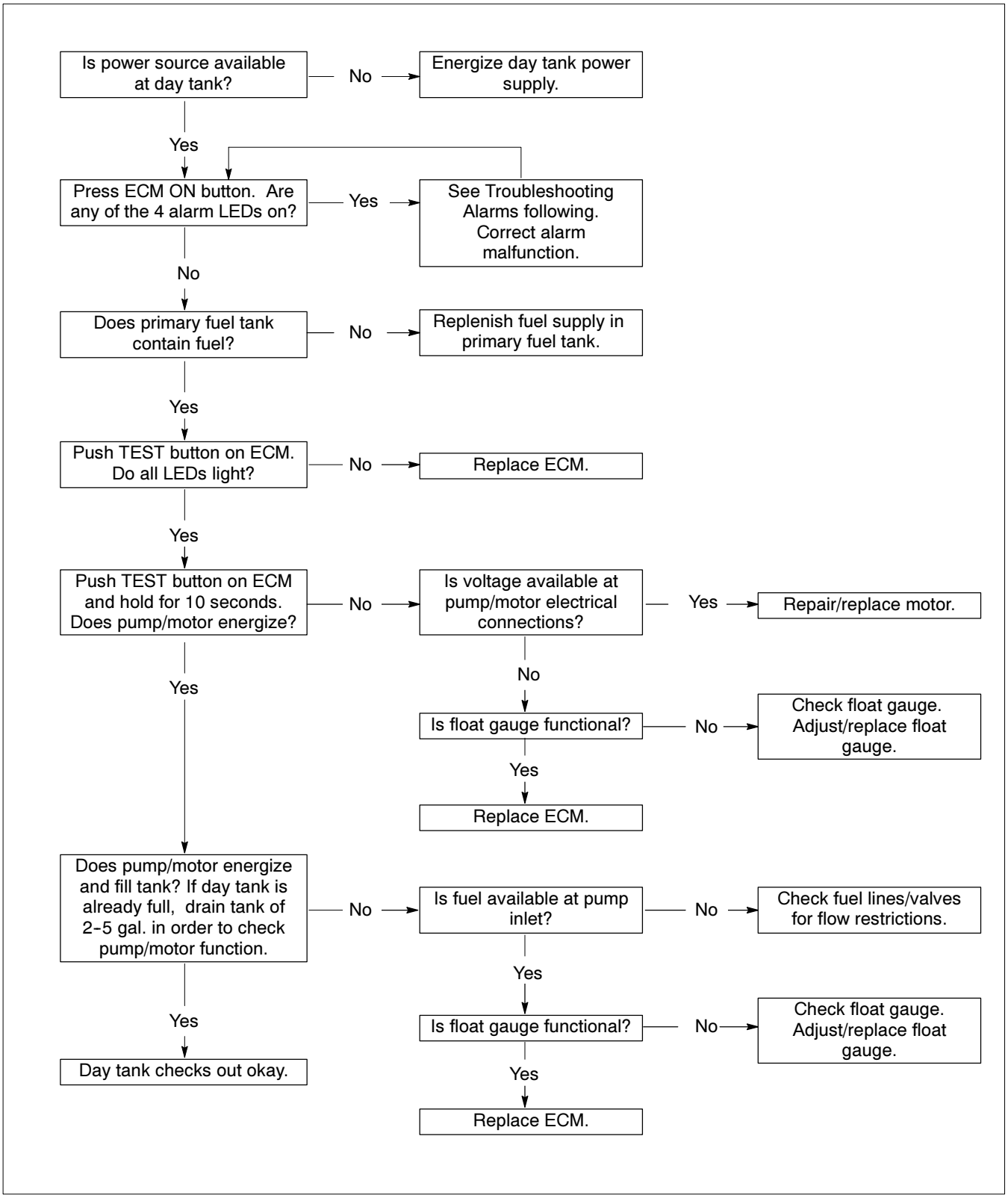
Day tanks without the ECM include a fuel level gauge and a 1/2 HP rated float switch which directly controls the pump/motor. The side-mounted float switch activates at approximately 75% of normal fuel level. Upon activation, the pump/motor fills the tank with fuel. The float switch deactivates pump/motor when the day tank fuel level reaches 100%.

The factory sets the float switch assembly. Use the following procedure if the switch needs further adjustment.

1. Disconnect power lines to the tank.
2. Reposition the two adjusting screws on the pie-shaped disk behind the electrical box.
   a. Adjust the bottom screw to change the point for the pump to start. Slide the screw up the slot to start the pump at a higher level, down for a lower level.
   b. Adjust the top screw to change the point for the pump to stop. Slide the screw up the slot to start the pump at a higher level, down for lower level.
3. Reconnect power and test the float switch function.

Troubleshooting

Testing Day Tank Function



Troubleshooting Alarms

Alarm LED Fault/Status	Probable Cause	Recommended Action
ECM functional		If the ECM functional LED is not illuminated, replace the ECM.
High fuel (106% of full)	Defective critical high switch and/or wiring ECM malfunction	Check switch contact function. Replace the defective switch. If the ECM functional LED is not illuminated, replace the ECM.
Low fuel (62% of full)	Low fuel level in primary tank No supply voltage to day tank Pump/motor malfunction Defective float gauge sender and wiring ECM malfunction	Replenish as necessary. Energize the power supply. Repair/replace the pump/motor. Use the Testing Day Tank Function flowchart. Test the float switch using an ohmmeter (R x 1). If the resistance range is 0–90 ohms, the float switch is functional. Replace the float switch if the float switch does not meet the above specs. If the ECM functional LED is not illuminated, replace the ECM.
Critical low fuel (6% of full)	Defective float gauge sender and wiring ECM malfunction	Test the float switch using an ohmmeter (R x 1). If the resistance range is 0–90 ohms, the float switch is functional. Replace the float switch if the float switch does not meet the above specs. If the ECM functional LED is not illuminated, replace the ECM.
Fuel in rupture basin	Defective basin alarm switch and wiring ECM malfunction Fuel tank damaged or defective	Check the switch contact function. Replace the defective switch. If the ECM functional LED is not illuminated, replace the ECM. If fuel is present in the rupture basin, check the source of fuel. Replace the day tank if it is leaking.

Parts List

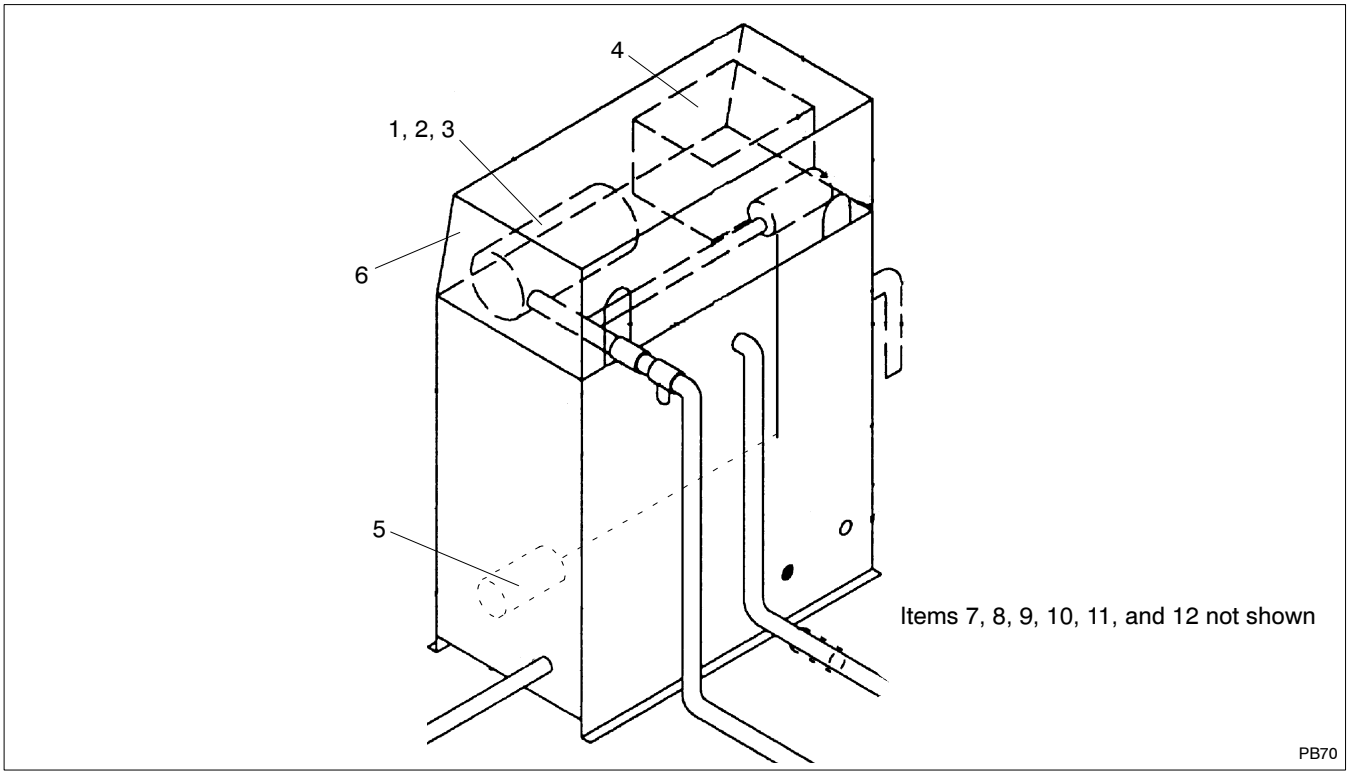


Figure 13 Day Tank and System Parts

Day Tank Kits

Kits: 274602, 274602-SD, 274603, 274603-SD, 292246, 292246-SD, 292247, 292247-SD							
				Unique Parts			
Item	Qty.	Description	Common Parts	292246 292246-SD	292247 292247-SD	274602 274602-SD	274603 274603-SD
1	1	Motor, pump	352898				
2	1	Pump	352899				
3	1	Coupling, pump	352900				
4	1	Controller, pump		354366	354366		
5	1	Sensor, float		354367	354367		
6	1	Cover, tank		354368	354368		
7	1	Basin, rupture			354369		354369
8	1	Switch, basin			354370		354370
9	1	Switch, float			354371		354371
10	1	Transformer, stepdown		354416	354416		
11	1	Switch, float (TRE model)				354417	354417

Kits: 274604, 274604-SD, 292251, 292251–SD, 292252, 292252-SD 292253, 292253-SD							
				Unique Parts			
Item	Qty.	Description	Common Parts	292251 292251-SD	292252 292252-SD	292253 292253-SD	274604 274604-SD
1	1	Motor, pump	352898				
2	1	Pump	352899				
3	1	Coupling, pump	352900				
4	1	Controller, pump		354366	354366	354366	
6	1	Cover, tank		354368	354368	354368	
8	1	Switch, basin		354370		354370	
9	1	Switch, float		354371		354371	354417
10	1	Transformer, stepdown		354415	354416	354416	
5	1	Sensor, float		354418	354418	354418	
7	1	Basin, rupture		354419		354419	

Kits: 274605, 274605-SD, 274717, 274717-SD, 274718, 274718-SD, 292254, 292254-SD							
				Unique Parts			
Item	Qty.	Description	Common Parts	274605 274605-SD	274717 274717-SD	274718 274718-SD	292254 292254-SD
1	1	Motor, pump	352898				
2	1	Pump	352899				
3	1	Coupling, pump	352900				
4	1	Controller, pump			354366	354366	354366
11	1	Switch, float (TRE model)		354417			
8	1	Switch, basin		354370		354370	
7	1	Basin, rupture		354419		354419	
5	1	Sensor, float		354418		354418	
6	1	Cover, tank			354420	354420	354368
9	1	Switch, float		354371		354371	
12	1	Valve, check			354421	354421	

Day Tank Kits, continued

Kits: 274606, 274606-SD, 292250, 292250-SD, 292258, 292258-SD, 292259, 292259-SD

				Unique Parts			
Item	Qty.	Description	Common Parts	292258 292258-SD	292259 292259-SD	274606 274606-SD	292250 292250-SD
1	1	Motor, pump	352898				
2	1	Pump	352899				
3	1	Coupling, pump	352900	352897	352897		354418
5	1	Sensor, float					
4	1	Controller, pump		354366	354366		354366
6	1	Cover, tank		354368	354368		354368
7	1	Basin, rupture			354372		
8	1	Switch, basin			354370		
9	1	Switch, float			354371	354417	
10	1	Transformer, stepdown		354416	354416		354415

Kits: 274607, 274607-SD, 274854, 274854-SD, 274855, 274855-SD, 292255, 292255-SD

				Unique Parts			
Item	Qty.	Description	Common Parts	292255 292255-SD	274607 274607-SD	274854 274854-SD	274855 274855-SD
1	1	Motor, pump		352898	352898	354422	354422
2	1	Pump		352899	352899	354423	354423
3	1	Coupling, pump		352900	352900	354424	354424
4	1	Controller, pump		354366		354366	354366
5	1	Sensor, float		354367		354373	354373
6	1	Cover, tank		354368		354368	354368
8	1	Switch, basin		354370	354370		354370
9	1	Switch, float		354371	354371		354371
7	1	Basin, rupture		354372	354372		354425
11	1	Switch, float (TRE model)			354417		

Kits: 274856, 274856-SD, 274857, 274857-SD,

				Unique Parts	
Item	Qty.	Description	Common Parts	274856 274856-SD	274857 274857-SD
12	1	Switch, float (TRE model)	354417		
1	1	Motor, pump	354422		
2	1	Pump	354423		
3	1	Coupling, pump	354424		
7	1	Basin, rupture			354425
8	1	Switch, basin			354370
9	1	Switch, float			354371

Kits: 292242, 292242-SD, 292243, 292243-SD, 292244, 292244-SD, 292245, 292245-SD

				Unique Parts			
Item	Qty.	Description	Common Parts	292242 292242-SD	292243 292243-SD	292244 292244-SD	292245 292245-SD
1	1	Motor, pump	352898				
2	1	Pump	352899				
3	1	Coupling, pump	352900				
4	1	Controller, pump	354366				
5	1	Sensor, float	354367				
6	1	Cover, tank	354368				
7	1	Basin, rupture			354369		354369
8	1	Switch, basin			354370		354370
9	1	Switch, float			354371		354371
10	1	Transformer, stepdown				354415	354415

Day Tank Kits, continued

Kits: 292248, 292248-SD, 292249, 292249-SD, 292256, 292256-SD, 292257, 292257-SD							
				Unique Parts			
Item	Qty.	Description	Common Parts	292248 292248-SD	292249 292249-SD	292256 292256-SD	292257 292257-SD
1	1	Motor, pump	352898				
2	1	Pump	352899				
3	1	Coupling, pump	352900				
4	1	Controller, pump	354366				
6	1	Cover, tank	354368				
5	1	Float, sensor		354418	354418	352897	352897
7	1	Basin, rupture			354419		354372
8	1	Switch, basin			354370		354370
9	1	Switch, float			354371		354371
10	1	Transformer, stepdown				354415	354415

FAA Day Tank Kits

Kits: 336846, 336847, 336860, 336861							
				Unique Parts			
Item	Qty.	Description	Common Parts	336846	336847	336860	336861
1	1	Motor, pump	352898				
2	1	Pump	352899				
3	1	Coupling, pump drive	352900				
4	1	Controller, pump	354366				
5	1	Sensor, float		354367	352897	352897	352897
6	1	Cover, tank	354368				
7	1	Basin, rupture		354369	354372	354382	354382
8	1	Switch, basin	354370				
9	1	Switch, float	354371				

Kits: 347627, 347629, GM15462						
				Unique Parts		
Item	Qty.	Description	Common Parts	347627	347629	GM15462
1	1	Motor, pump		352898	352898	354379
2	1	Pump		352899	352899	GM15488
3	1	Coupling, pump drive		352900	352900	354380
4	1	Controller, pump		354366	354366	224825
5	1	Sensor, float	354373			
6	1	Cover, tank	354368			
7	1	Basin, rupture		354374	354376	354376
8	1	Switch, basin	354370			
9	1	Switch, float	354371			

FAA Day Tank Kits, continued

Kits: 354711, 354713, 354715, 354716

				Unique Parts			
Item	**Qty.**	**Description**	**Common Parts**	**354711**	**354713**	**354715**	**354716**
1	1	Motor, pump	352898				
2	1	Pump		352899	352899	354378	354378
3	1	Coupling, pump drive		352900	352900	354380	354380
4	1	Controller, pump	354366				
5	1	Sensor, float		354719	354373	354373	354373
6	1	Cover, tank	354368				
7	1	Basin, rupture		354712	354714	354374	354376
8	1	Switch, basin	354370				
9	1	Switch, float	354371				
1	1	Motor				354379	354379

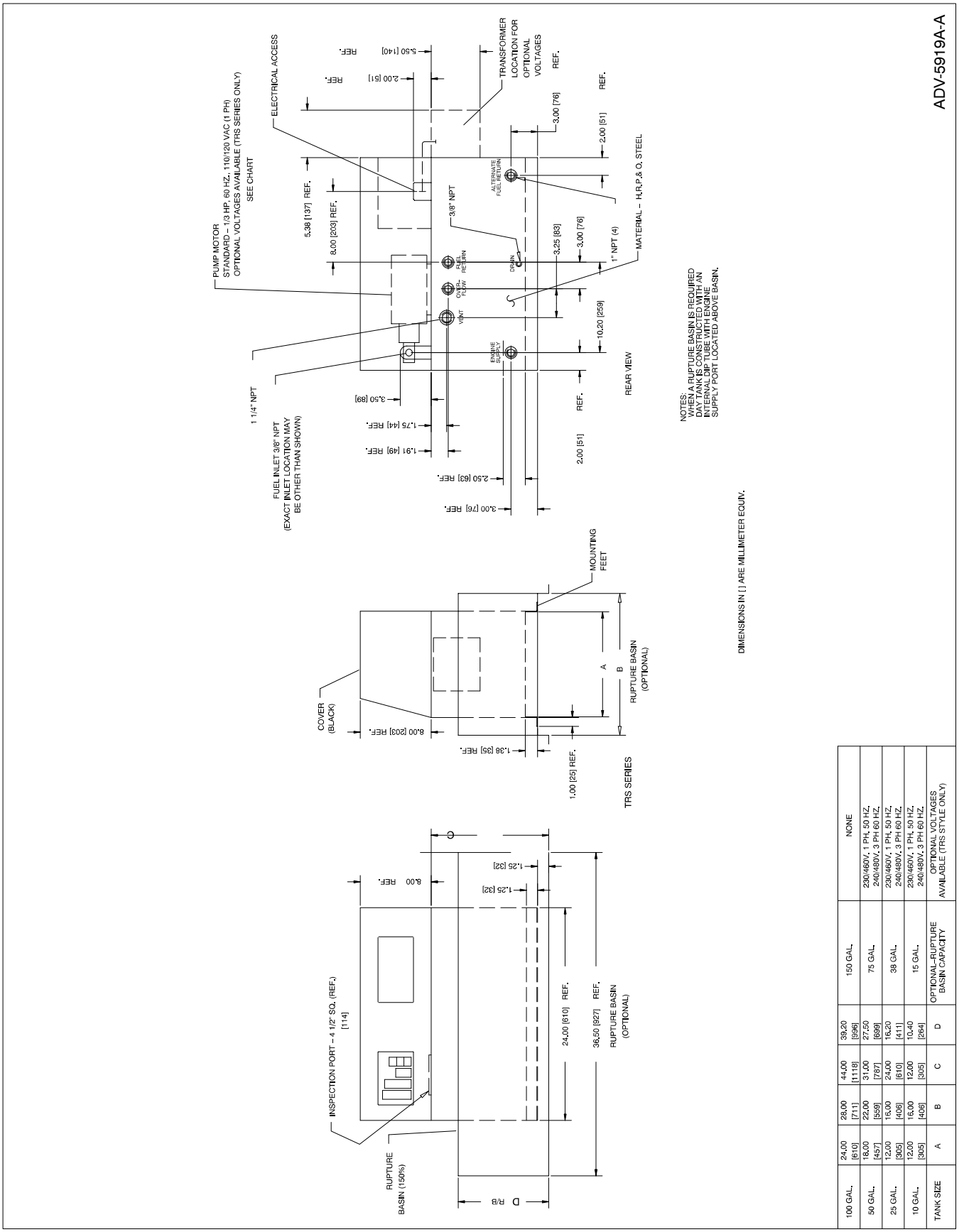
Kits: GM19964-KP1-C331 to GM19964-KP5-C335

				Unique Parts				
Item	**Qty.**	**Description**	**Common Parts**	**GM19964-KP1-C331**	**GM19964-KP2-C332**	**GM19964-KP3-C333**	**GM19964-KP4-C334**	**GM19964-KP5-C335**
—	1	Day tank assembly		GM19894	GM19895	GM19896	GM19897	GM19898
1	1	Motor, reverse spider mount, 1/3 HP, 115/208–230 VAC, 60 Hz	GM24580					
2	1	Pump, reverse spider mount, 4 gpm	GM24583					
—	1	Starter, motor 1PH for 3/4 HP motor						
—	1	Valve, solenoid, 120 VAC, 1/2 NPT, NC. 4 gpm max. (supply side)	GM24588					
5	1	Sensor, float		GM24592	GM24593	GM24594	GM24594	GM24594
7	1	Basin, rupture		354369	354419	354372	GM24575	GM24575
8	1	Switch, basin		GM24597	GM24598	GM24599	GM24599	GM24600
—	1	Relay, critical high	GM24590					
—	1	Relay, reverse pump	GM24591					
—	1	Switch, reverse pump	GM24602					
—	1	Pump, controller	354366					
—	1	Motor, supply C-face mount, 1/3 HP, 115 VAC, 60 Hz	352898					
—	1	Pump, supply, 2 gpm	352899					
—	1	Coupling, pump drive (white)	352900					

FAA Day Tank Kits, continued

Kits: GM19964-KP6-C336 to GM19964-KP9-C339							
				Unique Parts			
Item	Qty.	Description	Common Parts	GM19964-KP6-C336	GM19964-KP7-C337	GM19964-KP8-C338	GM19964-KP9-C339
—	1	Day tank assembly		GM19899	GM19900	GM19901	GM19902
1	1	Motor, reverse spider mount, 1/3 HP, 115/208–230 VAC, 60 Hz		GM24580	GM24580		
1	1	Motor, reverse C mount, 1/2 HP, 115/208–230 VAC, 60 Hz				GM24581	
1	1	Motor, reverse C mount, 3/4 HP, 115/208–230 VAC, 60 Hz					GM24582
2	1	Pump, reverse spider mount, 4 gpm		GM24583			
2	1	Pump, reverse spider mount, 7 gpm			GM24584		
2	1	Pump, reverse C mount, 10 gpm				GM24585	
2	1	Pump, reverse C mount, 19 gpm					GM24586
—	1	Starter, motor 1 ph for 3/4 HP motor					GM24587
—	1	Valve, solenoid. 120 VAC, 1/2 NPT, NC, 4 gpm max. (supply side)		GM24588	GM24588		
—	1	Valve, solenoid. 120 VAC, 3/4 NPT, NC, 10 gpm max. (supply side)				GM24589	GM24589
5	1	Sensor float		GM24595	GM24595	GM24595	GM24596
7	1	Basin, rupture		354425	354374	354376	GM24578
8	1	Switch, basin		GM24600	GM24600	GM24600	GM24601
—	1	Relay, critical high	GM24590				
—	1	Relay, reverse pump	GM24591				
—	1	Switch, reverse pump	GM24602				
—	1	Pump, controller	354366				
—	1	Coupling, pump drive (white)		352900			
—	1	Motor, supply C face mount, 1/3 HP, 115 VAC, 60 Hz		352898			
—	1	Motor, supply spider mount, 1/3 HP, 115/208–230 VAC, 60 Hz			GM24580	GM24580	
—	1	Motor, supply C mount, 1/2 HP, 115/208–230 VAC, 60 Hz					GM24581
—	1	Pump, supply 2 gpm		352899			
—	1	Pump, supply spider mount, 4 gpm			GM24583		
—	1	Pump, supply spider mount, 7 gpm				GM24584	
—	1	Pump, supply C mount, 10 gpm					GM24585

Dimension Drawings



TANK SIZE	A	B	C	D	OPTIONAL–RUPTURE BASIN CAPACITY	NONE
100 GAL.	24.00 [610]	28.00 [711]	44.00 [1118]	39.20 [996]	150 GAL.	230/460V. 1 PH, 50 HZ, 240/480V. 3 PH 60 HZ,
50 GAL.	18.00 [457]	22.00 [559]	31.00 [787]	27.50 [699]	75 GAL.	230/460V. 1 PH, 50 HZ, 240/480V. 3 PH 60 HZ,
25 GAL.	12.00 [305]	16.00 [406]	24.00 [610]	16.20 [411]	38 GAL.	230/460V. 1 PH, 50 HZ, 240/480V. 3 PH 60 HZ,
10 GAL.	12.00 [305]	16.00 [406]	12.00 [305]	10.40 [264]	15 GAL.	230/460V. 1 PH, 50 HZ, 240/480V. 3 PH 60 HZ,
					OPTIONAL VOLTAGES AVAILABLE (TRS STYLE ONLY)	

Figure 14 Day Tank with ECM Dimension Drawing

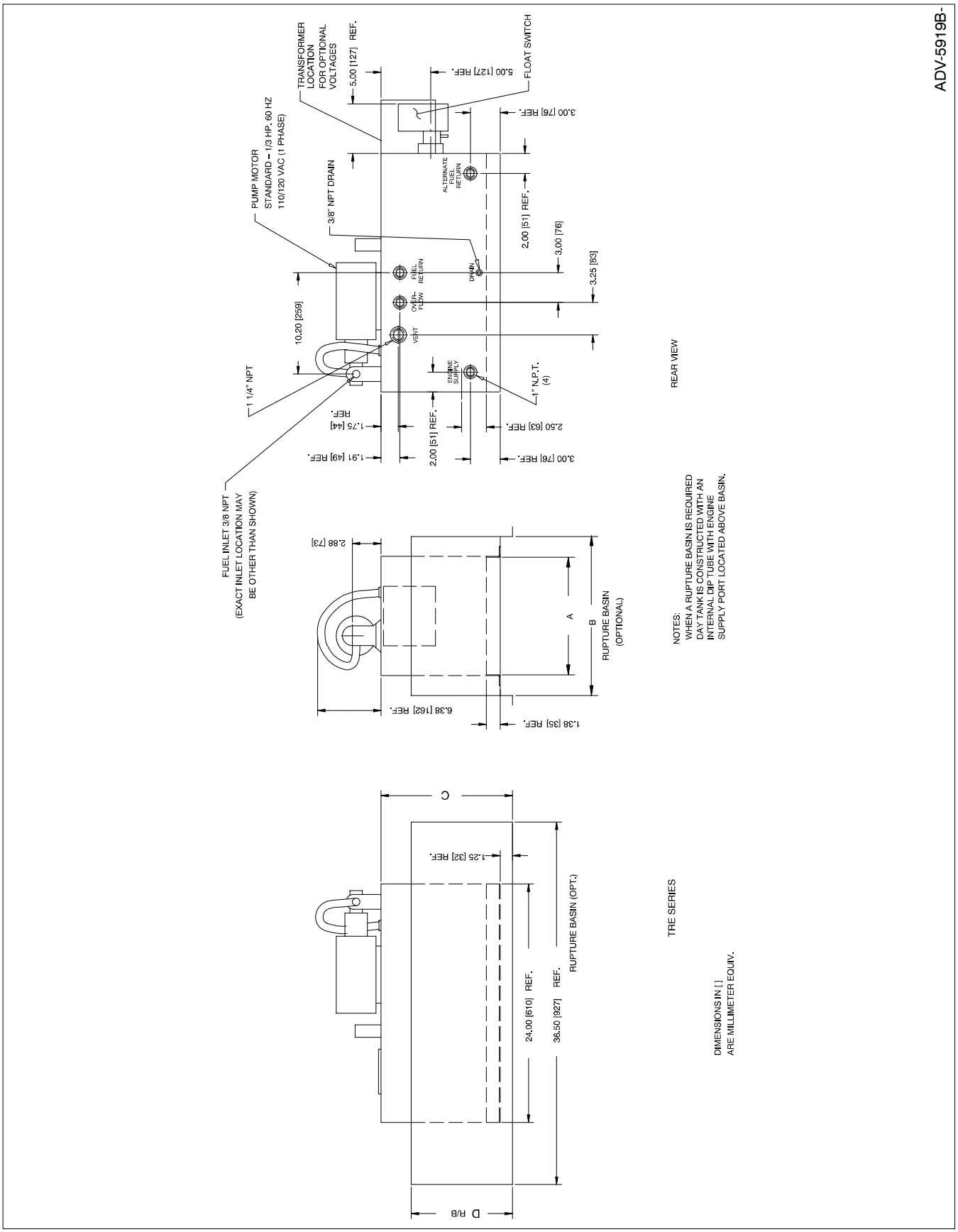
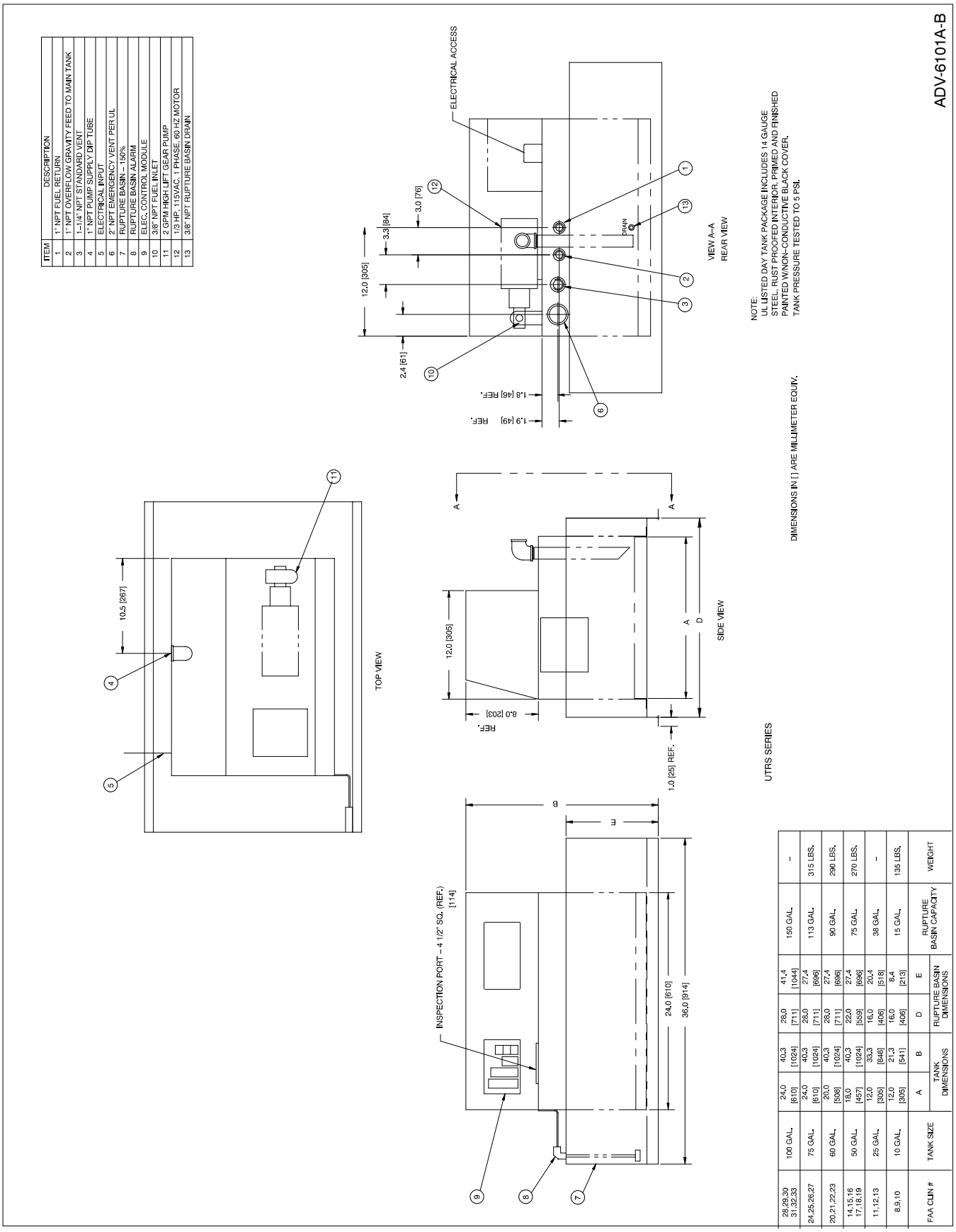


Figure 15 Day Tank Without ECM Dimension Drawing



FAA CLIN #	TANK SIZE	TANK DIMENSIONS A	TANK DIMENSIONS B	RUPTURE BASIN DIMENSIONS D	RUPTURE BASIN DIMENSIONS E	RUPTURE BASIN CAPACITY	WEIGHT
28,29,30 31,32,33	100 GAL.	24,0 [610]	40,3 [1024]	28,0 [711]	41,4 [1044]	150 GAL.	–
24,25,26,27	75 GAL.	24,0 [610]	40,3 [1024]	28,0 [711]	27,4 [696]	113 GAL.	315 LBS.
20,21,22,23	60 GAL.	20,0 [508]	40,3 [1024]	28,0 [711]	27,4 [696]	90 GAL.	290 LBS.
14,15,16 17,18,19	50 GAL.	18,0 [457]	40,3 [1024]	22,0 [559]	27,4 [696]	75 GAL.	270 LBS.
11,12,13	25 GAL.	12,0 [305]	33,3 [846]	16,0 [406]	20,4 [518]	38 GAL.	–
8,9,10	10 GAL.	12,0 [305]	21,3 [541]	16,0 [406]	8,4 [213]	15 GAL.	135 LBS.

Figure 16 Dimension Drawing for FAA CLINS 8–19

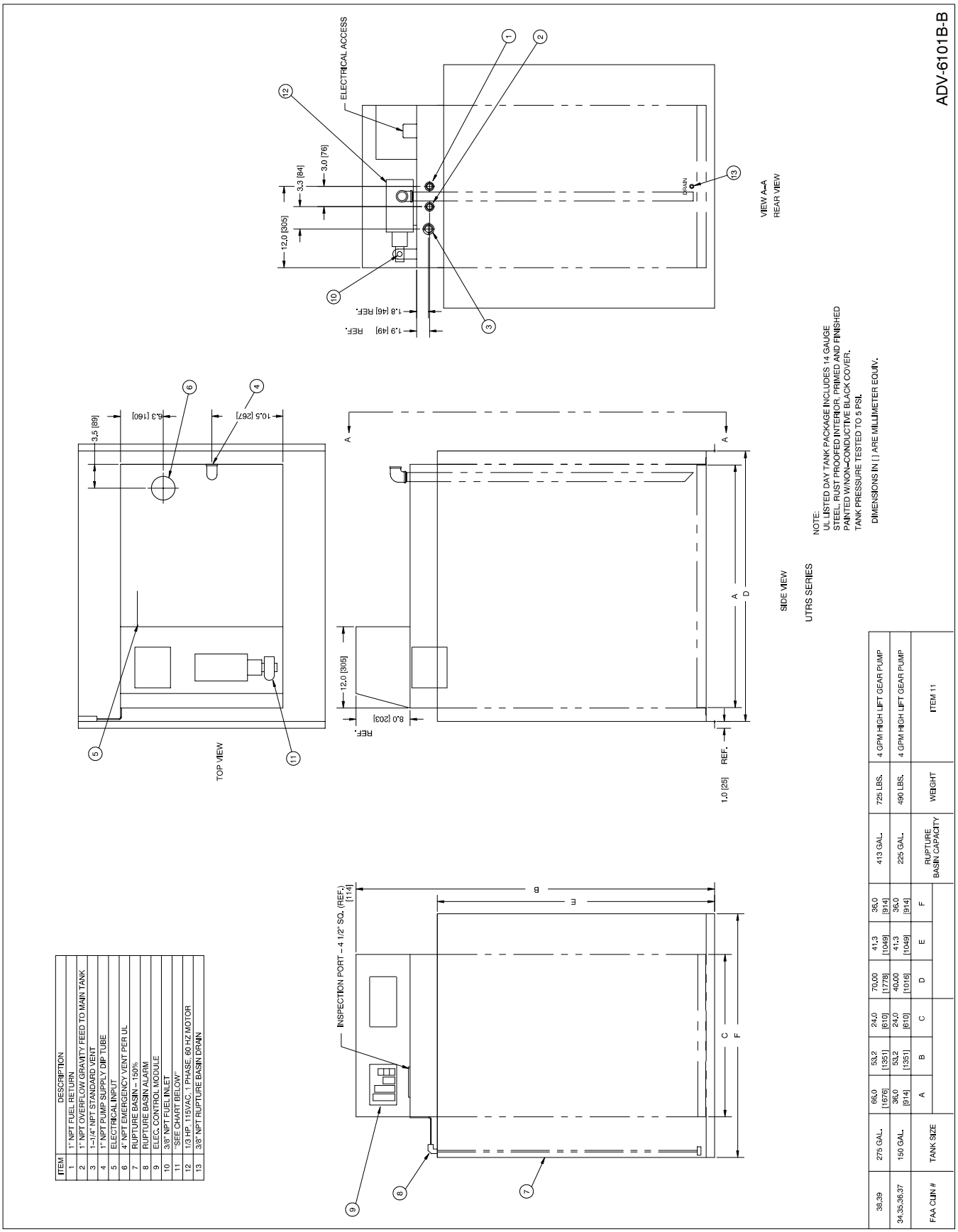
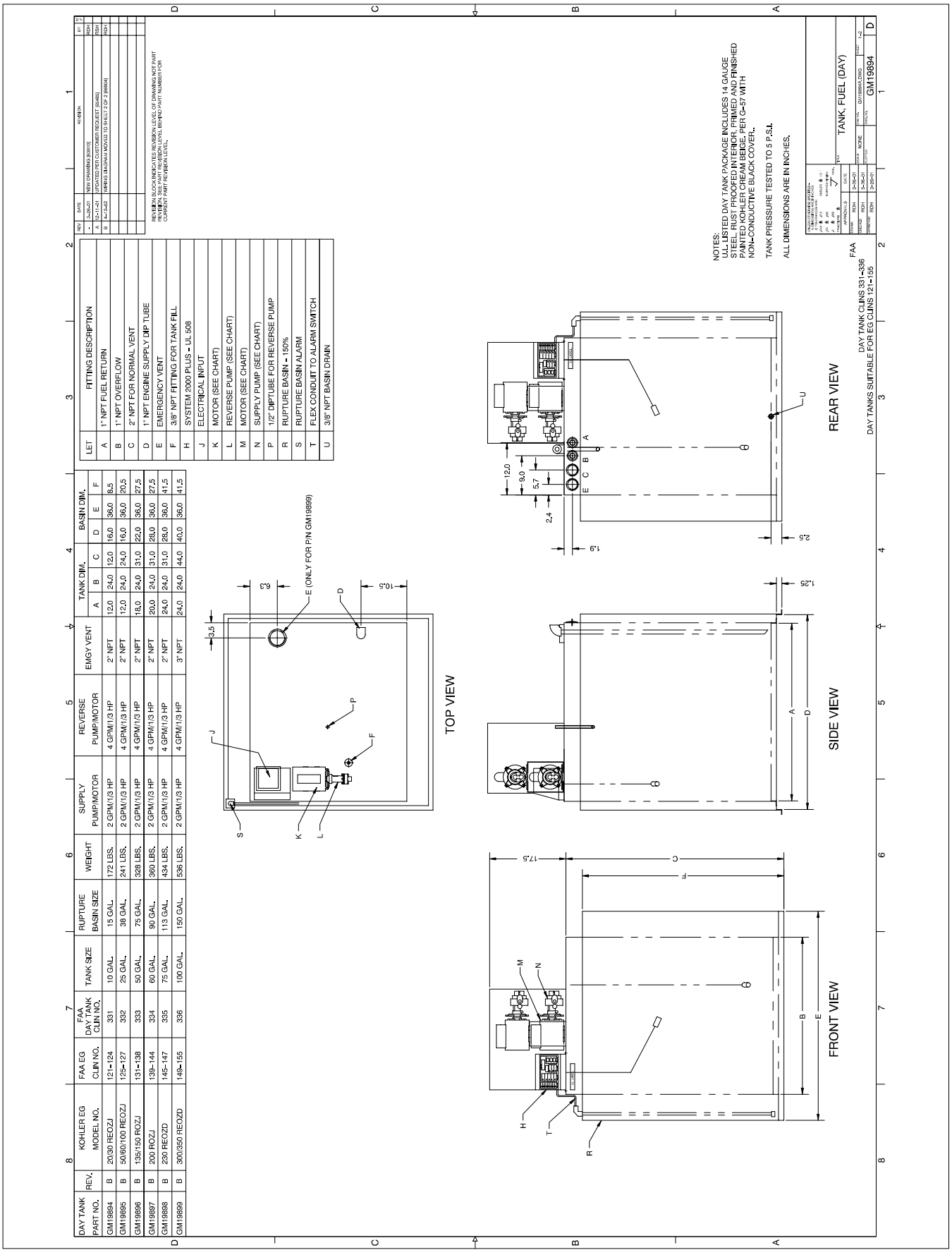


Figure 17 Dimension Drawing for FAA CLINS 20–39



DAY TANK PART NO.	REV.	KOHLER EG MODEL NO.	FAA EG DAY TANK CLIN NO.	FAA DAY TANK CLIN NO.	TANK SIZE	RUPTURE BASIN SIZE	WEIGHT	SUPPLY PUMP/MOTOR	REVERSE PUMP/MOTOR	EMGY VENT	TANK DIM.		BASIN DIM.		
											A	B	C	D	E	F
GM19894	B	20/30 REOZJ	121–124	331	10 GAL.	15 GAL.	172 LBS.	2 GPM/1/3 HP	4 GPM/1/3 HP	2" NPT	12.0	24.0	12.0	16.0	36.0	8.5
GM19895	B	50/60/100 REOZJ	125–127	332	25 GAL.	38 GAL.	241 LBS.	2 GPM/1/3 HP	4 GPM/1/3 HP	2" NPT	12.0	24.0	24.0	16.0	36.0	20.5
GM19896	B	135/150 ROZJ	131–138	333	50 GAL.	75 GAL.	328 LBS.	2 GPM/1/3 HP	4 GPM/1/3 HP	2" NPT	18.0	24.0	31.0	22.0	36.0	27.5
GM19897	B	200 ROZJ	139–144	334	60 GAL.	90 GAL.	360 LBS.	2 GPM/1/3 HP	4 GPM/1/3 HP	2" NPT	20.0	24.0	31.0	28.0	36.0	27.5
GM19898	B	230 REOZD	145–147	335	75 GAL.	113 GAL.	434 LBS.	2 GPM/1/3 HP	4 GPM/1/3 HP	2" NPT	24.0	24.0	31.0	28.0	36.0	41.5
GM19899	B	300/350 REOZD	148–155	336	100 GAL.	150 GAL.	536 LBS.	2 GPM/1/3 HP	4 GPM/1/3 HP	3" NPT	24.0	24.0	44.0	40.0	36.0	41.5

LET	FITTING DESCRIPTION
A	1" NPT FUEL RETURN
B	1" NPT OVERFLOW
C	2" NPT FOR NORMAL VENT
D	1" NPT ENGINE SUPPLY DIP TUBE
E	EMERGENCY VENT
F	3/8" NPT FITTING FOR TANK FILL
H	SYSTEM 2000 PLUS – UL 508
J	ELECTRICAL INPUT
K	MOTOR (SEE CHART)
L	REVERSE PUMP (SEE CHART)
M	MOTOR (SEE CHART)
N	SUPPLY PUMP (SEE CHART)
P	1/2" DIPTUBE FOR REVERSE PUMP
R	RUPTURE BASIN – 150%
S	RUPTURE BASIN ALARM
T	FLEX CONDUIT TO ALARM SWITCH
U	3/8" NPT BASIN DRAIN

REVISION BLOCK INDICATES REVISION LEVEL OF DRAWING NOT PART REVISION. PART REVISION LEVEL BEHIND PART NUMBER FOR CUSTOMER PART FORMULATION.

NOTES:
UL LISTED DAY TANK PACKAGE INCLUDES 14 GAUGE STEEL, RUST PROOFED INTERIOR, PRIMED AND FINISHED PAINTED KOHLER CREAM BEIGE, PER G-57 WITH NON-CONDUCTIVE BLACK COVER..

TANK PRESSURE TESTED TO 5 P.S.I.

ALL DIMENSIONS ARE IN INCHES.

TOP VIEW

REAR VIEW

SIDE VIEW

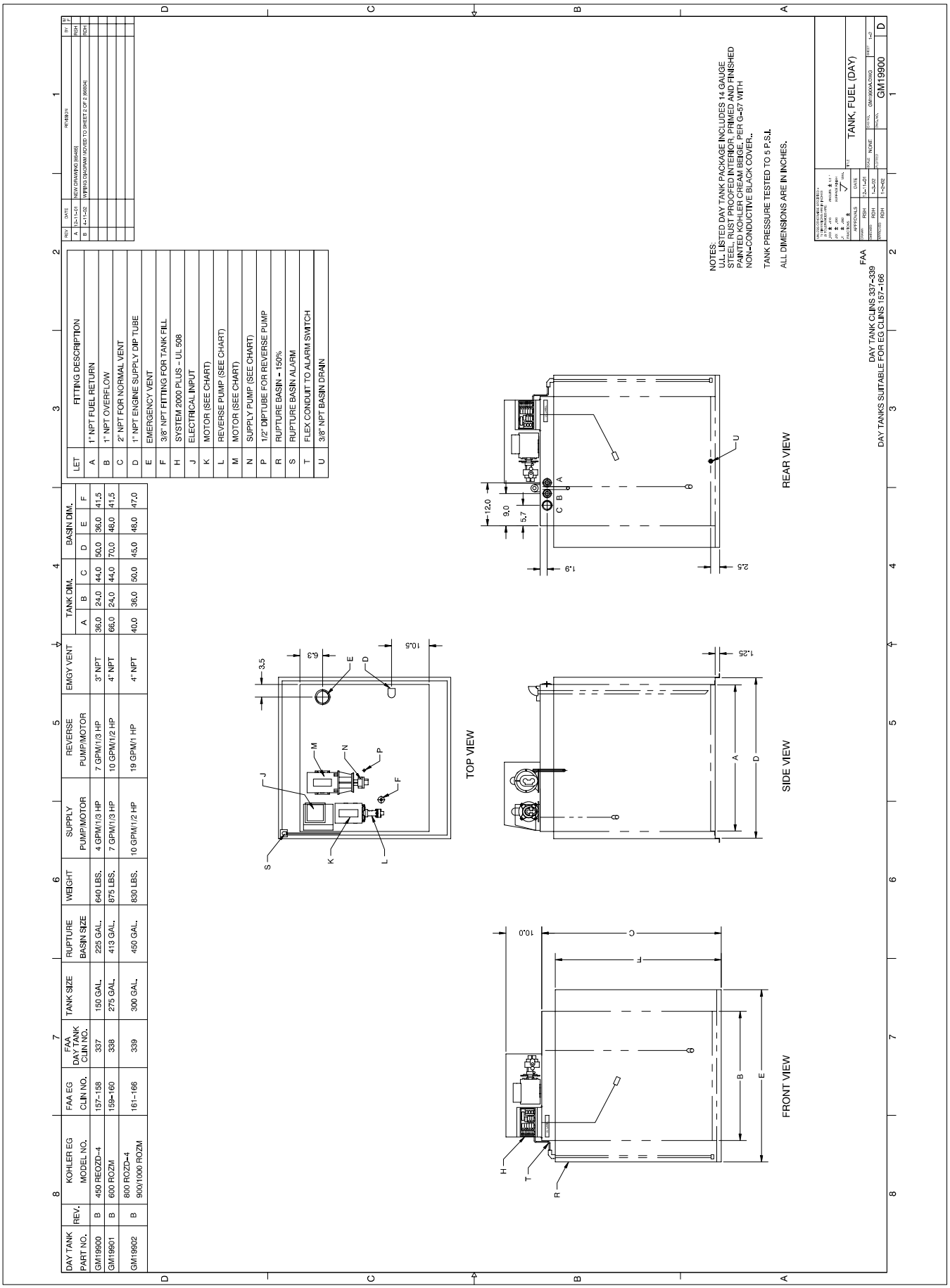
FRONT VIEW

DAY TANK CLINS 331-336
FAA
DAY TANKS SUITABLE FOR EG CLINS 121-155

TANK, FUEL (DAY)

GM19894

Figure 18 Dimension Drawing for FAA CLINS 331–336



DAY TANK PART NO.	REV.	KOHLER EG MODEL NO.	FAA EG CLIN NO.	FAA DAY TANK CLIN NO.	TANK SIZE	RUPTURE BASIN SIZE	WEIGHT	SUPPLY PUMP/MOTOR	REVERSE PUMP/MOTOR	EMGY VENT	TANK DIM. A	TANK DIM. B	TANK DIM. C	BASIN DIM. D	BASIN DIM. E	BASIN DIM. F
GM19900	B	450 REOZD-4	157-158	337	150 GAL.	225 GAL.	640 LBS.	4 GPM/1/3 HP	7 GPM/1/3 HP	3" NPT	36,0	24,0	44,0	50,0	36,0	41,5
GM19901	B	600 ROZM	159-160	338	275 GAL.	413 GAL.	875 LBS.	7 GPM/1/3 HP	10 GPM/1/2 HP	4" NPT	66,0	24,0	44,0	70,0	48,0	41,5
GM19902	B	800 ROZD-4 900/1000 ROZM	161-166	339	300 GAL.	450 GAL.	830 LBS.	10 GPM/1/2 HP	19 GPM/1 HP	4" NPT	40,0	36,0	50,0	45,0	48,0	47,0

LET	FITTING DESCRIPTION
A	1" NPT FUEL RETURN
B	1" NPT OVERFLOW
C	2" NPT FOR NORMAL VENT
D	1" NPT ENGINE SUPPLY DIP TUBE
E	EMERGENCY VENT
F	3/8" NPT FITTING FOR TANK FILL
H	SYSTEM 2000 PLUS – UL 508
J	ELECTRICAL INPUT
K	MOTOR (SEE CHART)
L	REVERSE PUMP (SEE CHART)
M	MOTOR (SEE CHART)
N	SUPPLY PUMP (SEE CHART)
P	1/2" DIPTUBE FOR REVERSE PUMP
R	RUPTURE BASIN – 150%
S	RUPTURE BASIN ALARM
T	FLEX CONDUIT TO ALARM SWITCH
U	3/8" NPT BASIN DRAIN

REV	DATE	REVISION	BY
A	10-1-01	NEW DRAWING [88486]	RSH
B	4-11-02	WIRING DIAGRAM MOVED TO SHEET 2 OF 2 [88804]	RSH

Figure 19 Dimension Drawing for FAA CLINS 337-339

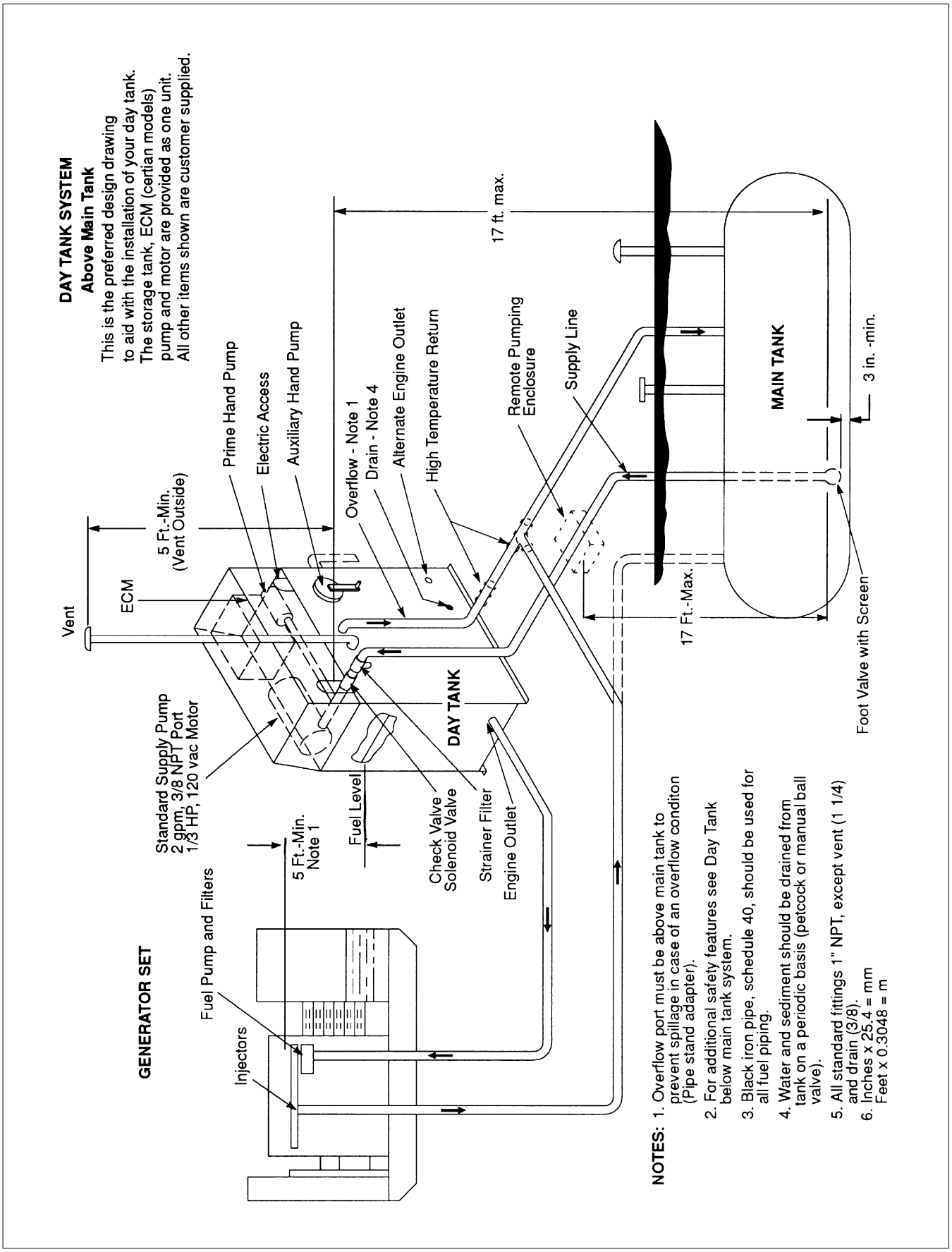


Figure 20 Day Tank System Above Main Tank

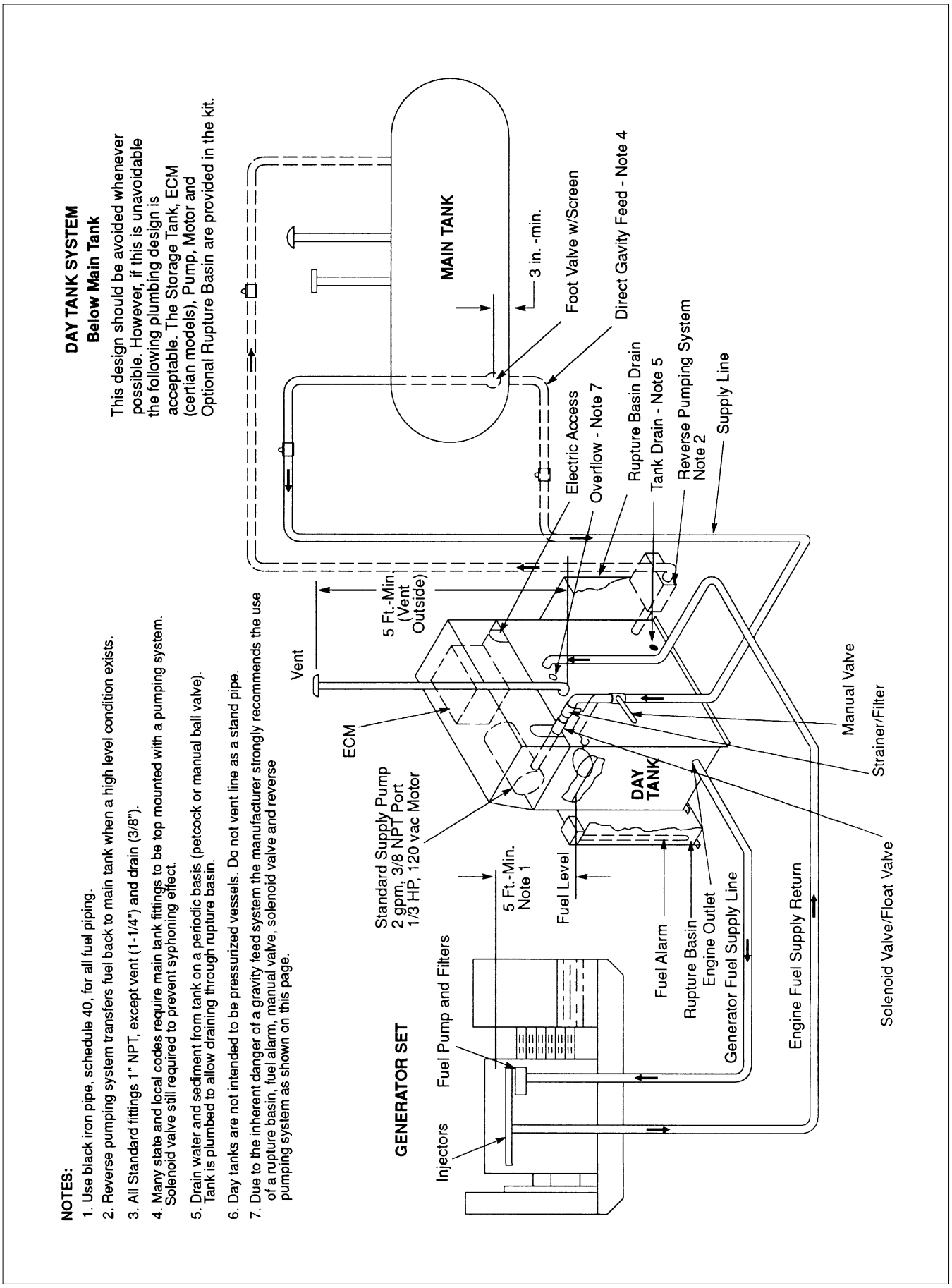


Figure 21 Day Tank System Below Main Tank

Pump Lift/Pump Head Worksheet

Lift Required for Day Tank and Pump Above Main Tank:

Directions: Use questions 1–10 for both applications, 11–14 for a day tank located above the main tank, and 15–18 for a day tank located below the main tank.

1. Total vertical pipe distance (day tank inlet to main tank bottom) . . . . . _____m (ft.)
2. Total length of pipe (vertical and horizontal) (calculate each pipe size in the line individually) . . . . . _____m (ft.)
3. Added length due to fittings in line (see Figure 4 and Figure 5) . . . . . _____m (ft.)
4. Add lines 2 and 3 . . . . . _____m (ft.)
5. Divide line 4 by 100 . . . . . _____C m (C ft.)
6. Pipe size . . . . . _____mm (in.)
7. Pump capacity . . . . . _____Lpm/gpm
8. Friction head loss for 100 feet (See Figure 4) . . . . . _____m (ft.)
9. Additional head loss—multiply line 5 by line 8 . . . . . _____m (ft.)
10. Repeat lines 2–9 for each pipe size used in the line . . . . . _____m (ft.)

Use questions 11–14 to compute pump lift.

11. Total lifting capacity needed (add lines 1, 9, and 10) . . . . . _____m (ft.)
12. Fuel tank elevation (above sea level) . . . . . _____m (ft.)
13. Available pump lift (see Figure 6) . . . . . _____m (ft.)
14. Subtract line 11 from line 13 (subtract even if result is a negative number) . . . . . _____m (ft.)

Use questions 15–18 for pump head.

15. Total head capacity needed (add lines 1, 9, and 10) . . . . . _____m (ft.)
16. Pump discharge pressure (see Figure 7) . . . . . _____kPa/psi
17. Available pump head (multiply line 16 by 2.31) . . . . . _____m (ft.)
18. Subtract line 15 from line 17 (subtract even if result is a negative number) . . . . . _____m (ft.)

Pump-Lift Results

If line 14 is a positive number, the system is correctly sized. If line 14 is a negative number, the system is beyond the safe lifting capacity. If line 1 is less than line 13, increase pipe size. If line 1 is larger than line 13, install a remote pumping unit.

Pump-Head Results

If line 18 is a positive number, the system is correctly sized. If line 18 is a negative number, the system is beyond a safe pushing capacity. Redesign the system.