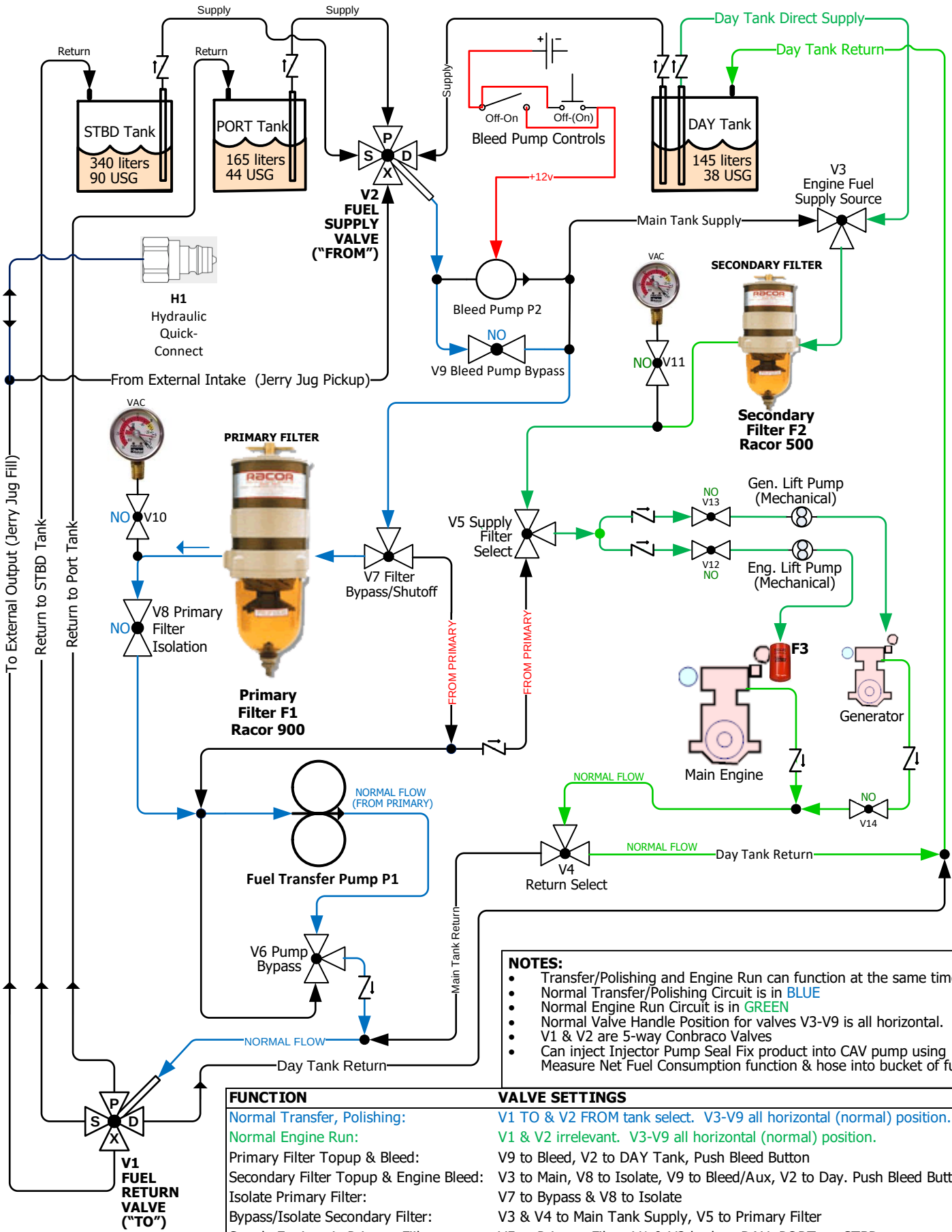
Fuel System Schematic - S/V *BEATRIX*

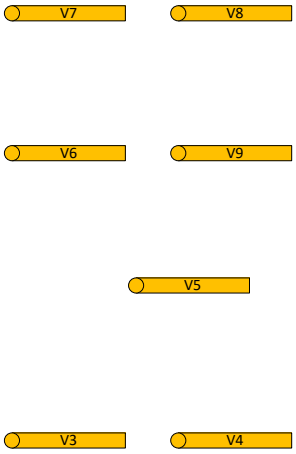


NOTES:

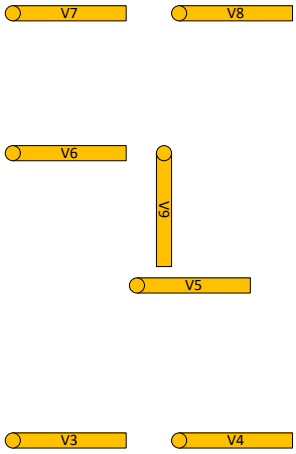
- Transfer/Polishing and Engine Run can function at the same time.
- Normal Transfer/Polishing Circuit is in BLUE
- Normal Engine Run Circuit is in GREEN
- Normal Valve Handle Position for valves V3-V9 is all horizontal.
- V1 & V2 are 5-way Conbraco Valves
- Can inject Injector Pump Seal Fix product into CAV pump using Measure Net Fuel Consumption function & hose into bucket of fuel.

FUNCTION	VALVE SETTINGS
Normal Transfer, Polishing:	V1 TO & V2 FROM tank select. V3-V9 all horizontal (normal) position.
Normal Engine Run:	V1 & V2 irrelevant. V3-V9 all horizontal (normal) position.
Primary Filter Topup & Bleed:	V9 to Bleed, V2 to DAY Tank, Push Bleed Button
Secondary Filter Topup & Engine Bleed:	V3 to Main, V8 to Isolate, V9 to Bleed/Aux, V2 to Day. Push Bleed Button
Isolate Primary Filter:	V7 to Bypass & V8 to Isolate
Bypass/Isolate Secondary Filter:	V3 & V4 to Main Tank Supply, V5 to Primary Filter
Supply Engine via Primary Fiilter:	V5 to Primary Filter, V1 & V2 both to DAY, PORT, or STBD
Supply Engine STBD or PORT, 2º Filter:	V3 & V4 to Main Tank Supply, V1 & V2 both set to PORT or STBD
Bypass Transfer Pump:	V6 to Bypass
Use Bleed Pump as Transfer Pump:	V6 to Bypass,V9 to Bleed/Aux, set V1 & V2. Turn Aux Switch ON
Use Bleed Pump as Eng. Fuel Pump:	As above plus set both V1 & V2 to Day, Turn Aux switch ON
Measure Net Fuel Consumption:	V1 & V2 to EXT, V3-V8 all handles vertical. H1 to hose into graduated cyl.

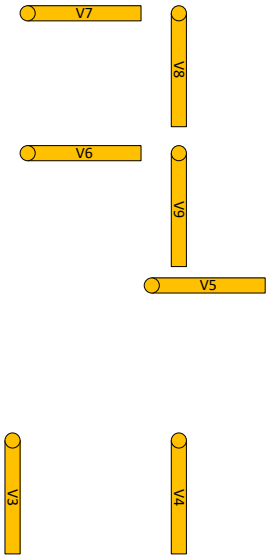
S/V *BEATRIX* - KELLY-PETERSON 44 #286 (1980)	TITLE	REV	SCALE	PAGE	UNITS	DATE	DRAWN BY
	Fuel Management and Control - Fuel System Schematic	H	1: 1	1 OF 7	mm	16/02/21	JMS



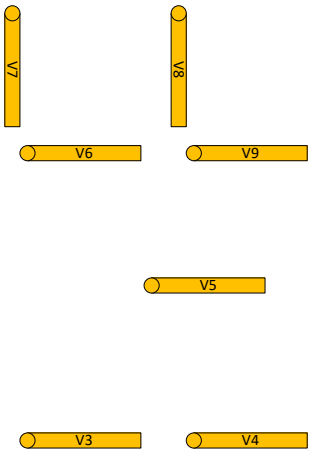
Normal Fuel Transfer & Polish
V2(FROM) → any tank
V1(TO) → any tank



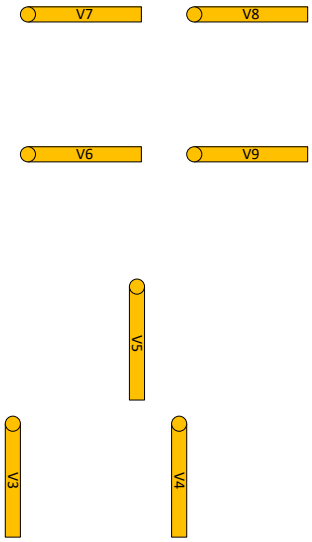
Primary Filter Top-up & Bleed
V2(FROM) →DAY
V1(TO) → any tank



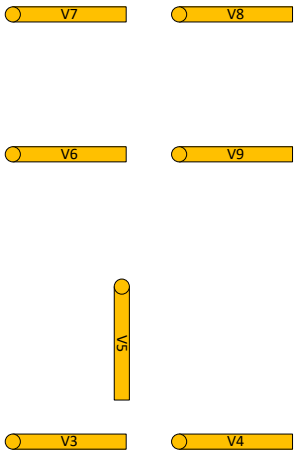
Secondary Filter Top-up & Engine Bleed
V2(FROM) →DAY
V1(TO) → any tank



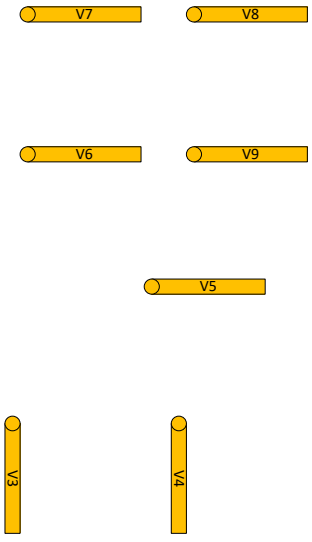
Isolate Primary Filter
V2(FROM) →any tank
V1(TO) → any tank



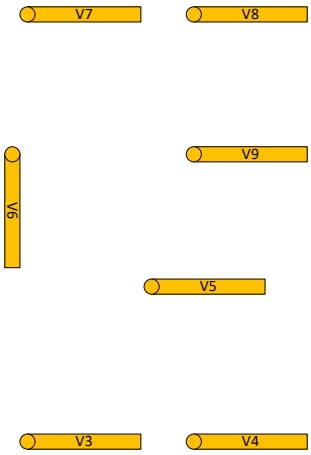
Bypass/Isolate Secondary Filter
V2(FROM) → any tank
V1(TO) → any tank



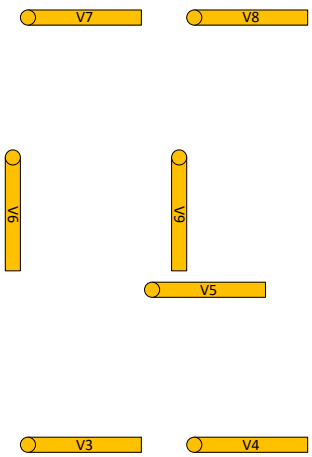
Supply Engine via Primary Filter
V2(FROM) →DAY, PORT, or STBD
V1(TO) → same as V2



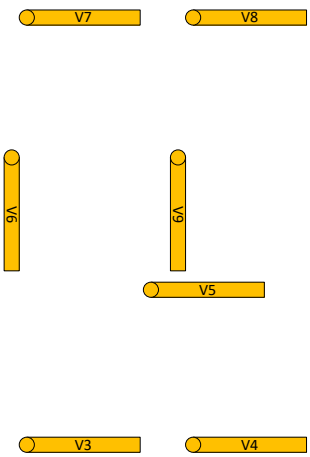
Supply Engine STBD or PORT Tank Via Secondary Filter
V2(FROM) →PORT or STBD
V1(TO) → same as V2



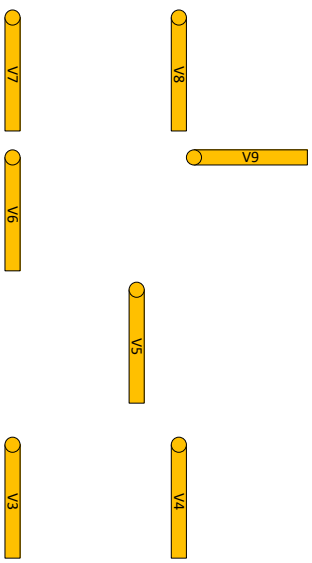
Bypass Transfer Pump
V2(FROM) →any tank
V1(TO) → any tank



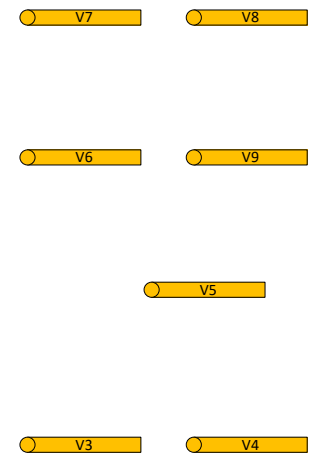
Use Bleed Pump as Transfer Pump
V2(FROM) → any tank
V1(TO) → any tank



Use Bleed Pump as Engine Fuel Pump
V2(FROM) →DAY
V1(TO) → DAY



Measure Net Fuel Consumption
V2(FROM) →EXT
V1(TO) → EXT → Hose → Grad. Cylinder



Normal Engine Run
V2(FROM) →any tank, irrelevant
V1(TO) → any tank, irrelevant

S/V *BEATRIX* - KELLY-PETERSON 44 #286 (1980)	TITLE: Fuel Management and Control - Valve Settings by Function	REV: H	SCALE: 1: 1	PAGE: 2 OF 7	UNITS: mm	DATE: 16/02/21	DRAWN BY: JMS

Control Valve, Pump and Filter Schedule

ITEM	LOC	TYPE	PORT SIZE	TITLE	FUNCTION	NORMAL POSITION
V1	A	Five way valve	1/2	Fuel Transfer/Polishing Return (TO)	Select: STBD, PORT, External or DAY Tank	DAY Tank
V2	A	Five way valve	1/2	Fuel Transfer/Polishing Supply (FROM)	Select: STBD, PORT, External or DAY Tank	STBD or PORT
V3	P	Three way valve	3/8	Engine Fuel Supply Source	Select Fuel Supply: DAY Tank / Main Tanks	DAY Tank
V4	P	Three way valve	3/8	Engine Fuel Return Target	Select Fuel Return: Day Tank / Main Tanks	DAY Tank
V5	P	Three way valve	3/8	Supply Filter Selector	Select: Primary Filter / Secondary Filter	Secondary
V6	P	Three way valve	1/2	Transfer Pump Bypass Valve	Transfer Pump: Pump Offline / Online	Pump Online
V7	P	Three way valve	1/2	Primary Filter Bypass/Shutoff Valve	Primary Filter: Isolate Filter for Element Changes	Filter Online
V8	P	Shutoff valve	1/2	Primary Filter Isolation Valve	With V7, Isolate Primary Filter for Element Changes	Filter Online
V9	P	Shutoff valve	1/2	Bleed Pump Bypass Valve	Close valve when using Bleed Pump	Open
V10	P	Shutoff valve	1/4	Vacuum Gauge Shutoff Primary Filter	Isolate Vacuum Gauge	Open
V11	P	Shutoff valve	1/4	Vacuum Gauge Shutoff Secondary Filter	Isolate Vacuum Gauge	Open
V12	F	Shutoff valve	1/4	Engine Fuel Line Shutoff Valve	Shutoff fuel supply line to main engine.	Open
V13	F	Shutoff valve	1/4	Generator Fuel Line Shutoff Valve	Shutoff fuel supply line to generator engine.	Open
V14	F	Shutoff valve	1/4	Generator Return Line Shutoff Valve	Shutoff fuel return line from generator engine.	Open
P1	F	Pump	1/4	Transfer & Polishing Pump	Oberdorfer 991-43C81 HD 12V gear pump 1.5gpm	n/a
P2	W	Pump	1/4	Bleed Boost Pump	Walbro WA 6092 7 PSI 0.5 gph gear pump	n/a
F1	F	Filter		Primary Filter	Racor 900 (10µ)	n/a
F2	F	Filter		Secondary Filter	Racor 500 (10µ)	n/a
F3	F	Filter		Engine Spin-on Fuel Filter	Baldwin BF988 (20µ) or equivalent	n/a
H1	P	Filter		Hydraulic Quick Connect to external source	Connect external (jug, bucket, drum) to fuel system	n/a

CODE	LOCATION
A	Fuel Control Panel Aft Cabin
P	Fuel Control Panel Eng. Room
F	Fuel System Eng. Room
W	Eng Room Wall Portside

Oberdofer 991-43C81

Walbro WA 6092 (now obsolete)

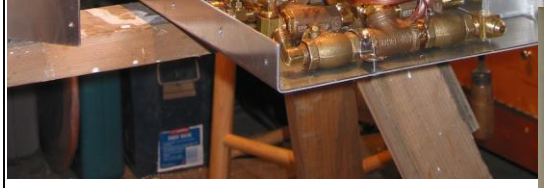
CONBRACO VALVE TYPES 1/2" NPT

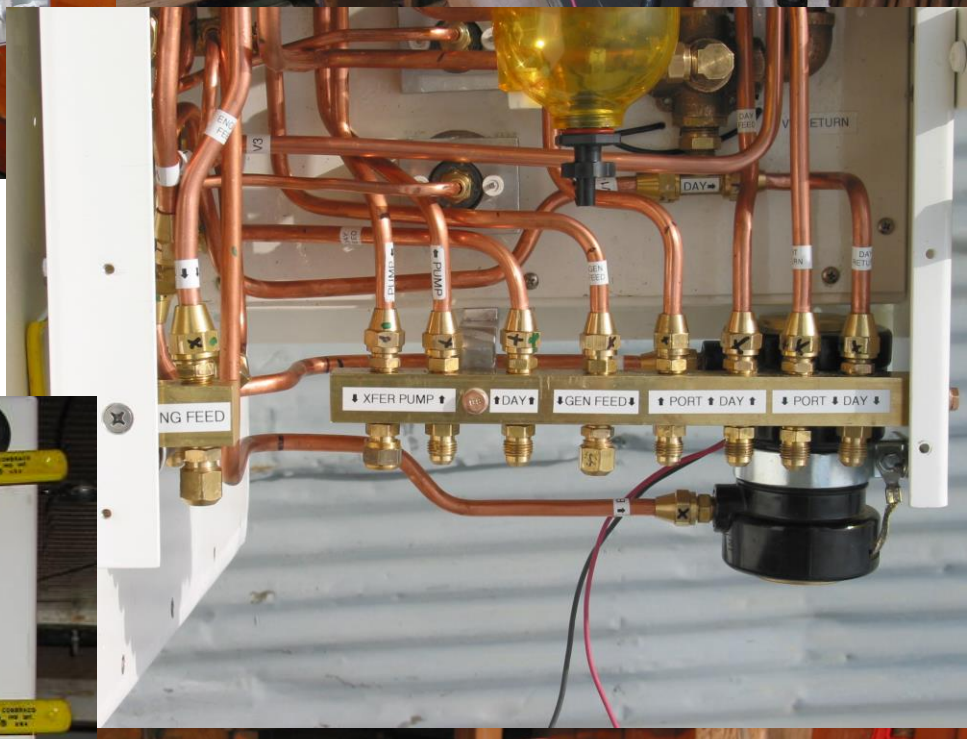
THREE WAY

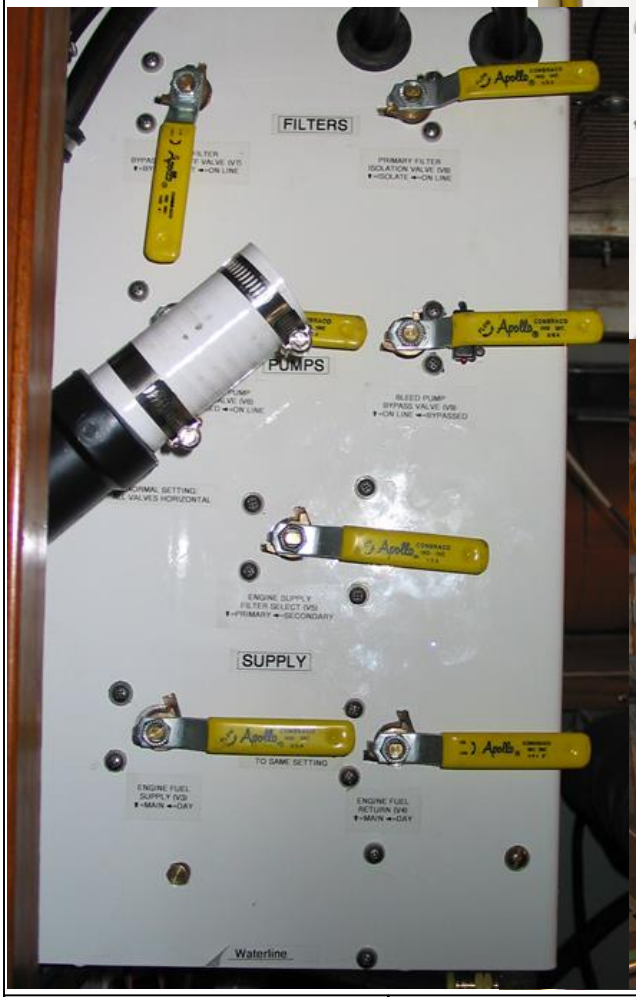
FIVE WAY

SHUTOFF

S/V *BEATRIX* - KELLY-PETERSON 44 #286 (1980)	TITLE: Fuel Management and Control - Control Valve, Pump and Filter Schedule	REV: H	SCALE: 1: 1	PAGE: 3 OF 7	UNITS: mm	DATE: 16/02/21	DRAWN BY: JMS







S/V *BEATRIX* - KELLY-PETERSON 44 #286 (1980)	TITLE	REV	SCALE	PAGE	UNITS	DATE	DRAWN BY
	Fuel Management and Control - Photos	H	1: 1	4 OF 7	mm	16/02/21	JMS

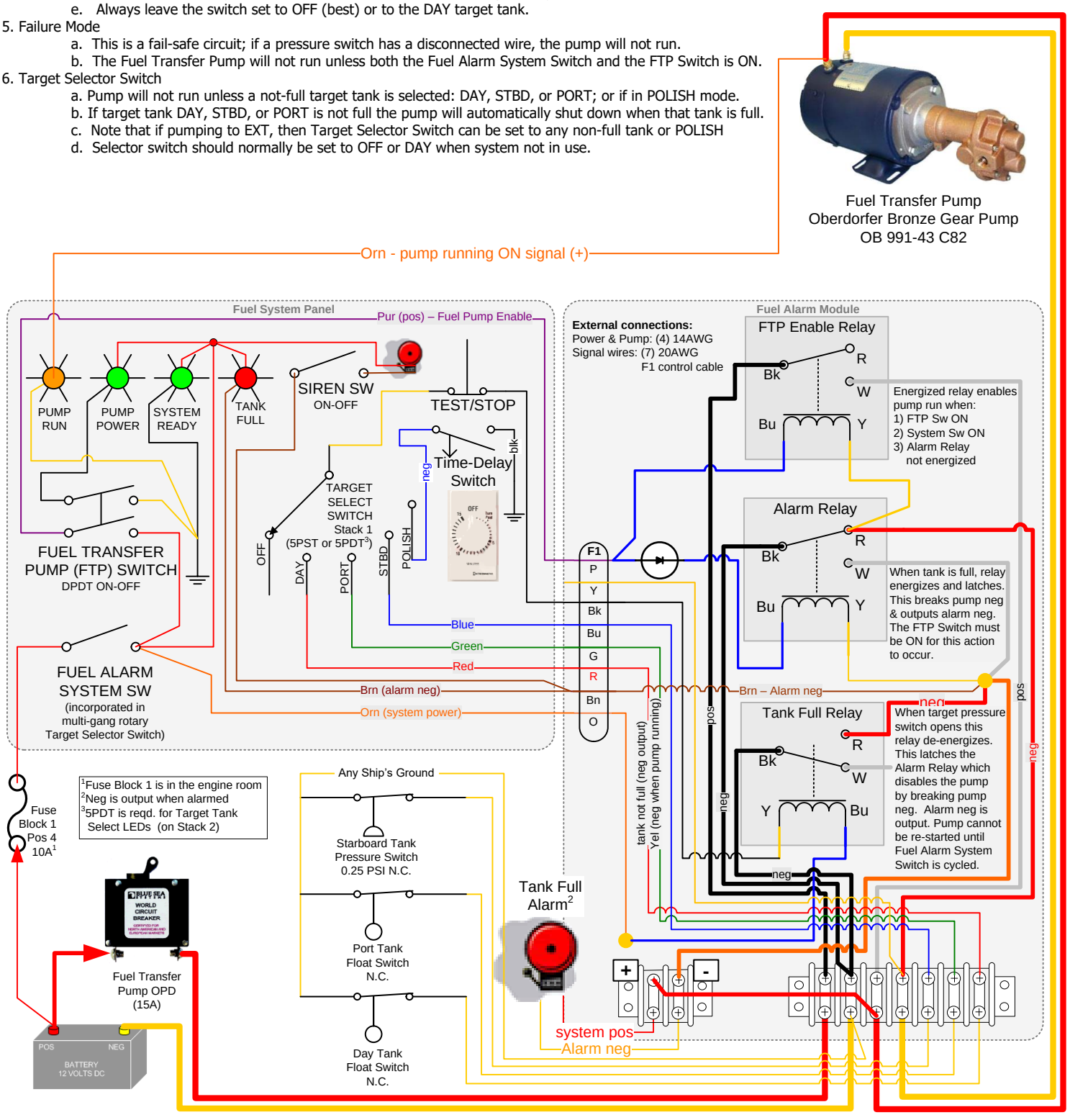
FUEL TRANSFER PUMP AUTOMATIC SHUTOFF FOR TANK OVERFLOW PREVENTION

1. Fill Sensors
   a. Previous system used a Mamco Pressure switch on each tank. Now only used on STARBOARD TANK.
      1. Mounted in vent line at tank level or in top of tank..
      2. Normally Closed Switch will open when pressure reaches 0.25 PSI. This is approx 100 mm (4") of head.
   b. Current system using Liquid Float Switch (Hall Effect Sensor) in N/C configuration. (PORT & DAY tanks). Available on eBay
2. Operation (Filling)
   a. Fuel Alarm System Switch ON. Fuel Transfer Pump Switch OFF. Target Selector Switch set to tank being filled.
   b. When tank is full, fuel is pumped up the vent line; pressure switch opens almost immediately.
   c. Alarm sounds when target tank is full. Select new target tank or turn system OFF to stop alarm.
3. Operation (Fuel Transfer)
   a. Fuel Alarm System Switch ON. Fuel Transfer Pump Switch ON. Target Selector Switch set to tank receiving the fuel.
   b. Alarm sounds when target tank is full and the Fuel Transfer Pump is disabled.
   d. Alarm Relay is latched in activated position to keep pump disabled.
   d. Pump will not restart until Target Selector Switch is set to a another, non-full tank & FTP or System Switch is reset.
4. Operation (Polishing or Pumping to External)
   a. Fuel Alarm System Switch ON. Fuel Transfer Pump Switch ON. Target Selector Switch set to POLISH.
   b. The Fuel Transfer Pump can now be run regardless of tank level.
   c. Turn Time-Delay Switch to start pump and set polishing time (or to allow for external pumping out of the boat).
   d. Never leave the Target Selector Switch in POLISH mode when polishing is finished.
   e. Always leave the switch set to OFF (best) or to the DAY target tank.
5. Failure Mode
   a. This is a fail-safe circuit; if a pressure switch has a disconnected wire, the pump will not run.
   b. The Fuel Transfer Pump will not run unless both the Fuel Alarm System Switch and the FTP Switch is ON.
6. Target Selector Switch
   a. Pump will not run unless a not-full target tank is selected: DAY, STBD, or PORT; or if in POLISH mode.
   b. If target tank DAY, STBD, or PORT is not full the pump will automatically shut down when that tank is full.
   c. Note that if pumping to EXT, then Target Selector Switch can be set to any non-full tank or POLISH
   d. Selector switch should normally be set to OFF or DAY when system not in use.

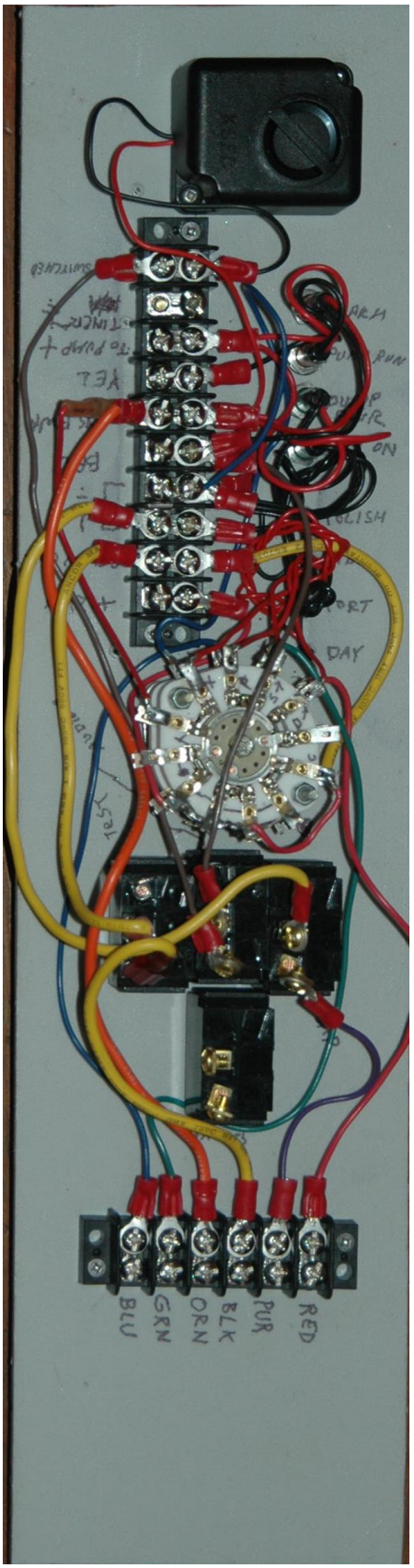
Auto Relay Relay Socket

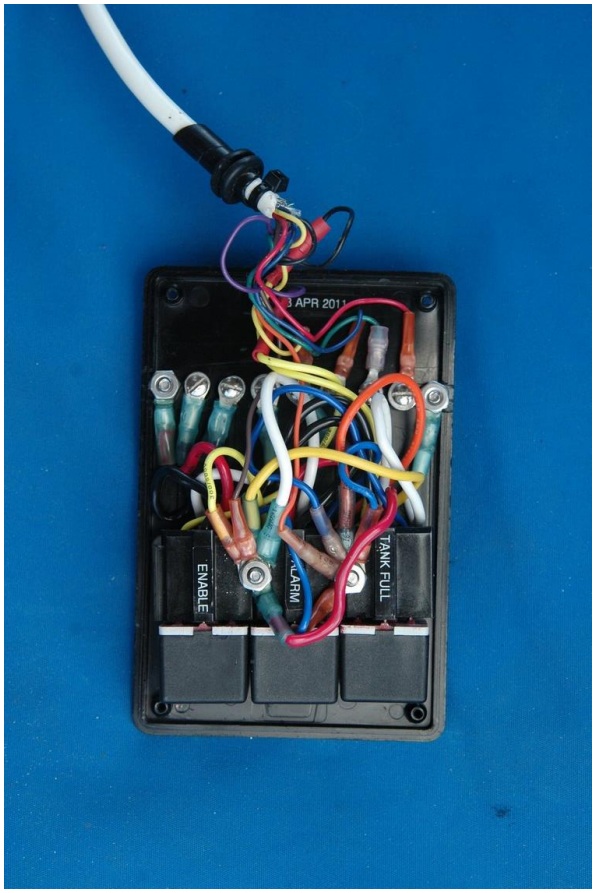
SS Float Sw

Fuel Transfer Pump
Oberdorfer Bronze Gear Pump
OB 991-43 C82



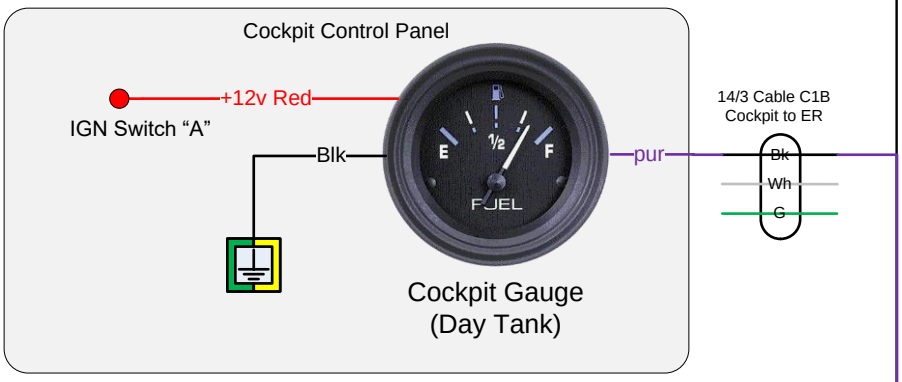
S/V *BEATRIX* - KELLY-PETERSON 44 #286 (1980)	TITLE: Fuel Management and Control - Fuel Transfer & Tank Overflow Prevention Circuit (Failsafe Version)	REV: H	SCALE: 1: 1	PAGE: 5 OF 7	UNITS: mm	DATE: 16/02/21	DRAWN BY: JMS

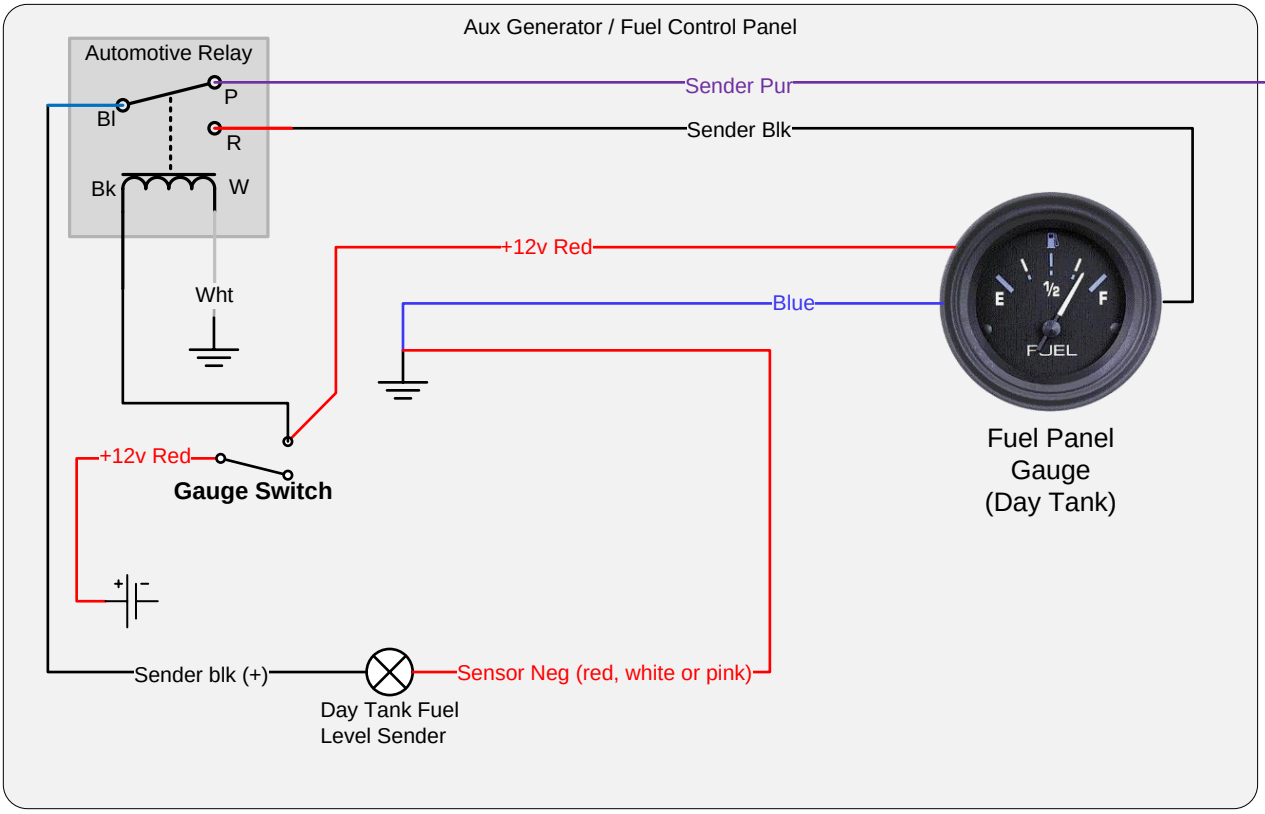


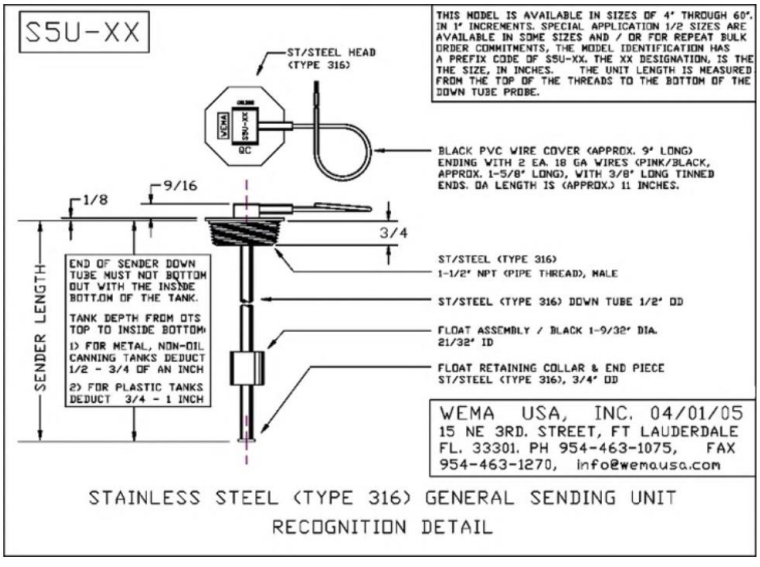


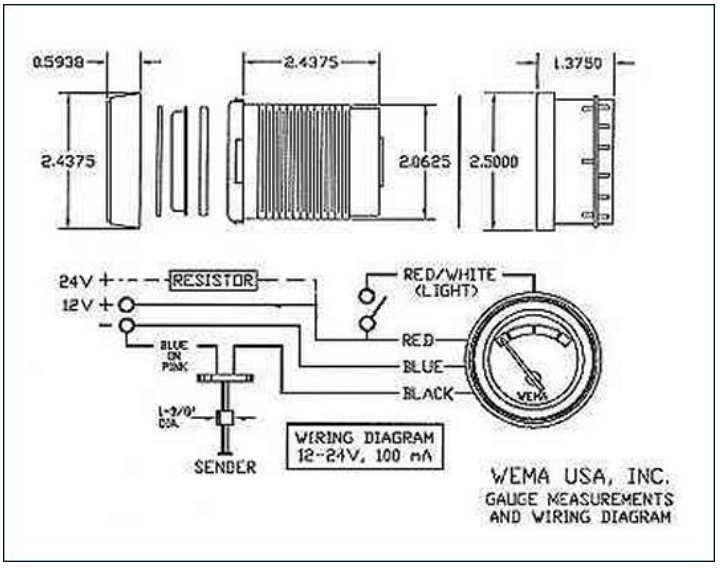
S/V BEATRIX - KELLY-PETERSON 44 #286 (1980)	TITLE: Fuel Management and Control - Fuel Tank Overflow System Photos	REV: H	SCALE: 1: 1	PAGE: 6 OF 7	UNITS: mm	DATE: 16/02/21	DRAWN BY: JMS

FUNCTION OF THIS SCHEMATIC:
Normally Active DAY Tank Fuel Gauge is at the Cockpit Control Panel.
When the Gauge Switch is ON at the Fuel Control Panel in the aft cabin, the local DAY Tank Gauge is active (and the Cockpit Gauge is disabled)









S/V *BEATRIX* - KELLY-PETERSON 44 #286 (1980)	TITLE	REV	SCALE	PAGE	UNITS	DATE	DRAWN BY
	Fuel Management and Control - DAY Tank Fuel Gauges	H	1: 1	7 OF 7	mm	16/02/21	JMS