

Inner Gear Doors Sequence Manifold

Installation Guide

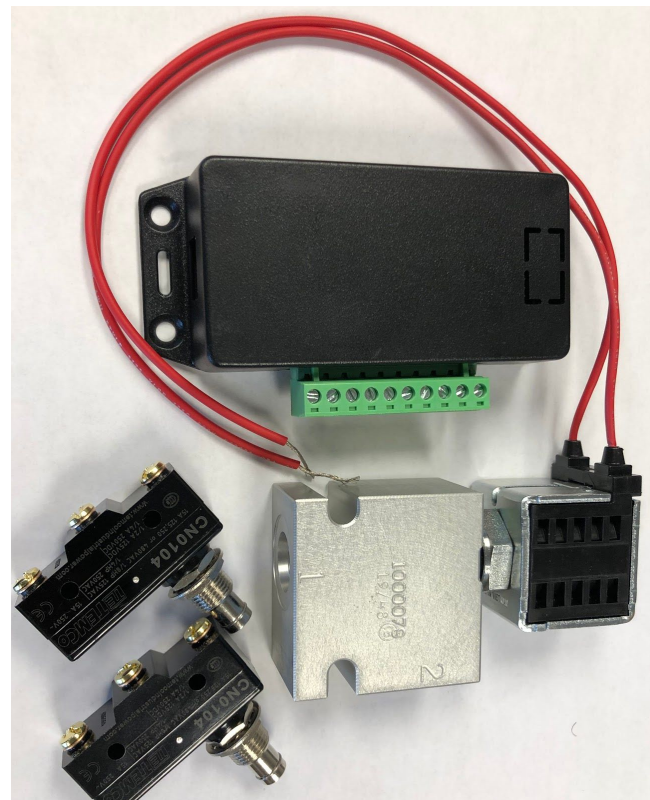
This system replaces both (or all three) Hydraulic Sequence Valves usually found on retractable experimental landing gear airplanes which allows the Inner Gear Doors to close after the gear is retracted.

The Hydraulic Sequence valves along with the plumbing are removed and replaced with Plunger type switches or Limit switches to indicate Landing Gear is fully Up.

The system includes a single spring-loaded Hydraulic Valve Solenoid that is fail-safe at all stages of the flight. The Controller momentarily blocks hydraulic fluid from reaching the Door Cylinders and this allows all available pressure to be directed towards raising the Landing Gear. Once the Landing Gear is fully up by the indication signal of all Plunger Switches; the Controller passes Hydraulic Pressure to the Inner Gear Door Cylinders to close the doors.

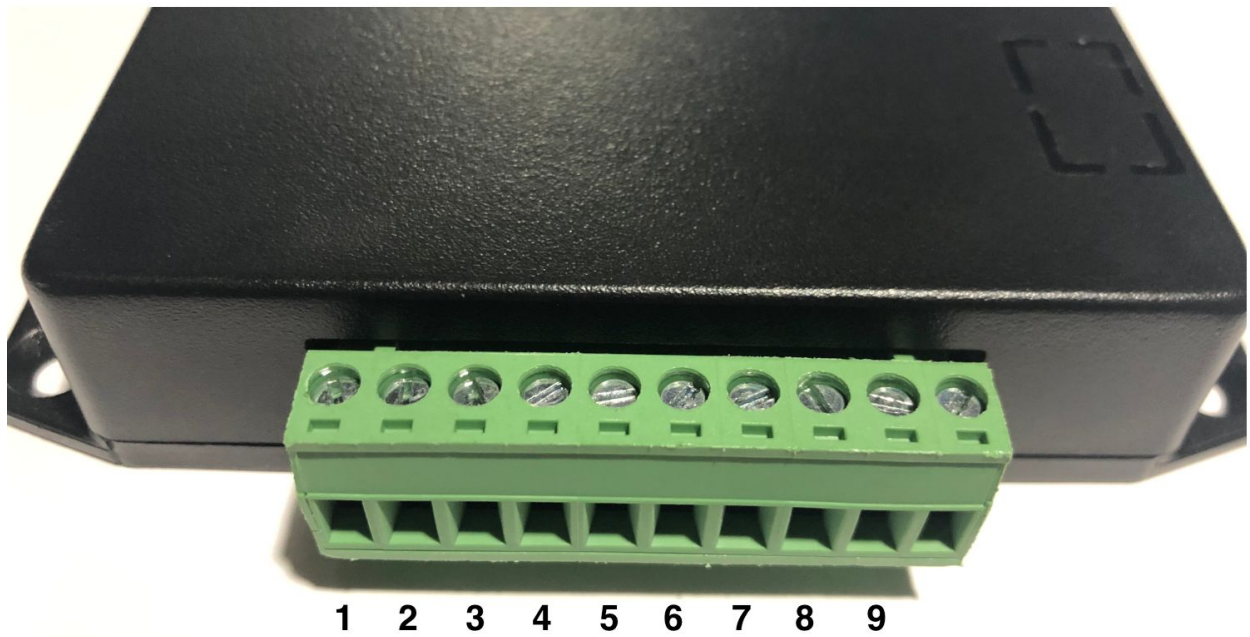
The system includes

- Two Plunger-Switches
- Solenoid valve & Manifold
- Controller Unit.



CONNECTIONS

Refer to the following table for explanation of each PIN and connections.



10-PIN Connector

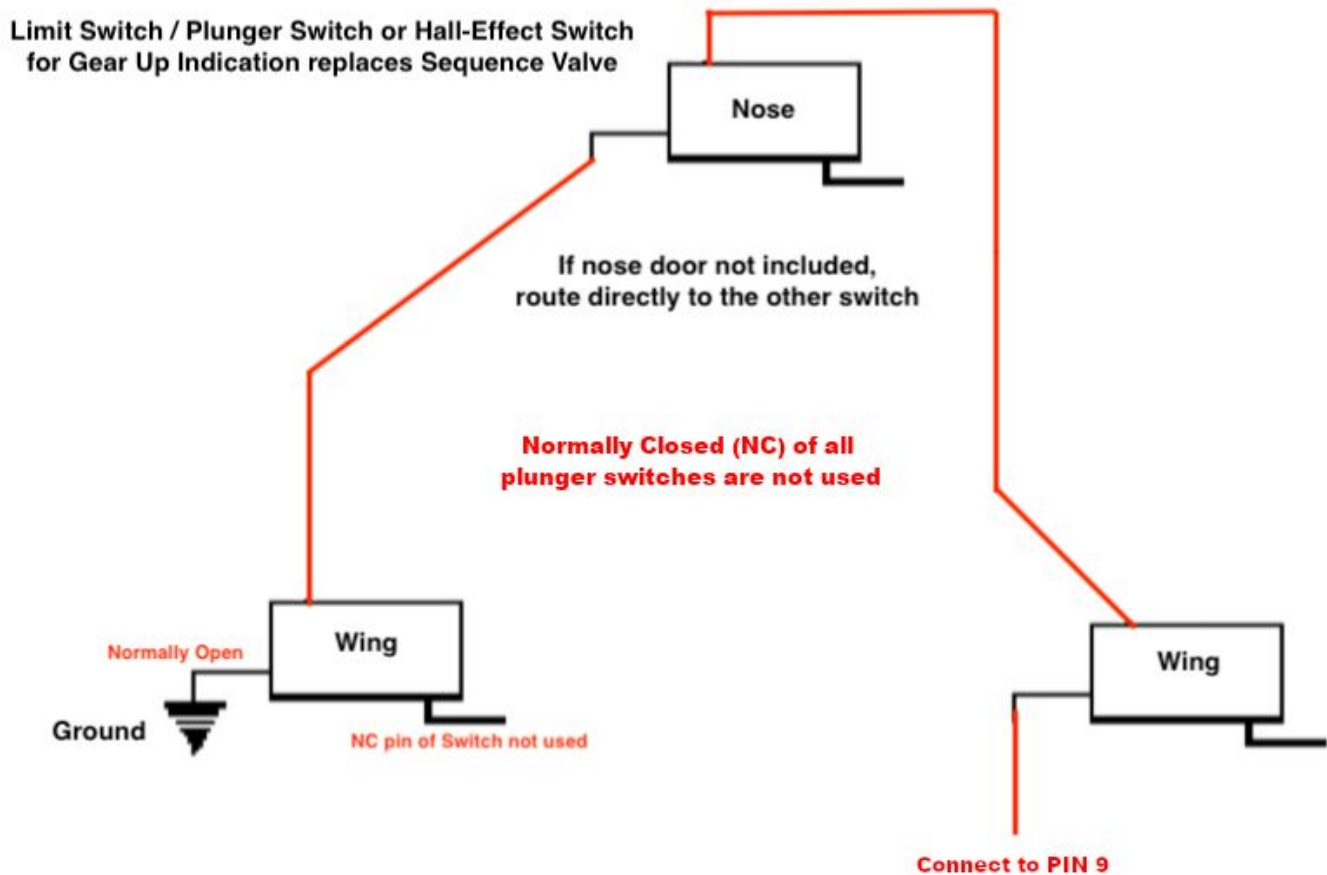
PIN	FUNCTION
1	(Input) GND. Connect this pin to airplane GND.
2	(Input) +12V. Airplane +12V. System uses a maximum of 1.5A momentarily while the Landing Gear is in motion (Retracting). AWG 22 is recommended.
3	N.C (No Connection)
4	Used as Jumper For MODE-2 (Jump to PIN 8)
5	Solenoid Wire (either wire can be connected here)
6	Gear Switch Up Indication
7	Solenoid Wire (either wire can be connected here)
8	Used as Jumper For MODE-2 (Jump to PIN 4)
9	Plunger Switches Signal
10	N.C (No Connection)

Plunger/Limit Switch

The Plunger/Limit Switches replace each of the Hydraulic Sequence valves. These switches provide a signal to the Controller that all gear legs are up.

Use N.O (Normally Open) type Switch. Switches are connected in series. N.O of the first switch is connected to GND, the COM (Common) end connects to the 2nd Switch COM Pin, then N.O of the last switch connects to the Controller PIN 9.

Checkout the following diagram for Switch connections.



Gear Up Indication Signal

Gear Switch Connection

Controller PIN 6 receives the “Gear Switch Up Indication”. Note to take this wire AFTER all Air-Speed Gear Safety or “squat switch” and not directly from the airplane Gear Switch lever.

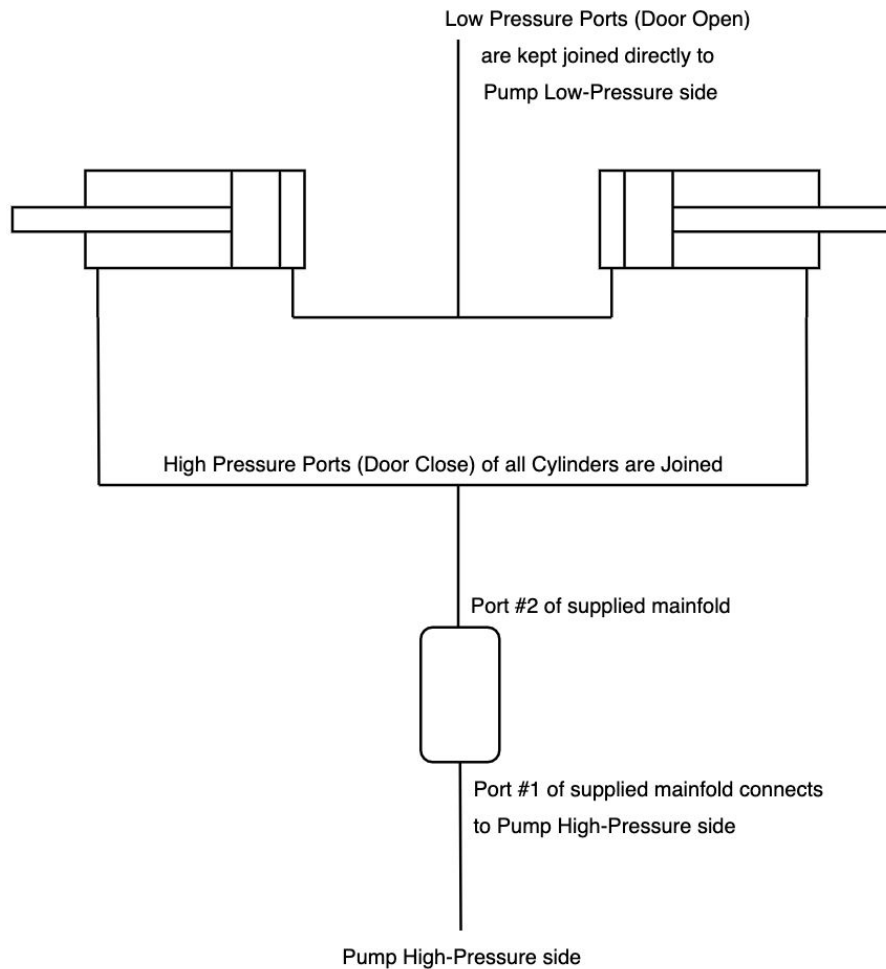
This is the same wire that goes to the Pump High-side Pressure Switch to activate the Pump to retract the Gear.

This tells the controller that the pilot just put the Gear Switch to the Up position.

HYDRAULIC PLUMBING

Remove all Hydraulic Sequence Valves and associated hoses. Join all inner Door Cylinder High-Side ports together and connect to PORT 2 of Solenoid Valve.

PORT 1 of Solenoid Valves connects to the Pump High Pressure Side which can be taken from the previously removed Sequence Valves High Pressure Port.



MODES OF OPERATION

The Controller is programmed with two Modes of Operation. MODE-1 is the default mode with no Jumper required. If MODE-2 is desired; place a jumper cable (AWG 24 is acceptable) between PIN 4 & PIN 8. For the default MODE-1, leave Pins unconnected.

MODE-1 (Default):

In this mode, once the Plunger Switches Signal is detected; the Controller immediately releases the pressure line to the Door cylinders. Depending on how efficient the hydraulic plumbing and setup for each airplane; the pump may switch off for a fraction of a second, then switch on again. Or it may just continue working directly without switching off. Tests can be done to confirm this case. If the pump is suspected to switch off for a fraction of a second; it's best to use MODE-2 to prevent this behavior. **The supplied Plunger Switches come with a long plunger that can travel further after the switch is triggered, this can be adjusted so the Gear still needs to travel 5-8 mm more before stopping and this helps the pump continue running to close the door without stopping.**

MODE-2 (Jumper):

The Controller waits 5 seconds after receiving the "Plunger Switches Signal" indicating the gear is fully up. This aids in the situation where the gear is still slightly bouncing and provides the extra time to confirm the signal is still present. This wait period causes the pump to switch off then 5 seconds later to go on again to supply pressure to the Door Cylinders.

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