Technical Bulletin

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Safety Bulletin 070395RB

Date: Monday, July 03, 1995
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Attention: Rebel Owners/Builders
Subject: Rebel Fuel System Modifications

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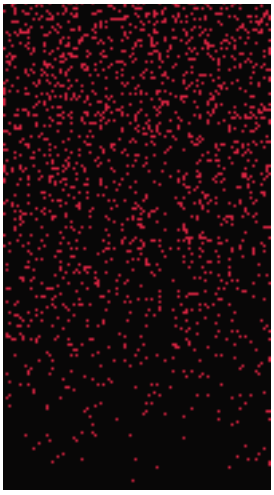
Information:

Over the past few months there have been isolated reports of problems with the Rebel fuel system. The problem has been reported as partial or total fuel starvation and appears to be due to air locked in the fuel lines. The problem is sporadic and has appeared in only a very few airplanes including two occurrences in over 600 flying hours in our company test aircraft.

We recognize that there may be some potential for a problem and have been working on isolating it and developing a solution. Our test pilots have been unable to reproduce the problem despite many attempts, using different fuel levels, flight attitudes, ambient conditions, etc.

After a great deal of research and experimentation, we have concluded that there is some potential for air to get into the system at the sight gauge. Except for the sight gauge, the present Rebel fuel system is nearly identical to that used in the Renegade and Maverick,



however none of these estimated 500-600 aircraft have experienced problems. The present design takes the fuel feed to the engine from the bottom of the sight gauge at the root of the wing. This appears to be the only point in the system where air could be introduced.

Recommendations:

Since the junction between the sight gauge and the fuel outlet is the only place for air to enter the line to the engine, it is advisable to isolate the sight gauge from the outlet. The present system may be modified very easily with a minimal amount of extra work and a few extra parts.

As our test aircraft is currently out of service for installation of a new engine and other additions, we have not been able to test this system yet. We believe there is adequate evidence to suggest that this modification should avoid any potential fuel flow problems in the system. Murphy Aircraft will supply parts for any builder making the change.

Because the new system has not been fully tested and it will take some time to prove beyond doubt that this has solved any fuel flow problems, we suggest that owners maintain a close observation of the fuel flow and avoid any situations which may increase the risk of problems. For example maintain adequate reserve fuel supply. Avoid flying with very low fuel levels. Always be sure that the fuel is clean and free of water by testing from the gascolator or drains at the low points.

It is also highly recommended that the tanks be cross-vented to maintain equal pressure in the system as detailed in bulletin# 100594RB. If cross-venting has not been installed the time of this modification is ideal to complete it as the tees which are being replaced can be used.

The extra parts required will be shipped to all builders automatically.

Steps to modify:

1) Drain all fuel from the tank and remove the wing. (Be sure to adequately vent the tank and allow it to dry, before working on it.)

2) Determine an alternate location for the bottom gauge outlet. The outlet can be directly under the top outlet or displaced toward the rear to angle the gauge back (see the attached figure), as long as it is as close as practically possible to the bottom of the tank. Mark the location with a felt pen.

3) Cut a hole and install a new W- 159 Fuel Tank Outlet at this mark. Be sure to proseal under the outlet when installing.

4) Install a Nylon 1/8 pipe to 1/4 hose barb (A1814) in the bottom gauge outlet.

5) Reattach the wing to the airplane.

6) Mark and cut a hole in the Fuselage Root Rib
(FUS-27) for the bottom of the sight gauge.

7) Remove the 3/8" Barbed Tee Fitting (T-38) which connected the fuel valve and the bottom of the sight gauge to the main fuel outlet from the bottom of the tank.

8) In place of the tee, install a 3/8" Barbed Elbow (EB3838), attaching to the hose from the main tank outlet and the front of the fuel valve.

9) Cut a piece of red Ortac fuel hose to attach between the bottom gauge outlet and the clear tubing of the sight gauge.

10) Attach the hose to the bottom gauge outlet using a hose clamp.

11) Install a 1/4" Nylon Elbow (EB1414) on the bottom of the clear sight tube and the hose from the bottom gauge outlet.(See the attached drawing for details)

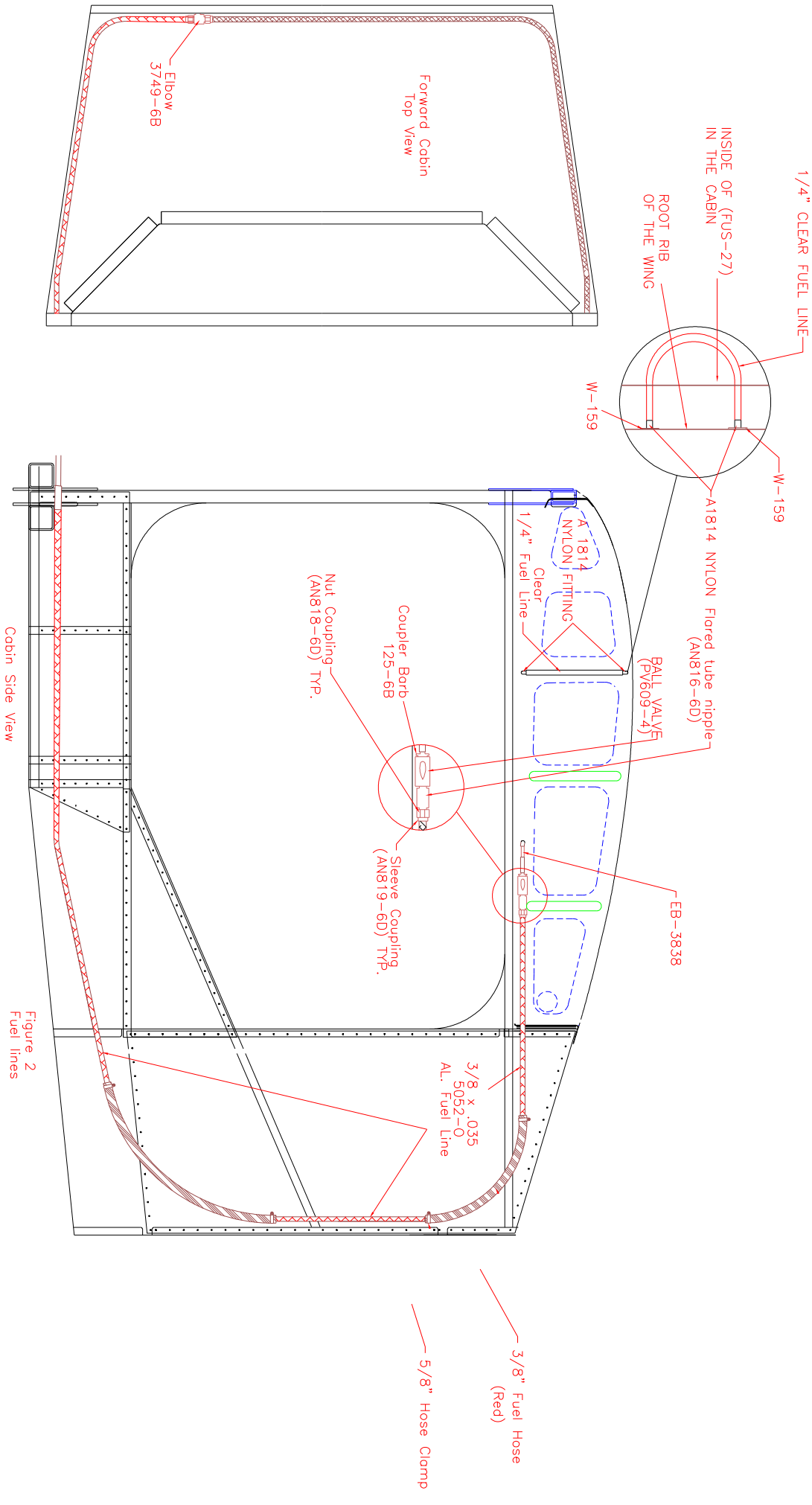


Figure 2
Fuel lines

FUEL TANK CROSS VENTING

If you are installing the flush mount style fuel cap, note that it is a non-vented cap. In order to properly vent tanks, allowing for proper fuel flow, it is necessary to cross vent the tanks. The following drawings illustrate how to properly cross vent the fuel tanks for your aircraft.

NOTE: Although not necessary, we strongly recommend cross venting of fuel tanks when using the standard fuel cap as well.