

SERVICE BULLETIN 128

SUBJECT: Hydraulic Pump Upgrade Offer

APPLICATION: Glasair RG Aircraft equipped with Oildyne model 108AA19-AL-2 and 108AE32-2VT pumps delivered with kits prior to kit #2074 (GII-S), #3206 (GIII).

DESCRIPTION: The basic retractable gear systems in the entire Glasair RG kit line are fundamentally similar. An Oildyne Hydraulic pump is used to supply hydraulic pressure to a hydraulic actuator at each gear leg for retraction and extension of the gear system. Components within the system have evolved and matured along with the various models of Glasair aircraft. The thousands of flight hours flown by Glasair Customers has provided Stoddard-Hamilton with constant feedback of operational experiences.

This extensive flight experience has shown the hydraulic system, along with its Oildyne pump, to be a very reliable and durable system. Problems experienced in the field regarding some early style pump output pressures prompted us to issue this Service Bulletin.

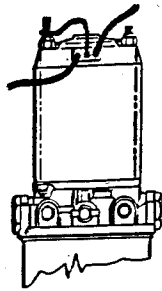
Glasair Pump History: There have been basically four different Oildyne hydraulic pumps supplied over the years, as described below and as shown in Figure (1).

1. Glasair I and early II kits were sent 108AA19-XX-2VT pump units or units with no label at all. This **three wire** pump has a square, **series wound** electric motor with a manually-operated plastic high pressure relief valve (for emergency gear extension) that screws into the pump housing.
2. Later Glasair II, and early Glasair III's were shipped 108AE32-XX-2VT and 108AE19-XX-2VT pump units. These are 12 volt **two wire** pumps that have a round, **permanent magnet** electric motor and require a remote high pressure relief valve for emergency extension.
3. Similar to the #2 configuration pumps above, the 108BE19-XX-2VT and 108BE32-XX-2VT pump units were shipped for the 24 volt systems. The 24 volt units (also **two wire permanent magnet**) have a physically smaller motor than the 12 volt motors.
4. Glasair II-S, Super II-S, and later Glasair III's have been supplied 108AM19-BL-2VT and 108AM19-BL-2VTT 12 volt pump units. The 108BI19-BL-2VT and 108BI19-BL-2VTT pump units were shipped for the 24 volt systems. This is the currently supplied "cold weather" pump. It has a larger square, **series wound** electric motor body and is again a **three wire** pump (not to be confused with the earlier three wire pumps)

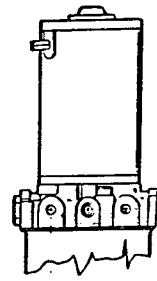
Internal clearances within the gear section of the pump and the speed at which the pump spins are important factors in the pressure output of all hydraulic pumps. We have found that the newest style (cold weather) pump is capable of greater output than the earlier style pumps. The pump internal clearances have been opened up slightly to allow a greater tolerance for thicker oil viscosities found in cold weather operations, and the pump motor turns at twice the speed as the old pumps to compensate. In addition, most of the cold weather pumps incorporate an additional thermal relief valve on the down pressure side of the system, indicated by a second "T" at the end of the model number.



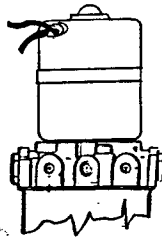
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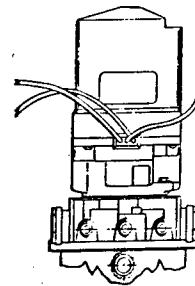
(#1)
12-VOLT
SERIES WOUND



(#2)
12-VOLT
PERMANENT MAGNET



(#3)
24-VOLT
PERMANENT MAGNET



(#4)
12/24-VOLT
SERIES WOUND

FIGURE (1)

Glasair Pump Operation: The hydraulic pump used in the Glasair aircraft operates at different pressures for up and down operation. The up and down pumping action of the pump itself has pressure output limiting ball type check valves. These valves open at specific pressure points to prevent over-pressurization of the aircraft system in the event of a pump controlling system malfunction. When the pressure relief valves open, they vent fluid back into the pump reservoir. The normal pump controlling units (Microswitches and/or Pressure Switches) are set to shut off the hydraulic pump at least 100 psi before the internal bypass ports open. Unless a 100 psi pressure differential exists between the controlling switches and the bypass ports, a condition can arise that allows the pump to internally bypass without the controlling switches shutting off the pump. If allowed to continue in this mode, the pump motor will eventually overheat.


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The up pressure output of the hydraulic pump is very important since the Glasair I, II and III use a 1400 to 1500 psi pressure switch to stop the landing gear retraction operation. Early Glasair III systems also use microswitches on the uplock hooks to stop the retraction cycle with the pressure switch used only as a backup. To achieve a proper operating margin above the pressure switch setting, the pumps should at least be able to produce the internal bypass pressure of 1750 ± 50 psi. Some very early pumps were set by Oildyne at an internal bypass pressure of 1550 ± 200 psi which proved to be too low for the III gear retraction, with a bypass pressure tolerance range too close to the pressure switch operating range.

Builder feedback indicates that a small number of pumps operate at or below the minimum internal bypass pressure output level for the Glasair II and III. In most cases this up output pressure can be adjusted to the desired 1750 ± 50 psi.

Note: If your system has been working satisfactorily, we recommend that if it's not broke, don't fix it.

RECOMMENDED ACTION: An in-house, function test and internal bypass pressure setting procedure was instituted near the end of the 108AE32-BL-2VT (round 2 wire motor) pump delivery period, about January, 1990. So, you can be assured that pumps shipped after that date were functioning properly when shipped. If, when installing and testing the landing gear, however, the pump internal bypass pressures fall below desired levels for correct gear operation, instructions (632-0195-026) are available from Stoddard-Hamilton to allow the builder to readjust the pump internal bypass pressures. If the builder wishes, S/H can test and adjust the pumps on our hydraulic pump test bench at a cost of \$25 per pump (subject to change after June 1st, 1995) plus shipping and handling. If we cannot get the pump to produce the desired pressures, we will recommend the customer purchase a new pump as indicated below. If you wish to have your pump tested, Attach a tag referencing service bulletin #128, with your name and kit number written on it.

Because proper landing gear operation is important for safe aircraft operation, Stoddard-Hamilton desires that all aircraft be equipped with pumps having pressure output levels adequately above the control switch shutoff point. Stoddard-Hamilton Aircraft is making the newest style (cold weather) pump available, **at cost**, to builders who feel their pumps are not performing with the desired performance margin. Builders desiring to take advantage of this offer should contact our Order Desk at 360-435-8533 and ask for the Service Bulletin #128 Hydraulic Pump Upgrade Offer. The cost of the cold weather pump will be \$326 plus shipping (does not include the reservoir). Since this is not intended to cover pumps damaged or worn out in service, this one time pricing offer has an expiration date of June 1, 1995, with no exceptions.

Note: Builders wishing to purchase a new Hydraulic Pump Reservoir (342-5661-103) with their pump for an additional \$19.90 (subject to change after June 1st, 1995), must specifically specify "with reservoir" when placing their order.

Maintaining a large stock of pumps is not cost effective. Once available stocks are exhausted, additional pumps will be ordered in blocks of 15. Normal delivery time is approximately 90 to 110 days. Please place your order early.

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