ENSTROM 480/480B OPERATOR'S MANUAL

AND

FAA APPROVED

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

CRASH RESISTANT FUEL SYSTEM (CRFS)

(P/N 4122100-1)

* * * * *

REPORT NO. 28-AC-085

HELICOPTER SERIAL NO._____

HELICOPTER REGISTRATION NO._____

* * * * *

THIS SUPPLEMENT MUST BE CARRIED IN THE HELICOPTER AT ALL TIMES IF EQUIPPED WITH THE CRASH RESISTANT FUEL SYSTEM. CHAPTERS 1, 2, 3, AND 4 ARE FAA APPROVED.

RYAN B NELSON Digitally signed by RYAN B NELSON Date: 2024.04.03 08:29:57 -05'00' FTP, AIR-712, for

Manager, Flight Test & Human Factors Branch, AIR-710
Federal Aviation Administration

Apr 3, 2024
Approved Date

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Mar 28/24

LOG OF REVISIONS

REV NO	FAA APPROVAL	SUMMARY DESCRIPTION
IR	Ryan Nelson, FTP, AIR-712, Apr 3, 2024	Initial Release
1		Added Enstrom copyright and proprietary statement. Added EASA Log of Revisions table. Clarified terminology (indicator/indicator dots). Deleted descriptive detail from preflight checks (detail presented in Chapter 7). Clarified dot orientation terminology. Updated Figure 7-4 and Figure 7-5.
	DENNIS J BARBINI Digitally signed by DENNIS J BARBINI Date: 2025.08.21 13:11:48 -05'00' FTE, AIR-712 for	August 21, 2025
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EASA LOG OF REVISIONS

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ROTORCRAFT FLIGHT MANUAL SUPPLEMENT

CRASH RESISTANT FUEL SYSTEM

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INTRODUCTION

This supplement contains the operating instructions, procedures, and limitations for the Crash Resistant Fuel System (CRFS) Installation – 480 Series (P/N 4122100-1).

The CRFS installation is standard equipment for newly manufactured Enstrom 480B helicopters beginning with S/N 5256. Fielded aircraft (480 and 480B helicopters S/N 5255 and prior) are eligible for conversion to CRFS upon availability of a kit via a service information letter (SIL).

The supplement is divided into two basic parts, the FAA approved RFM Supplement (Chapters 1 through 4) and additional data (Chapters 6 through 8) pertinent to the CRFS provided by the Enstrom Helicopter Corporation (Enstrom).

It is required by Federal Regulations that this supplement is always present in the helicopter if the CRFS is installed.

The chapters that follow in this supplement correspond to the chapters presented in the basic 480/480B RFM. Relevant content has been modified to distinguish information specific to the CRFS installation.

CHAPTER 1. OPERATING LIMITATIONS

1-1. General

Refer to the basic RFM.

CHAPTER 2. NORMAL PROCEDURES

2-1. General

Refer to the basic RFM.

NOTE

Refer to Figure 7-2 for depictions of the breakaway fuel valve in the open valve position and in the closed valve position.

WARNING

Maintenance action is required before flight if inspection of any of the breakaway fuel valves indicates a closed valve condition as indicated by a perpendicular orientation of the valve indicator dots.

NOTE

For the preflight checks of the valve status, it may be necessary to use a flashlight or similar source of light to see the valve indicator dots under low light conditions.

2-2. Preflight Check, Aft Fuselage Left Side

In the basic RFM, *Aft Fuselage Left Side – Exterior Check (Area 2),* perform the additional preflight inspection as described under *Engine Compartment – Check*:

1. Fuel lines – Check for condition, security, and leaks. Check breakaway fuel valves for condition, security, and leaks. Verify breakaway fuel valves are in the open position).

2-3. Preflight Check, Aft Fuselage Right Side

In the basic RFM, *Aft Fuselage Right Side – Exterior Check (Area 5),* perform the additional preflight inspection as described under *Engine Compartment – Check*:

1. Fuel lines – Check for condition, security, and leaks. Check breakaway fuel valves for condition, security, and leaks. Verify breakaway fuel valves are in the open position.

2-4. Preflight Check, Fuselage Top Area

In the basic RFM, *Fuselage Top Area – Exterior Check (Via steps),* perform the additional preflight inspection described as follows:

1. Upper transmission area – Fuel cell vent lines – Check fuel cell vent lines for condition and security. Check breakaway fuel valves for condition, security, and leaks. Verify breakaway fuel valves are in the open position. Check roll over valve for condition and security.

2. Upper transmission area – Crossover line – Check crossover line and breakaway valves for condition, security, and leaks. Verify breakaway fuel valves are in the open position.

2-5. Takeoff and Landing

Observe the following **WARNING** in conjunction with the normal procedures in the basic RFM under paragraphs 2-28, 2-29, 2-30, and 2-35 (*Normal Takeoff*, *Maximum Power Takeoff Profiles*, *Crosswind Takeoff*, and *Approach and Landing,* respectively).

WARNING

A left or right roll exceeding 27° during a take-off or landing maneuver will close the roll over valve. If the roll over valve closes and sticks, the vent system will not operate properly. Maintenance action is required to ensure the roll over valve is open.

CHAPTER 3. EMERGENCY PROCEDURES

3-1. General

Refer to the basic RFM.

CHAPTER 4. PERFORMANCE

4-1. General

Refer to the basic RFM.

CHAPTER 6. WEIGHT/BALANCE AND LOADING

6-1. General

Refer to the basic RFM.

6-2. Form F-511-2

In the basic RFM, *Form F-511-2* is revised as follows:

	WEIGHT LBS.	ARM IN.	MOMENT IN-LB.
PLUS: UNUSABLE FUEL (0.75 gal (US))			

CHAPTER 7. HELICOPTER AND SYSTEMS DESCRIPTION AND OPERATION

7-1. General

Refer to the basic RFM.

7-2. CRFS Description

The 480B is equipped with a fuel system architecture designed to retain fuel in a crash. The fuel bladders are fabricated from crash resistant material and extensible chimneys on the crossover line and vent line connections allow stretch and angular misalignment that resist pull-out at these locations. A combination of lacing, hook and loop patches, and frangible studs and tabs secure the fuel bladder to the fuel shelf structure. Each bladder is interconnected to the other bladder through a 1.5 inch/3.8 cm cross-feed line in the lower 1/3 of the fuel cell and a 0.5 inch/1.3 cm overboard vent line. A roll over valve is located

on the shared vent line to prevent fuel leaks in inverted aircraft orientations. A 0.75 inch/1.9 cm main fuel feed line from the lowest point in each bladder interconnects through the main fuel shutoff valve in a "tee" to provide the fuel to the engine equally from each cell.

Figure 7-1 depicts a schematic of the CRFS installation.

Breakaway couplings, consisting of paired, self-sealing breakaway fuel valves, are installed on the vent lines, fuel crossover line, and fuel feed lines. The couplings are frangible and seal the fuel from both directions to prevent leaks in the event of an impact. In the case of an impact that causes a fuel bladder to move with respect to the surrounding structure, the frangible mechanism of the valve halves releases each ball valve to instantly close and prevent fuel flow. The position of the ball valve is indicated by the orientation of indicator dots visible on the surface of the valve. The aircraft may only be flown if the indicator dots indicate an open position (indicator dots are parallel with the coupling body). Maintenance action is required before flight if any of the valve indicators indicate a closed position (indicator dots are perpendicular to the coupling).

Figure 7-2 depicts the valve indicator dot orientation for the open valve and closed valve conditions.

Figure 7-3 depicts a view of the roll over valve, and vent line and crossover line breakaway fuel valve couplings visible from the top of the fuselage.

Figure 7-4 depicts a view of the left-side fuel feed line breakaway fuel valve coupling and Figure 7-5 depicts a view of the right-side fuel feed line breakaway fuel valve coupling. Both couplings are visible through the left- and right-side engine access panels, respectively.

Refer to Table 8-1 for the CRFS fuel capacities.

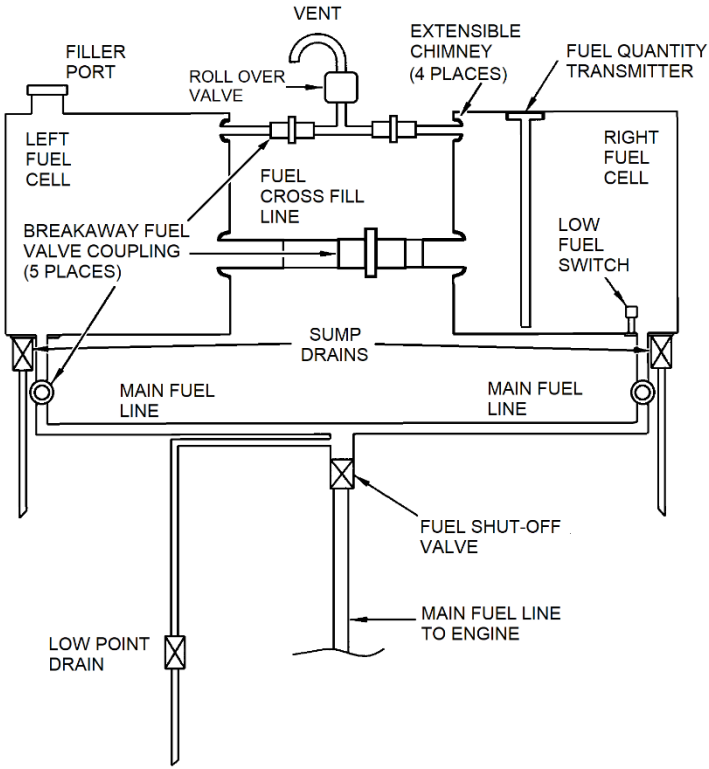
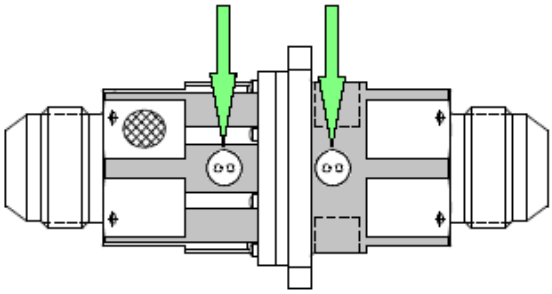
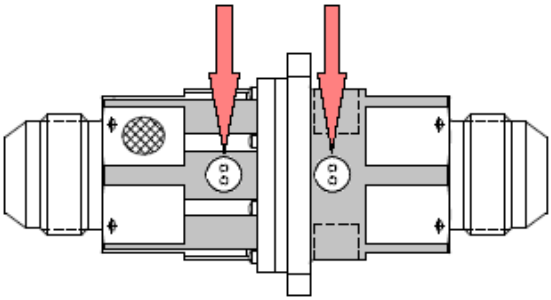


Figure 7-1. CRFS Schematic

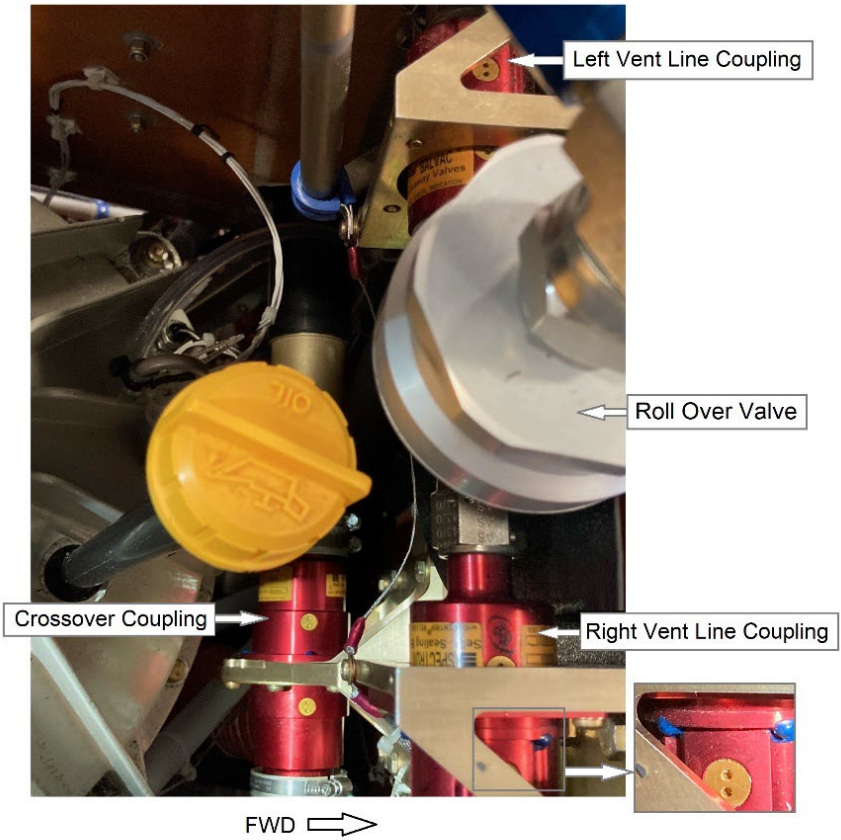


DOTS PARALLEL - VALVES ARE OPEN



DOTS PERPENDICULAR - VALVES ARE CLOSED

Figure 7-2. Valve Indicator Dot Orientations
Open Valves (Top) and Closed Valves (Bottom)

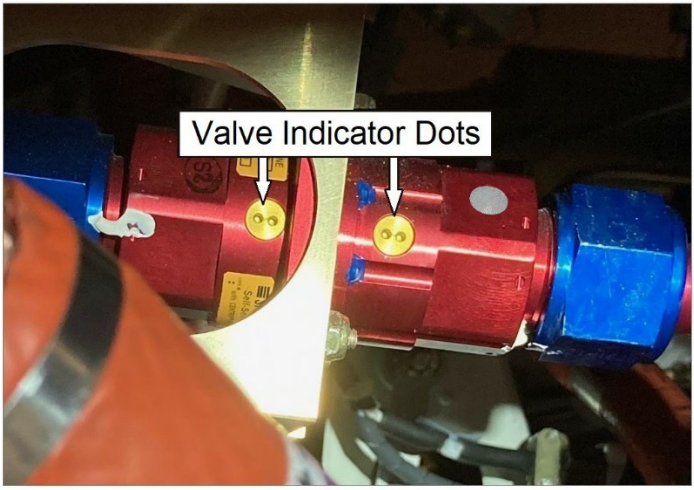


Left and right vent line couplings, crossover coupling, and roll over valve as viewed from the top of the fuselage.

(The forward scoop and upper plenum are removed for clarity.)

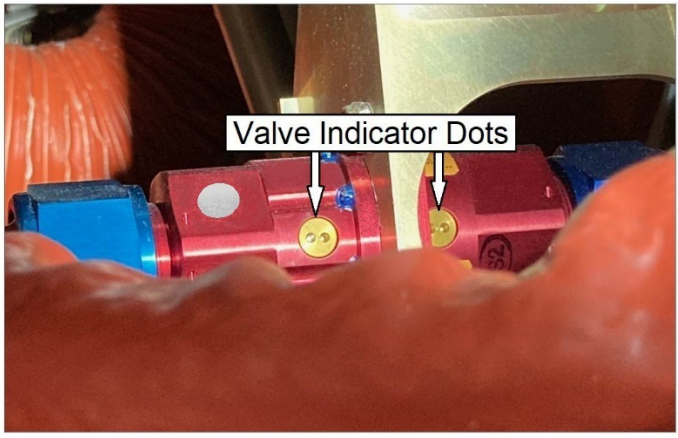
Inset photo in the lower right is a close-up of the valve indicator dots hidden from view by a bracket.

Figure 7-3. Vent Line Couplings, Crossover Coupling, and Roll Over Valve Installations



As viewed from the left-side engine access panel.

Figure 7-4. Left-Side Fuel Feed Line Coupling Installation



As viewed from the right-side engine access panel.

Figure 7-5. Right-Side Fuel Feed Line Coupling Installation

CHAPTER 8. HANDLING, SERVICING AND MAINTENANCE

8-1. General

Refer to the basic RFM.

8-2. Fuel System Servicing

Refer to Table 8-1 for CRFS fuel specifications and capacities.

Table 8-1. Fuels, Lubricants, Specifications, and Capacities

SYSTEM	SPECIFICATION	CAPACITY
Fuel - CRFS (P/N 4122100-1)	(See Note 1)	90.2 gal (US) / 341.4 L (89.5 gal (US) usable / 338.8 L usable)

NOTE:

1. Refer to Table 8-2, *Fuels, Lubricants, Specifications, and Capacities* (480B RFM) for further information.

8-3. Ground Operations

Observe the following **WARNING** in conjunction with the instructions listed in the basic RFM under paragraph 8-11 (*Ground Handling).*

WARNING

Do not exceed 25° tip of the aircraft during ground operations. Exceeding 25° will close the roll over valve. If the roll over valve closes and sticks, the vent system will not operate properly. Maintenance action is required to ensure the roll over valve is open.

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