

# Ford Lehman Model 2715E

Port Engine S/N 2104/66

Stbd Engine S/N 2104/242

## Fuel Filter Replacement Procedure

### Primary Racor Fuel Filters (Wall Mounted):

1. Close fuel valve at the engine's fuel tank and/or at the gate valve to the primary racor filter.
2. Drain excess fuel from old primary filter and save for refilling.
3. Loosen primary fuel filter and remove filter.
4. Replace primary fuel filter and refill with previously removed fuel.

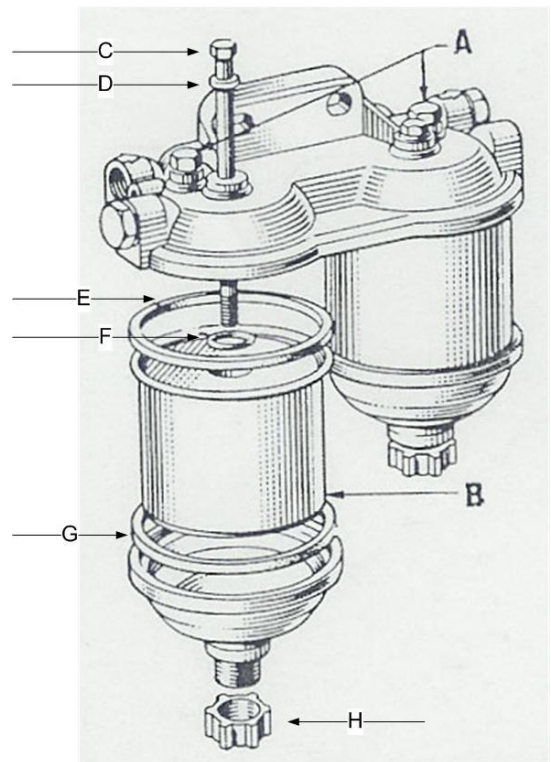
### Secondary Fuel Filters (Engine Mounted)

#### To remove all parts:

1. Close fuel valve at the engine's fuel tank and/or at the gate valve to the primary racor filter.
2. Drain excess fuel from bowl by loosening the rubber thumb screw/plug (H) located under the bowls.
3. Loosen fuel filter and remove filters (B) by removing the center bolt (C). Be careful as the whole lower section comes out.
4. Remove & discard the O-Ring from the center bolt (D) found at the top of the bolt.
5. Remove & discard the O-Ring (F) from the mounting in the upper section (not shown).
6. Remove & discard the top gasket (E) from inside the upper section of the housing.
7. Remove & discard the bottom gasket (G) from inside the lower section.

#### To replace all parts:

1. Replace O-Ring (D) from step 4 above
2. Replace O-Ring (F) from step 5 above
3. Replace or mount a fuel moistened O-ring (E) from step 6 above. NOTE: This O-ring is slightly larger than the bottom O-ring (G).
4. Replace or mount the fuel moistened O-Ring (G) from step 7 above.
5. Mount the filter (B), the O-ring (G) and the lower base as one assembled unit. Tighten down on the center bolt (C) until all parts come together and snug down fairly tight.
6. Repeat the process for the second filter.
7. Refill the filters with fuel through the bleed screws (A) over each filter.
8. Re-open the fuel valves previously closed in step 1 above in the removal steps.



See "Bleeding the Fuel System" to complete maintenance procedure on the next page.

# Bleeding the Fuel System

Bleeding air from the fuel system may well be one of the important procedures to be learned by the operator. Air in the injection system may cause erratic engine performance; "missing" on one or more cylinders, reduced power, stop fuel from reaching engine and prevent or cause hard engine starting.

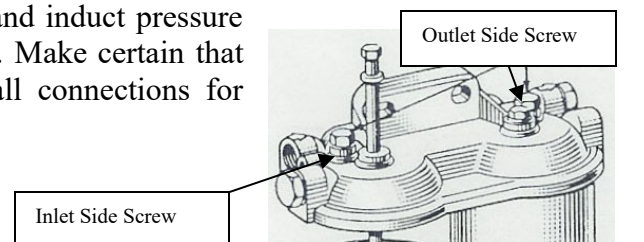
It must be remembered that the lift pump draws fuel from the tank, so any accumulation of air in the fuel system makes all connections, filters, etc. between fuel lift pump and tank suspect. In any new installation one must "bleed" the system of air for, obviously, air will be in the new fuel lines, filters, etc. If the fuel tank should run dry, bleeding will be needed when the boat is refueled. Bleeding will also be required after changing fuel filter elements. (Time and effort may be saved if filter is charged with fuel by removing the bleed plugs on top and slowly pouring fuel into the filter until it overflows.) Occasionally, after an extended run, an engine may slow down, or "miss", or lose RPM's or stop. Although there may be other causes, air in the fuel system should not be overlooked. Many times a tiny leak in a fuel line fitting may allow air to enter the system and accumulate until there is sufficient to cause the above mentioned symptoms.

Upon completing a new installation, best check against air leaks is to block the fuel tank vent and filler" cap, disconnect fuel line at tank side of fuel lift pump and induct pressure (approximately 10 lbs. should suffice) into the fuel line. Make certain that fuel line to tank will maintain pressure and inspect all connections for possible leaks.

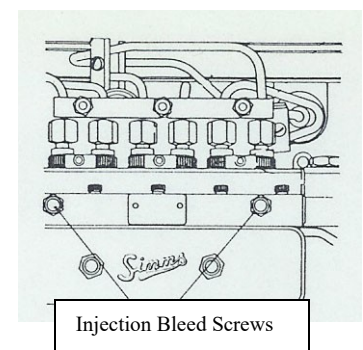
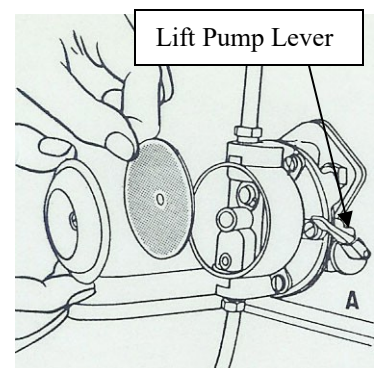
## To bleed system, follow this procedure:

1. Ascertain that there is sufficient fuel in tank, (Note: intake pipe being exposed due to "sloshing" of fuel, thus drawing air into system.
2. Make certain that fuel shut-off valve is turned on.
3. Loosen the bleed screw on the inlet side of the fuel filter about two or three turns.
4. Operate the priming lever at the side of the fuel lift pump until a flow of fuel, free of air, is expelled. Then close screw.
  - ◆ *Caution: Do not use excess pressure in tightening bleed screws as the castings are soft and threads strip easily. A slight pressure with wrench will seal all plugs tightly.*
  - ◆ *Note: If the eccentric which operates the fuel lift pump is on maximum lift the pump priming lever will be inoperative. If this occurs, rotate the engine using starter until priming lever can be operated.*
5. Loosen bleed screw on outlet side of filter and repeat operation 4.
6. Inspection of injection pump will reveal two additional bleed screws. First loosen screw nearest to inlet line and repeat operation 4. The same procedure is then used on the last bleed screw.

Caution: Allow engine to operate for at least ten minutes before leaving dockside to ensure all air has been purged from system.



Low fuel level may result in



## Servicing the Primary Filters – Racors R20TUL

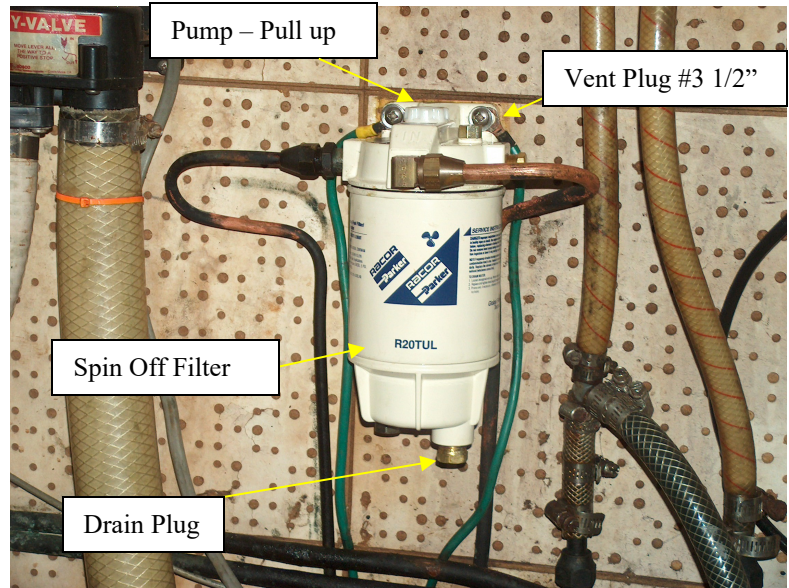
Frequency of water draining or element replacement is determined by the contamination levels present in diesel fuel. If the fuel tank is located higher than the Racor, close the fuel tank outlet valve prior to servicing.

### DRAIN THE COLLECTION BOWL.

Water is heavier than diesel fuel and will settle to the bottom of the bowl and appear different in color. The bowl must be drained before contaminants reach the bottom of the element or when the Water Detector (if equipped) indicates it's time to 'drain water'. Inspect or drain the collection bowl of water daily.

#### MARINE MODELS:

Remove the drain plug to drain off contaminants. Replace drain plug to bowl snugly.



### ELEMENT REPLACEMENT.

Element replacement frequency is determined by the contamination level in diesel fuels. Fuel flow to the engine becomes restricted as the element slowly plugs with contaminants, resulting in noticeable power loss and/or hard starting. Replace the element every 10,000 miles, every 500 hours of operation, every other oil change, annually or if a power loss is noticed, whichever comes first. If a vacuum gauge has been installed on the outlet side of the filter, change the element between 6 to 10 inches of mercury (restriction). The actual measurement varies in different fuel systems.

*Note: Always carry an extra element as one tankful of excessively contaminated fuel can plug a filter.*

1. Drain off *some* fuel by loosening the vent plug and opening the drain valve. (Marine models: remove the drain plug).
2. Disconnect the water sensor and heater connectors, if equipped.
3. **Spin the element and bowl off together.** Remove the bowl and clean the O-ring gland.
4. Apply a coating of clean fuel or motor oil to the new O-ring and element seal.
5. Spin the bowl onto the new element and then spin them both onto the filter head snugly by hand only. **DO NOT USE TOOLS. Look out for STBD being too tight.**
6. Close the bowl drain. (Marine models: replace the drain plug. Apply thread sealant to threads, if needed).
7. Connect the water sensor and heater connectors, if equipped.
8. With the vent plug still loosened, operate the primer pump until fuel purges at the vent plug. Close the vent plug, start the engine and check for leaks. Correct as necessary with the engine off **OR**
9. Use the Oil Changer pump to suck out air via the plastic vent plug identifies as #3 on replacement parts list diagram.
10. Follow manufacturer's priming procedures, if applicable.

<b>Tools Needed</b>
Rags
Plastic Bottle for fuel
7/16 <sup>th</sup> Wrench for Center Bolt
9/16 <sup>th</sup> Wrench for Filter Bleed Bolt Screws
½” Wrench for Injection Box Bleed Bolt Screws
Oil Filter removal tool for primary filters
Grip Pliers for bowls rubber thumb screw/plugs

<b>Parts</b>	<b>Part # or Crossover</b>
2 - Primary Filters (Every 500 Hrs)	Racors P/N R20TUL filters or R20 UL Series
2 – Secondary Filters (Every 300 Hrs)	Fram C119A1 American Diesel Recommended
Additional crossover secondary filters. NOTE: These filter packages have the right larger O-Rings, but they are lacking the smaller one for the bottom. May or may not have the 2 O-Rings either.	
Bleed Screws Washers for Filters	PN 1700617

<b>Primary - When Last Replaced</b>	<b>Engine Hours</b>	<b>Comments</b>
10-09-2006	2873.4	Brand New Installed Racors – STbd Eng Reading
04/07/12–Way Overdue (747 hrs)	3530.0	Brand New Installed Racors – STbd Eng Reading
Next Change is due now.	4030 / 4073	Slightly Overdue

<b>Secondary - Last Replaced</b>	<b>Engine Hours</b>	<b>Comments</b>
06-27-2006	2810	Port & STbd engines
08-10-2006	2862.5	Stbd only due to leaking around bowls
04-08-12 Way Overdue (668 Hrs)	3530.0	Port Engine Only + New Fuel Lift Pump
05/14/12 Way Overdue (712 Hrs)	3574.0	Stbd Engine Only
11-11-2013 Stbd side	3651.00	R&R Fuel Filters because gaskets were leaking
Next: R&R Port Side	3830.0	R&R both fuel filters.
Next R&R Stbd Side	3951.0	R&R both fuel filters.
Next: ....Way Overdue.....	4073	Current Reading