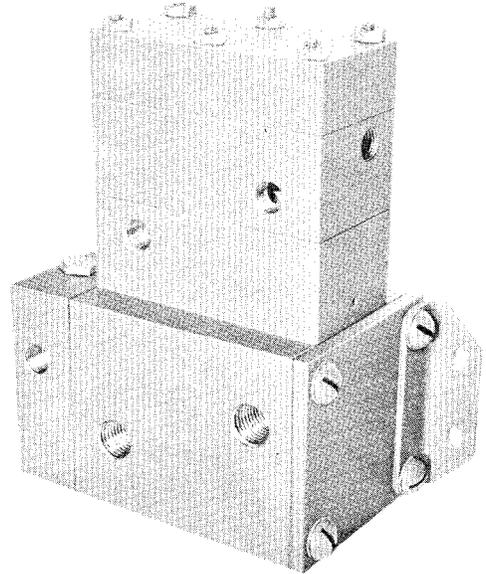


Combination Relay 99262-A1

GENERAL DESCRIPTION

The No. 99262-A1 Combination Relay is a two-position, multipurpose relay, which, in conjunction with the required sensors and indicator relays, serves as the nucleus of a basic safety control system.

The relay serves to initially "pulse" the system with pneumatic pressure, provides supply pressure to the various sensors and indicator relays, and also controls the "final control element" such as a gas valve, diesel fuel pump or a similar device.



SPECIFICATIONS

Construction:Brass body, stainless steel springs, elastomer gaskets, diaphragms and valve poppets.

Supply Pressure:20 to 60 psig.
 Factory calibrated using 25 ± 5 psig unless otherwise specified.

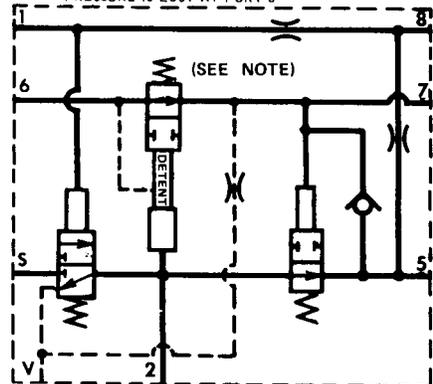
Maximum Pressure:60 psi
WARNING: Do Not Exceed Maximum Pressure.

Dimensions: See Figure 2.

Connections: See Figure 2.

Ordering Information:
 Specify No. 99262-A1

NOTE: ONCE CLOSED, THIS VALVE REMAINS CLOSED UNTIL PRESSURE IS LOST AT PORT 6



J.I.C. Symbol

INSTALLATION

A. GENERAL

Tubing and fittings used to connect relay must be free of chips, dirt, moisture or other foreign matter. If compound or shellac is used, apply it above second or third male thread in moderate amount. Do not allow compound to be deposited inside relay.

For continuous, trouble-free operation, the supply to the relay must be clean and dry.

B. MOUNTING

When installing the No. 99262-A1 Combination Relay, care must be taken to prevent any foreign matter from entering the ports.

The relay may be installed in any position and should be securely mounted, using the four 13/64" diameter holes (clearance for No. 10 screws), provided in the mounting brackets (see Figure 2).

Remove protective plug from PORT V before operating relay.

C. CONNECTIONS

Consult system schematic for proper connections.

Use 3/8 O.D. tubing to PORTS 6 and S.

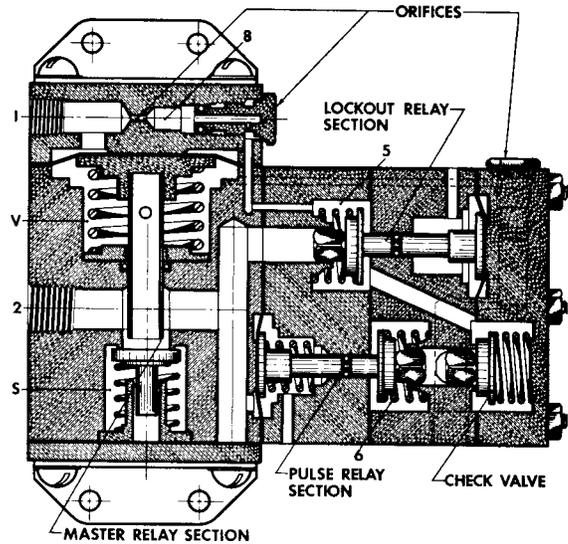


Figure 1

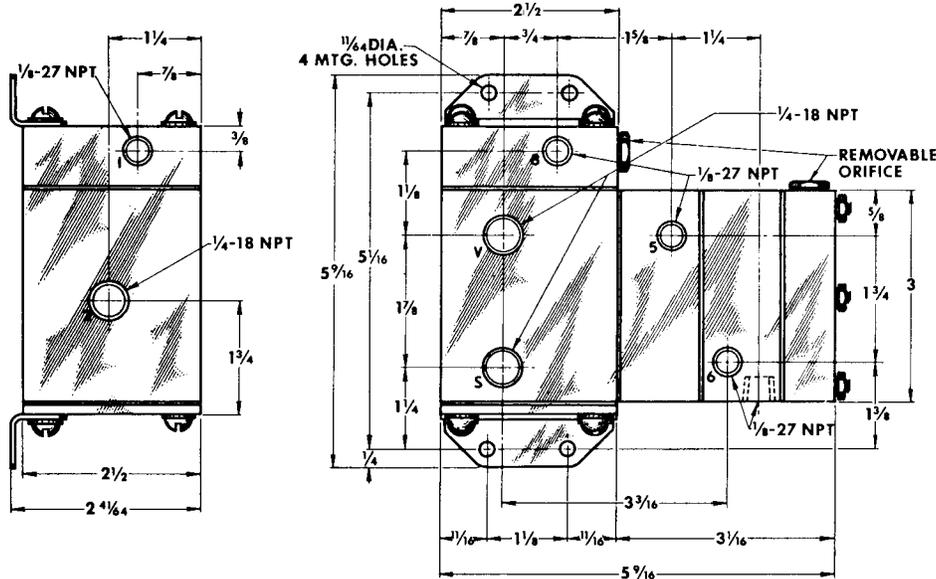


Figure 2

OPERATION

This relay requires supply pressure at two ports: (a) to the normally closed master relay supply PORT 5, and (b) to the normally-open pulse relay supply PORT 6. Pressure supplied at PORT 6 functions as pulse pressure to pressurize safety system. With supply pressure at PORT S, master relay Poppet 1 is held on Valve 1 by poppet return Spring 5 and by unbalanced pressure across the valve. With Valve 2 held open by Spring 1, supply pressure entering PORT 6 is transmitted to PORT 7 where it may be used to reset pneumatic Vibraswitches or to perform other functions requiring a short term pressure signal. Diaphragm 3 is pressurized to close normally open starting lockout relay Valve 3. This pressure also is transmitted through Check Valve 1 to the outlet side of lockout relay Valve 3. With Valve 3 closed by pressure on Diaphragm 3, loss of pulse pressure through vent PORT V is prevented. Pressure is transmitted through Port 5 to the safety system's supply manifold and through Orifices 2 and 3 to the top of master relay section Diaphragm 2.

During pressurization, pressure is supplied to the safety system's Class A control manifold through PORT 8. All Class A receiver relays must transfer (not venting) before sufficient pressure flows through Orifices 2 and 3 in series to pressurize master relay Diaphragm 2, closing Valve 4, and opening master relay Valve 1. A venting Class A receiver relay (due to an unsafe transmitter) prevents pressure buildup on master relay Diaphragm 2 and Valve 2 remains closed. 10-14 psi pressure on master relay Diaphragm 2 opens Valve 1.

With master relay Valve 1 open, supply pressurizes pulse relay Diaphragm 1, closing Valve 2. Pressure bleeds off of lockout relay Diaphragm 3 through "plug type" removable Orifice 1 to vent PORT V. Lockout relay Valve 3 opens, permitting supply pressure from PORT S to flow through Orifice 2 and 3 to maintain pressure on Diaphragm 2, holding master relay Valve 1 open. Pressure is maintained at control manifold PORT 8 through Orifice 2.

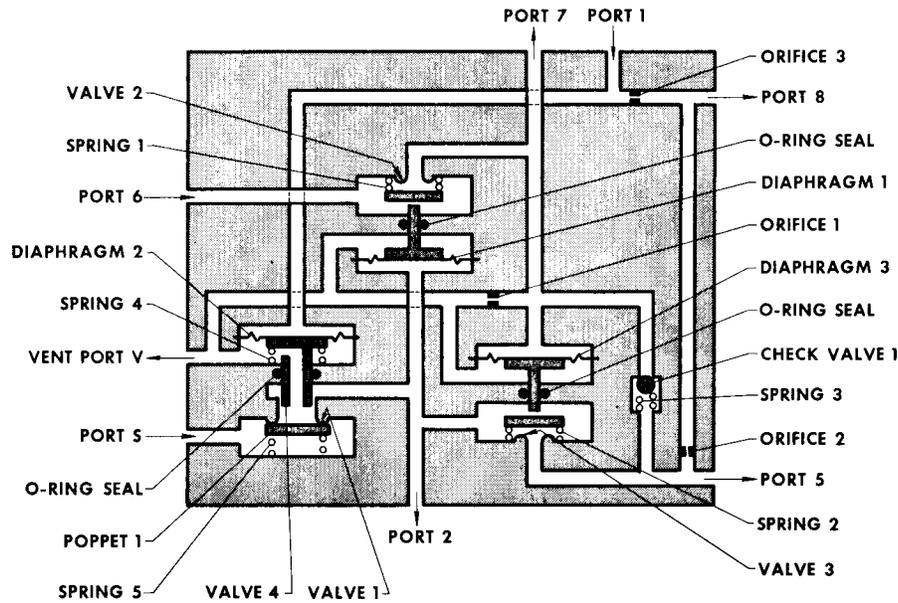


Figure 3

With master relay open and the safety system pressurized, the ultimate function of combination relay No. 99262-A1 is to furnish pressure through PORT 2 to the final control element, sequence system or safety shutdown valve.

If a sensor for an engine safety system senses a malfunction, pressure on master relay Diaphragm 2 holding Valve 1 open is lost through PORT 8 faster than pressure can be supplied through the .028" Orifice 2, and master relay Valve 1 returns to its normally closed position. Valve 4 opens, exhausting system pressure through vent PORT V. Pressure on "final control element" or safety shutdown valve is lost and the engine controlled by the safety system is shut down.

If the sensor which has sensed a malfunction should return to a safe condition after the mater relay Valve 1 has returned to its normally closed position, the Combination Relay cannot repressurize the safety system until the pressure at PORT 6 is lost to reset or open the pulse valve.

MAINTENANCE

WARNING: *Disassemble carefully-spring-load forces present.*

- A. Orifices 1 and 2 are removable and may be disassembled from relay to clean or check for blocked openings. Orifice 3 is fixed; however, it can be checked by removal of fitting at Connection 1 and cleaned with a small diameter wire.
- B. If relay does not function properly due to contamination by foreign matter, disassemble and clean all metal parts with non-flammable solvent and dry thoroughly. When reassembling the Combination Relay, care should be taken not to interchange the springs which bias the valve poppets in the pulse relay, lockout relay and check valve sections. While the springs have similar diameters, their spring rates differ considerably. The spring in the lockout relay section is the heaviest (2 3/4 lbs. at 1/2" length), the spring under the poppet in the pulse relay section is lighter (1 lb. at 1/2" length) and the spring in the check valve section is the lightest (1 /4 lb. at 1/2" length).
- C. After reassembly, check for external leakage. Retighten assembly screws as necessary. Gasket cement should not be used to seal leaks due to the possibility of plugging small passages and orifices or possible damage which might change the operational characteristics of the diaphragm.

(Pressure drop across Valve 2 will not let the pulse valve open.)

PORT 1 may be connected to a test valve to permit testing of components in the safety system without affecting engine operation. Fixed Orifice 3 between PORTS 1 and 8 permits an auxiliary source of pressure through a test valve connected at PORT 1 to be used to hold the master relay section open while testing components in the safety system (during this testing, the line connected to PORT 8 will be venting through Orifice 3 when a transmitter is unsafe and the safety system will be ineffective as long as the pressure is applied at PORT 1 for testing). The test valve used should be a three-way valve with a vent. The pressure from this test valve is applied to the combination relay at PORT 1 through a check valve to prevent the loss of pressure back out the vent of the test valve. The reason for the vent on the test valve is to eliminate the possibility of a bad test valve from biasing the combination relay permanently without the valve being manually opened.

CAUTION:

If cleaning is required, do not subject O-rings, valve poppets, diaphragm or gasket to cleaning fluid, acetone, or any halogenated hydrocarbons such as vapor degrease liquids, etc. Clean only with a soft, dry cloth.

Upon reassembly, all O-rings are to be lubricated with a non-drying silicone-type lubricant.

Do not permit lubricant to get on poppets or valve seats since this may cause leakage of the valves.

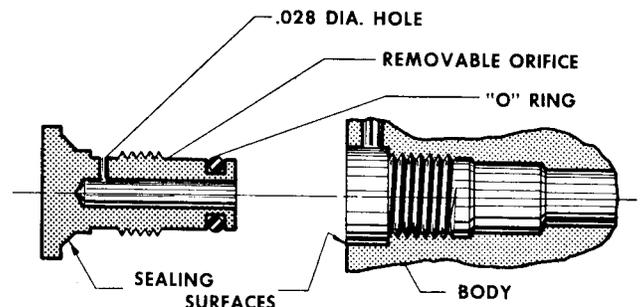


Figure 4

PARTS LIST

Item No.	No. Req'd	Description	Part No.
*1	2	"O" Ring	36240-N0008
2	2	Orifice Plug	24497-A1
3	1	Poppet Spring	25216-A1
*4	2	Poppet Assembly	99264-C1
*5	2	"O" Ring	36240-N1006
6	6	Lockwasher	36600-J0609
7	6	Nut	36602-A1309
8	6	Stud	25137-A1
9	2	Stem and Head Assembly	99520-A1
10	1	Cover	25133-A1
11	1	Poppet Spring	24603-A1
*12	1	Poppet Assembly	99263-B1
*13	1	Gasket	25132-A1
14	1	Poppet Spring	25121-A1
15	1	Housing	25135-A1
*16	1	Gasket	25131-A1
17	1	Spring	26148-A1
18	1	Housing	25134-A1
*19	1	Diaphragm	25130-A1
20	4	Screw	36618-E1509
21	1	Cover	24610-A1
*22	1	Gasket	25248-A1
23	1	Poppet Guide	24607-A1
24	1	Poppet Spring	24615-A1
*25	1	Poppet Assembly	84980-D1
26	1	Body	25125-A1
*27	1	"O" Ring	36243-N12
28	1	Spring Seat	24606-A1
29	1	Spring	24616-A1
30	1	Stem and Head Assembly	98969-A1
*31	1	Diaphragm	25128-A1
32	1	Housing	25250-A1
33	8	Lockwasher	36600-L0912
34	4	Screw	36618-E2409
35	2	Bracket	24637-A4
--	1	Name Plate	28862-C12

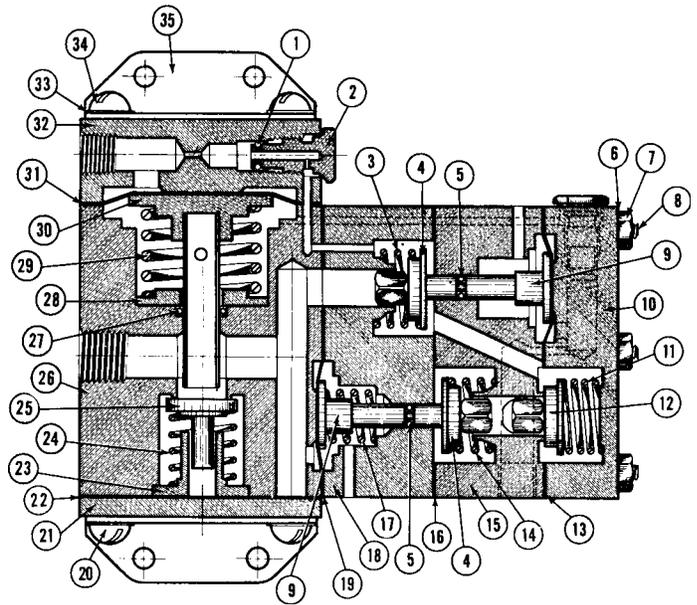


Figure 5

NOTE: For complete kit to service one unit, order Repair Kit No. 82665-A10. Kit contains parts marked *.

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