

SS200-AJ-MMM-010

[SGML Version See Change Record]

TECHNICAL MANUAL

OPERATION AND MAINTENANCE

**NAVY SHIPBOARD
COLLECTIVE PROTECTION
SYSTEM (CPS) PRESSURE
CONTROL VALVE (PCV)**

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RECORD OF CHANGES

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FOREWORD

The anticipated use of chemical, biological, and radiological (CBR) weapons against Navy ships has reinforced the need to provide better defensive measures to protect personnel and vital ship spaces from toxic chemical and biological agents and radioactive fallout. The Navy Shipboard Collective Protection System (CPS) provides CBR protection to designated shipboard zones. This manual provides instructions for the use and maintenance of the Pressure Control Valve (PCV) used in the CPS. The CPS PCV is a self-actuating device that regulates overpressure in a total protection (TP) zone, especially in the event of exhaust system failure. The PCV is one of several components that comprise the CPS; for a more detailed account of actual CPS operations, refer to the system description, operation and maintenance manual, SS200-AF-MMM-010.

The equipment described in this manual was developed and tested by the Naval Surface Warfare Center Dahlgren Division (NSWCDD) and approved by the Naval Sea Systems Command (NAVSEA). In certain instances, where prior contractual arrangements did not permit the use of this Navy-designed hardware, actual shipboard equipment may be different. When such deviations exist, the manual for that equipment should be referred to. Nevertheless, the purpose and function of such equipment should be similar to that described herein.

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SAFETY SUMMARY

The following are general safety precautions that are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

KEEP AWAY FROM LIVE CIRCUITS Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with the high voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the off position, due to charges retained by capacitors. To avoid casualties, always remove power and discharge and ground a circuit before touching it.

DO NOT SERVICE OR ADJUST ALONE Under no circumstances should any person reach into or enter the enclosure for the purpose of servicing or adjusting the equipment except in the presence of someone who is capable of rendering aid.

RESUSCITATION Personnel working with or near high voltages should be familiar with modern methods of resuscitation. Such information may be obtained from the Bureau of Medicine and Surgery.

CAUTION

PCV weighs approximately 16 lb. When dismantling the assembly, be prepared to accept the transfer of weight. (Page 6-2, page 6-2)

CAUTION

Do not turn adjusting screws, or calibration of PCV could be inadvertently affected. (Page 6-3)

CHAPTER 1

INTRODUCTION

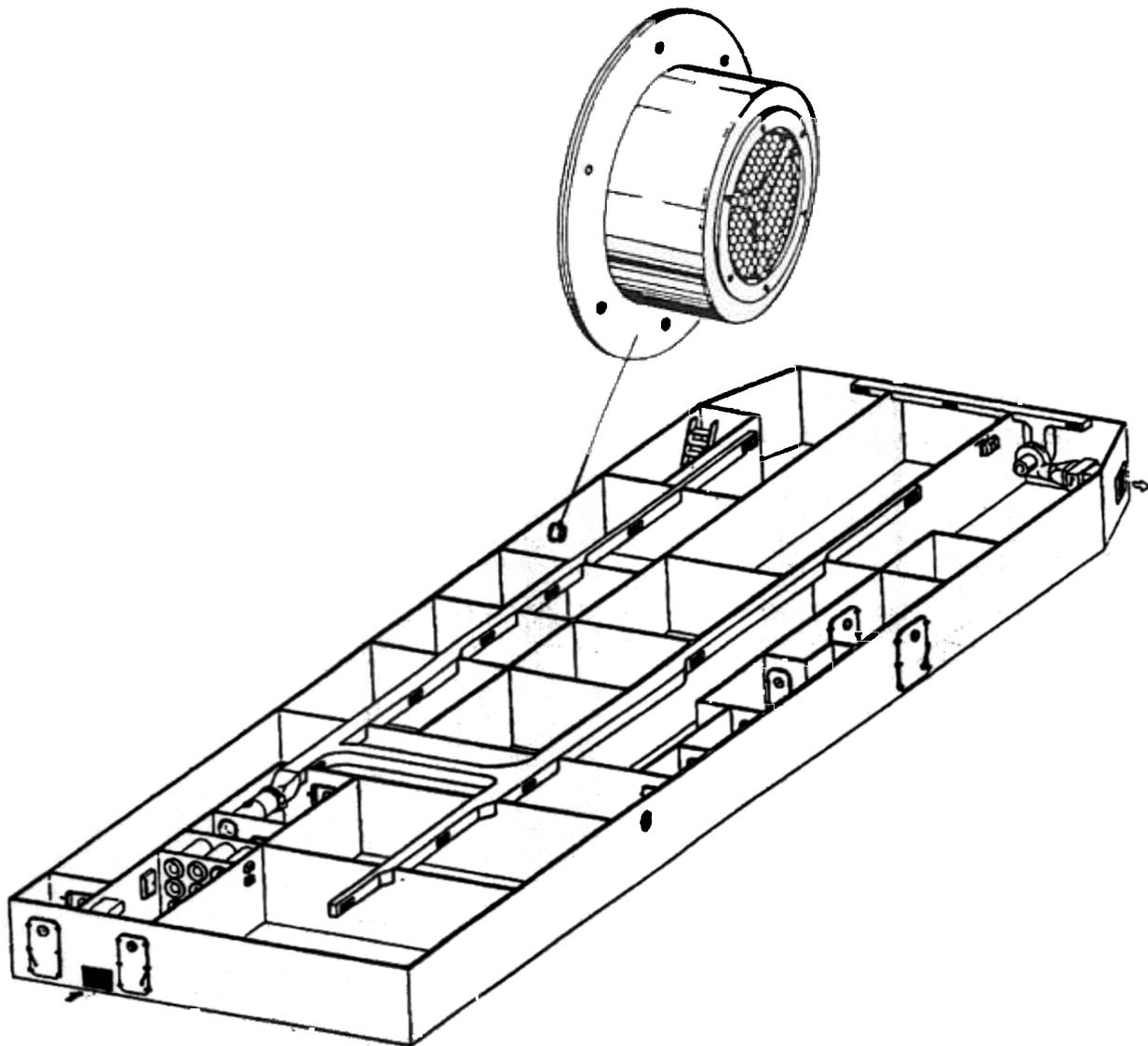


Figure 1-1. PCV as Component of Typical CPS TP Zone

1-1. SAFETY PRECAUTIONS.

Personnel involved with the use and maintenance of the Navy Shipboard Collective Protection System (CPS) Pressure Control Valve (PCV) must comply with the safety precautions included in this manual. The Safety Summary provides general safety precautions, as well as specific cautions contained elsewhere in this manual.

1-2. INTRODUCTION.

This manual provides users with instructions for operating and maintaining the PCVs used within the CPS total protection (TP) zones. The information provided includes physical and functional descriptions of the PCV,

instructions for use, and procedures for performing scheduled and corrective maintenance at the organizational level. Intermediate level and depot-level repair are not required for the PCV.

1-3. EQUIPMENT DESCRIPTION.

CPS provides filtered and pressurized air to designated shipboard zones to protect against chemical, biological, and radiological (CBR) contamination. To ensure the air remains free from CBR contaminants, the TP zone is pressurized to prevent unfiltered air from entering the zone through leaks at the zone boundary. The PCV is an automatic device that aids in regulating overpressure in a CPS TP zone by opening to release excess air or closing to minimize air loss. PCVs can be mounted to the bulkhead at the zone boundary (as shown in figure 1-1) or to a duct exhausting either to the weather or to a ship's space at atmospheric pressure. Two or more PCVs may be used, depending on the size of the TP zone.

Three versions of the CPS PCV exist onboard Navy ships: Revision A, Revision C, and Revision D. PCV versions can be determined from label information on the front of each PCV. All consist of three subassemblies: the housing, rear support, and diaphragm. The subassemblies for each PCV version are illustrated in Chapter 7 of this manual.

For all PCV versions, the housing assembly consists of a housing with intake and exhaust screens installed over front and rear openings, respectively.

The Revision A rear support assembly consists of a three-armed rear support, stainless steel rod, neoprene bellows, and stainless steel spring. The rod and bellows are attached to the rear support and are encircled by the spring, which fits into a groove in the rear support. The Revision C adds three adjusting screws, one attached to each arm of the rear support. The Revision D replaces the Revision C bellows with a piston assembly consisting of a mount and piston. The piston assembly is centered by the rod and is attached to the rear support.

The Revision A and Revision C diaphragm assemblies consist of a disc with a rubber gasket bonded to one face and a hub welded to the other. The hub contains two linear bearings held in place by internal retaining rings. The Revision D hub has been redesigned to include an inner cylinder.

When the PCV is assembled, the rear support and diaphragm assemblies are mated and installed inside the housing. The Revision A and Revision C bellows extends over the rod and is secured to the diaphragm, hub with a hose clamp. The spring, which encircles the bellows and rests in grooves on the rear support and diaphragm, is compressed to hold the diaphragm firmly against the inner housing surface. The Revision D piston fits inside the hub to form a built-in dashpot. The spring is positioned by the hub and a groove in the rear support. The adjusting screws of the Revision C and Revision D fit through the holes in the rear of the housing and are secured with spring pins.

1-4. REFERENCE DATA.

Reference data for the PCV are provided in table 1-1. table 1-2 provides a list of reference publications pertaining to the CPS and its other components. Additional information related to the operation and maintenance of CPS may be found in the Ship Information Book (SIB), the Damage Control (DC) book and plates, along with the booklet of general plans, NWP 62-1 and NSTM Chapters 470, 070, 079, and 510.

Table 1-1. Reference Data

Weight	16 lb
Dimensions	Diameter
	Housing: 12.75 in.
	Mounting Plate: 16.25 in.
	Depth: 7.25 in.

Table 1-1. Reference Data - Continued

Weight	16 lb
Pressure Range	Operational between 2.0-3.0 in. wg

1-5. EQUIPMENT, ACCESSORIES, AND DOCUMENTS SUPPLIED.

Equipment furnished with the PCV is limited to the PCV assembly, Part No. 53711-6264251. Three versions of the PCV exist: Revision A, Revision C, and Revision D.

1-6. SUPPORTING COMPONENTS.

Hardware required for mounting the PCV is not included as part of the PCV assembly. The PCV must be mounted to a bulkhead or duct with six appropriate length .375-16UNC cap screws.

Table 1-2. Reference Publications

PUBLICATION NUMBER	TITLE
SS200-AF-MMM-010	Technical Manual for Navy Shipboard Collective Protection System (CPS): System Description, Operation and Maintenance
SS200-AG-MMM-010	Technical Manual for Navy Shipboard Collective Protection System (CPS): Chemical, Biological, and Radiological (CBR) Filter System Operation and Maintenance
SS200-AH-MMM-010	Technical Manual for Navy Shipboard Collective Protection System (CPS): Alarm System Operation and Maintenance
SS200-AK-MMM-010	Technical Manual for Navy Shipboard Collective Protection System (CPS): Decontamination Station Operation and Maintenance

CHAPTER 2

OPERATION

2-1. INTRODUCTION.

The Pressure Control Valve (PCV) is part of the Navy Shipboard Collective Protection System (CPS), which provides filtered and pressurized air to designated shipboard zones to protect against chemical, biological, and radiological (CBR) contamination. The PCV aids in preventing excess overpressure in CPS total protection (TP) zones. The PCV has a spring-loaded diaphragm that begins to open when zone pressure exceeds 2.0 ± 0.2 in. wg and continues opening as zone pressure rises.

Since the PCV automatically adjusts to changes in zone pressure, assignment of an operator is not required. However, all personnel within the zone must understand the principles of CPS operation and be familiar with the location of CPS equipment so that zone pressure will be maintained.

2-2. CONTROLS AND INDICATORS.

Although the PCV does not include any controls or indicators, pressure gauges are located throughout the TP zone. These gauges can be used to monitor PCV operation. Figure 2-1 shows a typical zone pressure gauge.

2-3. NORMAL OPERATION.

The PCV aids in regulating TP zone pressure. When zone pressure exceeds 2.0 ± 0.2 in. wg, the springloaded diaphragm will automatically begin to open to release excess air. It will continue opening as pressure rises. The diaphragm closes when pressure falls below 2.0 ± 0.2 in. wg. Zone pressure should normally remain constant. However, any violation of the zone boundary (such as open doors or hatches or improper use of airlocks) will cause momentary loss of pressure. Once the boundary is secured, zone pressure will begin to rise and should stabilize within 2 min.

When the zone is not pressurized, the PCV will normally be closed, since there is no overpressure.

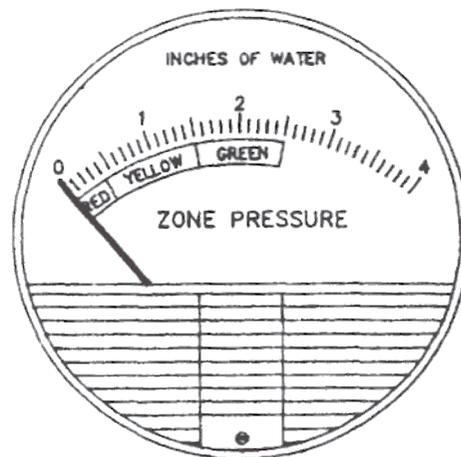


Figure 2- Typical Zone Pressure Gauge

CHAPTER 3

FUNCTIONAL DESCRIPTION

3-1. INTRODUCTION.

This chapter describes the function of the Pressure Control Valve (PCV) used with the Navy Shipboard Collective Protection System (CPS). It provides an explanation of the overall functional flow of the CPS, as well as a functional description of the subassemblies.

3-2. OVERALL FUNCTIONAL FLOW.

In a total protection (TP) system, filtered and pressurized air is delivered to the protected zone by supply fans. The PCV is a self-actuating device that aids in regulating zone pressure. A spring-loaded diaphragm opens to exhaust excess air to the weather or to a ship's space at atmospheric pressure. The diaphragm opens and closes in response to zone pressure: the higher the zone pressure, the greater the valve opening and the higher the flow.

A TP zone is designed for a maximum zone pressure of 3.0 in. wg. Although zone pressures greater than 3.0 in. wg will not harm personnel or equipment, the PCV limits overpressure to ensure that water is not pushed out of plumbing system traps, doors do not become difficult to operate, and zones operate consistently.

3-3. FUNCTIONAL DESCRIPTION OF SUBASSEMBLIES.

Three versions of the CPS PCV exist onboard Navy ships: Revision A, Revision C, and Revision D. PCV versions can be determined from label information on the front of each PCV. All consist of three subassemblies: the housing, rear support, and diaphragm. The subassemblies for each PCV version are illustrated in Chapter 7 of this manual.

3-3.1 Housing Assembly. For all PCV versions, the housing assembly protects the PCV's moving parts and provides a flange for mounting to a ship's structure. Intake and exhaust openings, through which excess air flows, are shielded by screens to protect the PCV.

3-3.2 Rear Support Assembly. The rear support assembly provides the means for interconnecting and mounting the individual components of the PCV. The three-armed rear support is the foundation of the assembly. The stainless steel rod attached to the center of the rear support guides the diaphragm assembly. The bellows of the Revision A and Revision C PCVs, also attached to the rear support, surrounds the rod to cover and protect it from dirt and contamination. The spring, which encircles the rod and bellows, provides the resisting force that controls the airflow through the PCV. The piston assembly of the Revision D PCV replaces the bellows. Adjusting screws on the Revision C and Revision D PCVs secure the rear support to the housing and provide the means for adjusting spring compression.

3-3.3 Diaphragm Assembly. The diaphragm assembly provides a means for the PCV to exhaust excess air by opening and closing in response to changes in the zone pressure. The diaphragm regulates the size of the opening and, hence, the amount of air that passes through the PCV. The gasket seals the diaphragm to the housing when ship's internal pressure is less than 2.0 in. wg. As zone pressure rises, the diaphragm slides along the rod, providing an opening through which excess air is released. Linear bearings inside the diaphragm allow it to move smoothly along the rod. The Revision D diaphragm and rear support assemblies combine to form a dashpot that slows the rate at which the diaphragm moves.

CHAPTER 4**SCHEDULED MAINTENANCE****4-1. INTRODUCTION.**

Scheduled maintenance procedures for the Pressure Control Valve (PCV) used with the Navy Shipboard Collective Protection System (CPS) are provided in the Planned Maintenance System (PMS).

4-2. MAINTENANCE ACTIONS.

Scheduled maintenance for the PCV is limited to a routine inspection in accordance with PMS, no adjustments are required.

CHAPTER 5

TROUBLESHOOTING

5-1. INTRODUCTION.

This chapter provides troubleshooting procedures to help ship's crew identify malfunctions that might occur during operation and/or maintenance of the Pressure Control Valve (PCV) used with the Navy Shipboard Collective Protection System (CPS). Since intermediate- and depot-level maintenance actions are not required for the PCV, all troubleshooting procedures in this chapter are performed at the organizational level.

5-2. ORGANIZATIONAL-LEVEL TROUBLESHOOTING PROCEDURES.

Table 5-1 is a troubleshooting chart for the CPS PCV. Use the chart to identify the problem and its probable cause, then perform the suggested remedy.

Table 5-1. Troubleshooting Chart for PCV

SYMPTOM	AFFECTED PCVs	POSSIBLE CAUSE	REMEDY
Valve does not open when CPS zone pressure is greater than 2.2 in. wg	Rev A, C, D	Diaphragm gasket sticking	Insert small screwdriver or rod through intake screen and free stuck gasket by pressing on diaphragm until it moves freely along rod; replace gasket if damaged per 6-11
	Rev A, C	Damaged bellows restricting diaphragm motion	Replace bellows per 6-7
	Rev D	Piston sticking inside hub	Clean or replace piston/hub per 6-12
	Rev A, C, D	Damaged spring restricting diaphragm motion	Replace spring per 6-6
	Rev C, D	Valve improperly adjusted	Adjust PCV per 6-2
Diaphragm does not move smoothly and freely on rod	Rev A, C, D	Linear bearing binding on rod	Inspect linear bearings and rod for corrosion, pitting, or contamination: Clean rod; replace if necessary per 6-8 Replace bearings if necessary per 6-9
	Rev A, C	Damaged bellows restricting diaphragm motion	Replace bellows per 6-7
	Rev D	Piston sticking inside hub	Clean or replace piston/hub per 6-12
	Rev A, C, D	Damaged spring restricting diaphragm motion	Replace spring per 6-6
Valve does not close or closes only partially when zone pressure falls below 1.8 in. wg	Rev A, C, D	Damaged intake screen	Replace screen per 6-3
	Rev A, C, D	Linear bearing binding on rod	Inspect linear bearings and rod for corrosion pitting, or contamination: Clean rod; replace if necessary per 6-8 Replace bearings if necessary per 6-9

Table 5-1. Troubleshooting Chart for PCV - Continued

SYMPTOM	AFFECTED PCVs	POSSIBLE CAUSE	REMEDY
	Rev A, C	Damaged bellows restricting diaphragm motion	Replace bellows per 6-7
	Rev D	Piston sticking inside hub	Clean or replace piston/hub per 6-12
	Rev A, C, D	Damaged spring restricting diaphragm motion	Replace spring per 6-6
	Rev C, D	Valve improperly adjusted	Adjust PCV per 6-2

CHAPTER 6

CORRECTIVE MAINTENANCE

6-1. INTRODUCTION

This chapter provides organizational-level corrective maintenance procedures for the Pressure Control Valve (PCV) used with the Navy Shipboard Collective Protection System (CPS). Intermediate-and depot-level maintenance actions are not required. Section I provides procedures for adjusting the Revision C and Revision D PCVs after replacing the spring. Section II provides procedures for removing and replacing damaged parts. The parts location illustrations provided in Chapter 7 can be used to identify repair parts called out in this chapter.

SECTION I. ADJUSTMENT

6-2. ADJUST PCV (REVISION C AND D PCVs).

The Revision C and Revision D PCVs must be adjusted after replacing the spring. After performing the procedures of paragraph 6-6, proceed as follows:

- a. **Revision C** With PCV rod in vertical position, apply 3.7 ± 0.2 lb force to the diaphragm (equally applied in three places, as shown in figure 6-1).

Revision D With PCV rod in vertical position, apply 3.4 ± 0.2 lb force to the diaphragm (equally applied in three places, as shown in figure 6-1).

- b. Adjust screws so diaphragm just begins to open.
- c. Reinstall spring pins.
- d. Reinstall exhaust screen using six cross-tip screws. Hand-tighten, do not overtorque.
- e. Reinstall intake screen using six cross-tip screws. Hand-tighten, do not overtorque.
- f. Remount PCV using .375-16 cap screws. Tighten screws to compress gasket; do not overtorque.

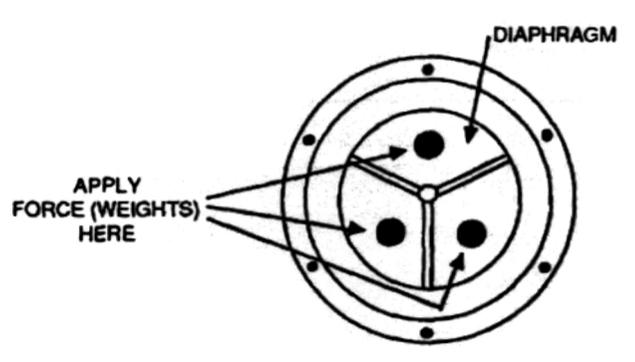


Figure 6-1. Weight Locations for Adjusting PCV

SECTION II.
REPAIR

6-3. REPLACE INTAKE SCREEN.

NOTE

The intake screen can be replaced without dismounting the PCV.

- a. Detach intake screen from front of housing by removing six cross-tip screws.
- b. Position new intake screen on front of housing.
- c. Reinstall screws; hand-tighten, do not overtorque

6-4. REPLACE EXHAUST SCREEN.

CAUTION

PCV weighs approximately 16 lb. When dismounting the assembly, be prepared to accept the transfer of weight.

- a. Dismount PCV from bulkhead or duct by removing six cap screws.
- b. Detach exhaust screen from rear of housing by removing six cross-tip screws
- c. Position new exhaust screen on rear of housing.
- d. Reinstall screws. Hand-tighten; do not overtorque.
- e. Remount PCV using .375-16 cap screws. Tighten screws to compress gasket; do not overtorque

6-5. DISASSEMBLE PCV.

CAUTION

PCV weighs approximately 16 lb. When dismounting the assembly, be prepared to accept the transfer of weight.

- a. Dismount PCV from bulkhead or duct by removing six cap screws.
- b. Detach exhaust screen from rear of housing by removing six cross-tip screws.
- c. Inspect mounting gasket attached to exhaust screen ring; if damaged, replace as follows:
 - (1) Using flat-blade knife, remove damaged gasket from surface of exhaust screen ring Clean and dry surface.
 - (2) Apply adhesive uniformly to one side of new gasket, and press onto surface of exhaust screen ring.

- (3) Put screen aside, allowing adhesive time to set (approximately 1 hr), while continuing with remaining steps.
- d. **Revision A** Remove three cross-tip screws. **Revision C** and **Revision D** - Remove spring pins from adjusting screws using 3/32-in. diameter punch.

CAUTION

Do not turn adjusting screws, or calibration of PCV could be inadvertently affected.

- e. **Revision A** Rotate rear support and remove rear support and diaphragm assemblies from inside housing.
- Revision C** and **Revision D** Push down and rotate rear support until adjusting screws are free from housing. Remove rear support and diaphragm assemblies from inside housing.

6-6. REPLACE SPRING (REVISION A, C, AND D PCVS).

- a. Dismount and disassemble PCV per 6-5.
- b. **Revision A** and **Revision C** Loosen hose clamp securing bellows, and remove diaphragm assembly.
- Revision D** Remove diaphragm assembly
- c. Remove damaged spring.
- d. Place spring in groove on rear support.
- e. **Revision A** and **Revision C** Slide bellows over diaphragm hub, and secure with hose clamp.
- f. **Revision A** and **Revision C** Position diaphragm so bore of hub fits over rod and spring fits in groove on diaphragm.
- Revision D** Position diaphragm so bore of hub fits over rod and spring fits around hub of diaphragm.
- g. While holding assembly together so that spring is compressed and rod is exposed, insert rod through center hole on front of housing.
- h. **Revision A** Position rear support and reinstall three cross-tip screws.
- Revision C** and **Revision D** Position rear support so adjusting screws fit through tabs on rear of housing.
- i. **Revision A** Reattach exhaust screen using six cross-tip screws. Hand-tighten; do not overtorque. Remount PCV using .375-16 cap screws. Tighten screws to compress gasket; do not overtorque.
- Revision C** and **Revision D** Adjust PCV per 6-2.

6-7. REPLACE BELLOWS (REVISION A AND C PCVs).

- a. Dismount and disassemble PCV per 6-5. (Ignore **Revision D** references).
- b. Loosen hose clamp securing bellows, and remove diaphragm assembly.
- c. Remove spring.
- d. Remove four cross-tip screws holding support ring and bellows to rear support.
- e. Lift bellows and support ring off rear support; remove ring from bellows

- f. Install ring on new bellows.
- g. Remount support ring and bellows to rear support.
- h. Reinstall screws; hand-tighten, do not overtorque.
- i. Reassemble PCV per 6-6d.through 6-6h. (Ignore Revision D references).
- j. Revision A Reattach exhaust screen using six cross-tip screws. Hand-tighten, do not overtorque.
Revision C Reinstall spring pins on adjusting screws; ensure pins fit in grooves on housing. Reattach exhaust screen using six cross-tip screws. Hand-tighten, do not overtorque.
- k. Remount PCV using .375-16 cap screws. Tighten screws to compress gasket; do not overtorque.

CLEAN OR REPLACE ROD (REVISION A, C, AND D PCVs).

- a. Dismount and disassemble PCV per 6-5.
- b. Revision A and Revision C - Loosen hose clamp securing bellows, and remove diaphragm assembly. Revision D - Remove diaphragm assembly.
- c. Remove spring.
- d. Inspect rod, and proceed as follows:
 - (1) If rod is not bent or damaged, clean with lint-free cloth.
 - (2) If rod is bent or damaged: Revision A, use adjustable wrench and 7/16-in. wrench to remove nut, lock washer, and washer on back of rear support. Remove damaged rod and replace with new rod. Reinstall nut, lock washer, and washer. Revision C and Revision D, use adjustable wrench, unscrew damaged rod from rear support, and replace with new rod.
- e. Reassemble PCV per 6-6d.through 6-6h.
- f. Revision A Reattach exhaust screen using six cross-tip screws. Hand-tighten, do not overtorque.
Revision C and Revision D Reinstall spring pins on adjusting screws; ensure pins fit in grooves on housing. Reattach exhaust screen using six cross-tip screws. Hand-tighten, do not overtorque.
- g. Remount PCV using .375-16 cap screws. Tighten screws to compress gasket; do not overtorque.

REPLACE LINEAR BEARINGS (REVISION A, C, AND D PCVs).

- a. Dismount and disassemble PCV per 6-5.
- b. Revision A and Revision C Loosen hose clamp securing bellows, and remove diaphragm assembly.
Revision D Remove diaphragm assembly
- c. Using retaining ring pliers, remove internal retaining ring from bore at each end of diaphragm hub.
- d. Remove each of the two linear bearings by inserting a small flat screwdriver through bore and pushing out bearing at opposite end of bore.
- e. Clean bore.
- f. Insert new bearings into each end of bore.
- g. Secure each bearing by reinstalling undamaged internal retaining ring

- h. Reassemble PCV per 6-6d.through 6-6h.
- i. Revision A Reattach exhaust screen using six cross-tip screws. Hand-tighten, do not overtorque.
Revision C and Revision D Reinstall spring pins on adjusting screws; ensure pins fit in grooves on housing. Reattach exhaust screen using six cross-tip screws. Hand-tighten, do not overtorque.
- j. Remount PCV using .375-16 cap screws. Tighten screws to compress gasket; do not overtorque.

6-10. REPLACE ADJUSTING SCREW (REVISION C AND D PCVs).

NOTE

Replacing adjusting screw(s) does not require adjusting PCV.

- a. Dismount and disassemble PCV per 6-5. (Ignore Revision A references).
- b. Measure and record distance from rear support to end of adjusting screw.
- c. Remove damaged screw from rear support.
- d. Clean threads of rear support.
- e. Install new adjusting screw to distance measured in 6-9b.above.
- f. While holding assembly together so that spring is compressed and rod is exposed, insert rod through center hole on front of housing.
- g. Position rear support so adjusting screws fit through tabs on rear of housing.
- h. Reinstall spring pins on adjusting screws; ensure pins fit in grooves on housing.
- i. Reattach exhaust screen using six cross-tip screws. Hand-tighten, do not overtorque.
- j. Remount PCV using .375-16 cap screws. Tighten screws to compress gasket do not overtorque.

6-11. REPLACE DIAPHRAGM GASKET (REVISION A, C, AND D PCVs).

- a. Dismount and disassemble PCV per 6-5.
- b. Using flat blade knife, remove damaged gasket from surface of diaphragm. Clean and dry surface.
- c. Apply adhesive uniformly to one side of new gasket, and press onto surface of diaphragm. Allow 15 min for adhesive to set.
- d. Reassemble PCV per 6-6g. through 6-6h.
- e. Revision A Reattach exhaust screen using six cross-tip screws. Hand-tighten, do not overtorque
Revision C and Revision D Reinstall spring pins on adjusting screws; ensure pins fit in grooves on housing. Reattach exhaust screen using six cross-tip screws. Hand-tighten, do not overtorque.
- f. Remount PCV using .375-16 cap screws. Tighten screws to compress gasket; do not overtorque.

6-12. CLEAN OR REPLACE PISTON/HUB (REVISION D PCV).

- a. Dismount and disassemble PCV per 6-5. (Ignore Revision A and Revision C references)

- b. Remove diaphragm assembly.
- c. Remove spring.
- d. Inspect piston assembly attached to rear support and inside surface of diaphragm hub. If they are not damaged, clean with lint-free cloth. If gasket on hub is damaged only:
 - (1) Using flat-blade knife, remove damaged gasket from surface of hub. Clean and dry surface.
 - (2) Apply adhesive uniformly to one side of new gasket, and press onto surface of hub. Allow 1 hr for adhesive to set.
- e. If inner surface of hub is damaged:
 - (1) Detach hub from disc by removing four cross-tip screws and lock washers.
 - (2) Position disc on new hub and reinstall screws and lock washers. Hand-tighten; do not overtorque.
- f. If piston is damaged:
 - (1) Detach piston from mount by removing four socket-head cap screws and lock washers using a 9/64-in. hex key.
 - (2) Position new piston on mount and reinstall screws and lock washers, finger-tighten only. The piston should slide freely on the mount at this time.
- g. If new hub or piston has been added:
 - (1) Attach one wrap of 3-mil tape around outer piston surface. This tape will be removed later.
 - (2) Position diaphragm so bore of hub fits over rod. Position piston so that it fits inside hub and is approximately centered. Tighten four socket-head cap screws, fixing piston position.
 - (3) Remove diaphragm. Remove tape from piston. Ensure that piston surface is free of tape and adhesive.
 - (4) Position diaphragm over rod. Check for interference between piston and hub. Diaphragm should spin freely when the rod is horizontal. Repeat step (1) through step (3) as necessary.
- h. Reassemble PCV per 6-6d. through 6-6h. (Ignore Revision A and Revision C references).
- i. Reinstall spring pins on adjusting screws; ensure pins fit in grooves on housing. Reattach exhaust screen using 6 cross-tip screws. Hand-tighten, do not overtorque.
- j. Remount PCV using .375-16 cap screws. Tighten screws to compress gasket; do not overtorque.

CHAPTER 7

7-1 INTRODUCTION.

This chapter identifies and illustrates the parts that comprise the Pressure Control Valve (PCV) used with the Navy Shipboard Collective Protection System (CPS). Three versions of the PCV are detailed. Revision A, Revision C, and Revision D. It contains a list of major components (table 7-1), parts lists cross-referenced to the applicable parts location illustrations for each version of the PCV (tables 7-2 to 7-4 and figures 7-1 to 7-9), and a list of manufacturers (table 7-5). All PCV parts, except attaching parts, have unique functions; therefore, a list of common item descriptions is not provided. Also, since all attaching parts are identified by military specification (MS) number on the parts list, a separate list of attaching parts is not provided.

7-2. LIST OF MAJOR COMPONENTS.

Table 7-1 lists the major components of the PCV and lists the page number where they first appear on the parts list.

Table 7-1. List of Major Components

Unit No.	Qty	Name	Rev A	Rev C	Rev D
1	1	Housing	7-2	7-4	7-6
2	1	Rear Support	7-2	7-4	7-6
3	1	Diaphragm	7-2	7-4	7-6

7-3. PARTS LIST.

Table 7-2, Table 7-3, and Table 7-4 provide an indented listing of each part used on the three versions of the PCV, cross-referenced to figure 7-1 through figure 7-9, the applicable parts location illustrations for each version of the PCV. It contains the following information for each part.

- a. Column 1, Figure and Index Number: This column contains the figure and index numbers of the parts location illustration(s) containing the part.
- b. Column 2, Name and Description: This column contains the name of the part, such as the MS number, physical characteristics (material, dimensions, grade, etc.), or any other information to aid in part replacement. An asterisk in this column indicates that the part is not replaceable.
- c. Column 3, Quantity: This column contains the quantity of parts required per PCV assembly.
- d. Column 4, Mfg. Code: This column contains the original part manufacturer's federal supply code identification number. Codes are not provided for common hardware items (screws, washers, retaining rings) that are available from many sources. However, they are identified in column 2 by MS number.
- e. Column 5, Mfg. Part Number: This column lists the part number, including revision letter, assigned by the original manufacturer of the part. Part numbers are not provided for common hardware items that are available from many sources.

7-4. LIST OF MANUFACTURERS.

Table 7-5 provides the names, addresses, and codes of the manufacturers supplying parts for the PCV, as referenced in column 4 of the parts list.

Table 7-2. Rev A PCV Parts List

Figure & Index No.	Name and Description	Qty	Mfg. Code	Mfg. Part No.
7-1-1	* Housing	1	53711	6264252-Rev A
7-1-2	Screen, Exhaust	1	53711	6573324-Rev-
7-1-3	Screw, Flat Hd, .164-32UNC, MS35190-253	6		
7-1-4	Gasket, Silicone Sponge Rubber	1	53711	6573324-3-Rev-
7-1-5	Screen, Intake	1	53711	6573322-Rev-
7-1-6	Screw, Flat lid, .164-32UNC, MS35190-253	6		
7-2-1	* Support, Rear	1	53711	6573333
7-2-2	Screw, Flat lid, .250-20UNC, MS35190-291	3		
7-2-3	Clamp, hose, 1.00 in. nom dia, WW-C-440, Type E			
7-2-4	Spring, Stainless Steel Wire	1	53711	6264256-Rev A
7-2-5	* Ring, Support	1	53711	6573310-Rev-
7-2-6	Screw, Flat Hd, .112-40UNC, MS35190.221	4		
7-2-7	Bellows, Neoprene	1	53711	6264255-Rev A
7-2-8	Rod, Stainless Steel	1	53711	6264254-Rev A
7-2-9	Nut, Hx, .250-20UNC, MS51971-1			
7-2-10	Washer, Lock-Spring, .250 in, nom, MS35338-139			
7-2-11	Washer, Flat, .281 in ID, MS15795.810			
7-3-1	* Diaphragm	1	53711	6264253-Rev A
7-3-2	Bearing, Linear, IAW Spec Control Dwg 53711-6263496	2	6881	A-61014-SS
7-3-3	Ring, Retaining, Internal, MS16625-4062	2		
7-3-4	Gasket, Silicone Sponge Rubber	1	53711	6264253-1-Rev A

*Non-replaceable part

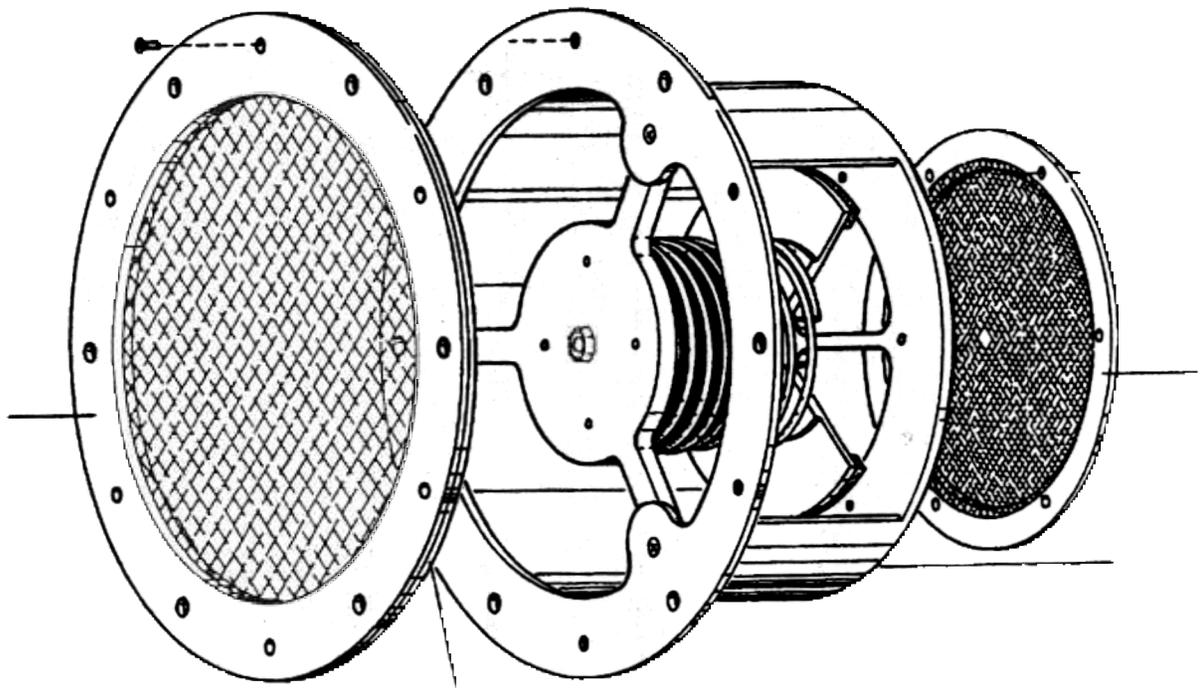


Figure Rev A Housing Assembly

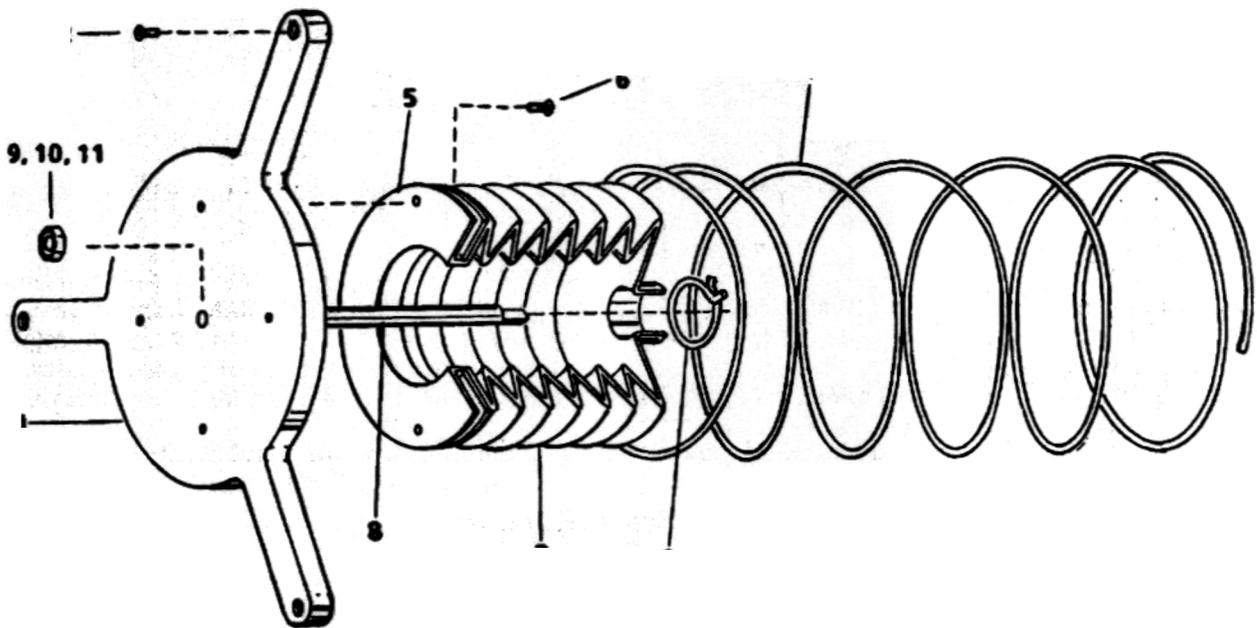


Figure Rev A Rear Support Assembly

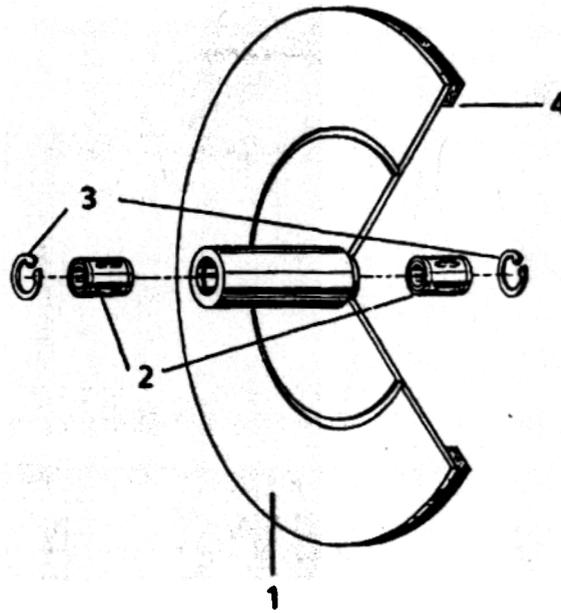


Figure 7-3. Rev A Diaphragm Assembly

Table 7-3. Rev C PCV Parts List

Figure & Index No.	Name and Description	Qty	Mfg. Code	Mfg. Part No.
7-4-1	* Housing	1	53711	6264252-Rev C
7-4-2	Screen, Exhaust	1	53711	6573324-Rev 13
7-4-3	Screw, Flat Hd, .164-3212 NC, MS35190-253	6		
7-4-4	Gasket, Silicone Sponge Rubber	1	53711	6573324-3-Rev 13
7-4-5	Screen, Intake	1	53711	6573322-Rev 13
7-4-6	Screw, Flat Hd, .164.32UNC, MS35190-253	6		
7-5-1	* Support, Rear	1	53711	6573333-Rev 13
7-5-2	Screw, Adjusting	3	53711	6573360-Rev A
7-5-3	Pin, Spring, MS171498	3		
7-5-4	Clamp, Hose, 1.00 in. nom dia. WW-C-440, Type E			
7-5-5	Spring, Stainless Steel Wire	1	53711	6264256-Rev C
7-5-6	* Ring Support	1	53711	6573310-Rev A
7-5-7	Screw, Flat Hd, .138-32UNC, MS35190-238	4		
7-5-8	Bellows, Neoprene	1	53711	6264255-Rev C
7-5-9	Rod, Stainless Steel	1	53711	6264254-Rev C
7-6-1	* Diaphragm	1	53711	6264253-Rev B
7-6-2	Bearing, Linear, IAW Spec Control Dwg 53711-6263496	2	96881	SUPER-6
7-6-3	Ring, Retaining, Internal, MS16625-4062	2		
7-6-4	Gasket, Silicone Sponge Rubber	1	53711	6264253-1-Rev 13

*Non-replaceable part

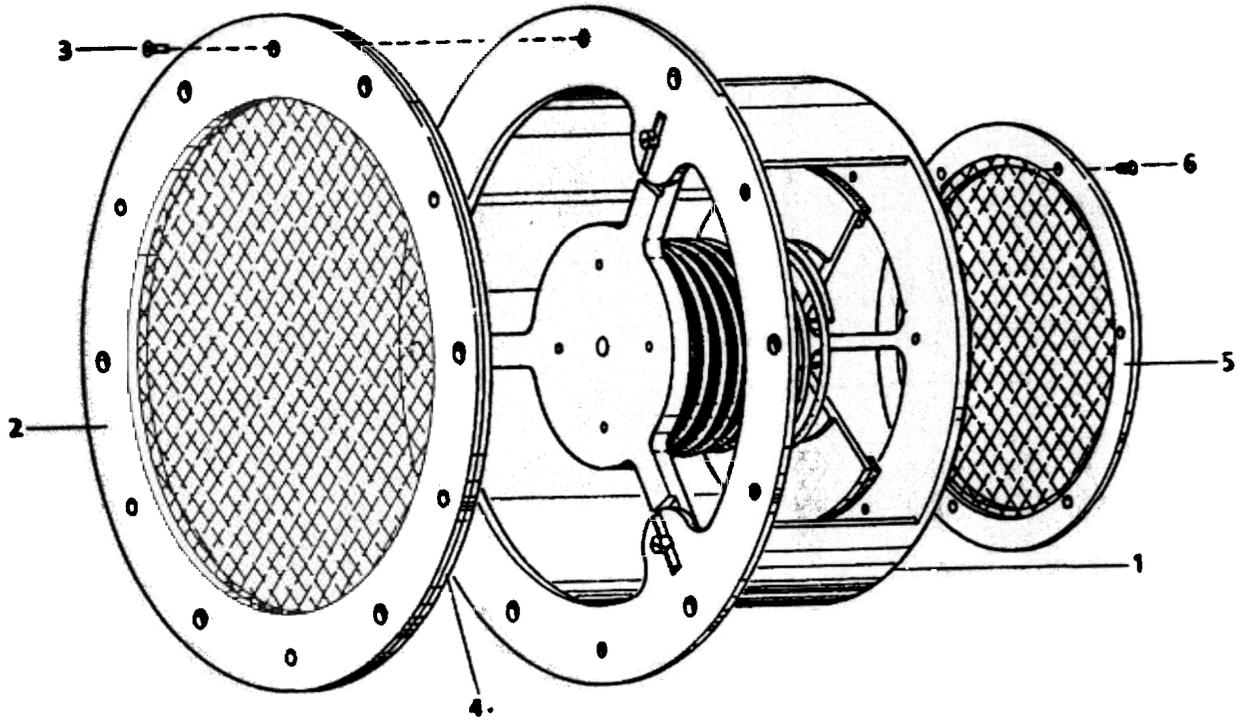


Figure 7-4. Rev C Housing Assembly

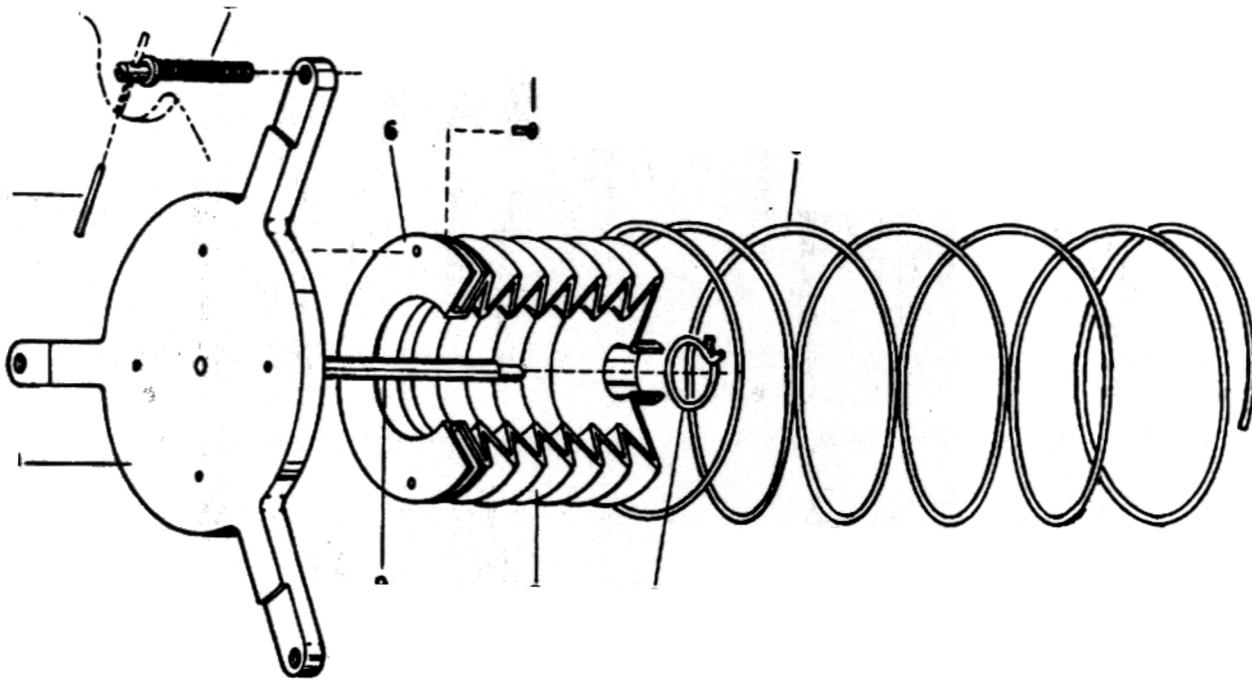


Figure Rev C Rear Support Assembly

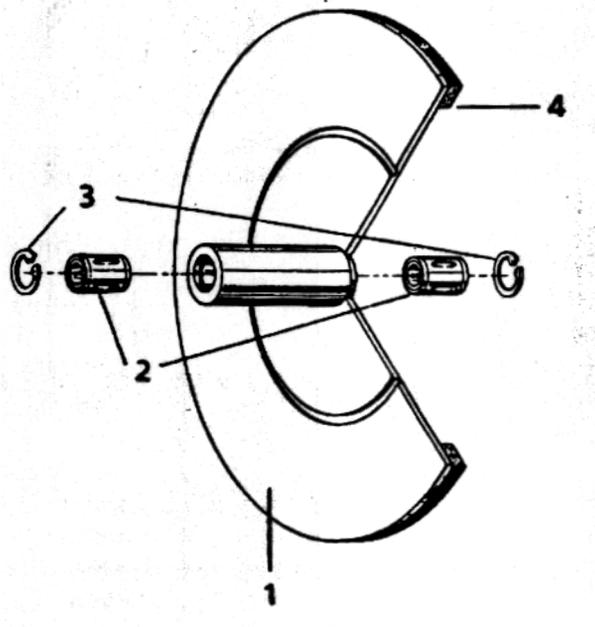


Figure 1-6. Rev C Diaphragm Assembly

Table 7-4. Rev D PCV Parts List

Figure & Index No.	Name and Description	Qty	Mfg. Code	Mfg. Part No.
7-7-1	* Housing	1	53711	6264252-Rev D
7-7-2	Screen, Exhaust	1	53711	6573324-Rev C
7-7-3	Screw, Flat Hd, .164-32UNC, MS51959-45	6		
7-7-4	Gasket, Silicone Sponge Rubber	1	53711	6573324-3-Rev C
7-7-5	Screen, Intake	1	53711	6573322-Rev C
7-7-6	-Screw, Flat Hd, .164-32UNC, MS51959-45	6		
7-8-1	* Support, Rear	1	53711	6573333-Rev C
7-8-2	Screw, Adjusting	3	53711	6573360-Rev. 13
7-8-3	Pin, Spring, MS171498	3		
7-8-4	Spring, Stainless Steel Wire	1	53711	6264256-Rev D
7-8-5	Mount	1	53711	6891564-Rev-
7-8-6	Screw, Pan lid, .164-32UNC, MS51957-49	3		
7-8-7	Washer, Lock-Spring, .164 in. nom, MS35338-80	3		
7-8-8	Piston	1	53711	6891565-Rev-
7-8-9	Screw, Hx Skt Hd, .164-32UNC, MS16995-27	4		
7-8-10	Washer, Lock-Spring, .164 in. nom, MS35338-80	4		
7-8-11	Rod, Stainless Steel	1	53711	6264254-Rev D
7-9-1	* Diaphragm	1	53711	6264253-Rev C
7-9-2	Disc	1	53711	6573318-Rev B
7-9-3	Gasket, Silicone Sponge Rubber	1	53711	6573318-1-Rev B
7-9-4	Screw, Pan Hd, .164-32UNC, MS51957-43	4		
7-9-5	Washer, Lock-Spring, .164 in nom., MS35338-80	4		
7-9-6	Hub	1	53711	6573319-Rev C
7-9-7	Gasket, Silicone Sponge Rubber	1	53711	6573319-1-Rev C
7-9-8	Bearing, Linear, IAW Spec Control Dwg 53711-6263496	2	96881	SUPER-6CR
7-9-9	Ring, Retaining, Internal, MS16625-4062	2		

*Non-replaceable part

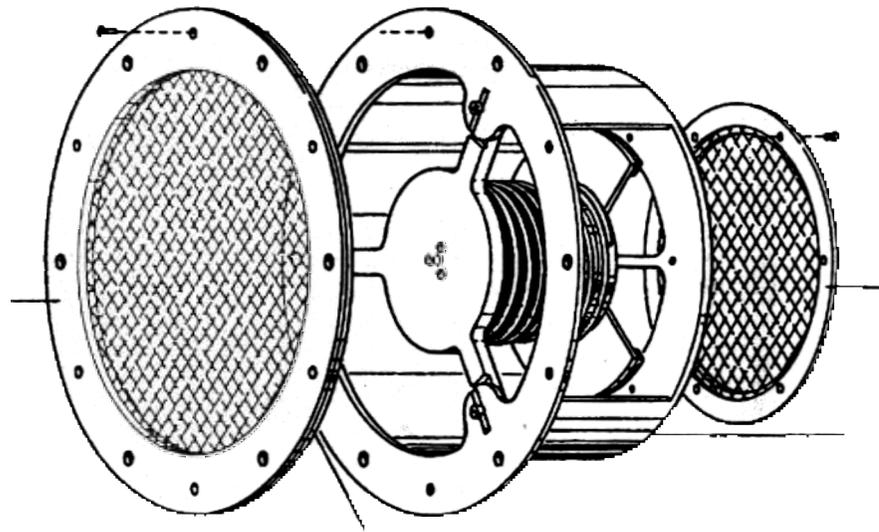


Figure Rev D Housing Assembly

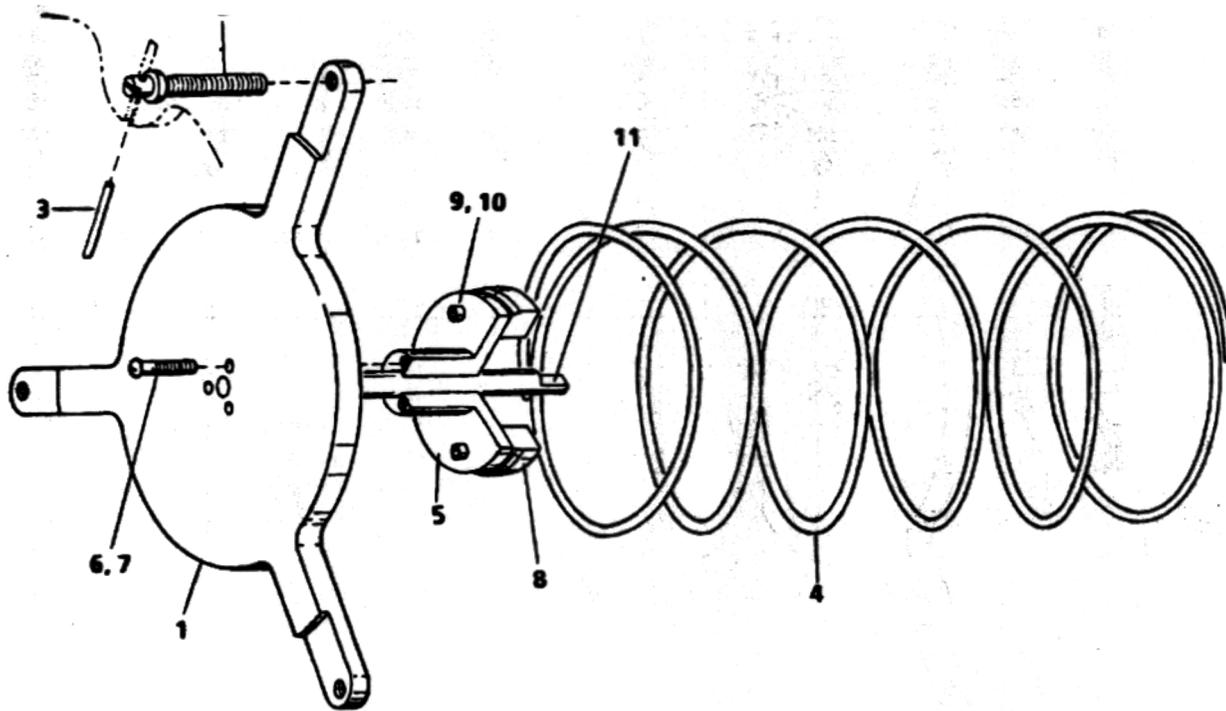


Figure -8 Rev D Rear Support Assembly

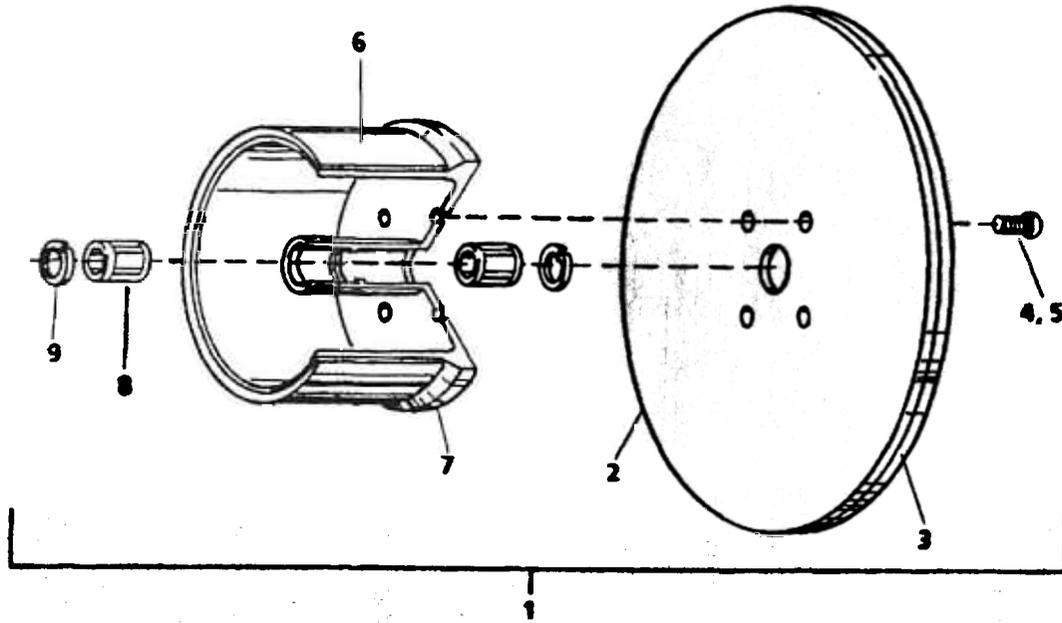


Figure 7-9. Rev D Diaphragm Assembly

Table 7-5. List of Manufacturers

CODE	NAME AND ADDRESS
53711	Department of the Navy Naval Sea Systems Command Washington, DC 20362
96881	Thomson Industries, Inc. Shore Road Port Washington, NY 11050

APPENDIX A**ABBREVIATIONS AND ACRONYMS**

CBR	Chemical, Biological, and Radiological
cfm	Cubic Feet per Minute
CPS	Collective Protection System
DC	Damage Control
in. wg	Inches of Water, Gauge
MS	Military Specification
NAVSEA	Naval Sea Systems Command
NAVSWC	Naval Surface Warfare Center
NPFC	Naval Publications and Forms Center
PCV	Pressure Control Valve
PMS	Planned Maintenance System
SIB	Ship Information Book
TP	Total Protection

