

RAPCO PNEUMATIC STANDBY VACUUM SYSTEM

OPERATIONAL INFORMATION

SYSTEM OVERVIEW

The RAPCO Pneumatic Standby System is designed to be fully automatic however a manual override is included for pre flight check or as an additional backup. For normal operations the switch on the standby panel should be left in the Auto position. In this mode the standby system is designed to activate any time the primary system vacuum drops below 4 IN.HG. The switch also has a Manual On position. When it is selected the standby system will stay engaged as long as the aircraft master switch is on. This position is used for a pre flight function check, or as a back up in the event the auto feature should fail. There is also a circuit breaker on the standby panel marked Clutch C/B, along with a green light which will illuminate to confirm that the standby system is actually producing vacuum greater than 4 IN.HG.

START UP

In the normal Auto mode, upon activation of the aircrafts master switch, and before the engine has started, the primary system pressure switch will sense vacuum to be less than 4 IN.HG. Therefore it will send current through the normally closed terminal to engage the standby system's electro magnetic clutch. At this point however the green light on the standby panel will not illuminate due to a lack of vacuum to close the contact on the normally open terminal of the standby vacuum switch. The clutch will disengage as the engine starts and the primary systems vacuum rises above 4 IN.HG.

PREFLIGHT CHECK

The following check should be performed before each flight, especially when flying IFR, or night flight.

1. After starting the engine and before the radios are turned on, momentarily turn off the battery portion of the master switch and observe the suction gauge to confirm that the primary pneumatic system is functioning properly. This will isolate the primary system from the standby system. Return battery master to the on position.
2. Momentarily toggle the switch on the standby system panel from the normal Auto mode to Manual On position while observing the suction gauge display a slight momentary increase in suction. Also confirm that the green light on the standby panel is illuminated. Return the switch to the Auto position for normal flight operations.

AUTOMATIC STANDBY SYSTEM OPERATION

When the aircrafts primary vacuum system fails the backup systems primary vacuum switch will send current through the normally closed terminal to engage the standby clutch. The clutch drives the standby dry air pump providing vacuum to the system. At this point the contact of the normally open terminal on the standby vacuum switch will close and activate the green light on the standby panel. Its purpose is to indicate that the standby system is actually producing a vacuum greater than 4 IN.HG. When the standby system is activated the vacuum gauge of the aircraft should indicate normal. Have system serviced as soon as possible.

BACKUP SYSTEM OVERRIDE

In the event the automatic standby system should fail to operate, activate the override feature by moving the switch on the standby panel from the Auto position to Manual On. If there is still no increase in vacuum, or the green light on the standby panel fails to illuminate, try pressing the circuit breaker on the standby panel marked Clutch C/B. Have system serviced as soon as possible.

ENGINE SHUT DOWN

In the normal Auto mode, as the aircraft engine is coming to a stop the clutch will engage when the primary vacuum switch senses a drop in vacuum below 4 IN.HG. At this point however the light will not illuminate due to the lack of vacuum in the standby system to close the contact on normally open terminal of the standby vacuum switch.

RAPCO STANDBY VACUUM SYSTEM

SERVICE INFORMATION

Standby Clutch TBO 7 years or 2000 hours. RAPCO service letter RASL-007. (CLUTCH NO LONGER AVAILABLE)
Replace Shear Couplers on clutch and dry air pump every 6 years. Refer to RAPCO service letter RASL-008
Replace Dry Air Pumps every 6 years. RAPCO service letter RASL-005
Replace inlet filter at annual inspection or with dry air pump change, replace inline filter every 500 hours.
Replace all pneumatic system hoses every 6 years.

TROUBLE SHOOTING TIPS

Consult Operational Information for an overview of the system along with the system diagrams for your aircraft.

To help determine where the problem lies, first isolate the primary system from the standby system by starting the engine and leaving radios off. Then turn off the battery side of the master switch. Observe pressure gauge to check if primary system is operable. Turn battery master back on.

Toggle the standby switch from the Auto position to the Manual On mode while observing the pneumatic pressure gauge to show a slight momentary increase in pressure. Also the green light in the standby panel should be illuminated. Return the switch to the Auto position for normal flight operations.

Both the clutch and the pump contain shear couplers. Assure couplers are functional. There should appear translucent with no sign of heat damage or distortion.

With engine off supply power to clutch lead. Clutch should make a click sound when it is energized.
Current draw: 12V 0.667 amps, 24V 0.277 amps.

Clutch lead is connected to the normally closed terminal of the primary vacuum switch and is designed to be activated when the primary pneumatic systems vacuum is below 4 IN.HG. It is also connected to the standby switch and is activated in the Manual On position. Check for continuity.

Green light lead is connected to the normally open terminal of the standby vacuum switch and is designed to illuminate only when the standby side of the system is producing a vacuum of greater than 4 IN.HG. Check for continuity.

Test green light for function.

Test circuit breaker for function.

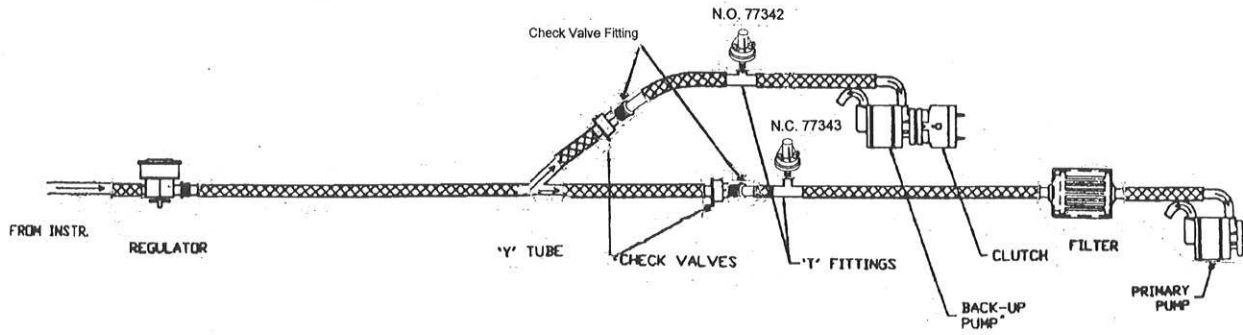
Standby system is designed with a Y pipe and two check valves to prevent air, from the operating side of the system to leak through the inoperative side. Test check valves for proper function.

REPLACEMENT PARTS LIST

<u>Item</u>	<u>Part Number</u>
Dry air pump	RAP216CW
Clutch 12 Volt	RA400-1200 (NO LONGER AVAILABLE)
Clutch 24 Volt	RA400-2400 (NO LONGER AVAILABLE)
Shear Coupler	RA-Shear Coupler Kit
In Line Filter	RA2J4-7
Check Valve	AV-7
Vacuum Switch, Normally Open (NO)	77342
Vacuum Switch, Normally Closed (NC)	77343
Lamp & Socket, Green 12 Volt	1090C5-12
Lamp & Socket, Green 24 Volt	1090C5-24
Circuit Breaker 3 Amp	ETA41-06-P30
Upgrade Kit	300K (Specify - Pressure or Vacuum, 12Volt or 24Volt, Vertical or Horizontal Placard) The Upgrade Kit converts early pneumatic standby systems with a single sensor, than simply showed that the primary system has failed, to a dual sensor system, which confirms that the standby system is in fact functioning.

Standby Vacuum System

Pneumatic Diagram



Wiring Diagram

