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NOISE EQUIPMENT INVENTORY FOR FF-1052 CLASS SHIPS, (U)
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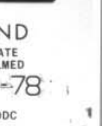
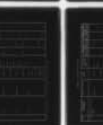
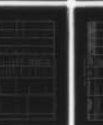
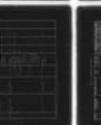
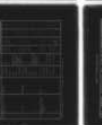
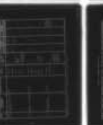
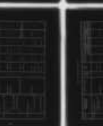
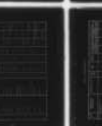
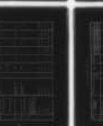
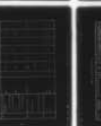
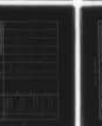
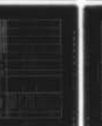
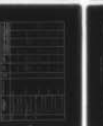
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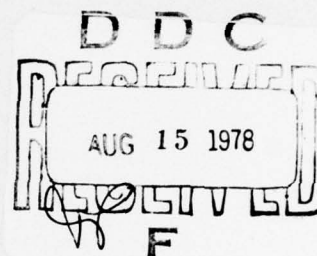
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NOISE EQUIPMENT INVENTORY
FOR FF-1052 CLASS SHIPS

July 1978



Prepared for
PERA(CRUDES)
PHILADELPHIA NAVAL SHIPYARD
Philadelphia, Pennsylvania
Under Contract N00140-77-D-0417-GG18 *new*

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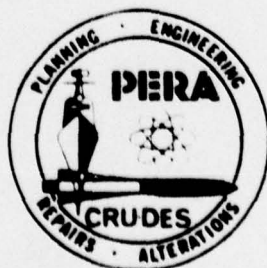
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NOISE EQUIPMENT INVENTORY
FOR FF-1052 CLASS SHIPS

July 1978

PERA(CRUDES)
PHILADELPHIA NAVAL SHIPYARD
Philadelphia, Pennsylvania



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FOR FF-1052 CLASS SHIPS

11 July 1978

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PHILADELPHIA NAVAL SHIPYARD
Philadelphia, Pennsylvania

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ABSTRACT

An inventory listing of resilient mounts and flexible hose connections on KNOX class frigates is presented. This information was developed to support the maintenance program for FF-1052 class ships.

1-150	White Section	☒
1-151	Blue Section	☐
DISCONTINUED		
LAST USED FOR		
BY DISCONTINUED/AVAILABILITY CODES		
or SPECIAL		
A		

SUMMARY

KNOX class frigates have many resilient mounts and flexible hose connections in their design. This large population of highly critical sound-isolation equipment necessitates an effective maintenance program to assure optimum low-noise performance.

As a basic part of an effective maintenance inspection program, a complete inventory listing of resilient mounts and flexible hose connections is needed, and such a listing is provided by this report.

The maintenance program will comprise several elements. An initial inspection to determine correct installation is essential. Periodic inspections in accordance with MRC requirements, supplemented by Equipment Guide Lists developed from Tables 2-1, 2-2, and 2-3, will serve to detect failures or deterioration between overhauls. Pre-overhaul planning for resilient mount and flexible hose replacement on a blanket basis with a POT&I check for detailed conditions will ensure renewal of the components just prior to the expiration of their allowable lifetimes.

During the development of the inventory listing, it was noted that the resilient mount Maintenance Requirement Card is not complete. The information needed to complete that MRC is provided in this report.

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INTRODUCTION

One of the characteristics of USS KNOX (FF-1052) class frigates is their quiet acoustic signature. The reduction of structureborne noise was a fundamental design consideration for this class program. Quiet machinery with low vibration levels was selected. Resilient mounts were used in conjunction with the quiet machinery to help ensure a minimum noise level. To preclude other structureborne noise paths to the ship structure, flexible connections were used in each resiliently mounted machinery installation. Flexible hoses were used to make the connections from the cooling water, fuel, lube oil, compressed air, and other service systems to the machinery.

The above design features have resulted in the use of more than 300 resilient mounts and associated flexible hose connections in each ship of the FF-1052 class. This large population of highly critical sound-isolation equipment demands an effective maintenance system to preserve optimum performance. *The foundation for an effective maintenance system must be a well defined program for inspection of noise attenuating components to detect signs of incipient failure in the resilient mounts or flexible piping connections.*

As the basis for such a program, this report and inventory listing of resiliently mounted units, and the type and quantity of resilient mountings and associated flexible pipe connections, was prepared. The purpose of this effort is to identify the current typical installation for these ships with respect to equipments requiring resilient mounting to meet noise reduction requirements. Not included in this report are *devices installed for improving resistance to shock, such as installed on electronic equipment cabinets; nor flexible connections for services not related to equipments resiliently mounted for noise reduction, e. g., flexible air and hydraulic hoses in the ASROC loader installation.*

Section 2 of this report discusses general maintenance requirements for sound-isolation equipment and presents the data developed to support the maintenance program for the FF-1052 class. Section 3 provides recommendations for revising the resilient mount Maintenance Requirement Card (MRC).

2 INSPECTION REQUIREMENTS

As stated earlier, the foundation for an effective maintenance system for sound-isolation equipment must be a well defined program for inspection of the noise attenuating components to detect signs of incipient failure in the resilient mounts and flexible piping connections. Elements of such a program are the initial, periodic, and pre-overhaul inspections, as discussed in Sections 2.1 through 2.3, respectively. The inspection support data for resilient mounts and flexible connections are described in Section 2.4.

2.1 INITIAL INSPECTION

A thorough initial inspection is necessary to ensure that the resiliently mounted machinery system is properly installed. The following key points should be checked:

- a. Correct mount type as required by the foundation drawing
- b. Correct mount orientation and direction of loading
- c. Proper angular alignment and loading of the mount
- d. Proper fasteners.

2.2 PERIODIC INSPECTION

Periodic inspection and replacement of resilient mounts and flexible connections is required to preserve effective performance. Two basic MRCs cover the quarterly and semiannual inspection of sound-isolation components:

- a. MRC A-176 S-1 for resilient mounts
- b. MRC A-709 Q-1 for flexible rubber and neoprene hose, and fittings and supports.

These cards are illustrated in Figures 2-1 and 2-2 respectively. Each contains detailed inspection procedures and component replacement criteria. Of the four ships visited during this study, three had the resilient mount MRC and three had the MRC for flexible hoses.

SHIP SYSTEM		SUBSYSTEM		MRC CODE	
		Flexible Hose		A-704 Q-1	
SYSTEM	EQUIPMENT	RATES	M/M		
	Hose	WQ/EN/RTI	0.2		
MAINTENANCE REQUIREMENT DESCRIPTION		TOTAL M/M			
1. Inspect flexible rubber/neoprene hose, fittings, and supports.		0.2			
SAFETY PRECAUTIONS		ELAPSED TIME			
1. Comply with Navy Safety Precautions for Forces Afloat, OPNAVINST 5100 series.		0.2			
TOOLS, PARTS, MATERIALS, TEST EQUIPMENT					
1. Rags 2. Flashlight 3. Inspection mirror					
PROCEDURE					
1. Inspect Flexible Rubber/Neoprene Hose, Fittings, and Supports.					
NOTE 1: Identification numbers are molded on hose covers. Refer to example for interpretation of identification numbers.					
Example: 1509-16/2073 MIL-Spec MIL-H-24133CL1-1b/2073					
Commercial MIL-Spec Interpretation					
1509	MIL-H-24133CL1	Hose type			
-16	-16	ID in 16th of an inch			
2073	2073	Quarter and year of manufacture			
NOTE 2: Installation date should be stamped on a metal tag and attached to hose. Do not install rubber hose that has been on shelf for more than four years, excluding quarter of manufacture.					
LOCATION	Equipment Guide List Recommended		DATE	MAY 1975	
MAINTENANCE REQUIREMENT CARD MRC			1100 NAVJAGENAC 4100-119-151		

Procedure (Cont'd)		PAGE 2 OF 2		35 281V 2	
a. Inspect hose for date of installation. Maximum service life in 5 years for wire reinforced hose and six years for polyester reinforced hose.					
CAUTION: Hose and fittings shall not be painted, however, replacement is not necessary when only a few drops of paint fall on a hose. Do not attempt to remove paint from hose as solvents and abrasives will damage hose.					
b. Inspect hose and fittings for leaks and large painted areas.					
c. Inspect fittings for pitting, discoloration, cracks, and corrosion.					
d. Inspect hose for cracking, abrasions, bulges, soft spots, twisting, and slippage from fittings.					
e. Inspect segmented fittings for loose or shifted bands, retaining rings, loose nuts and bolts.					
f. Inspect hose supports for broken welds, loose or damaged clamps, and deteriorated or missing rubber inserts.					
g. Operate equipment; inspect hose for vibration damage caused by improper support at fixed ends and for high pulsations, fluid hammer and whipping caused by pressure surges.					
h. Stop equipment if not needed for service.					

Figure 2-2. MRC for Hose, Fittings, and Supports

In consideration of the large number of resilient mounts and flexible connections to be inspected and their diverse locations, both MRCs recommend the use of an Equipment Guide List (EGL) with the controlling MRC. Of the four ships inspected, only one had prepared such EGLs. The EGL is to be prepared by the individual ship, which is necessary since the work center breakdown varies among ships. In addition, maintenance actions listed on an individual EGL must be limited so that no more than a single day's work is specified.

2.3 PRE-OVERHAUL INSPECTION

The critical nature of sound-isolation components dictates that a detailed inspection be made as part of the Pre-Overhaul Test and Inspection (POT&I) process. The POT&I Plan for KNOX class frigates should include an item to inspect resilient mounts and flexible connections. The MRC inspection procedures are recommended as a source for development of POT&I sheets.

Current NAVSEA/NAVSEC requirements prescribe that if a resilient mount has not failed or deteriorated in service, it is to be replaced after being in service for 10 years or at the overhaul closest to, but not exceeding, 10 years from the date of installation.

The DDEOC overhaul cycle for the KNOX class calls for an overhaul at 54 ± 6 month intervals. Planning for each overhaul should include identifying replacement requirements of all resilient mounts that have not been renewed within the required time interval. Detailed requirements will be determined by the POT&I.

The maximum service life for flexible rubber/neoprene hose is 5 years for wire reinforced hose and 6 years for polyester reinforced hose. Therefore, planning for each overhaul should provide for widespread replacement of flexible connections. Similar blanket replacement should be anticipated at each subsequent overhaul. Specific replacement will be determined by the POT&I.

2.4 INSPECTION SUPPORT DATA

To provide the source data necessary for shipboard development of EGLs to accompany MRC A-176 S-1 for resilient mounts and MRC A-709 Q-1 for flexible connections, Tables 2-1 through 2-4 were developed using FF-1052 class drawings,

technical manuals, and Ship Information Books. The data were verified by conducting a sight inventory of each component aboard USS MOINSTER (FF-1097), USS RATHBURNE (FF-1057), USS WHIPPLE (FF-1062), and USS VREELAND (FF-1068). During the inventory, the following general observations were made:

- Many resilient mounts and the majority of flexible connections are not marked with an installation date.
- Flexible connection support resilient mounts are in many instances not being replaced when the equipment mounts are replaced.
- Many flexible connections are not marked with identifying data such as size, type, manufacturing date, etc.
- Many mounts, particularly those in bilge areas, have been painted.

The normal configuration for flexible hoses was as a 90-degree assembly consisting of two hose sections joined by a 90-degree elbow fitting. Most flexible piping is supported by an attachment system at the elbow that includes a resilient mount. The inventory data are presented in the tables as follows:

- a. Table 2-1, "Summary of Resiliently Mounted Equipment", identifies machinery equipment items that are resiliently mounted and lists them in Ship Work Breakdown Structure (NAVSHIPS 0900-039-9010) order.
- b. Table 2-2, "Resilient Mount Data", presents, in a format designed to facilitate development of Equipment Guide Lists, equipment name and number, SWBS number, equipment location, mount type, number of mounts, and minimum allowable mount height. For the four ships inventoried, the manufacture or cure date and/or installation date for each mount is also shown. Also included in this table are associated hanger assembly resilient mounts. Since the piping configurations vary somewhat, the piping supports are not uniform from ship to ship or equipment to equipment. Typically, however, the piping applications listed were found to contain resilient mount sound-isolation components which should be inspected when accomplishing the MRC for flexible hoses.
- c. Table 2-3, "Flexible Connection Data", presents, in a format designed to facilitate development of Equipment Guide Lists for resiliently mounted

equipment, equipment name and number, SWBS number, equipment location, the flexible connection service, the hose type and size; and, for the four ships inventoried, the hose manufacture date and/or installation date. For Aeroquip hoses, the size is given in sixteenths of an inch by the last two digits of the nomenclature. For example, a type 2580-24 hose is a 1-1/2" hose. Hose manufacture and installation dates were recorded exactly as marked on the hose by the manufacturer or installer, e.g., "3/74" or "1Q74".

The following reference notes apply to Tables 2-2 and 2-3 as indicated by their letter designator in the data columns:

Reference Notes

- A — Not accessible for recording data
- B — Not labeled/marked
- C — Markings not legible
- D — Painted (some data may have been legible)
- E — Covered with insulation/lagging/tape, etc.
- F — Data taken from Reference Plan/Technical Manual
- G — None installed
- H — Not installed — removed for testing/replacement
- J — Resilient mount installed but not connected
- K — Installation not accessible for determination if a resilient mount was used
- L — Data not recorded.

TABLE 2-1 SUMMARY OF RESILIENTLY MOUNTED EQUIPMENT

SWBS	MACHINERY EQUIPMENT ITEM
2542	SSTG Gland Leakoff Exhaust Fan
2543	Auxiliary Gland Exhaust Fan
2553	Main Feed Booster Pumps
2555	Main Condensate Pumps
2556	SSTG Auxiliary Condensate Pumps
2563	SSTG Auxiliary Circulating Sea Water Pumps
2643	Lube Oil Purifier
3142	400 Hz Motor Generators
3424	SSDG Sea Water Circulating Pump
4631	Sonar MG Cabinet
4631	Lube Oil Filter Installation (LAPS)
5121	Vent Fans
5141	Chilled Water Circulating Pumps
5142	Air Conditioning Compressor Units
5142	Air Conditioning Sea Water Circulating Pump
5161	Refrigeration Compressor Units
5212	Fire Pumps
5311	Distiller Sea Water Feed Pumps
5331	Potable Water Pumps
5331	Potable Water Prime Pump
5345	Fresh Water Drain Tank Pumps
5515	High Pressure Air Compressors
5515	Low Pressure Air Compressors

TABLE 2-1 SUMMARY OF RESILIENTLY MOUNTED EQUIPMENT

SWBS	MACHINERY EQUIPMENT ITEM
5611	Steering Gear Units
5611	Steering Gear Units Pumps
5651	Fin Stabilizer Power Units
7211	Motor Generators
7212	ASROC Heating and Cooling Circulating Water Pumps
7212	ISSM Coolant Pump
7222	Hydraulic Power Unit

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE			
						SURFPAC		SURFLANT	
						FF-1057	FF-1062	FF-1068	FF-1097
2542	SSTG Gland Leakoff Ex- haust Fan	AMR 1	4			D	D	A	D
	Intake Hose Hanger		1	6E100	1.00	1/68*	A	G	G
	Exhaust Hose Hanger		1			D	A	G	G
2543	Auxiliary Gland Ex- haust Fan	Fireroom	4	15P220A 6E150	1.16 1.00	1/78	1Q74*	3Q75*	D
	Intake Hose Hanger		1	6E100	1.00	B	?/69	G	G
	Main Feed Booster Pumps								
2553	No. 1A	Fireroom	4	6E900	1.34	11/77	B	5/76*	11/68*
	Suction Hose Hanger		2			A	A	G	G
	Disch Hose Hanger	Fireroom	1			D	A	G	G
	No. 1B		4	6E900	1.34	11/77	B	6/76*	D
	Suction Hose Hanger		2			A	A	G	G
	Disch Hose Hanger	Fireroom	1			D	4/69	G	G
	No. 1C		4	6E900	1.34	11/77	B	6/76*	D
	Suction Hose Hanger		1			A		G	G

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE			
						SUREPAC		SUREPLANT	
						FF-1057	FF-1062	FF-1068	FF-1097
2553	Main Feed Booster Pumps (Continued)	Engineerom	2		1.34				
	Suction Hose Hanger (Continued)						A	G	G
	Disch Hose Hanger					D	A	G	G
2555	Main Condensate Pumps	Engineerom	4	6E900	1.34				
	No. 1A					1/78	D	D	11/81
	Suction Hose Hanger					A,D,J	A	D	D
	Disch Hose Hanger					D	D	1/78	D
	Vent Hose Hanger					4/68	D	G	G
	No. 1B					1/78	D	D	11/81
2556	Suction Hose Hanger	Engineerom	1	6E150	1.00	A,D	D	D	D
	Disch Hose Hanger					D	D	G	D
	Vent Hose Hanger					4/68	D	G	G
	2556 Aux Cond Pumps								
	No. 1A					11/77	2/70	2Q75	D
	Suction Hose Hanger					1/78	D	G	G

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE		
						SUPFPAC		SUPPLANT
						FF-1057	FF-1062	FF-1069 FF-1097
2556	SSTG Aux Cond Pumps No. 1A (Continued)							
	Disch Hose Hanger		1	J-8579-1		B		
			1				D	G
	No. 1B	AMP 1	4	7E450	0.90	11/77	7/70	2275*
	Suction Hose Hanger		1	6E100	1.00	D	D	G
	Disch Hose Hanger		1	J-8579-1		B		
2563	SSTG Aux Circ SW Pumps							
	No. 1A	AMP 1	5	7E450	0.90	11/77	D	1275*
	Suction Hose Hanger		1			D	A	D
	Disch Hose Hanger		1			D	A	D

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE			
						SURFPAC		SURFLANT	
						FF-1057	FF-1062	FF-1068	FF-1097
2563	SSTG Aux Circ SW Pumps (Continued) No. 1B	AMR 1	5	7E450	0.90	11/77	D	2Q75*	D
	Suction Hose Hanger		1			A	A	D	D
	Disch Hose Hanger		1			A,E	A	D	D
	No. 1C	AMR 1	5	7E450	0.90	11/77	D	2Q75*	D
	Suction Hose Hanger		1			D	A	D	D
2643	Disch Hose Hanger		1			D	A	D	D
	Lube Oil Purifier	Engine room	4	6E150 7E450	1.00 0.90	12/77	D	?/75*	6/58*, ?/73
	Support Brace		2			-	L	D	D
	Suction Hose Hanger		2	J-7580-2		D	-	-	-
			1			D	B	G	G
3142	400 Hz Motor Generators								
	No. 1	AMR 1	4	6E2000	1.38	11/77	4/65*	9/75*	?/73
	No. 2	AMR 2	4	6E2000	1.38	11/77	11/64*	9/75*	?/73

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE			
						SURFPAC		SURFLANT	
						FF-1057	FF-1062	FF-1068	FF-1097
3424	SSDG SW Circ Pump	AMR 2	4	7E450	0.90	9/76*	D	D	D
	Suction Hose Hanger		1			-	A	G	G
	Disch Hose Hanger		1	J-3879-1		D			
			1			D	D	G	G
4631	Sonar M.G. Cabinet	Sonar Eght Room 4-29-0-Q	6	6E2000	1.38	11/77	11/75	2/69	3/73
4631	Lube Oil Filter Unit	Sonar Eght Room 4-29-0-Q	4	7E450	0.90	D	7/69	C	3/73
	Filter Stand Brace		1			D	B	L	L
5121	Ventilation Fans (Each has 1 or 2 Bel- lows Type Spools depending on installa- tion)								
	2-21-1	2-16-0-Q	4	10M50	0.50	4/67*	10/67*	B	11/68*
	3-31-2	3-29-2-Q	4	6E100	1.00	D	10/67*	2/75*	5/73
	3-40-1	3-37-1-Q	4	6E150	1.00	2/68*	2/70	3Q75*	5/73
	2-42-2	2-41-2-Q	4	6E100	1.00	10/67*	10/67*	2/75*	5/73

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE			
						SURFPAC		SURFLANT	
						FF-1057	FF-1062	FF-1068	FF-1097
5121	Ventilation Fans (Continued) 2-51-1	2-50-1-A	4	11M25	0.56	-	4/67*	2/68*	D
				10M50	0.50	7/69*			
	3-59-1	3-50-0-Q	4	10M50	0.50	4/67*	2/70	2Q75*	?/73
	3-62-1	3-59-0-C	4	6E100	1.00	4/68*	10/67*	A	11/73
	2-74-1	2-67-0-C	4	11M25	0.56		2/68*	9/68*	Fan not installed
			4	10M50	0.50	7/69*			
	2-101-2	Engine room	4	7E450	0.90	D	B	?/75*	?/73
	2-103-1	Engine room	4			A	A	A	A
	3-113-1	3-107-1-A	4	10M50	0.50	10/67*	4/67*, 10/67*	10/67*	?/73
	3-136-1	3-135-1-Q	4	6E150	1.00		10/74*	3Q75*	Fan not installed
		Laundry Str Room	4	6E150	1.00	3Q75*	-	-	-
	2-137-1	2-136-0-Q	4	6E100	1.00	4/75*	2Q74*	Fan not installed	Fan not installed
	2-141-2	2-141-2-A	4	11M25	0.56	D	2/70		3/73
			4	10M50	0.50			4Q73*	

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE		
						SURFPAC		SURFLANT
						FF-1057	FF-1062	
5121	Ventilation Fans (Continued)							FF-1068
	2-159-2	2-147-0-1	4	10M50	0.50	2/68*	2/68*	2Q75*
	3-165-1	3-155-0-E	4	10M50	0.50	10/69	2/70	4Q75*
5141	Chilled Water Circ Pmps							
	No. 1	Engineroom	4	15P220A	1.16	12/77	D	A
	No. 2	Engineroom	4	15P220A	1.16	12/77	D	A
	Suction Hose Hanger		1			A	A	G
	Disch Hose Hanger		1			D	G	G
5142	No. 3	A/C Machinery Room	4	7E450	0.90	3/78		Pump not installed
	A/C Compressors			15P220A	1.16		10/77	
	No. 1	Engineroom	5	6E900	1.34	B	D	3Q75*
	Suction Hose Hanger		1	6E100	1.00		4/69	G
	Disch Hose Hanger		1	J-8579-1		D		
			1	6E100	1.00		4/69	

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE			
						SURFPAC		SURFLANT	
						FF-1057	FF-1062	FF-1068	FF-1097
5142	A/C Compressors No. 1 Disch Hose Hanger (Continued)	Engineer room	1	J-8579-1		D			
	No. 2 Suction Hose Hanger		5	6E900	1.34	B	B	3Q75*	D
	Disch Hose Hanger		1			A	A	G	A
	No. 3		1			A	A	G	A
	Suction Hose Hanger		6	6E900	1.34	3/78		Eqpt not installed	Eqpt not installed
5142 5161	A/C S.W. Circ. Pump #3 Refrigeration Compressors No. 1 Suction Hose Hanger	Engineer room Refrigeration Mach Room	4	15P220A	1.16	Not inst.	10/75	Not inst.	Not inst.
	Suction Hose Hanger		4	7E450	0.90	1Q75*	9/75	2Q75*	D
	Disch Hose Hanger		1	6E100	1.00	B		G	G
			1	Spool Type			B		
			3	15P50A	0.78 Inverted Minimum	2/76*	G		
5142 5161	A/C Compressors No. 1 Disch Hose Hanger (Continued)	Engineer room	1	J-8579-1		D			
	No. 2 Suction Hose Hanger		5	6E900	1.34	B	B	3Q75*	D
	Disch Hose Hanger		1			A	A	G	A
	No. 3		1			A	A	G	A
	Suction Hose Hanger		6	6E900	1.34	3/78		Eqpt not installed	Eqpt not installed
5142 5161	A/C S.W. Circ. Pump #3 Refrigeration Compressors No. 1 Suction Hose Hanger	Engineer room Refrigeration Mach Room	4	15P220A	1.16	Not inst.	10/75	Not inst.	Not inst.
	Suction Hose Hanger		4	7E450	0.90	1Q75*	9/75	2Q75*	D
	Disch Hose Hanger		1	6E100	1.00	B		G	G
			1	Spool Type			B		
			3	15P50A	0.78 Inverted Minimum	2/76*	G		

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE		
						SURFPAC		SURFLANT
						FF-1057	FF-1062	FF-1068 FF-1097
5161	Refrigeration Compress- sors (Continued)	Refrigeration Mach Room	1	6E100	1.00	1/68*		G
	Disch Hose Hanger			Spool Type			B	
	Disch Hose Hanger		1					G
	No. 2	Refrigeration Mach Room	4	7E450	0.90	9/76*	2/70	2Q75* D
	Suction Hose Hanger		1	6E100	1.00	1/68*		G
	Suction Hose Hanger		1	Spool Type			B	
5212	Disch Hose Hanger		1	6E100	1.00	1/68*		
	Disch Hose Hanger		1	Spool Type			B	
	Fire Pumps							
	No. 1	APM 1	4	15P800A	1.50	11/77	9/75	A D
	Suction Hose Hanger		1			D	D	D
	Disch Hose Hanger		1			D	D	D
	No. 2	Fireroom	4	15P800A	1.50	11/77	9/75	B ?/73
	Suction Hose Hanger		1	6E100	1.00	B	D	Missing L
	Disch Hose Hanger		1	6E100	1.00	D	D	Missing L

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE		
						SURFPAC		SURFLANT
						FF-1057	FF-1062	
5212	Fire Pumps (Continued)							FF-1097
	No. 3	Engine room	4	15P800A	1.50	11/77	D	A
	Suction Hose Hanger		1			D	A	Missing
	Disch Hose Hanger		1	7E450	0.90	D	A	Missing
	No. 4	AMR 2	4	15P800A	1.50	11/77	D	B
	Suction Hose Hanger		1			D	A	A
5311	Disch Hose Hanger		1			D	A	A
	Distiller S.W. Feed Pumps No. 1 and 2 (Common Bed Plate)	Engine room	5	15P220A	1.16	1/78	1Q74*	
	Distiller S.W. Feed Pump No. 1		4	6E150	1.00			4Q75*
	Distiller S.W. Feed Pump No. 2		4	6E150	1.00			4Q75*
	Suction Hose Hangers (2)		1 ea			D	D	G

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE			
						SURFPAC		SURFLANT	
						FF-1057	FF-1062	FF-1068	FF-1097
5331	Potable Water Pumps Nos 1 and 2 (Common Bed Plate)	Shaft Alley No. 1	4	6E150	1.00	1/78			
			4	7E450	0.90		B		
	Potable Water Pump #1		4	6E100	1.00				D
	Potable Water Pump #2		4	6E100	1.00			1275*	
	Potable Water Prime Pump		4	6E100	1.00			1275*	
5331	Potable Water Prime Pump	Shaft Alley No. 1	4	6E150	1.00	1/78		2075*	D
5345	F.W. Drain Tank Pumps No. 1A	Fireroom	4	7E450	0.90		2/74*		
	Suction Hose Hanger		3	15P220A	1.16	D	B	D	D
	Disch Hose Hanger		1			L	L	G	G
			1			D	D	G	G
	No. 1B		3	15P220A	1.16	A	A	D	D
	Suction Hose Hanger		1			L	L	G	G
	Disch Hose Hanger		1			D	A	G	G

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE			
						SURFPAC		SURFLANT	
						FF-1057	FF-1062	FF-1068	FF-1097
5515	H.P. Air Compressors								
	No. 1	AMP 1	4	6E900	1.34	B	B	3/75*	3/73
	Air Intake Hose Hanger		1			B	4/69	G	G
	No. 2	AMP 2	4	6E900	1.34	12/77	D	B	?/73
5515	Air Intake Hose Hanger		1			G	B	G	G
	L.P. Air Compressors								
	No. 1	AMP 1	9	7E450	0.90	12/77	D	7/69*	D
	Air Out Hose Hanger		1			G	A	G	G
	Cooling Water In Hose Hanger		1			G	B	G	G
	No. 2	AMP 2	9	7E450	0.90	B	2/70	4/76*	?/73
	Cooling Water In Hose Hanger		1	Spool Type		G	B	G	G
	Cooling Water Out Hose Hanger		1	Spool Type		G	B	G	G

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE		
						SURFPAC		SURFLANT
						FF-1057	FF-1062	
5611	Steering Gear Unit No. 1	Steering Gear Room	4	6E900	1.34	10/77	2/70	3Q75*
	Pump No. 1		4	J-6210-1		B	B	L
	H.P. Flex Hose Hang- ers (2)		1 ea	6E100	1.00	11/65*	1/70	G
	L.P. Flex Hose Hang- ers (2)		1	6E100	1.00	G	B	G
	Steering Gear Unit No. 2		4	6E900	1.34	10/77	2/70	3Q75*
5651	Pump No. 2	Steering Gear Room	4	J-6210-1		B	B	L
	H.P. Flex Hose Hang- ers (2)		1 ea			A	B	G
	Fin Stab. Power Unit No. 1		4	6E900	1.34	10/72*	9/75	2Q75*
	Fin Stab Power Unit No. 2		4	7E450				D
	Motor Generator No. 1		4	6E900	1.34	B	9/75	2Q75*
7211	Motor Generator No. 1	Launcher Control Power Room	4	A4200-T10		D	D	B
	Motor Generator No. 2	Launcher Control Power Room	4	A4200-T10		D	D	B

TABLE 2-2 RESILIENT MOUNT DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	MTS PER UNIT	MOUNT TYPE	MINIMUM HEIGHT	MANUFACTURE* OR INSTALLATION DATE			
						SURFPAC		SURFLANT	
						FF-1057	FF-1062	FF-1068	FF-1097
7212	ASROC Heating & Cooling Circ Water Pumps No. 1 and 2 (Common Bedplate)		5	15P300A	1.16	D	A		D
	Pump No. 1		4	15P150A	1.16			B	
	Pump No. 2		4	15P150A	1.16			B	
	Suction Hose Hangers (2)		1 ea	6E100	1.00	1/68*	10/67*	G	G
	Disch Hose Hangers (2)		1 ea	6E100	1.00	B	10/67*	G	G
7212	ISSM Coolant Pump		4			Equipment not installed	Equipment not installed	D	Eqpt not installed
7222	Hydraulic Power Unit		4	7E450	0.90	9/68*	10/69*	G	G

TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE			
					SURFPAC		SURFLANT	
					FF-1057	FF-1062	FF-1068	FF-1097
2542	SSTG Gland Leakoff Exhaust Fan	AMR 1	Suction	4.00	11/75	4075	L	L
			Exhaust	4.00	11/75	B	L	L
			Drain	1.00 Single Hose	L	3068*		
			Drain	Aeroquip				B
			Drain	Accordian Type Flex Rubber			B	
2543	Auxiliary Gland Exhaust Fan	Fireroom	Suction	3.00	B	B	L	L
			Exhaust	3.00	B	B	L	L
			Drain	1.00	A	B		
			Drain	1.00 Single Hose			B	
2553	Main Feed Booster Pumps No. 1A, 1B, 1C	Fireroom	Drain	Aeroquip				B
			Suction	8.00	E	E	E	Garlock Connectors S/A 136 Refers
			Discharge	8.00	E	E	E	
			Vent	2.00 Metal Braid Covrd	B	B	B	B
				2.00 Metal Braid Covrd Sngl Hose				

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TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE			
					SURFPAC		SURFLANT	
					FF-1057	FF-1062	FF-1068	FF-1097
2555	Main Condensate Pumps No. 1A	Engineer room	Suction	6.00	4Q77	A	D	B
			Discharge	4.00	4Q77	4Q75	B	B
			Vent	2.00	4Q77	4Q75		
			Vent	Aeroquip Sngl Hose				B
			Vent	Rigid Copper Tubing			B	
	No. 1B	Engineer room	Gland Seal	0.50 Single Hose	4Q77	A	B	B
			Suction	6.00	4Q77	H	B	B
			Discharge	4.00	4Q77	H	B	B
			Vent	2.00	4Q77	H		
			Vent	Aeroquip Sngl Hose				B
2556	SSTG Aux Condensate Pumps Nos. 1A, 1B, and 1C	AMR 1	Suction	3.00	4Q77	B	8/76	B
			Discharge	1.50	4Q77	B	B	
			Discharge	1.50 Sngl Hose				B
			Vent	1.00 Sngl Hose	4Q77	B	B	B
			Gland Seal	0.50 Sngl Hose	4Q77	B No 1C- 4Q75	L	L

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TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE		
					SURFPAC		SURFLANT
					FF-1057	FF-1062	FF-1068 FF-1097
2563	SSTG Aux S.W. Circ Pumps No. 1A No. 1B No. 1C	AMR 1	Suction		4Q77	1Q75*	8/76 B
			Discharge		4Q77	4Q67*	8/76 B
			Suction		4Q77	B	8/76 B
			Discharge		4Q77	B	8/76 B
			Suction		4Q77	B	8/76 B
			Discharge		4Q77	4Q67*	8/76 B
2643	Lube Oil Purifier	Engine room	Suction	1.25	B	4Q75	B
			Discharge	1.00	B	4Q75	B
			Discharge	Aeroquip Sngl Hose	B	4Q75	B
			Heater Suc- tion	1.25	B		
			Heater Suc- tion	Aeroquip Sngl Hose	B		B
			Heater Dis- charge	1.25	B	4Q75	B
3424	SSDG S.W. Circ Pump	AMR 2	Heater Dis- charge	Aeroquip Sngl Hose	L	4Q75	B
			Gauge	0.50 Single Hose			
			Suction	Aeroquip 150901-64	4Q77	B	

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TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE			
					SURFPAC		SURFLANT	
					FF-1057	FF-1062	FF-1068	FF-1097
3424	SSDG S.W. Circ Pump (Continued)	AMR 2	Discharge	Garlock Aeroquip 150901-48 Garlock	4Q77	B	B	B
4631	Sonar M.G. Cabinet (LAPS)	Sonar Equipment Rm 4-29-0-Q	S.W. Inlet	Aeroquip 2651-32/ Sngl Hose	4Q77	4Q75	4/74	B
			S.W. Outlet	Aeroquip 2651-32/ Sngl Hose	4Q77	4Q75	4/74	B
			L.O. Inlet/ Outlet	Stratoflex 212-12/ Sngl Hose from L.O. Filter Assy	4Q77			
			L.O. Inlet/ Outlet	Aeroquip FC 163/1509/ 24135/1/-12/ 50556/Single Hose from L.O. Filter Assembly		4Q75	B	B
	Lube Oil Filter Unit	Sonar Equipment Rm 4-29-0-Q	S.W. Inlet	Aeroquip 2651-32/ Single Hose	4Q77	B	4/74	B

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TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE ** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE			
					SURFPAC		SURPLANT	
					FF-1057	FF-1062	FF-1068	FF-1097
5141	Chilled Water Circulating Pumps Nos. 1 and 2	Engine room	Suction	3.50	4Q77	D		
			Suction	Garlock			B	B
			Discharge	3.50	4Q77	E		
			Discharge	Garlock			B	B
			Gland Drain	Aeroquip	G	G	B	B
5142	Air Conditioning Compr No. 1	Engine room	Suction	Aeroquip 150901-64	4Q77	B	Pump not installed	
			Discharge	Aeroquip 150901-48	4Q77	B	Pump not installed	
			Suction	Metal Braid Covered Anaconda AW-72	B, E	E	8/76	B
			Discharge	Metal Braid Covered Anaconda AW-72	B, E	B	8/76	B
			Gauge	Flex Tubing	L	B	L	L
5142	Air Conditioning Compr No. 2	Engine room	Suction	Metal Braid Covered Anaconda AW-72	B, E	E	8/76	B

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TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE ** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE			
					SURFPAC		SURPLANT	
					FF-1057	FF-1062	FF-1068	FF-1097
5142	Air Conditioning Compressor No. 2 (Continued)	Engine room	Discharge	Metal Braid Covered Anaconda AW-72	B, E	2/70	8/76	B
			Gauge	Flex Tubing	L	B	L	L
			Suction	Anaconda	B	B	Equipment not installed	
				Anaconda W-40				
5142	A/C S.W. Circulating Pump No. 3	Engine room	Discharge	Anaconda	B	B		
			Gauge	Metal Braid (4) Flex Tubing (2)	B	B		
			Suction		Eqpt not installed	4275	Equipment not installed	
			Discharge			4275		
5161	Refrigeration Compressors Nos. 1 and 2	Peer Machinery Rm	Suction	Metal Braid Covered	B	E	8/76	B
			Discharge	Metal Braid Covered	B	B	8/76	B
			Gauge	Metal Braid Covered (3)	B	L		
				Cloth Covered-Single Hose			B	B

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TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE ** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE			
					SURFPAC		SURFLANT	
					FF-1057	FF-1062	FF-1068	FF-1097
5212	Fire Pumps No. 1	AMR 1	Suction	6.00	4277	B		
			Discharge	Garlock			8/76	B
	No. 2	Fireroom	Suction	5.00	4277	B		
			Discharge	Garlock			8/76	B
	No. 3	Engineer room	Suction	6.00	4277	B		
			Discharge	Garlock			B	B
	No. 4	AMR 2	Suction	5.00	B	4275		
			Discharge	Garlock			5/76	B
			Suction	6.00	4277			
			Garlock	Garlock			5/76	B
			Discharge	5.00	A	B		
			Aeroquip 2758-80 Garlock	Garlock			B	B
			Discharge	5.00	A			
						2Q76*	5/78	B

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TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE			
					SURFPAC		SURFLANT	
					FF-1057	FF-1062	FF-1068	FF-1097
5311	Distiller S.W. Feed Pumps No. 1	Engineer room	Suction	4.00 Garlock	B	4Q75	B	2/71*
			Discharge		4Q77	H		
	No. 2	Engineer room	Suction	4.00 Garlock	B	H	B	2/71*
			Discharge		4Q77	4Q75	B	2/71*
				Garlock			B	2/71*
5331	Potable Water Pumps No. 1	Shaft Alley No. 1	Suction	Aeroquip 2652-48	1Q67*			
				Aeroquip		2/70	B	B
			Discharge	Aeroquip 2651-32	1Q70	2Q67*	B	B
			Prime	Aeroquip 2651-32	1Q70			
			Vent	Aeroquip 2651-8MP	2Q72*	2Q67*	B	B

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TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE ** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE		
					SURFPAC		SURFLANT
					FF-1057	FF-1062	
5331	Potable Water Pumps No. 1 (Continued)	Shaft Alley No. 1	Vent (Continued)	Aeroquip Garlock		B	B
			Gauge	Aeroquip Single Hose	L	L	B
	No. 2	Shaft Alley No. 1	Suction	Aeroquip 2652-48 Aeroquip	4Q67*	2/70	B
			Discharge	Aeroquip 2651-32 Aeroquip	1Q70		B
			Prime	Aeroquip 2651-32	1Q70	2Q67*	B
5331	Potable Water Prime Pump	Shaft Alley No. 1	Aeroquip	Aeroquip		2Q67*	B
			Vent		B	B	B
			Gauge	Aeroquip Single Hose	L	L	B
			Suction	Aeroquip 2651-24 Aeroquip	3Q67*		B
			Seal Tank Vent	Aeroquip 2651-24 Aeroquip Aeroquip Single Hose	3Q67*	B 2/70	B

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TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE			
					SURFPAC		SURFLANT	
					FF-1057	FF-1062	FF-1068	FF-1097
5345	F.W. Drain Tank Pumps No. 1	Fireroom	Suction	Garlock	A	A	B	B
			Discharge	Metal Braid Covered Aeroquip Single Hose Garlock	B	B	B	
			Vent	Single Hose	A	A	A	B
			Suction	Garlock	A	A	B	B
			Discharge	Metal Braid Covered	B	A		
5515	H.P. Air Compressors No. 1	AMR 1	Vent	Aeroquip Single Hose Garlock			B	B
				Single Hose	A	A	A	B
			Air Inlet	Rubber Accord- ian Flex Hse	B	B	B	B
			H.P. Outlet	Single Hose	1Q78	3Q73*		B

**All hose assemblies are 90° "L" configurations unless otherwise marked.

TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE			
					SURFPAC		SURPLANT	
					FF-1057	FF-1062	FF-1068	FF-1097
5515	H.P. Air Compressors No. 1 (Continued)	AMP 1	H.P. Outlet	Aeroquip 1508-8 Single Hose			2274*	
			S.W. Inlet	Ponco - Single Hose Aeroquip - Single Hose	4277	1275*	8/76	B
			S.W. Outlet		4277	2267*		
				Ponco - Single Hose Aeroquip Single Hose			8/76	B
No. 2	AMP 2		Unload Vlv Drain	Single Hose	B	B	G	G
			S.W. Drain	Single Hose	B	B	G	G
			Air Inlet		B	2/70	B	B
			H.P. Outlet	Aeroquip 1529-8 Single Hose	1278			
			S.W. Inlet/ Outlet	Single Hose Aeroquip 2651-24MP	4277	1/78 1/78	4274*	B

**All hose assemblies are 90° "L" configurations unless otherwise marked.

TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE			
					SURFPAC		SURFLANT	
					FF-1057	FF-1062	FF-1068	FF-1097
5515	H.P. Air Compressors No. 2 (Continued)	AMR 2	S.W. Inlet (Continued)	Single Hose RONCO - Single Hose 265103- 24V - 32 in Aeroquip Single Hose		1/78	8/76	
			Unload Vlv Drain	Single Hose	G	B	G	G
			S.W. Drain	Single Hose	G	B	G	G
5515	L.P. Air Compressors No. 1	AMR 1	L.P. Outlet	Aeroquip 2651-32MP	4077	3069*	1075*	
				Garlock				B
			S.W. Inlet	RONCO Single Hose	1078	1067*	8/76	
				Aeroquip Single Hose				B
			S.W. Outlet	RONCO Single Hose	1078	1067*	8/76	
				Aeroquip Single Hose				B

**All hose assemblies are 90° "L" configurations unless otherwise marked.

TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE			
					SURFPAC		SURFLANT	
					FF-1057	FF-1062	FF-1068	FF-1097
5515	L.P. Air Compressors No. 1 (Continued)	AMR 1	Unload Valve	Single Hose	4Q77	2Q68*	G	G
			Gauge	Aeroquip Single Hose	G	G	B	G
	L.P. Air Compressors No. 2	AMR 2	L.P. Outlet	Aeroquip	4Q77	1/78		
			S.W. Inlet		B	1/78	B	B
5611	Steering Unit No. 1	Steering Gear Room	S.W. Outlet	RONCO Single Hose	B	1/78	8/76	
				Aeroquip Single Hose				
			Unload Valve	Single Hose	L	B	G	G
			Gauge	Aeroquip	G	G	B	B
			H.P. (2)	Aeroquip 2786-20	4Q74*	1/78	7/76	B

**All hose assemblies are 90° "L" configurations unless otherwise marked.

TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE			
					SURFPAC		SURFLANT	
					FF-1057	FF-1062	FF-1068	FF-1097
5611	Steering Unit No. 1 (Continued)	Steering Gear Room	H.P. Gauge	Aeroquip 1509-8 Single Hose	3Q75*	9Q77	B	B
			L.P. Gauge	Weatherhead 1/2-H-104- SAE Single Hose Single Hose	B	9Q77	B	B
			L.P. Filter to Press Switch	Single Hose	B	B	7/76	B
			L.P. to Sol- enoid Vlv	Single Hose	B	B	7/76	B
			H.P. (2)	Aeroquip 2786-20	4Q74*	B	7/76	B
			H.P. Gauge	Aeroquip 1509-8 Single Hose	3Q75*	B	B	B
	Steering Unit No. 2	Steering Gear Room	L.P. Gauge	Weatherhead 1/2-H-104- SAE Single Hose Single Hose	B	B	B	B
			L.P. Filter to Press Switch	Single Hose	B	B	7/76	B

**All hose assemblies are 90° "L" configurations unless otherwise marked.

TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE		
					SURFPAC		SURFLANT
					FF-1057	FF-1062	
5611	Steering Unit No. 2 (Continued)	Steering Gear Room	L.P. to Sol- enoid Vlv	Single Hose	B	B	7/76
5651	Fin Stabilizers Units No. 1	AMR 1	Discharge (2)	Single Hose	11/75	4267*	?/76
			Suction	Single Hose	B	B	?/76
			Gauge (2)	Single Hose	3/78	3274*	?/76
	No. 2	AMR 1	Discharge (2)	Single Hose	11/75	3274*	?/76
			Suction	Single Hose	11/75	B	?/76
			Gauge (2)	Single Hose	3/78	4267*	?/76
7212	ASROC Heating & Cooling Water Circulating Pumps Nos. 1 and 2	AMR 1	Suction		B	1267*	8/76
			Discharge		B	4266*	8/76
7212	ISSM Coolant Pump	AMR 1	Suction	Metal Braid Covered Single Hose	G	G	B
			Discharge	Metal Braid Covered Single Hose	G	G	B
7222	Hydraulic Power Unit	Electronics Cooling Equipment Room	Suction	Aeroquip 2661-16 Single Hose	1277*	B	G

**All hose assemblies are 90° "L" configurations unless otherwise marked.

TABLE 2-3 FLEXIBLE CONNECTION DATA

SWBS	EQUIPMENT NAME AND NUMBER	EQUIPMENT LOCATION	HOSE SERVICE	HOSE IDENT AND SIZE** (INCHES ID)	MANUFACTURE* OR INSTALLATION DATE		
					SUREPAC		SURFLANT
					FF-1057	FF-1062	FF-1068 FF-1097
7222	Hydraulic Power Unit (Continued)	Electronics Cooling Equipment Room	Discharge	Single Hose	B	B	G
			Press Filter Outlet	Single Hose	B	B	G
			Oil Return Lines (2)	Weatherhead 1/2-H-25-SA	B	B	G
			Cooling Line	Single Hose	B	B	G

**All hose assemblies are 90° "L" configurations unless otherwise marked.

3

CHANGES TO RESILIENT MOUNT MRC

During development of the inventory listing of resilient mounts installed in KNOX class ships, it was noted that the mount inspection MRC is not complete. This section provides recommended changes to that MRC.

3.1 TECHNICAL CONSIDERATIONS

The Navy Resilient Mount Handbook, NAVSEA 0900-LP-089-501D of August 1977, enumerates inspection and replacement criteria that are more extensive than those listed in MRC A-176 S-1 for the inspection of resilient mounts. The current MRC (Figure 2-1) does not cover the following critical areas.

- a. Drift. Resilient mounts should be inspected and replaced if the mount has drifted beyond the specified minimum mount height established for each type of resilient mount. This condition occurs as a result of creep or relaxation of the rubber element that carries the mount loading. The minimum height specification can also be violated by misalignment at installation or by overloading.
- b. Age. In addition to the many other factors that dictate mount replacement, such as excessive swelling, deterioration of the rubber elements due to oil absorption, prominent breaks in the rubber elements, heavy painting, and failure of the rubber-to-metal bonds, there is an overriding age criterion. Mounts should be replaced when they have been in service for 10 years or at the overhaul nearest to, but not exceeding, 10 years from date of installation. The date a mount is installed is to be stamped on metal parts of the mount. Where the mount is inaccessible for inspection, a metal tag incorporating the required data should be attached to the equipment foundation or subbase adjacent to the applicable mount. A mount that has exceeded its maximum shelf life of 7 years should not be installed.

3.2 RECOMMENDED CHANGES TO MRC

The following changes to the resilient mount MRC A-176 S-1 are recommended:

- a. Revise the basic existing MRC in the manner shown in Figure 3-1, which incorporates the added inspection requirements for mount age and drift.
- b. Add information similar to that shown in Figure 3-2 and Table 3-1 to the MRC. Figure 3-2 is a set of drawings for representative types of resilient mounts used in the KNOX class. For each mount type, the points of measurement for determination of mount height, "H", are indicated. In Table 3-1, representative minimum values of H that govern mount replacement are given for each mount type of Figure 3-2.

Use of the revised MRC, in conjunction with the specific minimum height data in Table 3-1, will ensure that all aspects essential to effective maintenance of resilient mounts are considered during the required semiannual inspection.

TABLE 3-1. RESILIENT MOUNT HEIGHT REPLACEMENT CRITERIA

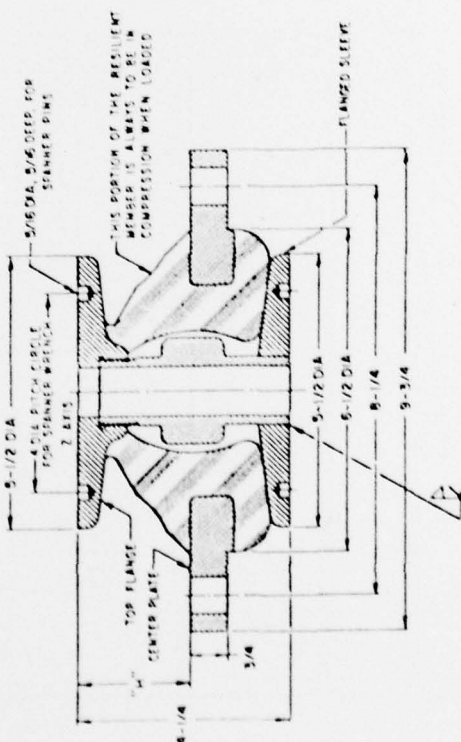
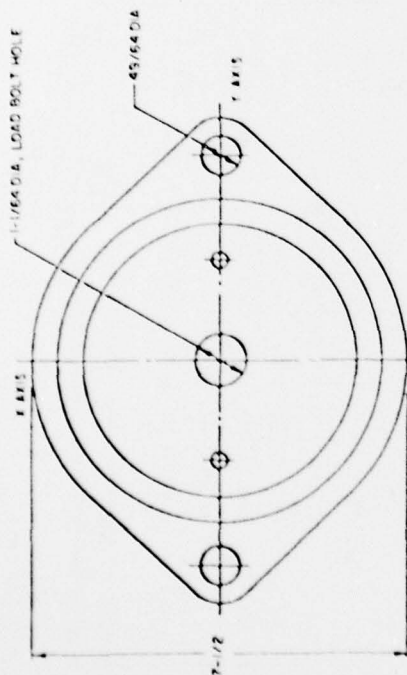
Resilient Mount Designation	Replacement Criterion — Minimum Allowable Mount Height (inches)
6E 100*	1.00
6E 150*	1.00
6E 900	1.34
6E 2000	1.38
*Natural rubber with protective coating.	

SHIP SYSTEM	SUBSYSTEM	MRC CODE	A-17b	S-1	M/M	PAGES	MM/EN/EMZ	0.2	TOTAL MMH	0.2	ELAPSED TIME	0.2
SYSTEM	EQUIPMENT	None										
MAINTENANCE REQUIREMENT DESCRIPTION 1. Inspect resilient mounts.												
SAFETY PRECAUTIONS												
TOOLS, PARTS, MATERIALS, TEST EQUIPMENT 1. Rags 2. Flashlight 3. Inspection mirror 4. Soap and water solution 5. Silicone Grease, FSN 9150-616-9212, or equivalent												
PROCEDURE 1. Inspect Resilient Mounts a. Inspect resilient mounts for: (1) Drift beyond minimum mount height (see mount drawing and Table I for location and minimum allowable height, "H"). (2) Age of mount. Replace mounts after 10 years of service or at the overhaul closest to, but not exceeding, 10 years from date of installation. Installation date should be stamped on metal parts of the mount. Do not install a mount which has exceeded its maximum shelf life of 7 years.												
LOCATION Equipment Grade List Recommended												
DATE October 1972												
MAINTENANCE REQUIREMENT CARD MRC IND NAVSACINAC 4700.1 (9.75)												
PAGE 2 OF 2												
A2												
1FQD												
N												

- (3) Large cuts, cracks, or abrasions. If these conditions exist, accomplishing the following interim actions:
- (a) Clean rubber element with soap and water solution.
 - (b) Apply a thin coat of silicone grease.
 - (4) Excessive swelling or softening of the rubber elements (usually due to soaking in oil).
 - (5) Failed rubber to metal bonds.
 - (6) Heavily painted rubber elements. Inadvertent or random brush strokes, spray or spatter are not cause for mount replacement. Removal of paint with paint remover or abrasives will degrade the rubber.

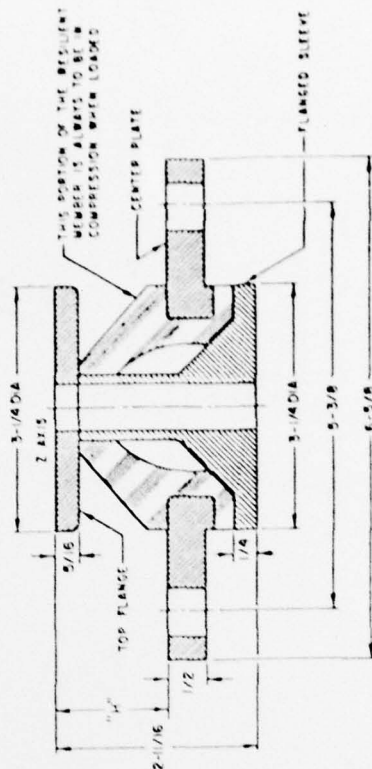
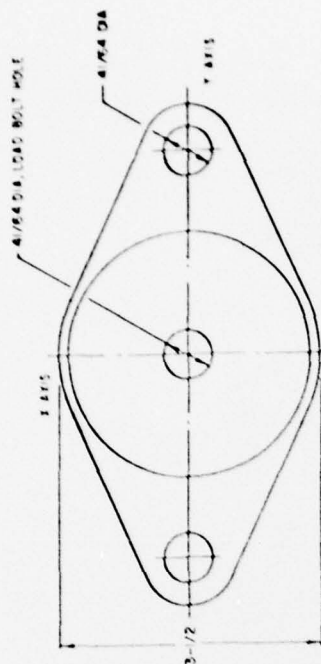
Figure 3-1. Proposed MRC for Resilient Mounts

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NOTES: 1. ALL DIMENSIONS ARE IN INCHES.
2. THE RESISTENT ELEMENT IS BOWED TO CENTER PLATE AND TOP FLANGE.
3. A PRESS FIT IS OPTIONAL BETWEEN FLANGED SLEEVE AND TOP FLANGE.

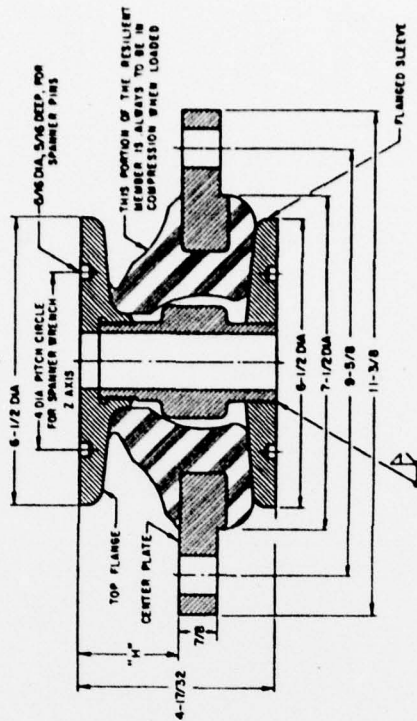
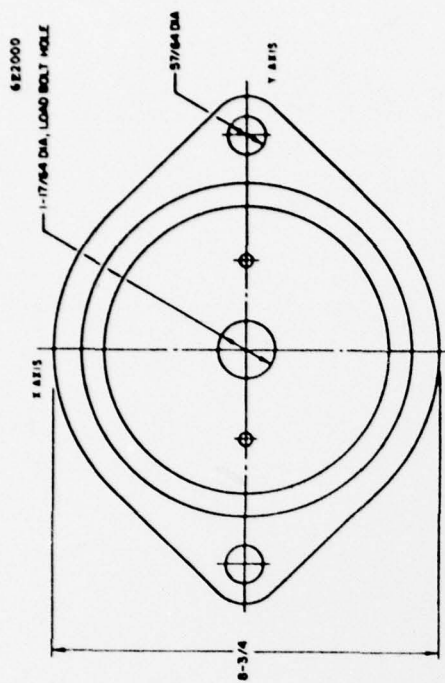
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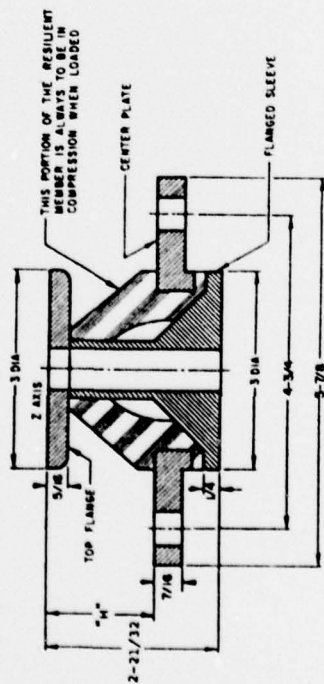
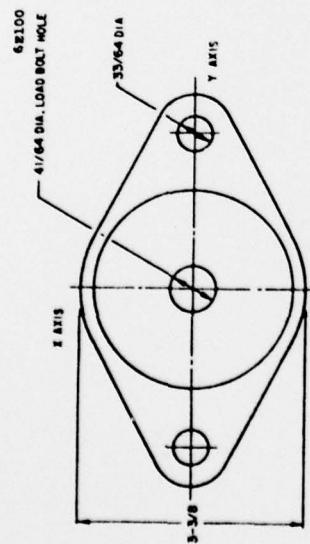
NOTES: 1. ALL DIMENSIONS ARE IN INCHES
2. THE RESILIENT ELEMENT IS BORED TO THE CENTER PLATE ONLY.

Figure 3-2. Drawings of Various Resilient Mount Types (Sheet 1 of 2)

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- NOTES:
1. ALL DIMENSIONS ARE IN INCHES.
 2. THE RESILIENT ELEMENT IS BORED TO THE CENTER PLATE AND TOP FLANGE.
 3. A PRESS FIT IS OPTIONAL BETWEEN FLANGED SLEEVE AND TOP FLANGE.



- NOTES:
1. ALL DIMENSIONS ARE IN INCHES.
 2. THE RESILIENT ELEMENT IS BORED TO THE CENTER PLATE ONLY

Figure 3-2. (Sheet 2 of 2)