

GLASTAR / SPORTSMAN LYCOMING VACUUM SYSTEM INSTALLATION INSTRUCTIONS

PARTS LIST: PLEASE REFER TO THE PACKING LIST

TOOL LIST:

1. Rule, 12
2. Fine-point marking pen
3. Piloted hole saws or Unibit, 7/8" and 1" diameters
4. Half-round file or deburring tool
5. Open-end wrench or adjustable wrench, 1 1/4"
6. Knife
7. Slotted screwdriver
8. Assorted 3/8" and 7/16" wrenches

LYCOMING VACUUM SYSTEM

The vacuum system installation kit provides all necessary components to install a conventional aircraft vacuum system in a GlaStar or Sportsman aircraft powered by a Lycoming engine. The kit includes a vacuum pump, regulator, filter, 1" diameter suction gauge and all the necessary fittings, hoses and hardware to install two vacuum-operated instruments (typically a directional gyro and an artificial horizon) in the instrument panel. Refer to Figure 1 for a vacuum system schematic.




Note: The component locations shown in these instructions are optional. You may choose alternative locations that better suit your own particular circumstances.

These instructions are divided into the following sections:

1. Vacuum System Components Installations
2. Vacuum System Plumbing



CAUTION: Read carefully the written materials that accompany your vacuum pump and heed the cautions contained there. The vacuum pump is a relatively fragile unit, and mishandling can easily damage it. In addition, various practices can void the warranty on the pump.

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|  | REVISION: A | DATE: 5/22/08 | PAGE: 1 |
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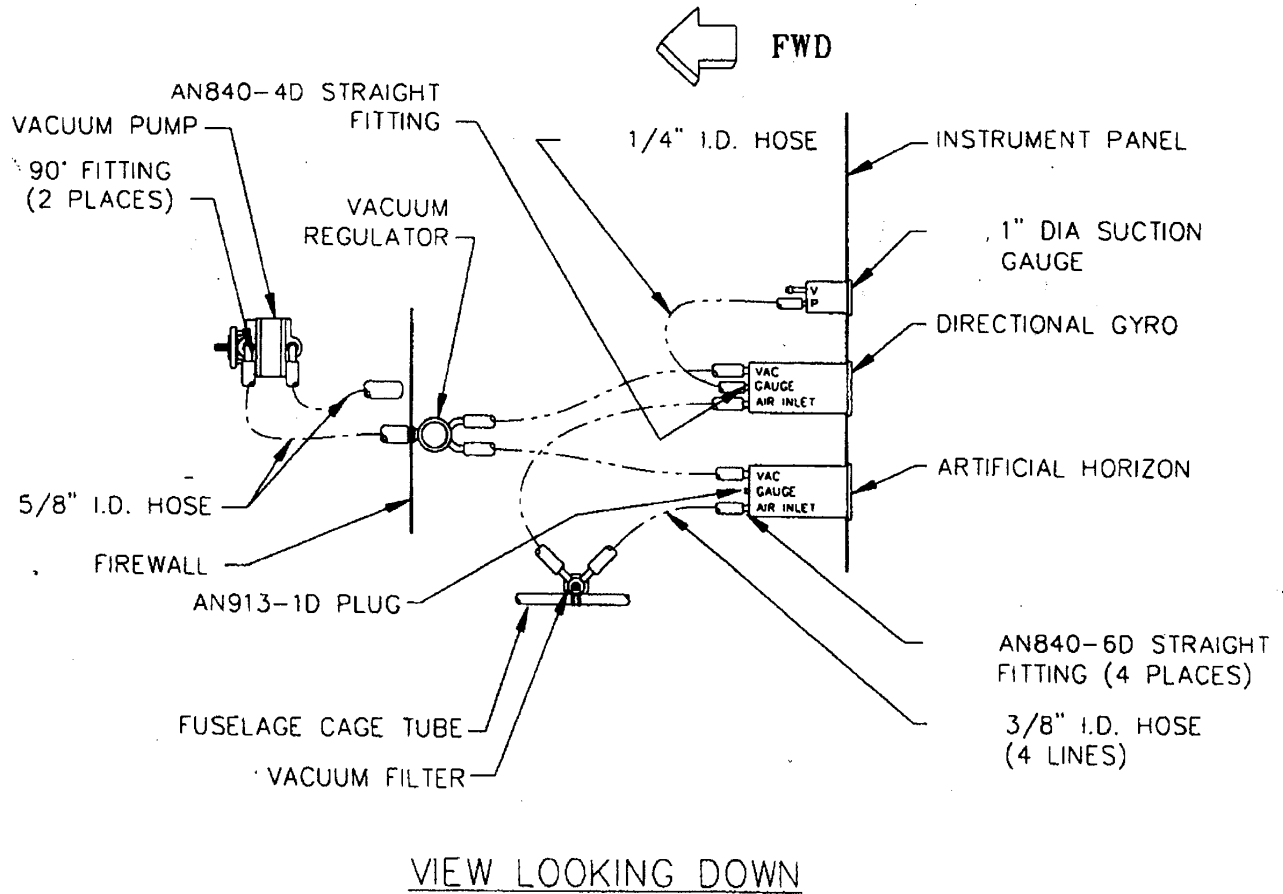



FIGURE 1: VACUUM SYSTEM SCHEMATIC

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VACUUM SYSTEM COMPONENTS INSTALLATION

Step 1: Mount the Vacuum Pump

Install the **90° fittings** into the ports on the top side of the **vacuum pump**, orienting the fittings to the left when the vacuum pump gear is forward, as shown in Figure 1.




Note: No form of thread sealant is required or recommended for the vacuum system threaded connections. In particular, do **not** use Teflon tape; *use of this material voids the warranty on the pump.*

Remove the cover (if present) from the vacuum pump drive pad on the engine accessory case. (Refer to your engine owner's manual if you are uncertain of the location.) Mount the vacuum pump on the drive pad, using the same hardware that secured the cover. If you are missing the hardware, we have supplied AN960-416 **washers**, MS35335-44 **lock washers**, and ¼-20 **plain nuts** for this purpose. Put the plain washers next to the pump; then install the lock washers and the nuts; we recommend using new lock washers even if you have the original hardware.



Hint: Because of the design of the Lycoming accessory housing and the limited clearances between accessory components and the engine mount tubes, we recommend installing the engine on its mount before installing the vacuum pump. Also, access for tightening the nuts securing the vacuum pump is very limited; removing the right magneto will greatly improve access to these fasteners.

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|  | REVISION: A | DATE: 5/22/08 | PAGE: 3 |
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Step 2: Mount the Vacuum Regulator

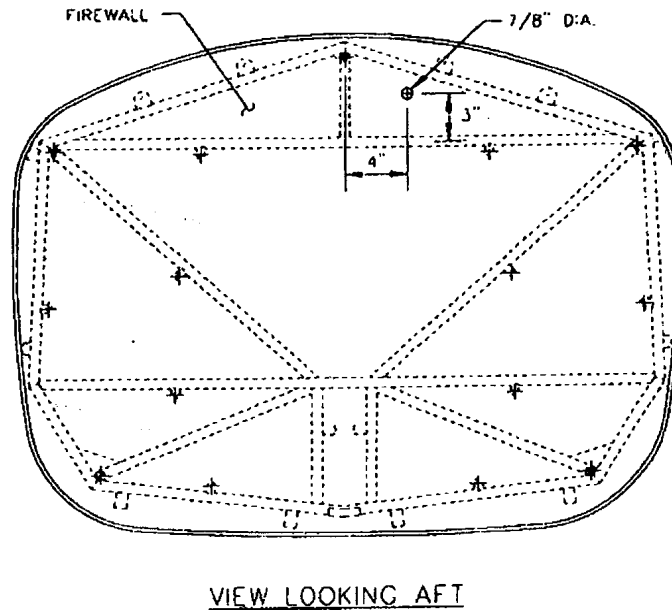


FIGURE 2: VACUUM REGULATOR LOCATION

The **vacuum regulator** requires a **7/8"** diameter hole in the firewall at the location shown in Figure 2. Mark the hole's location and then drill the hole using either a sharp, 7/8" diameter hole saw or a large Unibit. Deburr the hole.



Hint: If you don't have access to a hole saw or Unibit, mark the size of the hole as well as its location and use a **1/8"** bit to drill a series of holes inside the perimeter of the marked hole. Break away the material inside the hole and then use a half-round file to smooth and enlarge the hole to the final size.

Remove the large nut from the vacuum regulator and insert the regulator through the prepared hole from the aft (cockpit) side of the firewall, as shown in Figure 1. Reinstall the nut on the forward side of the firewall with an AN960C1416L **thin stainless-steel washer** under it. Use a **1 1/4"** open-end or adjustable wrench to tighten the nut sufficiently to prevent the regulator from rotating.



Note: Access for adjusting the regulator and replacing the foam filter is gained by removing the instrument panel glare shield.

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| | REVISION: A | DATE: 5/22/08 | PAGE: 4 |
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Step 3: Mount the Vacuum Filter

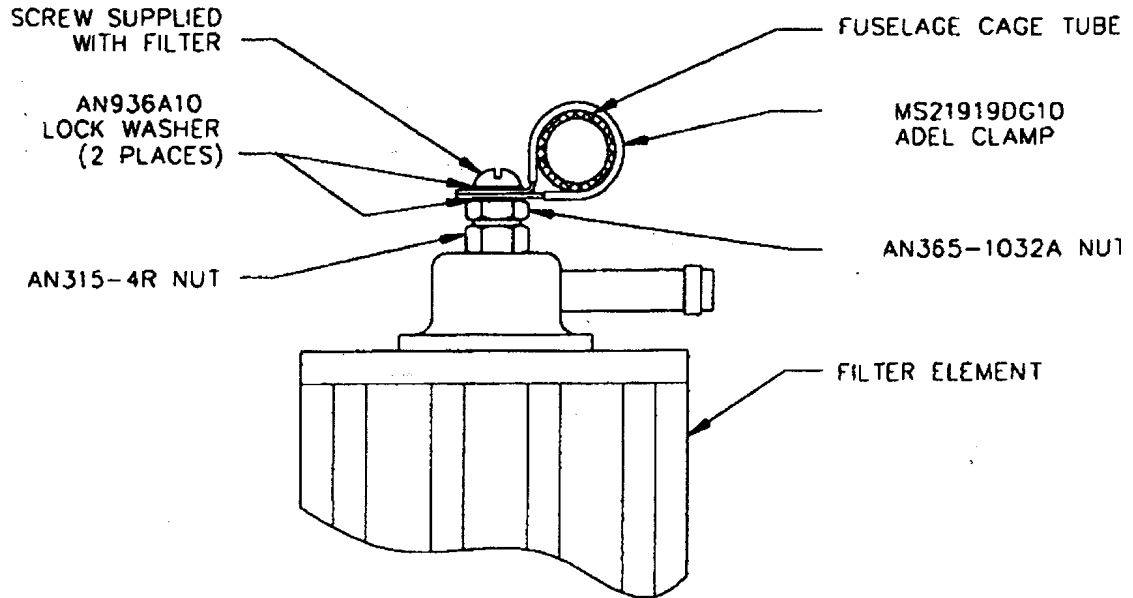



FIGURE 3: MOUNTING THE VACUUM FILTER

The **vacuum filter** is mounted to the fuselage cage framework of the instrument panel, as shown in Figure 1. Its exact location is not critical, but you should choose a location that provides convenient access for changing the filter element – either from below the instrument panel on the pilot's side or from above, by removing the glare shield.

Disassemble the vacuum filter by removing the nut at the bottom for the filter element. Use the long screw from the filter assembly, two AN936A10 **lock washers**, an AN365-1032A **nylon self-locking nut** and an AN315-4R **plain nut** to secure the MS21919DG10 **Adel clamp** to a fuselage cage tube at the chosen location. Refer to Figure 3. Install the vacuum filter assembly onto the long screw, securing it with the original hardware.

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|  | REVISION: A | DATE: 5/22/08 | PAGE: 5 |
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Step 4: Mount the Gyro Instruments to the Suction Gauge

Thread AN840-6D **straight fittings** into the “vacuum” and “air inlet” ports of both gyro instruments. Thread an AN840-4D **straight fitting** into the “gauge” port of the gyro instrument closest to the suction gauge and an AN913-1D **plug** into the “gauge” port of the other gyro instrument.

Use either a hole saw or a Unibit to drill a 1” diameter hole in the instrument panel for the **suction gauge**. Mount the gauge using the two knurled nuts supplied with it. Be careful in installing the gauge, as the back of the gauge is fragile and the bezel nut can be somewhat difficult to tighten.

Also, if you have not already done so, mount the artificial horizon and the directional gyro in the instrument panel.

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VACUUM SYSTEM PLUMBING

Step 5: Install the Vacuum Pump Hoses

Install a length of **5/8” diameter hose** between the **inlet** port of the vacuum pump and the forward port of the vacuum regulator, as shown in Figure 1. Make the hose long enough to allow movement of the engine on its mount, and provide a generous bend radius to prevent kinks. Secure the hose at both ends with **stainless-steel hose clamps**.



Note: Use compressed air to blow out all hoses before installation, and do not use oil or other lubricants to install the hoses. (Since this is a vacuum system, any foreign material or contaminates in the hoses will be drawn through the instruments and/or the pump.) Also, do not cut into the hose by overtightening the clamps. Excessive tightening is not necessary since the vacuum in the hoses will tend to hold them in place.

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| The logo for Glasair Aviation, featuring the word "Glasair" in a stylized font above the word "AVIATION" in a smaller, all-caps font, with a red horizontal bar below "AVIATION". | REVISION: A | DATE: 5/22/08 | PAGE: 6 |
|---|----------------|------------------|------------|

Use of stainless-steel hose clamp to secure another length of 5/8" diameter hose to the **outlet** port of the vacuum pump. Leave the other end of this hose open to the atmosphere and oriented downward so that dirt or engine-compartment fluids will not collect inside. Use of **cable ties** to secure the open end of this hose to an engine mount tube.

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Step 6: Install the Instrument Hoses

Install lengths of **3/8" diameter hose** between the aft ports of the **vacuum regulator** and the "vacuum" ports of the gyro instruments, as shown in Figure 1. Secure the hoses at both ends with **miniature hose clamps**, again refraining from overtightening the clamps. Secure the hoses to the cage tubes with cable ties where convenient.


In a similar manner, route lengths of 3/8" diameter hose between the ports of the **vacuum filter** and the "air inlet" ports of the gyro instruments.

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Step 7: Install the Suction Gauge Hose

Install a length of 1/4" diameter hose between the AN840-4D fitting in the "gauge" port of one of the gyro instruments and the "P" (pressure) port of the suction gauge. Secure the hose with miniature clamps at both ends. Leave the "V" (vent) port of the suction gauge open to the atmosphere.

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|  | REVISION: A | DATE: 5/22/08 | PAGE: 7 |
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