

S6360-AM-MMO-010

0910-LP-018-4420

REVISION 01

TECHNICAL MANUAL
FOR
CORROSION CONTROL

(INGALLS SHIPBUILDING, INC.
CONTRACT NO. N00024-87-C-2256)



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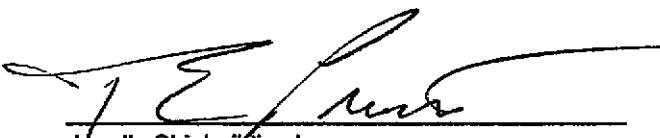
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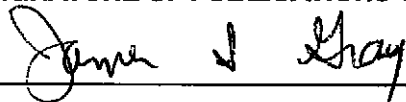
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FOREWORD

NAVSEA S6360-AM-MMO-010 is applicable for DDG 52, DDG 55, DDG 57, DDG 59, DDG 61, DDG 63, DDG 65, DDG 67, DDG 69, DDG 71, DDG 74, DDG 78.

This manual provides information and instructions for Corrosion Control and consists of the following chapters.

Chapter 1	Introduction
Chapter 2	Corrosion Discussion
Chapter 3	Corrosion Prevention Systems
Chapter 4	Topside Corrosion Prevention Systems Applications
Chapter 5	Interior Spaces Corrosion Prevention Systems Applications
Chapter 6	Location and Identification of Corrosion Control Components and Systems
Chapter 7	Corrosion Control Materials
Chapter 8	Surfaces Preparation and General Painting Guidelines
Chapter 9	References

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SAFETY SUMMARY

GENERAL SAFETY NOTICES.

The following general safety notices supplement the specific warnings and cautions appearing elsewhere in this manual. They recommend precautions that must be understood and applied during operation and maintenance of the equipment covered herein. Should situations arise that are not covered in the general or specific safety precautions, the commanding officer or authority will issue orders as found necessary to cover the situation. For more detailed safety information related to painting and preservation, see NSTM Chapter 631.

EYE PROTECTION.

Safety glasses and safety goggles shall be worn in areas where there is a possibility of particulates, mists, or vapors entering eyes (for example, during blasting, sanding, or spraying operations). Eyewear should fit well, contain unbreakable glass or plastic lenses, and allow adequate peripheral and straight-ahead vision. Safety eyewear shall be kept clean and available. Crewmembers working with chemicals shall wear chemical safety goggles. If chemicals or debris enter the eyes, flush the eyes with potable water for at least 15 minutes, lifting the upper and lower lids. Obtain immediate medical attention.

VENTILATION.

During painting operations, all tanks and enclosed areas shall be properly ventilated. If the vented paint vapors create an explosive hazard outside the tank or compartment being painted, water curtains shall be installed at the vents, and ventilation shall continue for at least 1-hour after the operation has been completed and until vapor concentrations remain below 10 percent of the lower explosive limit (LEL).

RESPIRATORY PROTECTION.

Personnel shall wear the proper type of face mask in hazardous areas. All devices shall be approved by the National Institute for Occupational Safety and Health (NIOSH) and Mining Enforcement and Safety Administration (MESA) (formerly Bureau of Mines).

PROTECTIVE CLOTHING.

Personnel shall wear adequate clean clothing and gloves to prevent skin contact with painting and cleaning materials. Clothing with cuffs, loose pockets or rips, and loose ties and jewelry shall not be worn since they are potential causes of hangups. The following precautions shall be adhered to with regard to protective clothing:

1. Safety helmets shall be worn during abrasive blasting.
2. Hardhats and steel-toed safety shoes shall be worn where there is possible danger from falling objects.
3. Nonskid, rubber-soled shoes shall be worn in enclosed spaces or where flammable vapors may be present (spark prevention).
4. Acid-proof clothing shall be worn when handling acid or caustic cleaners.
5. Acid-proof, air-supplied suits shall be worn when using acid or caustic cleaning materials in enclosed areas.

PERSONNEL PRECAUTIONS.

Personnel with a history of chronic skin diseases, allergies, or asthma shall not be permitted to work with paint compounds and thinners. Personnel who are sensitive to paint compounds and thinners shall be reported to the medical department.

Persons handling painting materials shall avoid contact of material with skin and eyes, and inhalation of mists or vapors. No food or drink shall be allowed in the paint area.

SAFETY EQUIPMENT.

Use necessary safety equipment. This may include hardhats, safety glasses, steel-toed rubber-soled footwear, gloves, coveralls, respirators, explosion-proof lights, safety harnesses, and lifejackets. Lifejackets shall be worn when working near or over water. Lifelines shall have no more than 2 feet of slack so that the jolt from a fall will not cause injury.

SAFETY SUMMARY - CONT.

WARNING AND CAUTION NOTICES.

The following Warnings and Cautions appear in the text of this manual and are repeated here for emphasis.

WARNING

Airless spray equipment sprays paint at very high pressure - sufficiently high to force paint through the skin. Never direct the spray at any part of your body or at another person. The safety guard on the nozzle is designed to protect you against paint injection but never put your hand or fingers or any part of your body over the nozzle. (Page 8-42).

WARNING

Cartridge respirator must be worn when spray painting. (Page 8-57)

CAUTION

Do not use power tools, as they will wear through the MSC coating to the substrate. (Page 3-6 and 3-10)

CAUTION

Use blasting pressures low enough to minimize abrasion and removal of the MSC coating but great enough for reasonable sealer topcoat removal and development of sufficient anchor tooth pattern for reapplication of the sealer. (Page 3-6)

CAUTION

Use blasting pressures low enough to minimize abrasion and removal of the MSC coating but great enough for reasonable paint removal and development of sufficient anchor of sealers and topcoat paints. (Page 3-6)

CAUTION

Do not use on apparatus of circuits exceeding 5000 volts to ground. (Page 8-16)

CAUTION

Do not attempt to clean spray gun by soaking assembled gun in thinner. Thinner will dissolve the oils in the leather packings and other lubrication, points, (Page 8-40)

CAUTION

Never operate the sprayer without paint or fluid in it. (Page 8-42)

CAUTION

Removal of contaminants by hand cleaning must be done carefully to avoid deep tool marks or gouges on the surface. (Page 8-17)

CHAPTER 1

INTRODUCTION

1-1 INTRODUCTION.

Aegis destroyers were outfitted with a comprehensive program of corrosion protection during construction. Included in this program were several thousand fasteners, structures, fittings, components, and miscellaneous equipments. The durability of this protection, however, sometimes falls short of the planned overhaul-to-overhaul life cycle of onboard equipment in general. Therefore, ship's force must schedule systematic surveillance and perform periodic preventive maintenance to ensure sustained high level corrosion protection. This manual is intended as a practical guide for shipboard use in understanding, identifying, controlling and preventing the corrosion that would otherwise occur both topside and in interior spaces of the ship.

1-1.1 CHAPTER DESCRIPTIONS. Chapter 1 describes the purpose, concept and goals of the corrosion control program. Chapter 2 explains the basic corrosion principles. Chapter 3 introduces basic metal surface preparation and the corrosion prevention systems. Chapter 4 deals with topside corrosion prevention systems. Chapter 5 deals with interior spaces and corrosion prevention systems. Both Chapters 4 and 5 provides work instruction notes which the shipbuilder utilized to apply corrosion prevention systems to the ship structures, systems and equipment. Chapter 6 provides tables that list corrosion control components, systems location and identification. Chapter 7 lists, in table format, the corrosion control materials used. Chapter 8 provides

surface preparation and general painting guidelines applicable to IMA and Depot level activities. Chapter 9 lists all references used to compile this technical manual and those which will provide ship's force with additional information on corrosion control. The Glossary provides a listing of corrosion control related words, terms and acronyms.

1-1.2 ITEM INDEXING AND ZONE LOCATIONS. The ship is divided into 19 zones. The topside of the ship is divided into Zones 1 through 10 (see Figures 4-1 through 4-9). The interior of the ship is divided into zones 11 through 19 (see Figures 5-1 through 5-10). There are no line drawings for Zone 10 or Zone 18. These two zones cover miscellaneous areas and are shown in specific zones of occurrences. Items within each zone that receive corrosion prevention are identified with an index number. Table 6-1 is a matrix listing the components in alphabetical order associated with their index number and zone and corrosion prevention systems. Specific items can be located by name, referring to location tables, or by zone referring to figures and then cross referencing the index number.

1-1.3 REPORTING NEW TECHNIQUES AND PROBLEMS. Corrosion control is an on-going discipline that changes as new techniques are developed and as new problems are identified. The reader should report new problems that should be covered in the manual. Forms are provided in the back of the manual for this purpose.

CHAPTER 2

CORROSION DISCUSSION

2-1 GENERAL.

Unprotected iron and steel exposed to the weather slowly turn into rust. Sea air and seawater greatly accelerate the process. Other metals undergo similar reactions for which the general term is corrosion. Degrees of corrosion differ and the resulting changes in appearance differ for each metal and alloy, but many common factors are present wherever corrosion occurs. Corrosion is a chemical change occurring on the unprotected surfaces of metals and alloys when they combine with elements in the atmosphere to form more stable compounds. The metals used in ship construction are not in their natural state but have been refined and processed into plates and shapes of the pure metal. These pure metals are not chemically stable and will corrode unless techniques of prevention are implemented and maintained.

2-1.1 CORROSION SUSCEPTIBILITY. A better understanding of the corrosion process may be gained by analyzing the frequently used electrochemical model shown in Figure 2-1. For corrosion to occur, four elements must be present at the same time. They are:

- a. A metal or local area of metal that is susceptible to corrosion and deteriorates in the process, called the anode
- b. A second metal or local area that is less susceptible to corrosion and does not deteriorate, called the cathode
- c. A metallic path for electrical continuity between the anode and the cathode
- d. A liquid solution that is capable of carrying a electrical current between the anode and the cathode. The liquid, which could be salt spray, is called the electrolyte.

2-1.2 THE CORROSION PROCESS. The corrosion process occurs when a current flows from the anode to the cathode through the metallic path, shown in (Figure 2-1). The current flows because a voltage potential difference exists between the anode and the cathode, similar to the open circuit voltage of a battery. It has been found that the different metals and alloys have different tendencies to form galvanic corrosion cells. It is possible to arrange the metals in a series ranked by this tendency. This listing, summarized in Figure 2-2, is known as the "Galvanic Series of Metals and Alloys in Seawater" and shows the anode (the corroding or most active) at the top and the cathode (the protected or least active) at the bottom. The metals can be divided into groups whose members have little or no tendency to produce galvanic corrosion with each other. Joining two metals that are widely separated in the series will produce a strong tendency for the metals to interact, and will result in corrosion of the metal that is higher in the galvanic series e.g., more active. The galvanic series gives only a general indication of the tendency of metals to corrode. Other factors that have an important effect are:

- a. Ratio of the anode and cathode areas
- b. Surface films
- c. Applied or residual stresses
- d. Concentration and type of ions in the solution
- e. Operating temperatures.

2-1.3 CORROSION CONTROLS. Since each of the four elements previously listed in para 2-1.1 is necessary for corrosion to continue, methods of corrosion control are based on elimination or control of one of the elements as follows:

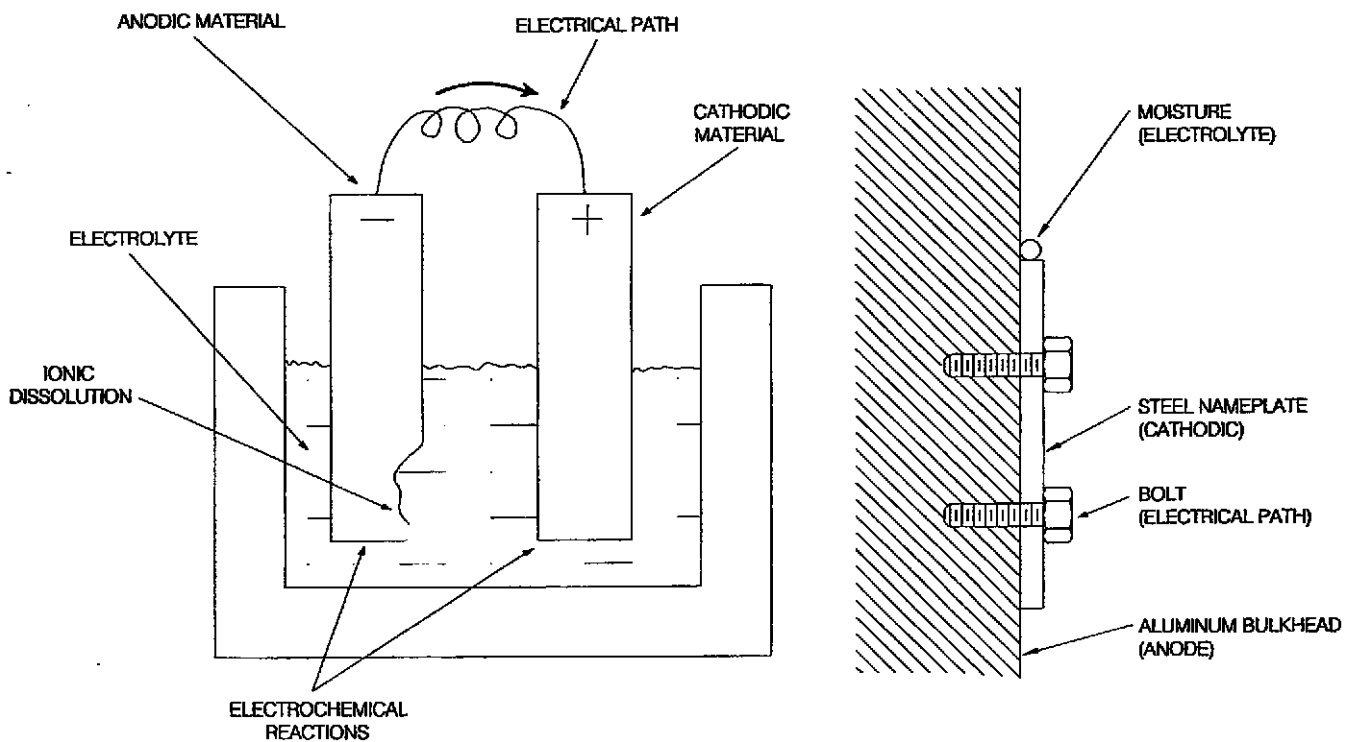
a. Break the electrical path between the anode and the cathode in the liquid by placing a barrier film, such as paint, rubber, plastic, sealants, or other dielectric material, between the surface of the metal and the electrolyte

b. Select metals that are in the same group in the galvanic series. In practice, this is sometimes achieved by applying a coating of plating on one metal over another. In other cases, a sacrificial anode, such as underwater hull zincs, is provided to present a more active metal that is intentionally sacrificed to

protect another metal. The implementation of one or more of these options will be noted in each of the corrosion preventive systems presented in this manual.

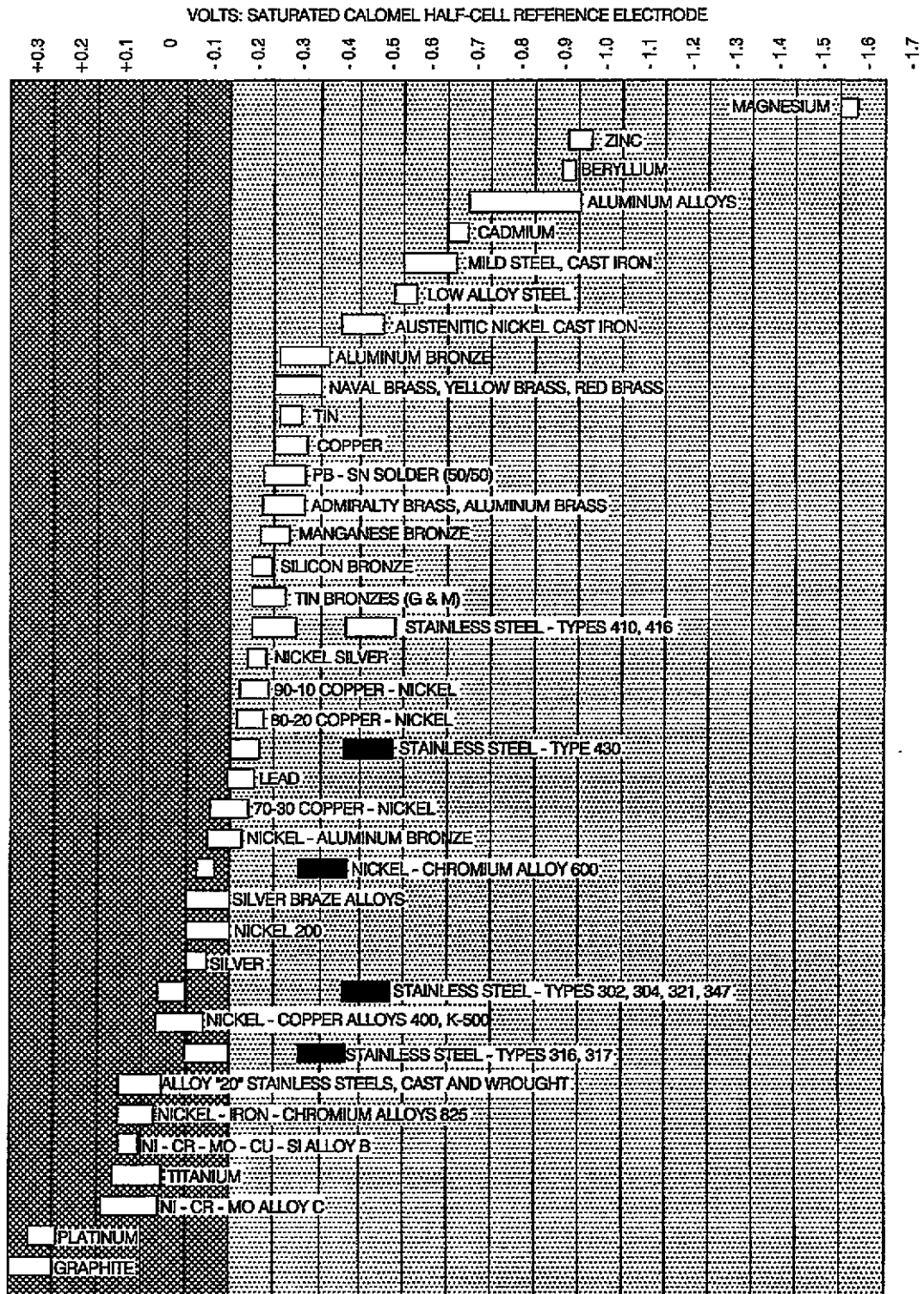
2-2 TYPES OF CORROSION COMMONLY FOUND ON BOARD SHIPS.

2-2.1 GENERAL. The types of corrosion most frequently observed aboard ship are uniform attack, galvanic corrosion, pitting, crevice corrosion, and erosion corrosion. These are discussed in the following paragraphs.



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Figure 2-1. Simple Electrolytic Cell



Alloys are listed in the order of the potential they exhibit in flowing seawater. Certain alloys indicated by the symbol in low-velocity or poorly aerated water, and at shielded areas, may become active and exhibit a potential near -0.5 volts.

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Figure 2-2. Electrochemical Potential (Galvanic Series) of Metals in Seawater

2-2.2 UNIFORM ATTACK. The simplest form of corrosion to recognize, and the form found most frequently, is uniform electrochemical attack or direct surface attack corrosion resulting from the direct reaction of a metal surface with oxygen and moisture in the air. This form of corrosion occurs frequently under normal shipboard conditions of exposure and is characterized by relatively uniform discoloration over large areas of the metal.

Uniform corrosion occurs on the surface of the metal where the structure of the metal surface is uniform, without small areas of stress concentration, pitting, or crevices. In addition, the attacking environment is also uniform and is usually unrestricted. In this form of attack, the anode and cathode are both found on the surface of the material itself and change locations, so that the corrosion products build up on the entire surface and not in isolated locations. The rusting of iron is an example of uniform corrosion.

2-2.3 GALVANIC CORROSION. Galvanic corrosion occurs when dissimilar metals are in contact and exposed to an electrolyte, as described in paragraph 2-1.1. It is frequently necessary to use steel components, studs, or bolts and nuts to fasten aluminum structural members to obtain adequate strength. In other cases, steel is used to provide shock resistance in topside installations. The steel and aluminum form a strong galvanic cell if they are in contact and are exposed to salt water, spray or sea air. The cathode-anode relationship of this metal combination is illustrated in Figure 2-1. An important factor in galvanic attack is the relative sizes of the anode and cathode. The greatest damage occurs when the area of the more active metal is relatively small so that the current density is high. The current density of the protected metal will be correspondingly lower. In a typical shipboard example, a fastener is small compared to the material joined. Therefore, if the fasteners cannot be of the same material, they should be of a metal lower in the galvanic series, so that the larger surface areas, and not the fasteners, tend to corrode.

2-2.4 PITTING. Pitting is a severe form of localized corrosion. Steel, stainless steel and aluminum are among the metals most susceptible to this type of corrosion. Local galvanic cells caused by various metals in an alloy may be the source of pitting action. Localized pit-type corrosion can also start as a result of incomplete coatings, such as paint damage around bolt heads or nuts (caused when the fasteners are removed and reinstalled). Pitting of a severe nature often occurs at the water line where a metal is partly in the water and partly exposed to the atmosphere. Thin metal sheets are quite vulnerable, because this form of concentrated attack can result in a full penetration of the sheet and loss of structural integrity even though the overall loss of metal may be very small.

2-2.5 CREVICE CORROSION. Crevice corrosion is sometimes called concentration cell corrosion. This type of corrosion is due to physical irregularities on the metal surface. A nonuniform electrolyte or environment can cause a difference in the concentration of ions or dissolved gases (oxygen), resulting in differences of potential on the surface of the same metal. As an example, differences in surface environment can be caused by cracks or crevices which, because of reactions in confined spaces, deplete the electrolyte. A deficiency of oxygen at faying (joined) surfaces, for instance, may cause accelerated corrosion. The anode and cathode areas are created by this variation of physical properties. A metallic electrical path is provided by direct metal-to-metal contact between two parts or directly on the surface of one part forming the crevice. The electrolyte can be salt water or any of the fluids found topside. CRES is particularly susceptible to this form of corrosion.

2-2.6 EROSION CORROSION. Erosion corrosion is a combination of mechanical action and chemical or electro-chemical reaction. Metal loss is accelerated due to the relative movement between a fluid and metal surface. The metal is removed between a fluid and metal surface. The metal is removed as dissolved ions, or it forms solid corrosion products which are mechanically

swept from the metal surface. Many metals depend on a passive surface film for their corrosion resistance, and when erosive forces remove these films, erosion corrosion proceeds. Erosive forces can be accelerated by particles, as bubbles carried in suspensions, or cavitation, a kind of erosion corrosion caused by the formation and collapse of vapor bubbles in a liquid, contacting a metal surface. Erosion corrosion is characterized by grooves, gullies, waves, rounded holes and valleys. It usually exhibits a directional pattern. In copper alloy heat exchanger tubes, it often forms horseshoe-shaped depressions. Soft metals are more susceptible because they are readily worn mechanically.

2-3 EFFECTS OF CORROSION ON METALS.

2-3.1 GENERAL. Each of the metals and alloys commonly used in ship construction is discussed in a following paragraph with regard to its resistance to corrosion in a marine environment. Specific details of metallurgy, chemical treatments, and alloy compositions have been summarized and highlighted. More detailed information can be obtained in references and handbooks on the subject.

2-3.2 STEEL ALLOYS. Generally speaking, the types of steel used in shipbuilding can be divided into three groups according to the amounts and types of alloys present. In the first category are cast iron, wrought iron and carbon steel to which no alloy is deliberately added. These steels are most susceptible to corrosion. The second category comprises low-alloy steels containing small percentages of chromium and copper. These steels are less susceptible to corrosion. The last category is the family of stainless steels in which chromium and nickel are the main additives.

2-3.3 STAINLESS STEELS. Stainless steels have high resistance to corrosion under adverse environmental conditions. Iron and its alloys are all susceptible to chemical attack caused by the oxygen and water in the atmosphere, but salt,

high temperature, and alternate wetting and drying accelerate the attack. The stainless steel alloys show improved resistance to uniform attack, pitting, erosion corrosion and to attack arising from contact with dissimilar metals. In general, this resistance increases with increasing amounts of chromium and decreases with higher carbon content. Stainless steel alloys are termed active or passive. Passivation is a chemical treatment that forms a surface film to enhance corrosion resistance. Stainless steels are referred to in this manual as corrosion resistant steel, abbreviated CRES. Stainless steel shall not be used in immersion service.

2-3.4 COPPER. Copper has always been considered a corrosion resistant metal. It exhibits good resistance to the atmosphere and salt water. Copper in combination with zinc is termed brass. Brass is used for some topside and interior hardware such as electrical boxes and fog applicator tips. The term bronze applies to copper alloys in which the principal alloy is a metal other than zinc or nickel. Seawater piping is generally formulated of 90-10 or 70-30 copper nickel alloy. Protective coatings are not used on copper alloy unless there is a requirement for the item to match the surrounding paint scheme or to prevent the formation of the green corrosion; product called verdigris. Treatment with epoxy powder coating has been successful for corrosion protection.

2-3.5 ALUMINUM ALLOYS. Aluminum and its alloys are used for many engineering applications because of a combination of strength with lightness, high thermal and electrical conductivity, good corrosion resistance, high heat and light reflectivity, and nontoxic and hygienic properties, and conventional fastening techniques can be used in fabricating equipment or structures.

Aluminum and aluminum alloys generally exhibit good resistance to natural environments and to various forms of corrosive attack. Aluminum and aluminum alloys may be subject to pitting (more usual), stress corrosion, intergranular attack,

crevice corrosion and corrosion fatigue. In addition, galvanic action may result from coupling with dissimilar metals.

Pitting may occur in many corrosive situations, but especially in seawater and marine atmospheres. Stress corrosion cracking may occur in aluminum alloys that contain substantial amounts of such elements as copper magnesium and zinc. High-purity aluminum and aluminum alloys that contain magnesium or magnesium and silicon in the proper proportions have good resistance to seawater and marine atmospheres. In general, aluminum should not be joined to copper or brass, nor to any other cathodic metal. Contact with stainless steel alloys, despite its apparently more cathodic electrode potential] usually causes relatively slight galvanic attack on aluminum alloys.

2-3.6 NICKEL ALLOYS. Nickel alloys, such as Monel and K-Monel, offer good resistance to localized attack and excellent resistance to general corrosion along with high strength. Monel and K-Monel are used where fasteners are subject to seawater corrosion and for connection of non-ferrous material other than aluminum and aluminum alloys where high strength is required. Monel and K-Monel are relatively immune to chloride ion stress-corrosion cracking. Monel may also be used for locking keys on pipe hangers.

2-4 FACTORS INFLUENCING CORROSION.

Some of the primary factors that must be recognized in establishing effective corrosion control are discussed in the following paragraphs. These factors are:

- a. Material selection
- b. Design deficiencies
- c. Application of coating material
- d. Marine environment.

2-4.1 MATERIAL SELECTION. One of the most significant factors influencing the potential

amount of corrosion that will be present on a ship is the selection of materials. Steel and aluminum are the most common metals used for exterior and interior structures and fittings. The metal used in each application normally was selected as the best compromise to meet several constraints such as cost, strength, weight, durability, and shock resistance. As a result, the most corrosion-resistant metal or combination of metals was not always selected. In all ships, many corrosion problems arise as a result of trading off corrosion control against strength, weight, cost and other factors.

2-4.2 DESIGN DEFICIENCIES. Careful consideration of life-cycle corrosion control costs should definitely be a step in the design process for each area or system of the ship. Examples of design deficiencies follow.

- a. Inadequate or poorly installed drainage, which results in standing water
- b. Location of components and structures in such close proximity that inaccessible areas are created where maintenance is difficult or impossible
- c. Combinations of dissimilar metals in areas exposed to salt water and spray. In some instances inadequate dielectric insulation is provided between the two metals
- d. Selection of metal shapes that are functional for their primary purpose but create corrosion maintenance problems by their complex form and shape.
- e. Use of commercial fixtures or fittings which, because of their construction or material, were not intended for and are not suitable for use in a marine environment
- f. Use of fastener systems that combine bolts, nuts and washers of dissimilar metals and are used to join dissimilar metals

- g. Use of absorbent materials, such as insulation, in exposed areas.

Most of these design considerations that have inherent corrosion shortcomings do not lend themselves to solution by easy corrective action short of a structural modification or ship alteration.

2-4.3 . APPLICATION OF COATING

MATERIAL. The prompt and complete removal of corrosion products and proper application of paint coatings is one of the most effective and important methods of corrosion control. Paint coatings available for use on exterior ship surfaces have improved in durability and quality in recent years. Other improved coatings are being evaluated and tested and will eventually be approved for shipboard use. The objective of having ship coating systems that will last the full eight years between overhauls is close to being realized. It is generally true, however, that the improved performance coating systems demand more careful attention during the application process.

Surface preparation and application techniques must be correctly followed if premature coating failures are to be avoided. When early paint failures are investigated, it is usually found that contributing factors were incomplete surface preparation, or failure to follow the military specification or standard or the coating manufacturer's instructions. The instructions for applying the coating systems given in this manual include full compliance with the manufacturer's instructions.

The following paint coating inspection guidance is quoted from NSTM Chapter 631 to aid in identifying common paint failures:

- a. **Alligatoring and Checking.** This condition exists when the outer layer of paint is broken and underlying paint coats are visible, often presenting an appearance similar to "alligator hide." This may be caused by applying paint to unseasoned wood, over a relatively soft undercoat, or

over previous coats before they have dried; or by application of hard-drying, inelastic paint over a more elastic paint.

- b. **Cracking.** This condition exists when a break extends through the paint film to the painted surface. Paints that lack elasticity due to aging or other causes can no longer contract or expand with moisture and temperature changes and therefore crack.

- c. **Flaking, Scaling and Peeling.** This condition is characterized by the detachment of pieces of paint, generally irregular in shape. When pieces are small, it is termed flaking; when pieces average over 1/4-inch, it is termed scaling; when pieces are larger (over 1-inch) it is termed peeling. Flaking and scaling pains generally result from cracking paint and are due to the same causes. Peeling is often due to the presence of moisture behind the film or incompatibility of paint films.

- d. **Bleeding.** This condition exists when the color of a previous coat is absorbed into the topcoat, and is usually caused by the solubility of the color ingredient of the undercoat in the vehicle of the new coat.

- e. **Blistering.** This condition is characterized by the detachment or raising of unbroken areas from the underlying surface, resulting from gases or liquid (usually water) forming beneath the coating or in between coats.

- f. **Chalking.** This condition is characterized by the presence of a loose powder evolved from the paint film itself, at or just beneath the surface. Slight chalking is desirable for some applications, because it makes the surface self-cleaning. Chalking may be detected by rubbing the film under the fingertips. The degree of chalking is affected by the composition of the paint itself. Epoxies are especially susceptible to chalking.

g. Discoloration. This describes an alteration in the original color and includes yellowing, darkening, fading and mottling color.

2-4.4 MARINE ENVIRONMENT. While not unique to any particular ship, a final factor - operation in a marine environment- must be considered a major influence in corrosion control. Moisture is the greatest contributor to corrosion; seawater, which is the only electrolyte commonly occurring in nature that contains a high concentration of salts, is one of the most severe and naturally corrosive agents. Since saltwater accelerates corrosion, it would be beneficial if the salt water were washed away with freshwater as

frequently as possible; however, this is not practical for Navy ships except possibly in port. A freshwater washdown is an effective way to reduce corrosion. The salinity of seawater in the major oceans does not vary widely and is generally between 33 and 37 parts per thousand. The direction and force of the wind, relative humidity, and duration of rainfall influence the amount of sea salt carried by normal sea winds. Consequently, the typical marine atmosphere varies considerable in the concentration of airborne salt. Salt content ranges from 10 to 100 pounds of sea salt per cubic mile of air. In addition, other pollutants, such as the combustion products found in stack gases, can increase the corrosive effects of the sea salts in the air.

CHAPTER 3

CORROSION PREVENTION SYSTEMS

3-1 GENERAL.

This chapter describes the corrosion prevention systems that are recommended for use in treating or preventing shipboard corrosion problems. Included in the discussion of each system is a description of surface preparation requirements. The following references provide further details and procedures. DDG Ship Specification Section 630, NAVSEA Corrosion Control Drawing 630-6597083, NAVSEA Paint Drawing 631-6596633. Additional reference are provided in Chapter 9.

3-2 METAL SURFACE PREPARATION.

Some form of surface preparation is required for each of the coating systems recommended for specific application. The surface preparation phase of any coating process is by far the most critical. Quality of surface preparation is the predominant factor in determining the effectiveness of the coating applied. To ensure that the corrosion preventive coating system will adhere to the metal surface it is necessary that the surface (1) be free of contaminants, and (2) be roughened to the degree necessary for adhesion of the coating to be applied. This roughened profile, known as the surface profile, may vary according to the coating system requirements, the original condition of the surface, the method of surface preparation, and the service requirements of the system.

A clean, properly prepared metal surface can be obtained by various methods. Handchipping, which is the simplest procedure, is not recommended in this manual, since it will not yield a uniform anchor tooth pattern, may drive particles of contamination into the metal surface, and will not clean the surface fully. The use of power-assisted tools is another method that will do an adequate job if proper care is taken (SSPC-SP3 and SSPC-SP11, Section 8-2.2).

Abrasive-blasting is the most Effective method of surface preparation and is most often specified as the preferred procedure for the coating systems recommended (SSPC-SP5 and SSPC-SP10, Section 8-2.1). Abrasive-blasting is generally not carried out by ship's force (except in blast cabinets).

Other important considerations in selecting a surface preparation technique are safety of personnel; protection of surrounding surfaces and equipment from abrasive, dust or corrosion products; portability of the equipment; and environmental protection regulations related to air or water pollution.

3-3 CORROSION PREVENTION SYSTEMS.

The systems discussed here as corrosion prevention systems are not limited to conventional oil and alkyd paints, but include other materials that prevent corrosion by establishing a barrier to screen out corrosive elements, chemically protect, or sacrificially corrode themselves to protect the less noble underlying metal. The systems are varied in nature and, in addition to paint system (such as silicone alkyd and epoxy polyamide), include such items as metallic-ceramic coatings, metal sprayed coatings, preventive compounds (such as polysulfide sealants), improved corrosion resistant fasteners and anti-seize thread compound. In the following subsections, each of the systems is described and a detailed procedure for its application is given, together with any necessary health and safety precautions. Corrosion prevention systems listed in Table 3-1 with the appropriate surface preparation procedure, are the recommended corrosion treatment for the problem areas. These systems are described in greater detail in the following paragraphs.

Table 3-1. Corrosion Prevention Systems

System Number	Method
1	Metal Sprayed Coating (MSC) with Heat-Resisting, High Temperature Sealer (DOD-STD-2138)
2	Metal Sprayed Coating (MSC) with Low Temperature Sealer (DOD-STD-2138)
3	Dielectric Coatings - Epoxy Coating System (MIL-P-24441)
4	Powdered Epoxy Coating; Fluidized Bed and Electrostatically Applied
5	Ceramic Coatings (MIL-C-81751)
6	Anti-Seize Thread Compound (MIL-T-22361)
7	Clear Water Displacing Corrosion preventive Compound (MIL-C-85054)
8	Polysulfide Thread Sealant (MIL-S-81733 Type I)
9	Polysulfide Sealant (MIL-S-81733 Type IV)
10	Protection of Electrical Connectors with Filler Tape (MIL-1-17695) and Heat Shrinkable Sleeving (MIL-1-23053)
11	Plastic Dielectric Barrier of Acrylonitrile Butadienestyrene (ABS) (MIL-P-19904)
12	Vapor Phase Inhibitor (MIL-1-22110)
13	Strippable Coating Compound (MIL-S-8802)
14	Improved Fasteners from CRES 316
15	Cosmetic Coating
16	Non-Corrosive Materials Including Manganese Bronze, Nickel Aluminum Bronze, Silicone Bronze, Nickel Cooper (Monel) and CRES

3-3.1 SYSTEM 1: METAL SPRAYED COATING (MSC) WITH HEAT-RESISTING, HIGH TEMPERATURE SEALER (DOD-STD-2138).

3-3.1.1 System Description. System 1 is required for the protection of steel where temperature greater than 175° F is continuous or intermittent. This system is recommended for use on structures that are subject to high heat, high humidity. In this system, a coating of pure molten aluminum metal is sprayed on the surface to be protected. The coating of aluminum is then sealed and covered with a heat-resisting paint. The resulting coating system protects the steel surface against corrosion. The aluminum forms a sacrificial coating that becomes the base for the sealing system, without which the system cannot be used successfully. The expected service life of this Metal Sprayed Coating (MCS) is at least 7 years in most applications.

The aluminum spraying process is controlled by a hand-held wire spray gun. The pure aluminum, in the form of a 1/8-inch or 3/16-inch wire, is drawn into the gun by a turbine turned by compressed air. The gun is supplied with controlled compressed oxygen and acetylene, which combine in the gun and burn to form the flame necessary to melt the aluminum. The molten aluminum is propelled to the surface by a stream of compressed air; it solidifies into a protective coating upon contact with the surface. Since the drops of aluminum form a porous coating, a sealer is applied over the aluminum to fill the pores and eliminate any open path through the aluminum to the surface being protected. Some applications can be performed by the electric arc or powder-spray method.

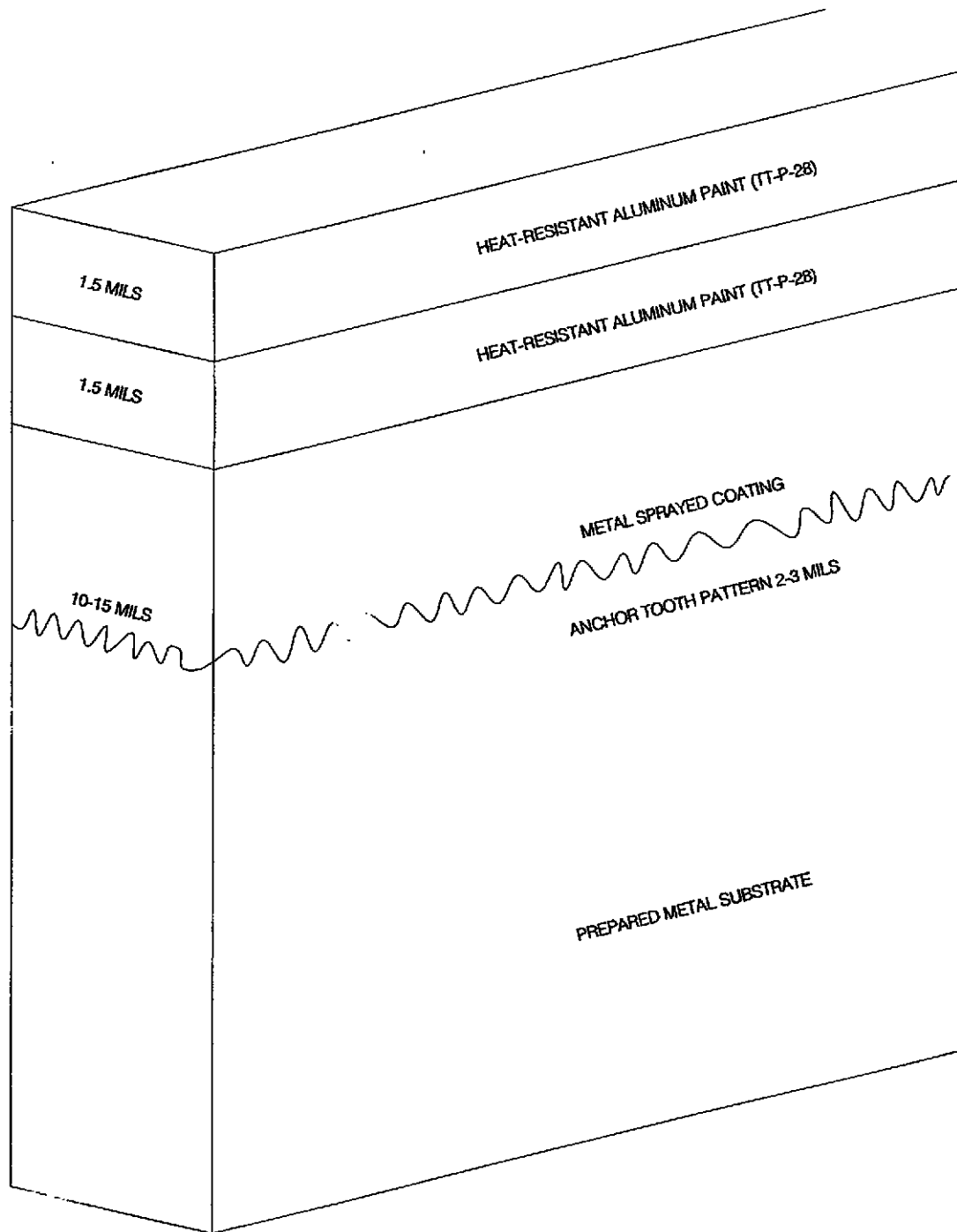
For high-temperature applications the MSC is applied at a thickness of 10 to 15 mils to a white-metal-blasted surface (SPC-SP5) with a 2 to 3 mil surface profile. This aluminum layer is then sealed with two coats of heat-resistant aluminum paint (GG-P-28), 1.5 mils Dry Film Thickness (DFT) per coat, as shown in Figure 3-1. The first sealing coat shall be applied within 4 hours of spraying. DOD-STD-2138 is the governing document for MSC application.

Capability for metal sprayed coating application exists at most depot- and intermediate-level maintenance activities. Use of the metal spray equipment by ship's force during overhaul may be authorized following extensive training and certification, as described in DOD-STD-2138.

There are some significant limitations to the metal sprayed coating process. First, the surface to be protected must be carefully prepared to a white-metal standard as described in Section 3-3.1.2. Also, too thin a coating (less than 5 mils) will shorten the service life. The aluminum will sacrificially protect a steel surface over a long period of time, but if copper or stainless steel is in contact with the aluminum, the aluminum will sacrifice rapidly and fail prematurely. In addition, the aluminum coating will not withstand heavy concentrations of strong alkaline cleaning solutions or acids. Either will cause premature failure.

Metal sprayed coating is intended for selected application to external and internal steel and aluminum alloy surfaces. Do not use it on the following surfaces:

- a. Plastic, rubber, or painted surfaces
- b. Internal surfaces of moving machinery (e.g., pump casings, valves)
- c. Copper, brass, bronze, nickel-copper or Monel surfaces
- d. All stainless steels
- e. Surfaces subject to strong acids or bases
- f. Threads of fasteners
- g. Valve stems
- h. Within 3/4-inch of surfaces to be welded
- i. Steel alloys with yield strength greater than 120,000 pounds per square inch
- j. Nonskid deck surfaces (except as approved NAVSEA)
- k. Exterior underwater hull surfaces
- l. Interior of sanitary tanks
- m. Ventilation plenums.



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Figure 3-1. System 1, MSC with Heat-Resisting, High Temperature Sealer

3-3.1.2 Surface Preparation: Abrasive-Blasting. Abrasive-blasting is the process by which the surface to be coated is bombarded with small particles of an abrasive. This method is the most effective way to remove scale and rust and is preferred for steel surface preparation. Equipment for abrasive-blasting is normally available at depot- and intermediate-level maintenance facilities. Some ships may have a blasting cabinet for small components such as valves.

It is important to remove grease, oil and other contaminants from the surface by solvent cleaning before blasting. Abrasive-blasting does not remove grease and oil. If contamination is excessive, a trisodium phosphate solution followed by freshwater rinse may be used to clean the surface prior to solvent-cleaning. Solvent-cleaning may be accomplished by dipping, wiping, brushing, or spraying, using toluene or trichloroethane. Precautions should be taken to protect parts that may be attacked by the solvents. Personnel safety precautions must be observed when solvents are used. Surfaces should be cleaned with a trisodium phosphate solution, rinsed with clean, potable water, and dried after solvent-cleaning. Surfaces that are not to be blasted, such as keyways, bearing surfaces, or tapped holes must be heavily masked or plugged before blasting. Care must be taken to protect the interior of machinery, hydraulic equipment and other components to prevent contamination by the abrasive or the removed rust particles.

For MSC, the blasted surface must have a white-metal-blast-cleaned surface (SSPC-SP5) with a sharp anchor-pattern (not peened) surface profile to 2 to 3 Mils (see figure 3-1). Various abrasives may be used for initial cleaning and removal of heavy deposits; however, in the final blasting for the anchor pattern, the abrasives must meet the requirements of DOD-STD-2138.

DOD-STD-2138 specifies 16- to 30 mesh aluminum oxide grit for steel or aluminum surfaces, or 25- to 40-mesh angular chilled iron grit for steel. Carbon steel grit or shot should never be used on aluminum, because particles of

steel metal will become embedded in the aluminum and cause corrosion.

The blasting operation is performed by making repeated passes until the surface condition meets the requirements for white-metal surface with a 2 to 3 mil profile. A white-metal-blast cleaned surface (SSPC-SP5) is defined as a surface which, when viewed without magnification, is free of all visible oil, grease, dirt, dust, Mill scale, rust, paint, oxides, corrosion products, and other foreign matter except for variations in appearance caused by type of steel, original surface condition, thickness of the steel, Mill or fabrication marks, heat treating, heat-affected zones, blasting abrasive, and differences in the blast pattern. The surface profile must be validated (measured) with profile tape and a dial micrometer. Abrasive-blasted surfaces shall not be allowed to become contaminated prior to completion of metal spray and sealing processes. Prepared surfaces shall be handled only with clean gloves, rags or slings.

A blasted surface left uncoated will corrode rapidly. The metal spray operation shall be started within 4 hours after surface preparation of steel has been completed and shall be finished within 6 hours. If the steel surface temperature is not greater than 10 degrees above the dew point, no metal spraying shall be conducted. If more than 15 minutes, but not more than 4 hours, is expected to elapse between the surface preparation and the start of the metal spray process, or if the part must be moved to another location, the prepared surface shall be protected from moisture, contamination, and fingermarks. Wrapping with clean paper will normally provide adequate protection from fingerprinting.

When specified in the contract or other guidance documents, for periods longer than 4 hours, a flash coat of metal spray (at least 1 mil) shall be used to protect the surface until final metal spray can be applied. If the period exceeds 6 hours for steel, or if other contamination or deterioration of the surface occurs, the surface shall be reblasted to white metal condition.

3-3.1.3 Maintenance. To repair any damage to the MSC preservation system that exposes the MSC coating but not the substrate:

- a. Surface preparation, small areas
 1. Degrease as required
 2. Use a 1-inch flexible-blade paint scraper and remove loose sealer around the wear/damage area to boundary of good bonded sealer. Be careful not to gouge or further damage the MSC coating
 3. Lightly abrade the area around the exposed MSC with sandpaper to provide a feathered edge and good mechanical bonding surface for the sealer
 4. Use a stiff, hand-held bristle brush and vigorously brush away loose debris.

CAUTION

Do not use power tools, as they will wear through the MSC coating to the substrate.

- b. Surface preparation, large areas
 1. Degrease as required
 2. Abrasive-brush-blast away loose sealer and the exposed MSC area. Feather a 2 to 3 inch collar into the good paint area.

CAUTION

Use blasting pressure low enough to minimize abrasion and removal of the MSC coating but great enough for reasonable sealer topcoat removal and development of sufficient anchor tooth pattern for reapplication of the sealer.

- c. Reseal prepared surface with two coats of high-temperature aluminum paint

(TT-P-28), 1.5 mils DFT per coat, as shown in Figure 3-1.

3-3.1.3.1 To repair cuts or wears through the MSC coating and exposures of the substrate:

- a. Surface preparation
 1. Degrease as required
 2. Using a paint scraper, push the blade underneath the MSC coating to lift off all loosely bonded MSC coating until a good bonded area is reached
 3. A portable power wire brush can be used to clean steel substrate, to clean metal, feathering 2 to 3 inches into the undamaged area.
- b. Surface preparation for MSC system
 1. Degrease as required
 2. Abrasive-blast area to be repaired with 16-to 30-mesh aluminum oxide to white metal (SSPC-SP-5) to give a 2 to 3 MIL surface profile.
 3. Feather 2 to 3 inches into the good coating area.
- c. Apply MSC in accordance with DOD-STD-2138
- d. Topcoat with two coats of high-temperature aluminum paint (TT-P-28), 1.5 mils DFT per coat, as shown in Figure 3-1.

3-3.1.4 Health and Safety Precautions. The following items are only a few of the health and safety precautions listed in NSTM Chapter 631 and DOD-STD-2138. Refer to NSTM Chapter 631, Section A, for more complete coverage of health and safety precautions.

When using cleaning solvents (or trichloroethane), the following safety-related items should be observed:

- a. Shipping containers are marked to indicate dangerous or safety-related items; these labels should be read before the solvent is used, and the stated precautions should be followed in their use
- b. Trichloroethane vapors are harmful; use only in adequate ventilation. Avoid prolonged breathing of vapor
- c. Avoid prolonged or repeated contact with skin.

Safety precautions for abrasive blasting are covered in NSTM Chapter 631 and include such items as avoiding explosion hazards and using safety goggles, face shields, protective clothing and hearing protectors.

When the metal spray equipment is set up, all connections should be checked for tightness before the system is operated. The gun is a burn hazard and must be handled carefully. Goggles should be worn during spraying operations, and adequate ventilation should be provided. Metal spraying should never be done in the vicinity of combustible materials, because of the fire hazard. A fire watch must be provided. The operation is also extremely noisy, and personnel in the area must wear hearing protection.

3-3.1.5 References. Before using this system, the following publications should be studied thoroughly:

- a. Procedures
 1. NSTM Chapter 631
 2. DOD-STD-2138.
- b. Precautions
 1. NSTM Chapter 631
 2. DOD-STD-2138.

3-3.2 SYSTEM 2: METAL SPRAYED COATING (MSC) WITH LOW TEMPERATURE SEALER (EPOXY POLYAMIDE) DOD-STD-2138. Except that F-150, MIL-P-24441, at 1 mil shall be used in lieu of Strontium Chromate, MIL-P-23377.

3-3.2.1 System Description. System 2 is used for the corrosion protection of steel components whose operating temperature is less than 175° F. In this system, a coating of pure molten aluminum metal is sprayed on the surface to be protected. The coating of aluminum is then covered with a thin coat of epoxy polyamide and a topcoat system. The resultant coating system protects the steel surface against corrosion. The aluminum forms a sacrificial coating that becomes the base for the sealing and topcoat system, without which the system cannot be used successfully. The expected service life of the MSC is at least 7 years in most applications.

DDG 78 only. Where inorganic zinc silicate primer is specified as an alternate to metal spray coating, NAVSEA approved epoxy paints may be substituted. On the exterior and weather surfaces areas of the ship where the final topcoat paint system is military specification MIL-P-24635A, a single 3-5 mils DFT coat of Amercoat Ameron 385 shall be applied in lieu of inorganic zinc silicate primer. For the interior, in lieu of inorganic zinc silicate primer, a single 3-5 mils DFT coat of Amercoat Ameron 385, MIL-P-24441 Type IV, or Devco Coating Rust B 236, MIL-P-23236 Type IV Class 2, shall be applied. Surface preparation of the affected areas where alternate epoxy systems are used shall be SSPC-SP10.

The aluminum spraying process is controlled by a hand-held wire spray gun. The pure aluminum, in the form of a 1/8-inch or 3/16-inch wire, is drawn into the gun by a turbine turned by compressed air. The gun is supplied with controlled compressed oxygen and acetylene, which combine in the gun and burn to form the flame necessary to melt the aluminum. The molten aluminum is propelled to the steel surface by a stream of compressed air. It solidifies into a protective coating upon contact with the surface. Since the drops of aluminum form a porous

coating, a sealer is applied over the aluminum to fill the pores and eliminate any open path through the aluminum to the surface being protected. The aluminum coating, shown in Figure 3-2, is sealed with low-temperature sealer and topcoated with various coatings.

For low-temperature applications, the MSC is applied at a thickness of 7 to 10 mils to a white-metal blasted surface (SSPC-SP5) with a 2- to 3-MIL profile. The aluminum layer is then sealed with one thin coat of epoxy polyamide, Formula 150 (MIL-P-24441), within 4 hours of application of MSC. This coating of sealer should be approximately 1 mil thick. The sealer is followed by an epoxy polyamide paint primer and topcoat (MIL-P-24441) system. Extended delays between application of sealer and application of the first coat of the system must be avoided. The first coat (typically Formula 150 of MIL-P-24441) of the selected topcoat system shall be applied within 4 hours after the sealer coat has dried (coating should be dry hard in less than 7 hours). DOD-STD-2138 is the governing document for MSC application.

Capability for metal sprayed coating application exists at most depot- and intermediate-level maintenance activities. Use of the metal spray equipment by ship's force during overhaul may be authorized following extensive training and certification, as described in DOD-STD-2138.

There are some significant limitations to the metal sprayed coating process. First, the surface to be protected must be carefully prepared to a white-metal standard as described in Section 3-3.2.2. Also, too thin a coating (less than 5 mils) will allow some of the steel surface to be exposed to moisture, and the aluminum will begin to sacrifice to protect the steel. This reduces the effectiveness of the coating as a protective barrier. The aluminum will galvanically protect a steel surface over a long period of time, but if copper or stainless steel is in contact with the aluminum, the aluminum will sacrifice rapidly and fail prematurely. In addition, the aluminum coating will not withstand heavy concentrations of strong alkaline cleaning solutions or acids. Either will cause premature failure.

Metal sprayed coating is intended for selected application to external and internal steel and aluminum alloy surfaces. Do not use it on the following surfaces:

- a. Plastic, rubber, or painted surfaces
- b. Internal surfaces of moving machinery (e.g., pump castings, valves)
- c. Copper, brass, bronze, nickel-copper, or Monel surfaces
- d. All stainless steels
- e. Surfaces subject to strong acids or bases
- f. Threads of fasteners
- g. Valve stems
- h. Within 3/4-inch of surfaces to be welded
- i. Steel alloys with yield strength greater than 120,000 lb/sq in
- j. Nonskid deck surfaces except as approved by NAVSEA
- k. Exterior underwater hull surfaces
- l. Interior of sanitary tanks
- m. Ventilation Plenums.

3-3.2.2 Surface Preparation: Abrasive-Blasting. Abrasive-blasting is the process by which the surface to be coated is bombarded with small particles of an abrasive. This method is the most effective way to remove scale and rust and is preferred for steel surface preparation. Equipment for abrasive blasting is normally available at the depot- and intermediate-level maintenance facilities. Some ships may have a blasting cabinet for small components.

It is important to remove grease, oil, and other contaminants from the surface by solvent cleaning before blasting. Abrasive-blasting does not remove grease and oil. If contamination is excessive, a trisodium phosphate solution followed by freshwater rinse may be used to clean the surface prior to solvent cleaning. Solvent cleaning may be accomplished by wiping, brushing, or spraying, using toluene or

trichloroethane. Precautions should be taken to protect parts that may be attacked by the solvents. Personnel safety precautions must be observed when solvents are used. Steel surfaces should be cleaned with a trisodium phosphate solution, rinsed with clean, potable water and dried after solvent-cleaning. Surfaces that are not to be blasted, such as keyways, bearings surfaces, or tapped holes, must be heavily masked or plugged before blasting. Care must be taken to protect the interior of machinery, hydraulic equipment, and other components to prevent contamination by the abrasive or the removed rust particles.

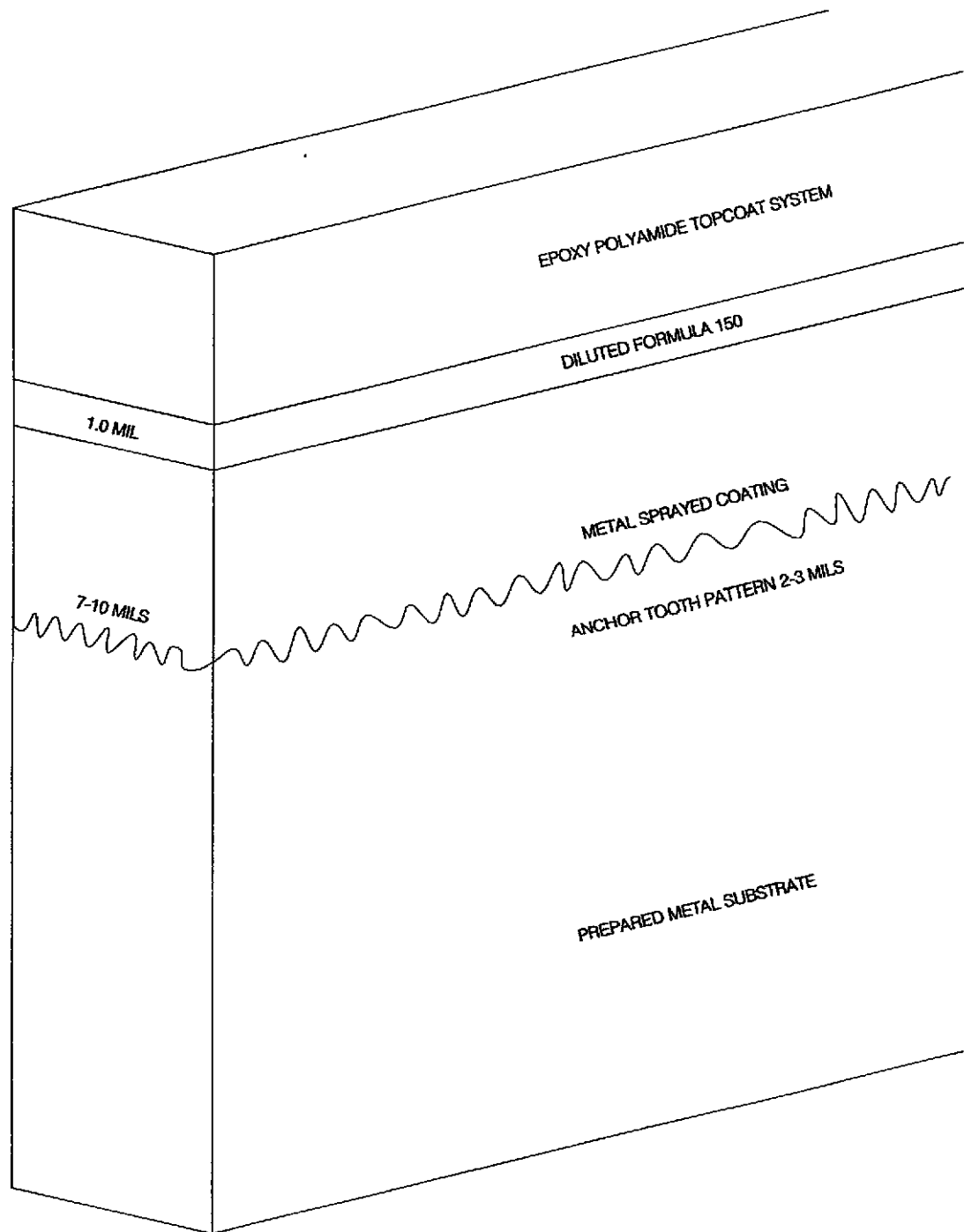
For MSC, the blasted surface must have a white-metal-blast cleaned surface (SSPC-SP5) with a sharp anchor-pattern (not peened) surface profile of 2 to 3 mils (see Figure 3-2). Various abrasives may be used for initial cleaning and removal of heavy deposits; however, in the final blasting for the anchor pattern, the abrasives must meet the requirements of DOD-STD-2138. DOD-STD-2138 specifies 16-to 30-mesh aluminum oxide grit for steel or aluminum surfaces, or 25- to 40-mesh angular chilled iron grit for steel. Carbon steel grit or shot should never be used on aluminum, because particles of steel metal will become embedded in the aluminum and cause corrosion.

The blasting operation is performed by making repeated passes until the surface condition meets the requirements for white-metal surface with a 2 to 3 Mil profile. A white-metal-blast cleaned surface (SSPC-SP5) is defined as a surface which, when viewed without magnification, is free of all visible oil, grease, dirt, dust mill scale, rust, paint, oxides, corrosion products and other foreign matter except for variations in appearance caused by type of steel, original surface condition, thickness of the steel, mill or fabrication marks, heat treating, heat-affected zones, blasting abrasive, and differences in the blast pattern. The surface profile must be validated (measured) with profile tape and a dial micrometer. DOD-STD-2138 defines this procedure. Abrasive-blasted surfaces shall not be allowed to become contaminated prior to completion of metal spray and sealing processes. Prepared surfaces shall be handled only with clean gloves, rags or slings.

A blasted surface left uncoated will corrode rapidly. The metal spray operation on steel shall be started within 4 hours after surface preparation has been completed and shall be finished within 6 hours. If the steel or aluminum surface temperature is not greater than 10 degrees above the dew point, no metal spraying shall be conducted. If more than 15 minutes, but not more than 4 hours, is expected to elapse between the surface preparation and the start of the metal spray process, or if the part must be moved to another location, the prepared surface shall be protected from moisture, contamination and fingermarks. Wrapping with clean paper will normally provide adequate protection from fingerprinting. When specified, in the contract or other guidance documents, for periods longer than 4 hours, a flash coat of metal spray (at least 1 mil) shall be used to protect the surface until final metal spray can be applied. If the period exceeds 6 hours for steel, or if other contamination or deterioration of the surface occurs, the surface shall be reblasted to white metal condition.

3-3.2.3 Maintenance. To repair any damage to the MSC preservation system that exposes the MSC coating but not the substrate:

- a. Surface preparation, small areas
 1. Degrease as required
 2. Use a 1-inch flexible-blade paint scraper and remove loose sealer around the wear/damage area to boundary of good bonded paint. Be careful not to gouge or further damage the MSC coating
 3. Lightly abrade the area around the exposed MSC with sandpaper to provide a feathered edge and good mechanical bonding surface for the primer/sealer
 4. Use a stiff, hand-held bristle brush and vigorously brush away loose debris.



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Figure 3-2. System 2, Metal Sprayed Coating with Low Temperature Sealer

CAUTION

Do not use power tools, as they may wear through the MSC coating to the substrate.

- b. Surface preparation, large areas
 - 1. Degrease as required
 - 2. Abrasive-sweep-brush-blast away loose paint and the exposed MSC area. Feather a 2 to 3 inch collar into the good paint area.

NOTE

To minimize cosmetic difference between new and old paint, sweep blast (or sandpaper) and repaint an area bordered by a weld bead or a structural item.

CAUTION

Use blasting pressures low enough to minimize abrasion and removal of the MSC coating but great enough for reasonable paint removal and development of sufficient anchor pattern of sealers and topcoat paints.

- c. Reseal and retopcoat with products identical to or compatible with existing sealer/topcoat. Follow manufacturer's instructions for touching up paint products. To minimize cosmetic differences, touch up area should be bordered by a weld bead or a structural item. Follow the procedure described in Section 3.3.2.2.

3-3.2.3.1 To repair cuts or wears through the MSC coating and exposures of the substrate:

- a. Surface preparation for paint
 - 1. Degrease as required
 - 2. Using a paint scraper, push the blade underneath the MSC coating to lift off all loosely

bonded MSC coating until a good bonded area is reached

- 3. A portable power wire brush can be used to clean steel substrate, to clean metal, feathering 2 to 3 inches into the undamaged area.

- b. Surface preparation for MSC system

- 1. Degrease as required
- 2. Abrasive-blast area to be repaired with 16 to 30 mesh aluminum oxide to white metal (SSPC-SP5) to give a 2 to 3 Mil anchor pattern. Feather 2 to 3 inches into the good coating area.

3-3.2.3.2 Apply MSC in accordance with DOD- STD-2138 and low-temperature sealer

3-3.2.3.3 Reseal and retopcoat with products identical to or compatible with existing sealer/topcoat. Follow procedure described in Section 3-3.3.2.

3-3.2.4 Health and Safety Precautions. The following items are only a few of the health and safety precautions listed in NSTM Chapters 631 and 634. Refer to NSTM Chapter 631, Section 2, and NSTM Chapter 634, Section 3, for more complete coverage of health and safety precautions

When using cleaning solvents (or trichloroethane), the following safety-related items should be observed:

- a. Shipping containers are marked to indicate dangerous or safety-related items; these labels should be read before the solvent is used, and the stated precautions should be followed in their use
- b. Trichloroethane vapors are harmful; use only in adequate ventilation. Avoid prolonged breathing of vapor
- c. Avoid prolonged or repeated contact with skin.

Safety precautions for abrasive blasting are covered in NSTM Chapter 631 and include such items as avoiding explosion hazards and using safety goggles, face shields, protective clothing and hearing protectors.

When the metal spray equipment is set up, all connections should be checked for tightness before the system is operated. The gun is a burn hazard and must be handled carefully. Goggles should be worn during spraying operations, and adequate ventilation should be provided. Metal spraying should never be done in the vicinity of combustible materials, because of the fire hazard. A fire watch must be provided. The operation is also extremely noisy and personnel in the area must wear protection.

The following special safety precautions apply to the use of epoxy paints (topcoat systems):

- a. Spray painters shall wear protective garments that fit snugly at the ankles, neck and wrists. They shall also wear gloves and approved filter-type respirators while spraying or when mixing dry colors or using other finishing materials that create flammable vapors. They should never inhale the mist from the spray gun. See NSTM Chapter 631
- b. Personnel mixing these paints should wear solvent-resistant synthetic rubber or plastic gloves and apron. Sleeves should be kept rolled down. NIOSH-approved respiratory protection shall be required when air sampling data indicate solvent concentrations in excess of the threshold limit values, or when it is reasonable to assume that solvent vapor concentrations cannot be controlled by ventilation and are expected to exceed the threshold limit value for the solvent involved.

3-3.2.5 Reference. Before using this system, the following publications should be thoroughly reviewed:

- a. Procedures
 1. NSTM Chapter 631 and 634
 2. DOD-STD-2138.

b. Precautions

1. NSTM Chapter 631 and 634
2. DOD-STD-2138.

3-3.3 SYSTEM 3: DIELECTRIC COATING-EPOXY COATING SYSTEM (MIL-P-24441).

3-3.3.1 System Description. Epoxy coating systems are used to establish an environmental barrier film that is hard, durable, chemical-resistant and non-porous. Generally, either two or three coats are applied at a total thickness (dry film) of 8 to 10 mils (see Table 3-2 and Figure 3-3).

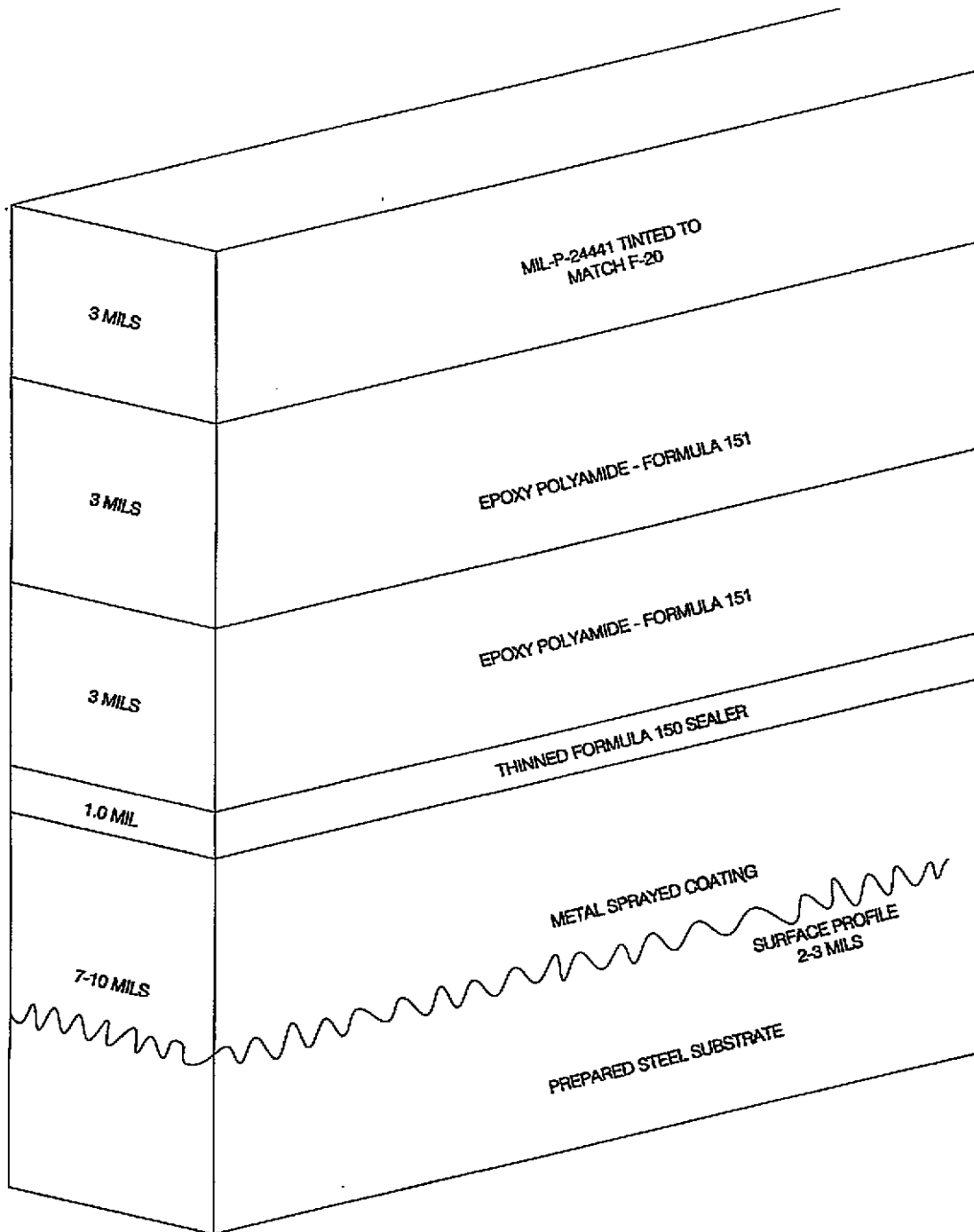
For DDG 78 and Follow, areas under false decks may be coated with two coats of an epoxy system conforming to MIL-P-24441 (including primer) in lieu of three coats.

The coating system that is used as the standard is the epoxy polyamide paint (MIL-P-24441). This coating is designed to provide a high-dielectric, hard, durable, chemical-resistant, and non-porous film. The coating provides a superior barrier and exceptional service in wet spaces. The epoxy polyamide paint system differs from conventional paints in that each formula consists of two components (a polyamide resin-containing portion marked component A, and epoxy resin-containing portion marked component B) that must be mixed together.

The epoxy system is usually applied in two or three coats. However, since epoxy coatings are moderately sensitive to light and subject to mottling and chalking, silicone alkyd paints are frequently used as the top coat for exterior service. Epoxy paint formulations suitable for priming and for topcoats are available as follows:

The standard coatings over System 2 are as follows:

- a. Primer Coats - One coat of Formula 150 and one coat of Formula 151 over Metal Spray Coating to produce minimum DFT of 5 mils. Paint applied to produce approximately 3 MILS DFT per coat.
- b. Finish Coating - (Cosmetic) to match surroundings (see Figures 3-3 and 3-4).



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Figure 3-3. System 3, Epoxy Polyamide, Used Over System 2 (MSC) with Low Temperature Sealer, Horizontal Surface

Table 3-2. MIL-P-2441 Coatings

Formula Number	Color	Type
150	Green	Primer
151	Haze Gray No. 27	Topcoat
152	White	Topcoat
153	Black	Topcoat
154	Very Dark Gray	Topcoat
155	Dark Gray	Topcoat
156	Red	Topcoat

3-3.3.2 Recoating of Dielectric Paint Systems. General guidance for recoating of the paint system is as follows:

- a. Old paint in good condition is a good base for recoating when properly cleaned, degreased and abraded
- b. If the old paint is blistered or peeling, or shows effects of corrosion or disintegration, it should be removed down to bare metal
- c. The surface to be painted must be completely free of moisture, oil, dust and other contamination
- d. To recoat a small area or component, the old paint should be removed back to a point where a tight coat exists with no rust or blistering. The intact paint around the area to be recoated should be feathered. Feathering can be accomplished by hand-sanding. Recoating an area without feathering will result in paint breaking at the "cliff" due to shrinking, damage, or minute air spaces, and a resumption of the original coating failure problem (See Figure 3-5)
- e. To recoat metal sprayed coating areas, the surface shall be mechanically cleaned to the first sound layer of paint or sound metal of the MSC layer

f. Mixing and application instructions provided on the containers for the various coatings should be followed exactly

g. Interior fittings are usually topcoated (final) to match the structure surrounding their stowed position.

3-3.3.3 Application of Epoxy Polyamide System. Requirements for applying the epoxy polyamide system are as follows:

- a. The surface to be painted must be clean and free of oil, dust, moisture and contamination such as grit particles. Never paint over loose or badly cracked paint. When painted surfaces show signs of corrosion, peeling, blistering, chalking or general breakdown, remove the old paint down to bare metal before repainting. See Table 7-1.
- b. Areas contaminated with oil or grease should be cleaned with solvent. See Table 7-1.
- c. The MIL-P-24441 coatings are supplied as two components that must be mixed individually and then together before use. the mixing ratios of the MIL-P-24441 coatings are all 1:1 by volume, e.g., 5 gallons of

MIL-P-24441 component A to 5 gallons of MIL-P-24441 component B.

NOTE

The individual components of the various formulas are not interchangeable.

d. Each component must be thoroughly stirred before being mixed together. After equal volumes of the two components are mixed, this mixture must again be thoroughly stirred until well blended. The induction time is defined as the time immediately following the mixing together of components A and B during which the critical chemical reaction period of these components is initiated. This reaction period is essential to ensure the complete curing of the coating. See Table 3-3 for induction times.

e. The approximate temperature of the paint components in storage should be estimated in order to judge the amount of induction time to allow and the pot life that might be expected. The job site application temperature will greatly affect the time required for the paint to cure and must be considered in estimating induction time, cure time, and the effect of batch size on these functions.

f. MIL-P-24441 coatings may be applied by rushing, roller coating or spraying. During maintenance painting, brush application is recommended for the first coat of paint over mechanically cleaned surfaces such as handcleaned bilges. The brushing effort forces the paint into surface irregularities and acts to displace any traces of surface contaminants.

g. The MIL-P-24441 paints do not require thinning before application. If paint has thickened appreciably during cold-temperature application, up to 1-pint of Ethylene Glycol Monoethyl ether EGM per gallon of mixed paint may be added, if

desired. When applied at the proper thicknesses, without thinning, these paints will have no tendency to sag.

h. MIL-P-24441 paints may be sprayed with the normal spray guns and normal spray-pot pressures. The spray gun should be equipped with a middle-size ("D") needle, nipple and nozzle setup. Both conventional and airless spray equipment are suitable for use.

i. Since epoxy paints cure with time due to an internal chemical reaction, the paint should not be allowed to remain in spray equipment for an extended period, especially in the sun or a warm area. Increasing temperature cures the paint more rapidly. When components A and B are mixed together, the pot life of the mixture (including the induction time) is 6 hours at 70° F. Pot life is longer at lower temperatures and less than 6 hours at temperatures above 70° F.

j. Spray equipment should be cleaned after use by flushing and washing with EGM ether solvent. General cleanup is also accomplished by using EGM ether solvent. Brushes and rollers should be given a final cleaning in warm, soapy water, rinsed clean with warm fresh water, and hung up to dry.

3-3.4 SYSTEM 4: POWDERED EPOXY COATING; FLUIDIZED BED AND ELECTROSTATIC SPRAY APPLIED.

DDG 52-74: Annex A1 of ASTM A775.

DDG 78: Annex A1 of ASTM A775 or polyester MIL-C-24712. Electrostatic spray application may be utilized on a case basis for larger items where fluidized bed is not practical.

3-3.4.1 System Description. Powder coatings are approved for interior and exterior applications on steel surfaces above the upper limit of boot topping. Powder coating systems are used in areas that are difficult to maintain or for components and equipment that are subject to severe moisture, wear or abrasion. The coating is applied in powder form either by electrostatic deposition or by the fluidized bed process, and

heat-fused onto the surface of the metal. This system is normally applied by an industrial activity.

For DDG 78, electrostatic spray application may be utilized on a case basis for larger items where fluidized application is not practical.

In the fluidized bed process, the typical application equipment consists of a dip tank with a perforated shelf near the bottom. The powder is placed on this shelf and low-pressure air is fed under the shelf, creating a fine cloud of powder in which electrically charged particles do not stick together, but behave like a fluid. The electrostatic attraction draws the charged particles to all surfaces of the grounded work piece, front and back, and into depressions and irregular contours. Another technique used in the fluidized bed process, rather than the electrostatic means, is to heat the work piece to approximately 400° F and then dip it into fluidized bed.

For electrostatic spray applications, the powder particles are fed in an air stream from a tank or hopper to a spray gun. At the nozzle of the spray gun, the particles are given a charge by an electrode connected to a power supply. The charged particles are then sprayed on to the electrically grounded piece to be coated. The particles are carried to the work piece by air pressure and adhere because of the electrostatic attraction between the charged particles and the grounded work piece. The electrostatic attraction draws the charged particles to all surfaces of the work piece, front and back and into depressions and irregular contours.

For both processes, the particles coat the work uniformly and adhere for a period of several hours. During this time, the work is placed in an oven operating at 50° F to 68° F above the melting point of the coating powder. The particles melt, flow together and form a thick, tough, tightly adhering and uniform film. This forms a dense barrier coating that will prevent moisture penetration. Fluidized bed application shall be used unless specifically stated.

There are several coatings that can be applied by this process, including polyvinyl chloride, polyethylene, polyester, epoxy, acrylic and nylon. The epoxy systems are approved for use at this time. Epoxies offer superior corrosion and

chemical resistance. A slight loss of color and gloss can occur with prolonged exposure, but this does not degrade corrosion protection.

Epoxy powder coating has been used on the following: Shore discharge sewage bracket; FAS station gageboards; vent screens and frames; electrical connection, switch, terminal and junction boxes and lockers, cabinets and similar containers exposed to weather or interior humid environments.

3-3.4.2 Coating Thickness. The epoxy powder shall be capable of providing a cured coating of 20 to 25 mils for fluidized bed and 6 to 10 mils for electrostatic spray.

3-3.4.3 Procedure. The coating system is applied in accordance with the following guidance:

- a. The surface to be coated must be clean and free of oil, dust, moisture and other contamination. A near-white metal surface (SSPC-SP10), described in Section 8.2.1.1 is required
- b. If parts to be blasted contain oil or contamination, heat the part at 450° F for 1-hour in the oven. Allow part to cool to room temperature before blasting
- c. The powder coating shall approximate haze gray or other approved colors, and shall be applied in accordance with manufacturer's instructions.

3-3.4.4 Powder Coating Touch-Up. To repair cuts to or wear through of the powder coating and exposures of the substrate:

- a. Surface preparation for paint touch-up
 1. Degrease as required
 2. Using a paint scraper, push the blade underneath the powder coating to lift off all loosely bonded coating until a good bonded area is reached
 3. Using a portable power wire brush, clean steel metal. Feather 2

to 3 inches into the undamaged area by hand-sanding.

b. Surface preparation for powder coating system touch-up to large areas

1. Degrease as required
2. Abrasive-blast area to be repaired with 16 to 30 mesh aluminum oxide to near white metal (SSPC-SP10) to give a 2 to 3 mil surface profile. Feather (by sanding) 2 to 3 inches into the good coating area.

c. Apply epoxy primer and finishes required to match area in accordance with MIL-P-24441.

3-3.4.5 Health and Safety Precautions. The blaster shall wear necessary protective clothing and proper safety equipment, e.g., goggles, face shields, and respirators (dust type for exterior or air-fed for interior). All other personnel subject to blast dust environments shall wear monogoggle and dust filter respirators.

3-3.5 SYSTEM 5: CERAMIC COATINGS (MIL-C-81751).

3-3.5.1 System Description. In System 5, ceramic coatings provide corrosion and oxidation protection to carbon steel components, such as nuts, bolts and fittings. System 5 is an inorganic coating formula consisting of an aqueous (water) binder solution containing aluminum powder pigmentation. The particle size is about 5 to 10 microns. Chromates surround the aluminum particles and inhibit their natural tendency to corrode. The system contains phosphates that have been added to improve adhesion to the metal being coated. This coating is normally applied to fasteners at 1.0 to 1.5 mil thickness where tolerance requirements exist such as fasteners or machined surfaces, or 1.5 to 4.0 mil thickness where the system is used without tolerance limitations. Thickness on fastener threads shall be 0.4 to 0.7 mils.

3-3.5.2 Procedure. This process must be performed by a licensed commercial source. Coating of parts when specified can be performed by a company that is qualified under MIL-C-81751.

3-3.5.3 Intended Use. Ceramic coatings are intended for all carbon and alloy steel fasteners of Grade 5 and below greater than 3/8-inch diameter and components with surface smoothness interface tolerance or similar limitations exposed to marine environments. The following shall not be coated with ceramic coating:

- a. Surfaces subject to strong acids or bases
- b. Within 3/4-inch of surfaces to welded
- c. Steel alloys with a yield strength of greater than 120,000 lb/square-inch
- d. Exterior underwater hull surfaces
- e. VCHT tank interiors
- f. Materials other than steel alloy surfaces.

3-3.5.4 Ceramic Coating Touch-Up. To repair cuts or worn through areas of ceramic coatings or for general breakdown of the coating, degrease as required and hand sand to remove all corrosion products. Reseal by priming the damaged area with epoxy polyamide Formula 150 primer. Apply finish coatings to match surrounding area.

3-3.5.5 Health and Safety Precautions. This coating is highly toxic and it requires care in handling. Contact with eyes, skin and mucous membranes, and ingestion should be avoided. While spraying, the mist of the atomized coating should not be inhaled. Well ventilated spraying areas with a high exhaust rate 150 cfm or greater should be used, and respirators should be worn. For all Navy applications, this coating should be applied by commercial sources.

Table 3-3. MIL-P-24441 Induction Table

Ambient Temperature at Job Site	Induction Time (Stand-in-Time) at Job Site ¹
35 to 50° F	2 hours at 70° F ²
50 to 60° F	2 hours
60 to 70° F	1 - to 1-1/2 hours
70° F and above	1/2 - hour to 1-hour

¹ The induction times listed are approximations and are based on a 10-gallon batch. Smaller batches require a longer induction time.

² When MIL-P-24441 paints are used at a job site having temperatures in the range of 35° to 60°, it is essential that a 2 hour induction period in a warm, 70 degrees area is used to ensure that the coating will fully cure. When the induction period is completed, the paint is then carried to the job site. To ensure that the reaction proceeds uniformly, the paint must be stirred periodically during its induction period to avoid localized overheating, or "hot spots" within the paint mixture.

Table 3-4. Recommended Curing Times for MIL-P-24441 Paints

Ambient Temperature Range (°F)	Minimum Drying Time Between Coats ^{1,2} (Hours)	Minimum Curing Time for Topcoat (Final Coat) Before Placing in Service ³ (Hours)
35 to 40	24	144
41 to 60	18	120
61 to 80	12	96
81 to 100	8	64
101 to 120	6	32

¹ These minimum curing times should always be adhered to, unless otherwise specified in NSTM Chapter 631, which will take precedence. When two thin layers (no more than 1 to 2 mils DFT each) of Formulas 150 to 151 of the epoxy system are required to be applied on the same day to meet production schedules, the second layer may be applied over the first after 6 hours cure time of the first layer has elapsed provided the temperature range is within 61 to 100° F. A minimum of 16 hours will be required at 41 to 60° F.

² When other paints, such as Formula 20 or TT-E - 90, are to be applied over epoxy paint coats, they must be applied while the epoxy paint is still tacky.

³ An epoxy paint system should have a minimum curing time of 7 days prior to being placed in service. Documentation should be made on the ship docking report regarding epoxy paint-coated ship areas that require flooding within less than the minimum recommended curing time.

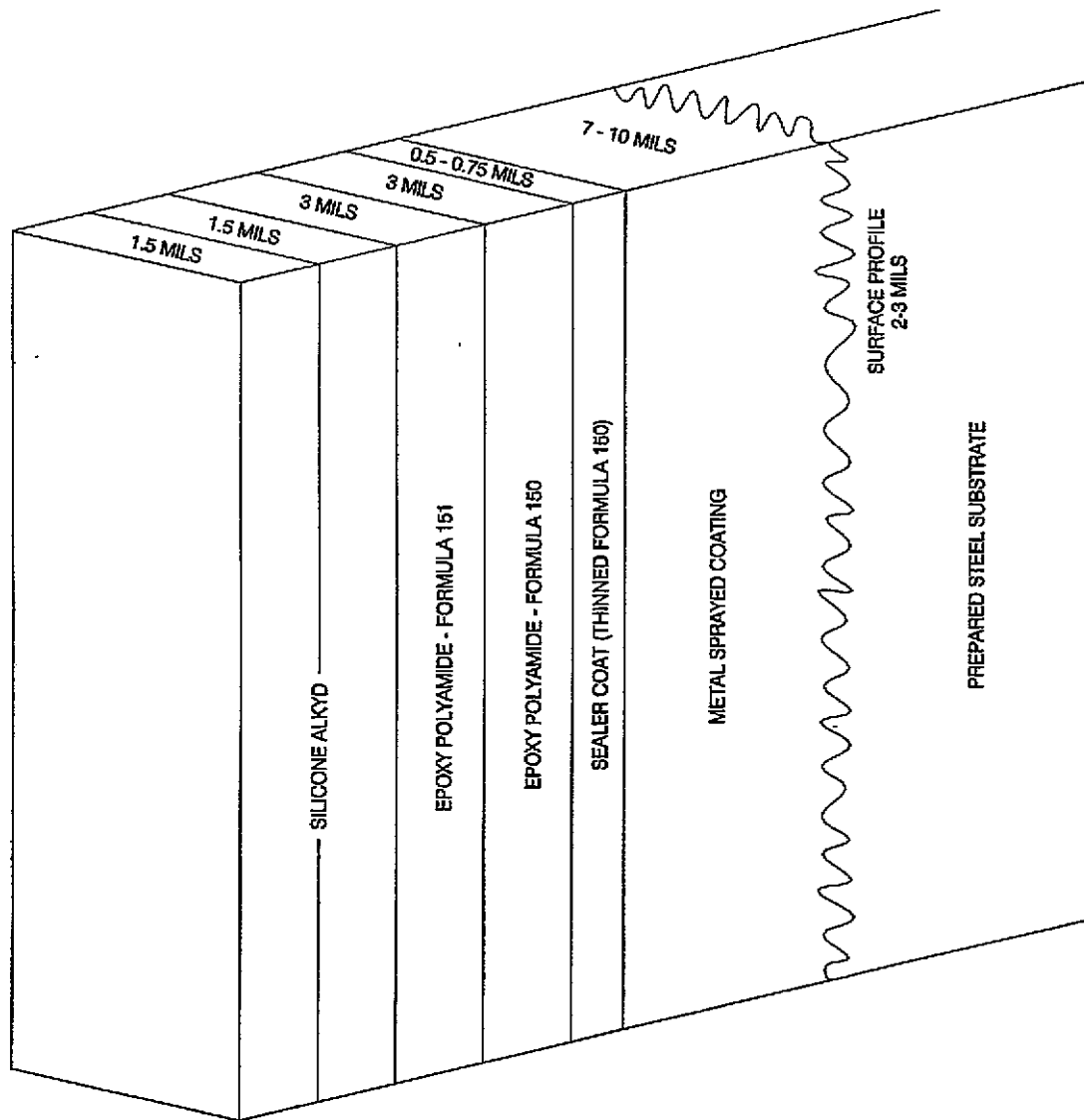


Figure 3-4. System 3, Epoxy Polyamide, Used Over System 2 (MSC) with Low Temperature Sealer, Vertical Surface

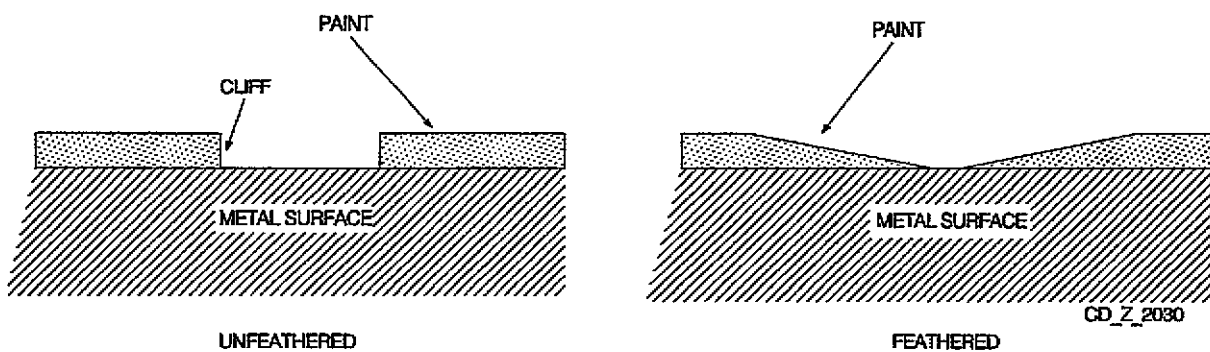


Figure 3-5. Feathering Edges of Old Paint

3-3.6 SYSTEM 6: ANTI-SEIZE THREAD COMPOUND (MIL-T-22361).

3-3.6.1 System Description. This system is a zinc dust-petrolatum thread compound. The compound is intended to prevent seizing during the assembly or disassembly of threaded components that are engaged with components made from similar or dissimilar metals. The compound also acts to provide corrosion protection for the metal surfaces. MIL-T-22361 is the applicable military specification.

3-3.6.2 Procedure. Apply a liberal coating of the compound to each of the components being joined. Under low temperature conditions (less than 30° F), the compound hardens and will be difficult to apply. It should be kept at room temperature for 24 to 48 hours before use in near-freezing weather.

3-3.6.3 Intended Use. This system shall be used for all fasteners subjected to temperatures less than 100° F where polysulfide thread sealant (System 8) is not used. It is intended for use on items disassembled by ship's force. Where Grade 5 ceramic coated or CRES 316 fasteners are installed in the weather or in high humidity or wet spaces and subjected to temperatures less than 100° F, apply anti-seize compound, MIL-I-22361, to bolt threads and shank. Do not apply antiseize compound to Inconel, Monel, K-Monel, or Grade 8 steel fasteners or where polysulfide thread sealant is specified for fastener threads.

3-3.7 SYSTEM 7: CLEAR WATER DISPLACING CORROSION PREVENTION COMPOUND MIL-C-85054.

3-3.7.1 System Description. System 7 is a dry, clear, water-displacing corrosion-prevention compound (MIL-C-85054). System 7 will not prevent corrosion beyond a few weeks, but it is used where servicing, such as plugging/unplugging connections or removal of inspection cover plates is frequent. The compound may be applied from gas-pressurized containers. This material will displace light saltwater moisture, leaving a clear, corrosion-preventive film.

System 7 is intended for use by ship's force on metal areas that are unpainted, or where the paint is cracked or damaged, such as around multipin electrical connectors, joints, seams and access panels. It is not intended for use on moving parts where a lubricated surface is required. It is primarily intended for in-service use.

3-3.7.2 Procedure. System 7 is applied as follows:

- a. Wipe off dirt and excess moisture from the surface to be protected before applying the corrosion-prevention compound
- b. Apply a thick, uniform coat of corrosion-prevention compound directly on the area to be protected
- c. Allow 1/2-hour drying time
- d. Apply a second uniform coat of compound
- e. Application by wiping is not recommended. The compound must be reapplied when the surface is cleaned with a solvent or when the coating is damaged by abrasion
- f. The compound may be removed by using JP-5, DFM or isopropyl alcohol.

3-3.7.3 Health and Safety Precautions. The aerosol propellants may be low-boiling halogenated hydrocarbons or other hydrocarbons that are flammable, such as propane or isobutane. The contents of the aerosol-type pressured containers are under pressure, and exposure to heat may cause bursting of the dispensers. The propellants in higher concentrations are anesthetic, asphyxiating or extremely flammable. The decomposition products may be corrosive, irritating or toxic in contact with flames or hot metal surfaces.

During stowage of pressure-packaged dispensers, the following requirements shall be observed:

- a. Inside stowage shall be in the flammable liquids storeroom
- b. Stocks of ship's stores aerosol items where approved shall be stowed in the flammable liquids storeroom
- c. Containers shall be protected against physical damage
- d. Containers shall not be stowed at temperatures above 120° F or adjacent to steam lines, hot surfaces or heat sources
- e. Ready-usage stocks located at work areas shall not exceed three containers of any one product

During the use and handling of pressure-packaged materials the following precautions shall be observed:

- a. Keep containers away from steam lines, electronic equipment, hot water and other heat sources
- b. Avoid prolonged exposure to sunlight
- c. Avoid contact of spray or residual liquid with eyes, skin or clothing
- d. Avoid prolonged or repeated inhalation of aerosol spray or vapors of residual liquid
- e. Do not disperse spray in presence of flames, hot surfaces or other sources of ignition or thermal decomposition
- f. Do not contaminate food or food products with spray
- g. Avoid accumulation of wetted rags or clothing that may be subject to spontaneous heating or ignition. Ignition may be initiated by the temperature of low-pressure steam pipes, the surfaces of incandescent light bulbs, sunlight or any other heat source
- h. Avoid accumulation of toxic or flammable concentrations of aerosol spray or vapors in the air.

Containers received from stock or from outside sources will normally be labeled nonflammable,

combustible, flammable or extremely flammable, depending upon the relative hazard of the propellant or other materials contained in the dispenser. Material labeled extremely flammable shall not be stored or used onboard ships unless required for a specific end use and only when authorized by the cognizant division officer. Most formulations contained in aerosol spray cans are capable of forming flammable or explosive vapor-air mixtures when dispersed as spray under conditions of use. For disposal, the following requirements shall be observed:

- a. Do not incinerate or puncture
- b. Whenever possible, empty containers shall be stowed and disposed of ashore.

3-3.8 SYSTEM 8: POLYSULFIDE THREAD SEALANT (MIL-S-81733, TYPE I).

3-3.8.1 System Description. System 8 is a sealing and coating compound recommended for use on fasteners that are not expected to be disassembled until SRA. The polysulfide sealant has corrosion-inhibitive chromates added to help protect the metal against any moisture that may ultimately penetrate the barrier. It is a two-part system that cures at room temperature to form a resilient (rubber-like) coating that adheres well to steel, aluminum and other metals. MIL-S-81733 is the applicable military specification. The Type I sealing compound under this specification is suitable for application by brush, dipping or beading. Types II and III are not included in this manual. Dash numbers are used to designate time in hours in which the compound can be used after mixing. Type 1-1/2 designates a material that, after mixing, will remain suitable for application for one-half hour. Type I-2 (2-hour life) is generally the most useful.

DDG 52 - DDG 74. Corrosion control methods shall not degrade the bonding and grounding requirements of NAVSEA drawing 300-6597363.

DDG 78. The installation control drawing fastener selection lists and grounding and bonding installation procedure, NAVSEA drawing 0D32382 shall prevail.

3-3.8.2 Procedure. The sealant is applied in accordance with the manufacturer's direction and the following general guidance:

- a. The surfaces to be protected must be cleaned with solvents just before the sealant is applied to remove dirt, grease, and other contamination. A small area at a time should be cleaned and dried with a clean cloth
- b. The system is packaged in a kit that contains the proper proportions of base compound and accelerator
- c. The base compound should be thoroughly mixed to obtain a uniform consistency before adding the accelerator. The accelerator should also be mixed thoroughly in its container
- d. The accelerator is stirred into the base compound and thoroughly mixed for 5 to 7 minutes. It is important to scrape the sides and bottom of the container and the mixing paddle to be sure blending is uniform
- e. For a 75° F temperature and 50 percent humidity work environment, the application life is 1/2 - hour. For every 10 to 15° F rise in temperature above 75° F, the application life is cut in half (approximately); for every 10 to 15° F drop below 75° F, the application life is doubled (approximately). If the humidity is high during the mixing time, the application life is shortened
- f. The sealant can be applied with a brush, using parallel strokes over seams and a circular motion around fasteners, making sure to force the sealant into all small gaps or crevices. The sealant is used either as an overcoat to help feather or smooth out fillets, or as a sealant around metal fasteners and over seams
- g. Bolts, studs and nuts are dipped in the sealant to liberally cover the threads, shank and underside of the bolt head. The hole should also be filled with the sealant. Applying large quantities to both fastener and hole will ensure that all surfaces are

protected. The fastener should be installed immediately after coating and torqued to the proper tightness

- h. For Grade 8 steel and Inconel bolts installed in the weather, in high humidity areas, or in wet spaces, after installation of bolts is complete, coat bolt heads, nuts, and exposed bolt threads with polysulfide sealant, MIL-S-81733, Type 1 (use two coats for DDG 78). Epoxy paint, MIL-P-24441/1, Formula 150, shall be applied to dried polysulfide sealant
- i. Equipment requiring special bonding and grounding shall have polysulfide sealant (System VIII) applied, after assembly, to bolt heads, exposed bolt threads, nuts and equipment or foundation flanges immediately adjacent to fasteners. Polysulfide sealant (System IX) shall be applied to exposed edges of the bond interface after equipment installation. Apply epoxy paint, MIL-P-24441, and appropriate topcoats after the polysulfide sealants have dried
- j. Tools can be cleaned by using 1,1,1 trichloroethane (inhibited methyl chloroform) in a ventilated area.

3-3.8.3 Surface Preparation. Solvent degreasing shall be in accordance with Section 8.2.4.

3-3.8.4 Health and Safety Precautions. The following items are only a few of the health and safety precautions listed in NSTM Chapter 631. Refer to NSTM Chapter 631, Section 2, for more complete coverage of health and safety precautions.

The sealant contains flammable and volatile solvents. It should be kept away from heat, sparks and flame. The accelerator contains a chromium compound and harmful vapors and is readily absorbed through the skin. All contact with the body should be avoided by using polyethylene gloves, goggles, and adequate ventilation. Hands should be washed well before eating or smoking. If the accelerator contacts the skin, the area should be flushed with warm water.

The Type I sealant contains methyl ethyl ketone and toluene (extremely flammable). Adequate ventilation or air-supplied respirators are necessary during application. Repeated or prolonged breathing of vapors must be avoided.

3-3.8.5 References. Before using polysulfide thread sealant (MIL-S-81733, Type 1), the following publications should be thoroughly reviewed:

- a. Procedures - NSTM Chapter 631
- b. Precautions - NSTM Chapter 631.

3-3.9 SYSTEM 9: POLYSULFIDE SEALANT (MIL-S-81733, TYPE IV).

3-3.9.1 System Description. System 9 is a corrosion-inhibitive sealing compound. The polysulfide sealant has soluble chromates to help protect the metal against any moisture that may ultimately penetrate the barrier. The sealant is intended for use only as a sealing compound at faying surfaces where metals are joined or fastened tightly together. This is a two-part system that will only cure in a joint in the absence of air. The curing process forms a resilient seal and will adhere well to steel, aluminum and other metals. MIL-S-81733 is applicable military specification. The Type IV sealing compound under this specification is suitable for application to faying surfaces by spatula or gun. Dash numbers are used to designate the minimum application time in hours. Type IV-12 designates a faying surface sealant that, after mixing, will remain suitable for application for 12 hours. Types IV-12, -24, -40 and -48 are available. This system shall not be applied to faying surfaces where it would conflict with the bonding and grounding requirements. Where conflict exists, the bonding and grounding requirements shall take precedence.

3-3.9.2 Procedure. The sealant is applied in accordance with the manufacturer's direction and the following general guidance:

- a. The surfaces must be abrasive-blasted to near-white-metal (see Section 8.2.1.1). Dirt, grease and other contamination shall be removed by solvent degreasing. Only oil-free

solvents such as 1,1,1 trichloroethane can be used (see Section 8.2.4)

- b. The system is packaged in a kit that contains the proper proportions of base compound and accelerator
- c. This sealant mixes differently than other two-part polysulfide sealants. Proper mixing and correct proportions are extremely important if proper results are to be obtained. The mixing instructions provided with the sealant must be followed exactly
- d. It is mandatory that the material be maintained at 75° F or lower throughout the mixing operation and kept out of direct sunlight until application
- e. The sealant may be applied by spatula or gun
- f. All work on the faying surfaces must be completed and the fasteners made tight before the assembly life of the sealant expires
- g. To be sure that no path for leakage remains through the sealant and that the surfaces are fully sealed, a small continuous bead of sealant should be applied on both sides of the overlap when the fasteners are made tight
- h. Tools can be cleaned by using a chlorinated solvent such as 1,1,1 trichloroethane
- i. Unmixed sealant must be stored at temperatures below 80° F.

3-3.9.3 Surface Preparation. Solvent-degreasing shall be in accordance with Section 8.2.4.

3-3.9.4 Health and Safety Precautions. The following items are only a few of the health and safety precautions listed in NSTM Chapter 631. Refer to NSTM Chapter 631, Section 2, for more complete coverage of health and safety precautions.

The sealant accelerator contains a chromium compound. All contact with the body should be avoided by using polyethylene gloves, goggles and adequate ventilation. Hands should be

washed well before eating or smoking. If the accelerator contacts the skin, the area should be flushed with warm water.

The Type IV sealant contains toluene (extremely flammable). Adequate ventilation or air supplied respirators are necessary during application. Repeated or prolonged breathing of vapors must be avoided.

3-3.9.5 References. Before using polysulfide thread sealant (MIL-S-81733, Type 1), the following publications should be thoroughly reviewed.

- a. Procedures - NSTM Chapter 631
- b. Precautions - NSTM Chapter 631.

3-3.10 SYSTEM 10: PROTECTION OF ELECTRICAL CONNECTORS WITH FILLER TAPE (MIL-I-17695) AND SHRINKABLE SLEEVING (MIL-I-23053).

3-3.10.1 System Description. The following three systems are for protecting topside electrical connections and are especially useful for multi-pin or cannon-plug connections on electronic equipment, such as interior communications or radio handsets, fire-control devices, and other electrical, radar or radio components. The systems are discussed in order of preference: heat shrinkable tubing, sealant with vinyl tape, and vinyl tape with putty. Variations and combinations of each may be used to suit the particular situation. Each is easy to remove with either a knife or moderate heat and a knife.

For DDG 59 and follow, moisture barrier in electrical equipment connections that are exposed to the weather may be accomplished as follows. The preferred method utilizes 3M cold shrink components as required, including top hats, Scotch 130C electrical tape, where required and cold shrink connector covers. An alternate method, employing filler tape conforming to MIL-Spec MIL-I-17695, and electrical heat shrinkable sleeving conforming to MIL-Spec MIL-I-23053, may be utilized. Where the installation of small angle connectors precludes the use of the preferred or alternate methods indicated above, a 3M brand tape and Scotch-Kote wrap and sealing method may be utilized.

3-3.10.2 Heat Shrinkable Tubing. The heat shrinkable tubing is rubber-sleeving material that is flexible, noncorrosive and thermally stable. The standard material conforms to MIL-I-23053. This method will provide significant corrosion protection, but requires tailored ordering and some additional, but modest equipment.

Install the sleeve to cover the entire connector including the rotating cap. After completely tightening the connector, heat the sleeve to not more than 250° F using a cool torch or electrical heat gun. The sleeve will shrink to fit the connector, and at the same time, an adhesive in the sleeve will soften, thereby, providing additional corrosion protection.

If the connector must be disconnected frequently, as is done for radio and IC handsets, do the above step for only the nonrotating parts. The cap should be treated with water displacing clear corrosion prevention compound (MIL-C-85054) at each reinstallation.

3-3.10.3 Sealant with Vinyl Tape. This system consists of brushing on a fast-drying sealant over vinyl tape. The vinyl tape overlaps the connector approximately 3 inches and is sealed with two coats of the fast drying sealant. If the cable is unprotected, double wrap the connection (first with a silicone rubber tape and secondly with the standard vinyl insulation tape).

3-3.10.4 Vinyl Tape and Putty. This system uses a special insulation compound which is further covered by tape. Tightly wrap the connection using a suitable insulation putty or caulking compound; include at least 3 inches of cable. While wrapping, stretch the insulation tape to 1/2-inch thickness and apply at least four overlapping layers. If the caulking compound is used, allow it to harden before the next step.

For either the tape or caulk, cover with three layers of tightly drawn vinyl electric tape. As for the shrinkable tubing, modify as needed to suit the permanency of the connection.

3-3.11 SYSTEM 11: PLASTIC DIELECTRIC BARRIER OF ACRYLONITRILE BUTADIENE STYRENE (MIL-P-19904); MIL-T-2314 AND 3M PN51.

3-3.11.1 System Description. In System 11, a dielectric barrier of ABS (acrylonitrile butadiene styrene) MIL-P-19904 or insulating tape (MIL-I-24391A) is used to provide a dielectric barrier between metal surfaces such as between a label plate and a metal bulkhead. The main purpose of separation is to provide discontinuity of conductance between two dissimilar metals when in direct contact with moisture and air at their faying surfaces.

Material used to provide dielectric separation should not be porous to the degree the water or other electrolytes will be absorbed or retained. Dielectric materials are good electrical insulators. Selection of material should be based on the environment. The more aggressive the conditions and wider EMF potential, the higher is the required ohmic resistance. ABS plastic and insulating tape generally satisfy the requirements of a dielectric barrier for topside use. The required thickness of the insulating tape is specified as 20 mils minimum for steel/aluminum-faying surfaces. For DDG 78, Teflon washers may be used.

3-3.12 SYSTEM 12: VAPOR PHASE INHIBITOR (CORTEC VCI: NAVSEA Drawings 630-7060942, 630-7060949).

3-3.12.1 System Description. System 12, Vapor Phase Inhibitor (VPI), is intended as a preservation for ferrous, aluminum, aluminum-base alloys, and components in closed or low air flow spaces. When VPI material is exposed, it sublimates into a vapor which penetrates through the spaces to all exposed metallic surfaces. On contact with the surface, the vapors condense into a highly protective, invisible molecular film which provides corrosion resistance. As a rule, the application of vapor phase inhibitors must be in confined areas with limited air flow such as tool boxes, lockers and small containers.

3-3.12.2 Procedure. Vapor phase inhibitors can be applied by powder contained in a sponge or tablet, as impregnated into paper or plastic. As per manufacturer's instructions, apply vapor phase material to space specified where it will not be disturbed. There is virtually no maintenance expense for life of this product and it has virtually no effect on physical properties of protected equipment. In the case of tools and

similar items which must be handled, the residue should be wiped off before using.

3-3.12.3 Safety and Health Precautions. The safety and health precautions listed by the manufacturer should be carefully followed.

3-3.13 SYSTEM 13: STRIPPABLE COATING COMPOUND (MIL-S-8802).

In System 13, a synthetic rubber compound is used as a strippable coating for fasteners and similar components for corrosion protection when these components for corrosion are exposed to marine environments. It is a two-part system that cures at room temperatures to form a resilient coating that adheres well to steel, aluminum and other metals. MIL-S-8802 is the applicable specification. The Class A compound is intended for brush application; Class B compound is intended for application by gun or spatula; Class C compound is suitable for faying surface sealing. Dash numbers used to designate time in hours which compound can be used in mixing. Available dash numbers are 1/2, 1, 2 and 4.

3-3.14 SYSTEM 14: IMPROVED FASTENERS FROM CRES 316, MONEL, K-MONEL, INCONEL 718 OR OTHER CORROSION RESISTANT MATERIAL.

3-3.14.1 System Description. The term fasteners covers devices such as screws, bolts, nuts, rivets, inserts, studs, internally thread weld pads, threaded rod couplings, spring pins and other devices used to attach fittings and metal components together. Fasteners are subject to corrosion by direct attack, pitting, stress corrosion, and galvanic action. The initial selection of fastening techniques and fastener material does not always optimize corrosion resistance, but in many cases is decided on the basis of availability, commonality or stress requirements.

In every application it is essential that all components of a fastening system be compatible. For example, the use of a steel washer with a stainless steel or nickel-copper bolt and nut is a commonly observed incompatibility. The

galvanic series chart (Figure 2-2) indicates the relative potential for galvanic corrosion when noncompatible metals are used.

The most common fastening applications in structural areas are steel to steel, steel to aluminum alloys, and aluminum alloys to aluminum alloys. Table 3-5 provides, in order of preference, the fastener materials that generally meet strength requirements while providing the best resistance to corrosion, especially galvanic corrosion. For steel-to-steel applications where high strength is required, low-alloy steel fasteners, such as Grade 5 of MIL-S-001222G coated with ceramic coating system described in System 5, or Grade 8 shall be used.

3-3.14.2 References. Additional information on fasteners can be found in NSTM Chapter 075.

3-3.15 SYSTEM 15: COSMETIC COATING.

3-3.15.1 System Description. Topcoats are used to enhance the cosmetic appearance of shipboard structures and equipment. The epoxy polyamide dielectric coatings described under System 3 are susceptible to chalking when exposed to sunlight for long periods. When these coatings are applied to external surfaces, one of the following topcoats is chosen:

- a. TT-E-490: Silicone alkyd enamel used on vertical surfaces
- b. DOD-E-699: Silicone alkyd enamel used on horizontal surfaces (Formula 20)
- c. For DDG 78 only. MIL-E-24635 Type II Class 2 formula to be used only on vertical (slanted), exterior topsides of the ship, from

the boot-top up with the exception of the mast.

3-3.15.2 References. Before using the cosmetic coating systems, the following publications should be thoroughly reviewed for proper procedures and precautions.

- a. NSTM Chapter 631
- b. NSTM Chapter 634.

3-3.16 SYSTEM 16: NON-CORROSIVE MATERIALS INCLUDING MANGANESE BRONZE, NICKEL ALUMINUM BRONZE, SILICONE BRONZE, NICKEL COPPER (MONEL) AND CRES.

Non-corrosive materials are used in areas where a change in material composition will enhance equipment appearance and operation. Materials such as CRES 316, copper-nickel alloys, bronze, brass, nickel-copper alloy (Monel), glass reinforced polyester (GRP), Polyvinyl Chloride (PVC) and Kevlar are considered non-corrosive materials. In many cases, items such as hasps, hinges and locking and bolting mechanisms can be manufactured from an alternative material without affecting the operation of the mechanisms. Material changes for load-bearing components and structures were coordinated during design and construction to ensure that mechanical properties of the material are not degraded by the material change. Some examples of non-corrosive materials and their specific use are shown in Table 3-6.

Table 3-5. Fastener Materials for Joining Metals

Fastener Material to be Used (in descending joined priority)

Metals Being Joined	3/8" Dia or Less	Greater than 3/8" Dia
Steel and Steel	1. CRES 316 Alloy 2. CRES 304 Alloy 3. Nickel-copper 4. Other 18-8 CRES	*1. Steel with ceramic coating 2. CRES 316 alloy 3. CRES 304 alloy 4. Nickel-copper (Monel) 5. Other 18-8 CRES alloys
Steel and Aluminum Alloys**	1. CRES 316 alloy 2. CRES 304 alloy 3. Other 18-8 CRES alloys	1. CRES 316 alloy 2. CRES 304 alloy 3. Other 18-8 CRES alloys
Aluminum Alloys and Aluminum**	1. CRES 316 alloy 2. CRES 304 alloy 3. Other 18-8 CRES alloys	1. CRES 316 alloy 2. CRES 304 alloy 3. Other 18-8 CRES alloys
Nickel-copper and Nickel-copper (Monel) or steel	1. Nickel-copper (Monel)	1. Nickel-copper (Monel)

*Ceramic coating in accordance with System 5.

**Aluminum alloy fasteners are not approved.

Table 3-6. Some Non-Corrosive Materials

Material	Use
Bronze, Brass	Air Escape Vent Screens
CRES 316	CCOL Holders
	Deck Light Mounting Fasteners, Hinges and Latches
	Diamond Plate Bow Anchor Chain Area
	Portable Rigid Lifeline Sections
	Turnbuckles
	Ventilation Exhaust and Intake Plenums
Copper Alloys	Low Pressure Air Fittings
Polyvinyl Chloride (PVC)	Deck Floodlight Shields

CHAPTER 4

TOPSIDE CORROSION PREVENTION SYSTEMS APPLICATIONS

4-1 GENERAL.

This chapter identifies all items of hardware located topside to which corrosion preventive guidelines apply. The topside areas of the ship have been divided into 10 inspection zones (see Table 4-1). All corrosion prone structures, surfaces or equipment in a particular inspection zone are itemized on the index for the zone. Each item on the list is assigned an index number. Items which occur in multiple topside zones are assigned Zone 10 index numbers.

4-1.1 INDIVIDUAL ZONE LINE DRAWING.

The inspection zones are shown on Figures 4-1 through 4-9. Zones 1-9 are specific areas; Zone 10 covers miscellaneous topside side areas. A plan view for each of Zones 1-9 has been prepared to show locations of the individual corrosion control systems. There is no line drawing for Zone 10 because it covers miscellaneous items which are shown in the individual topside zones.

4-1.2 INDIVIDUAL ZONE INDEX. This index shows in table form all corrosion control items located in each zone. There are two types of index numbers. Items unique to a zone will have an index number for the zone. Items that occur in more than one zone will have an index number 10XX. Tables 4-1 through 4-10 are an index listing of applications for each individual zone in the topside area of the ship.

4-1.3 CORROSION SUMMARY SHEET. A corrosion summary sheet has been prepared for every item. These are located either in the individual zone (if unique) or in Zone 10 (Miscellaneous Topside Areas), if the item appears in more than one zone. The summary sheet describes each problem area or component and lists exact locations. The type and extent of corrosion is given for a typical case and the

frequency of occurrence is indicated in general terms. The sheet describes early signs to look for and gives other guidelines pertinent to performing periodic inspection for corrosion damage. The summary sheet indicates corrective and preventive action that shall be taken and cites pertinent procedures and corrosion preventive systems covered by this manual.

4-1.4 SERVICE REQUIREMENTS AND LIFE CYCLE MAINTENANCE. Service requirements include preventive and corrective maintenance action which can be performed by the ship's force. Life cycle maintenance, other than the service requirements performed by the ship's crew and listed in each corrosion summary sheet, is generally performed at the Depot/IMA Level. The Ship Restricted Availability (SRA) and Regular Overhaul Maintenance (ROM) requirements are also performed at the Depot/IMA Level on an inspect and repair as needed basis.

4-2 TOPSIDE CORROSION PREVENTION SYSTEMS APPLICATIONS.**4-2.1 ZONE NO. 1, MAIN DECK, FRAME 370 TO STERN.**

- a. Plan view of the zone
- b. Index of applications in the zone
- c. Corrosion summary sheets for each item, including illustration where possible
- d. Ship service requirements.

4-2.2 ZONE NO. 2, 01 LEVEL, BOW TO FRAME 200.

- a. Plan view of the zone
- b. Index of applications in the zone

c. Corrosion summary sheets for each item, including illustrations where possible

d. Ship service requirements.

d. Ship service requirements.

4-2.3 ZONE NO. 3, 01 LEVEL, FRAME
202 - 316.

a. Plan view of the zone

b. Index of applications in the zone

c. Corrosion summary sheets for each item, including illustrations where possible

d. Ship service requirements.

4-2.7 ZONE NO. 7, 03 LEVEL, FRAME
109 - 315.

a. Plan view of the zone

b. Index of applications in the zone

c. Corrosion summary sheets for each item, including illustrations where possible

d. Ship service requirements.

4-2.8 ZONE NO. 8, 04 LEVEL, FRAME
126 - 301.

a. Plan view of the zone

b. Index of applications in the zone

c. Corrosion summary sheets for each item, including illustrations where possible

d. Ship service requirements.

4-2.4 ZONE NO. 4, 01 LEVEL, FRAME
316 - 388.

a. Plan view of the zone

b. Index of applications in the zone

c. Corrosion summary sheets for each item, including illustrations where possible

d. Ship service requirements.

4-2.9 ZONE NO. 9, 05 LEVEL, FRAME
130 - 289.

a. Plan view of the zone

b. Index of applications in the zone

c. Corrosion summary sheets for each item, including illustrations where possible

d. Ship service requirements.

4-2.5 ZONE NO. 5, 02 LEVEL, FRAME
111 - 228.

a. Plan view of the zone

b. Index of applications in the zone

c. Corrosion summary sheets for each item, including illustrations where possible

d. Ship service requirements.

4-2.10 ZONE NO. 10, MISCELLANEOUS
TOPSIDE AREAS

a. Miscellaneous items shown on plan views of other topside zones

b. Index of applications in the zone

c. Corrosion summary sheets for each items, including illustrations where possible

d. Ship service requirements.

4-2.6 ZONE NO. 6, 02 LEVEL, FRAME
228 - 320.

a. Plan view of the zone

b. Index of applications in the zone

c. Corrosion summary sheets for each item, including illustrations where possible

Table 4-1. Corrosion Control Zones

Topside/ Interior	Zone	Location	Paragraph	Figure
Topside	1	Main Deck: Frame 370 to Stern	4.2.1	4-1
Topside	2	01 Level: Bow - Frame 202	4.2.2	4-2
Topside	3	01 Level: Frames 202-316	4.2.3	4-3
Topside	4	01 Level: Frames 316-388	4.2.4	4-4
Topside	5	02 Level: Frames 111-228	4.2.5	4-5
Topside	6	02 Level: Frames 228-320	4.2.6	4-6
Topside	7	03 Level: Frames 109-285	4.2.7	4-7
Topside	8	04 Level: Frames 112-301	4.2.8	4-8
Topside	9	05 Level and Above: Frames 131-289	4.2.9	4-9
Topside	10	Miscellaneous Topside Areas	4.2.10	N/A

Table 4-2. Corrosion Control Zone 1 (See Figure 4-1)

Zone Number: 1		Location: Main Deck	Frame: 370 to Stern
Index Number	Description	Index Numbers for Other Zones	
0101	Not Used		
0102	Pallet Staging Area and Helicopter Tiedowns		
0103	Safety Net, Helo Deck		
0104	Stern Light Foundation		
0105	Vertrep Line-up Lights		
0106	Retractable Chocks and Bitts		
0107	SSGTG No. 3 Intake Room		
	<u>Problems Common to Other Areas:</u>		
	Air Escape Vents	1002	
	Alignment Bench Mark and Cover	1057	
	Baxter Bolts	1004	
	Bitts	1005	
	Bolted Grounding Straps	1006	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Cable Standoffs and Clips (Weather Exposed)	1008	
	Chocks	1009	
	Compartment Check-off List Holders	1011	
	Countermeasure Washdown Pipe Hangers	1012	
	Exhaust and Intake Vent Screens	1017	
	Fire Extinguisher Stowage Brackets	1019	
	Gas Turbine Intake and Exhaust Fasteners	1056	
	Gun Mount Foundations	1021	
	Jack and Ensign Staffs	1023	
	Kick Pipes and Stuffing Tubes (Weather Exposed)	1024	
	Label Plates (Weather Exposed)	1025	
	Low Profile Hatches and Scuttles in the Weather	1029	
	Ordnance and Marine Lockers	1030	
	Pipe Hangers and Fasteners (Steel Only)	1031	
	Portable Sockets and Davits	1032	
	Portable Rigid Lifeline Sections	1033	
	Propulsion GTRB and SSGTG Air Intake Vanes	1052	
	Quarter Deck IC and Alarm Enclosures	1034	
	Raised Deck Hatches in the Weather	1035	
	Scuppers	1036	
	Seawater Fire Station Hardware	1037	
	Security Lights and Brackets	1038	
	Tilt Whip Antenna Foundations	1039	
	Topside Lockers	1041	
	Topside Navigational Aids	1042	
	Topside Telephone Boxes	1043	
	Turnbuckles	1044	
	Ventilation Exhaust and Intake Plenums	1810	
	Visual Landing Aids	1046	
	Weather Deck Areas	1048	
	Weather Doors (Steel)	1049	
	Weather Exposed Announcing System	1050	
	Weather Exposed Meter and Gage Cases	1051	
	Windows in the Weather	1055	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Pallet Staging Area and Helicopter Tiedowns

AREA OF OCCURRENCE: Zone 1

TYPE OF CORROSION: Uniform Attack, Galvanic

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: Tiedown is a steel cup recessed into deck plating. Cup has crossbar over opening for securing hook on lashing. See figure 4-0102. These fittings catch debris and deck drainage causing corrosion problems. Each tiedown fixture bolts to the underside of the deck with four bolts.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Pallet Staging Area and Helo Tiedowns and Associated Drawings:
600-6596702, 600-6596707 and 600-6596710.

2. DDG 52 - DDG 55. Tiedowns shall be galvanized in accordance with ASTM A-153.
3. DDG 57 - DDG 74. Apply primer coat of inorganic zinc silicate paint followed by System 3 epoxy on all tiedowns. As an option, tiedowns may be galvanized in accordance with ASTM A-153.
4. DDG 78. Tiedowns shall be primed with a NAVSEA approved epoxy primer and coated with System 3 (three coats) epoxy paint at 8 mils DFT.
5. Apply metal spray coating (System 2) to 6 inches of deck surrounding tiedowns.

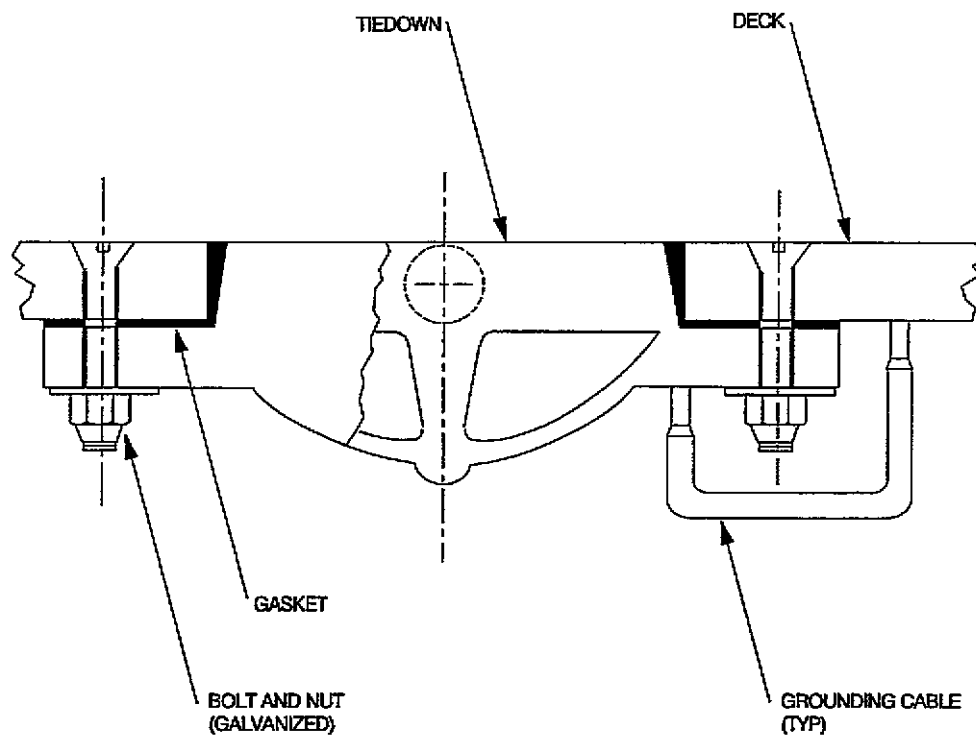
SERVICE REQUIREMENTS (SHIP): Inspect tiedowns and fasteners bimonthly. Touch up as needed. Replace fasteners as required.

S6360-AM-MMO-010

Index Number 0102

Pallet Staging Area and Helicopter Tiedowns

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Tiedown Fitting	Main deck Frame 408 1/2 Port (3):	1
Tiedown Fitting	1' 9" Off CL	
Tiedown Fitting	8' 6" Off CL	
Tiedown Fitting	23' Off CL	
Tiedown Fitting	Main deck Frame 408 1/2 Stbd (2):	
Tiedown Fitting	5' 3" Off CL	
Tiedown Fitting	12' 3" Off CL	
Tiedown Fitting	Main Deck Frame 409 Port (1):	
Tiedown Fitting	16' 3" Off CL	
Tiedown Fitting	Main Deck Frame 409 Stbd (1):	
Tiedown Fitting	Port 19' 3" Off CL	
Tiedown Fitting	Main Deck Frame 412 Stbd (3)	
Tiedown Fitting	Main Deck Frame 415 1/2 Port (3)	
Tiedown Fitting	Main Deck Frame 419 Stbd (3)	
Tiedown Fitting	Main Deck Frame 422 1/2 Port (3)	
Tiedown Fitting	Main Deck Frame 425 1/2 Stbd (3)	
Tiedown Fitting	Main Deck Frame 429 1/2 Port (3)	
Tiedown Fitting	Main Deck Frame 433 Stbd (3)	
Tiedown Fitting	Main Deck Frame 436 1/2 Port (3)	
Tiedown Fitting	Main Deck Frame 440 Stbd (3)	
Tiedown Fitting	5' 3" Off CL	
Tiedown Fitting	12' 3" Off CL	
Tiedown Fitting	19' 5" Off CL	
Tiedown Fitting	Main Deck Frame 412 Port (4)	
Tiedown Fitting	Main Deck Frame 415 1/2 Stbd (4)	
Tiedown Fitting	Main Deck Frame 419 Port (4)	
Tiedown Fitting	Main Deck Frame 422 1/2 Stbd (4)	
Tiedown Fitting	Main Deck Frame 425 1/2 Port (4)	
Tiedown Fitting	Main Deck Frame 429 1/2 Stbd (4)	
Tiedown Fitting	Main Deck Frame 433 Port (4)	
Tiedown Fitting	Main Deck Frame 436 1/2 Stbd (4)	
Tiedown Fitting	Main Deck Frame 440 Port (4)	
Tiedown Fitting	1' 9" Off CL	
Tiedown Fitting	8' 6" Off CL	
Tiedown Fitting	15' 3" Off CL	
Tiedown Fitting	23' Off CL	



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Figure 4-0102. Typical Helicopter Tiedown

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Safety Nets, Helo Deck

AREA OF OCCURRENCE: Zone 1, Main Deck, 370 - Stern

TYPE OF CORROSION: Galvanic, Direct Surface Attack

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: Netting is stainless steel. Frames are carbon steel tubing. Braces, hinge pins and struts are carbon steel. See figure 4-0103.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Safety Net Components and Associated Drawings:

600-6596702, 600-6596707, 600-6596710, 8100-1312-0275 and 612-6597994.

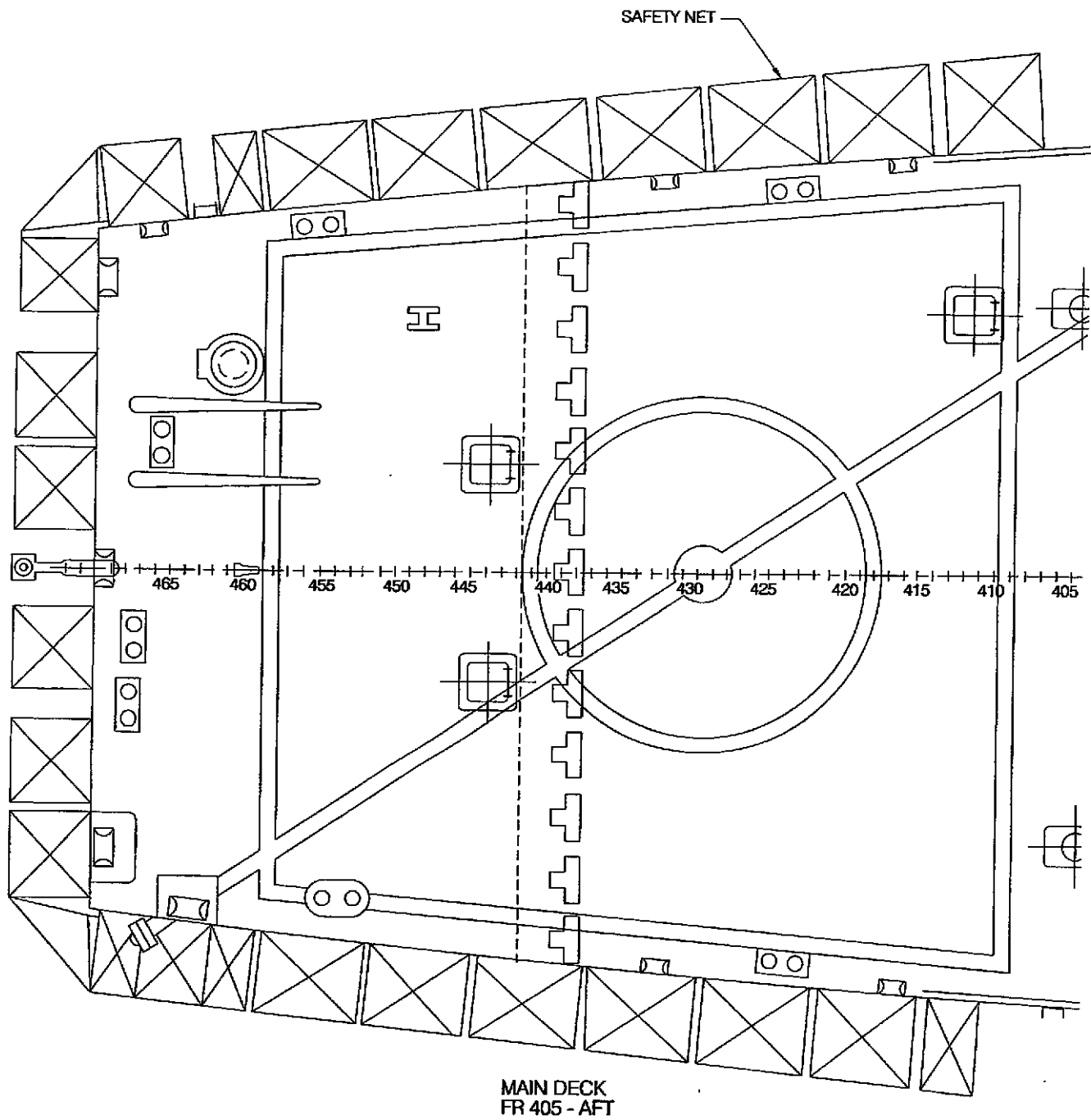
2. DDG 52 - DDG 78. Apply metal spray coating (System 2) to steel deck edge net frames, steel hinged supports and welded steel foundations of the safety net frames.
3. DDG 52 - DDG 78. Metal spray coating shall not be applied to non-ferrous base metals.
4. DDG 52 - DDG 78. When necessary to join dissimilar metals (i.e. galvanically incompatible) a suitable dielectric barrier shall be provided to completely isolate the faying surfaces (System 11).
5. DDG 52 - DDG 74. The safety net, fasteners and snap hooks shall be CRES 316.
6. DDG 78 fasteners to be of corrosion resistant material (System 14) snap hooks shall be CRES 316.
7. DDG 78 wire lanyards and frame filler bars shall be CRES 316 with CRES 304 swage fittings. Toggle pins shall be CRES 316 with CRES 304, MONEL or naval brass pivot pins strap weld pads shall be CRES 316.

SERVICE REQUIREMENTS (SHIP): Inspect nets, frames, hinges and securing hardware bimonthly. Touch up and replace as required.

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Index Number 0301
Safety Net Components

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Safety Net Assy	Mn Dk Frames 405-44 Port	1
Safety Net Assy	Mn Dk Frames 407-411 Stbd	1
Safety Net Assy	Mn Dk Frames 419-427 P/S (2)	1
Safety Net Assy	Mn Dk Frames 435-442 P/S (2)	1
Safety Net Assy	Mn Dk Frames 411-419 P/S (2)	1
Safety Net Assy	Mn Dk Frames 427-435 P/S (2)	1
Safety Net Assy	Mn Dk Frames 450-458 P/S (2)	1
Safety Net Assy	Mn Dk Frames 458-462 Port	1
Safety Net Assy	Mn Dk Frames 466-470 Stbd	1
Safety Net Assy	Mn Dk Frames 458-461 Stbd	1
Safety Net Assy	Mn Dk Frames 471 (Port 3'-8" Off CL) (Rsvd)	1
Safety Net Assy	Mn Dk Frames 471 (Port 8'-14" Off CL)	1
Safety Net Assy	Mn Dk Frames 471 Stbd (8'-8" & 15' Off CL)	1
Safety Net Assy	Mn Dk Frames 464-471 Port	1
Safety Net Assy	Mn Dk Frames 471 Stbd (15'-21' & 8" Off CL)	1
Safety Net Assy	Mn Dk Frames 471 Stbd 2'-2" & 6'-10" Off CL)	1
Safety Net Assy	Mn Dk Frames P (16'-15" & 21'-8" Off CL)	1
Safety Net Assy	Mn Dk Frames 443, 450 P/S (2)	1
Final Net	Mn Dk Frames 471 P/S (2)	1
Final Net	Mn Dk Frames 482-465 Port	1
Final Net	Mn Dk Frames 471 Stbd (6'-8' & 10" Off CL)	1
Final Net	Mn Dk Frames Port (13'-8" & 16'-5" Off CL)	1
Final Net	Mn Dk Frames 461-466 1/2 Stbd	1
Final Net	Mn Dk Frame 471 CL (2'-2" Off CL P/S)	1
Safety Net Assy	Mn Dk Frames 386-394 P/S	1



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Figure 4-0103. Safety Nets, Helicopter Deck

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Stern Light Foundation

AREA OF OCCURRENCE: Zone 1, Transom

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: This foundation is exposed to seawater and weather.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Stern Light Foundation and Associated Drawings: 401-6597218 and 180-6597225.
2. DDG 52 - DDG 59. Apply metal spray coating (System 2) to all steel foundation surfaces.
3. DDG 61 - DDG 74. Apply inorganic zinc silicate primer to all steel foundation surfaces prior to coating with epoxy system (System 4).
4. DDG 71 - DDG 78. Install a plastic dielectric barrier (System 11) between small dissimilar metal surfaces. Barrier shall extend 1/4-inch beyond all sides of the protected piece.
5. DDG 78. Apply a NAVSEA approved epoxy primer to all steel foundation surfaces prior to coating with epoxy system.
6. DDG 78. Fasteners to be of corrosion resistant material (System 14).
7. Apply powered epoxy coating (System 4) to stern light housing.
8. Apply anti-seize compound (System 6) to fasteners prior to installation.

NOTE

See Corrosion Control Item 1042, topside navigational aids for related information.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up and replace as needed.

Index Number 0104

Stern Light Foundation

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Stern Light Foundation	Mn Dk Frames 468 & 470 CL	1

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: VERTREP Line-up Lights

AREA OF OCCURRENCE: Zone 1, Main Deck, 370 - Stern

TYPE OF CORROSION: Direct Surface Attack, Galvanic, Pitting, Abrasion

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: The VERTREP line-up light is a low profile light fixture welded to the deck at intervals along the drop zone center stripe to illuminate the stripe. See figure 4-0105. Weather exposure and deck traffic cause corrosion.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA vertrep line-up lights and associated drawings: 301-6596554 and 301-6596566, 301-6596576

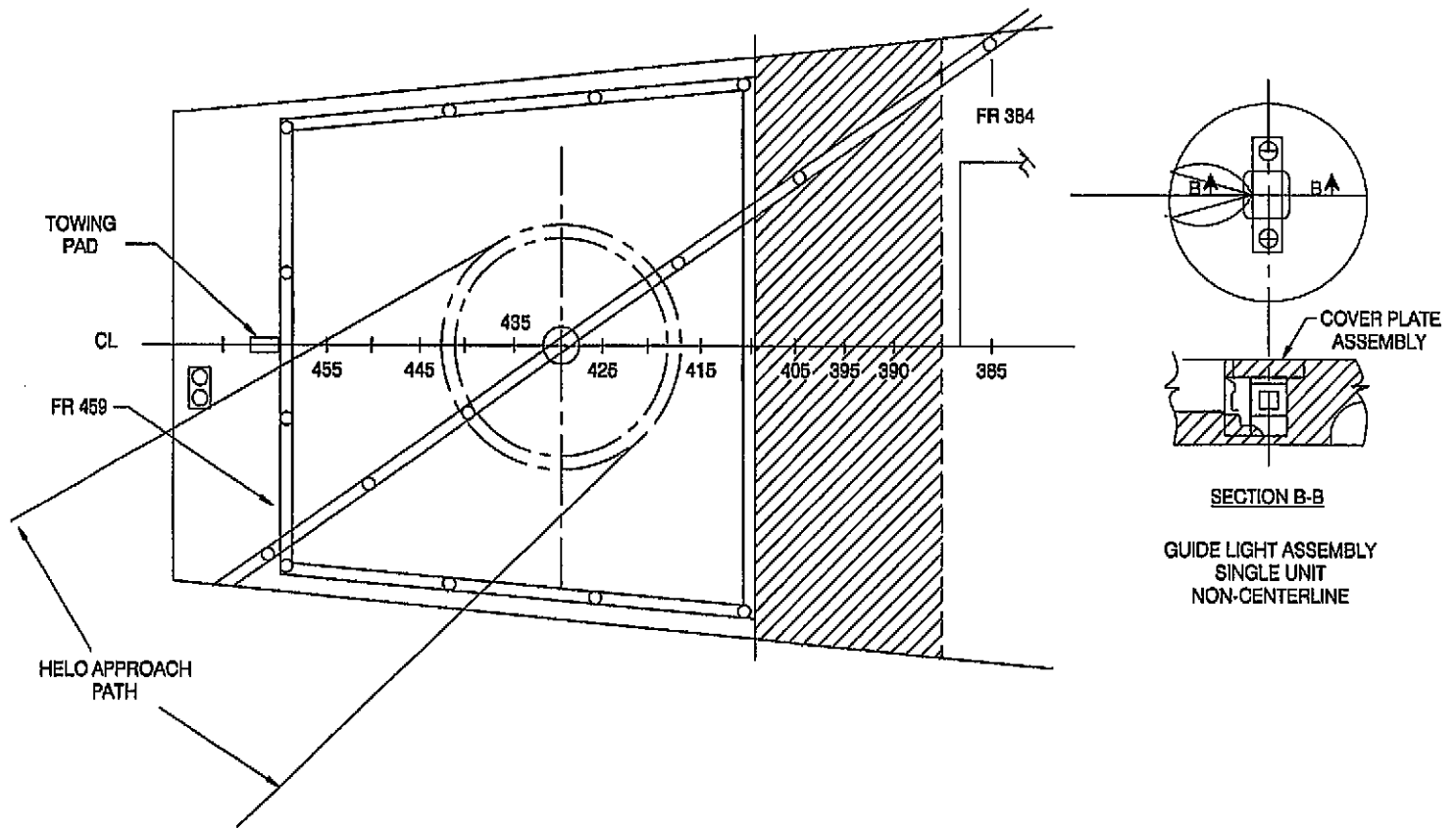
2. Apply polysulfide sealant (System 9) to faying surfaces of the coverplate at the time of the assembly.
3. DDG 52 - DDG 74. Fasteners shall be fabricated from nickel-copper (MONEL) or CRES 316 (System 14).
4. Apply anti-seize compound (System 6) to fasteners prior to installation.
5. DDG 78. Fasteners shall be of corrosion resistant material (System 14).

SERVICE REQUIREMENTS (SHIP). Inspect periodically for corrosion damage. Touch up as required. Replace fasteners as required.

Index Number 0105

VERTREP Line-up Lights

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Line-up Lights	Mn Dk Frame 414 Port	1
	Mn Dk Frame 426-/2 Port	1
	Mn Dk Frame 439 Stbd	1
	Mn Dk Frame 450 Stbd	1
	Mn Dk Frame 463 Port	1
	Mn Dk Frame 402 Port	1
	Mn Dk Frame 390 Port	1



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Figure 4-0105. VERTREP Line-up Light Location

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Retractable Chocks and Bitts

AREA OF OCCURRENCE: Zone 1, Main Deck

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These items are exposed to salt spray, weather and standing seawater and are subject to abrasion.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Retractable Chocks, Bitts and Associated Drawings: 180-6597725, 582-6597246 and 600-6596710.

2. DDG 52 - DDG 55. Apply metal spray coating (System 2) to retractable chocks and bitts, recess areas and deck area extending out 12 inches.
3. DDG 57 - DDG 78. Apply System 2 to retractable chocks and bitts, recess areas and deck area extending out 6 inches.
4. DDG 52 - DDG 74. Apply ceramic coating (System 5) to the turning bar on the retractable bitt.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as required.

Index Number 0106

Retractable Chocks and Bitts

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Fitting Retractable Bitt and Turning Bar	Mn Dk Frame 454 Stbd	1
Retractable Chock	Mn Dk Frame 465 Stbd	1
Retractable Chock	Mn Dk Frame 470 Stbd	1
Retractable Chock Cover	Mn Dk Frames 465 & 470 Stbd	1

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: SSGTG No. 3 Intake Room

AREA OF OCCURRENCE: Zone 1, (1-378-2-Q)

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: The steel surfaces are exposed to weather, saltwater and impact.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA SSGTG No. 3 Intake Room and Associated Drawing: 600-6596715

2. Apply metal spray coating (System 2) to all steel surfaces including deck, bulkheads and intake air.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed.

Index Number 0107

SSGTG No. 3 Intake Room

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Weather Exposed Steel Surfaces of SSGTG No. 3 Intake Room	1-378-2-Q	1

Table 4-3. Corrosion Control Zone 2 (See Figures 4-2 and 4-2.2)

Zone Number: 2		Location: 01 Level	Frame: Bow to Frame 202
Index Number	Description	Index Numbers for Other Zones	
0201	Anchor Chain Hawse Pipe Covers and Securing Fittings		
0202	Bow Anchor Chain Area		
0203	Bullnose		
0204	Chain Locker Covers and Securing Fittings		
0205	Retractable Kingposts and Trunk		
0206	Life Jacket Lockers		
	<u>Problems Common to Other Areas:</u>		
	AFFF Hose Reels in the Weather	1001	
	Air Escape Vents	1002	
	Alignment Benchmark and Cover	1057	
	Antenna Foundations	1003	
	Bits	1005	
	Bolted Grounding Straps	1006	
	Bkhd and Dk Mounted Padeyes, Cleats and Fairleads	1007	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Cable Standoffs and Clips (Weather Exposed)	1008	
	Chocks	1009	
	Countermeasure Washdown Pipe Hangers	1012	
	Deck Lights and Fixtures	1013	
	Exhaust and Intake Vent Screens	1017	
	Fueling at Sea Station Valves, Etc.	1018	
	Gas Turbine Intake and Exhaust Fasteners	1056	
	Gun Mount Foundations	1021	
	Jack and Ensign Staffs	1023	
	Low Pressure Air Service Stations	1028	
	Low Profile Hatches and Scuttles in the Weather	1029	
	Ordnance and Marine Lockers	1030	
	Pipe Hangers and Fasteners (Steel Only)	1031	
	Portable Davits and Sockets	1032	
	Portable Rigid Lifeline Sections	1033	
	Raised Deck Hatches in the Weather	1035	
	Scuppers	1036	
	Seawater Fire Station Hardware	1037	
	Security Lights and Brackets	1038	
	Topside Lockers	1041	
	Topside Navigational Aids	1042	
	Topside Telephone Boxes	1043	
	Turnbuckles	1044	
	Ventilation Exhaust and Intake Plenums	1810	
	Waterway Bars	1047	
	Weather Deck Areas	1048	
	Weather Doors (Steel)	1049	
	Weather Exposed Announcing System	1050	
	Weather Exposed Meter and Gage Cases	1051	
	Topside Deck Washdown Piping Riser	1054	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Anchor Chain Hawse Pipe Cover and Fittings

AREA OF OCCURRENCE: Zone 2, 01 Level, Bow

TYPE OF CORROSION: Direct Surface Attack, Galvanic

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These covers offer protection against personnel injury or the falling of deck gear into the hawse and chain pipe openings. Seawater, weather exposure, galvanic corrosion, and abrasion accelerate corrosion of these covers and securing hardware. See figure 4-0201.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Anchor Chain Hawse Pipe Cover and Securing Fittings (Bolster SAF Cover) and Associated Drawings: 600-6596646, 581-6597244 and 581-6595902.

2. DDG 52 - DDG 57. Apply metal spray coating (System 2) to steel anchor chain hawse pipe cover.
3. DDG 59 - DDG 78. Steel anchor chain hawse pipe cover shall be CRES 304 (System 16).
4. DDG 78. Chain pipe deck bolster buckler shall be CRES 304 (System 16).
5. DDG 78. Drop Bolt Ferrule Pin to be CRES 304, MONEL or naval brass (Systems 14 and 16). All grease fittings in anchor handling system to be nickel copper alloy (System 16).
6. All securing fittings shall be fabricated from CRES 316 (System 16).
7. Apply anti-seize compound (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect covers, dogs, staples, eyebolts and eye nuts for corrosion. Touch up as required. Replace fasteners as required.

Index Number 0201

Anchor Chain Hawse Pipe Cover and Securing Fittings

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Bolster Safety Cover	01 Lvl Frame W CL	2

NOTE: FOR DDG 52, DDG 55 AND DDG 57 APPLY MSC (SYS 2) TO PART NO. 1, 2 AND 3 OF COVER. PART NO. 5, 6, AND 7 SHALL BE CRES 316 (SYS 14). FOR DDG 59 AND FOLLOW ON PARTS SHALL BE CRES 316 (SYS 14 AND 16)

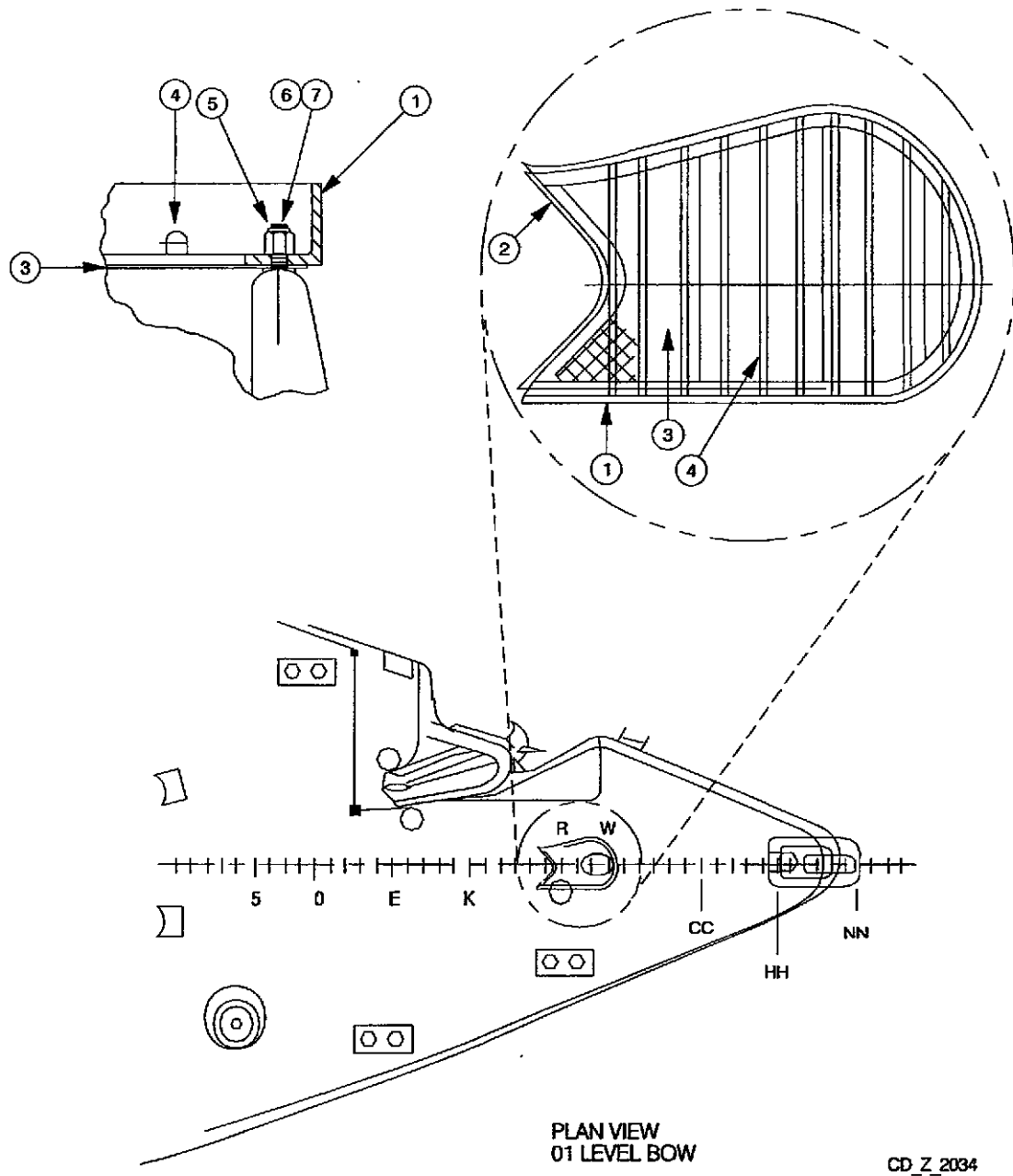


Figure 4-0201. Anchor Chain Hawse Pipe Cover and Securing Fitting

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Bow Anchor Chain Area

AREA OF OCCURRENCE: Zone 2, 01 Level, Bow

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: This area is subject to repeated abrasion from the anchor chains. Seawater and weather exposure accelerate the corrosion. See figure 4-0202.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Bow Anchor Chain Area and Associated Drawings: 600-6596646, 581-6597244 and 581-6595902.
2. DDG 52 - DDG 57. Apply metal spray coating (System 2) to the area extended out 6 inches onto the deck from the diamond plate. Do not apply metal spray coating to the diamond plate.
3. DDG 59 - DDG 78. Do not apply System 2. Apply a primer coat of inorganic zinc silicate paint.
4. DDG 67 - DDG 78. All grease fittings in anchor handling system are to be CRES 316 (System 14 or Monel (System 16).
5. Weld 1/4-inch thick CRES 316 diamond tread plate under both anchor chains.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed.

Index Number 0202

Bow Anchor Chain Area

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Chafing Plate	01 Lvl Frame 3 CL	2
Chafing Plate	01 Lvl Frame E Port	2
Chafing Plate	01 Lvl Frame F CL	2
Chafing Plate	01 Lvl Frame R CL	2

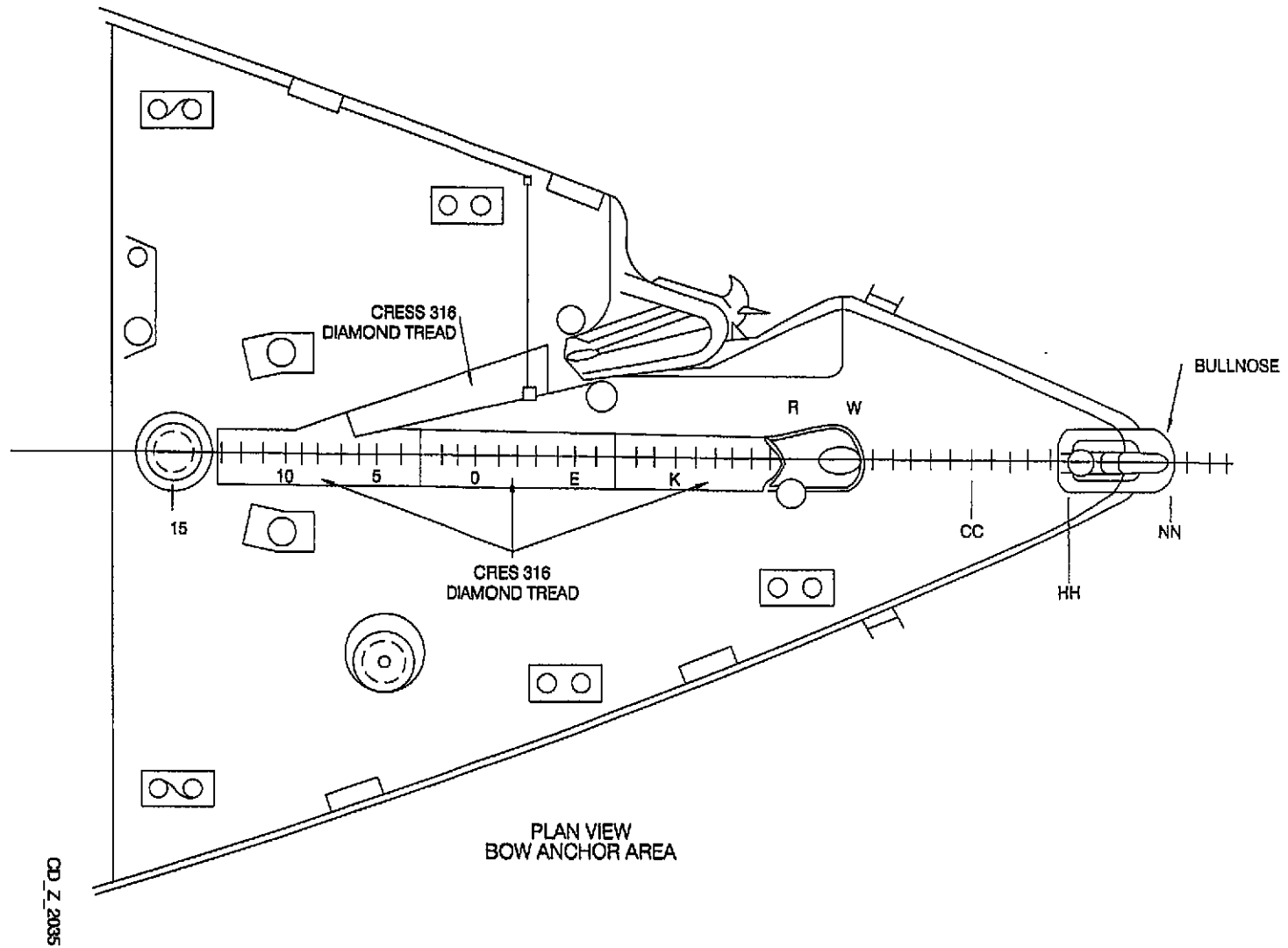


Figure 4-0202. Bow Anchor Chain Area

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Bullnose

AREA OF OCCURRENCE: Zone 2, 01 Level, Bow

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: This area is subject to seawater and weather exposure. Abrasion from bowlines accelerate corrosion. See figure 4-0203.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Bullnose and Associated Drawings: 161-6597182 and 581-6597244.

2. Apply metal spray coating (System 2) to bullnose extending at least 6 inches onto surrounding deck.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed.

Index Number 0203

Bullnose

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Bullnose	01 Lvl Frame NN CL	1

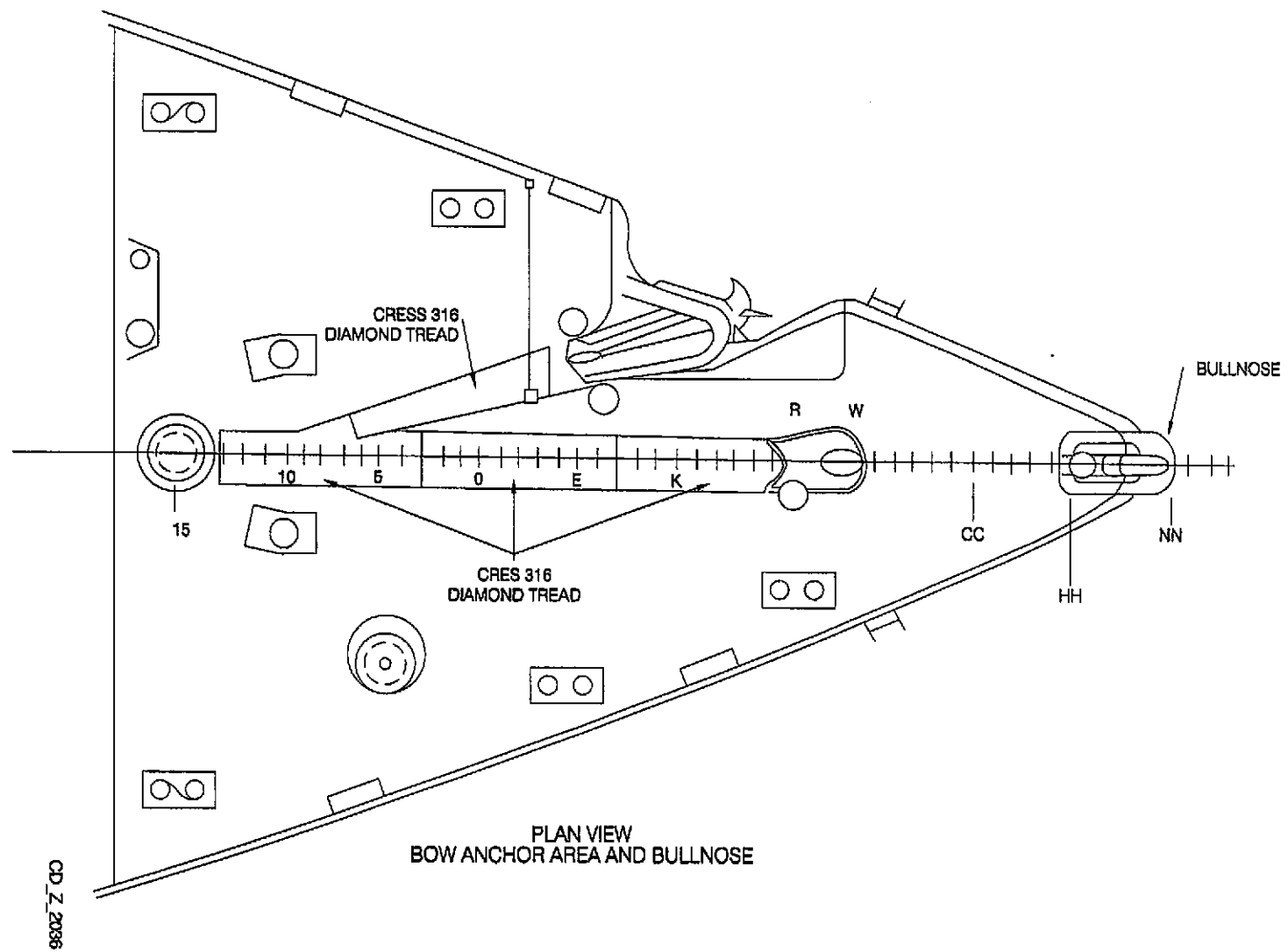


Figure 4-0203. Bullnose

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Chain Locker Cover and Securing Fittings

AREA OF OCCURRENCE: Zone 2, 01 Level, Bow

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: The items are subject to abrasion from the anchor chains. Exposure to seawater and weather accelerate corrosion. See figure 4-0204.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Chain Locker Securing Fittings and Associated Drawings: 600-6596646, 581-6597244 and 581-6595902.

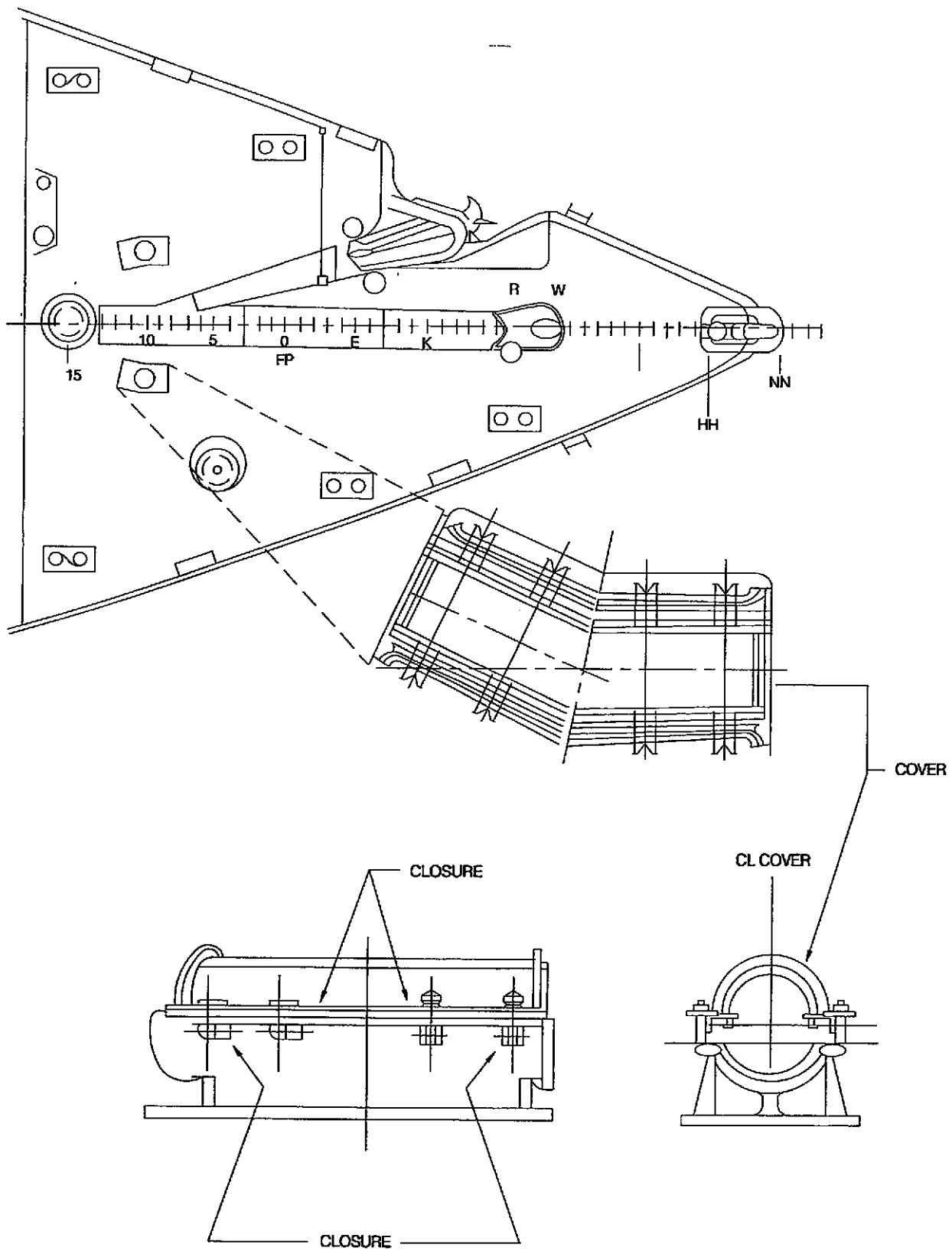
2. DDG 52 - DDG 57. Apply metal spray coating (System 2) to cover and surrounding deck for a minimum of 6 inches.
3. DDG 59 - DDG 78. Chain locker covers are to be CRES 316. Do not use System 2 on covers. Apply System 2 to deck area surrounding covers for a minimum of 6 inches.
4. DDG 78. Buckler to be made from CRES 604 (System 16).
5. DDG 52 - DDG 74. Securing fasteners shall be fabricated out of CRES 316 (System 14).
6. DDG 78. All securing hardware and fasteners to be CRES 316 except drop bolt ferrule pins shall be CRES 304, MONEL, or naval brass. Other fasteners shall be of corrosion resistant material (System 14).
7. Apply anti-seize compound (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 0204

Chain Locker Cover and Secure Fittings

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Cover	01 Lvl Frame 10 Port 5' off CL Stbd 3' off CL	2
Closures	01 Lvl Frame 10 Port 5' off CL Stbd 3' off CL	2



CHAIN LOCKER COVER AND SECURING FITTING

CD_Z_2037

Figure 4-0204. Chain Locker Cover and Securing Fittings

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Retractable Kingpost and Trunk

AREA OF OCCURRENCE: Zones 2 and 19

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: This item is located in the bow and opens to the weather. It is subject to intermittent seawater and weather exposure.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Retractable Kingpost and Watertight Kingpost Trunk and Associated Drawings: 600-6596652, 571-6595875, 571-6596628, 600-6596649, 600-6596650, and 600-6596651.

2. Apply Metal Spray Coating (System 2) to steel alloy surfaces, structures, attachment points and fittings for the kingpost, including the sliding padeye (SPE), and hatch 12 inches onto surrounding deck.
3. DDG 52 - DDG 74. Apply ceramic coating (System 5) to steel fasteners and actuating mechanisms.
4. DDG 52 - DDG 74. CRES 316 alloy (System 14) shall be used for fasteners where loading permits.
5. Polysulfide sealer (System 9) shall be applied to faying surfaces.
6. Apply anti-seize compound (System 6) to fasteners prior to installation.
7. DDG 78. Fasteners and actuating mechanism shall be CRES 316 where loading permits, (System 14 and System 16).
8. DDG 78. Cut-out switches and mounting brackets shall be CRES 316. Grease fittings to be Nickel Copper Alloy.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 0205

Retractable Kingpost and Trunk

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Kingpost & Kingpost Trunk	01-39-0-X 01-229-P&S	2, 19

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Life Jacket Lockers

AREA OF OCCURRENCE: Zone 2, 01 Level

TYPE OF CORROSION: General, Galvanic

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These aluminum life jacket lockers are located in the port and starboard breezeway passages. They are mounted on steel foundations. Exposure to the weather is a contributing factor to corrosion. See figure 4-0206.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Life Jacket Locker and Associated Drawings: 600-6596720, 600-6596714, 8100-1316-0251, 600-6596711 and 640-6595958.
2. DDG 52 - DDG 74. Apply powered epoxy coating (System 4) to the life jacket locker body, doors and legs.
3. DDG 52 - DDG 67. Apply metal spray coating (System 2) to carbon steel mounting brackets, support foundations and the carbon steel components of the hinge assembly.
4. DDG 69 - DDG 78. Delete metal spray and prime carbon steel mounting brackets, support foundations and carbon steel components of the hinge assembly with inorganic zinc silicate paint prior to finish paint with epoxy paint system.
5. DDG 52 - DDG 74. Fasteners, hardware, ancillary fittings and the hinge assembly spring pin shall be CRES 316 (System 14 and System 16).
6. DDG 78. Apply powered epoxy coating (System 4) to aluminum portions of weather exposed Type C life jacket locker bodies, doors, legs and hinges. Loading door barrel bolts shall be brass. Fasteners to be corrosion resistant material (System 14).
7. DDG 78. Hardware, ancillary fittings, hinge pins and split pins shall be CRES 316. Hinge assembly spring shall be CRES 304. Spill door latch bolt assembly shall be CRES 304 or CRES 316.
8. Apply polysulfide sealant (System 9) to all faying surfaces.
9. Apply anti-seize compound (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners and hardware as required.

Index Number 0206

Life Jacket Lockers

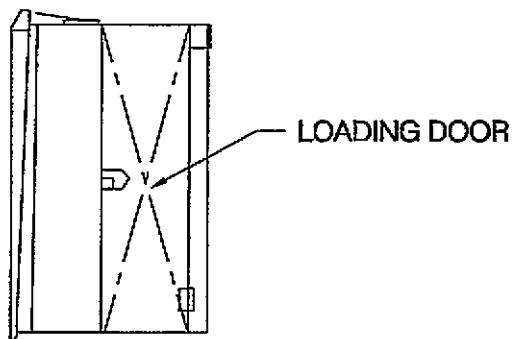
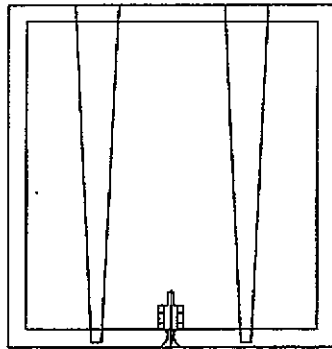
<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Lifejacket Locker	01 Lvl Frame 127 Stbd	2
Foundation	01 Lvl Frame 127 Stbd	2
Lifejacket Locker	01 Lvl Frame 130 Stbd	2
Foundation	01 Lvl Frame 130 Stbd	2
Lifejacket Locker	01 Lvl Frame 135 Stbd	2
Foundation	01 Lvl Frame 135 Stbd	2
Lifejacket Locker	01 Lvl Frame 140 Stbd	2
Foundation	01 Lvl Frame 140 Stbd	2
Lifejacket Locker	01 Lvl Frame 139 Stbd	2
Foundation	01 Lvl Frame 139 Stbd	2
Lifejacket Locker	01 Lvl Frame 169 Stbd	2
Foundation	01 Lvl Frame 169 Stbd	2
Lifejacket Locker	01 Lvl Frame 127 Port	2
Foundation	01 Lvl Frame 127 Port	2
Lifejacket Locker	01 Lvl Frame 131 Port	2
Foundation	01 Lvl Frame 131 Port	2
Lifejacket Locker	01 Lvl Frame 132 Port	2
Foundation	01 Lvl Frame 132 Port	2
Lifejacket Locker	01 Lvl Frame 143 Port	2
Foundation	01 Lvl Frame 143 Port	2
Lifejacket Locker	01 Lvl Frame 142 Stbd	2
Foundation	01 Lvl Frame 142 Stbd	2
Lifejacket Locker	01 Lvl Frame 142 Stbd	2
Foundation	01 Lvl Frame 142 Stbd	2
Lifejacket Locker	01 Lvl Frame 143 Stbd	2
Foundation	01 Lvl Frame 143 Stbd	2
Lifejacket Locker	01 Lvl Frame 146 Stbd	2
Foundation	01 Lvl Frame 146 Stbd	2
Lifejacket Locker	01 Lvl Frame 151 Stbd	2
Foundation	01 Lvl Frame 151 Stbd	2
Lifejacket Locker	01 Lvl Frame 154 Stbd	2
Foundation	01 Lvl Frame 154 Stbd	2

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Index Number 0206

Life Jacket Lockers - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Lifejacket Locker	01 Lvl Frame 160 Stbd	2
Foundation	01 Lvl Frame 160 Stbd	2
Lifejacket Locker	01 Lvl Frame 148 Port	2
Foundation	01 Lvl Frame 148 Port	2
Lifejacket Locker	01 Lvl Frame 151 Port	2
Foundation	01 Lvl Frame 151 Port	2
Lifejacket Locker	01 Lvl Frame 153 Port	2
Foundation	01 Lvl Frame 153 Port	2
Lifejacket Locker	01 Lvl Frame 159 Port	2
Foundation	01 Lvl Frame 159 Port	2
Lifejacket Locker	01 Lvl Frame 160 Port	2
Foundation	01 Lvl Frame 160 Port	2
Lifejacket Locker	01 Lvl Frame 169 Port	2
Foundation	01 Lvl Frame 169 Port	2
Lifejacket Locker	01 Lvl Frame 175 Stbd	2
Foundation	01 Lvl Frame 175 Stbd	2
Lifejacket Locker	01 Lvl Frame 178 Stbd	2
Foundation	01 Lvl Frame 178 Stbd	2
Lifejacket Locker	01 Lvl Frame 176 Port	2
Foundation	01 Lvl Frame 176 Port	2
Lifejacket Locker	01 Lvl Frame 189 Port	2
Foundation	01 Lvl Frame 189 Port	2
Lifejacket Locker	01 Lvl Frame 192 Port	2
Foundation	01 Lvl Frame 192 Port	2
Lifejacket Locker	01 Lvl Frame 196 Port	2
Foundation	01 Lvl Frame 196 Port	2
Lifejacket Locker	01 Lvl Frame 181 Port	2
Foundation	01 Lvl Frame 181 Port	2
Lifejacket Locker	01 Lvl Frame 184 Port	2
Foundation	01 Lvl Frame 184 Port	2



TYPICAL LIFE JACKET
(TYPE C)

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Figure 4-0206. Life Jacket Lockers

Table 4-4. Corrosion Control Zone 3 (See Figures 4-3 and 4-3.1)

Zone Number: 3		Location: 01 Level	Frame: FR 202 to 316
Index Number	Description	Index Numbers for Other Zones	
0301	Boat Cradles		
0302	Fender Stowage Racks		
0303	Slewing Arm Davit		
0304	Brow Support		
0305	Accommodation Ladder		
	<u>Problems Common to Other Areas:</u>		
	Air Escape Vents	1002	
	Alignment Benchmark and Cover	1057	
	Bitts	1005	
	Bolted Grounding Straps	1006	
	Bkhd and Dk Mtd Padeyes, Cleats and Fairleads	1007	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Cable Standoffs and Clips (Weather Exposed)	1008	
	Chocks	1009	
	Countermeasure Washdown Pipe Hangers	1012	
	Deck Lights and Fixtures	1013	
	Exhaust and Intake Vent Screens	1017	
	Gas Turbine Intake and Exhaust Fasteners	1056	
	Hawser Reels (Mooring Line Reels)	1808	
	Label Plates (Weather Exposed)	1025	
	Life Jacket Lockers	0206	
	Low Profile Hatches and Scuttles in the Weather	1029	
	Ordinance and Marine Lockers	1030	
	Pallet Staging Area and Helicopter Tiedowns	0102	
	Pipe Hangers and Fasteners (Steel only)	1031	
	Portable Rigid Lifeline Sections	1033	
	Security Lights and Brackets	1038	
	Topside Lockers	1041	
	Topside Telephone Boxes	1043	
	Turnbuckles	1044	
	Ventilation Exhaust and Intake Plenums	1810	
	Waterway Bars	1047	
	Weather Doors (Steel)	1049	
	Weather Exposed Announcing System	1050	
	Weather Exposed Meter and Gage Cases	1051	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Boat Cradles

AREA OF OCCURRENCE: Zone 3, 01 Level

TYPE OF CORROSION: Direct Surface Attack

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Cradle secures outboard end of boom when in the fore and aft stowed position. See figure 4-0301.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Boat Cradles and Associated Drawings: 583-6597074 and 180-6597709.

2. DDG 52 - DDG 78. Apply metal spray coating (System 2) to deck area in way of boat cradles extending 6 inches onto surrounding deck.
3. DDG 52 - DDG 78. Apply polysulfide sealant (System 9) to faying surfaces between cradles and steel foundations.
4. DDG 71 - DDG 78. MacCluney hooks, turnbuckle assemblies, anchor shackles, cotter pins, and master links shall be CRES 316. Safety eye hooks to be CRES 347. Wire rope, swage sleeves and eye splices to be CRES 304. Sizes to be adjusted as necessary.
5. DDG 71 - DDG 78. Boat gripes shall consist of nylon webbed straps with CRES 316 "D" rings at both ends. One "D" ring shall attach to a CRES 316 snaphook attached to a CRES 316 anchor shackle. The other "D" rings shall attach to CRES 316 open jaw turnbuckle assembly. The other end of the turnbuckle assembly shall attach to a CRES 316 snaphook in turn attached to a CRES 316 anchor shackle.
6. DDG 71 - DDG 78. Boat cradle mounting fasteners shall be K-MONEL (System 16).
7. DDG 78. Cover latches for slat control station to be fabricated from CRES 304 or CRES 316. Fasteners to be of corrosion resistant material (System 14).

SERVICE REQUIREMENTS (SHIP): Inspect quarterly and repair as needed. Reapply System 9 as needed. Replace fasteners as needed.

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Index Number 0301
Boat Cradles

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Fwd Boat Cradle	01 Lvl Frame 265 Stbd	3
Aft Boat Cradle	01 Lvl Frame 277 Stbd	3
Aft Cradle	01 Lvl Frame 295 Stbd	3
Fwd Boat Cradle	01 Lvl Frame 307 Stbd	3

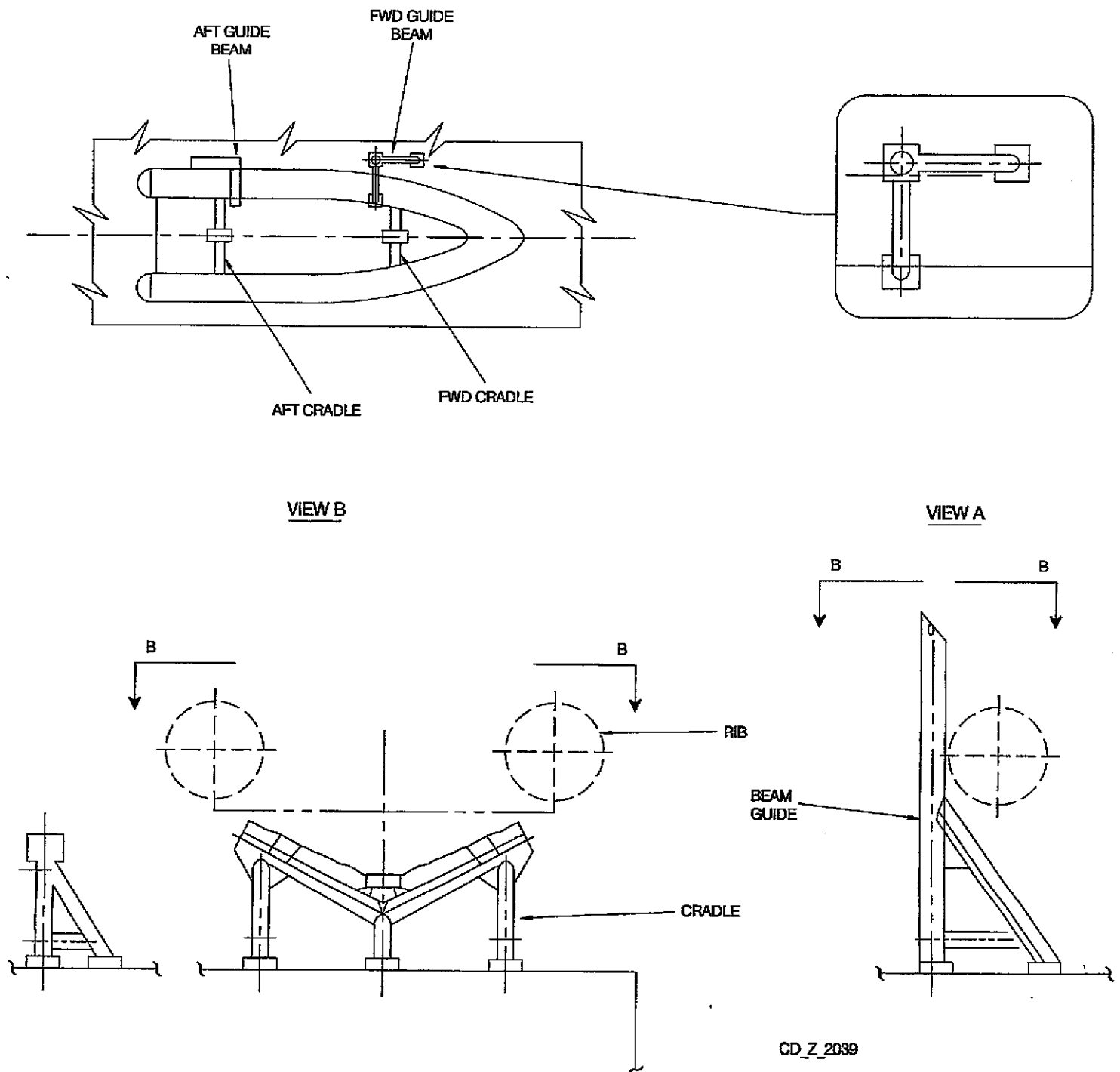


Figure 4-0301. Boat Cradles

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Fender Stowage Racks

AREA OF OCCURRENCE: Zone 3, 01 Level, Frames 202 - 316

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: The fender stowage racks are located beneath the starboard boat cradles. They are subject to abrasion and impact. Exposure to seawater and weather accelerate corrosion. See figure 4-0302.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

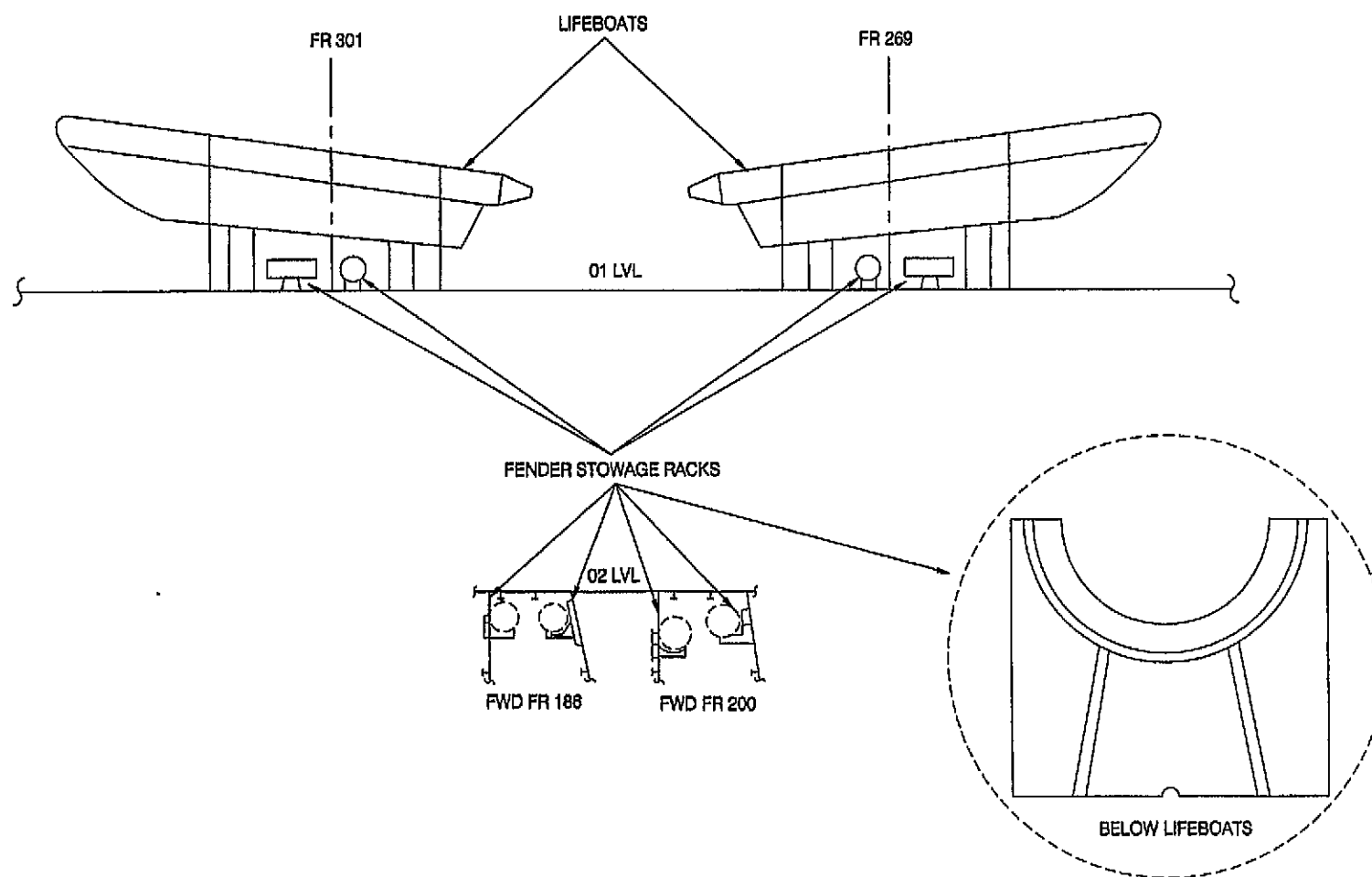
1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Fender Stowage Racks and Associated Drawings: 670-6595925, 611-6597245, 600-6596687, 600-6596723, 670-6595916, 670-6595927, 600-6596720 and 670-6595924.
2. Apply metal spray coating (System 2) to fender stowage racks, bulkhead-mounted racks, supporting structure, and deck area underneath racks, extending 6 inches past rack.
3. DDG 52 - DDG 74. Fasteners shall be steel treated with ceramic coating (System 5).
4. Apply anti-seize compound (System 6) to fasteners prior to installation.
5. DDG 78. Tiedown strap hardware including ratchet tightening mechanism to be 300 series CRES (CRES 316 as much as practicable). Fasteners to be corrosion resistant material (System 16).

Index Number 0302

Fender Stowage Racks

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Fender Stowage Rack	01 Lvl Frame 261 Stbd	3
Fender Stowage Rack	01 Lvl Frame 312 Stbd	3
Fender Stowage Rack	01 Lvl Frame 184 Stbd	2
Fender Stowage Rack	01 Lvl Frame 189 Stbd	2
Fender Stowage Rack	01 Lvl Frame 196 Stbd	2



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Figure 4-0302. Fender Stowage Racks

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Slewing Arm Davit (SLAD)

AREA OF OCCURRENCE: Zone 3, 01 Level

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: The SLAD is located between the life boat cradles. It is exposed to seawater and weather. See figure 4-0303.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA SLAD Racks and Associated Drawings: 583-6597074, 56W4-S100, 56W4-S101, 56W4-S102, 56W4-S103, 56W4-S104, 56W4-S105, 56W4-S106, 56W4-S107, 56W4-S108, 56W4-S109, 56W4-S110, 56W4-S111, 56W4-S112, 56W4-S113, 56W4-S114, 56W4-S115, 56W4-S116, 56W4-S117 and 56W4-S118, 180-6597699.
2. Vendor shall apply metal spray coating (System 2) to steel surfaces of slewing arm davit.
3. Apply metal spray coating (System 2) to foundations and surrounding deck area to a distance of 6 inches.
4. Apply polysulfide sealer (System 9) to all faying surfaces prior to installation of davit.
5. DDG 52 - DDG 74. Fasteners shall be carbon steel treated with ceramic coating (System 5).
6. Apply anti-seize thread compound (System 6) to fasteners prior to installation.
7. SLAD motors and associated breaks shall be coated in accordance with drawing 301-6596566.
8. DDG 78. Fasteners to be of corrosion resistant material (System 14). SLAD control cover to be watertight with latch assembly made from CRES 316 or CRES 304.
9. DDG 78. Wire lanyards shall be CRES 316 with CRES 304 swage fittings. Toggle pins shall be CRES 316 with CRES 304 or MONEL pivot pins. Grease fittings shall be CRES 316 or MONEL (System 16).
10. DDG 78. RCS fairing plates shall be CRES 316. Sand sweep and prime with AMERON 236 prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 0303
Slewing Arm Davit

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Slewing Arm Davit	01 Lvl Frame 286 Stbd	3
Bulkhead Mounted Padeyes	01 Lvl Frame 292 Stbd	3
	01 Lvl Frame 308 Stbd	
Grip Padeyes	01 Lvl Frame 266 Stbd	3
	01 Lvl Frame 278 Stbd	3
	01 Lvl Frame 307 Stbd	3
	01 Lvl Frame 295 Stbd	
Lashing Padeyes	01 Lvl Frame 284 Stbd	3
	01 Lvl Frame 274 Stbd	3
	01 Lvl Frame 266 Stbd	3
	01 Lvl Frame 317 Stbd	3
	01 Lvl Frame 284.5 Stbd	3
RCS Fairing Plates	01 Lvl Frame 284 Stbd	3

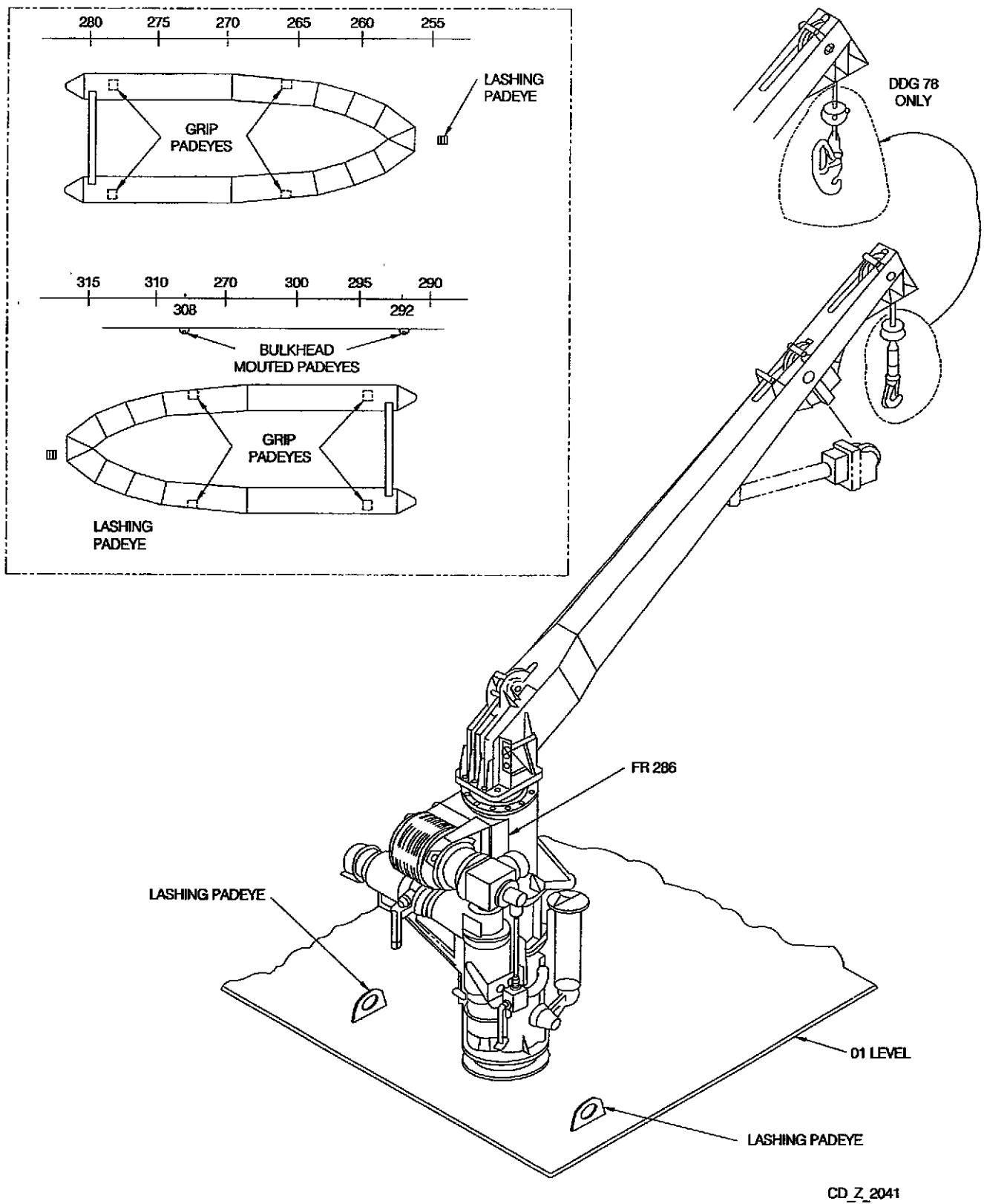


Figure 4-0303. Slewing Arm Davit

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Brow/Brow Support

AREA OF OCCURRENCE: Zone 3, 01 Level, Midships, Port and Stbd

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These items are exposed to weather and salt spray and are subject to abrasion.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Brow and Associated Drawing: 301-6596501.
2. DDG 52 - DDG 55. Apply metal spray coating (System 2) to brow support and deck area, extending out at least 6 inches.
3. DDG 57 - DDG 74. Do not apply System 2. Apply a primer coat of inorganic zinc silicate paint to the brow support and deck area, extending out at least 6 inches.
4. DDG 78. Apply a NAVSEA approved epoxy primer to the brow support and to the surrounding deck area extending out at least 6 inches.
5. DDG 52 - DDG 74. Fasteners shall be carbon steel treated with ceramic coating (System 5).
6. DDG 78. Brow fasteners to be of corrosion resistant material (System 14). Brow wire lanyards to be CRES 316 with CRES 304 swage fittings. Toggle pins to be CRES 316 with CRES 304 or MONEL pivot pins.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as required.

Index Number 0304

Brow Support

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Brow Support	01 Level P/S	3

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Accommodation Ladders

AREA OF OCCURRENCE: Zone 1

TYPE OF CORROSION: General, Crevice

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: The accommodation ladders incorporate many ferrous components and fasteners in the feathering mechanism and in the upper and lower platforms. Ferrous staples, cleats and fittings are also required to rig and to stow the ladder. See figure 4-0305. The ladders require corrosion protection as described below.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Accommodation Ladder and Associated Drawings: 623-6595872, 623-6597064, 804-2255400, 804-2255403 through 804-2255408.
2. DDG 52 - DDG 55. Apply metal spray coating (System 2) to steel hardware and supporting structures. The hardware and structures that can not have System 2 applied because of tolerance considerations shall be ceramic coated (System 5).
3. DDG 52 - DDG 55. All carbon steel fasteners are to be treated with System 5.
4. DDG 52 - DDG 55. Apply anti-seize compound (System 6) to fastener threads prior to installation.
5. DDG 57 - DDG 74. Apply metal spray coating (System 2) to steel hardware and supporting structures. The hardware and structures that can not have System 2 applied because of tolerance considerations shall be ceramic coated (System 5).
6. DDG 57 - DDG 74. All fasteners and wire lanyards are to be made from CRES 316 (System 14).
7. DDG 57 - DDG 74. Apply anti-seize compound (System 6) to fastener threads prior to installation.
8. DDG 78. Apply metal spray coating (System 2) to steel hardware and supporting structures. All galvanized steel hardware shall not receive any additional coatings.
9. DDG 78. Fasteners and lanyards shall be of CRES 316, System 14. All grease fittings shall be MONEL, System 16.
10. DDG 78. All staples mounted to the ship structure shall be CRES 316/CRES 304 as strength requirements allow. All toggle pins shall be CRES 316 with CRES 304 or MONEL pivot pins. All wire lanyards shall be CRES 316 with CRES 304 swage fittings.

11. DDG 78. Apply anti-seize compound (System 6) to fastener threads prior to installation.
12. DDG 78. Stanchions, stanchion socket, stowage shapes, lanyards and grounding straps shall be CRES 316. Sand sweep and prime with AMERON 236, one coat at 1-2 MILS DFT, prior to installation.
13. DDG 78. Accommodation ladder yoke guide shall be CRES 304.
14. DDG 78. Accommodation ladder dollies shall be CRES 316.

NOTE

See Index Numbers 1032 and 1033 for davits and stanchions that are associated with the accommodation ladder.

SERVICE REQUIREMENTS (SHIP): Inspect threads and pivot points and reapply System 6 anti-seize as required. Inspect ladder components, fasteners, rigging components, stowage components and replace as needed. Apply touch up as needed.

Index Number 0305

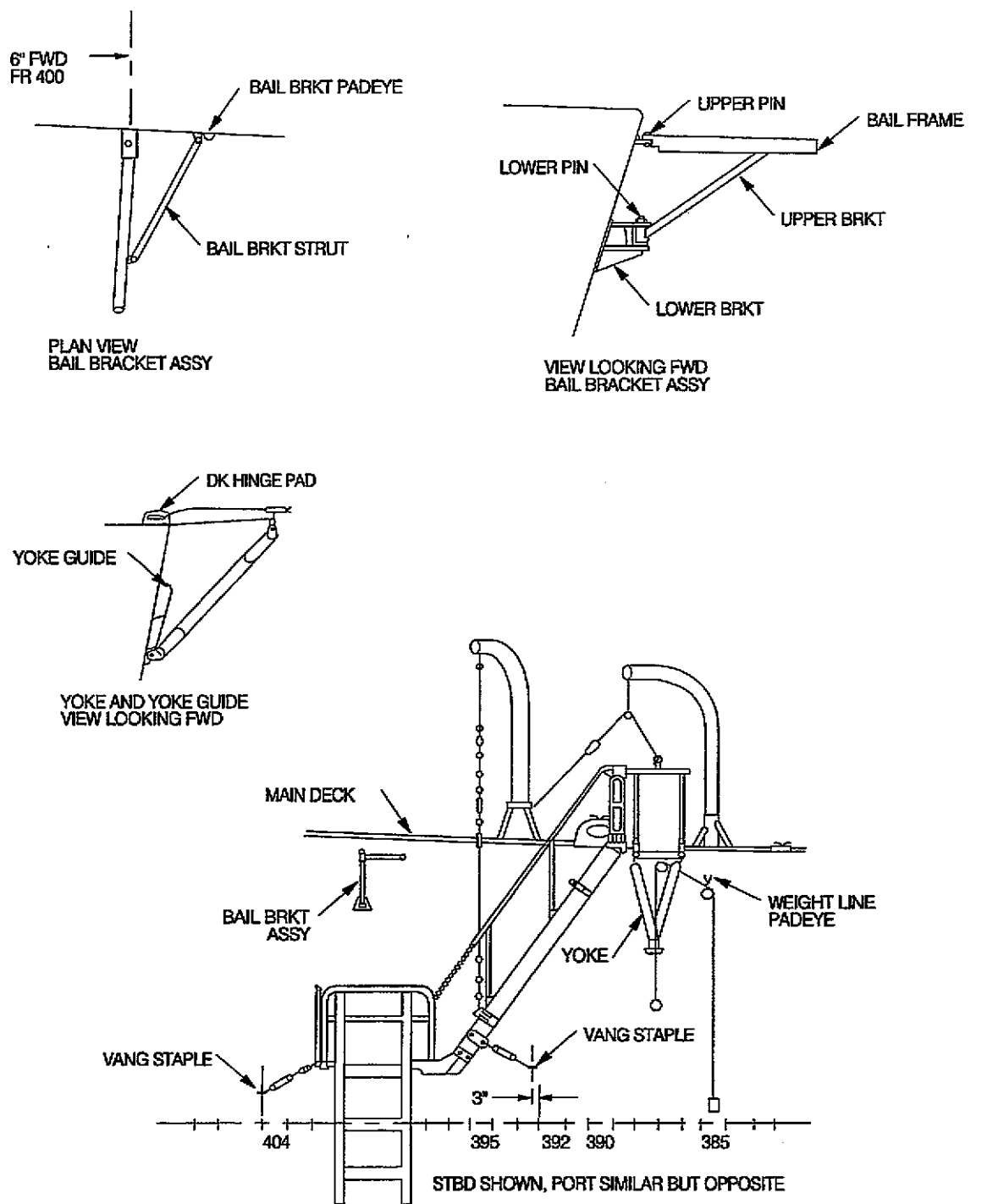
Accommodation Ladder for DDG 52 and DDG 55

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Accommodation Ladder	Mn Dk Frame 386 P/S	1
Deck Hinge Pad	Mn Dk Frame 308 P/S	1
Deck Hinge Pad	Mn Dk Frame 391 P/S	1
Deck Hinge Pad	Mn Dk Frame 398 P/S	1
Weight Line Padeye	Ext Shell Frame 385 P/S	1
Vang Staple	Ext Shell Frame 392 P/S	1
Vang Staples	Ext Shell Frame 404 P/S	1
Yoke Guide	Ext Shell Frame 387 P/S	1
Bail Frame	Ext Shell Frame 400 P/S	1
Lower Bracket	Ext Shell Frame 400 P/S	1
Bail Bracket Padeye	Ext Shell Frame 398 P/S	1
Upper Bracket	Ext Shell Frame 400 P/S	1
Bail Bracket Strut	Ext Shell Frame 398 P/S	1

Index Number 0305

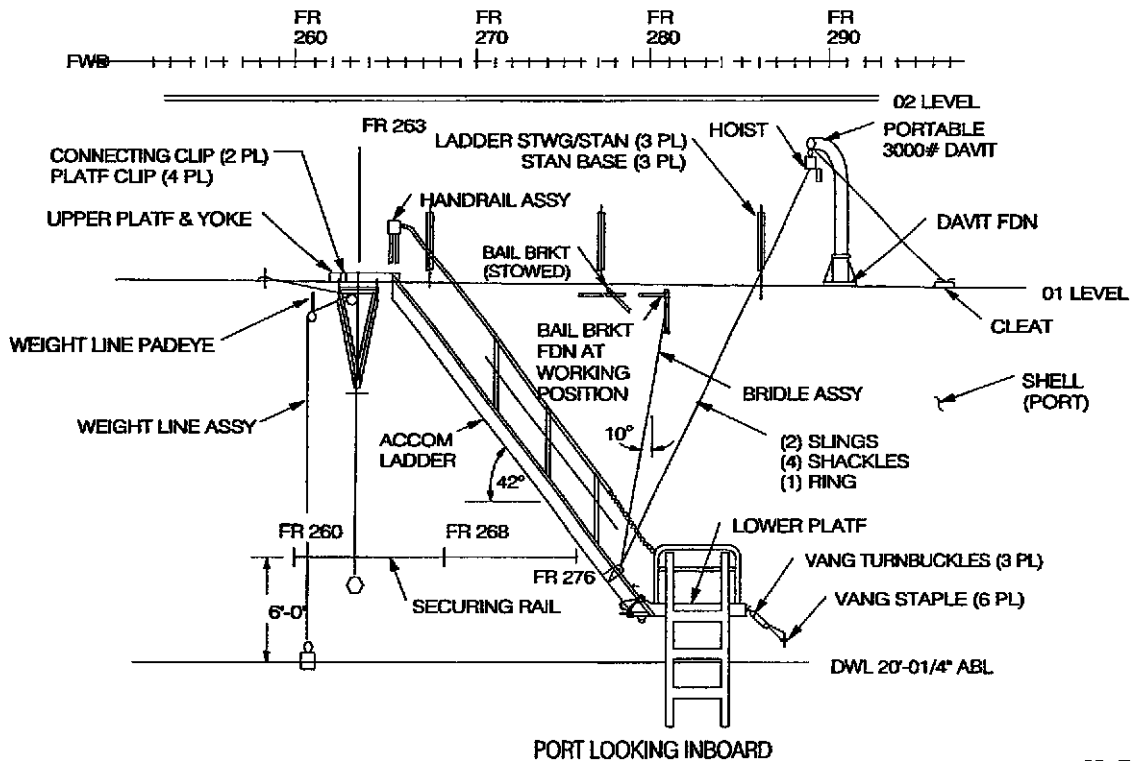
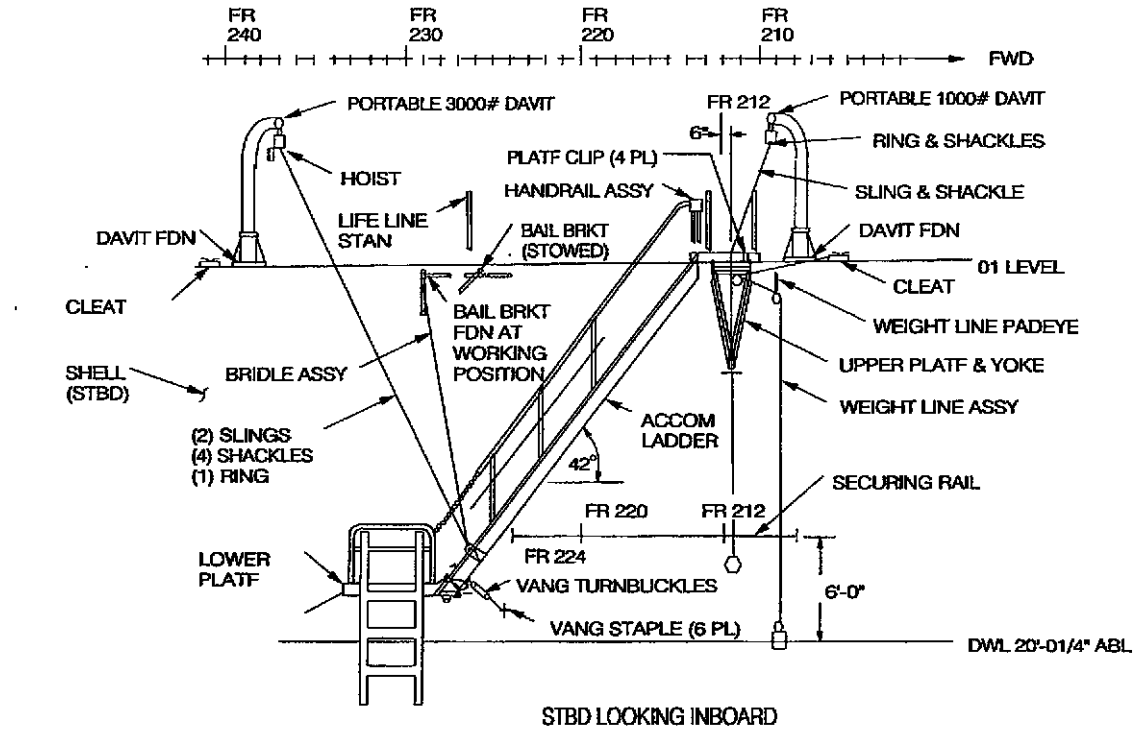
Accommodation Ladder for DDG 57 - DDG 78

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Accommodation Ladder	01 Lvl Frame 263 (P)	1 & 3
Connecting Clip	01 Lvl Frame 263 (P)	1 & 3
Stanchions	01 Lvl Frame 263 (P)	1 & 3
Stanchions Socket	01 Lvl Frame 263 (P)	1 & 3
Stowage Shapes	01 Lvl Frame 263 (P)	1 & 3
Lanyards	01 Lvl Frame 263 (P)	1 & 3
Ground Straps	01 Lvl Frame 263 (P)	1 & 3
Yoke Guide	01 Lvl Frame 234 (S) & Frame 260 (P)	3
Dollies	01-118-4-L	3
Platf Clip	01 Lvl Frame 263 (P)	1 & 3
Platf Clip	01 Lvl Frame 212 (S)	1 & 3
Ladder Stwg/Stan	01 Lvl Frame 266 (P) thru Frame 285 (P)	1 & 3
Weight Line Padeye	01 Lvl Frame 261 (P) & Frame 210 (S)	1 & 3
Vang Staple	01 Lvl Frame 275 (P) thru Frame 292 (P)	1 & 3
Vang Staple	01 Lvl Frame 225 (P) thru Frame 238 (S)	1 & 3
Securing Rail	01 Lvl Frame 260 (P) & Frame 224 (S)	1 & 3
Channel Sprt	01 Lvl Frame 280 (P) & Frame 229 (S)	1 & 3
Brace pad	01 Lvl Frame 275 (P) & Frame 279 (P)	1 & 3
Brace Pad	01 Lvl Frame 225 (S) & Frame 232 (S)	1 & 3
Stwg Pad	01 Lvl Frame 276 (P) & Frame 225 (S)	1 & 3
Bail Bracket Pad	Mn Dk Frame 280 (P) & Frame 229 (S)	1 & 3



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Figure 4-0305. Accommodation Ladder for DDG 52 and DDG 55 (Sheet 1 of 2)



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Figure 4-0305. Accommodation Ladder for DDG 57 and Follow (Sheet 2 of 2)

Table 4-5. Corrosion Control Zone 4 (see figure 4-4)

Zone Number: 4		Location: 01 Level	Frames: 316 to 388
Index Number	Description	Index Numbers for Other Zones	
0401	Harpoon Foundations		
0402	Torpedo Tube Foundations		
	<u>Problems Common to Other Areas:</u>		
	AFFF Hose Reels in the Weather	1001	
	Air Escape Vents	1002	
	Alignment Benchmark and Cover	1057	
	Bitts	1005	
	Bolted Grounding Straps	1006	
	Bhd and Dk Mtd Padeyes, Cleats and Fairleads	1007	
	Bhd Mounted Fog Applicator Brackets	1020	
	Cable Standoffs and Clips (Weather Exposed)	1008	
	Chocks	1009	
	Countermeasure Washdown Pipe Hangers	1012	
	Deck Lights and Fixtures	1013	
	Exhaust and Intake Vent Screens	1017	
	Fueling-at-Sea Station Valves, etc.	1018	
	Inclined Ladder Brackets	1022	
	Label Plates (Weather Exposed)	1025	
	Low Profile Hatches and Scuttles in the Weather	1029	
	Pipe Hangers	1031	
	Portable Davits and Sockets	1032	
	Portable Rigid Lifeline Sections	1033	
	Seawater Fire Station Hardware	1037	
	Topside Telephone Boxes	1043	
	Turnbuckles	1044	
	Vertical Launching System (VLS)	1045	
	Visual Landing Aids	1046	
	Waterway Bars	1047	
	Weather Exposed Announcing System	1050	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Harpoon Foundations

AREA OF OCCURRENCE: Zone 4, 01 Level, Frame 324 Port and Frame 330 Starboard

TYPE OF CORROSION: Rocket Exhaust, Weather Exposure, Seawater

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: The two Harpoon launchers are twin fixed air rocket launchers, one facing to port and the other to starboard. See figure 4-0401. Each holds four Harpoon canisters. The exhaust flame from the Harpoon rocket erodes the corrosion protection applied to the foundations and to the surrounding decks.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Harpoon Foundation and Associated Drawings: 611-6595934, 722- 6596637 and 180-6597709.
2. DDG 52 - DDG 78. Apply metal spray coating (System 2) to foundations and install harpoon launcher while still wet. Do not apply to machined surfaces. Extend metal spray coating at least 6 inches outward onto surrounding deck.
3. DDG 52. Fasteners shall be carbon steel treated with ceramic coating (System 5).
4. DDG 52 - DDG 74. Fasteners shall be government furnished Inconel (System 16).
5. DDG 52 - DDG 74. Fasteners shall be coated with polysulfide sealant (System 8).
6. DDG 78. Selection of fasteners for mounting combat system equipment in weather, wet or humid areas shall be in general per System 14. For bonding/grounding installation procedures, NAVSEA drawing OD32382 shall be used.

SERVICE REQUIREMENTS (SHIP): Inspect periodically and after every firing for damage to protective coatings. Touch up as needed.

Index Number 0401
Harpoon Foundations

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Harpoon Foundation	01 Lvl Frame 324 Port	4
Harpoon Foundation	01 Lvl Frame 330 Port	4

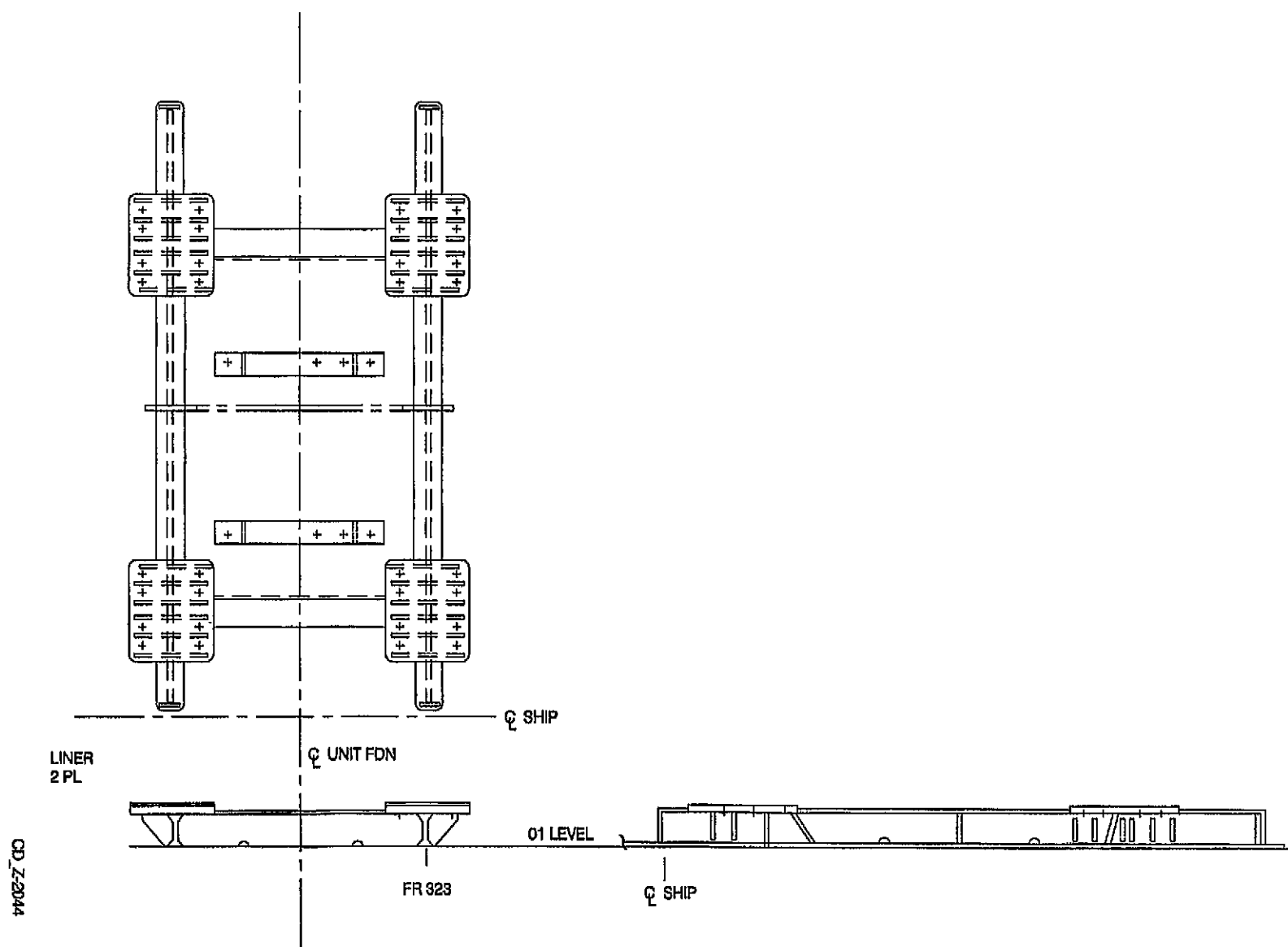


Figure 0401. Harpoon Foundation

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Torpedo Tube Foundation

AREA OF OCCURRENCE: Zone 4, 01 Level, Frame 351, Port and Starboard

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: The torpedo tubes are located on the 01 level weather deck, port and starboard. The foundations are exposed to seawater and weather. See figure 4-0402.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Torpedo Tube Foundation and Associated Drawings: 702-6596402 and 180-6597713.
2. DDG 52 - DDG 78. Apply meal spray coating (System 2) to foundations prior to installation of torpedo tubes. Extend coating out 6 inches onto surrounding deck. Do not apply System 2 to machined surfaces.
3. DDG 52 - DDG 74. Fasteners used to attach torpedo tubes to foundations shall be ceramic coated carbon steel (System 5).
4. DDG 52 - DDG 74. Apply polysulfide thread sealant (System 8) to fasteners prior to installation.
5. DDG 78. Selection of fasteners for mounting combat system equipment in weather, wet or humid areas, shall in general be per System 14.
6. DDG 78. Where corrosion control requirements conflict with bonding and grounding requirements, NAVSEA drawing OD32382 shall prevail.
7. DDG 78. RCS fairing plates (01 Level Frame 340 Port and Starboard) shall be CRES 316 (System 16).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 0402

Torpedo Tube Foundations

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Torpedo Tube Foundation	01 Lvl Frame 351 P/S	4
RCS Farrings Plates	01 Lvl Frame 340 P/S	4

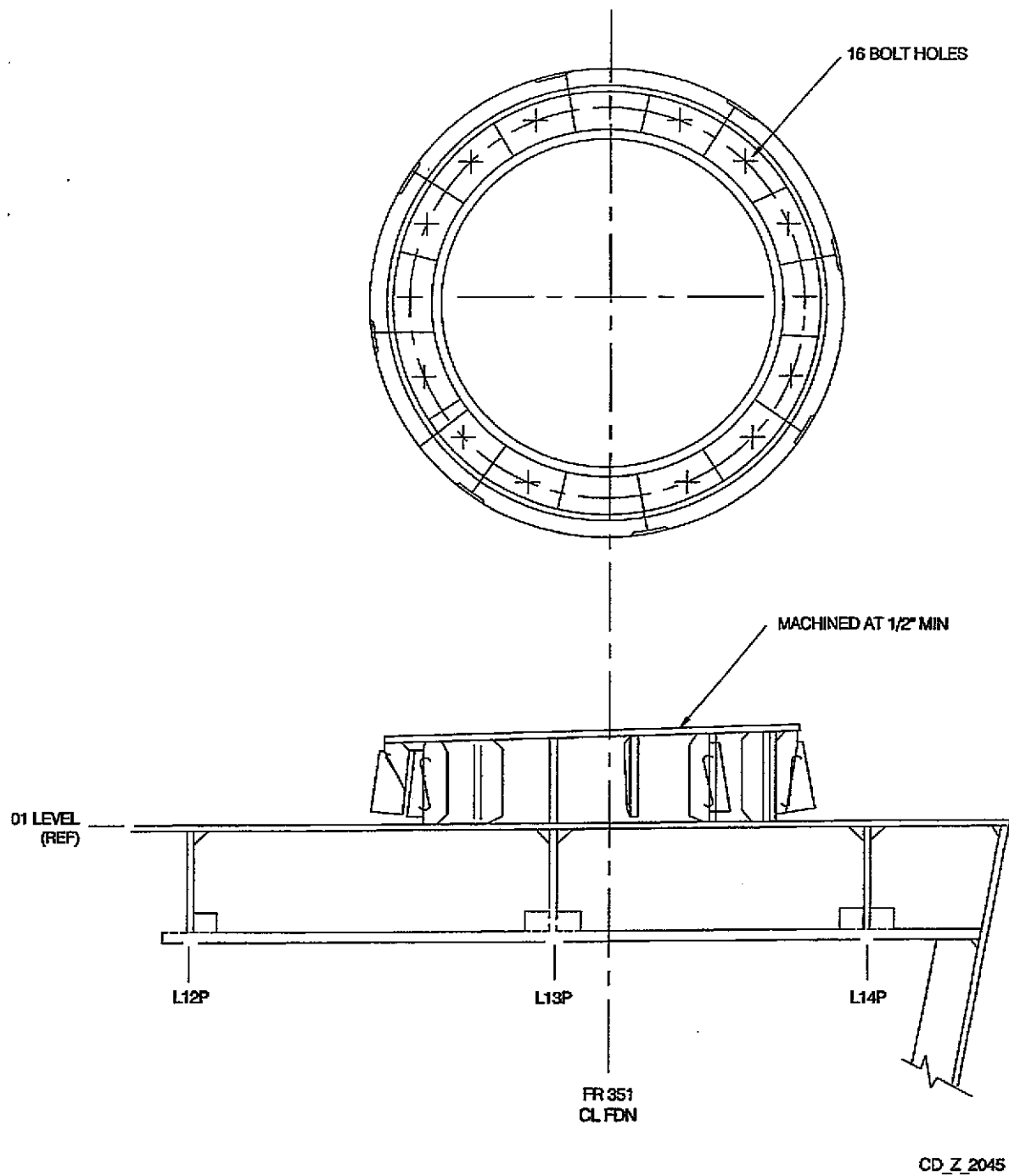


Figure 4-0402. Torpedo Tube Foundations

Table 4-6. Corrosion Control Zone 5 (See Figures 4-5, 4-5.1, and 4-5.2)

Zone Number: 5		Location: 01 Level	Frames: 111 to 228
Index Number	Description	Index Numbers for Other Zones	
0501	Decoy Launcher Foundations		
0502	Blow-In Door Fasteners		
	<u>Problems Common to Other Areas:</u>		
	Air Escape Vents	1002	
	Blow-in Door Fasteners	1053	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Cable Standoffs and Clips (Weather Exposed)	1008	
	Climber Safety Rail Fasteners	1010	
	Compartment Check-off List Holders	1011	
	Countermeasure Washdown Pipe Hangers	1012	
	Deck Drain Fasteners	1014	
	Deck Lights and Fixtures	1013	
	Encapsulated Lifeboat Release Mechanism	1016	
	Exhausts and Intake Vent Screens	1017	
	Fueling-at-Sea Station Valves, etc.	1018	
	Gas Turbine Intake and Exhaust Fasteners	1056	
	Inclined Ladder Brackets	1022	
	Label Plates (Weather Exposed)	1025	
	Life Raft Stowage Racks	1026	
	Low Profile Hatches and Scuttles in the Weather	1029	
	Ordnance and Marine Lockers	1030	
	Portable Davit and Sockets	1032	
	Propulsion GTRB and SSTG Air Intakes	1052	
	Raised Deck Hatches in the Weather	1035	
	Seawater Fire Station Hardware	1037	
	Topside Deck Drains	1040	
	Topside Navigational Aids	1042	
	Ventilation Exhaust and Intake Plenums	1810	
	Weather Doors (Steel)	1049	
	Weather Exposed Announcing System	1050	
	Weather Exposed Meter and Gage Cases	1051	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Decoy Launcher Foundations

AREA OF OCCURRENCE: Zone 5, 02 Level, Frames 201 and 203, Port and Starboard (for DDG 52).
Zone 5, 02 Level, Frames 199, 200 and 204, Port and Starboard for
DDG 55 and Follow).

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These foundations are located on the 02 level weather deck and are exposed to salt spray and blast heat from the launchers. (See figure 4-0501).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Decoy Launching (DLS) Foundations and Associated Drawings: 702-6596401, 722-6596637, 180-6597742 and 600-6596724.

2. DDG 52 - DDG 78. Apply metal spray coating (System 2) to decoy launcher foundations prior to launcher installation. Extend coating out 6 inches onto surrounding deck.
3. DDG 52 - DDG 74. Apply polysulfide sealer (System 9) to faying surfaces prior to launcher installation.
4. DDG 52 - DDG 74. Foundation fasteners shall be ceramic-metallic coated steel (System 5), if greater than 3/8-inch diameter or CRES 316, if 3/8-inch diameter or less (System 14).
5. Apply polysulfide sealant (System 8) to paying surfaces.
6. Apply anti-seize thread compound (System 6) to fasteners prior to installation.
7. DDG 78. Selection of fasteners for mounting combat system equipment in weather, wet or humid areas shall in general per System 14.
8. DDG 78. The installation fasteners selection list and the grounding and bonding installation procedure, NAVSEA drawing OD32382 shall prevail.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

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Index Number 0501

Decoy Launcher Foundations

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Decoy Launcher Fdn (DDG 55 - DDG 78)	02 Lvl Frame 204 P&S	5
	02 Lvl Frame 199 P&S	5
	02 Lvl Frame 200 P&S	5
Decoy Launcher Fdn (DDG 52)	02 Lvl Frame 201 P&S	5
	02 Lvl Frame 203 P&S	5

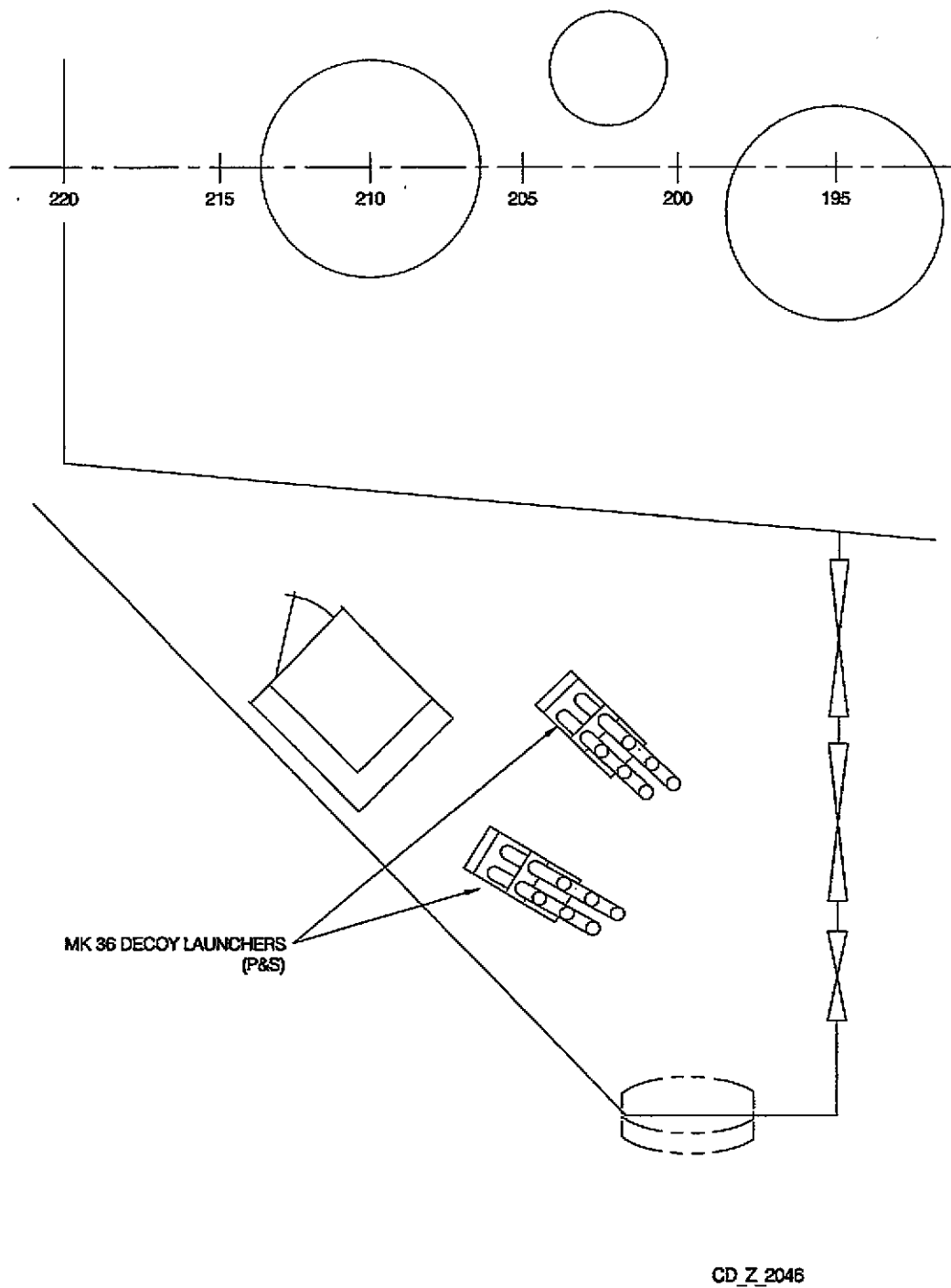
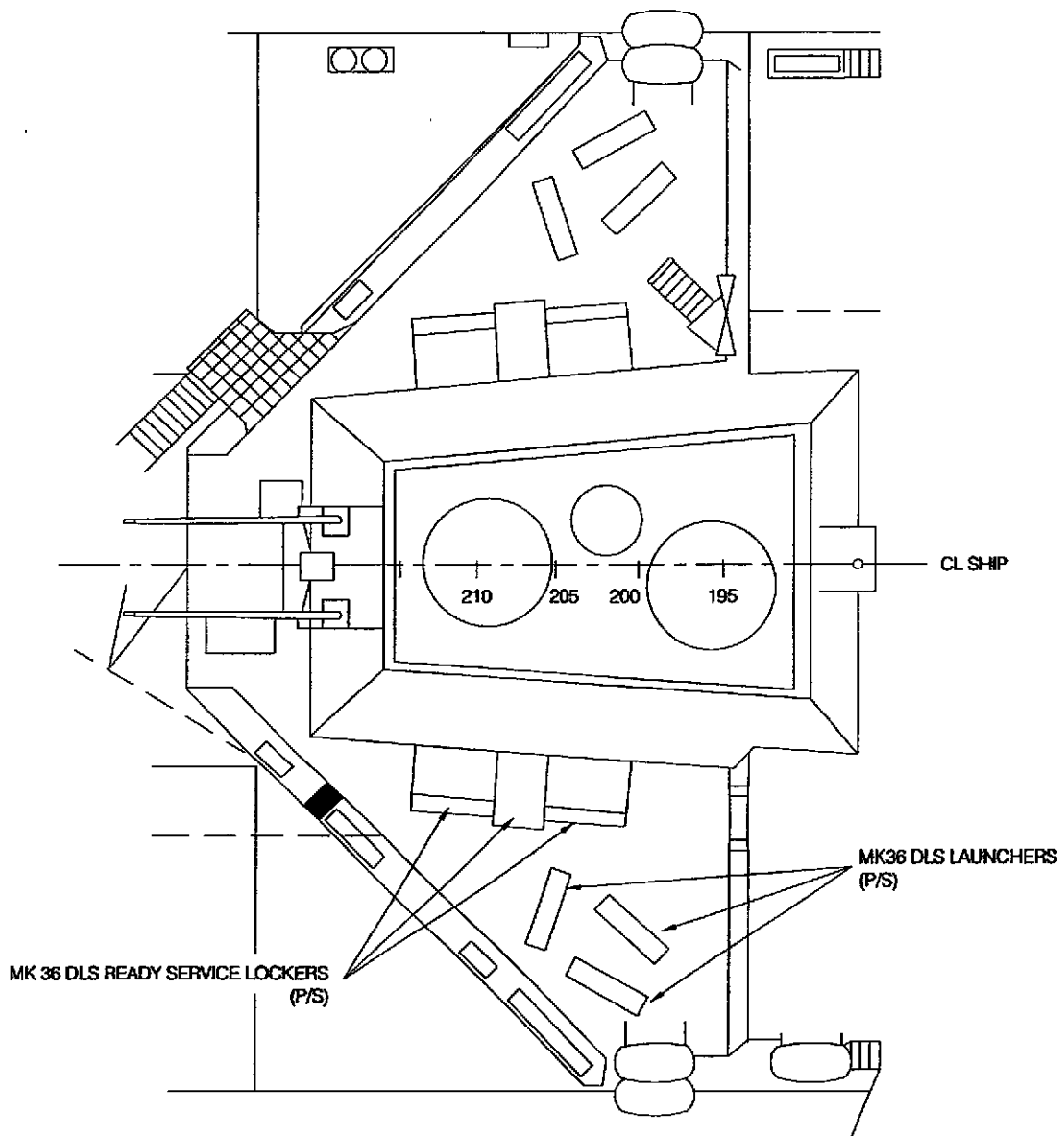


Figure 4-0501. Decoy Launcher Foundation Locations for DDG 52 (Sheet 1 of 2)



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Figure 4-0501. Decoy Launcher Foundation Locations for DDG 55 and Follow (Sheet 2 of 2)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Blow-in Door Fasteners

AREA OF OCCURRENCE: Zone 5

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Blow-in door fasteners are exposed to the weather and salt spray.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Blow-In Door Fasteners and Associated Drawings: 180-6597748, 180-6597717, 180-6597730, 180-6597743 and 180-6597740.

2. Blow-in door fasteners shall be fabricated from CRES 316 (System 14).
3. Apply anti-seize thread compound to fasteners prior to installation (System 6).
4. The blown-in panels shall have protective CRES FOD screens (System 16).

SERVICE REQUIREMENTS (SHIP): Inspect monthly. Replace as needed.

Index Number 0502

Blow-in Door Fasteners

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Blow-in Door Fasteners	02 Lvl P/S Frame 183	5
Blow-in Door Fasteners	02 Lvl P/S Frame 176	5
Blow-in Door Fasteners	02 Lvl P/S Frame 187	5
Blow-in Door Fasteners	02 Lvl P/S Frame 170	5

Table 4-7. Corrosion Control Zone 6 (See Figures 4-6 and 4-6.1)

Zone Number: 6		Location: 02 Level	Frames: 228 to 320
Index Number	Description	Index Numbers for Other Zones	
	<u>Problems Common to Other Areas:</u>		
	Antenna Foundations	1003	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Cable Standoffs and Clips (Weather Exposed)	1008	
	Climber Safety Rail Fasteners	1010	
	Compartment Check-off List Holders	1011	
	Countermeasure Washdown Pipe Hangers	1012	
	Deck Drain Fasteners	1014	
	Deck Lights and Fixtures	1013	
	Encapsulated Liferaft Release Mechanism	1016	
	Gas Turbine Intake and Exhaust Fasteners	1056	
	Gun Mount Foundations	1021	
	Inclined Ladder Brackets	1022	
	Label Plates (Weather Exposed)	1025	
	Life Raft Stowage Racks	1026	
	Low Profile Hatches and Scuttles in the Weather	1029	
	Mk 36 DLS Ready Service Lockers (RSL)	1030	
	Propulsion GTRB and SSTG Air Intakes	1052	
	Seawater Fire Station Hardware	1037	
	Tilt Whip Antenna Foundations	1039	
	Topside Deck Drains	1040	
	Turnbuckles	1044	
	Visual Landing Aids	1046	
	Weather Doors (Steel)	1049	
	Weather Exposed Announcing System	1050	

Table 4-8. Corrosion Control Zone 7 (See Figures 4-7 and 4-7.1)

Zone Number: 7		Location: 03 Level	Frames: 109 to 315
Index Number	Description	Index Numbers for Other Zones	
	<u>Problems Common to Other Areas:</u>		
	Antenna Foundations	1003	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Cable Standoffs and Clips (Weather Exposed)	1008	
	Climber Safety Rail Fasteners	1010	
	Compartment Check-off List Holders	1011	
	Counter Measure Washdown Pipe Hangers	1012	
	Gas Turbine Intake and Exhaust Fasteners	1056	
	Gun Mount Foundations	1021	
	Inclined Ladder Brackets	1022	
	Kick Pipes and Stuffing Tubes (Weather Exposed)	1024	
	Label Plates (Weather Exposed)	1025	
	Pipe Hangers and Fasteners (Steel only)	1031	
	Propulsion GTRB and SSGTG Air Intake Vents	1052	
	Seawater Fire Station Hardware	1037	
	Topside Deck Drains	1040	
	Weather Doors (Steel)	1049	

Table 4-9. Corrosion Control Zone 8 (See Figures 4-8 and 4-8.1)

Zone Number: 8		Location: 04 Level	Frames: 126 to 301
Index Number	Description	Index Numbers for Other Zones	
0801	Binocular Pedestals/Fasteners		
	<u>Problems Common to Other Areas:</u>		
	Antenna Foundations	1003	
	Binocular Pedestals/Fasteners	1020	
	Bulkhead Mounted Fog Applicator Brackets	0801	
	Cable Standoffs and Clips (Weather Exposed)	1008	
	Compartment Check-off List Holders	1011	
	Deck Lights and Fixtures	1013	
	Exhaust and Intake Vent Screens	1017	
	Inclined Ladder Brackets	1022	
	Kick Pipes and Stuffing Tubes (Weather Exposed)	1024	
	Label Plates (Weather Exposed)	1025	
	Miscellaneous Foundations	1809	
	Ordnance and Marine Lockers	1030	
	Pipe Hangers and Fasteners (Steel only)	1031	
	Topside Deck Drains	1040	
	Ventilation Exhaust and Intake Plenums	1810	
	Weather Doors (Steel)	1049	
	Weather Exposed Announcing System	1050	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Binocular Pedestals/Fasteners

AREA OF OCCURRENCE: Zone 8, 04 Level, Frame 164 Port and Starboard

TYPE OF CORROSION: Moderate

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: See figure 4-0801. Binocular pedestal is a tube with welded end plates and gussets, mounted on the ridge wing.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

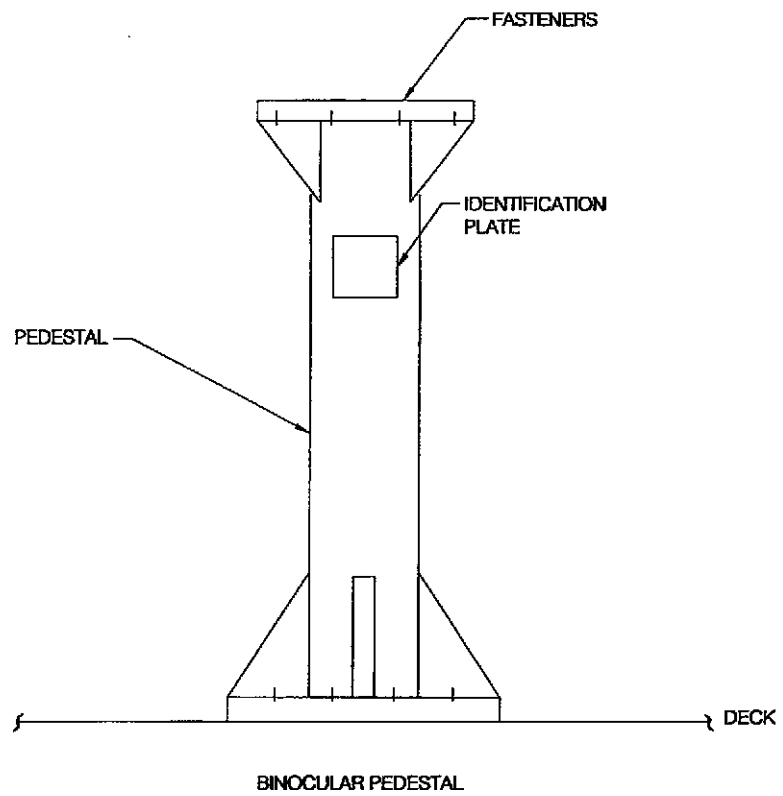
NAVSEA Binocular Pedestals/Fasteners and Associated Drawings: 101-65970995, 9240-005 and 600-6596717.
2. Apply metal spray coating (System 2) to carbon steel binocular pedestals and deck area to 6 inches around each pedestal.
3. DDG 52 - DDG 74. Fasteners shall be fabricated of CRES 316 (System 14).
4. DDG 78. Fasteners to be of corrosion resistant material (System 14). Wire lanyards to be CRES 316 with CRES 304 swage fittings. Toggle pins shall be CRES 316 with CRES 304 or MONEL pivot pins (System 16).
5. Apply anti-seize compound (System 6) to fasteners prior to installation where polysulfide sealant (System 8) is not used.
6. DDG 52 - DDG 69. Where corrosion control requirement conflicts with bonding and grounding requirements of NAVSEA drawing 300-6597363, bonding and grounding requirements shall take precedence.
7. DDG 71 - DDG 78. The installation control drawing fastener selection list and the ground and bonding installation procedure, NAVSEA drawing OD32382 shall prevail.

SERVICE REQUIREMENTS (SHIP): Inspect quarterly and touch up. Repair or repaint as needed. Replace fasteners as needed.

Index Number 0801

Binocular Pedestal/Fasteners

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Binocular Pedestal (2)	04 Lvl Frame 164 P/S	8



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Figure 4-0801. Binocular Pedestals/Fasteners

Table 4-10. Corrosion Control Zone 9 (See Figures 4-9, 4-9.1, and 4-9.2)

Zone Number: 9		Location: 05 Level and Above	Frames: 130 to 289
Index Number	Description	Index Numbers for Other Zones	
0901	Whistle (DDG 78)		
	<u>Problems Common to Other Areas:</u>		
	Antenna Foundations	1003	
	Cable Standoffs and Clips (Weather Exposed)	1008	
	Compartment Check-off List Holders	1011	
	Countermeasure Washdown Pipe Hangers	1012	
	Baxter Bolts	1004	
	Bulkhead and Deck Mounted Padeyes, Cleats and Fairleads	1007	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Exhaust and Intake Vent Screens	1017	
	Kick Pipes and Stuffing Tubes (Weather Exposed)	1024	
	Label Plates (Weather Exposed)	1025	
	Pipe Hangers and Fasteners (Steel only)	1031	
	Portable Rigid Lifeline Sections	1033	
	Seawater Fire Station Hardware	1037	
	Topside Deck Drains	1040	
	Topside Navigational Aids	1042	
	Topside Telephone Boxes	1043	
	Ventilation Exhaust and Intake Plenums	1810	
	Visual Landing Aids	1046	
	Weather Doors (Steel)	1049	
	Windows in the Weather	1055	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Whistle (DDG 78 only)

AREA OF OCCURRENCE: Zone 9

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Whistle, fastener and hardware are exposed to the weather.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Whistle and Associated Drawings: 301-6596602 and 505-6596877.

2. Fasteners, cotter pins and other small hardware shall be made from CRES 316 (System 14 and System 16).
3. Apply anti-seize compound (System 6).
4. Apply dielectric barrier between dissimilar metals (System 11).

SERVICE REQUIREMENTS (SHIP): Inspect quarterly and touch up. Repair or repaint as needed. Replace fasteners as needed.

Index Number 0901

Whistle

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Whistle (Artic Airhorn)	07 Lvl Mast	9
Fasteners (CRES 316)	07 Lvl Mast	9
Cotter Pins (CRES 316)	07 Lvl Mast	9
Small Hardware (CRES 316)	07 Lvl Mast	9

Table 4-11. Corrosion Control Zone 10

Zone Number: 10

Location: Topside Area Common Problems

Index Number	Description	Index Numbers for Other Zones
1001	AFFF Hose Reels in the Weather	
1002	Air Escape Vents	
1003	Antenna Foundations	
1004	Baxter Bolts	
1005	Bits	
1006	Bolted Grounding Straps	
	Bulkhead and Deck Mounted Padeyes, Cleats, and	
1007	Fairleads	
1008	Cable Standoffs and Clips (Weather Exposed)	
1009	Chocks	
1010	Climber Safety Rail Fasteners	
1011	Compartment Check-off List Holders	
1012	Countermeasure Washdown Pipe Hangers	
1013	Deck Lights and Fixtures	
1014	Deck Drain Fasteners	
1015	Electrical Pin Connectors (Weather Exposed)	
1016	Encapsulated Life Raft Release Mechanism	
1017	Exhaust and Intake Vent Screens	
1018	Fueling-at-Sea Station Valves, etc.	
1019	Fire Extinguisher Brackets	
1020	Bulkhead Mounted Fog Applicator Brackets	
1021	Gun Mount Foundations	
1022	Inclined Ladder Brackets	
1023	Jack and Ensign Staffs	
1024	Kick Pipes and Stuffing Tubes (Weather Exposed)	
1025	Label Plates (Weather Exposed)	
1026	Life Raft Stowage Racks	
1027	Life Ring and Light Holder Foundations	
1028	Low Pressure Air Service Station	
1029	Low Profile Hatches and Scuttles in the Weather	
1030	Ordnance and Marine Lockers	
1031	Pipe Hangers and Fasteners (Steel only)	
1032	Portable Davit and Sockets	
1033	Portable Rigid Lifeline Sections	

Table 4-11. Corrosion Control Zone 10 - CONT.

Zone Number: 10 Location: Topside Area Common Problems		
Index Number	Description	Index Numbers for Other Zones
1034	Quarter Deck IC and Alarm Enclosures	
1035	Raised Deck Hatches in the Weather	
1036	Scuppers	
1037	Seawater Fire Station Hardware	
1038	Security Lights and Brackets	
1039	Tilting Whip Antenna Foundations	
1040	Topside Deck Drains	
1041	Topside Lockers	
1042	Topside Navigational Aids	
1043	Topside Telephone Boxes	
1044	Turnbuckles	
1045	Vertical Launching System (VLS)	
1046	Visual Landing Aids	
1047	Waterway Bars	
1048	Weather Deck Areas	
1049	Weather Doors (Steel)	
1050	Weather Exposed Announcing System	
1051	Weather Exposed Meter and Gage Cases	
1052	Propulsion GTRB and SSTG Air Intakes	
1053	Not Used	
1054	Topside Deck Washdown Piping Risers	
1055	Windows in the Weather	
1056	Gas Turbine Intake and Exhaust Fasteners	
1057	Alignment Benchmarks and Covers	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: AFFF Hose Reels in the Weather

AREA OF OCCURRENCE: Zone 10 (2 and 4)

TYPE OF CORROSION: Uniform Attack, Seawater

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Corrosive effects of AFFF concentrate residues and of seawater accelerate corrosion on AFFF hose reels in the weather. See figure 4-1001.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA AFFF and Associated Drawings: 555-6597121, 505-6596778; Wormald Drawing 67496N Rev C.
2. DDG 52 - DDG 67, DDG 69 - DDG 78. Apply Metal Spray Coating (System 2) to AFFF hose reel foundations and 3 inches onto surrounding deck for DDG 69 - DDG 78. Do not use System 2 on the 3 inches surrounding deck.
3. DDG 63 - DDG 78. Hose reel crank handle stowage hangars are CRES, apply topcoatings only.
4. DDG 69 - DDG 78. Apply System 2 to AFFF hose reel foundations.
5. DDG 78. Hose restraining strap hardware to be 300 series CRES (CRES 316 as much as practical).
6. DDG 52 - DDG 78. Apply powered epoxy coating (System 4) to AFFF hose reels. DDG 78: Apply Polyester Powder Coating (TIGC) Type 4, Class 3 to AFFF hose reels at 01-367-1 and 01-382-2.
7. DDG 52 - DDG 74. All fasteners for the AFFF hose reels shall be CRES 316 (System 14).
8. DDG 52 - DDG 78. Apply anti-seize compound (System 6) to fasteners prior to installation.
9. DDG 63 - DDG 78. Place dielectric barrier between dissimilar materials (System 11). Ensure barrier extends 1/4-inch beyond all edges of protected piece.
10. DDG 78. Polysulfide sealants System 8 and System 9 are to be used.
11. DDG 78. Fasteners to be of corrosion resistant material (System 14).
12. DDG 78. AFFF Pump No. 1 and No. 2 electric remote operations start switch covers shall be CRES 316. Sand sweep and prime with Ameron 236, one coat at 1-2 MILS DFT, prior to installation.
13. Apply cosmetic coating (System 15) as required.

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SERVICE REQUIREMENTS (SHIP): Inspect quarterly and touch up. Replace fasteners as needed.

Index Number 1001

AFFF Hose Reel in Weather

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
AFFF Hose Reel	01 Lvl Frame 108 Port (DDG 61 and follow)	2
AFFF Hose Reel	01 Lvl Frame 110 Port	2
AFFF Hose Reel	01 Lvl Frame 116 Stbd	2
AFFF Hose Reel	01 Lvl Frame 367 Stbd (DDG 55 and follow)	4
AFFF Hose Reel	01 Lvl Frame 372 Stbd & Port (DDG 52 only)	4
AFFF Hose Reel	01 Lvl Frame 382 (DDG 55 and follow)	4
Remote Operator Start	01-110-2	2
Switch Covers	01-118-1	2
Switch Covers	01-384-2	4
Switch Covers	01-368-1	4

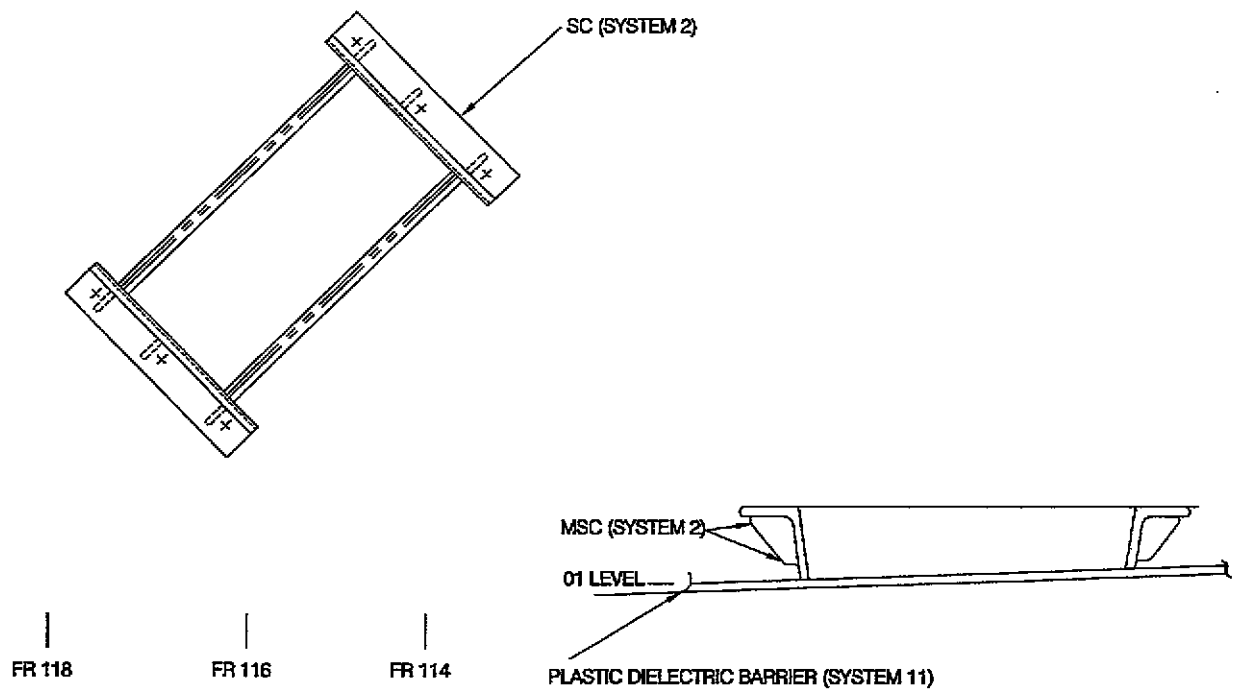
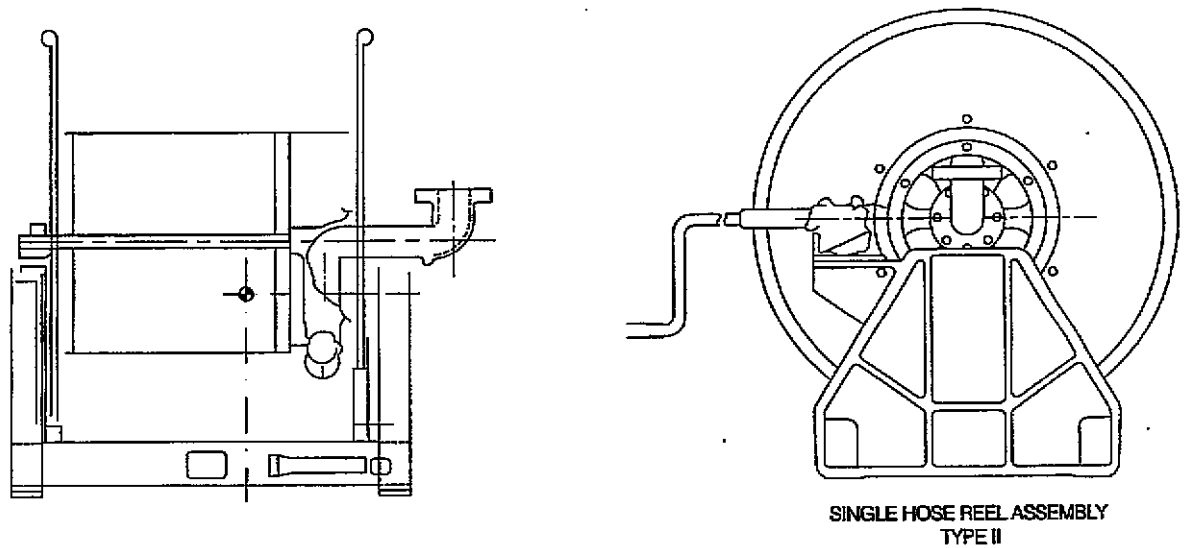


Figure 4-1001. Foundation for Single Hose Reel (Typical)



CD_Z_2049

Figure 4-1001. Single Hose Reel Assembly Type II (Typical)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Air Escape Vents

AREA OF OCCURRENCE: Zone 10 throughout Ship

TYPE OF CORROSION: General, Galvanic

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These vents carry fumes from tanks to the weather. They are subject to sea spray and weather. See figure 4-1002.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Air Escape Vents (Screens Diffusers and Fasteners) and Associated Drawings:
506-6597129, 529-6597159, 529-6597164, 505-6596778, 262-6597158, 505-6596750,
505-6596810, 505-6596816, 505-6596849, 505-6596850, 505-6596862, 505-6596868,
505-6596878, 505-6596879, 505-6596885 and 505-6596886.
2. DDG 52 - DDG 78. Fabrication all vent screens out of bronze, brass, or nickel copper system.
3. DDG 63 - DDG 78. Anti-siphon angle shields for drain piping will be fabricated out of CRES material (System 16).
4. DDG 52 - DDG 78. Apply metal spray coating (System 2) to all surfaces of steel vents where applicable and steel piping exposed to the weather for 6 inches above the deck and 3 inches on deck surrounding. Do not apply metal spray coating (System 2) to CRES, nickel copper, bronze or brass.
5. DDG 52 - DDG 74. Fasteners used to attach the vent screens to the piping shall be in accordance with System 16.
6. DDG 78. Fasteners to be of corrosion resistant material (System 14).
7. DDG 78. Wire lanyards to be CRES 316 with CRES 304 swage fitting, toggle pins to be CRES 316 with CRES 304 or MONEL pivot pins.
8. Where dissimilar metals are joined, a dielectric barrier or insulating tape, MIL-I-24391 (or equal) shall be provided to isolate the faying surfaces (System 11).
9. Apply anti-seize compound (System 6) to fasteners prior to installation.
10. Apply cometic coatings (System 11) as required.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1002

Air Escape Vents (Screens, Diffusers, and Fasteners)

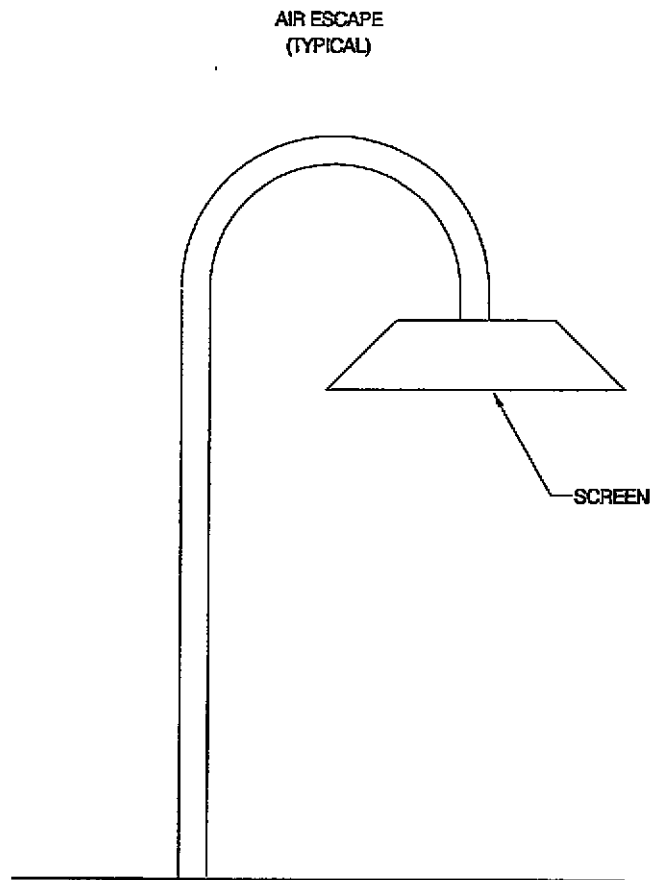
<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
2" Air Escape	01 Lvl Frame 122 Stbd	2
2" Air Escape	01 Lvl Frame 123 Port	2
2" Air Escape	02 Lvl Frame 225 Port	2
2" Air Escape	01 Lvl Frame 246 Port	3
2" Air Escape	01 Lvl Frame 250 Port	3
2" Air Escape	01 Lvl Frame 250 Port	3
2" Air Escape	01 Lvl Frame 294 Stbd	3
2" Air Escape	01 Lvl Frame 308 Stbd	3
2" Air Escape	01 Lvl Frame 308 Port	3
1-1/2" Air Escape	01 Lvl Frame 372 Stbd	4
2-1/2" Air Escape	01 Lvl Frame 386 Port	4
2-1/2" Air Escape	01 Lvl Frame 386 Port	4
2-1/2" Air Escape	Mn Dk Frame 385 Stbd	1
2-1/2" Air Escape	Mn Dk Frame 387 Stbd	1
1-1/2" Air Escape	01 Lvl Frame 181 Stbd	2
1-1/2" Air Escape	01 Lvl Frame 180 Stbd	2
1-1/2" Air Escape	01 Lvl Frame 293 Stbd	3
1-1/2" Air Escape	01 Lvl Frame 295 Stbd	3
1-1/2" Air Escape	1st Platf 297 Port	15
1-1/2" Air Escape	01 Lvl Frame 372 Stbd	4
2" Air Escape	01 Lvl Frame 206 Port	3
2" Air Escape	01 Lvl Frame 276 Port	3
2" Air Escape	01 Lvl Frame 127 Port	5
1-1/2" Air Escape	01 Lvl Frame 298 Stbd	3

Work Instruction Note

Index Number 1002

Air Escape Vents (Screens, Diffusers, and Fasteners) - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
2" Air Escape	01 Lvl Frame 307 Port	3
2" Air Escape	01 Lvl Frame 225 Port	3
2" Air Escape	41' Flat Frame 24 Port	19
2" Air Escape	41' Flat Frame 2 Port	19
2-1/2" Air Escape	01 Lvl Frame 378 Port	4
2-1/2" Air Escape	01 Lvl Frame 378 Port	4



CD_Z_2050

Figure 4-1002. Air Escape Vents

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Antenna Foundations (Steel)

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These foundations are subject to salt spray and weather.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Antenna Foundations and Associated Drawings 180-6597731, 180-6597735, 180-6597736, 180-6597724, 180-6597744, 180-6597748, 180-6597750, 180-6597732, 180-6597725, 401-6597218, 180-6597747, 300-6597363 and 301-6596622.
2. DDG 52 - DDG 74. Apply metal spray coating (System 2) to carbon steel antenna foundations prior to installation of antennas, coating shall extend at least 6 inches outward onto surrounding deck.
3. DDG 52 - DDG 74. Polysulfide sealant (System 9) shall be applied to faying surfaces prior to installation of antennas.
4. DDG 52- DDG 74. Fasteners shall be carbon steel with ceramic coating (System 5).
5. DDG 52 - DDG 74. Apply polysulfide sealant (System 8).
6. DDG 52 - DDG 74. Apply anti-seize compound (System 6) to fasteners prior to installation where System 8 is not used.
7. DDG 52 - DDG 78. Where necessary to join metals, a dielectric barrier of insulating tape (MIL-I-24391 or equal) shall be used to isolate faying surfaces.
8. DDG 78. Fasteners will be corrosion resistant material (System 14).
9. DDG 78. Two coats of polysulfide sealant shall be applied to waveguide flanges and 1/4-inch onto the waveguide itself.
10. DDG 52 - DDG 69. Where corrosion control requirements conflict with bonding and grounding requirement NAVSEA drawing 300-6597363 shall prevail.
11. DDG 71 - DDG 78. The installation control drawing fastener selection list and the grounding and bonding installation procedure, NAVSEA drawing OD32382 shall prevail.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1003
Antenna Foundations (Steel)

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
AS2815/SSR-1 & ACU6-714AMO425 (Common Fdn)	04 Lvl Frame 129 CL	8
AS2815/SSR-1 & AM6534/SSR-1	02 Lvl Frame 243 Port	6
AS2815/SSR-1 & AM6534/SSR-1	02 Lvl Frame 243 Stbd	6
OE415(V)1/SRC	05 Lvl Frame 245 P&S	9
OE418(V)1/SRC	05 Lvl Frame 220 P&S	9
AS-3771A/U	05 Lvl Frame 187 CL	9
AS-3018A/WSC-1(V)	05 Lvl Frame 137 Stbd	9
AS-3018A/WSC-1(V)	05 Lvl Frame 155 Port	9
CW-1187/SLQ-32(V)	03 Lvl Frame 150 Stbd	7
CW-1187/SLQ-32(V)	03 Lvl Frame 150 Port	7
AS-3802/SLQ-32(V) (DDG 52-71)	04 Lvl Frame 150 Stbd	8
AS-3802/SLQ-32(V) (DDG 52-71)	04 Lvl Frame 150 Port	8
MK52, MOD 0, AS3444/SPG62	06 Lvl Frame 150 CL	9
MK52, MOD 0, AS3444/SPG62	06 Lvl Frame 280 CL	9
MK52, MOD 0, AS3444/SPG62	06 Lvl Frame 292 CL	8
EX5, MOD 0, (Antenna Unit) (Gun Barrel)	01 Lvl Frame 56 CL	2
AN-USC-38(V)2 EHF (P)		
SAT COM ANT (DDG 74-78)	05 Lvl Frame 137 P	9
SAT COM ANT (DDG 74-78)	05 Lvl Frame 166 S	9

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Baxter Bolt and Socket

AREA OF OCCURRENCE: Zones 1, 9 and 10

TYPE OF CORROSION: Galvanic, Crevice

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: The Baxter bolt is a reversible deck bolt used to provide a deck padeye where a permanent fitting would be undesirable. Figure 4-1004 shows typical Baxter bolts. The bolt portion and the thread ring is fabricated from CRES 304 (System 16). Deck traffic and trapped water cause corrosion problems with Baxter bolt.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Baxter Bolts (Deck Screw Reversible Eyebolts) and Associated Drawings:
611-6595934, 600-6596646, 805-1639000, 180-6597735, 600-6596681, 600-6596691 and
611-6597245.

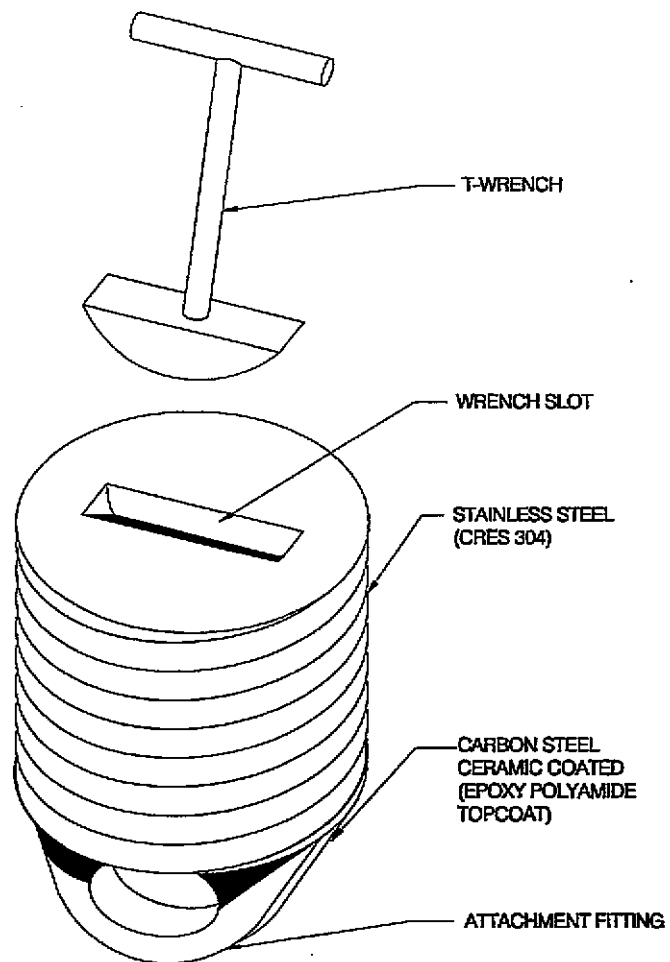
2. DDG 52 - DDG 74. Apply ceramic metallic coating (System 5) to the pad portion of steel baxter bolts.
3. Fabricate the bolt portion and the thread ring from CRES 304 (System 14).
4. Apply anti-seize compound (System 6) to the threads prior to installation.
5. DDG 78. All reversible eyebolts (baxter bolts) to be CRES 304L (System 16).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace from stock as required. Apply System 6 as required.

Index Number 1004

Baxter Bolts

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Baxter Bolt (Pad Only)	Various	10 (1, 9)
Baxter Bolt (Bolt Portion and Thread Ring)	Various	10 (1, 9)



CD-Z_2051

Figure 4-1004. Baxter Bolt

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Bitts

AREA OF OCCURRENCE: Zones 10, 01 Level and Main Deck

TYPE OF CORROSION: Uniform Attack, Pitting, Abrasion

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Bitts are installed at intervals along the deck edges of the main deck and 01 level.

Bitts are used to restrain or prevent line outhaul. See figure 4-1005.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Bitts and Associated Drawings: 600-6596646, 600-6596665, 600-6596681, 600-6596698, 600-6596702, 600-6596707, 600-6596710 and 581-6597244.

2. DDG 52 - DDG 55. Apply metal spray coating (System 2) to bitts 12 inches onto surrounding deck.
3. DDG 57 - DDG 78. Apply metal spray coating (System 2) to bitts and 6 inches onto surrounding deck.
4. Apply cosmetic coating as required (System 15).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touchup as needed.

Index Number 1005

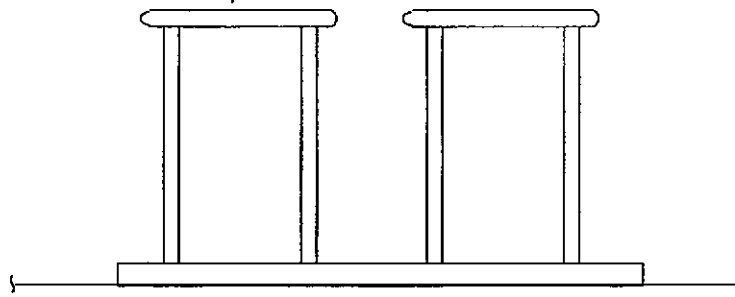
Bitts

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Double Barrell Bitt	01 Lvl Frame U Stbd	2
Double Barrell Bitt	01 Lvl Frame F Stbd	2
Double Barrell Bitt	01 Lvl Frame 0 Port	2
Double Barrell Bitt	01 Lvl Frame 14 P/S	2
Double Barrell Bitt	01 Lvl Frame 86 P/S	2
Double Barrell Bitt	01 Lvl Frame 215 Port	3
Double Barrell Bitt	01 Lvl Frame 246 Stbd	3

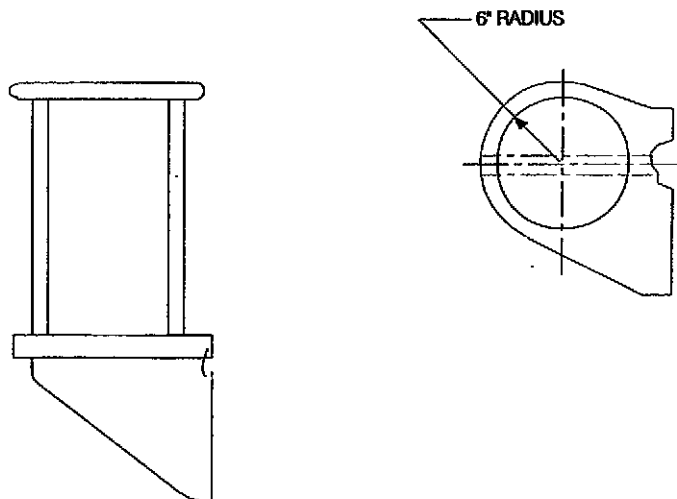
Index Number 1005

Bitts - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Double Barrell Bitt	01 Lvl Frame 359 P/S	4
Double Barrell Bitt	Mn Dk Frame 394 P/S	1
Double Barrell Bitt	Mn Dk Frame 423 P/S	1
Double Barrell Bitt	Mn Dk Frame 455 Port	1
Double Barrell Bitt	Mn Dk Frame 465 Port (6' Off CL)	1
Double Barrell Bitt	Mn Dk Frame 466 Stbd (3' Off CL)	2
Single Barrell Bitt	01 Lvl Frame S CL	2
Single Barrell Bitt	01 Lvl Frame F Port (6' Off CL)	

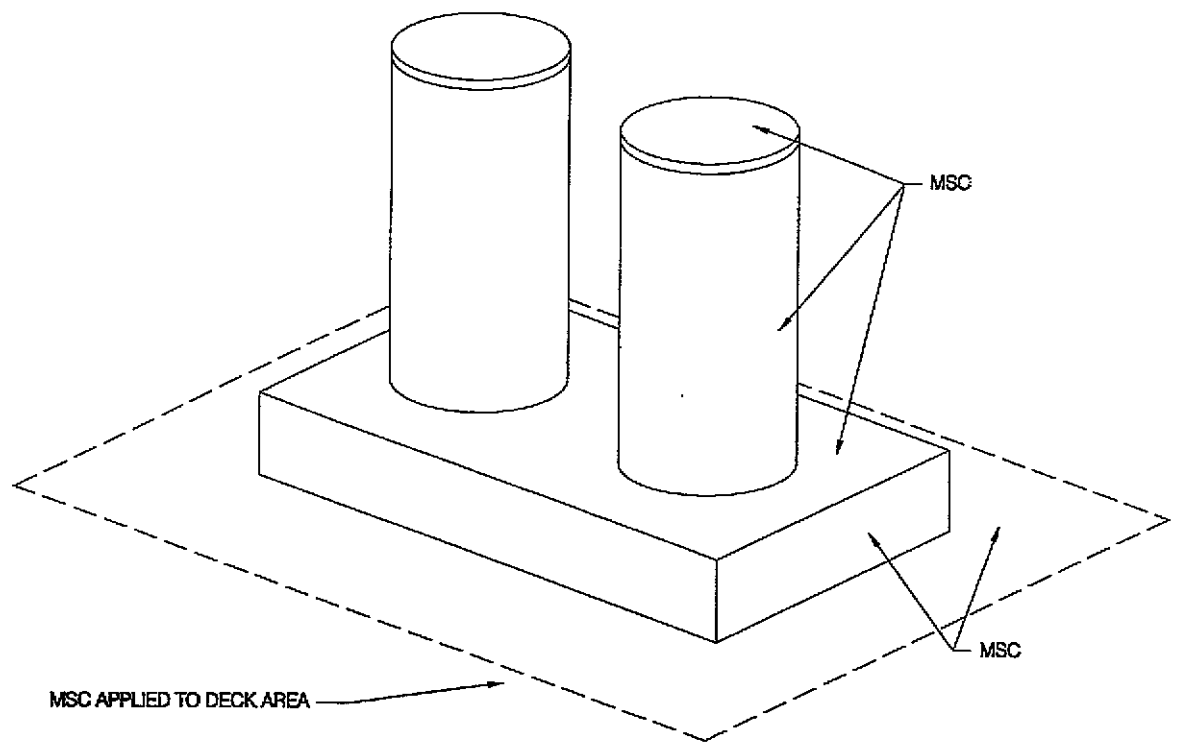


DOUBLE BARREL BITT



CD_Z_2052

Figure 4-1005. Bitts Corrosion Protection (Sheet 1 of 2)



DC_Z_2053

Figure 4-1005. Bitt Corrosion Protection (Sheet 2 of 2)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Bolted Grounding Straps

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: These items are located on weather decks where they are exposed to seawater. See figure 4-1006.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

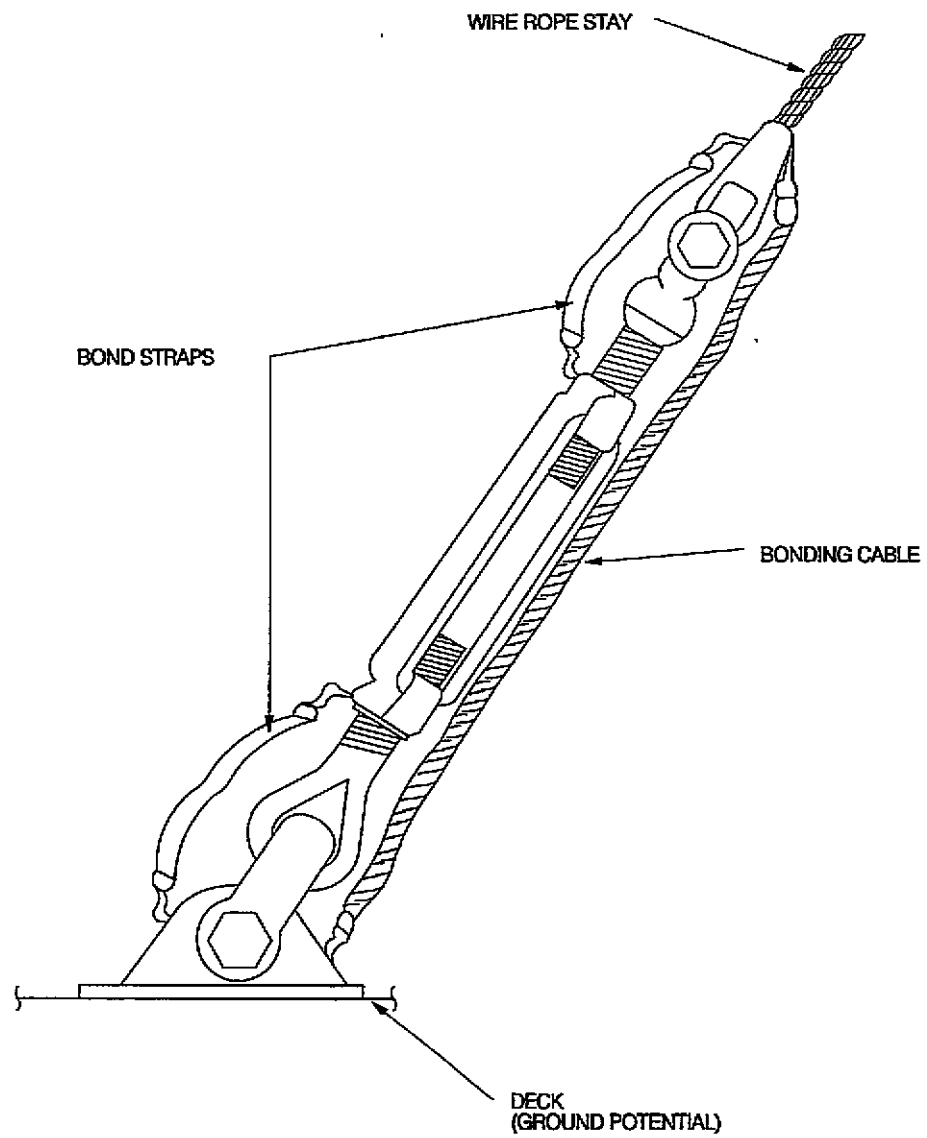
NAVSEA Bolted Grounding Straps and Associated Drawings: 8100-3535-0059 and 300-6598062.
2. DDG 52 - DDG 74. Fasteners shall be CRES 316 (System 14), grounding strap lugs CRES 316 (System 16).
3. DDG 78. Fasteners shall be CRES 316 or K-MONEL, grounding strap lugs CRES 316L.
4. Wire rope shall be CRES 316.
5. Apply polysulfide sealant (System 8). Apply anti-seize compound (System 6) prior to installation where polysulfide sealant (System 8) is not used.
6. Where corrosion control requirements conflict with bonding and grounding requirements, bonding and grounding requirements shall take precedence.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace as needed.

Index 1006

Bolted Grounding Straps

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Fasteners	Various	10, 18
CRES Wire Rope	Various	10, 18
Grounding Strap Lugs	Various	10, 18



CD_Z_2054

Figure 4-1006. Bolted Grounding Strap

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Bulkhead and Deck Mounted Padeyes, Cleats, and Fairleads

AREA OF OCCURRENCE: Zone 10, 01 Level, Main Deck, 03 level and 05 Level

TYPE OF CORROSION: Galvanic, pitting, salt spray

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: Bulkhead and deck mounted padeyes, cleats and fairleads are subject to saltwater and weather. Abrasion from equipment and lines accelerates corrosion. See figure 4-1007.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Bulkhead and Deck Mounted Padeyes, Cleats, Fairleads and Associated Drawings:
180-6597644, 180-6597736, 301-6596460, 571-6595875, 582-6597246, 600-6596646,
600-6596659, 600-6596665, 600-6596681, 600-6596693, 600-6596698, 600-6596702,
600-6596718, 600-6596720, 600-6596726, 600-6596728, 600-6596722, 600-6596731,
611-6595883, 611-6595884, 611-6595885, 611-6595886, 611-6595937 and 613-6597081.

2. DDG 52 - DDG 55. Apply metal spray coating (System 2) to all carbon steel weather exposed bulkhead and deck mounted padeyes, cleats and fairleads. System 2 shall extend 6 inches onto surrounding area.
3. DDG 57 - DDG 74. Do not apply System 2 on bulkhead and deck mounted padeyes and prime with inorganic zinc silicate paint. Apply System 2 to all carbon steel weather exposed fairleads and extend 6 inches onto surrounding areas. Cleats in the weather shall be System 2 coated or galvanized in lieu of System 2.
4. DDG 52 - DDG 74. Fasteners shall be CRES 316 (System 14) or steel with ceramic coating (System 5).
5. DDG 78. Fasteners shall be of corrosion resistant material (System 14).
6. DDG 78. Bulkhead and deck mounted padeyes shall be primed with a NAVSEA approved epoxy primer.
7. Apply polysulfide sealer (System 9) to faying surfaces of removable hardware.

SERVICE REQUIREMENTS (SHIP): Inspect for corrosion, touch up as required. Replace fasteners as needed.

Index Number 1007
Bulkhead and Deck Mounted Padeyes, Cleats
and Fairleads in the Weather

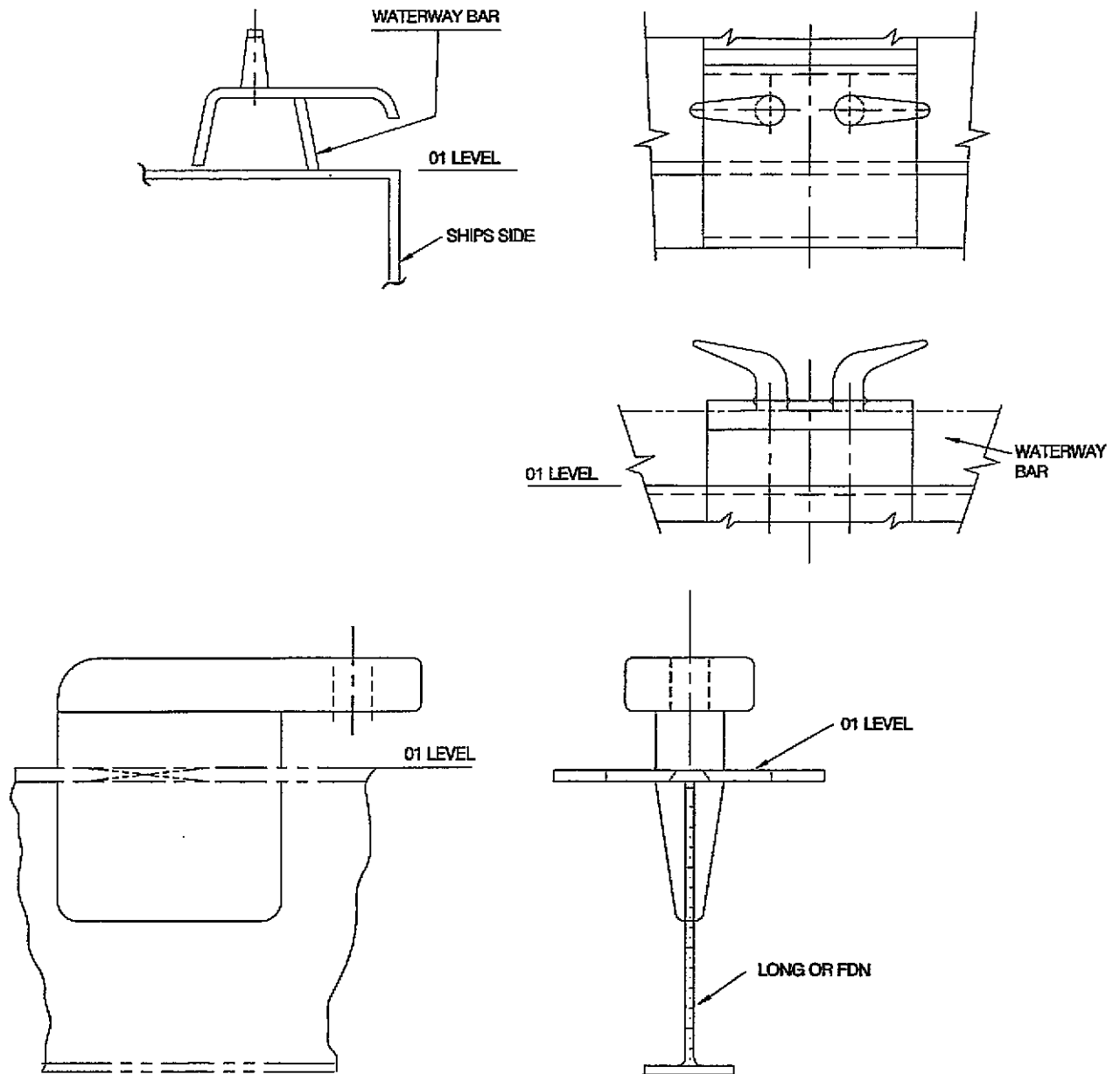
<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Towing Padeye	01 Lvl Frame 2 CL 01 Lvl Frame C Port (2' Off CL)	2
Chain Stopper Padeye	01 Lvl Frame H Stbd 01 Lvl Frame 0 Stbd 01 Lvl Frame 3 Port 01 Lvl Frame 5 Port 01 Lvl Frame 7 Port 01 Lvl Frame 8 CL 01 Lvl Frame 9 Port	2
Fairleader	01 Lvl Frame 5 Stbd	2
Cleat	01 Lvl Frame 116 P/S	2
Cleat	01 Lvl Frame 264 Stbd	3
Cleat	01 Lvl Frame 289 Stbd	3
Padeye Gripe	01 Lvl Frame 266 Stbd (2) 01 Lvl Frame 277 Stbd (2)	3
Padeye Lashing	01 Lvl Frame 256 Stbd 01 Lvl Frame 276 Stbd 01 Lvl Frame 284 Stbd	3
Padeye Gripe	01 Lvl Frame 295 Stbd (2)	3
Padeye Lashing	01 Lvl Frame 289 Stbd	3
Cleat	01 Lvl Frame 269 Port 01 Lvl Frame 292 Port	3
Padeye Gripe	01 Lvl Frame 306 Stbd (2)	3
Cleat	05 Lvl Frame 152 Stbd	9
12-Inch Cleat	01 Lvl Frame 314 Stbd	3
Fairleader	01 Lvl Frame 72 Stbd	2
Padeye and Link	01 Lvl Frame 315-1/2 Stbd 01 Lvl Frame 318 Stbd 01 Lvl Frame 319 Stbd 01 Lvl Frame 325 Stbd 01 Lvl Frame 326-1/2 Stbd	3 4 4 4 4
12-Inch Cleat Assy	01 Lvl Frame 93 P/S 01 Lvl Frame 112 P/S	2 2

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Index Number 1007

Bulkhead and Deck Mounted Padeyes, Cleats
and Fairleads in the Weather - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Padeye Lashing	01 Lvl Frame 317 Stbd	4
20-inch Cleat	01 Lvl Frame 323 Port	4
	01 Lvl Frame 329-1/2 Stbd	
Kingpost Base	01 Lvl Frame 321 Stbd	4
Sidelong Base	01 Lvl Frame 317 Stbd	4
	01 Lvl Frame 324 1/2 Stbd	
Cleat	01 Lvl Frame 344 Port	4
8-Inch Cleat Horn	Mn Dk Frame 389 P/S	1
	Mn Dk Frame 403 P/S	
12-Inch Cleat Horn	Mn Dk Frame 381 P/S	1
Handling Line Padeye	01 Lvl Frame 292 Stbd	3
	01 Lvl Frame 308 Stbd	
Cleat Assy	03 Lvl Frame 179 P/S	7



TYPICAL TOWING (CHAIN STOPPER PADEYE)

CD_Z_2065

Figure 4-1007. Bulkhead and Deck Mounted Padeyes, Cleats

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Cable Standoffs and Clips in the Weather

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: Support clips for weather deck cables. Subject to sea spray. See figure 4-1008.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

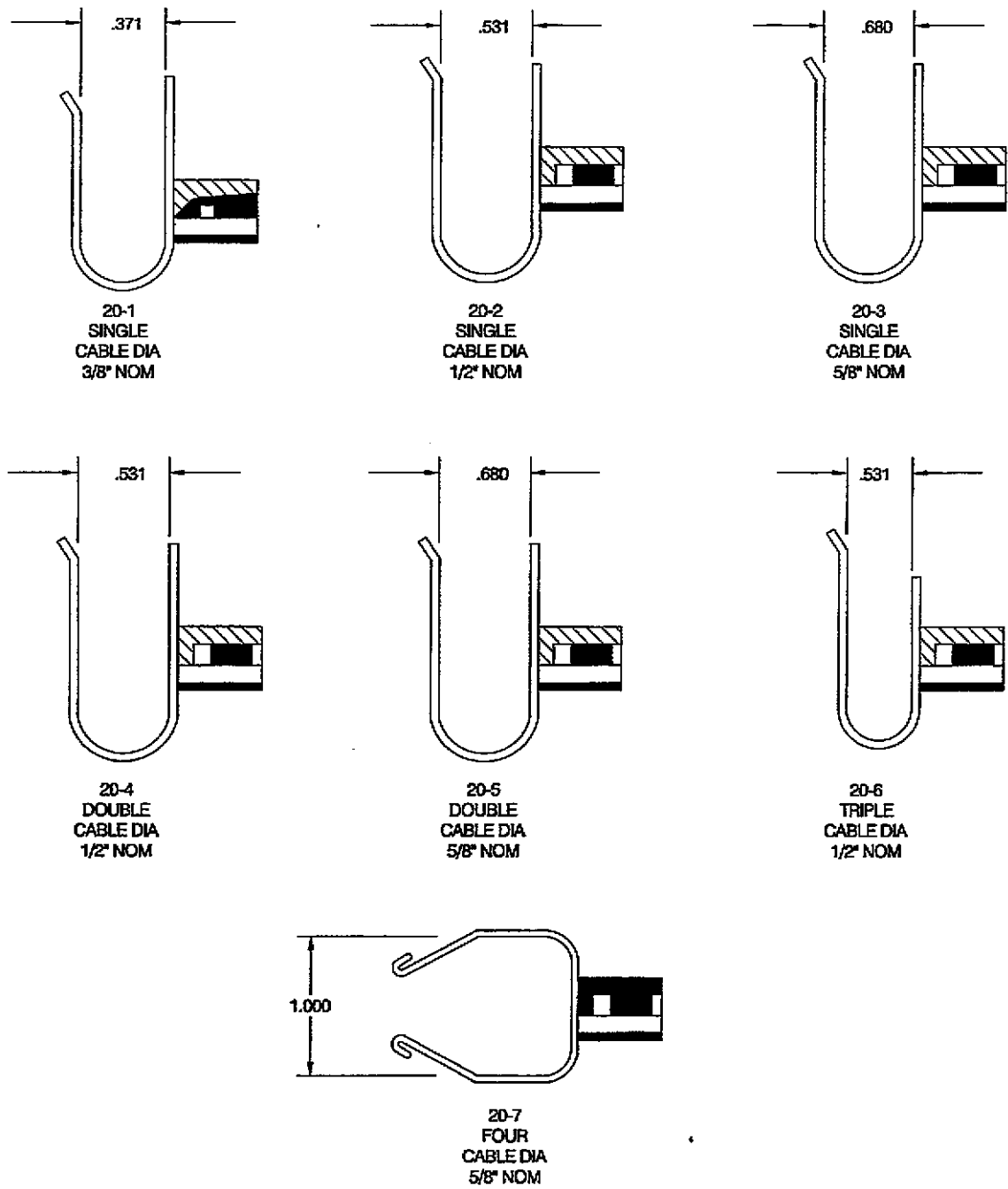
NAVSEA Cable Standoffs and Clips in the Weather and Associated Drawing: 8100-3504-0039
2. DDG 52 - DDG 74. Cable clips, straps, and fasteners located in the weather shall be CRES 316 (System 16).
3. DDG 78. Cable clips and straps located in the weather shall be CRES 316 or CRES 304 (System 16).
4. DDG 78. Apply a zinc-based anti-seize thread compound (System 6) to CRES 316 and steel (Grade 5) fasteners subjected to temperature less than 100° F where polysulfide thread sealant (System 8) is not used.
5. DDG 78. Zinc-based anti-seize compound (System 6) shall not be used for fasteners made of Inconel, K-Monel or Grade 8 steel fasteners.
6. DDG 78. No metallic based anti-seize compound shall be used on Grade 8 or B16 steel fasteners.
7. Apply polysulfide thread sealant (System 8) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1008

Cable Standoffs and clips in the Weather

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Cable Standoffs and Clips in the Weather	Various	10



CD_Z 2056

Figure 4-1008. Cable Standoffs and Clips in the Weather

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Chocks

AREA OF OCCURRENCE: Zone 10, 01 Level and Main Deck

TYPE OF CORROSION: Uniform Attack, Pitting, Abrasion

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Chocks are installed at intervals along the deck edges of the main deck and 01 level. The chocks guide the ships mooring lines and protect them from sharp edges. See figure 4-1009. The chocks are carbon steel and require corrosion protection.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Chocks and Associated Drawings: 600-6596646, 600-6596707, 600-6596653, 600-6596687, 600-6596693, 600-6596698, 600-6596710, 600-6596723, 161-6597182, 581-6597244, 582-6597246, 581-6595902, 600-6596665, 180-6597644, 180-6597699, 180-6597690, 180-6597720, 180-6597662 and 600-6596702.

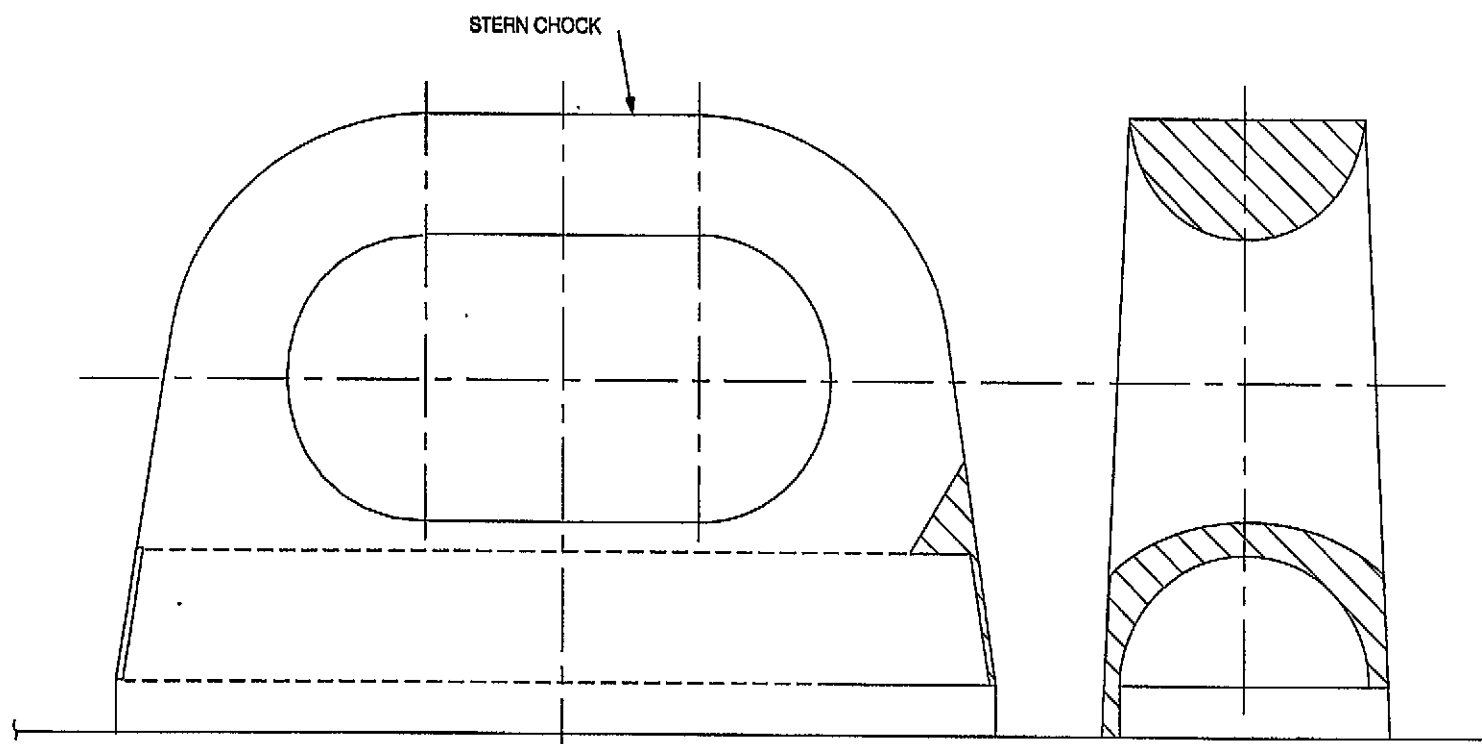
2. DDG 52 - DDG 58. Apply metal spray coating (System 2) to chocks, extending the coating at least 12 inches onto the surrounding deck.
3. DDG 57- DDG 78. Apply metal spray coating (System 2) to chocks, extending the coating at least 6 inches on to the surrounding deck.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed.

Index Number 1009

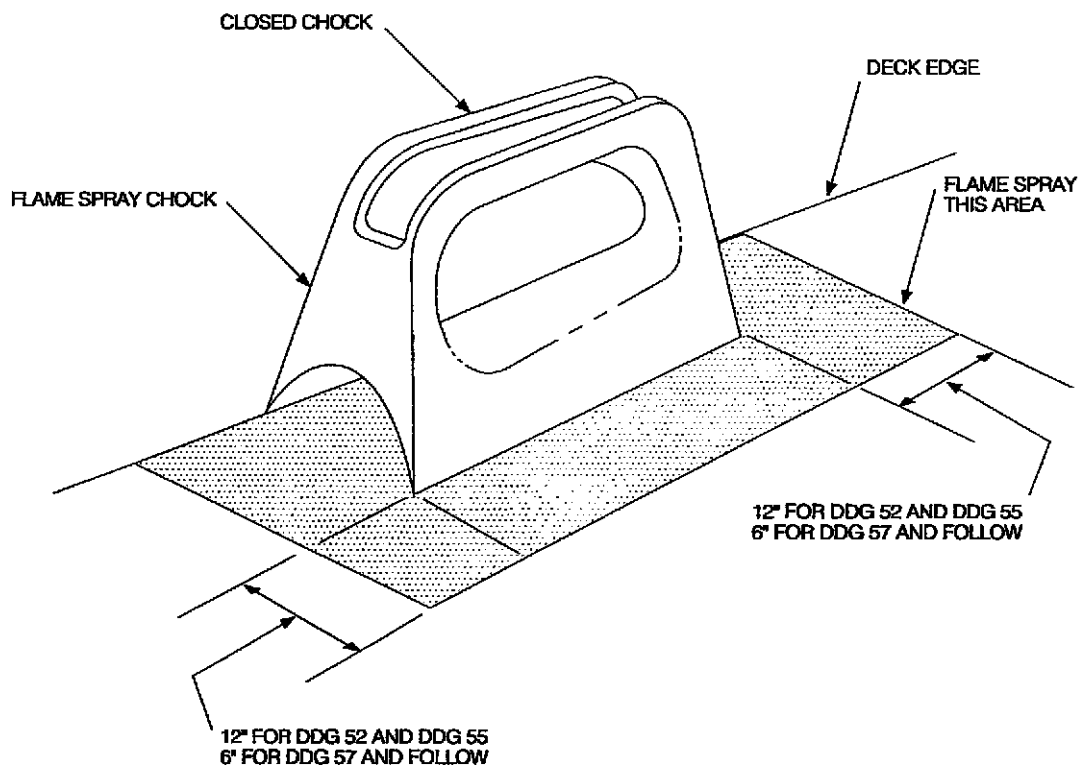
Chocks

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Closed Chocks	01 Lvl Frame F Port	2
	01 Lvl Frame R Port	2
	01 Lvl Frame M Stbd	2
	01 Lvl Frame 6 P/S	2
	01 Lvl Frame 78 P/S	2
	01 Lvl Frame 205 Port	3
	01 Lvl Frame 256 Stbd	3
	01 Lvl Frame 362 P/S	4
	Mn Dk Frame 389 P/S	1
	Mn Dk Frame 402 P/S	1
	Mn Dk Frame 416 P/S	1
	Mn Dk Frame 432 P/S	1
	Mn Dk Frame 466 Port	1
	Mn Dk Frame 470 Port	1
	Mn Dk Frame 469 CL	1
	01 Lvl Frame 94 P/S	2
Stern Chocks		
Closed Chocks	Mn Dk Frame 469 CL	1
	01 Lvl Frame 94 P/S	2



CD_Z_2057

Figure 4-1009. Closed Chock Corrosion Protection (Sheet 1 of 2)



CD_Z_2058

Figure 4-1009. Closed Chock Corrosion Protection (Sheet 2 of 2)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Climber Safety Rail Fasteners

AREA OF OCCURRENCE: Zone 10, 02 and 03 Level

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These items are subject to weather and salt spray.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Climber Safety Rail Fasteners and Associated Drawings: 600-6596724 and 600-6596726.
2. DDG 52 - DDG 74. Fasteners on climber safety rails shall be fabricated out of CRES 316 (System 14).
3. DDG 78. Fasteners and climber safety rails shall be fabricated out of CRES 316 (System 14).
4. Apply anti-seize thread compound (System 6) to threaded fasteners prior to installation.
5. Where necessary to join dissimilar metals, a suitable dielectric barrier shall be provided to isolate the faying surface.
6. DDG 78. Wire lanyards shall be CRES 316 with CRES 304 swage fittings. Toggle pins shall be CRES 316 with CRES 304 or Monel pivot and roll pins (System 16).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace as needed.

Index Number 1010

Climber Safety Rail Fasteners

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Rail Saf-T-Notch	02 Lvl Frame 220 Stbd	5
Rail Saf-T-Notch	03 Lvl Frame 186 Stbd	7
Carrier Rail	02 Lvl Frame 241 Stbd	6
Rail Saf-T-Notch	03 Lvl Frame 297 Stbd	7

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Compartment Check-off List (CCOL) Holders

AREA OF OCCURRENCE: Zones 10 and 18, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: CCOL Holders are located ship wide. See figure 4-1011.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA CCOL Holders and Associated Drawings: 8100-1262-0266 and 602-6598101.

2. CCOL Holders and fasteners shall be fabricated from CRES 316 (System 14 and System 16).
3. DDG 78. The CCOL holders and fasteners at the following locations are to be replaced with polyester label plates.

<u>Deck</u>	<u>Frame</u>	<u>CCOL #/Location</u>
Mn Dk	Frame 138 (S)	1-118-1-L Frame 168 (S)
Mn Dk	Frame 346 (S)	1-346-3-L Frame 346 (S)
Mn Dk	Frame 352 (S)	1-350-3-L Frame 352 (S)
Mn Dk	Frame 354 (S)	1-354-1-L Frame 354 (S)
Mn Dk	Frame 358 (S)	1-357-1-L Frame 358 (S)
01 Lvl	Frame 113 (P)	01-113-2-L Frame 113 (P)
01 Lvl	Frame 118 (P)	01-118-4-L Frame 188 (P)
01 Lvl	Frame 118 (S)	01-126-WE Frame 118 (S)
01 Lvl	Frame 120 (P)	01-120-2-L Frame 120 (P)
01 Lvl	Frame 188 (P)	01-126-WE Frame 118 (P)
01 Lvl	Frame 209 (P)	01-210-WE Frame 308 (S)
01 Lvl	Frame 209 (P)	01-201-WE Frame 209 (S)
01 Lvl	Frame 252 (S)	01-201-WE Frame 252 (S)
01 Lvl	Frame 273 (P)	01-201-WE Frame 273 (P)
01 Lvl	Frame 275 (P)	01-201-WE Frame 275 (P)
01 Lvl	306 (P)	01-201-WE Frame 306 (P)
01 Lvl	Frame 308 (S)	01-201-WE Frame 308 (S)

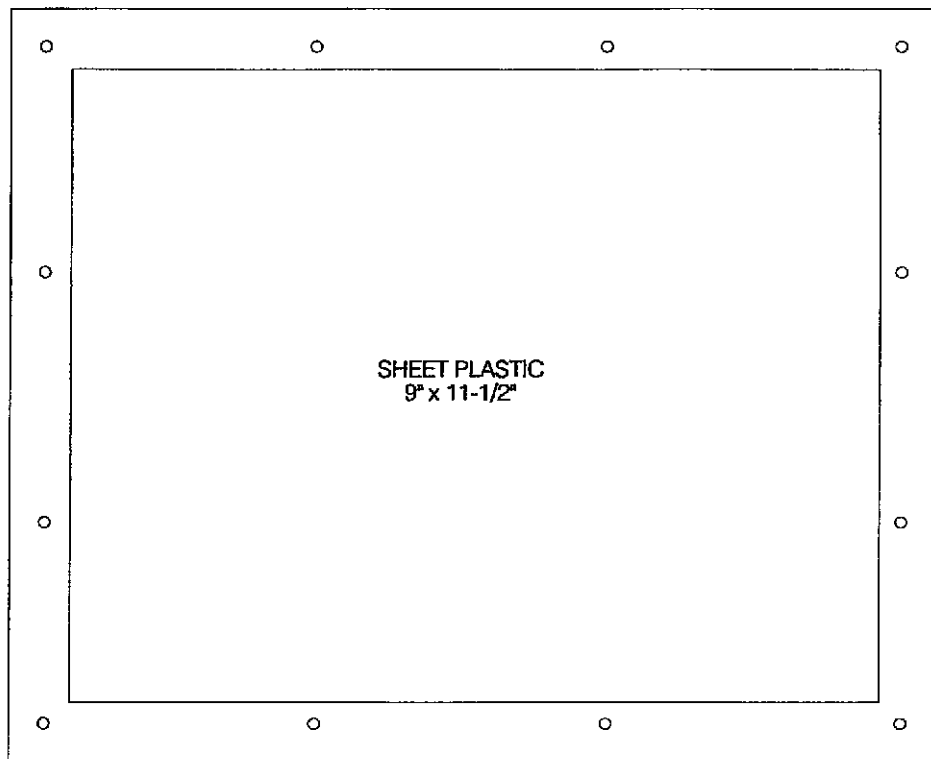
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<u>Deck</u>	<u>Frame</u>	<u>CCOL #/Location</u>
01 Lvl	370 (P)	01-370-WE Frame 370 (P)
02 Lvl	Frame 215 (P)	02-194-WE Frame 215 (P)
02 Lvl	Frame 246 (P)	02-240-WE Frame 246 (P)
03 Lvl	Frame 177 (S)	03-126-WE Frame 177 (S)
04 Lvl	Frame 145 & 150 (S)	04-132-WE Frame 145-150 (S)
04 Lvl	Frame 146 & 148 (P)	04-132-WE Frame 146-148 (P)
05 Lvl	Frame 155 (S)	05-130-WE Frame 155 (S)

SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace as needed.

Index Number 1011
CCOL Holders

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
CCOL Holder/Fasteners	Various	10, 18



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Figure 4-1011. CCOL Exterior Card Holder

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Countermeasure Washdown Piping Hangers

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: Hangers are exposed to salt spray and weather.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS: Not a separate Corrosion Control Item for DDG 78, included with Item 1031.

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Countermeasure Washdown Piping Hangers and Associated Drawings: 523-6597136, 637-6596633, 8100-2400-0062, 702-6595939, 611-6595934, 300-6595851, 505-6596850, 505-6596862, 505-6596883, 505-6596886, 505-6596889, 505-6596879, 505-659874, 505-6596871, 505-6596850 and 505-6596798.

2. DDG 52 - DDG 74. Ferrous hangars exposed to the weather (exterior steel) are to be coated.

Abrasive Blast -	SSPC-SP10
Inorganic Zinc -	3-5 Mils
MIL-P-2441 F151 (Seal Coat) -	1 Mil
MIL-P-2441 F151 -	3 Mils
TT-E-490 Gray -	1 Mil
TT-E-490 Gray -	1 Mil
3. DDG 52 - DDG 74. Fasteners shall be CRES 316 (System 14).
4. Where necessary to join dissimilar metals a dielectric barrier of insulating tape, MIL-1-24391 (or equal) shall be provided to isolate the faying surfaces (System 11).
5. Not a separate Corrosion Control Item for DDG 78, included with Item 1031.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1012

Countermeasure Washdown Pipe Hangers

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Hangers for Countermeasure Washdown Piping	Various	10

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Deck Lights and Fixtures

AREA OF OCCURRENCE: Zone 10 - Weather Decks, Ship Wide

TYPE OF CORROSION: Galvanic, Uniform Attack

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: Deck lights and fixtures of the type shown in figure 4-1013 are installed on bulkhead mounts which allow two-axis aiming. Bulkhead mounts, hoods, yoke components, body and fasteners require corrosion protection.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Deck Lighting Fixtures and Associated Drawings: 301-6596554, 301-6596581, 301-6596584, 301-6596608, 301-6596610, 301-6596578, 301-6596612, 301-6596616, 301-6596590, 180-6597747, 301-6596584, 301-6596619, 301-6596599, 301-6596602, 301-6596460, 301-6596516, 301-6596576, 301-6596596, 301-6596614, 301-6596619, 301-6596622, 180-6597748 and 301-6596593.
2. DDG 52 - DDG 74. Apply powered epoxy coating (System 4) to steel weather deck lighting fixtures, mounting springs (shock mounts), receptacles, switches, connection and terminal boxes and other steel electrical equipment enclosures, including removable metallic shields and shock mounts. Shock mounts for symbol 69 floodlights and Symbols 92.2 and 93.2 incandescent lights should be brass or CRES.
3. DDG 78. Apply powered epoxy (System 4) to steel weather deck lighting fixtures, receptacles, switches, connection and terminal boxes and other steel equipment including removable metallic shields.
4. DDG 52 - DDG 78. Apply metal spray coating (System 2) to steel mounting brackets and foundations.
5. DDG 52 - DDG 78. All mounting fasteners, latches and hinges shall be CRES 316 (System 14 and System 16) or appropriate improved material, with the exception of electrical or other specialized fittings required for system function.
6. DDG 71 - DDG 78. Shock mounts shall be made of CRES 304 for symbol 69, 92.2 and 93.2 lights. Teflon washers shall be installed between inner and outer brackets of Symbol 263.1 through 263.4, Symbol 303.1 through 303.4 and Symbol 317 floodlights.
7. DDG 71 - DDG 78. Dielectric barrier (System 11) shall be used where necessary.
8. DDG 71 - DDG 78. Inner and outer brackets of Symbol 263.1 through 263.4 floodlights shall be made of CRES 316.

9. DDG 71 - 78. Ice detector sensor reference assembly screws shall be CRES 316 (System 16).
10. DDG 78. Toggle pins to be CRES 316 with pivot pins of CRES 304 or Monel.
11. DDG 78. Weather deck floodlights (FLD7) waterline security lights, RAS, FLOT, CIWS FLDT, decoy locker FLDT and boat handling FLDT including shields shall be attached with CRES 316 fasteners with Teflon washers between inner and outer brackets.
12. Apply anti-seize thread compound (System 6) to fasteners prior to installation. Apply polysulfide thread sealant to shock mounts fasteners (System 8).
13. Light shields on deck floodlights shall be fabricated from PVC (System 16). Wire lanyards should be CRES 316 with CRES 304 swages.
14. DDG 78. Deck light hoods (Symbol 69) at 01-289-2, 01-307-2, 01-315-1, 01-315-2 shall be CRES 316.

SERVICE REQUIREMENTS (SHIP):

Index Number 1013

Deck Lights and Fixtures

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Deck Floodlight (Sym 69)	Mn Deck Frame Port	3
Deck Floodlight (Sym 69)	01 Lvl Frame 210 Stbd	3
Deck Floodlight (Sym 69)	01 Lvl Frame 118 Stbd	2
Deck Floodlight (Sym 69)	01 Lvl Frame 118 Port	2
Deck Floodlight (Sym 69)	02 Lvl Frame 214 Port	5
Deck Floodlight (Sym 69)	02 Lvl Frame 214 Stbd	5
Deck Floodlight (Sym 69)	01 Lvl Frame 110 Port	2
Deck Floodlight (Sym 69)	01 Lvl Frame 110 Stbd	2
Deck Floodlight (Sym 69)	02 Lvl Frame 123 Port	5
Deck Floodlight (Sym 69)	02 Lvl Frame 123 Stbd	5
Deck Floodlight (Sym 69)	01 Lvl Frame 210 Port	3
Deck Floodlight (Sym 69)	01 Lvl Frame 220 Port	3
Deck Floodlight (Sym 69)	02 Lvl Frame 137 Port	5
Deck Floodlight (Sym 69)	02 Lvl Frame 137 Stbd	5
Deck Floodlight (Sym 69)	01 Lvl Frame 242 Stbd	3
Deck Floodlight (Sym 69)	01 Lvl Frame 241 Stbd	3
Deck Floodlight (Sym 69)	01 Lvl Frame 224 Port	3
Deck Floodlight (Sym 69)	01 Lvl Frame 279 Stbd	3

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Index Number 1013

Deck Lights and Fixtures - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Deck Floodlight (Sym 69)	01 Lvl Frame 288 Port	3
Deck Floodlight (Sym 69)	01 Lvl Frame 312 Stbd	3
Deck Floodlight (Sym 69)	01 Lvl Frame 316 Stbd	3
Deck Floodlight (Sym 69)	01 Lvl Frame 316 Port	3
Deck Floodlight (Sym 69)	01 Lvl Frame 313 Port	3
Deck Floodlight (Sym 69)	02 Lvl Frame 310 Port	3
Deck Floodlight (Sym 69)	02 Lvl Frame 315 Port	6
Deck Floodlight (Sym 69)	02 Lvl Frame 315 Stbd	6
Deck Floodlight (Sym 69)	01 Lvl Frame 306 Port	3
Deck Light (Sym 92.2)	04 Lvl Frame 146 Stbd	8
Deck Light (Sym 92.2)	04 Lvl Frame 146 Port	8
Deck Light (Sym 92.2)	04 Lvl Frame 158 Stbd	8
Deck Light (Sym 92.2)	04 Lvl Frame 158 Port	8
Deck Light (Sym 92.2)	04 Lvl Frame 168 Stbd	8
Deck Light (Sym 92.2)	04 Lvl Frame 168 Port	8
Deck Light (Sym 92.2)	04 Lvl Frame 169	8
Deck Light (Sym 92.2)	01 Lvl Frame 216 Stbd	2
Deck Light (Sym 92.2)	02 Lvl Frame 127 Port	5
Deck Light (Sym 92.2)	02 Lvl Frame 127 Stbd	5
Deck Light (Sym 92.2)	Mast 89' ABL CL	9
Deck Light (Sym 92.2)	Mast 190' ABL CL	9
Deck Light (Sym 92.2)	Mast 121' ABL CL	9
Deck Light (Sym 92.2)	Mast 137' ABL CL	9
Deck Light (Sym 92.2)	01 Lvl Frame 111 Stbd	2
Deck Light (Sym 92.2)	01 Lvl Frame 111 Port	2
Deck Light (Sym 92.2)	02 Lvl Frame 219 Port	5
Deck Light (Sym 92.2)	02 Lvl Frame 197 Port	5
Deck Light (Sym 92.2)	02 Lvl Frame 219 Stbd	5
Deck Light (Sym 92.2)	02 Lvl Frame 197 Stbd	5
Deck Light (Sym 92.2)	02 Lvl Frame 228 Stbd	3
Deck Light (Sym 92.2)	02 Lvl Frame 228 Port	3
Deck Light (Sym 92.2)	02 Lvl Frame 145 Port	9

Index Number 1013

Deck Lights and Fixtures - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Deck Light (Sym 92.2)	02 Lvl Frame 145 Stbd	9
Deck Light (Sym 92.2)	02 Lvl Frame 160 Port	9
Deck Light (Sym 92.2)	02 Lvl Frame 160 Stbd	9
Deck Light (Sym 92.2)	01 Lvl Frame 241 Stbd	3
Deck Light (Sym 92.2)	01 Lvl Frame 240 CL	3
Deck Light (Sym 92.2)	01 Lvl Frame 241 Port	3
Deck Light (Sym 92.2)	01 Lvl Frame 254 Port	3
Deck Light (Sym 92.2)	01 Lvl Frame 278 Stbd	3
Deck Light (Sym 92.2)	01 Lvl Frame 275 Port	3
Deck Light (Sym 92.2)	01 Lvl Frame 313 Stbd	3
Deck Light (Sym 92.2)	01 Lvl Frame 316 Cl	3
Deck Light (Sym 92.2)	01 Lvl Frame 313 Port	3
Deck Light (Sym 92.2)	02 Lvl Frame 243 Port	3
Deck Light (Sym 92.2)	02 Lvl Frame 243 Stbd	6
Deck Light (Sym 92.2)	02 Lvl Frame 300 Port	6
Deck Light (Sym 92.2)	02 Lvl Frame 315 Port	6
Deck Light (Sym 92.2)	02 Lvl Frame 315 Stbd	6
Deck Light (Sym 93.5)	Mn Deck Frame 389 Port	1
Deck Light (Sym 93.5)	Mn Deck Frame 378 Port	1
Deck Light (Sym 92.2)	Mn Deck Frame 378 Port	1
Deck Light (Sym 93.5)	Mn Deck Frame 388 Cl	1
Deck Light (Sym 93.5)	Mn Deck Frame 370 Stbd	1
Deck Light (Sym 92.2)	03 Lvl Frame 114 Port	7
Deck Light (Sym 92.2)	03 Lvl Frame 114 Port	7
Deck Light (Symbol 93.4)	Mn Deck Frame 387 Stbd	1
Floodlight (Symbol 263.3)	01 Lvl Frame 68 Port	1
Floodlight (Symbol 263.3)	01 Lvl Frame 62 Stbd	1
Floodlight (Symbol 263.3)	01 Lvl Frame 371 Port	4
Floodlight (Symbol 263.3)	01 Lvl Frame 369 Stbd	4
Floodlight (Symbol 263.3)	01 Lvl Frame 369 Stbd	4
Floodlight (Symbol 263.3)	01 Lvl Frame 373 Port	4
Floodlight (Symbol 263.3)	01 Lvl Frame 373 Port	4

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Index Number 1013

Deck Lights and Fixtures - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Floodlight (Symbol 263.3)	01 Lvl Frame 244 Stbd	4
Floodlight (Symbol 263.3)	01 Lvl Frame 327 Stbd	4
Floodlight (Symbol 263.3)	01 Lvl Frame 285 Stbd	4
Floodlight (Symbol 263.3)	01 Lvl Frame 337 Port	4
Floodlight (Symbol 263.3)	01 Lvl Frame 337 Stbd	4
Floodlight (Symbol 263.3)	01 Lvl Frame 337 Stbd	4
Floodlight (Symbol 263.3)	02 Lvl Frame 312 Stbd	6
Floodlight (Symbol 263.4)	02 Lvl Frame 111 Port	5
Floodlight (Symbol 263.3)	02 Lvl Frame 111 Stbd	5
Floodlight (Symbol 263.3)	01 Lvl Frame 379 Port	4
Floodlight (Symbol 263.3)	01 Lvl Frame 379 Port	4
Floodlight (Symbol 263.3)	01 Lvl Frame 379 Port	4
Floodlight (Symbol 263.3)	01 Lvl Frame 379 Port	4
Bow Numeral Light (Symbol 304)	01 Lvl Frame 2 Port	2
Bow Numeral Light (Symbol 304)	01 Lvl Frame 7 Port	2
Bow Numeral Light (Symbol 304)	01 Lvl Frame 2 Stbd	2
Bow Numeral Light (Symbol 304)	01 Lvl Frame 7 Stbd	2
Deck Floodlight (Symbol 317)	04 Lvl Frame 129 Stbd	8
Deck Floodlight (Symbol 317)	04 Lvl Frame 129 Stbd	8
Deck Floodlight (Symbol 317)	02 Lvl Frame 204 Stbd	5
Deck Floodlight (Symbol 317)	02 Lvl Frame 204 Stbd	5
Deck Floodlight (Symbol 317)	01 Lvl Frame 287 Stbd	3
Deck Floodlight (Symbol 317)	01 Lvl Frame 258 Stbd	3
Deck Floodlight (Symbol 317)	01 Lvl Frame 314 Stbd	3
Switch Lvl (Symbol 277)	01 Lvl Frame 361 Stbd	4
Box Term Com (Symbol 317)	01 Lvl Frame 361 Stbd	4
Box Term Com (Symbol 528.0)	02 Lvl Frame 306	6
Box Term Com (Symbol 400.2)	03 Lvl Frame 114, P & S	7
Box Term Com (Symbol 400.2)	02 Lvl Frame 315, P & S	6

Index Number 1013
Deck Lights and Fixtures - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Lamps Coax Jack Panel	Mn Deck Frame 389 Port	1
Fiddle Board	01 Lvl Frame C Stbd	2
Shock Mount for Symbol 69 MIL-F-16377/41-029	Mn Deck Frame 370 Port	1
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 210 Stbd	3
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 118 Stbd	2
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 118 Port	2
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 214 Port	5
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 214 Stbd	5
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 119 Port	2
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 110 Port	2
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 110 Stbd	2
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 123 Port	5
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 123 Stbd	5
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 137 Port	5
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 137 Stbd	5
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 242 Stbd	3
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 241 Stbd	3
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 224 Port	3
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 279 Port	3

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Index Number 1013

Deck Lights and Fixtures - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 288 Port	3
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 312 Stbd	3
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 316 Stbd	3
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 316 Port	3
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 313 Port	3
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 310 Port	6
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 315 Stbd	6
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 306 Port	3
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 110 Port	7
Shock Mount for Symbol 69 MIL-F-16377/41-029	01 Lvl Frame 110 Stbd	7

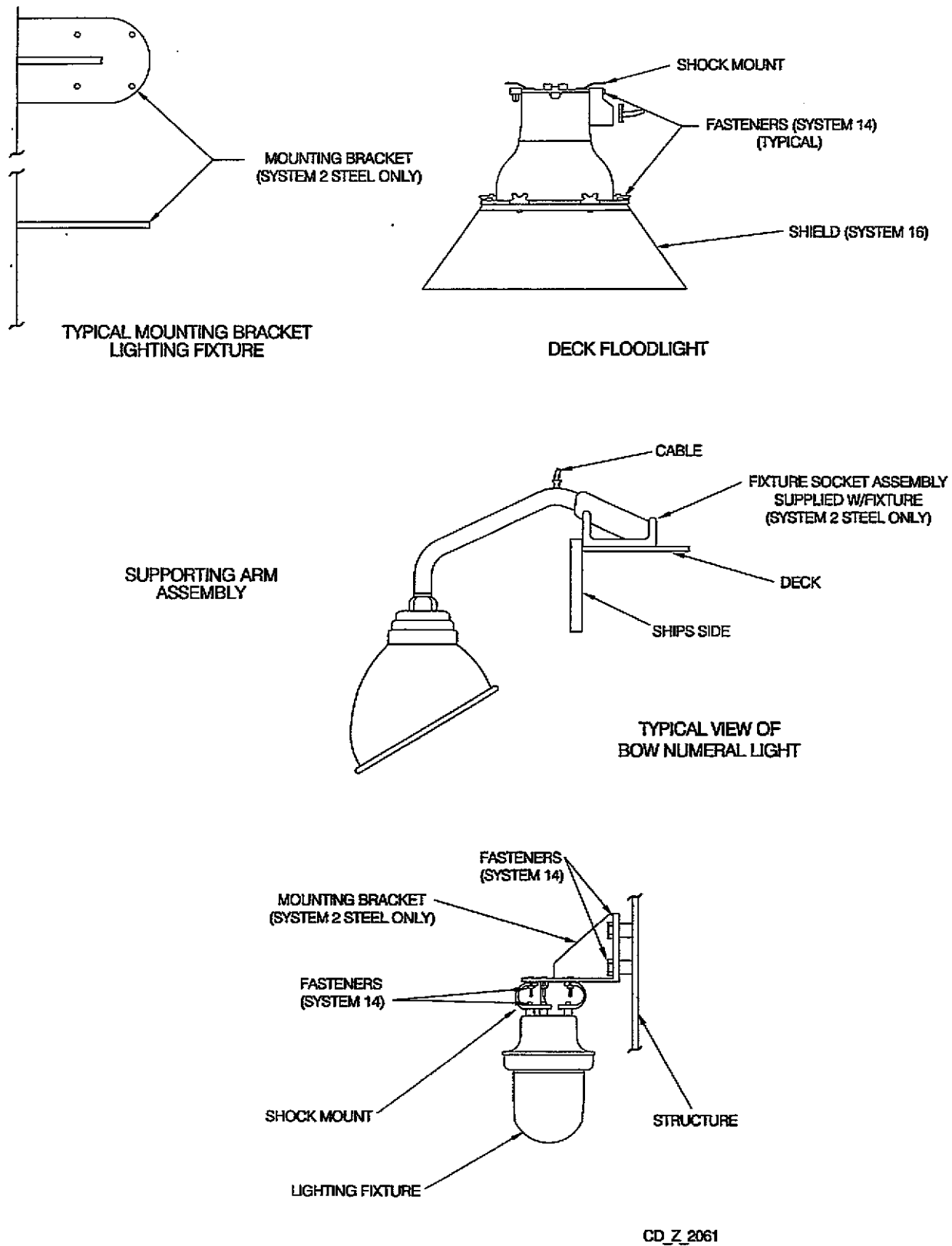
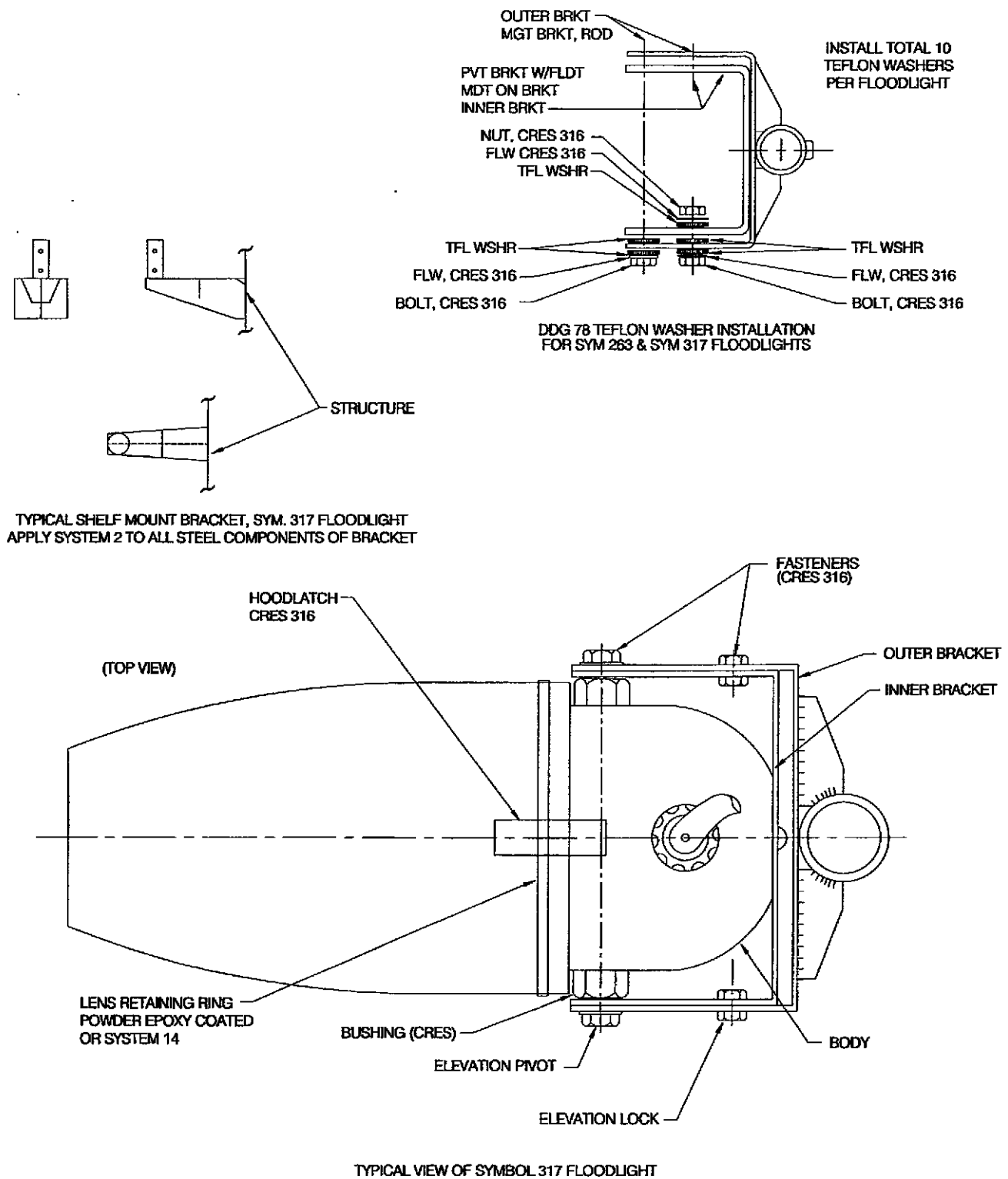


Figure 4-1013. Deck Lights Examples (Sheet 1 of 2)



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Figure 4-1013. Deck Lights Examples (Sheet 2 of 2)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Deck Drain Fasteners

AREA OF OCCURRENCE: Zone 10, 02 Level

TYPE OF CORROSION: Uniform attack

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: See figure 4-1014.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Deck Drain Fasteners and Associated Drawings: 526-6597168, 301-6596578, 505-6596873, 050-6596883, 505-6596817, 505-6596857, 505-6596886, 505-6596783, 505-6596858, 505-6596856, 505-6596829, 505-6596879, 505-6596768, 505-6596871, 505-6596774 and 505-6596807.

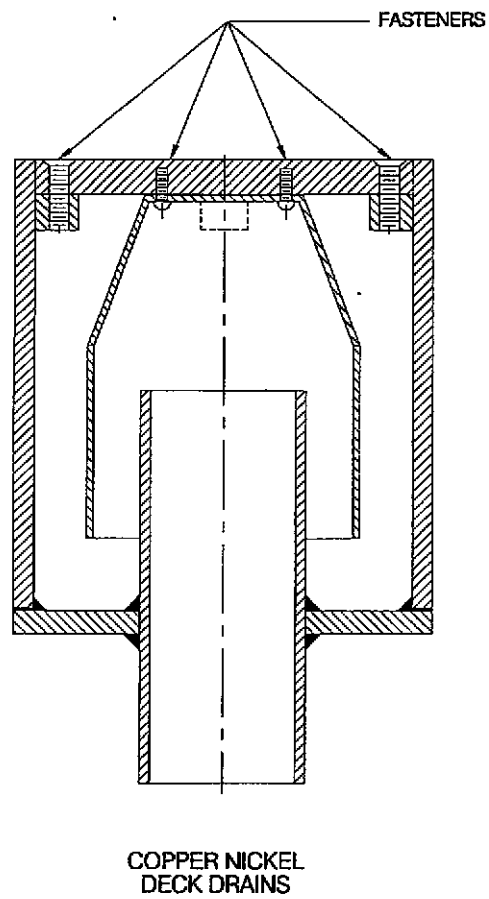
2. DDG 52 - DDG 74. Deck Drain fasteners shall be fabricated from CRES 316 (System 14).
3. Apply anti-seize thread compound (System 6) to deck drain fasteners prior to installation.
4. DDG 78. Fasteners to be corrosion resistant material (System 14). Apply polysulfide faying surfaces sealant (System 9).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace fasteners as needed.

Index Number 1014

Deck Drain Fasteners

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Deck Drain Fasteners	Various	10



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Figure 4-1014. Deck Drain Fasteners

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Electrical Pin Connectors (Weather Exposed)

AREA OF OCCURRENCE: Zone 10, Exterior

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Weather exposed electrical pin connectors are exposed to salt spray and salt air.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Electrical Pin Connectors (Weather Exposed) and Associated Drawings:
300-6598096, 451-6597048, 320-6597028 and 441-6596983.

2. Apply anti-seize compound (System 6) to the thread of all weather exposed electrical connectors. Provide a waterproof seal by using one of the methods described in System 10.
3. DDG 59 - DDG 78. Use 3M cold shrink components, with tophats, and Scotch 130C electrical tape. Cold shrink connector covers are required.
4. DDG 71 - DDG 78. Install plastic dielectric barrier for all dissimilar metal surfaces (System 11).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed.

Index Number 1015

Electrical Pin Connectors (Weather Exposed)

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Electrical Pin Connectors (Weather Exposed)	Various	10

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Encapsulated Life Raft Release Mechanism

AREA OF OCCURRENCE: Zone 10, 01 and 02 Levels

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These racks are subject to weather and salt spray. Corrosion is accelerated by impact and abrasion during normal operation. See figure 4-1016.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Encapsulated Life Raft Release Mechanism and Associated Drawings: 583-6595881, 583-6595882, 600-6596687, 583-6597243, 101-6597095, 600-6596715, 600-6596726 and 600-6596724.

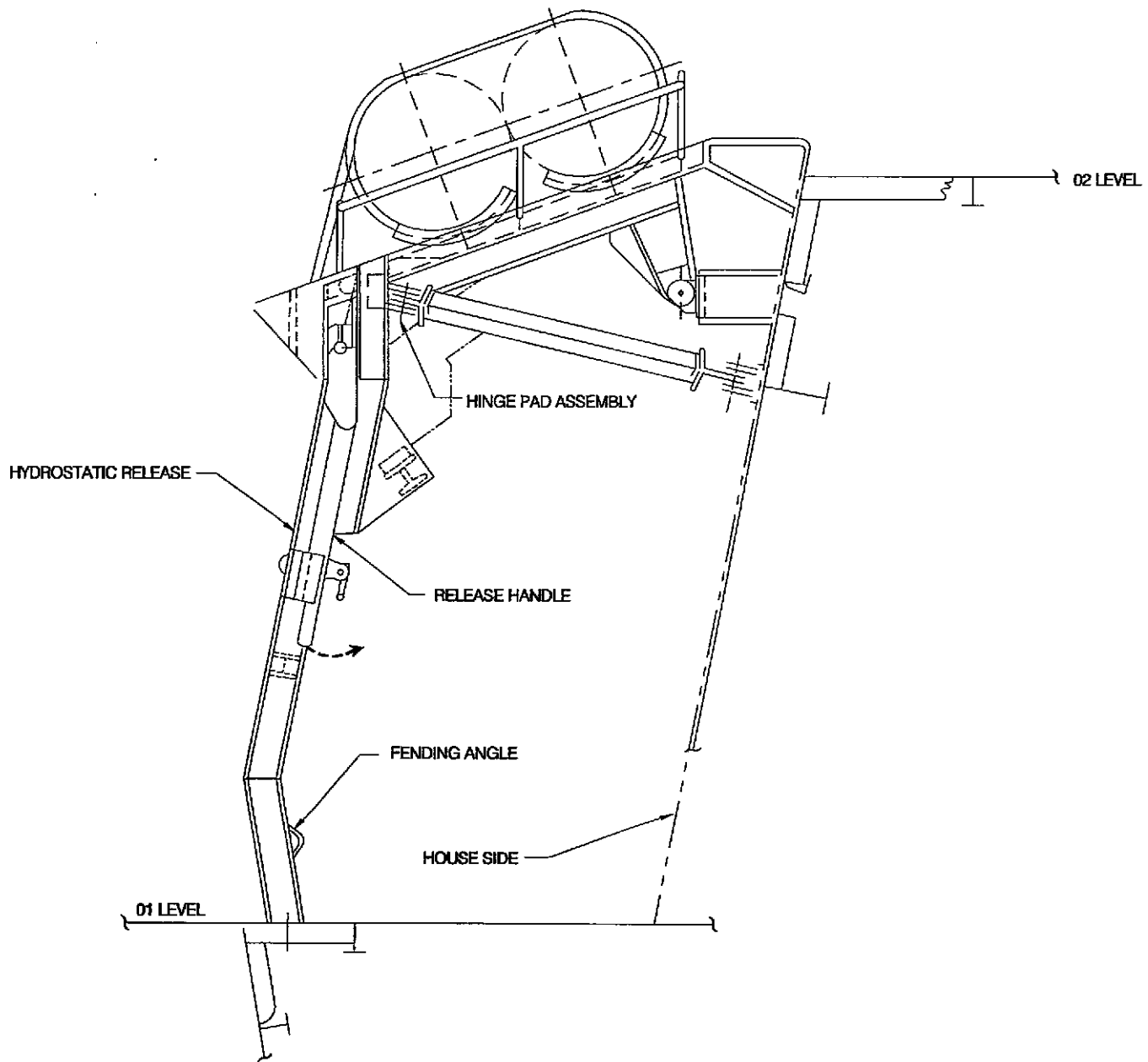
2. Apply metal spray coating (System 2) to the carbon steel components of the encapsulated life raft release mechanism (except for bearing surfaces).
3. Apply polysulfide sealant (System 9) to all faying surfaces on removable hardware.
4. DDG 52 - DDG 74. Fasteners shall be carbon steel treated with a ceramic-metallic coating (System 5) or CRES 316 (System 14).
5. Apply anti-seize compound (System 6) to fasteners prior to installation.
6. DDG 78. Fasteners to be of corrosion resistant material (System 14) hydrostatic release clips and tiedown pads to be CRES 304. Securing fittings shall be CRES 316 or CRES 304 (System 16).
7. DDG 78. Wire rope tiedowns (bridles) with CRES or copper swages to be replaced with jacketed kevlar bridles with open jaw electroline fittings at both ends. Tiedown clips and hydrostatic release clips shall be replaced with CRES 304 pads. Tiedown pads shall accept open end of electroline fittings or CRES shackles. Right jaw end fittings for hydrostatic release mechanism shall be CRES 304 or CRES 316.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1016

Encapsulated Life Raft Release Mechanism

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Encapsulated Life Raft Release Mechanism	01-02 Lvl Frame 299 Port	3
Encapsulated Life Raft Release Mechanism	01-02 Lvl Frame 267 Port	3
Encapsulated Life Raft Release Mechanism	01-02 Lvl Frame 262 Port	3
Encapsulated Life Raft Release Mechanism	02 Lvl Frame 198 P/S	5
Encapsulated Life Raft Release Mechanism	02 Lvl Frame 173 P/S	5
Encapsulated Life Raft Release Mechanism	02 Lvl Frame 168 P/S	5
Encapsulated Life Raft Release Mechanism	03 Lvl Frame 190 Port	7



CD_Z_2065

Figure 4-1016. Life Raft Hydrostatic Release Mechanism

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Exhaust and Intake Vent Screens

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These screens are located in the weather and are exposed to salt spray and in some cases warmed moist air from the interior of the ship. See Figure 4-1017.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Exhaust and Intake Vent Screens and Associated Drawings: 512-6596890, 512-6596891, 512-6597195, 259-6595938, 512-6596943, 512-6596937, 512-6596938, 512-6596940, 512-6596941, 512-6596943, 512-6596945, 512-6596944, 512-6596927, 512-6596382, 512-6596380, 512-6596376, 512-6596368, 512-3566374, 512-6596385, 512-6596388, 259-6596138, 512-6596390, 512-6596354, 512-6596386, 512-6596383, 512-6596376, 512-6596368 and 512-6596388.

2. All exterior exhaust and intake vent screens and frames shall be fabricated out of CRES 316 (System 16).
3. DDG 52- DDG 74. Vent screens and frames shall be powered epoxy coated (System 4) prior to installation. The coating shall be applied at 4.0 - 7.0 MILS.
4. Apply anti-seize compound (System 6) to fasteners prior to installation.
5. DDG 52 - DDG 74. Fasteners used to attach vent screen frame work shall be fabricated out of CRES 316 (System 14). Use Teflon washers.
6. DDG 78. Fasteners to be of corrosion resistant material (System 14). Use teflon washers.
7. DDG 71 - DDG 78. Frames and screws to receive powdered polyester (System 4) prior to installation. The coating shall be applied at 4.0 to 7.0 MILS, Type II.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed with MIL-P-2441 epoxy. Replace fasteners as needed.

Index Number 1017

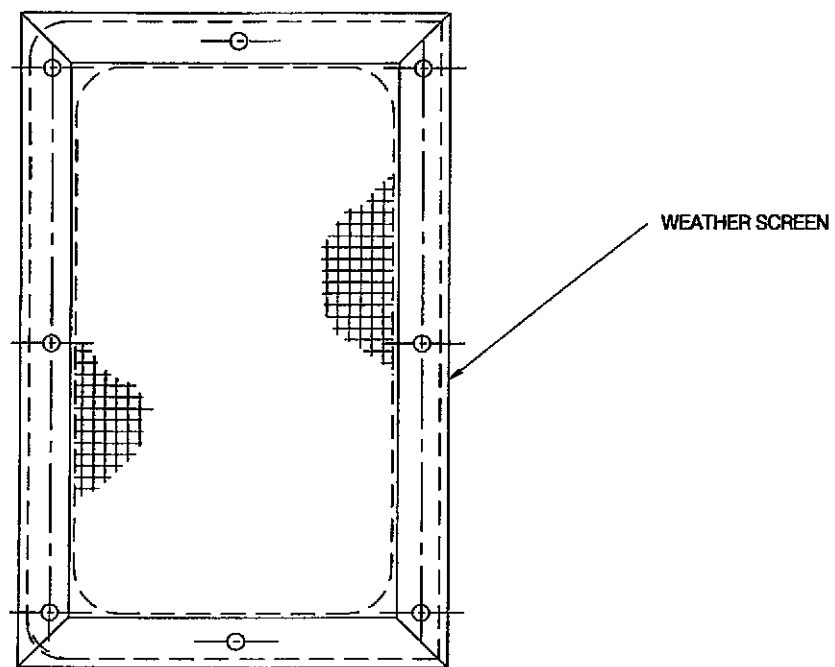
Exhaust and Intake Vent Screens

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Natural Exhaust	05 Lvl Frame 170 Stbd	9
Natural Exhaust	05 Lvl Frame 150 Stbd	9
Natural Exhaust	04 Lvl Frame 138 Stbd	8
Natural Exhaust	04 Lvl Frame 162 P/S	8
Supply	04 Lvl Frame 169 Stbd (CL)	8
Exhaust	02 Lvl Frame 162 Stbd	5
Exhaust	02 Lvl Frame 166 Stbd	5
Exhaust	02 Lvl Frame 172 Stbd	5
Natural Exhaust	01 Lvl Frame 110 Stbd	2
Exhaust	01 Lvl Frame 110 Stbd	2
Exhaust	01 Lvl Frame 110 Stbd	2
Supply	01 Lvl Frame 115 Stbd	2
Exhaust	01 Lvl Frame 119 Port	2
Exhaust	01 Lvl Frame 123 Port	2
CPS Supply (CF)	01 Lvl Frame 123 Stbd	2
CPS Supply (CF)	01 Lvl Frame 135 Stbd	2
CPS Supply (HF)	01 Lvl Frame 153 Stbd	2
CPS Supply (HF)	01 Lvl Frame 158 Stbd	2
CPS Supply (CF)	01 Lvl Frame 210 Port	3
Exhaust	01 Lvl Frame 211 Stbd	3
CPS Supply (HF)	01 Lvl Frame 212 Port	3
CPS Supply (HF)	01 Lvl Frame 214 Port	3
Supply	01 Lvl Frame 216 Stbd	3
Exhaust (RSVD)	01 Lvl Frame 222 Stbd	3
CPS Supply (CF)	01 Lvl Frame 241 Port	3
CPS Supply (CF)	01 Lvl Frame 241 Port	3
CPS Supply (HF)	01 Lvl Frame 241 CL	3
Exhaust	01 Lvl Frame 244 Stbd	3
Exhaust	01 Lvl Frame 250 Stbd	3
Exhaust	01 Lvl Frame 255 Port	3
Exhaust	01 Lvl Frame 258 Port	3
Exhaust	01 Lvl Frame 260 Port	3

Index Number 1017

Exhaust and Intake Vent Screens - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
SSGTG Intake	01 Lvl Frame 260 Stbd	3
CPS Supply (HF)	01 Lvl Frame 273 Port	3
CPS Supply (HF)	01 Lvl Frame 273 Port	3
CPS Supply (CF)	01 Lvl Frame 276 Port	3
CPS Supply (CF)	01 Lvl Frame 276 Port	3
Exhaust	01 Lvl Frame 305 Port	3
Exhaust	01 Lvl Frame 305 Port	3
Exhaust	01 Lvl Frame 305 Port	3
Exhaust	01 Lvl Frame 305 Port	3
Supply	Mn Dk Frame 370 Stbd	3
Exhaust	Mn Dk Frame 370 Stbd	3
Exhaust	Mn Dk Frame 370 Stbd	3
Supply	01 Lvl Frame 314 Stbd	3
Exhaust	02 Lvl Frame 219 Stbd	5
Exhaust	02 Lvl Frame 219 Stbd	5
	01 Lvl Frame 182 Port	2



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Figure 4-1017. Weather Screen, Exhaust and Intake

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Fueling-at-Sea (FAS) Station Valves, etc.

AREA OF OCCURRENCE: Zone 10, 01 Level Frame 321 Stbd, 01 Level Frame 311 Port,
01 Level Frame 66 Port, 02 Level Frame 132 Port and Stbd

TYPE OF CORROSION: Galvanic, Pitting, Abrasion

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: Most FAS stations include a similar arrangement of fittings and attachments for receiving and supporting the fuel probe and for attaching the fueling rigging. FAS in figure 4-1018 is typical.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA FAS Station Valves, Brackets, Fasteners, Hardware and Associated Drawings:
571-6595875 and 571-6596629.
2. DDG 52 - DDG 55. Apply metal spray coating (System 2) to all steel valves, cleats, shackles, brackets and hardware, including the swivel joint arm and pelican hook.
3. DDG 57 - DDG 74. Delete System 2 on valves, cleats, shackles, brackets, padeyes, swivel joint, swivel arm and pelican hook.
4. DDG 57 - DDG 74. Prime with inorganic zinc all steel cleats, brackets, and hardware including the swivel joint arm and pelican hook. Galvanize shackles to ASTM A-153.
5. DDG 78. Prime cleats, padeyes, brackets, swivel joints, swivel arm and pelican hook with a NAVSEA approved primer.
6. DDG 52 - DDG 69. Gageboard assemblies shall be treated with a powered epoxy coating (System 4), if aluminum and System 2, if steel.
7. DDG 71 - DDG 78. Apply top coatings (System 15) for CRES gageboards.
8. DDG 52 - DDG 74. Fasteners within the FAS station shall be either steel treated with a ceramic-metallic coating (System 5) of CRES 316 (System 14).
9. DDG 78. JP-5 deck connection valve handwheel and locknuts shall be bronze. Lockwashers to be CRES 316 or nickel copper alloy. The outside level weight and fasteners to be CRES 316. Limit switches and mounting brackets to be CRES 316. Remaining fasteners and actuating mechanisms to be corrosion resistant material (System 14 and System 16).

10. DDG 78. Gland and gland flange to be CRES 304. Gland eye bolt and nuts to be CRES 304 and CRES 316. Gage line clips to be CRES 316 or 304. Groove pins to be CRES 316. Grease fittings to be CRES 316 or Monel. Wire lanyards to be CRES 316 with CRES 304 swage fittings. Toggle pins to be CRES 316 with CRES 304 or Monel pivot pins. The retaining chain and "S" hooks to be nickel copper alloy. Stay retain chain and "S" hooks for caps to be copper alloy.
11. Polysulfide sealant (System 9) shall be applied to faying surfaces prior to installation of equipment.
12. Apply anti-seize compound (System 6) to all fasteners prior to installation.
13. Place plastic dielectric barrier (System 11) between dissimilar metal. Ensure barrier extends 1/4-inch beyond all sides of protected piece.

SERVICE REQUIREMENTS (SHIP): Inspect weather exposed staples, cleats, padeyes and probe swivel for corrosion. Apply touch up as required. Replace fasteners as needed.

Index Number 1018

Fueling-at-Sea (FAS) Station Valves, etc.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
FAS Station	01 Lvl Frame 321 Stbd	4
FAS Station	01 Lvl Frame 311 Port	3
FAS Station	02 Lvl Frame 132 P/S	5
FAS Station	01 Lvl Frame 66 Port	2

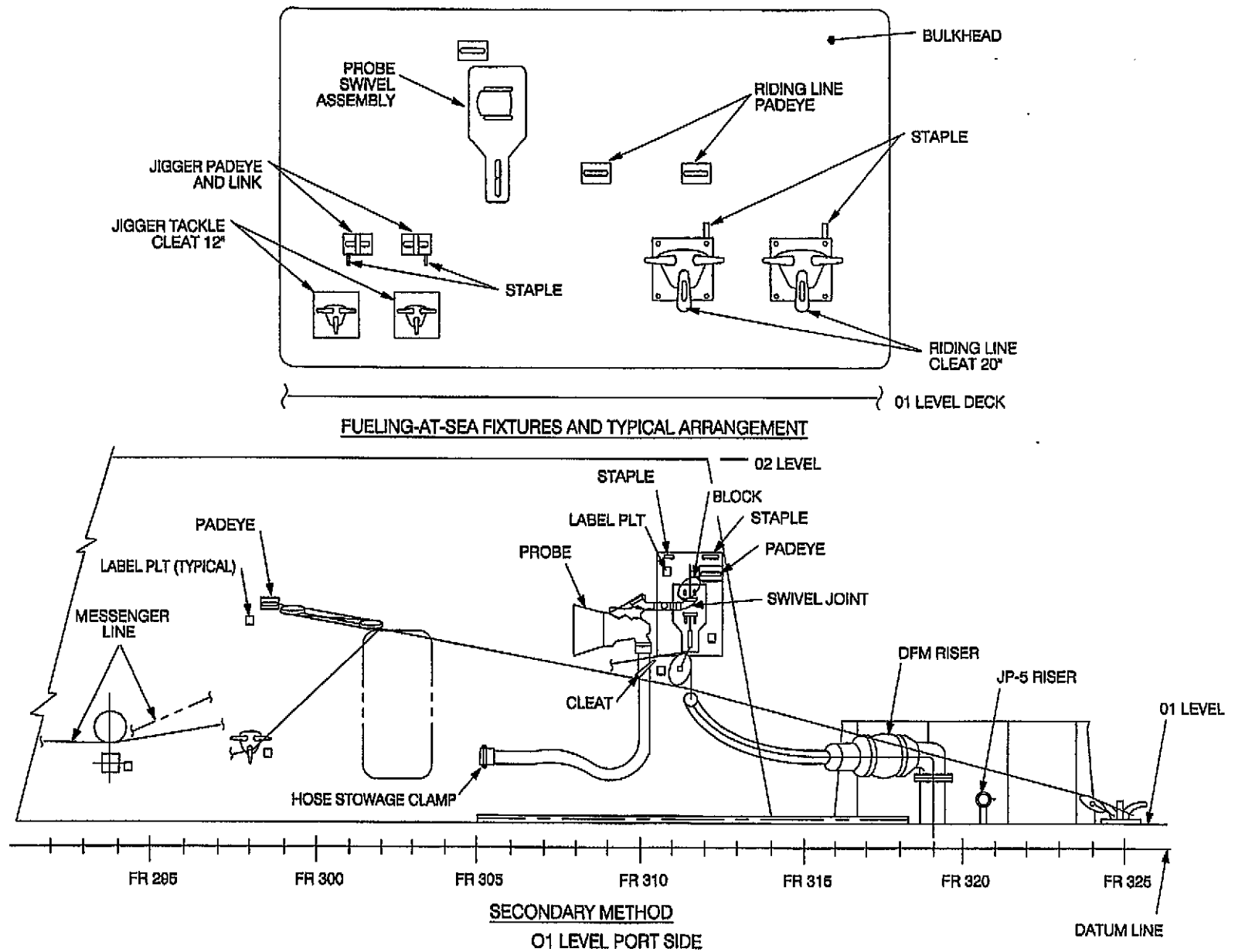
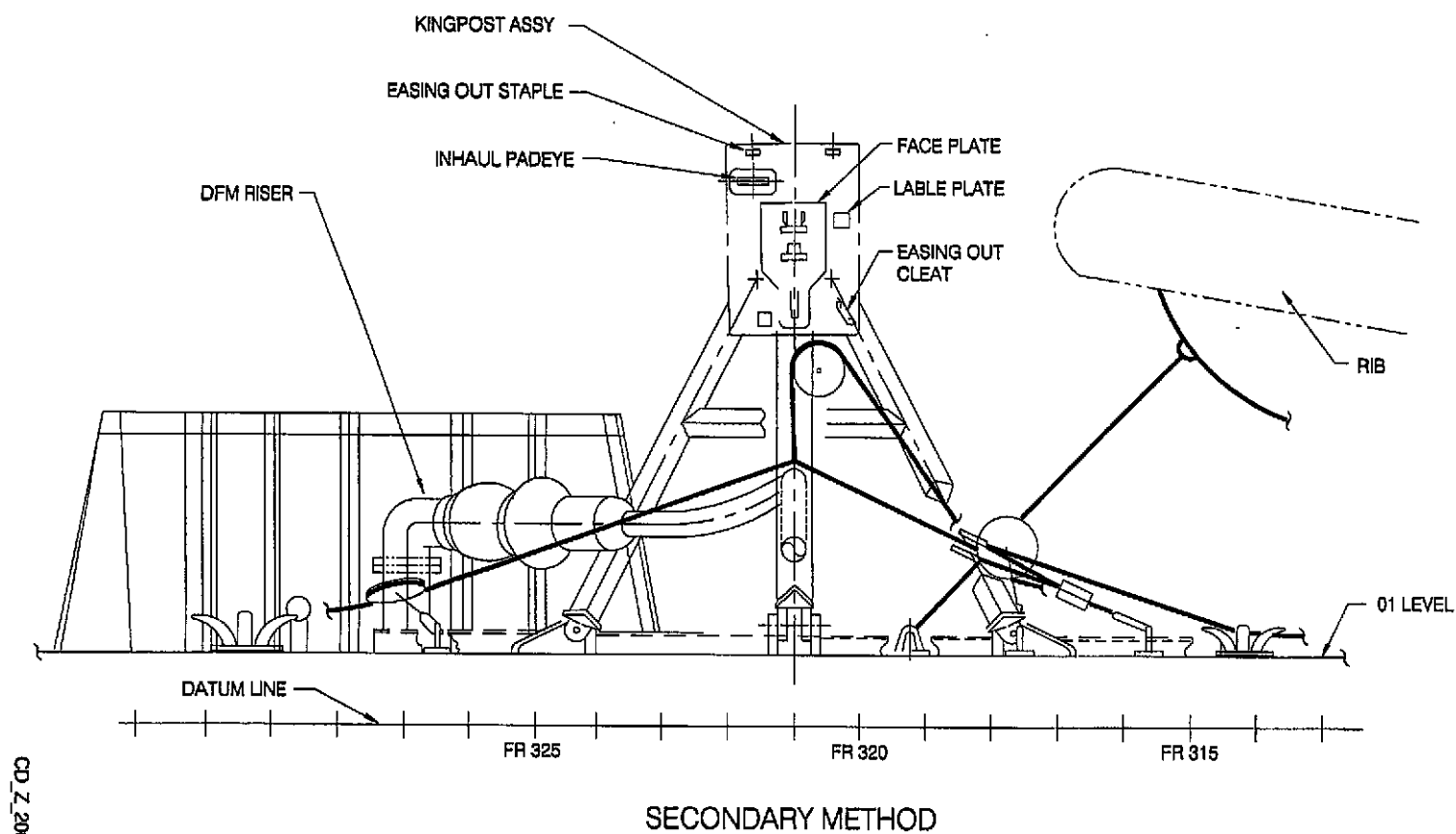


Figure 4-1018. FAS Station Fixtures (Typical) (Sheet 1 of 2)

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Figure 4-1018. FAS Station Fixtures (Typical) (Sheet 2 of 2)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Fire Extinguisher Stowage Brackets

AREA OF OCCURRENCE: Zone 10 in the Weather, Frame 129 Port (Passage 01-122-0-L) and
Frame 130 Stbd (Passage 01-188-1-L)

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These weather exposed brackets are subject to salt spray and impact.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Fire Extinguisher Stowage Brackets and Associated Drawings: 8100-2388-0058, 600-6596711 and 600-6596714.

2. DDG 52 - DDG 74. Apply metal spray coatings (System 2) to all carbon steel fire extinguisher stowage brackets exposed to weather, including 6 inches of surrounding deck. Apply System 8 thread compound.
3. Securing hardware straps and locking clasp shall be CRES 316 (System 14 and System 16).
4. DDG 78. Apply metal spray coating (System 2) to all fire extinguisher mounting bracket foundations in the weather including a minimum of 6 inches onto the surrounding deck. Fasteners to be of corrosion resistant material (System 14). Apply System 8 thread compound.

SERVICE REQUIREMENTS (SHIP): Inspect quarterly. Touch up as needed. Replace fasteners as needed. Reapply System 8 thread compound as needed.

Index Number 1019

Fire Extinguisher Stowage Brackets

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Fire Extinguisher Stowage Brackets	In the Weather	1, 10

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Bulkhead Mounted Fog Applicator Brackets*

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These brackets are subject to impact and in many cases the weather or humid spaces. See Figure 4-1020.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS: *Not applicable to any ship that has Radar Control System (RCS) material applied.

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Mounting Brackets for Fog Applicators and Associated Drawings: 520-6596738, 8100-2388-0058 and 600-6596724.

2. All mounting brackets and fasteners shall be CRES 316 (System 14 and System 16).

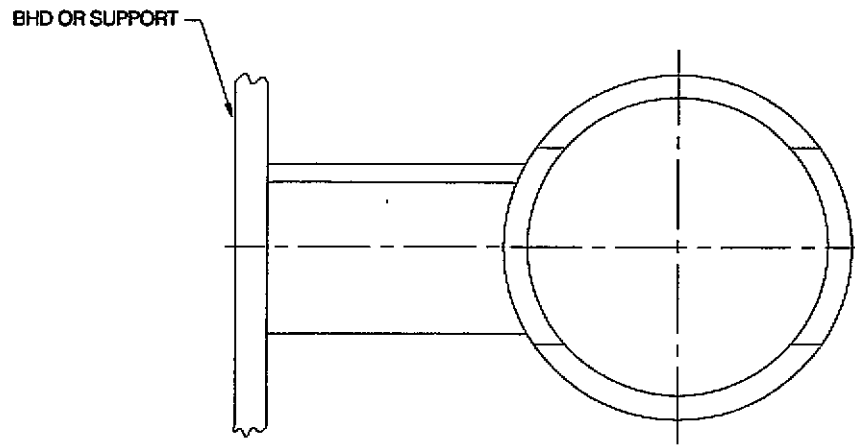
3. Apply anti-seize compound (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace as needed.

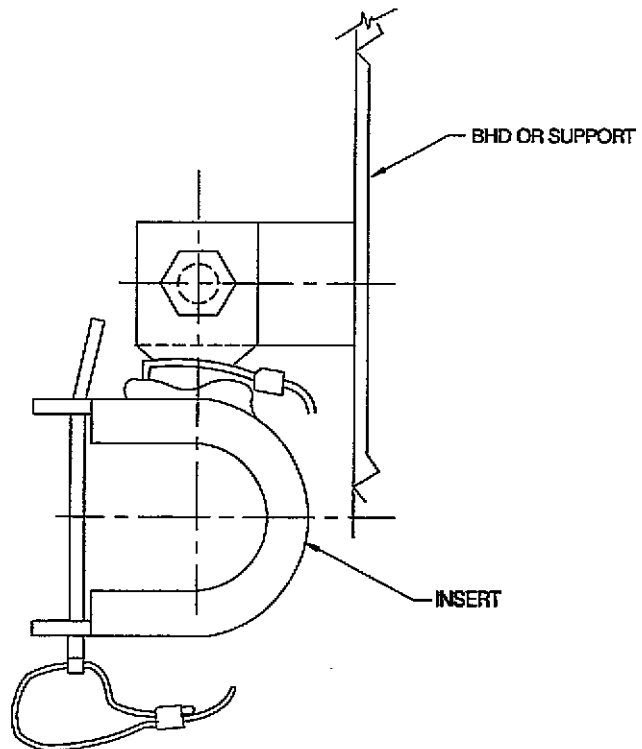
Index Number 1020

Mounting Brackets for Fog Applicators

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Fog Applicator Brackets/Fasteners	Various	10, 18



FOG NOZZLE BRACKET



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Figure 4-1020. Fog Applicator Brackets, Bulkhead Mounted

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Gun Mount Foundations

AREA OF OCCURRENCE: Zone 10, Main Deck Frame 392 Starboard and 405 Port, 01 Level
Frame 61 and 101 Centerline and Frame 110 Port and Starboard,
02 Level Frame 308 Centerline and 03 Level Frame 116 Centerline

TYPE OF CORROSION: Direct Surface Attack, Galvanic

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: The gun mount bolts a circular steel foundation. See figure 4-1021. Lifting lugs simplify installation and removal. The circular foundations, foundation bolts and lifting lugs require frequent inspection and touch up of corrosion preventive coatings.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

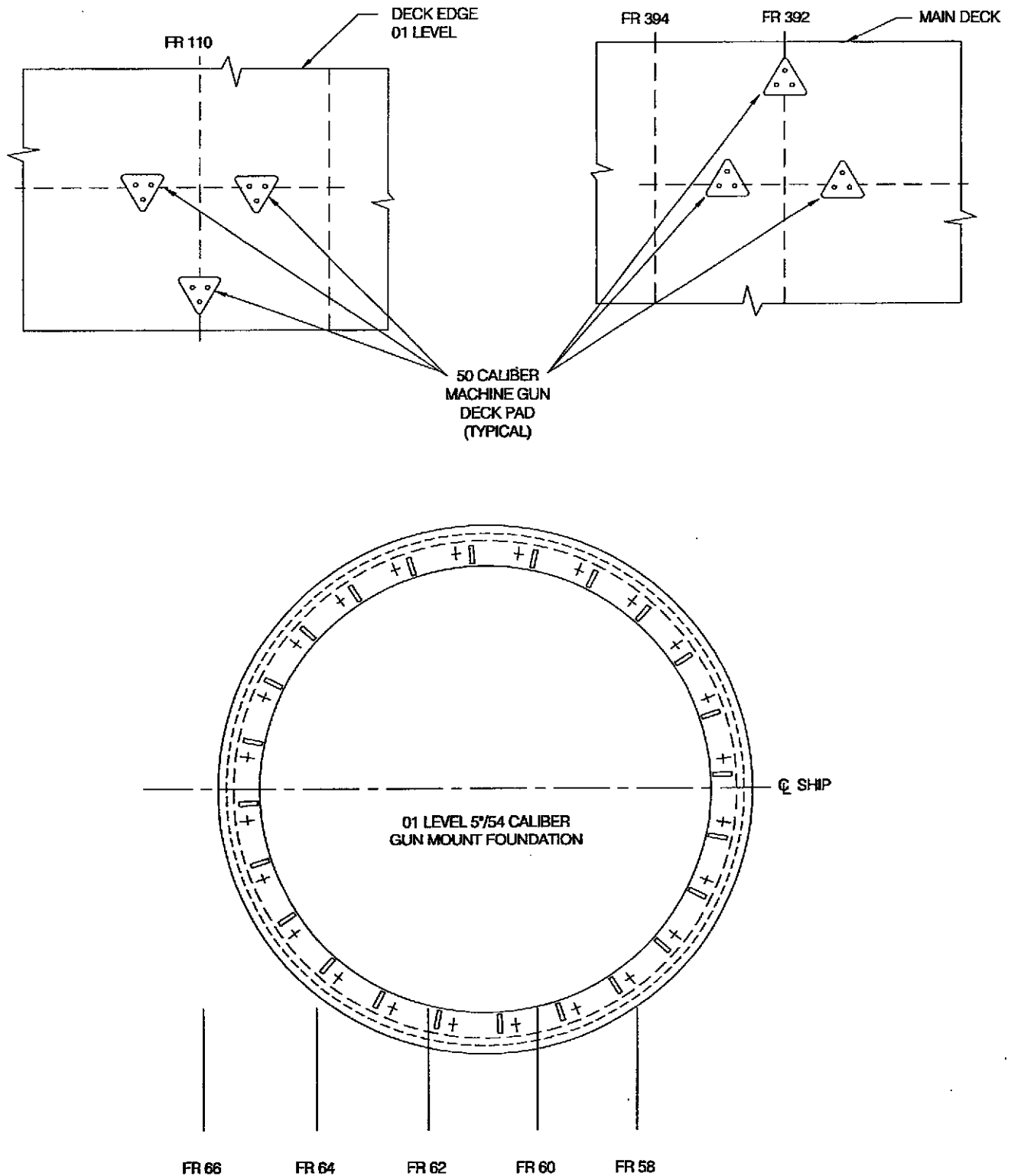
NAVSEA Gun Mount Foundations and Associated Drawings: 611-6595934, 611-6595936, 702-6595939, 6236595871, 702-6596399, 187-6597655, 600-6596665, 180-6597747, 600-6596713, 600-6596728, 180-6597728 and 180-6597654.
2. DDG 52 - DDG 78. Apply meal spray coating (System 2) to foundations prior to installation of gun mounts. Do not apply to machined surfaces. Extend metal spray coating at least 6 inches outward onto surrounding deck.
3. DDG 52 - DDG 74. Fasteners shall be treated with ceramic metallic coating (System 5).
4. DDG 52 - DDG 74. Polysulfide sealant (System 8) shall be applied to fasteners.
5. DDG 59 - DDG 78. The 5-inch/54 caliber gun foundation fasteners shall be Grade 8 alloy steel with no prior coating before installation. After installation, the weather exposed portions of the fasteners shall be coated with two coats of polysulfide (System 8) and out to 1-inch of the adjacent stand flanges.
6. DDG 78. Selection of fasteners for mounting combat system equipment in weather, wet or humid areas shall be in general per System 14. For bonding/grounding installation procedures, NAVSEA drawings OD32382 shall not be used.
7. DDG 78. RCS fairing plates and mounting foundation shall be CRES 316. Sand sweep and prime with AMERON 236 prior to installation.
8. DDG 78. Tram blocks, cover plates and fasteners shall be CRES 316L.

SERVICE REQUIREMENTS (SHIP): Inspect for corrosion damage to lugs, foundation, bolts and surrounding deck. Touch up as required. Replace fasteners as needed.

Index Number 1021

Gun Mount Foundations

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
5"/54 Caliber Gun Mount	01 Lvl Frame 61 CL	2
50 Caliber Mach Gun Dk Pad (3)	01 Lvl Frame 110 Port	2
50 Caliber Mach Gun Dk Pad (3)	01 Lvl Frame 110 Stbd	2
50 Caliber Mach Gun Pad (3)	Mn Dk Frame 392 Stbd	1
50 Caliber Mach Gun Pad (3)	Mn Dk Frame 405 Port	1
CIW (Mk 16 Mod 2) Mt 22 Gun Group	02 Lvl Frame 308 CL	6
CIW (Mk 16 Mod 2) Mt 21 Gun Shop	03 Lvl Frame 116 CL	7
Header Tank Assembly	01 Lvl Frame 101 CL	2
RCS Fairing Plates and Mounting Foundations	01 Lvl Frame 60 CL	2



CD_Z_2071

Figure 4-1021. Gun Mount Foundations

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Inclined Ladder Brackets and Platforms

AREA OF OCCURRENCE: Zone 10

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These brackets are exposed to the weather and to salt spray. (See figure 4-1022.)

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA inclined ladder and associated drawings: 623-6597941, 803-5959202, 8100-1266-0280, 8100-1266-0222 and 600-6596724.
2. DDG 52 - DDG 55. Apply metal spray coating (System 2) to carbon steel brackets, supporting structure, and deck area extending 6 inches out from the ladder feet.
3. DDG 57 - DDG 78. Do not apply System 2. Ladder brackets shall be manufactured from CRES material (System 16). Prime deck areas with inorganic zinc silicate paint extending 6 inches from the ladder feet.
4. DDG 52 - DDG 74. Fasteners shall be ceramic coated steel (System 5), if greater than 3/8-inch diameter, or CRES 316 of 3/8-inch or less (System 14).
5. DDG 78. Fasteners to be corrosion resistant material (System 14). Toggle pins to be CRES 316 with CRES 304 Monel pivot pins (System 16). Wire lanyards to be CRES 316 with CRES 304 swage fittings (System 16).
6. DDG 71 - DDG 78. All steps to stringer faying surfaces shall be coated with polysulfide sealant, MIL-S-81733, prior to assembly (System 9).
7. DDG 74 - DDG 78. All handrails shall be CRES 316 (System 16).
8. DDG 78. Ladders shall be CRES 316. Sand sweep and prime with one coat of AMERON 236 prior to top coating and installation.
9. Apply anti-seize thread compound (System 6) to all fasteners prior to installation.
10. DDG 78. Incline ladder platforms and stanchion sockets shall be CRES 316L. Sand sweep and prime with AMERON 236, one coat 1-2 MILS DFT, before installation.

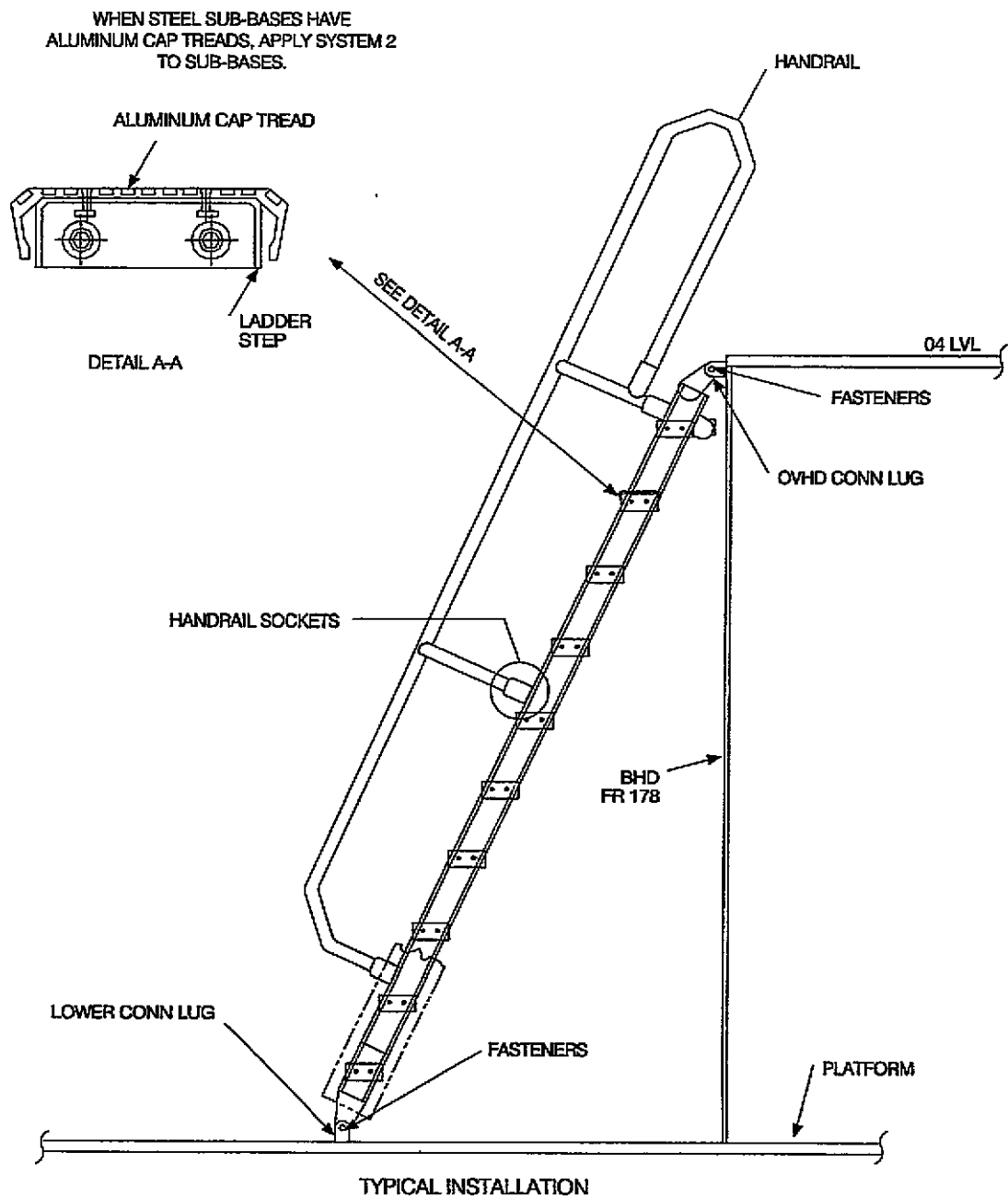
SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

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Index Number 1022

Inclined Ladder Brackets

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Inclined Ladder	Mn Dk Frame 374 S	1
Inclined Ladder	Mn Dk Frame 384 P	1
Inclined Ladder	01 Lvl Frame 224 P	3
Inclined Ladder	02 Lvl Frame 196 P	5
Inclined Ladder	03 Lvl Frame 180 P	7
Inclined Ladder	03.5 Lvl Frame 179 CL	7



NOTE: SEE WORK INSTRUCTIONS
FOR SPECIFIC HULL APPLICATIONS

CD_Z_2072

Figure 4-1022. Inclined Ladder Typical Installation 03-1/2 Lvl Fr 180 CL Shown

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Jack and Ensign Staffs

AREA OF OCCURRENCE: Zone 10 Bow and Transom

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These items are constantly exposed to seas and weather.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Jack and Ensign Staffs and Associated Drawings: 600-6596691, 600-6596697, 600-6596646 and 600-6596710.
2. Apply metal spray coating (System 2) to the chocks on which the jack staff and ensign staff are mounted.
3. Base assembly and stowage shall be series 300 CRES (System 16) in accordance with drawings 600-6596697 and 180-6597658.
4. Associated fasteners and stowage clamps shall be CRES 316 (System 14 and System 16). Cleat, open base shall be bronze.
5. Apply anti-seize compound(System 6) to fasteners prior to installation.
6. DDG 78. Cleats and snaphooks shall be bronze. Wire lanyards shall be CRES 316 with CRES 304 swage fittings. Toggle pins shall be CRES 316 with CRES 304 or MONEL pivot pins.
7. DDG 78. The jack staff and ensign staff base and stowage clamp assemblies shall be fabricated from CRES 316. Jack staff hold down assemblies shall be fabricated from CRES 316. All fasteners and small hardware including spring pins shall be CRES 316. Apply anti-seize (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1023

Jack and Ensign Staffs

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Jackstaff Chock, Base Assy Stowage	01 Lvl Frame JJ CL	2
Ensign Staff Chock, Base Assembly, Stowage	Mn Dk Frame 469 CL	1

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Kick Pipes and Stuffing Tubes in the Weather

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These items are exposed to seawater spray and weather.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Kick Pipes, Stuffing Tubes in the Weather and Associated Drawings: 300-6598062, 301-6596620, 301-6596557, 301-6596545, 301-6596502, 301-6596576, 301-6596609, 301-6596585, 301-6596567, 301-6596582, 301-6596626, 301-6596613, 301-6596606, 301-6596591, 301-6596603, 301-6596611, 301-6596620, 301-6596532, 301-6596597, 301-6596600 and 441-6596404.

2. DDG 52 - DDG 74. Coat exterior of steel kick pipes and stuffing tubes, including gland nuts, with inorganic zinc or fabricate from CRES 316 (System 16).
3. DDG 78. Coat exterior of steel kick pipes and stuffing tubes, including gland nuts, with a NAVSEA approved epoxy primer or fabricate from CRES 316 (System 16).
4. Threads of steel stuffing tubes shall be coated with anti-seize compound (System 6) prior to installation.
5. After installation, stuffing tubes and conduit fittings shall be coated with polysulfide sealant (System 9).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed.

Index Number 1024

Kick Pipes and Stuffing Tubes in the Weather

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Kick Pipes	Various (Weather)	10
Stuffing Tubes	Various (Weather)	10

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Label Plates in the Weather

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: Galvanic, General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: Aluminum label plates are fitted to steel structure and components in the weather.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Label Plates (Weather Exposed) and Associated Drawings: 8100-2346-0066, 8100-2346-0078, 8100-1260-0280, 507-6597473, 301-6596596, and 507-6597528.
2. Labels fitted to weather exposed bulkhead and vertical surfaces shall be of 5005-H34 aluminum flash hard anodized in accordance with Mil-Spec MIL-A-8625 Type 3, Class 1.
3. Identification labels fitted to weather decks shall be fabricated out of CRES 316 alloy (System 16).
4. A dielectric barrier consisting of 3-M Company Number 468 adhesive or equal shall be used where aluminum labels are mounted on dissimilar metal surfaces (System 11).
5. Fasteners used to attach label plates shall be CRES 316. Fasteners through the weather decks or through exterior superstructure bulkheads shall not be used.
6. Apply anti-seize compound (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1025

Label Plates (Weather Exposed)

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Label Plates (Weather Exposed)	Various	10

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Life Raft Stowage Racks

AREA OF OCCURRENCE: Zone 10, 01 and 02 Levels

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: These items are exposed to weather and saltwater and subject to impact and abrasion. See figure 4-1026.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Life Raft Stowage Rack and Associated Drawings: 583-6595882, 600-6596687, 600-6596715, 600-6596725, 600-6596727, 600-6596728, 600-6596724, and 600-6596716.

2. DDG 52 - DDG 74. Fasteners shall be ceramic coated carbon steel (System 5) if greater than 3/8-inch diameter and CRES 316 (System 16), if 3/8-inch in diameter or less.
3. DDG 78. Fasteners to be of corrosion resistant material (System 14).
4. DDG 78. Tiedown pads to be CRES 304 (System 16).
5. Apply metal spray coating (System 2) to the carbon steel life raft stowage racks.
6. Apply polysulfide sealant (System 9) to all bolted faying surfaces.
7. Apply anti-seize thread compound to all fasteners prior to installation (System 6).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1026
Life Raft Stowage Racks

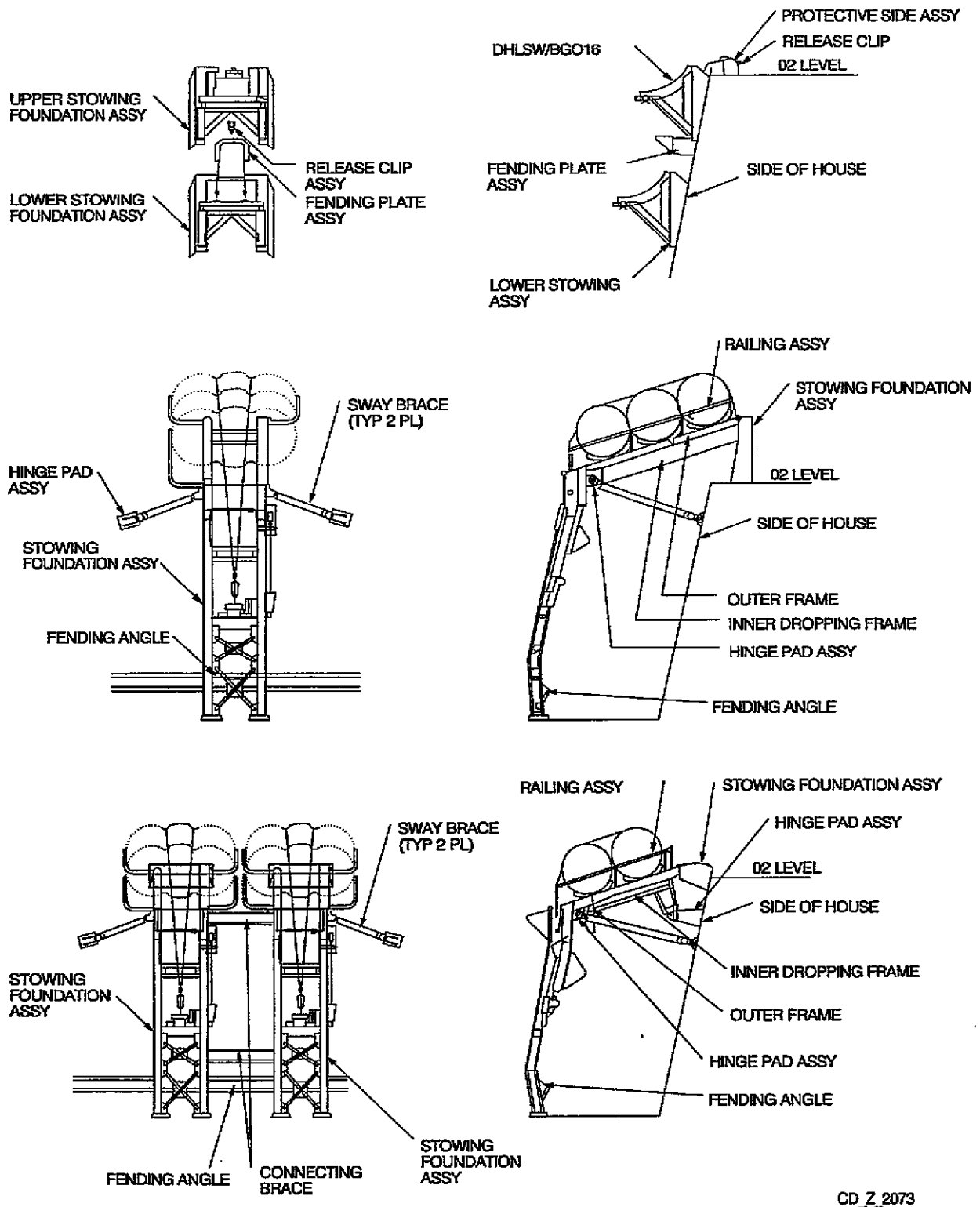
<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Upper Stowing Assy	02 Lvl Frame 198 P/S	5
Lower Stowing Assy		
Fending Plate Assy		
Release Clip Assy		
Protective Side Assy		

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Index Number 1026

Life Raft Stowage Rack - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Stowing Fdn Assy	02 Lvl Frame 299 Port	6
Sway Brace		
Hinge Pad Assy		
Fending Angle		
Outer Frame		
Railing Assy		
Inner Dropping Frame		
Stowing Fdn Assy	01/02 Lvl Frames 262 and 267 Port	6
Sway Brace		
Hinge Pad Assy		
Connecting Brace		
Fending Angle		
Outer Frame		
Railing Assy		
Inner Dropping Frame		



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Figure 4-1026. Life Raft Stowage Racks Arrangements

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Life Ring, Marine Location Marker and Light Holder Foundations

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These foundations are located in the weather and are exposed to salt spray. See Figure 4-1027.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

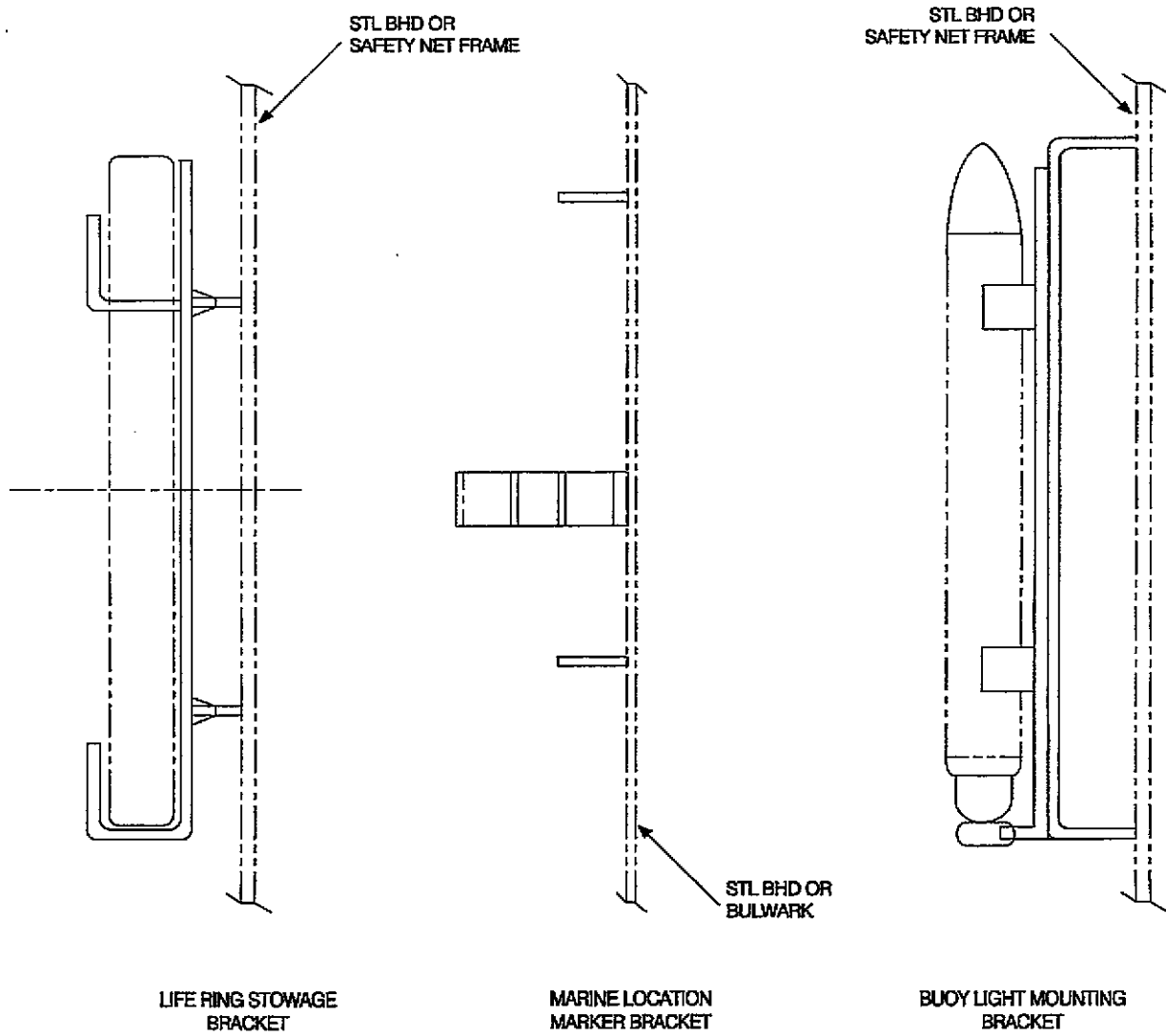
NAVSEA Life Ring And Light Holder Foundations and Associated Drawings: 600-6596712, 600-6596715, 600-6596727 and 8100-1316-0244.
2. DDG 52 - DDG 59. Apply metal spray coating (System 2) to all mounting brackets/foundations in the weather. Extend coating 6 inches onto bulkhead.
3. Apply polysulfide sealer (System 9) to all bolted faying surfaces.
4. DDG 52 - DDG 74. Fasteners shall be CRES 316 (System 14).
5. Apply anti-seize compound (System 6) to fasteners prior to installation.
6. DDG 61. All mounting brackets/foundations shall be manufactured from CRES material (System 16).
7. DDG 78. Swivel eye hooks to be bronze. Fasteners to be corrosion resistant material (System 14).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1027

Life Ring and Light Holder Foundations

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Life Ring Stowing Bracket	Various	10
Buoy Light Mtg Bracket	Various	10



CD_Z-2074

Figure 4-1027. Buoy Light Mounting, Marine Location Marker and Life Ring Stowage Bracket Foundations

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Low Pressure Air Service Station and System Piping

AREA OF OCCURRENCE: Zone 10

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: Various fittings located in the weather

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Low Pressure Air Service Station and Associated Drawings: 551-6597124, 505-6596862 and 505-6596778.
2. Low Pressure air weather deck fittings such as couplings, tees and elbows shall be fabricated from copper alloy (System 16).
3. DDG 52 - DDG 74. Fasteners topside and in humid spaces shall be fabricated according to (System 14).
4. Apply anti-seize compound (System 6) to fasteners prior to installation.
5. DDG 78. Fasteners to be of corrosion resistant material (System 14).
6. DDG 71 - DDG 78. All air service station filter, regulator and lubricator assemblies located in the weather, exposed to the weather, in wet or humid spaces shall be Norgen type 22 or equal with CRES/plastic weatherproof gages (System 16).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace up as needed.

Index Number 1028

Low Pressure Air Service Station

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
L.P. Air Connection	01 Lvl Frame 113 P/S	2
L.P. Air Connection	01 Lvl Frame 111 Stbd	2 3
L.P. Air Connection	01 Lvl Frame 296 P/S	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Low Profile Hatches and Scuttles in the Weather

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These hatches and scuttles are exposed to the weather salt spray and in some cases standing water. They are subject to repeated impact.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Low Profile Hatches and Scuttles and Associated Drawings: 600-6596646, 600-6596653, 600-6596659, 600-6596665, 600-6596693, 600-6596702, 600-6596703, 600-6596710, 600-6596712, 600-6596724, 600-6596726, 600-6596727, 600-6596710, 167-6597065, 167-6597066 and 167-6597068.
2. DDG 52 - DDG 63. Apply metal spray coating (System 2) to carbon steel components of low profile hatches and scuttles, including coaming and 6 inches onto surrounding deck.
3. DDG 65 - DDG 74. Apply System 2 to carbon steel components of low profile hatches and scuttles only.
4. DDG 78. Apply System 2 to only the interior side of carbon steel panels including the stiffeners hatch brace rods for weather deck hatches shall be made of CRES 304, CRES 316 or carbon steel coated with a NAVSEA approved inorganic zinc silicate primer.
5. DDG 52 - DDG 74. Fasteners shall be fabricated from CRES 316 (System 14).
6. DDG 78. Fasteners shall be of corrosion resistant material (System 14). Hardware including dogs, connecting linkage, operating handles, and dog spindle shafts shall be CRES 304 or CRES 316.
7. DDG 78. All wire lanyards shall be CRES 316 with CRES 304 swage fittings. All toggle pins shall be CRES 316 with CRES 304 or Monel pivot pins. Grease fittings shall be CRES 316 or MONEL (System 16).
8. Apply anti-seize compound (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1029

Low Profile Hatches and Scuttles in the Weather

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Scuttle	01 Lvl Frame F Port (3' off CL)	2
Rope Scuttle	01 Lvl Frame 31 Stbd	2
Rope Scuttle	01 Lvl Frame 37 Port	2
Hatch w/Scuttle	01 Lvl Frame 21 CL	2
Hatch RLP QA	01 Lvl Frame 40 Stbd	2
Hatch	01 Lvl Frame 44 CL	2
Hatch	01 Lvl Frame 70 Port	2
Hatch	01 Lvl Frame 75 CL	2
Scuttle	01 Lvl Frame 99 S (7'-10" off CL)	2
Scuttle	01 Lvl Frame 99 P (3'-6" off CL)	2
Scuttle	01 Lvl Frame 285 Stbd	3
Hatch	01 Lvl Frame 336 Port (8'-9 off CL)	4
Scuttle	01 Lvl Frame 336 1/2 Port (3' off CL)	4
Access Covers (HVAC)	01 Lvl Frame 320 1/2 P/375 P	4
Scuttle	Mn Dk Frame 373 Stbd (1'-2" off CL)	1
Hatch	Mn Dk Frame 412 Port (17'-3" off CL)	1
Hatch	Mn Dk Frame 444 S (7'-3") off CL)	1
Hatch	Mn Dk Frame 444 Port (7' off CL)	1
Hatch	02 Lvl Frame 222 Port (4'-3" off CL)	5
Scuttle RSD WRTT QA	02 Lvl Frame 252 1/2 Port	6
Scuttle RSD WRTT QA	02 Lvl Frame 274 1/2 Stbd	6
Scuttle WRTT	01 Lvl Frame 39 S (2'-0" off CL)	2

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Lockers, Ordnance and Marine

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: Uniform Attack, Crevice

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Lockers are sheet metal with sun shields. Weather exposure causes hinges, dogs, fasteners and panels to corrode. See figure 4-1030.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

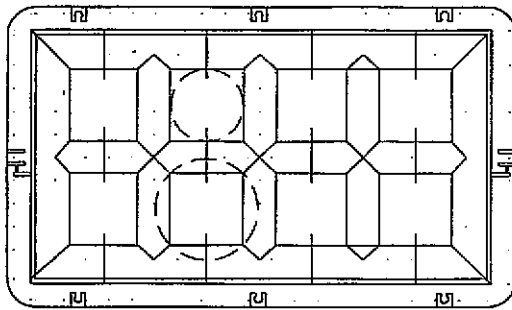
NAVSEA Ordnance and Marine Lockers and Associated Drawings: 611-6595934, 611-6595936, 611-6595937, 600-6596687, 600-6596681, 600-6596693, 600-6596702, 600-6596723, 600-6596724, 600-6596727, 600-6596717, 710-6597253 and 640-6595958.
2. DDG 52 - DDG 69. Apply powder epoxy coating (System 4) to sheetmetal locker or in the event of size constants apply MSC (System 2) to carbon steel lockers.
3. DDG 52 - DDG 69. Apply metal spray coating to steel sub-base and deck surface within 6 inches.
4. DDG 71 - DDG 78. Fabricate lockers from CRES 316L and sunshields from CRES 316. Fasteners and small hardware shall be CRES 316 except that drain plugs shall be brass and sunshield rivnuts shall be CRES 305.
5. DDG 71 - DDG 78. Cover drop bolts to be CRES 316 with CRES 316 ferrules and CRES 304 or Monel ferrule pins. Fasteners to be of corrosion resistant material (System 14).
6. DDG 71 - DDG 78. Wire lanyards to be CRES 316 with CRES 304 swage fittings. Toggle pins shall be CRES 316 with CRES 304 or Monel pivot pins.
7. DDG 71 - DDG 78. Mk 36 DLS RS stowage locker (6) replace existing label plate rivets with CRES 316 rivets.
8. DDG 78. Marine smoke locker foundations shall be CRES 316L. Sand sweep and prime with AMERON 236, one coat at 1-2 mils DFT, prior to installation.
9. Fasteners and hardware shall be fabricated from CRES 316 (System 14 and System 16), unless stated otherwise on government documents or specifications.
10. Apply anti-seize thread compound (System 6) to fasteners prior to installation.

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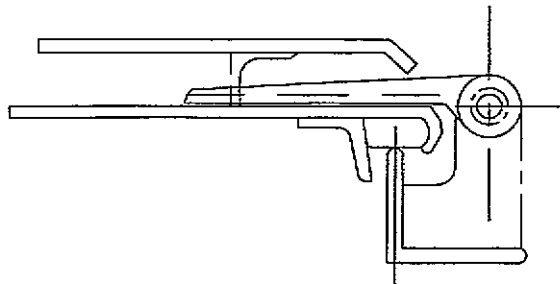
SERVICE REQUIREMENTS (SHIP): Inspect hinges, dogs, doors, sunshields, lugs and fasteners monthly and touch up as needed.

Index Number 1030
 Ordnance and Marine Lockers

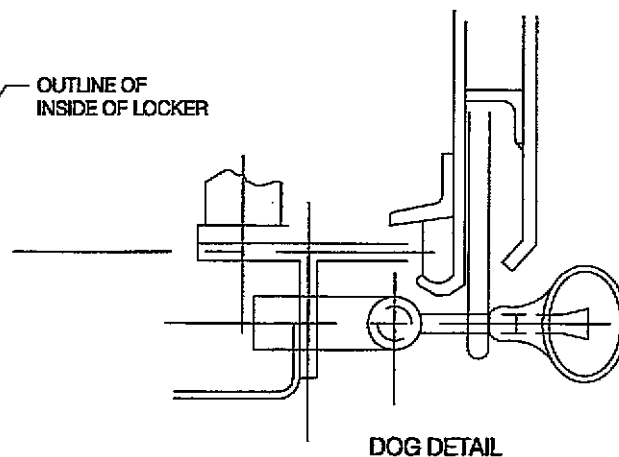
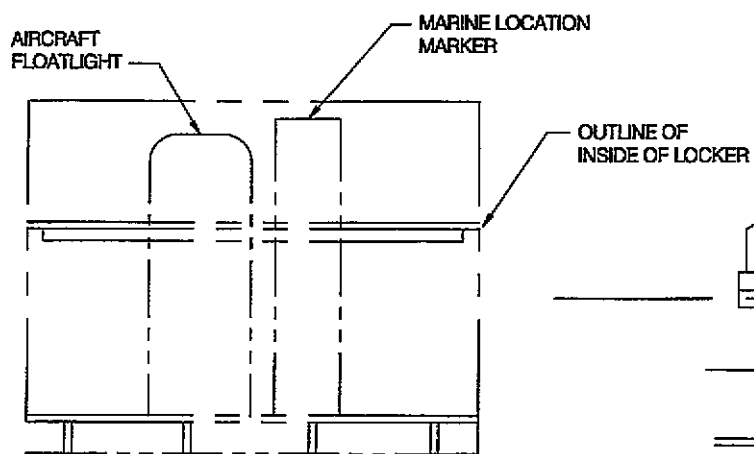
<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Locker, 50 Caliber Ammo	Mn Dk Frame 391 Port	1
Locker, 50 Caliber Ammo	Mn Dk Frame 373 Stbd	1
Locker, Pyro Signal	04 Lvl Frame 152 Port	8
Locker, LCTN Marker	04 Lvl Frame 151 Stbd	8
Locker, Marine Smoke Signal	01 Lvl Frame 316 Stbd	3
Locker, Hand Grenade	01 Lvl Frame 245 Port	2
Locker, 50 Caliber Ammo	01 Lvl Frame 114 P&S	
Locker, Mk 36 DLS	02 Lvl Frame 210 P&S	5
Locker, Mk 36 DLS (6 each) (For DDG 55 and Follow)	02 Lvl Frames 200-215 P&S	5
Locker, Abandon Ship Eqpt	01 Lvl Frame 257 Stbd	3
Locker, Pyro Signal and Marine Smoke Signal	01 Lvl Frame 314 Stbd	3



PLAN VIEW, COVER REMOVED



HINGE DETAIL



DOG DETAIL

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Figure 4-1030. Lockers, Ordnance and Marine

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Pipe Hangers and Fasteners (Steel Only)

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: Uniform Attack, Galvanic

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Pipe hangers are located ship wide. Common types are shown in figure 4-1031. Sizes vary with pipe size and ship structure. When treating or touching up ferrous pipe hangers retain these components for reassembly.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Pipe Hangers and Fasteners (Steel Only) and Associated Drawings:

8100-2400-0062, 631-6596633, 505-6596815, 505-6596801, 505-6596817, 505-6596802, 505-6596781, 505-6596780, 505-6596855, 505-6596816, 505-6596797, 600-6596726, 505-6596752, 505-6596868, 505-6596778, 505-6596827, 505-6596851, 505-6596768, 505-6596871, 505-6596831, 505-6596826, 505-6596774, 505-6596753, 505-6596807 and 505-6596801.

2. DDG 52 - DDG 74. Fasteners shall be fabricated out of Grade 5 carbon steel with zinc flake coating.
3. DDG 52 - DDG 74. Pipe hanger locking keys shall be carbon steel.
4. DDG 52 - DDG 74. Treat all steel alloy clamp and nelson type pipe hangers in accordance with corrosion control (System 15). See notes for interior and exterior steel application. Two coats of epoxy conforming to MIL-P-24441 or DOD-P-23236 may be used in lieu of ceramic metallic coating. Total thickness shall be minimum of 6 mils. The finish color shall be black. The coating shall be applied after hanger fabrication.

NOTES: DDG 52 - DDG 74

A. Liner materials shall be attached prior to installation, after cure out of paint coatings.

B. Ferrous Hangers in Weather (Exterior Steel):

1. Abrasive Blast SSPC-SP10
2. Inorganic Zinc (L-91 Ref 123) - 3 to 5 mils
3. MIL-P-24441 F-151 Seal Coat - 1 mil
4. MIL-P-24441 F-151 - 3 mils
5. TT-E-490 - 1 mil
6. TT-E-490 - 1 mil

B. Ferrous Hangers In Weather (Interior Steel) (CONT.)

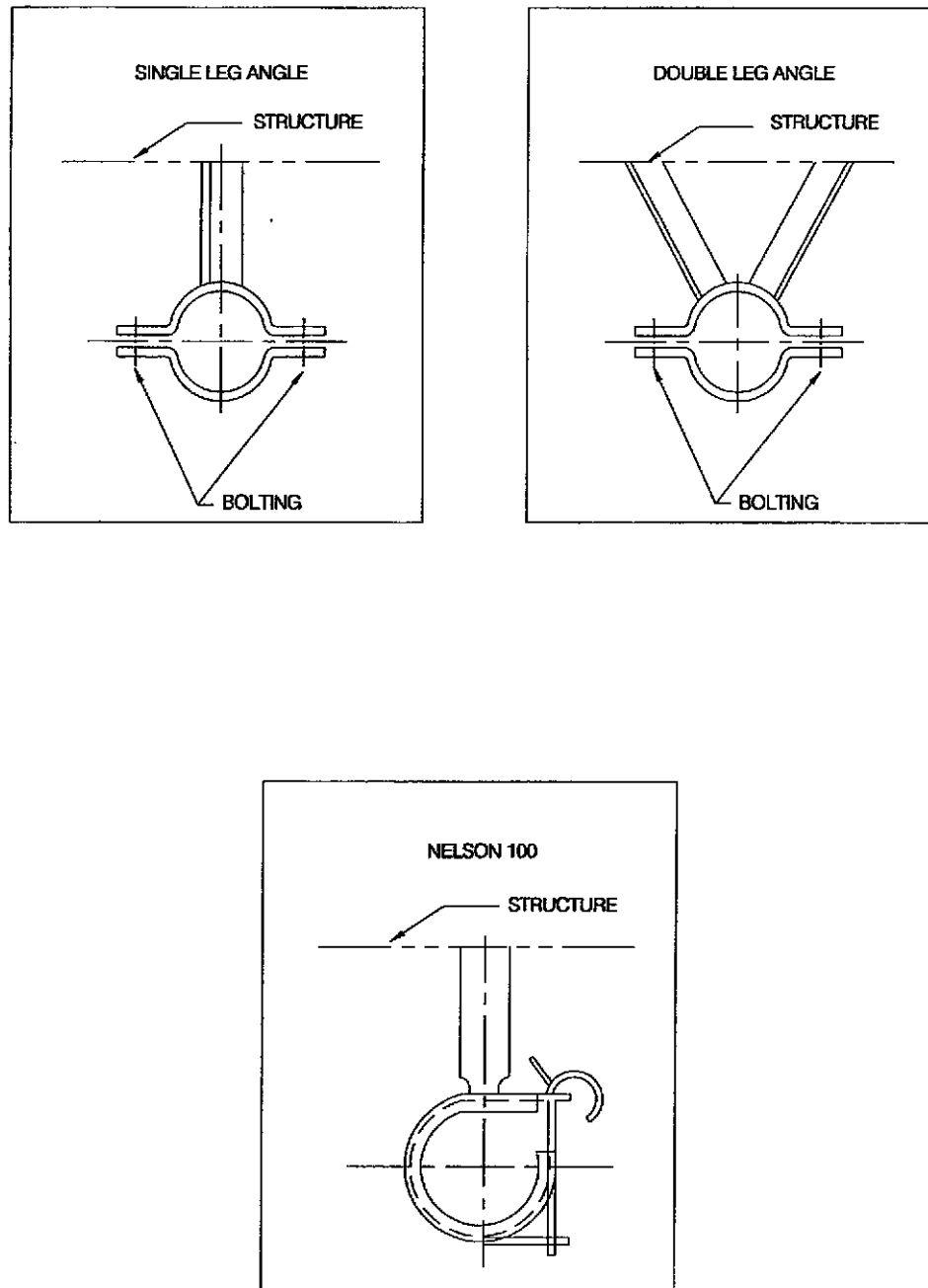
1. Abrasive Blast SSPC-SP10
 2. MIL-P-24441 F-151 - 3 mils
 3. MIL-P-24441 F-156 - 3 mils
 4. MIL-P-24441 F-151 - 2 mils
5. DDG 78. All rigid pipe hangers in weather, dirty side of CPS fan rooms, propulsion and ship service gas turbine air intake rooms, plenums, trunks, passageways open to weather and in the mast shall be CRES 304L or CRES 316L (System 16). CRES pipe hangers shall be rubber lined if temperature permits.
 6. DDG 78. Pipe hanger locking keys to be CRES 316 or MONEL. Fasteners to be of nickel copper alloy for hangers in tanks, floodable voids and sonar dome and to be of CRES 316 or nickel copper alloy elsewhere (System 14).
 7. DDG 78. Anti-siphon drain piping side shell and house side anti-siphon angle and backing plate shall be CRES 316L.

SERVICE REQUIREMENTS (SHIP): Inspect hangers and fasteners. Replace as needed. Perform in-place touch up where practical. Clean area with power tools and apply to top coatings MIL-P-2441.

Index Number 1031

Pipe Hangers and Fasteners (Steel Only)

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Pipe Hangers and Fasteners	Various	10, 18



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Figure 4-1031. Pipe Hangers, Typical

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Portable and Fixed Davits and Sockets

AREA OF OCCURRENCE: Zone 10

TYPE OF CORROSION: Uniform Attack

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Sockets for inserting the portable davits are installed at designated deck edges and hatch openings for vertical movement of load using the davit and chain hoist. The steel sockets and davits require corrosion protection as described below. See figure 4-1032.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Davits/Sockets and Associated Drawings: 611-6598151, 600-6596646, 600-6596653, 600-6596665, 600-6596693, 600-6596698, 600-6596702, 600-6596705, 600-6596710 and 600-6596712.

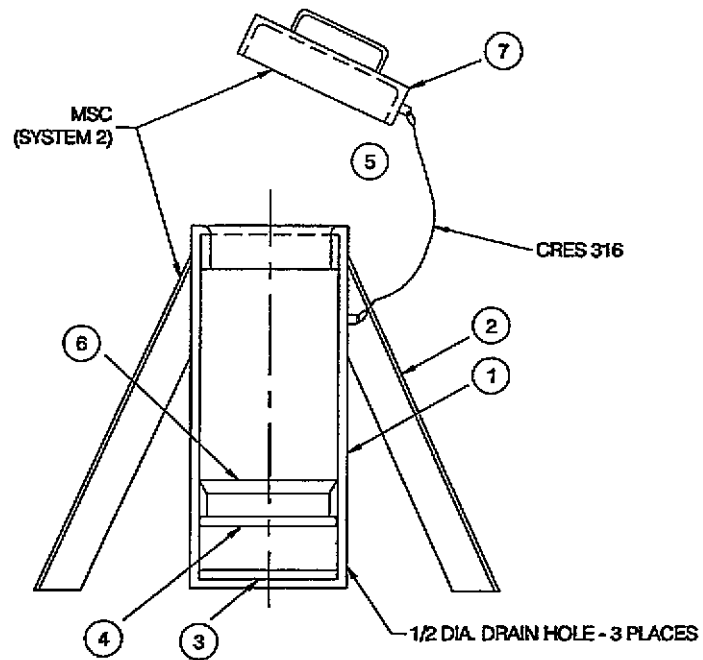
2. Remove phenolic insert of socket. Apply metal spray coating (System 2) to steel portable davits, davit sockets and support structure, padeyes and cleats, and 6 inches onto surrounding deck. As an alternate to System 2, 8 mils MDFT of Devco Bar-Rust (235/236 primer or equal) may be applied.
3. Apply polysulfide sealer (System 9) to all bolted faying surfaces on removable hardware prior to assembly.
4. Eye bolts and ring bolts shall be CRES 316 (System 16).
5. Interiors of davit sockets shall be coated prior to insertion of phenolic bearing.

SERVICE REQUIREMENTS (SHIP): Inspect quarterly. Remove debris. Open drain holes. Apply touch up as needed. Replace fasteners as needed.

Index Number 1032

Portable and Fixed Davits and Sockets

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Portable Davit Sockett/Assembly	Mn Dk Frame 384 Stbd	1
Portable Davit Sockett/Assembly	Mn Dk Frame 401 Stbd (DDG 52)	1
Portable Davit Sockett/Assembly	Mn Dk Frame 405 Stbd (DDG 55 - DDG 78)	1
Portable Davit Sockett/Assembly	Mn Dk Frame 447 Stbd	1
Portable Davit Sockett/Assembly	Mn Dk Frame 396 Port	1
Portable Davit Sockett/Assembly	Mn Dk Frame 405 Port (DDG 52 - DDG 67)	1
Portable Davit Sockett/Assembly	Mn Dk Frame 414 Port	1
Portable Davit Sockett/Assembly	Mn Dk Frame 447 Port	1
Portable Davit Sockett/Assembly	01 Level Frame 21 Stbd	2
Portable Davit Sockett/Assembly	01 Level Frame 327 Stbd	4
Portable Davit Sockett/Assembly	01 Level Frame 354 Stbd	4
Portable Davit Sockett/Assembly	01 Level Frame 74 Port	2
Portable Davit Sockett/Assembly	01 Level Frame 342 Port	4
Portable Davit Sockett/Assembly	01 Level Frame 15 Stbd	2
Portable Davit Sockett/Assembly	02 Level Frame 222 Stbd (DDG 52 - DDG 71)	5
Portable Davit Sockett/Assembly	02 Level Frame 116 Port	5
Portable Davit Sockett/Assembly	02 Level Frame 124 Port	5
Portable Davit Socket/Assembly	01 Level Frame 72 Stbd	2
Portable Davit Socket/Assembly	01 Level Frame 75 Stbd	2
Portable Davit Socket/Assembly	01 Level Frame 110 Stbd	2
Portable Davit Socket/Assembly	01 Level Frame 205 Stbd	3
Portable Davit Socket/Assembly	02 Level Frame 113 Port (DDG 57 - DDG 78)	5
Portable Davit Socket/Assembly	01 Level Frame 225 Stbd (DDG 74 - DDG 78)	3
Portable Davit Socket/Assembly	02 Level Frame 268 Stbd (DDG 78)	3
Portable Davit Socket/Assembly	01 Level Frame 240 Stbd	3
Portable Davit Socket/Assembly	01 Level Frame 292 Port	3
Portable Davit Socket/Assembly	01 Level Frame 315 (2) Stbd	4
Fixed Davit Socket	01 Level Frame 105 Stbd	2
Fixed Davit Socket	01 Level Frame 105 Port	2
Fixed Davit Socket	02 Level Frame 222 Stbd	5



LEGEND

① SOCKET (STEEL)	④ RETAINER (1/8" THICK RING)
② BRACE (4-REQUIRED)	⑤ UPPER BEARING (PHENOLIC)
③ CAP PLATE (WELDED)	⑥ LOWER EARING (PHENOLOC)
	⑦ WEATHER COVER (CAPTIVE)

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Figure 4-1032. Portable Davit Socket

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Portable Rigid Liferail Sections

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These items are installed on the weather decks and are subject to seawater and impact.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Portable Liferails, Stanchions, Lifeline Sections and Associated Drawings:

612-6597073, 612-6597242, 612-6595901, 600-6596646, 600-6596653, 600-6596659, 600-6596665, 600-6596681, 600-6596687, 600-6596694, 600-6596702, 600-6596703, 600-6596707, 600-6596712, 600-6596718, 600-6596723, 600-6596724, 600-6596726, 600-6596728, 600-6596713, 600-6596722, 600-6596730 and 600-6596731.

2. DDG 52. Apply metal spray coating (System 2) to steel portable rigid liferail sections, portable lifeline stanchions, stanchion bases and non-threaded areas of sockets.
3. DDG 55 - DDG 78. Portable rigid liferails, portable lifeline stanchions, stanchion bases and sockets for stanchions shall be fabricated from CRES 316 (System 16).
4. DDG 71-DDG 78. Fasteners to be of corrosion resistant material (System 14). All wire lanyards to be CRES 316 with CRES 304 swage fittings. All toggle pins to be CRES 316 with CRES 304 or Monel pivot pins. The standoffs for bolted ground straps shall be made of CRES 316. Lifeline shackles and safety shackles shall be CRES 316 with CRES 316 pins and cotter pins.
5. DDG 78. Stanchion bases shall be fabricated from CRES 316L material (System 16).
6. Steel and CRES liferail and CRES lifeline sections shall be attached to the stanchion bases using CRES 316 alloy pins and lanyards (System 14 and System 16).
7. CRES lifelines shall be set up with CRES 316 turnbuckle assemblies and CRES 316 clevis, sister-hook assemblies.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace hardware and fasteners as needed.

Index Number 1033
 Portable Rigid Liferail Sections

<u>Description</u>	<u>Quantity</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Stanchion Base	4	01 Lvl Frame CC Port	2
		01 Lvl Frame 0 Port	2
		01 Lvl Frame 2 Port	2
		01 Lvl Frame 15 Port	2
Stanchion Base	10	01 Lvl Frame CC Stbd	2
		01 Lvl Frame Y P/S	2
		01 Lvl Frame V P/S	2
		01 Lvl Frame N Port	2
		01 Lvl Frame J Stbd	2
		01 Lvl Frame 0 Stbd	2
		01 Lvl Frame 9 Stbd	2
Stanchion Base	2	01 Lvl Frame 15 Stbd	2
		01 Lvl Frame 0 Port	2
Stanchion Base Rem	3	01 Lvl Frame 22 Stbd	2
		01 Lvl Frame 31 Stbd	2
		01 Lvl Frame 40 Stbd	2
Stanchion Base Rem	3	01 Lvl Frame 22 Port	2
		01 Lvl Frame 31 Port	2
		01 Lvl Frame 40 Port	2
Stanchion Base Rem	3	01 Lvl Frame 43 Stbd	2
		01 Lvl Frame 59 Stbd	2
		01 Lvl Frame 68 Stbd	2
Stanchion Base Rem	3	01 Lvl Frame 49 Port	2
		01 Lvl Frame 59 Port	2
		01 Lvl Frame 68 Port	2
Stanchion Base Rem	1	01 Lvl Frame 78 Port	2
Stanchion Base Rem	1	01 Lvl Frame 78 Stbd	2
Stanchion Base Rem	4	01 Lvl Frame 87 Port	2
		01 Lvl Frame 96 Port	2
		01 Lvl Frame 106 Port	2
		01 Lvl Frame 115 Port	2

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Index Number 1033

Portable Rigid Liferail Sections - CONT.

<u>Description</u>	<u>Quantity</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
	4	01 Lvl Frame 87 Stbd	2
		01 Lvl Frame 96 Stbd	2
		01 Lvl Frame 106 Stbd	2
		01 Lvl Frame 115 Stbd	2
Stanchion Base Rem	9	01 Lvl Frame 222 P/S (2)	3
Stanchion Base	11	01 Lvl Frame 372 P/S (7)	4
		01 Lvl Frame 379 Port (1)	4
		01 Lvl Frame 387 Port (3)	4
Stanchion Base	1	01 Lvl Frame 372 Stbd	4
Stanchion Base	8	Mn Dk Frame 388 P/S (2)	1
		Mn Dk Frame 396 P/S (2)	1
		Mn Dk Frame 404 P/S (2)	1
		Mn Dk Frame 408 P/S (2)	1
Stanchion Base	1	Mn Dk Frame 385 Port	1
Stanchion Base	1	Mn Dk Frame 385 Stbd	1
Stanchion Base	8	01 Lvl Frame 251 Stbd	3
		01 Lvl Frame 267 Stbd	3
		01 Lvl Frame 270 Stbd	3
		01 Lvl Frame 277 Stbd	3
		01 Lvl Frame 285 Stbd	3
		01 Lvl Frame 288 Stbd	3
		01 Lvl Frame 296 Stbd	3
		01 Lvl Frame 299 Stbd	3
Stanchion Base	5	01 Lvl Frame 341 P/S (2)	4
		01 Lvl Frame 360 P/S (2)	4
		01 Lvl Frame 367 Port (1)	4
Stanchion Base Rem	4	01 Lvl Frame 345.5 P/S (2)	4
		01 Lvl Frame 355.5 P/S (2)	4
Stanchion Base	1	01 Lvl Frame 367 Port	4
Lifeline Stanchion	2	01 Lvl Frame M Port	2
		01 Lvl Frame B Port	2

Index Number 1033

Portable Rigid Liferail Sections - CONT.

<u>Description</u>	<u>Quantity</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Lifeline Stanchion	1	01 Lvl Frame B Port	2
Lifeline Stanchion	2	01 Lvl Frame J Stbd	2
		01 Lvl Frame 9 Stbd	2
Lifeline Stanchion	4	01 Lvl Frame Y Port/Stbd	2
		01 Lvl Frame 8 Port	2
		01 Lvl Frame 9 Port	2
Lifeline Stanchion	2	01 Lvl Frame V Port/Stbd	2
Lifeline Stanchion	6	01 Lvl Frame CC P/S	2
		01 Lvl Frame 0 Stbd	2
		01 Lvl Frame 1 Port	2
		01 Lvl Frame 15 P/S	2
Lifeline Stanchion	2	01 Lvl Frame 22 Port (2)	2
		01 Lvl Frame 40 Stbd	2
Lifeline Stanchion	2	01 Lvl Frame 22 Port	2
		01 Lvl Frame 40 Port	2
Intermediate Stanchion	2	01 Lvl Frame 31 P/S	2
Portable Stanchion	3	01 Lvl Frame 24 Port (2)	2
		01 Lvl Frame 42 Stbd	2
Portable Stanchion	4	01 Lvl Frame 18 CL	2
		01 Lvl Frame 20 Port	2
		01 Lvl Frame 38 Stbd (2)	2
Portable Stanchion		01 Lvl Frame 42 Stbd	2
Portable Stanchion	4	01 Lvl Frame 46 CL/Stbd (2)	2
		01 Lvl Frame 72 Port (2)	2
Portable Stanchion	8	01 Lvl Frame 43 CL/Stbd (2)	2
		01 Lvl Frame 72 P/S (2)	2
		01 Lvl Frame 78 P/S (2)	2
Lifeline Stanchion	2	01 Lvl Frame 59 Stbd	2
		01 Lvl Frame 78 Port	2
	1	01 Lvl Frame 59 Port	2
	1	01 Lvl Frame 77 Stbd	2

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Index Number 1033

Portable Rigid Liferail Sections - CONT.

<u>Description</u>	<u>Quantity</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Intermediate Stanchion	4	01 Lvl Frame 49 Por (2)	2
		01 Lvl Frame 68 P/S (2)	2
Lifeline Stanchion	2	01 Lvl Frame 96 Stbd	2
		01 Lvl Frame 115 Port	2
	2	01 Lvl Frame 96 Port	2
		01 Lvl Frame 115 Stbd	2
Intermediate Stanchion	4	01 Lvl Frame 87 P/S (2)	2
		01 Lvl Frame 106 P/S (2)	2
Portable Stanchion	2	01 Lvl Frame 100 Stbd (2)	2
Portable Stanchion	2	01 Lvl Frame 98 Stbd (2)	2
Lifeline Stanchion	3	01 Lvl Frame 222 Stbd	3
		01 Lvl Frame 242 Stbd	3
		01 Lvl Frame 253 Stbd	3
Lifeline Stanchion	2	01 Lvl Frame 330 P/S	3
	1	01 Lvl Frame 239 Stbd	3
	1	01 Lvl Frame 239 Port	3
	1	01 Lvl Frame 222 Port	3
	1	01 Lvl Frame 242 Port	3
	1	01 Lvl Frame 251 Port	3
Intermediate Stanchion	2	01 Lvl Frame 261 Stbd	3
		01 Lvl Frame 277 Stbd	3
End Stanchion	1	01 Lvl Frame 285 Stbd	3
End Stanchion	1	01 Lvl Frame 280 Stbd	3
Intermediate Stanchion	1	01 Lvl Frame 278 Stbd	3
Lifeline Stanchion	1	01 Lvl Frame 288 Port	3
Lifeline Stanchion	2	01 Lvl Frame 270 Port	3
		01 Lvl Frame 299 Stbd	3
Lifeline Stanchion	2	01 Lvl Frame 267 Stbd	3
		01 Lvl Frame 296 Stbd	3

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Index Number 1033

Portable Rigid Liferail Sections - CONT.

<u>Description</u>	<u>Quantity</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Corner Stanchion	1	01 Lvl Frame 367 Port	4
Lifeline Stanchion	2	01 Lvl Frame 353.5 Port	4
	2	01 Lvl Frame 345.5 Stbd	4
Lifeline Stanchion	2	01 Lvl Frame 345.5 Port	4
	2	01 Lvl Frame 355.5 Stbd	4
Lifeline Stanchion	1	01 Lvl Frame 360.5 Port	4
Lifeline Stanchion	3	01 Lvl Frame 341 P/S (2)	4
	2	01 Lvl Frame 360.5 Stbd (1)	4
Corner Stanchion	1	01 Lvl Frame 367 Port	4
Stanchion	1	01 Lvl Frame 372 Stbd (15' 10 1/2" off CL)	4
Stanchion	1	01 Lvl Frame 372 Stbd (18' 10 1/2" off CL)	4
Stanchion	1	01 Lvl Frame 372 Stbd (8' 6" off CL)	4
Intermediate Stanchion	1	01 Lvl Frame 372 Stbd (24' 7" off CL)	4
Corner Stanchion	1	01 Lvl Frame 372 Stbd	4
Guardline Stanchion	1	01 Lvl Frame 372 Port (18' 3" off CL)	4
Guardline Stanchion	1	01 Lvl Frame 372 Port (20' 9" off CL)	4
Corner Stanchion	2	01 Lvl Frame 387 Port (2)	4
Intermediate Stanchion	1	01 Lvl Frame 387 Port (9' off CL)	4
Lifeline Stanchion	1	Mn Dk Frame 385 Port	1
Lifeline Stanchion	1	Mn Dk Frame 385 Stbd	1
Lifeline Stanchion	3	Main Deck Frame 388 Port	1
		Main Deck Frame 404 Stbd	1
		Main Deck Frame 408 Port	1
Lifeline Stanchion	2	Main Deck Frame 388 Stbd	1
		Main Deck Frame 404 Port	1

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Index Number 1033

Portable Rigid Liferail Sections -CONT.

<u>Description</u>	<u>Quantity</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Lifeline Stanchion	2	Mn Dk Frame 396 P/S (2)	1
Lifeline Stanchion	1	Mn Dk Frame 408 Stbd	1
Stanchion	2	Mn Dk Frame 403 P/S (4)	1
		Mn Dk Frame 407 P/S (4)	1
Stanchion	2	Mn Dk Frame 411 Port (2)	1
		Mn Dk Frame 411 Port (2)	1
Stanchion	2	01 Lvl Frame 224.5 Port	5
Stanchion Assy	9	05 Lvl Frame 272 P/S (2)	9
Lifeline Stanchion		05 Lvl Frame 277 P/S (2)	9
Lifeline Stanchion	9	05 Lvl Frame 282.5 P/S (2)	9
Lifeline Stanchion		05 Lvl Frame 284 P/CL/S (3)	9

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Quarter Deck IC and Alarm Enclosures

AREA OF OCCURRENCE: Zone 10

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These enclosures are subject to weather and salt spray.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Quarter Deck IC and Alarm Enclosures and Associated Drawings: 301-6596531, 301-6596544, 301-6596554, 301-6596556, 301-6596576, 301-6596608, 301-6596590, 301-6596578 and 301-6596616.

2. Apply epoxy powder coating (System 4) to IC safety and warning system alarm enclosures.
3. DDG 52 - DDG 74. Apply metal spray coating (System 2) to the steel mounting brackets.
4. All fasteners shall be fabricated out of CRES 316 alloy (System 14).
5. The closing latch, hinges, and other accessories shall be CRES 316 (System 16).
6. Apply a vapor phase inhibitor (System 12) to the interior of the IC and alarm enclosures.
7. Apply anti-seize compound (System 6) to fasteners prior to installation.
8. DDG 71 - DDG 78. Install dielectric barrier (System 11). Use nylon or Teflon washers on inside of alarm enclosures hinges. Threaded attachment buttons to be corrosion resistant.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners, hardware, and accessories as needed.

Index Number 1034

Quarter Deck IC and Alarm Enclosures

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Quarter Deck IC & Alarm Enclosures	Various	10

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Raised Deck Hatches in the Weather

AREA OF OCCURRENCE: Zone 10, Main Deck, 01 Level, 02 Level

TYPE OF CORROSION: Uniform Attack, Galvanic

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These hatches are steel closures providing vertical access and watertight seal of the deck opening. Figure 4-1035 shows typical raised hatch.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Raised Deck Hatches and Associated Drawings: 600-6596665, 600-6596693, 600-6596702, 600-6596712, 600-6596703, 600-6596728, 167-6597067, 167-6597066, 168-6597068 and 600-6596714.
2. DDG 52 - DDG 74. Apply metal spray coating (System 2) to raised deck hatch (both sides), coaming, carbon steel components and the deck area surrounding the hatch area at least 6 inches out.
3. DDG 52 - DDG 74. Dog bolts and brace rods shall be fabricated out of CRES 316 (System 16).
4. DDG 78. Apply metal spray (System 2) to interior and exterior of hatch panels including stiffeners and 6-inch minimum of surrounding deck. All other ordinary strength steel components shall receive System 2 or NAVSEA approved inorganic zinc silicate primer.
5. DDG 78. Fasteners to be of corrosion resistant material (System 14). Hardware including dogs, connecting linkage, operating handles, and dog spindle shafts to be CRES 304 or CRES 316. Drop bolt collars/ferrules to be CRES 316 with CRES 304, MONEL or naval brass collar ferrule pins. Wire lanyards to be CRES 316 with CRES 304 swage fittings. Toggle pins to be CRES 316 with CRES 304 or Monel pivot pins. Grease fittings shall be MONEL.
6. DDG 78. Dog pad pins to be CRES 316. Dog wedges to be aluminum bronze, ASTM B148, alloy C95200 or C95300. Bolted dog wedges to have machined screws in accordance with Fed Spec FF-S-92B, Type III, Style 3C, copper alloy, ASTM B98.
7. DDG 78. Raised watertight scuttle security covers shall be CRES 316 at the locations following. Sand sweep and coat with AMERON 236 prior to installation.
8. DDG 78. All hatch brace rods for weather deck hatches to be CRES 304, CRES 316 or carbon steel coated with NAVSEA approved inorganic zinc silicate primer.
9. DDG 78. Raised hatches at frame 405 Main Deck Port and Starboard shall have CRES 316L hinge blades, hinge pads and hinge pins.

10. Apply anti-seize compound (System 6) to all threads before assembly.
11. Apply polysulfide sealant (System 9) to faying surfaces.

SERVICE REQUIREMENTS (SHIP): Touch up as required. Replace fasteners as required. Inspect and reapply thread compound as required.

Index Number 1035

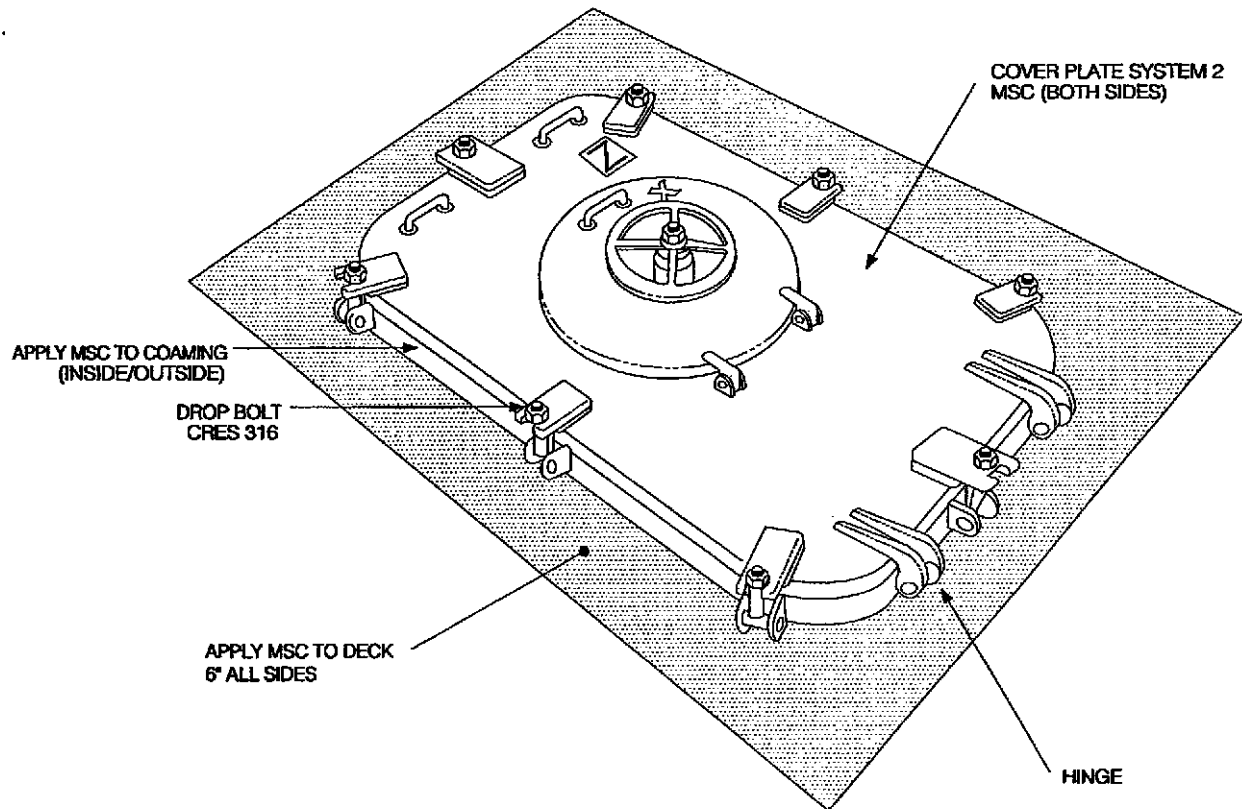
Raised Deck Hatches in the Weather

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Raised Hatch	01 Lvl Frame 99 Stbd (2' off CL)	2
Raised Hatch	01 Lvl Frame 324 Stbd (5'-" off CL)	4
Raised Hatch	Mn Dk Frame 405 Stbd (17'-6" off CL)	1
Raised Hatch	Mn Dk Frame 405 Port (17'-6" off CL)	1
Raised Hatch	01Lvl Frame 324 Stbd (9'-3" off CL)	4
Raised Hatch	02 Lvl Frame 124 Port (2' off CL)	5
Raised Hatch	02 Lvl Frame 262 Stbd	5
Raised Hatch	01 1/2 Lvl Frame 385 Por	5

Index Number 1035

Raised Watertight Scuttle Security Covers (DDG 78)

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Scuttle Security Covers	01-98-1	2
Scuttle Security Covers	01-372-1	1
Scuttle Security Covers	02-252-2	6
Scuttle Security Covers	01-324-1	4
Scuttle Security Covers	02-124-2	5
Scuttle Security Covers	01-324-3	4
Scuttle Security Covers	01-99-1	2



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Figure 4-1035. Raised Steel Hatch with Scuttle, Typical

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Scuppers

AREA OF OCCURRENCE: Zone 10, Ship Wide at Deckhouse

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These items drain fluids from weather decks and are exposed to salt spray and are subject to impact and abrasion. (See Figure 4-1036.)

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Scuppers and Associated Drawings: 526-6597168, 8100-5220-0003, 600-6596659, 600-6596681, 600-6596687, 600-6596693, 600-6596698, 600-6596702, 600-6596707, 600-6596710, 600-6596716, 600-6596723, 100-6597578, 100-6597583, 100-6597598, 100-6597603, 100-6597608, 100-6597612, 100-6597615, 100-6597619, 100-6597616, 100-6597623, 150-6597624, 150-6597628 and 150-6597635.
2. DDG 52 - DDG 74. Apply metal spray coating (System 2) to the sheet metal scupper straps, the flat bar overhang and deck area surrounding the scupper to a distance of 6 inches.
3. DDG 52 - DDG 74. CRES 316 fasteners shall be used to attach rubber scupper lips to straps (System 14).
4. Apply anti-seize compound (System 6) to fasteners prior to installation.
5. DDG 78. Scupper straps and flatbar overhangs shall be CRES 316L (System 16). Fasteners to be of corrosion resistant material (System 14).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1036

Scuppers

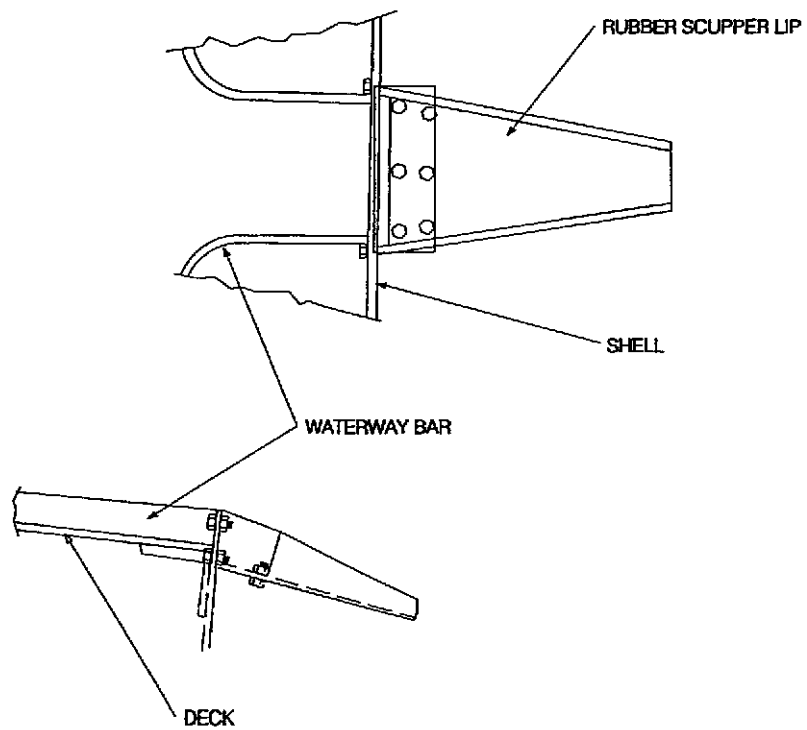
<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Scuppers	Various	10
Overboard Discharge Plates/Flanges	01 Level Frame 195-S	2
Overboard Discharge Plates/Flanges	1st Platform Frame 120-S	15
Overboard Discharge Plates/Flanges	1st Platform Frame 163-S	15

Index Number 1036
Scuppers - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Overboard Discharge Plates/Flanges	1st Platform Frame 183-S	15
Overboard Discharge Plates/Flanges	1st Platform Frame 190-S	15
Overboard Discharge Plates/Flanges	1st Platform Frame 213-S	15
Overboard Discharge Plates/Flanges	1st Platform Frame 217-S	15
Overboard Discharge Plates/Flanges	1st Platform Frame 470-S Transom	16
Overboard Discharge Plates/Flanges	1st Platform Frame 416-S	16
Overboard Discharge Plates/Flanges	1st Platform Frame 366-S	15
Overboard Discharge Plates/Flanges	01 Level Frame 187-P	2
Overboard Discharge Plates/Flanges	1st Platform Frame 112-P	15
Overboard Discharge Plates/Flanges	1st Platform Frame 113-P	15
Overboard Discharge Plates/Flanges	1st Platform Frame 168-P	15
Overboard Discharge Plates/Flanges	1st Platform Frame 175-P	15
Overboard Discharge Plates/Flanges	1st Platform Frame 188-P	15
Overboard Discharge Plates/Flanges	1st Platform Frame 220-P	15
Overboard Discharge Plates/Flanges	1st Platform Frame 250-P	15
Overboard Discharge Plates/Flanges	1st Platform Frame 286-P	15
Overboard Discharge Plates/Flanges	1st Platform Frame 310-P	15
Overboard Discharge Plates/Flanges	1st Platform Frame 311-P	15
Overboard Discharge Plates/Flanges	1st Platform Frame 366-P	15
Overboard Discharge Plates/Flanges	1st Platform Frame 371-P	15

Index Number 1036
 Scuppers - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Overboard Discharge Plates/Flanges	1st Platform Frame 380-P	16
Overboard Discharge Plates/Flanges	1st Platform Frame 258-S	16
Overboard Discharge Plates/Flanges	Shell Frame 70	1
Overboard Discharge Plates/Flanges	Shell Frame 380	1



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Figure 4-1036. Scupper

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Fire Stations, Seawater

AREA OF OCCURRENCE: Zone 10

TYPE OF CORROSION: Uniform Attack, Seawater

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Each seawater fire station is equipped with a fire plug, strainer, fire hose, fog applicator, and a multipurpose nozzle. Figure 4-1037 shows a typical arrangement.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Seawater Fire Station Hardware and Associated Drawings: 600-6596724, 670-6595925, 8100-2388-0058, 520-6596738, 600-6596652, 600-6596665, 600-6596653, 600-6596693, 600-6596702, 600-6596712, 301-6596501, 600-6596716, 600-6596718, 600-6596726, 505-6596849, 505-6596757, 505-6596865, 505-6596866, 505-6596876, 505-6596872, 505-6596884, 505-6596882, 505-6596778, 505-6596834, 505-65968110 and 505-6596871.

2. Apply metal spray coating (System 2) to all steel support structure and mounting brackets.
3. DDG 52 - DDG 78. Fasteners and small supporting hardware shall be fabricated from CRES 316 (System 14).
4. DDG 78. Stay chains and "S" hooks shall be copper alloy (System 16).
5. DDG 78. Small supporting hardware shall be fabricated from CRES 316.
6. DDG 78. Fasteners shall be of corrosion resistant material (System 14).

SERVICE REQUIREMENTS (SHIP): Inspect quarterly and touch up as needed. Repair or replace as needed.

Index Number 1037

Seawater Fire Station Hardware

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
SW Fire Station Hardware	02 Lvl Frame 210 S&P	5
SW Fire Station Hardware	Mn Dk 383 P	1
SW Fire Station Hardware	Mn Dk 370 S	1
SW Fire Station Hardware	01 Lvl Frame 110 P	2
SW Fire Station Hardware	01 Lvl Frame 314 S	3
SW Fire Station Hardware	02 Lvl Frame 261 P	6
SW Fire Station Hardware	02 Lvl Frame 263 S	6
SW Fire Station Hardware	05 Lvl Frame 151 P	9

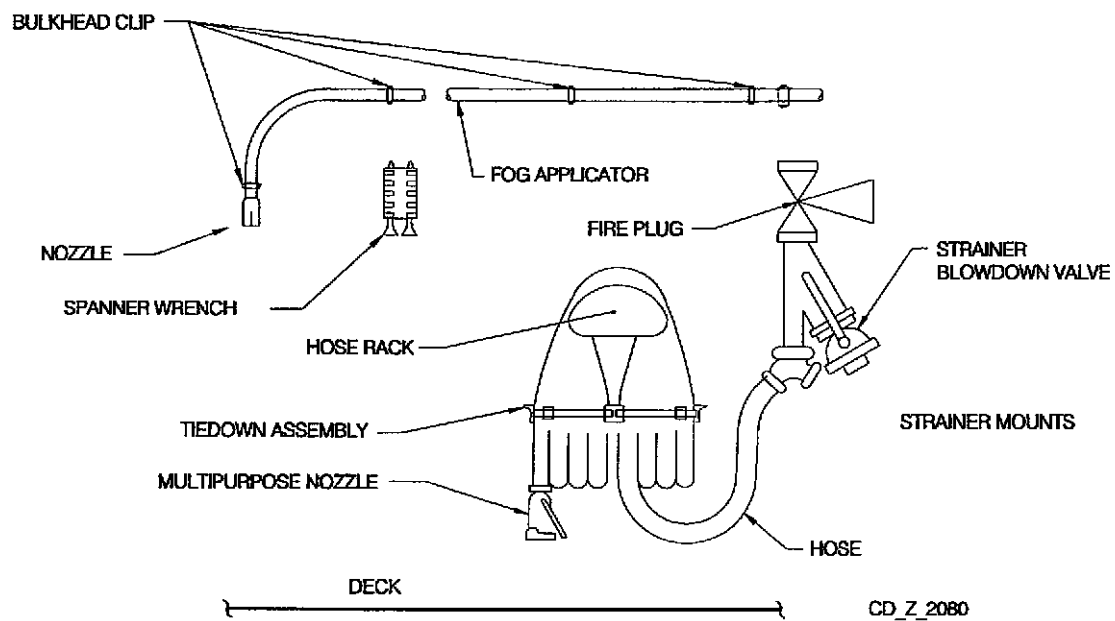


Figure 4-1037. Fire Station, Typical

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Security Light and Brackets

AREA OF OCCURRENCE: Zone 10, Main Deck and 01 Levels

TYPE OF CORROSION: Direct Surface Attack

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Bracket is an L-shaped steel bar welded to the shell plating with a bolted L-shaped steel bar and welded tubing to form a standoff mount for the portable light. See figure 4-1038.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Security Lights and Brackets and Associated Drawings: 301-6596413, 301-6596445, 301-6596460, 301-6596501, 301-6596516, 301-6596531, 301-6596544, 301-6596554, 301-6596576 and 301-6596608.

2. Apply powdered epoxy coating (System 4) to steel housing.
3. Apply metal spray coating (System 2) to steel brackets and mounting.
4. DDG 52 - DDG 74. All fasteners shall be fabricated from CRES 316 (System 14).
5. Apply anti-seize compound (System 6) to fasteners prior to installation.
6. DDG 78. Teflon washers shall be installed between inner and outer brackets. Mounting fasteners, latches and hinges shall be CRES 316, other fasteners, to be of corrosion resistant material (System 14).
7. DDG 78. Shock mounts to be CRES 304. Support brackets to be CRES 316. All wire lanyards to be CRES 316 with CRES 304 swage fittings (System 16).
8. DDG 71 - DDG 78. Dielectric barrier (System 11) shall be used where necessary.

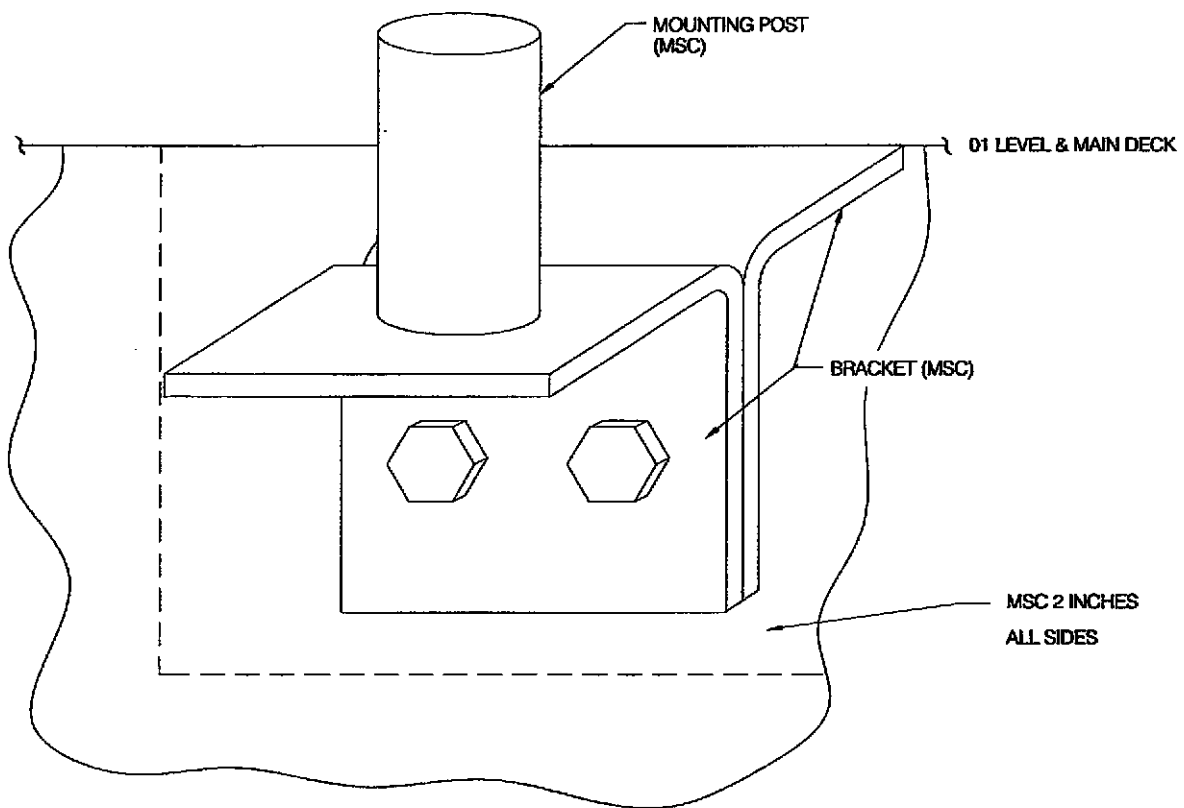
SERVICE REQUIREMENTS (SHIP): Inspect quarterly and touch up as needed. Replace fasteners as needed.

Index Number 1038
Security Lights and Brackets

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Waterline Security Lights (Symbol 303.4)	Mn Dk Frame 409 Port	1
Waterline Security Lights (Symbol 303.4)	Mn Dk Frame 409 Port	1
Waterline Security Lights (Symbol 303.4)	Mn Dk Frame 409 Stbd	1
Waterline Security Lights (Symbol 303.4)	Mn Dk Frame 409 Stbd	1
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 13 Port	2
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 13 Port	2
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 13 Stbd	2
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 13 Stbd	2
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 63 Port	2
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 63 Port	2
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 63 Stbd	2
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 63 Stbd	2
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 121 Stbd	2
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 121 Stbd	2
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 120 Port	2
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 120 Port	2
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 207 Port	3
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 207 Port	3
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 207 Stbd	3
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 207 Stbd	3

Index Number 1038
Security Lights and Brackets - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 360 Stbd	4
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 359 Stbd	4
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 359 Port	4
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 360 Port	4
Waterline Security Lights (Symbol 303.4)	Mn Dk Frame 471 CL	1
Waterline Security Lights (Symbol 303.4)	Mn Dk Frame 471 CL	1
Waterline Security Lights (Symbol 303.4)	Mn Dk Frame 449 Port	1
Waterline Security Lights (Symbol 303.4)	Mn Dk Frame 449 Port	1
Waterline Security Lights (Symbol 303.4)	Mn Dk Frame 449 Stbd	1
Waterline Security Lights (Symbol 303.4)	Mn Dk Frame 449 Stbd	1
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 258 Stbd	3
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 258 Stbd	3
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 258 Port	3
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 258 Port	3
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 308 Stbd	3
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 308 Stbd	3
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 308 Port	3
Waterline Security Lights (Symbol 303.4)	01 Lvl Frame 308 Port	3



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Figure 4-1038. Waterline Security Light Bracket (Sheet 1 of 2)

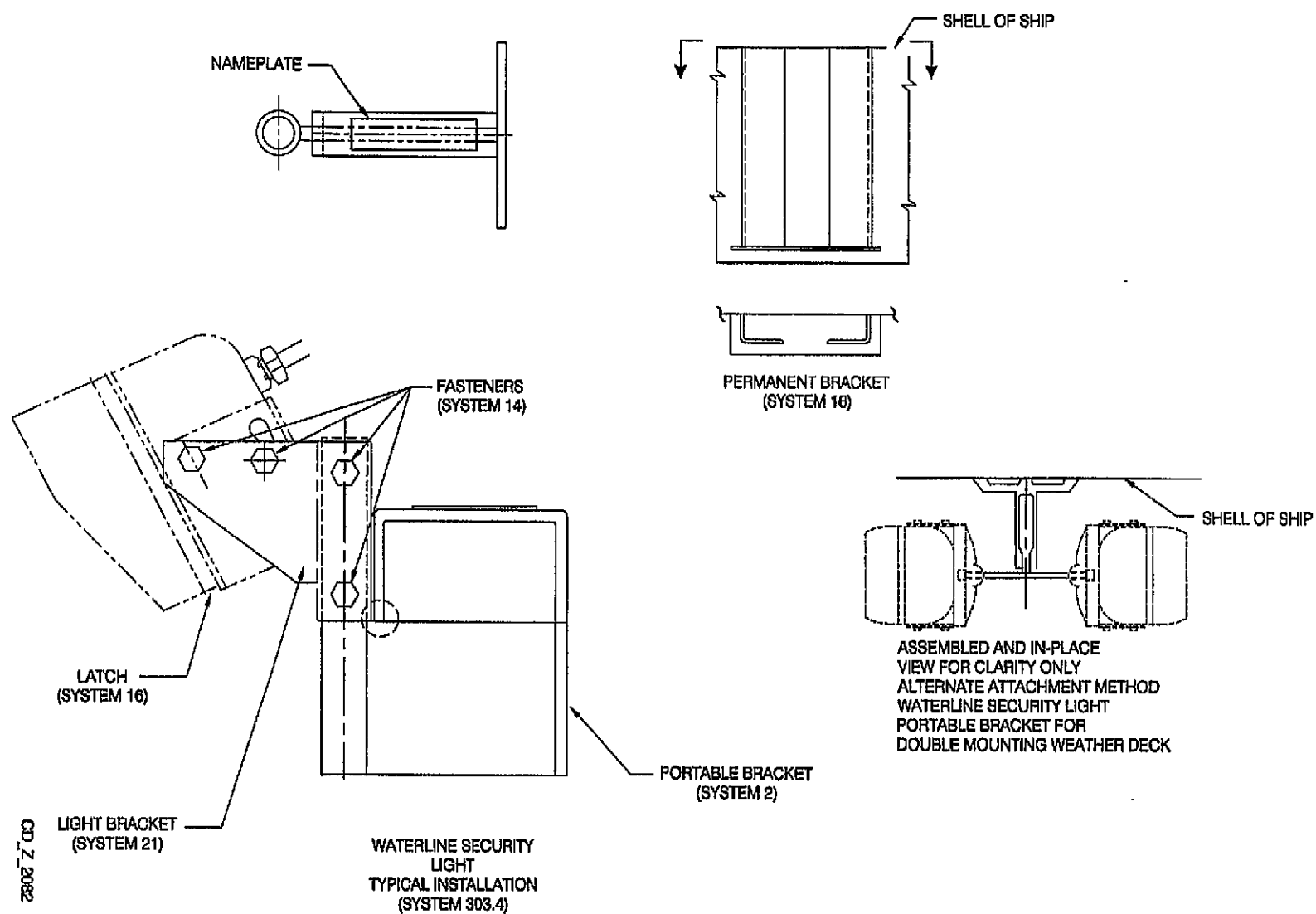


Figure 4-0138. Waterline Security Light Bracket (Sheet 2 of 2)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Tilting Whip Antenna Foundation

AREA OF OCCURRENCE: Zone 10, Main Deck and 01 Levels, 02 Level Frame 264 - Port,
02 Level Frame 292 - Port

TYPE OF CORROSION: Direct Surface Attack, Galvanic

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: The tilt antenna is a normally vertical twin antenna that can be tilted. The foundation is exposed to weather and sea spray, and requires MSC System 2 for corrosion protection.

See figure 4-1039.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

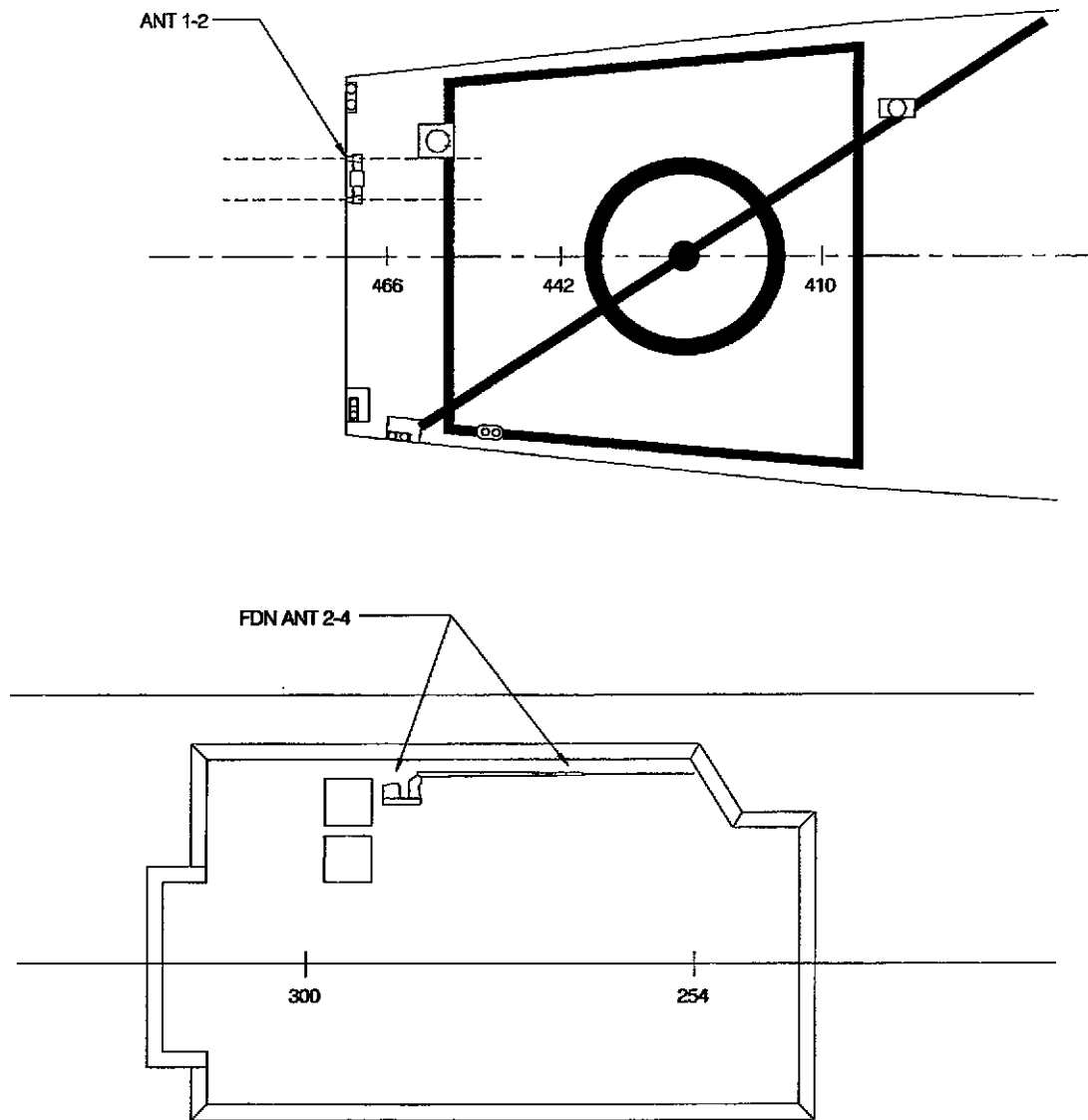
1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Tilting Whip Antenna Foundation and Associated Drawings: 180-6597725, 180-6597744, 180-6597747, 401-6597218 and 300-6597363.
2. Apply metal spray coating (System 2) to antenna foundation, well and deck area, extending out 6 inches from the well.
3. DDG 52 - DDG 74. Apply polysulfide sealant (System 9) to faying surfaces prior to installation of antennas.
4. DDG 52 - DDG 74. Foundation fasteners and tilting equipment fasteners shall be ceramic-metallic coated steel (System 5).
5. DDG 52 - DDG 74. Apply polysulfide sealant (System 8) to fasteners prior to installation. Apply anti-seize compound (System 6) where System 8 is not used.
6. DDG 78. Fasteners to be of corrosion resistant material (System 14).
7. DDG 52 - DDG 69. Where corrosion control requirements conflict with bonding and grounding requirements of NAVSEA drawing 300-6597363, bonding and grounding requirements shall prevail.
8. DDG 71 - DDG 78. The installation control drawing fasteners selection list and the grounding and bonding installation procedure, NAVSEA drawing OD32382, shall prevail.
9. DDG 78. The securing upper cradle (02-163-P) shall be CRES 316. Sand sweep and prime with AMERON 236 prior to topcoating and installation (System 16).

SERVICE REQUIREMENTS (SHIP): Inspect for corrosion and touch up as required. Replace fasteners as required.

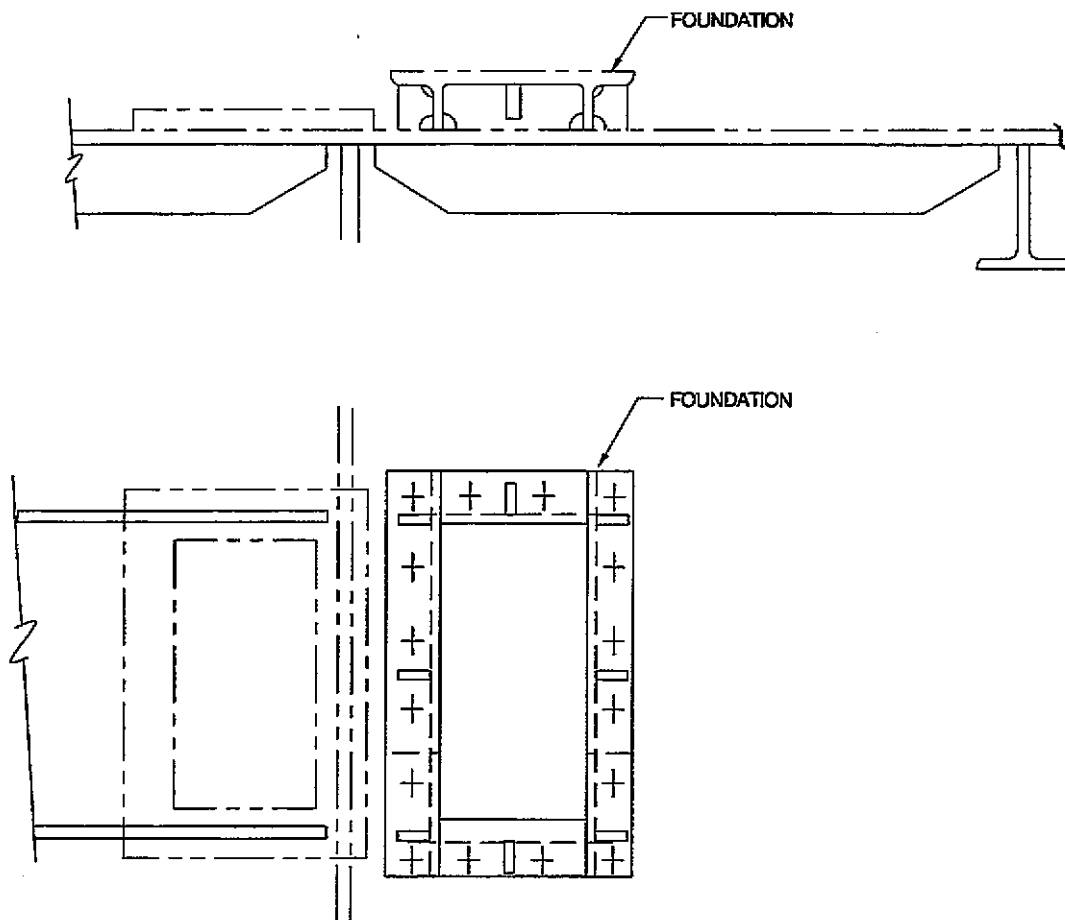
Index Number 1039
 Tilting Whip Antenna Foundation

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
OE 416/SRC (Twin Tilting Whip)	Mn Dk Frame 470 P 02 Lvl Frame 264 P	1 6
OE 417/SRC (Emergency Tilting Whip)	Mn Dk Frame 292 P 02 Lvl Frame 264 P	6
Securing Upper Cradle	02 Lvl Frame 163 P	5



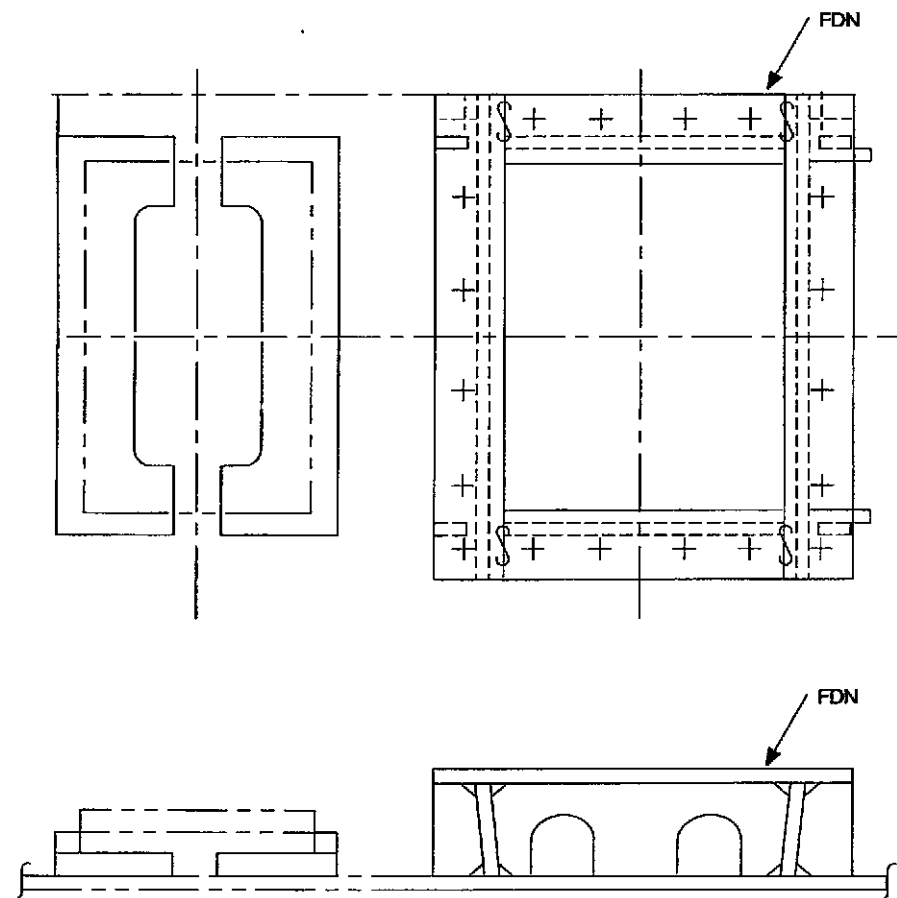
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Figure 4-1039. Tilting Whip Antenna Foundations (Sheet 1 of 3)



CD_Z_2084

Figure 4-1039. Tilting Whip Antenna Foundations (1-2) (Sheet 2 of 3)



CD_Z_2085

Figure 4-1039. Tilting Whip Antenna Foundations (2-4) (Sheet 3 of 3)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Topside Deck Drains

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These drains channel fluids off weather decks and are subject to salt spray and impact. See figure 4-1040.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

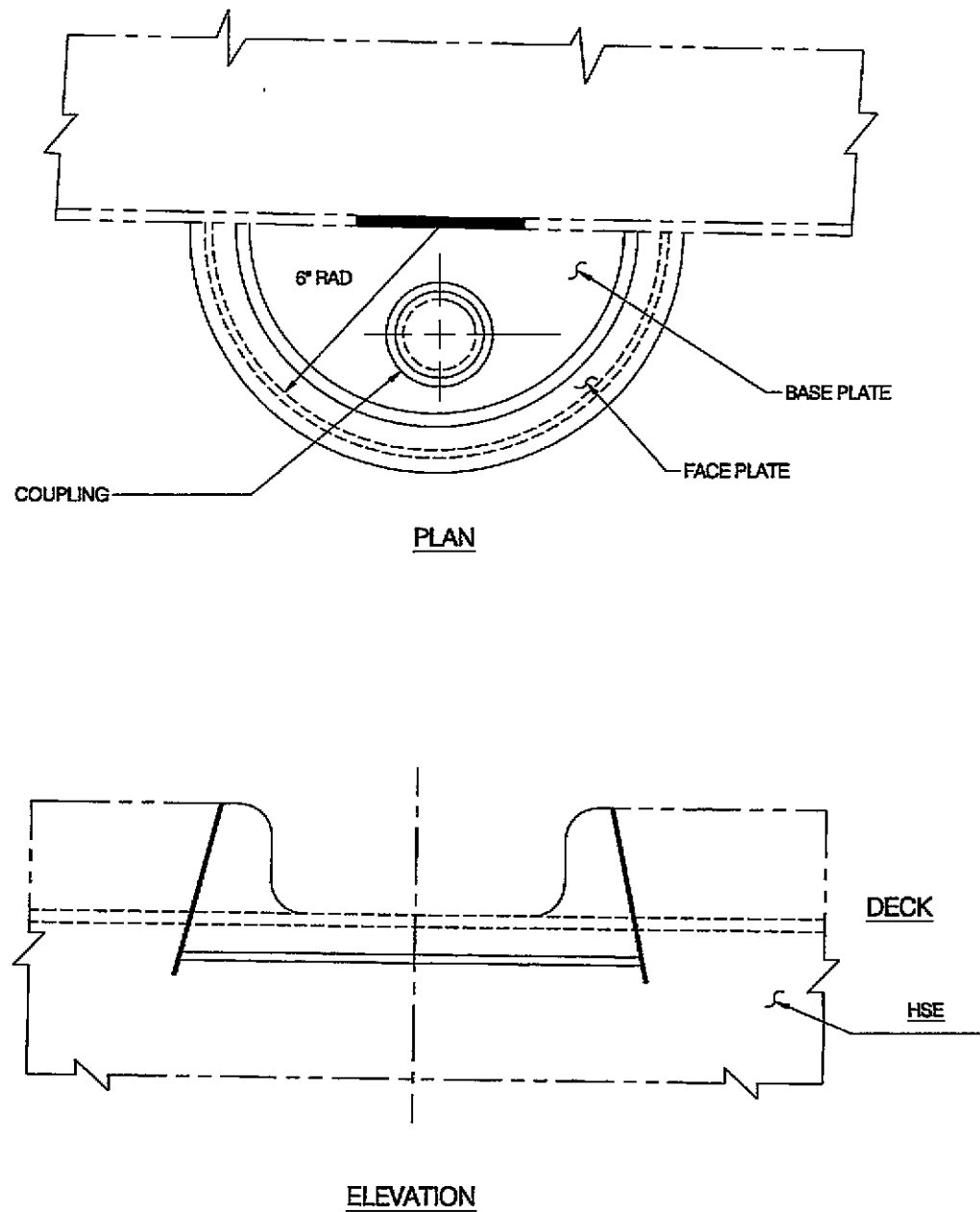
NAVSEA Topside Deck Drains and Associated Drawings: 301-6596610, 301-6596619, 526-6597168, 600-6596730, 600-6596726 and 150-6597639.
2. DDG 52 - DDG 78. Apply metal spray coating (System 2) to deck drains extend coating out at least 3 inches onto surrounding decks. For drain troughs, the interiors shall be painted with the coats of high-solid epoxy paint (System 3); the trough strainer shall be CRES (System 16). Do not apply System 2 to CRES, bronze, brass or copper/nickel.
3. DDG 63 - DDG 78. Helo deck drains shall be fabricated from copper/nickel (90:10).
4. DDG 52 - DDG 74. Fasteners shall be CRES.
5. DDG 78. Fasteners shall be of corrosion resistant material (System 14).
6. Apply anti-seize thread compound (System 6) to all strainer hold down fasteners prior to installation.
7. Where copper alloy or CRES deck drain strainers are installed, apply polysulfide sealant (System 9) to faying surfaces between strainer and cup.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed (see Index No. 1014). Reapply anti-seize compound System 6.

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Index Number 1040
 Topside Deck Drains

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Scupper Drain	06 Lvl Frame 156 P/S (2)	9
	05 Lvl Frame 142 P/S (2)	9
	05 Lvl Frame 157 P/S (2)	9
	05 Lvl Frame 168 P/S (2)	9
Deck Drain	05 Lvl Frame 214 P/S (2)	9
Deck Drain	05 Lvl Frame 270 P/S (2)	9
Scupper Drain	05 Lvl Frame 284 P/S (2)	9
	04 Lvl Frame 149 P/S (2)	8
	04 Lvl Frame 155 P/S (2)	8
	04 Lvl Frame 178 P/S (2)	8
	04 Lvl Frame 296 P/S (2)	8
	03 Lvl Frame 120 P/S (2)	7
	03 Lvl Frame 315 P/S (2)	7
	03 Lvl Frame 112 P/S (2)	7
Drain Trough	03 Lvl Frame 178 P/S (2)	7
Scupper Drain	03 Lvl Frame 194 2P/2S	7
	02 Lvl Frame 111 P/S (2)	5
Deck Drain	02 Lvl Frame 125 2P/2S (4)	5
	02 Lvl Frame 137 P/S (2)	5
Scupper Drain	02 Lvl Frame 201 P/S (2)	5
	02 Lvl Frame 210 P/S (2)	5
	02 Lvl Frame 227 P/S (2)	6
	02 Lvl Frame 245 P/S (2)	6
	02 Lvl Frame 276 P (1)	6
	02 Lvl Frame 284 S (1)	6
	02 Lvl Frame 291 P (1)	6
	02 Lvl Frame 313 2P/1S	6
	02 Lvl Frame 317 P/S (2)	6



CD_Z_2086

Figure 4-1040. Topside Deck Drain

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Lockers, Topside

AREA OF OCCURRENCE: Zone 10, Main Deck and 01 Level

TYPE OF CORROSION: Uniform Attack, Galvanic, Crevice

TYPICAL EXTENT OF CORROSION: Moderate to Severe

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These lockers are sheet metal cabinets with sun shields.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Topside Lockers and Associated Drawings: 600-6596687, 600-6596710, 600-6596724, 600-6596727, 710-6597253, 600-6596646, 600-6596707, 640-6595957, 640-6595947, 640-6595961, 640-6595962, 804-4477923 and 670-6595923.
2. DDG 52 - DDG 78. Apply powdered epoxy coating (System 4) to steel lockers, or apply metal spray coating (System 2) in event of size constraints.
3. DDG 52 - DDG 74. Apply metal spray coating (System 2) to steel sub-base foundation and deck surface within 6 inches for steel lockers.
4. DDG 52 - DDG 78. Apply powdered epoxy coating (System 4) to all aluminum lockers.
5. DDG 52 - DDG 74. Apply metal spray coating (System 2) to steel sub-base or bulkhead supports for aluminum lockers.
6. DDG 52 - DDG 74. All fasteners, hardware and ancillary fittings on both steel and aluminum lockers shall be CRES 316 (System 14 and System 16).
7. DDG 71 - DDG 78. Replace ferrous label plate rivets with CRES 316 rivets (System 16).
8. DDG 78. Apply metal spray coating (System 2) to steel subbase, steel sub-base foundation, deck surface and bulkhead supports out to a minimum of 6 inches for all lockers. Drain plugs to be CRES 316 or Monel.
9. DDG 78. Hardware and ancillary fittings on both steel and aluminum lockers shall be CRES 316 (System 16). Fasteners to be corrosion resistant material (System 14).
10. DDG 52 - DDG 78. Apply polysulfide sealant (System 9) to faying surfaces between locker body and sub-base.
11. DDG 52 - DDG 78. Apply anti-seize compound (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect hinges, latch panels, foundations and fasteners. Touch up or repair as needed.

Index Number 1041

Topside Lockers

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Stowage Box Foundation	01 Lvl Frame 118 Stbd	2
Headset Stowage Box	01 Lvl Frame 118 Stbd	2
Foundation	01 Lvl Frame 256 Stbd	3
Foundation	01 Lvl Frame 256 Stbd	3
Locker, Abandon Ship	01 Lvl Frame 256 Stbd	3
Foundation	Mn Dk Frame 427 Port	1
Foundation	Mn Dk DR 427 Port	1
Headset Stowage Box	Mn Dk Frame 427 Port	1
Headset Locker Foundation	01 Lvl Frame 240 Port	3
Headset Stowage Locker	01 Lvl Frame 240 Port	3
Headset Locker Foundation	01 Lvl Frame 240 Stbd	3
Headset Stowage Locker	01 Lvl Frame 240 Stbd	3
Headset Stowage Foundations	01 Lvl Frame 314 Stbd	3
Headset Stowage Box	01 Lvl Frame 314 Stbd	3
Stowage Box Foundation	Mn Dk Frame 469 Stbd	1
Stowage Box Foundation	Mn Dk Frame 469 Stbd	1
Stowage Box Foundation	01 Lvl Frame 118 Stbd	2
Stowage Box Foundation	Mn Dk Frame 460 Port	1
Stowage Box Foundation	Mn Dk Frame 460 Port	1
Topside Equipment Locker	05 Lvl Frame 161 Port	9

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Topside Navigational Aids

AREA OF OCCURRENCE: Zone 10, Main Deck and above

TYPE OF CORROSION: General, Galvanic, Crevice

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These lights are located in the weather and are subject to salt spray and salt air.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Topside Navigational Aids and Associated Drawings: 301-6596413, 301-6596531, 301-6596596, 301-6596602, 331-6597002, 180-6597735, 401-6597218 and 180-6597736.
2. Apply powdered epoxy coating (System 4) to removable steel housing, lighting fixture bodies and shields for navigational lights, signal lights and searchlights.
3. DDG 69 - DDG 78. 12-inch searchlights shall be fabricated from non-magnetic material (CRES) and the exterior surfaces coated for cosmetic reasons only.
4. Apply metal spray coating (System 2) to steel foundations for these lights.
5. DDG 52 - DDG 74. Fasteners and small removable steel hardware for these lights shall be ceramic coated (System 14 and System 16).
6. Apply anti-seize compound (System 6) to fasteners prior to installation.
7. DDG 78. Small removable hardware to be CRES 316. Fasteners including mounting fasteners to be (System 14) corrosion resistant material.
8. DDG 78. All CRES material surfaces shall be free of iron, metallic deposits, and other contaminants as determined by visual inspection.
9. DDG 67 - DDG 78. Fasteners and hardware shall be CRES 316 (System 14) or non-corrosive material such as CRES 304 or Monel (System 16).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners and hardware as needed.

Index Number 1042
Topside Navigational Aids

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Aircraft Warning Light (2) (Symbol 160.1)	Mast 162'6" ABL CL	9
Anchor Light (Symbol 161.4)	01 Lvl Frame EE CL	2
	Mn Dk Frame 475 CL	1
Masthead Light (Symbol 172.2)	Mast 161'-10" ABL CL	9
	05 Lvl Frame 131	2
	84'-11" ABL CL	
Revolving Beam ASW Light (Symbol 176)	Mast 121' ABL P	9
Sidelight (Symbol 182.2)	03 Lvl Frame 139 P	5
Sidelight (Symbol 183.2)	03 Lvl Frame 139 S	5
Task Light (Symbol 190.1)	Mast 142' ABL S	9
	Mast 142' ABL P	9
	Mast 107' ABL P	9
	Mast 107' ABL S	9
Blinker Light (Symbol 191.2)	Mast 137' ABL S	9
	Mast 137' ABL P	9
Task Light (Symbol 192.1)	Mast 125' ABL P	9
	Mast 125' ABL S	9
Stern Light (White) (Symbol 196.3)	Mn Dk Frame 474 CL	1
Stern Light (Blue) (Symbol 197.2)	Mn Dk Frame 472 CL	1
Wake Light (Symbol 200.2)	Mn Dk Frame 471 CL	1
Station Marking Light (Symbol 285)	01 Lvl Frame 58 P	2
	01 Lvl Frame 122 S	2
	01 Lvl Frame 56	2
	01 Lvl Frame 226 S	3
	01 Lvl Frame 330 S	3
Searchlight 12" (Symbol 299)	04 Lvl Frame 155 P & S	8
	04 Lvl Frame 159 P & S	8
Searchlight 8" (Symbol 297)	04 Lvl Frame 144 P & S	8
	04 Lvl Frame 172 P & S	8
Homing Beacon Light (Symbol 258)	Mast 121' ABL P	9

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Topside Telephone Boxes

AREA OF OCCURRENCE: Zone 10

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These boxes are mounted in the weather and are subject to salt spray.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Topside Telephone Boxes and Associated Drawings: 301-6596413, 301-6596460, 301-6596531, 301-6596544, 301-6596566, 301-6596576, 301-6596599, 301-6596602, 301-6596596, 301-6596584, 301-6596556, 301-6596608, 301-6596610, 301-6596619, 301-659445, 301-6596554, 301-6597050, 301-6597052, 301-6596578, 301-6596612, 301-6596616, 301-6596590 and 301-6596593.

2. Apply a powdered epoxy coating (System 4) to all topside telephone stowage boxes.
3. Apply metal spray coating (System 2) to carbon steel mounting brackets.
4. All fasteners, hardware and ancillary fittings shall be CRES 316 (System 16).
5. Apply a vapor phase inhibitor (System 12) to the interior of the telephone stowage boxes.
6. DDG 71 - DDG 78. Dielectric barrier (System 11) shall be used where necessary.
7. DDG 78. Telemetry panel, jack box No. 2, 01 level frame 223 port shall be CRES 316. Sand sweep and prime with AMERON 236 A7 2-4 MILS DFT and topcoat with DOD-E-24635B after installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace as needed.

Index Number 1043
 Topside Telephone Boxes

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Telephone Box TA-1002A	01 Lvl Frame 375 CL	4
Telephone Box TA-1002A	AN/SPS 64 Platf	10
Telephone Box TA-1002A	01 Lvl Fwd Vls	2
Telephone Box TA-1002A	01 Lvl Aft Vls	2
② Stowage Box (Symbol 2929.1)	Mn Dk Frame 387 Port	1
④ Stowage Box (Symbol 2924.1)	02 Lvl Frame 207 Stbd	5
④ Stowage Box (Symbol 2924.1)	02 Lvl Frame 210 Port	5
④ Stowage Box (Symbol 2925.1)	01 Lvl Frame 71 Port	2
Stowage Box (Symbol 2929.1)	01 Lvl Frame 74 Stbd	2
① GF Tel Bx TA-1002A	Mn Dk Frame 370 Stbd	1
② GF Tel Bx TA-1002A	01 Lvl Frame 364 Stbd	4
GF Tel Bx TA-1002A	01 Lvl Frame 384 Port	4
③ GF Tel Bx TA-1002A	01 Lvl Frame 45 Port	2
GF Tel Bx TA-1002A	01 Lvl Frame 45 Stbd	2
GF Tel Bx TA-1002A	01 Lvl Frame 110 Port	2
GF Tel Bx TA-1002A	01 Lvl Frame 110 Stbd	2
GF Tel Bx TA-1002A	01 Lvl Frame 112 Stbd	2
GF Tel Bx TA-1002A	01 Lvl Frame 311 Stbd	3
② Jack Box	04 Lvl P&S B/W	
④ Stowage Box 1 Compt (Symbol 2924.1)	01 Lvl Frame 326 Stbd	4
④ Stowage Box 6 Compt (Symbol 2929.1)	01 Lvl Frame 334 Stbd	4
④ Stowage Box 6 Compt (Symbol 2929.1)	01 Lvl Frame 335 Port	4
④ Stowage Box 2 Compt (Symbol 2925.1)	Mn Dk Frame 410 Stbd	1
④ Stowage Box 1 Compt (Symbol 2924.1)	01 Lvl Frame 70 Stbd	2
④ Stowage Box 1 Compt (Symbol 2924.1)	01 Lvl Frame 6 Stbd	2
④ Stowage Box 3 Compt (Symbol 2926.1)	01 Lvl Frame E Stbd	2
④ Stowage Box 2 Compt (Symbol 2925.1)	Mn DkFrame 382 Port	1
④ Stowage Box 1 Compt (Symbol 2924.1)	Mn Dk Frame 460 Port	1
④ Stowage Box 4 Compt (Symbol 2327.1)	Mn Dk Frame 470 Port	1

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Index Number 1043

Topside Telephone Boxes - CONT.

Description	Location	Corrosion Control Zones
④ Stowage Box 1 Compt (Symbol 2924.1)	02 Lvl Frame 126 Stbd	5
④ Stowage Box 1 Compt (Symbol 2924.1)	02 Lvl Frame 126 Port	5
④ Stowage Box 1 Compt (Symbol 2924.1)	02 Lvl Frame 126 Stbd	5
④ Stowage Box 1 Compt (Symbol 2924.1)	03 Lvl Frame 150 Stbd	7
④ Stowage Box 1 Compt (Symbol 2924.1)	03 Lvl Frame 150 Port	7
④ Stowage Box 4 Compt (Symbol 2327.1)	03 Lvl Frame 139 Stbd	7
④ Stowage Box 1 Compt (Symbol 2924.1)	01 Lvl Frame 314 Stbd	3
④ Stowage Box 1 Compt (Symbol 2924.1)	01 Lvl Frame 240 Stbd	3
④ Stowage Box 3 Compt (Symbol 2926.1)	01 Lvl Frame 240 Port	3
Tell Stowage Box (Symbol 2938) Weather	5'-1" Aft Frame E 01 Lvl Stbd	2
Telephone Box TA-1002A	Mn Dk Frame 412 Stbd	1
Telephone Box TA-1002A	Mn Dk Frame 470 Port	1
Telephone Box TA-1002A	01 Lvl Frame 334 Stbd	2
Telephone Box TA-1002A	01 Lvl Frame 16 Port	2
Telephone Box TA-1002A	01 Lvl Frame 16 Port	2
Telephone Box TA-1002A	01 Lvl Frame 0 Port	2
Telephone Box TA-1002A	01 Lvl Frame 18 Stbd	2
Telephone Box TA-1002A	01 Lvl Frame 107 Port	2
Telephone Box TA-1002A	01 Lvl Frame 107 Stbd	2
Telephone Box TA-1002A	01 Lvl Frame 165 Port	2
Telephone Box TA-1002A	01 Lvl Frame 345 Stbd	4
Telephone Box TA-1002A	01 Lvl Frame 240 Stbd	3
Telephone Box TA-1002A	01 Lvl Frame 308 Port	3
Telephone Box TA-1002A	01 Lvl Frame 18 Stbd	2
Telephone Box TA-1002A	01 Lvl Frame 77 Port	2
Telephone Box TA-1002A	01 Lvl Frame 74 Port	2
Telephone Box TA-1002A	01 Lvl Frame 76 Stbd	2

NOTE: ① DDG 55 only ② DDG 55 and Follow ③ DDG 55 - 59 ④ DDG 52 and 55 only

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Turnbuckles, Lifeline

AREA OF OCCURRENCE: Zone 10, Deck Edges, Ship Wide

TYPE OF CORROSION: Uniform Attack, Galvanic

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: The turnbuckle is a fitting used to adjust tension of the lifeline. Ferrous turnbuckles require corrosion protection and lubrication at regular intervals.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Turnbuckles and Associated Drawings: 612-6595901, 600-6596646, 600-6596653, 600-6596659, 600-6596665, 600-6596681, 600-6596687, 600-6596693, 600-6596698, 600-6596703, 600-6596711, 600-6596723, 600-6596725 and 600-6596727.

2. Fabricate all weather exposed turnbuckles, lifeline/liferail shackles (with pins and cotter pins) and associated fasteners out of CRES 316 alloy in accordance with System 16 and System 14 respectively, unless otherwise specified (eg., heavy weather lifeline turnbuckles shall be galvanized steel).

3. DDG 78. Fasteners shall be of corrosion resistant material (System 14).

SERVICE REQUIREMENTS (SHIP): Inspect quarterly. Lubricate as needed. Replace as needed.

Index Number 1044

Turnbuckles, Lifeline

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Turnbuckle	Topside	10

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Vertical Launching System (VLS)

AREA OF OCCURRENCE: Zone 10, 01 Level Bow and Stern

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: The exterior components are exposed to weather, saltwater and impact.

See figure 4-1045.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA VLS and Associated Drawings: 702-6596396, 702-6596397, OD 323821, Technical Repair standard 140-VLS-11-1, Change C.

2. DDG 52. Apply System 2 to the horizontal structural cap plate (skirt) and vertical collar (coaming).
3. DDG 52 - DDG 67. All steel fasteners exposed to the weather shall be treated with ceramic coating (System 5).
4. DDG 55 - DDG 69. Apply System 2 to the horizontal structural cap plate (skirt) and vertical collar (coaming) and fairing plate that is attached to the 01 level deck.
5. DDG 7. Apply System 2 to the vertical collar portion and the fairing plate bracket portion of the forward and aft VLS module skirts that are attached to the 01 level deck (see Detail, Figure 4-1045).
6. DDG 69 - DDG 78. All steel fasteners exposed to the weather shall be CRES 316 (System 14) and in compliance with the following procedures:

6.1. VLS Launcher Deck Bolts.

- a. The underside of the heads of all VLS launcher deck-to-coaming bolts and the VLS module installation and shipping fixture bolts shall receive a bead of polysulfide sealant, MIL-S-81733, Type I or II, at installation so that a bead of sealant squeezes out all around the bolt head when it is torqued (System 8).
- b. If a full circumferential bead is not obtained, additional sealant shall be applied around the bolt head after a bolt has been installed and torqued.
- c. After the bolts have been installed and the polysulfide sealant has cured, exposed portions of the fasteners shall be primed and painted the same as the surrounding areas.

6.2. VLS Module to Sub-base Bolting.

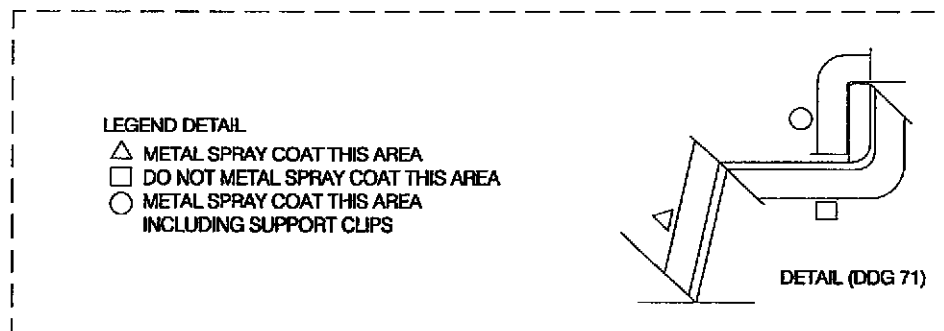
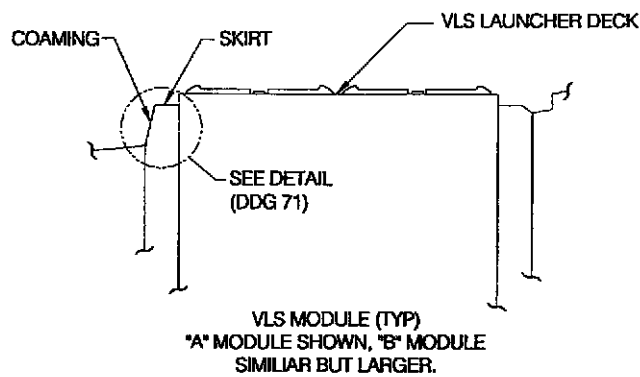
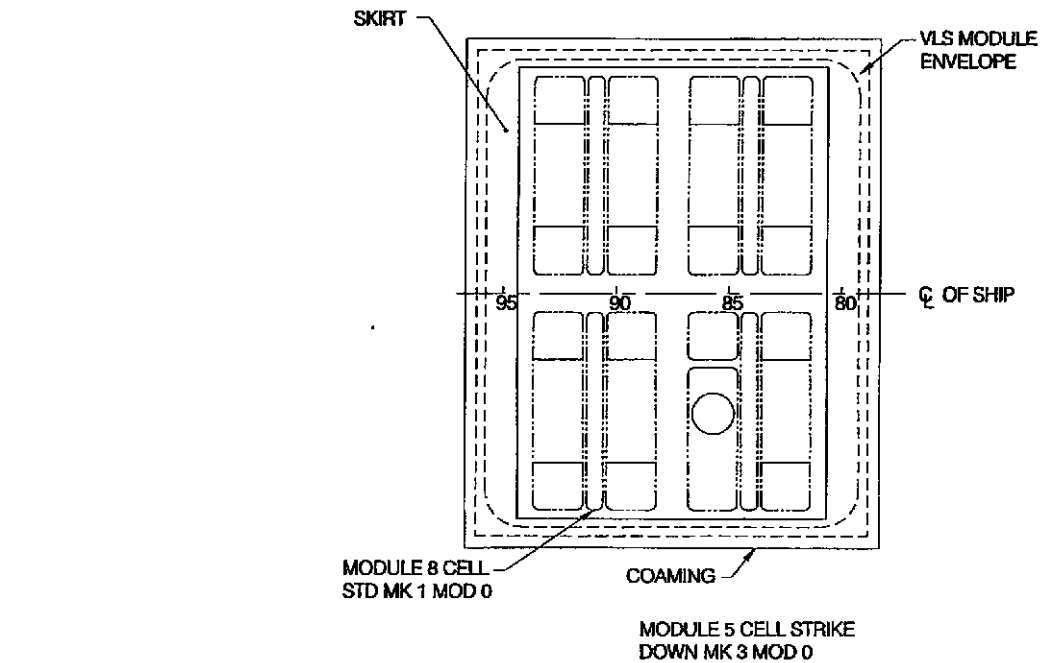
- a. After the installation of VLS Module to sub-base mounting capscrews is complete, all exposed portions of fasteners and adjacent areas consisting of liners, sub-base pads and module feet shall be cleaned with solvent to remove oil and other contaminants.
 - b. The fasteners and adjacent areas shall be inspected for cleanliness and no corrosion.
 - c. If corrosion is found in these areas it shall be removed.
 - d. Then the fasteners and all uncoated areas adjacent to the fasteners shall be primed and painted the same as the surrounding area using MIL-P-24441 epoxy paint or approved equivalent.
 - e. After the primer and paint have cured (no less than 24 hours), the fasteners shall be inspected for readiness of sealant application.
 - f. Non-acidic RTV silicone, MIL-A-46146, General Electric RTV 162 or equal, shall be applied to all exposed fasteners and onto adjacent areas.
 - g. All capscREW head sockets and jacking screw holes shall be filled with RTV silicone, ensuring that a mound is formed to prevent accumulation of liquid at these points.
7. DDG 74 - DDG 78. Do not apply system to the vertical surfaces and the fairing plate and fairing plate mounting brackets of the forward and aft VLS launchers.
 8. DDG 78. Grounding and bonding installation procedures, NAVSEA drawing OD32382, shall prevail.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace items as needed.

Index Number 1045

Vertical Launching System (VLS)

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
"A" Weapon Module	01 Lvl Frame 78 - 97 CL	2
"B" Weapon Module	01 Lvl Frame 338 - 370 CL	4



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Figure 4-1045. VLS Module (Typical) DDG 52- DDG 78

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Visual Landing Aids

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: General, Crevice

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These lights are in the weather and are exposed to salt spray and salt air.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Visual Landing Aids and Associated Drawings: 180-6597928, 180-6597717, 301-6596544 and 301-6596576.
2. DDG 52 - 78. Metal spray coating (System 2) shall be applied to floodlight fixture supports and to the foundations of lighting and optical systems (carbon steel only).
3. DDG 52 - DDG 78. Powdered epoxy coating (System 4) shall be applied to small removable brackets and light shields of the housing of lighting and optical systems.
4. DDG 52 - DDG 78. Floodlights, lighting and optical systems shall be installed and or secured to the supports with CRES 316 fasteners (System 14).
5. DDG 52 - DDG 69. Ancillary steel fittings and hardware shall be ceramic coated (System 5).
6. DDG 71 - DDG 78. Install a plastic dielectric barrier (System 11) between small dissimilar metal surfaces. The barrier shall extend 1/4-inch beyond all sides of the protected surface. Teflon washers to be installed between inner and outer brackets.
7. DDG 71 - DDG 78. A plastic dielectric barrier (System 11) shall be installed between CRES latches and aluminum light housings for all Symbol 249.3 deck surface floodlights. Fasteners, brackets, latch clips and other small hardware for Symbol 249.3 and Symbol 263.3 VLA lights shall be made from CRES 316 (System 14).
8. DDG 78. Fasteners to be corrosion resistant material (System 14).
9. DDG 78. Shock mounts to be CRES 304. Support brackets to be CRES 316. All wire lanyards to be CRES 316 with CRES 304 swage fittings (System 16).
10. DDG 52 - 78. Apply anti-seize thread compound (System 6) to threaded fasteners.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners and fittings as needed.

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Index Number 1046
Visual Landing Aids

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Dropline Light Bar (Symbol 243.2)	Mn Dk Frame 465 Stbd	1
Extended Line-up Light (Symbol 243.3)	Mn Dk Frame 381 Port	1
Deck Surface Floodlight (Symbol 249.3)	Mn Dk Frame 451 Port	1
	Mn Dk Frame 459 Port	1
	Mn Dk Frame 389 CL	1
	Mn Dk Frame 389 Port	1
Homing Beacon (Symbol 258)	Mast 121' ABL Port	9
Flight Deck Light (Symbol 259.5)	01 LVL Frame 379 Port	4
Floodlight (Symbol 249.3)	Mn Dk Frame 435 Port	1
	Mn Dk Frame 441 Port	1
	Mn Dk Frame 411 Stbd	1
	Mn Dk Frame 435 Stbd	1
	Mn Dk Frame 441 Stbd	1
HIFR Heading Light (Symbol 93.2)	02 Lvl Frame 266 Port	6
	02 Lvl Frame 286 Port	6
	02 Lvl Frame 305 Port	6
Wave-Off Lights (2)	01 Lvl Frame 371 Port	4

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Waterway Bars*

AREA OF OCCURRENCE: Zone 10, Deck Edges Ship Wide

TYPE OF CORROSION: Uniform Attack

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: The waterway bar is a steel strip paralleling the deck edge and covers deck drainage to the scuppers or drains.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS: *Not a corrosion control item for DDG 74 and follow.

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Waterway Bars and Associated Drawings: 100-6597578, 100-6597583, 100-6597598, 100-6597603, 100-6597608, 100-6597612, 100-6597615, 100-6597619, 100-6597616, 100-6597623, 100-6597634, 100-6597693 and 100-659724.

2. Apply metal spray coating (System 2) to waterway bars. Coating should extend outboard to 2 inches onto the shell plating and inboard 3 inches.

SERVICE REQUIREMENTS (SHIP): Inspect quarterly and touch up as needed.

Index Number 1047

Waterway Bars

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Waterway Bars	Main Deck and 01 Level	2, 3, 4, 10

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Weather Deck Areas*

AREA OF OCCURRENCE: Zone 10, 01 Level

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Weather decks. See figure 4-1048.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS: *Not a corrosion control item for DDG 74 and follow.

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Weather Deck Areas and Associated Drawing: 101-6597094

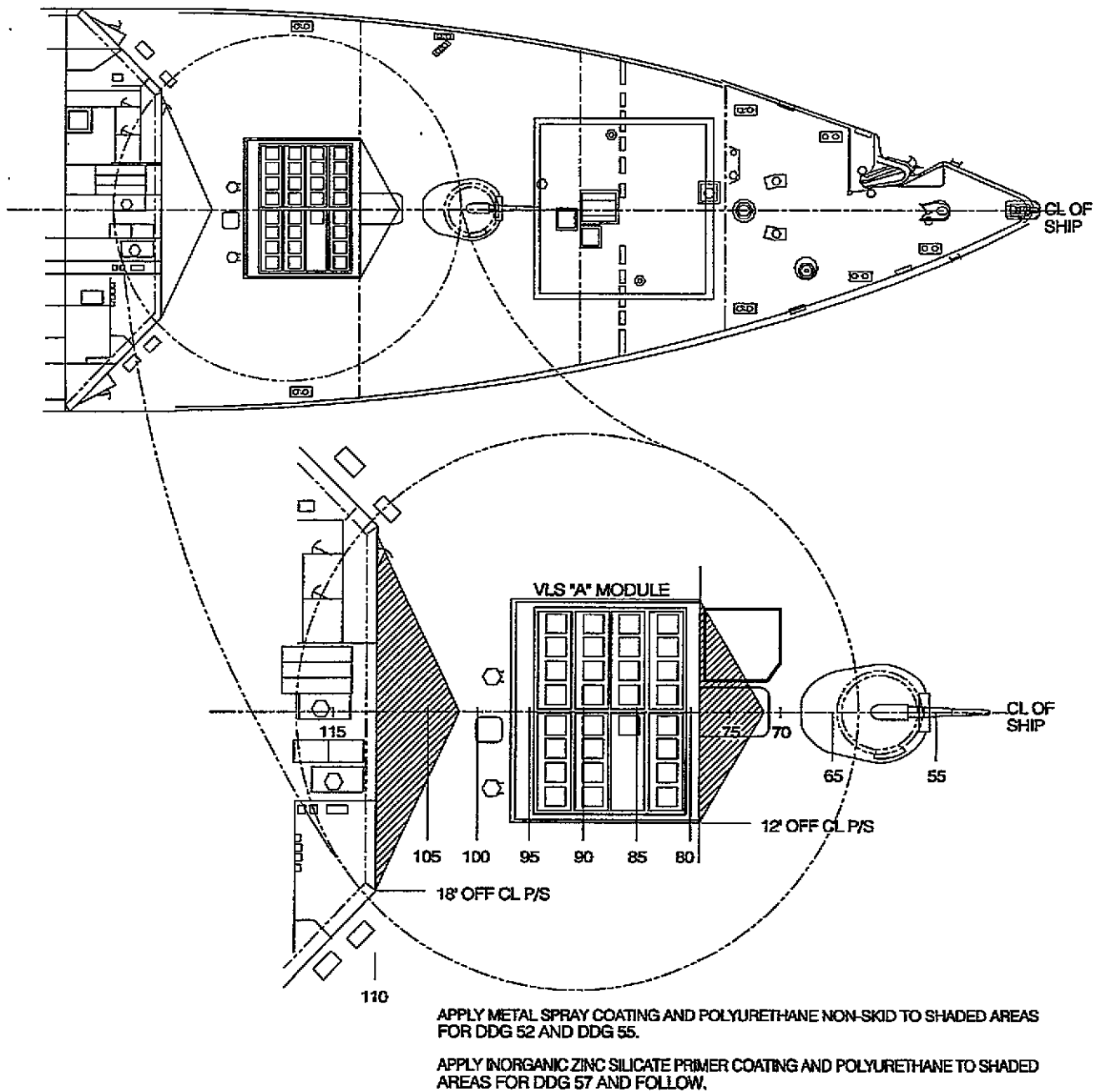
2. DDG 52 - DDG 55. Apply metal spray coating (System 2) to polyurethane non-slip deck covering to two triangular 01 level areas defined by the following points listed in Item 3.
3. DDG 57 - DDG 71. Apply primer coat of inorganic zinc silicate paint and polyurethane non-slip deck covering to two triangular 01 level areas defined by the following points.
 - a. 110 feet aft of fwd perpendicular, 18 feet to port
110 feet aft of fwd perpendicular, 18 feet to stbd
102 feet aft of fwd perpendicular on CL
 - b. 78 feet aft of Fwd perpendicular, 12 feet to port
78 feet aft of Fwd perpendicular, 12 feet to stbd
72 feet aft of fwd perpendicular on CL
4. DDG 57 - DDG 71. Do not apply (System 2), apply primer coat of inorganic zinc silicate paint, and polyurethane non-slip deck covering to two rectangular areas on the main deck abutting and extending athwart ships along the bulkhead at frame 370 and ending 371 feet 3 inches aft of the forward perpendicular.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed.

Index Number 1048

Weather Deck Areas

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Specific Weather Deck Areas	Weather Decks 01 Level	2



CD_Z_2088

Figure 4-1048. Forward Weather Deck Areas

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Weather Doors (Steel)

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: Direct Surface Attack and Galvanic

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: All weather access doors are steel except the four on the mast and one ballistic door on the 01 level. Weather exposure, frequent use, and wear degrade the corrosion protection of these doors and ferrous operating components. See figure 4-1049.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Weather Doors (Steel) and Associated Drawings: 600-6596697, 600-6596702, 600-6596716, 600-6596723, 600-6596727 and 600-6596728.
2. DDG 52 - DDG 55. Apply System 2 to steel weather doors including weather exposed deck and bulkhead surfaces to 12 inches from doors prior to attachment of hardware.
3. DDG 57 - DDG 78. Apply System 2 to steel weather doors only and prime exposed deck and bulkhead surfaces 12 inches from door with inorganic zinc silicate paint, or NAVSEA approved epoxy primer, before applying sealer coat.
4. Apply anti-seize compound (System 6) to all threads prior to installation.
5. DDG 52 - DDG 78. Dogs, actuating mechanisms, and fasteners shall be fabricated out of CRES 316, System 14 and System 16.
6. DDG 78. Fasteners to be of corrosion resistant material, System 14.
7. DDG 78. Hardware (System 14 and System 16), including dogs, dog wrench holder clips, dog stop brackets, set screws, connecting linkage, operating handles and dog spindle shafts to be CRES 304 or CRES 316; drop bolt collars/ferrules to be CRES 316 with CRES 304, monel or naval brass collar ferrule pins; wire lanyards to be CRES 316 with CRES 304 swage fittings; toggle pins to be CRES 316 with CRES 304 or monel pivot pins; grease fittings shall be monel; dog pads to be CRES 316; dog wedges to be aluminum bronze, ASTM B148, alloy C95200 or C95300; bolted dog wedges to have machined screws in accordance with FED SPEC FF-S-92-B, Type III, Style 3C, copper alloy, ASTM B98.
8. DDG 78. Pallet truck stowage battery room and CPS zone boundary doors dog wedges to be bronze MIL-B-16033 (System 16).
9. DDG 78. For vertical package conveyor door, 01-228-2, the adjusting yoke, cotter pin, dog spindles, and set screws shall be fabricated from CRES 316 (System 16). Apply System 2 to trunk door panel only.

10. DDG 78. Door stops/stays of topside watertight doors shall be CRES 316L, see locations of DDG 78 watertight doors.
11. DDG 78. Watertight door uptake No. 2 (02-224-1) and coating shall be CRES 316L. Sand sweep, prime with AMERON 236 and topcoat. Install new silicone gasket ZZ-R-765.

SERVICE REQUIREMENTS (SHIP): Inspect for corrosion. Apply System 6 as required. Apply touch up as required.

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Weather Doors

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Structural Door	1-370-1	1
Structural Door	1-370-2	1
Structural Door	1-370-3	1
Structural Door	1-372-2	1
Structural Door	01-121-1	2
Structural Door	01-121-2	2
Structural Door	01-121-3	2
Structural Door	01-121-4	2
Structural Door	01-110-2	2
Structural Door	01-120-2	2
Structural Door	01-124-1	2
Structural Door	01-124-2	2
Structural Door	01-130-3	2
Structural Door	01-156-1	2
Structural Door	01-172-1	2
Structural Door	01-172-2	2
Structural Door	01-178-2	2
Structural Door	01-188-1	2
Structural Door	01-192-1	2
Structural Door	01-210-1	3
Structural Door	01-218-2	3
Structural Door	01-217-1	3
Structural Door	01-222-2	3
Structural Door	01-222-1	3
Structural Door	01-228-1	3
Structural Door	01-228-2	3
Structural Door	01-240-1	3
Structural Door	01-243-1	3

(See next page for DDG 78 watertight door stops/stays)

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Weather Doors - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Structural Door	01-244-8	3
Structural Door	01-270-2	3
Structural Door	01-270-1	3
Structural Door	01-282-2	3
Structural Door	01-286-2	3
Structural Door	01-302-1	3
Structural Door	01-302-2	3
Structural Door	01-314-1	3
Structural Door	01-314-2	3
Structural Door	02-118-2	5
Structural Door	02-302-2	6
Structural Door	02-308-2	6
Structural Door	03-116-2	7
Structural Door	03-121-2	7
Structural Door	03-178-1 (DDG 59 and Follow)	7
Structural Door	04-148-1	8
Structural Door	04-148-2	8
Structural Door	04-167-2	8
Structural Door	04-170-1	8
Structural Door	05-154-1	9
Door Wtrtt Aluminum	06-161-2	9
Door Wtrtt Aluminum	07-165-1	9
Door Wtrtt Aluminum	08-169-2	9
Door Wtrtt Aluminum	09-173-1	9

(See next page for DDG 78 watertight door stops/stays).

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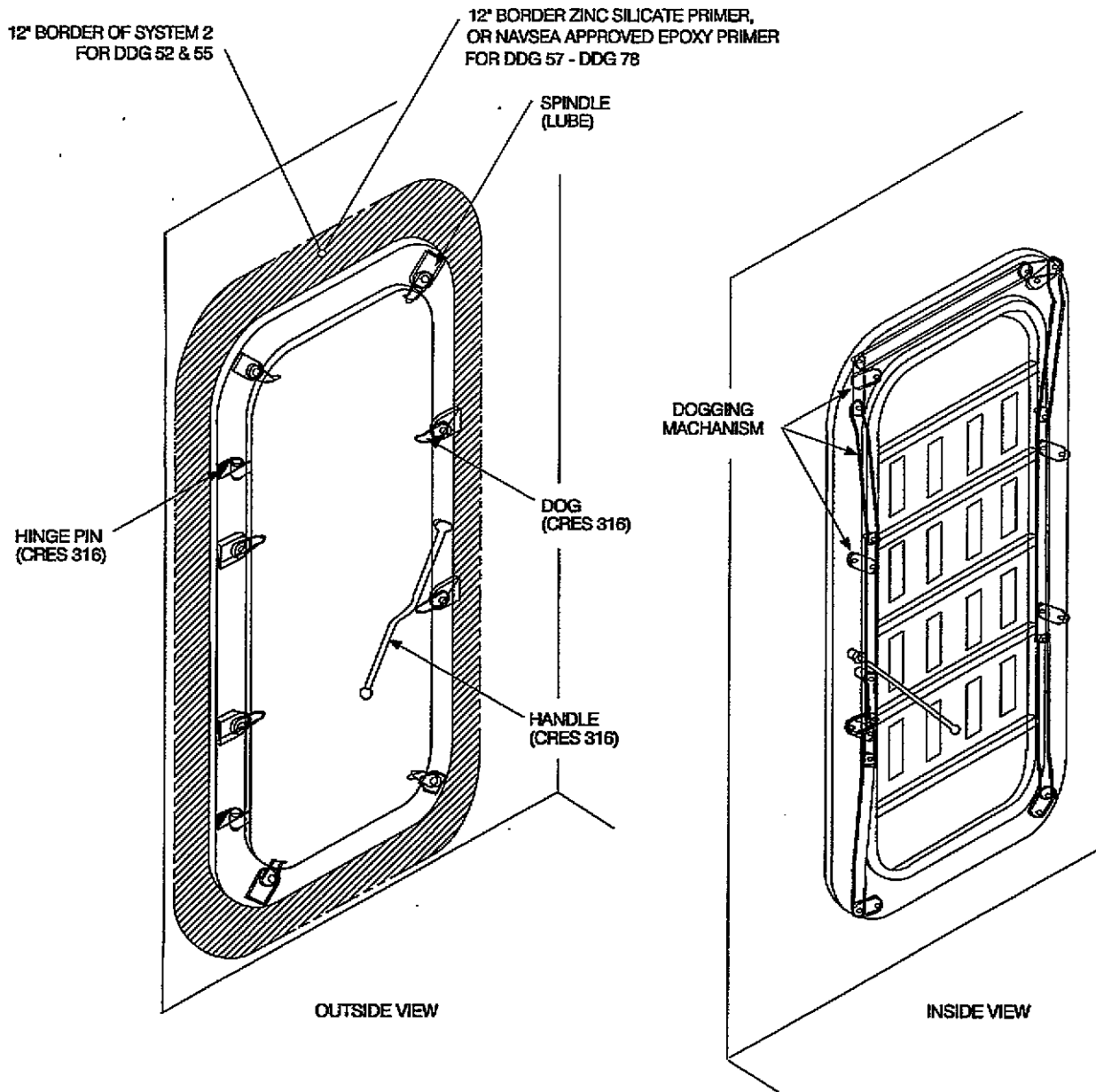
Watertight Doors (DDG 78)

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Door Stops/Stays (CRES 316L)	01-110-2	2
Door Stops/Stays (CRES 316L)	01-121-2	2
Door Stops/Stays (CRES 316L)	01-121-3	2
Door Stops/Stays (CRES 316L)	01-121-4	2
Door Stops/Stays (CRES 316L)	01-124-1	2
Door Stops/Stays (CRES 316L)	01-130-3	2
Door Stops/Stays (CRES 316L)	01-156-1	2
Door Stops/Stays (CRES 316L)	01-171-1	2
Door Stops/Stays (CRES 316L)	01-188-1	2
Door Stops/Stays (CRES 316L)	01-192-1	2
Door Stops/Stays (CRES 316L)	01-124-2	2
Door Stops/Stays (CRES 316L)	01-172-2	2
Door Stops/Stays (CRES 316L)	01-176-2	2
Door Stops/Stays (CRES 316L)	01-180-4	2
Door Stops/Stays (CRES 316L)	01-210-1	2
Door Stops/Stays (CRES 316L)	01-122-1	2
Door Stops/Stays (CRES 316L)	01-128-1	2
Door Stops/Stays (CRES 316L)	01-128-2	2
Door Stops/Stays (CRES 316L)	01-240-1	3
Door Stops/Stays (CRES 316L)	01-244-2	3
Door Stops/Stays (CRES 316L)	01-270-2	3
Door Stops/Stays (CRES 316L)	01-282-2	3
Door Stops/Stays (CRES 316L)	01-286-2	3
Door Stops/Stays (CRES 316L)	01-302-2	3
Door Stops/Stays (CRES 316L)	01-310-1	3
Door Stops/Stays (CRES 316L)	01-302-1	3
Door Stops/Stays (CRES 316L)	01-270-1	3
Door Stops/Stays (CRES 316L)	01-248-1	3
Door Stops/Stays (CRES 316L)	01-314-2	3
Door Stops/Stays (CRES 316L)	02-118-2	5
Door Stops/Stays (CRES 316L)	02-217-2	5
Door Stops/Stays (CRES 316L)	02-302-2	6
Door Stops/Stays (CRES 316L)	02-308-2	6
Door Stops/Stays (CRES 316L)	03-116-2	7
Door Stops/Stays (CRES 316L)	03-121-2	7

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Watertight Doors (DDG 78) - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Door Stops/Stays (CRES 316L)	03-178-1	7
Door Stops/Stays (CRES 316L)	04-148-1	8
Door Stops/Stays (CRES 316L)	04-148-2	8
Door Stops/Stays (CRES 316L)	04-167-2	8
Door Stops/Stays (CRES 316L)	04-170-1	8
Door Stops/Stays (CRES 316L)	04-285-2	8
Door Stops/Stays (CRES 316L)	05-154-1	9
Door Stops/Stays (CRES 316L)	01-370-1	4
Door Stops/Stays (CRES 316L)	01-372-1	4
Door Stops/Stays (CRES 316L)	01-389-2	4
Door Stops/Stays (CRES 316L)	01-228-1	3
Door Stops/Stays (CRES 316L)	01-228-2	3
Door Stops/Stays (CRES 316L)	01-128-3	3
Door Stops/Stays (CRES 316L)	01-209-2	3
Door Stops/Stays (CRES 316L)	01-213-2	3



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Figure 4-1049. Steel Watertight Door, Typical

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Weather Exposed Announcing Systems

AREA OF OCCURRENCE: Zone 10

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These loudspeakers are installed in the weather and are exposed to salt spray.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Announcing Systems in the Weather and Associated Drawings: 301-6596610, 301-6596556, 301-6596596, 301-6596602, 301-659608, 301-659614, 301-6596578, 301-659616 and 301-6596965.

2. Apply powdered epoxy coating (System 4) to announcing system enclosures, loudspeakers and equipment exposed to the weather.
3. Apply metal spray coating (System 2) to mounting brackets.
4. Enclosure latches, hinges and other accessories shall be CRES 316 (System 16).
5. Mounting fasteners shall be CRES 316 (System 14).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners, fittings, and hardware as needed.

Index Number 1050

Weather Exposed Announcing Systems

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Loudspeaker LS-387/SIC	Mn Dk Frame 389 P&S	1
Loudspeaker LS-387/SIC	Mn Dk Frame 385 Stbd	1
Loudspeaker LS-387/SIC	01 Frame 350 P&S	4
Loudspeaker LS-387/SIC	01 Frame 310 P&S	3
Loudspeaker LS-387/SIC	01 Frame 110 P&S	2
Loudspeaker LS-387/SIC	01 Frame T Stbd	2

Index Number 1050

Weather Exposed Annoucning Systems - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Loudspeaker LS-387/SIC	01 Frame 220 P&S	3
Loudspeaker LS-387/SIC	01 Frame 240 Port	3
Loudspeaker LS-387/SIC	01 Frame 205 P&S	2
Loudspeaker LS-387/SIC	Fwd Mast Leg CL	8
Loudspeaker LS-387/SIC	02 Frame 260 P&S	6
Loudspeaker LS-387/SIC	02 Frame 195 P&S	5
Loudspeaker LS-387/SIC	04 Frame 143 P&S	8
Loudspeaker LS-387/SIC	04 Frame 160 P&S	8

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Weather Exposed Meter and Gage Cases

AREA OF OCCURRENCE: Zone 10, Ship Wide

TYPE OF CORROSION: Uniform Attack, Galvanic

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Gageboards provide a mounting surface for temperature, pressure and other instruments needed at topside operating stations. Carbon steel gageboards are difficult to maintain. Figure 4-1051 show typical gageboards.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Weather Exposed Meter and Gage Cases and Associated Drawings: 505-6596746, 505-6596745, 8100-2447-0069 and 8100-2447-0066.
2. Apply powdered epoxy coating (System 4) to aluminum gageboards. Apply metal spray coating (System 2) to all steel gageboards.
3. Valve bodies and gage tube nuts shall be fabricated out of CRES 316 (System 16).
4. Isolate the valve body and gage board from each other by means of a plastic dielectric barrier (System 11).
5. Apply metal spray coating (System 2) to steel alloy support structure.
6. DDG 52 - DDG 74. Mounting fasteners shall be steel treated with ceramic coating (System 5) or CRES 316 (System 14).
7. Apply anti-seize compound (System 6) to mounting fasteners prior to installation.
8. DDG 54 - DDG 74. Flush mounting rings and nuts shall be treated with ceramic coating (System 5). Apply polysulfide thread sealer (System 8) to mounting rings prior to installation.
9. DDG 78. Fasteners shall be of corrosion resistant material (System 14).
10. DDG 78. Instrument face rings and spacers shall be CRES 316. Apply polysulfide thread sealer (System 8) to mounting rings prior to installation.
11. DDG 78. Instrument cases shall be CRES 316/plastic. Gage line clips shall be CRES 304 or CRES 316 with CRES 316 fasteners. Wire lanyards shall be CRES 316 with CRES 304 swages. Hinge pins and securing hardware shall be CRES 316. Stem test connection globe valves MIL-V-24578 bonnets and bonnet and tailpiece nuts shall be CRES 316.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners and dielectric barrier as needed.

Index Number 1051

Weather Exposed Meter and Gage Cases

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Gageboard	01 Lvl Frame 212 Port (CPW-GA-3)	3
Gageboard	01 Level Frame 212 Starboard (CPW-GA-3)	3
Gageboard	01 Level Frame 322 Port (FT-GA-4) FAS No. 8	4
Gageboard	01 Level Frame 325 Starboard (FT-GA-3) FAS No. 7	4
Gageboard	02 Level Frame 133 Starboard (FT-GA-1) FAS No. 3	5
Gageboard	Mn Dk Frame 386 Port (JP5-GA-1-373-2)	1
Gageboard	01 Level Frame 322 Starboard (JPT-GA-3) FAS No. 7	4
Gageboard	01 Level Frame 325 Port (JPT-GA-4)	4
Gageboard	02 Level Frame 133 Port (FT-GA-2) FAS No. 4	5
Gageboard	01 Level Frame 16 Port (ALP-GA-01-16-2)	2
Gageboard	Mn Dk Frame 387 Port (FM-GA-214)	1

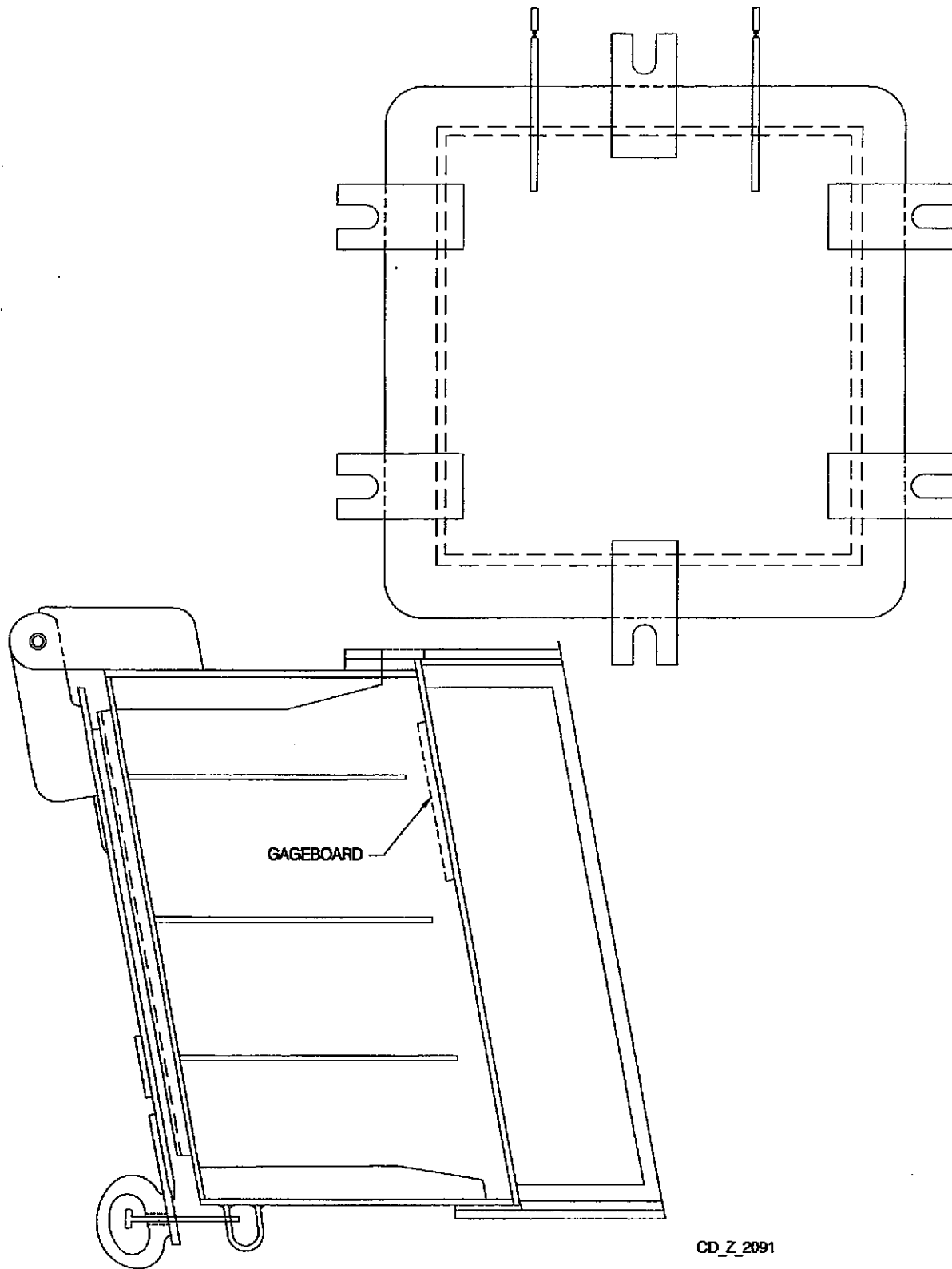
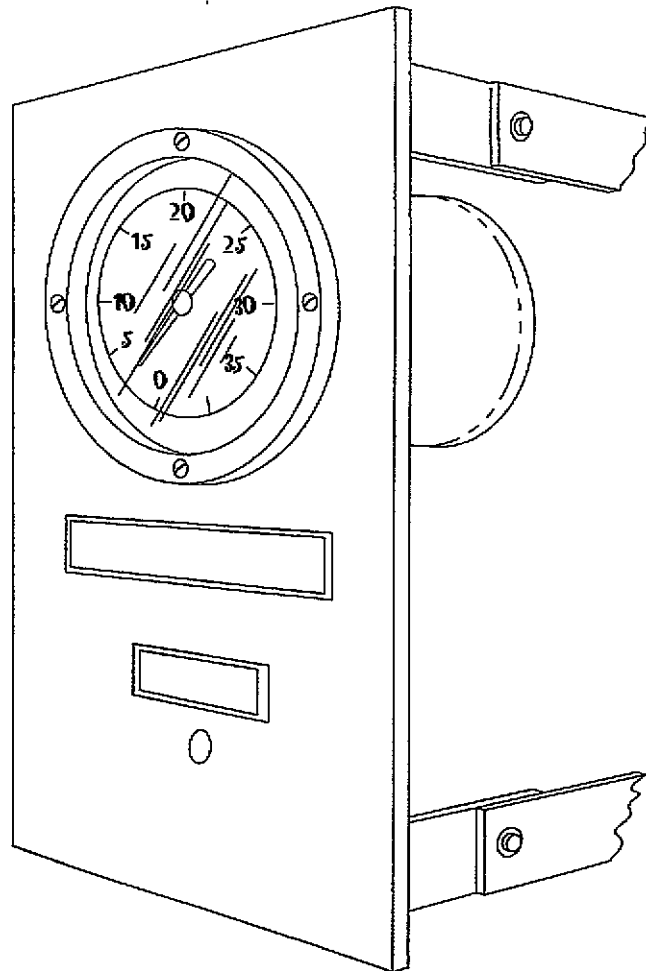


Figure 4-1051. Typical Gageboard (Sheet 1 of 2)



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Figure 4-1051. Typical Gageboard (Sheet 2 of 2)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Propulsion GTRB and SSGTG Air Intake Vanes

AREA OF OCCURRENCE: Zones 10, 01, 02, 03 Levels and Main Deck

TYPE OF CORROSION: Direct Surface Attack

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: Air intake vanes are exposed to the weather and salt spray.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.
NAVSEA Propulsion GTRB and SSGTG Air Intake Vanes and Associated Drawings: 259-6595938, 101-6597095, 101-6597094, 101-6597093 and 101-6597638.
2. DDG 52 - DDG 55. Apply metal spray coating (System 2) to steel surfaces of propulsion GTRB and SSGTG air intake vanes (louvers).
3. DDG 57 - DDG 78. Apply hot dip galvanize to all steel surfaces of propulsion gas turbine intake louver and vane assemblies
4. DDG 78. Main engine gas turbine and SSGTG exhaust and intake duct fasteners exposed to weather to be of corrosion resistant material (System 14).

SERVICE REQUIREMENTS (SHIP): Inspect for corrosion. Touch up System 2 coatings as required.

Index Number 1052

Propulsion GTRB and SSGTG Air Intake Vanes

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Louver	02 Level Frame 194 P&S (6)	5
	02 Level Frame 174 P&S (2)	5
	02 Level Frame 180 P&S (2)	5
	02 Level Frame 186 P&S (2)	5
	02 Level Frame 292 P&S (2)	6
	02 Level Frame 276 P&S (2)	6
	02 Level Frame 280 P&S (2)	6
	02 Level Frame 284 P&S (2)	6
	02 Level Frame 288 P&S (2)	6
	03 Level Frame 280 P&S (2)	7
	03 Level Frame 275 P&S (2)	7
	03 Level Frame 178 P (1)	3
	01 Level Frame 260 S (1)	1
	Mn Dk Frame 379 P (1)	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Topside Deck Washdown Piping Risers

AREA OF OCCURRENCE: Zone 2

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: Topside washdown piping risers are exposed to the weather salt spray and in some cases standing water. They are subject to repeated impact.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Topside Deck Washdown Piping Risers and Associated Drawing: 505-6596883

2. Apply metal spray coating (System 2) to the carbon steel piping risers.
3. DDG 52 - DDG 74. Ancillary steel fittings and hardware shall be ceramic coated (System 5).
4. DDG 78. Ancillary fittings and hardware shall be corrosion resistant material (System 16).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed.

Index Number 1054

Topside Deck Washdown Piping Risers

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Piping Risers for Topside Deck Washdown	Various	2

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Windows in the Weather

AREA OF OCCURRENCE: Zones 1, 9 (Helo Control Station and Pilot House)

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These windows are located in the weather and subject to salt spray and salt air. See figure 4-1055.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Windows in the Weather and Associated Drawings: 600-6596702 and 600-6596717.

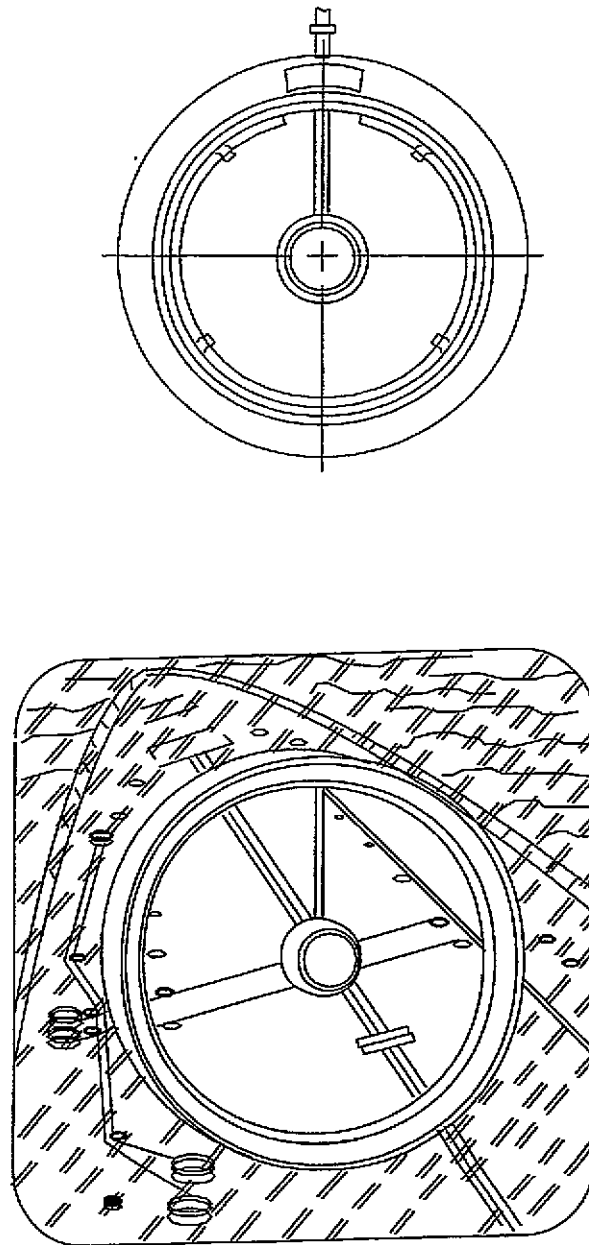
2. All fittings, frames, fasteners and hardware shall be CRES 316 (System 14 and System 16).
3. The spinning window assemblies shall be of solid brass construction (interior and exterior). The parent/supporting plates shall be installed in CRES 316 frames (System 14).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace as needed.

Index Number 1055

Windows in the Weather

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Windows in the Weather	Helo Control Station and pilot House	1, 9



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Figure 4-1055. Spinning Window Assemblies

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Gas Turbine Intake and Exhaust Duct Fasteners (DDG 55 and Follow)

AREA OF OCCURRENCE: Zone 10, Exposed to Weather

TYPE OF CORROSION: Severe

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: Persistent

DESCRIPTION: These fasteners are exposed to the weather and ingested salt spray.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Main Engine Gas Turbine and SSGTG Uptake Ducting Assembly and Mounting Hardware and Associated Drawings: 259-6595723 and 259-6595724.

2. DDG 78. Duct mounting and assembly fasteners in uptake areas exposed to the weather shall be Inconel 718 (System 16).
3. DDG 55 - DDG 74. Fasteners and material to be accordance with MIL-S-1222.
4. DDG 55 - DDG 74. Fabricate fasteners from CRES 316 (System 14).

SERVICE REQUIREMENTS (SHIP): Inspect fasteners and material monthly and replace as needed.

Index Number 1056

Gas Turbine Intake and Exhaust Duct Fasteners

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
No. 1 Engine Room Uptake	01 Lvl Frame 210 CL	3
Engine 1A Uptake Fasteners	01 Lvl Frame 195 S	2
Engine 1B Uptake Fasteners	01 Lvl Frame 210 CL	3
SSGTG No. 1 Uptake Fasteners	01 Lvl Frame 202 P	3
No. 2 Engine Room Uptake	02 Lvl Frame 260	6
Engine 2A Uptake Fasteners	02 Lvl Frame 259 P	6
Engine 2B Uptake Fasteners	02 Lvl Frame 260	6
SSGTG No. 2 Uptake Fasteners	02 Lvl Frame 258 S	6

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Alignment Benchmarks and Covers
AREA OF OCCURRENCE: Zones 10 and 18
TYPE OF CORROSION: General
TYPICAL EXTENT OF CORROSION: Moderate to Severe
FREQUENCY OF CORROSION: Moderate to Severe
DESCRIPTION: These items are located throughout the ship in all types of atmospheres. See figure 4-1057.
RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

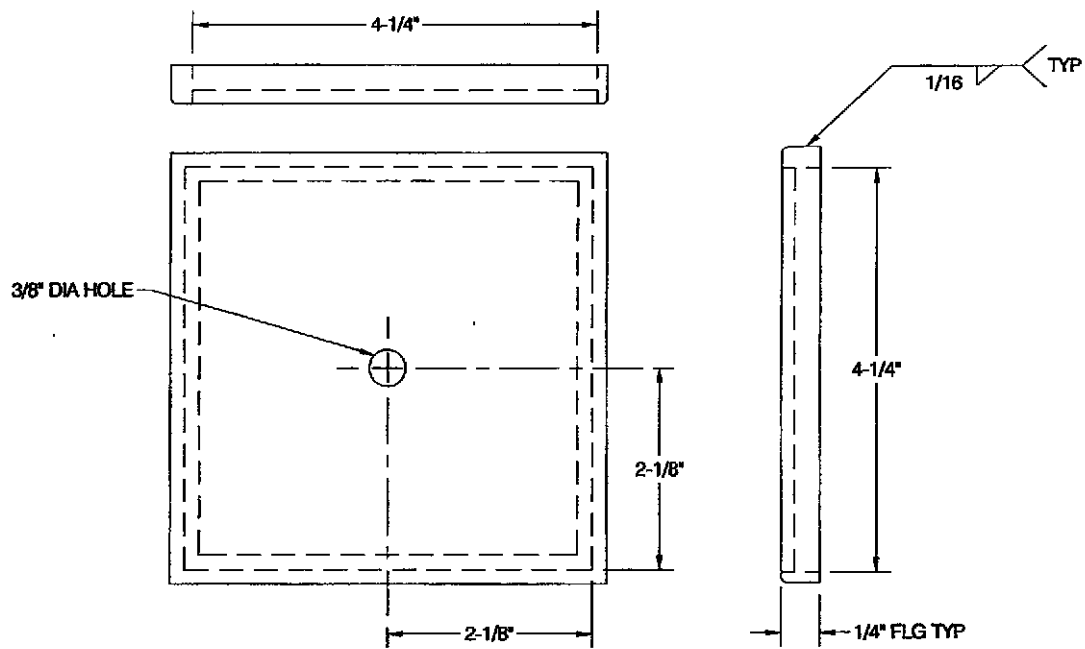
1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Alignment Benchmarks and Covers and Associated Drawing: 180-6597686
2. Alignment benchmarks shall be fabricated from CRES 316 (System 14).
3. Apply metal spray coating (System 2) to the steel alignment benchmark covers, or fabricate from CRES 316 (System 14).
4. The screw used to attach alignment benchmark covers shall be CRES 316 (System 16).

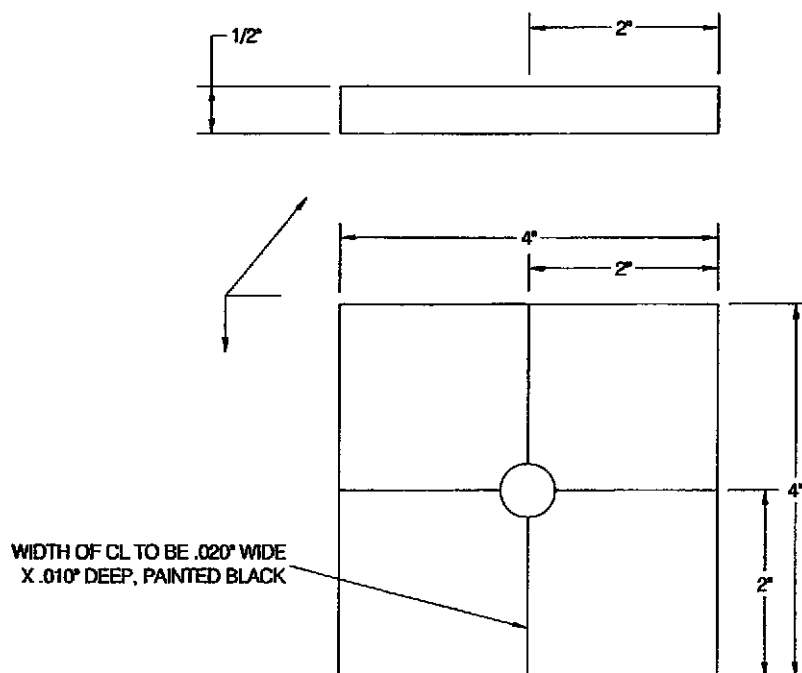
SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace fasteners as needed. Touch up as required.

Index Number 1057
Alignment Benchmarks and Covers

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Alignment Benchmarks and Covers	Various	10, 18



TYPICAL COVER PLATE



TYPICAL BENCHMARK

CD_Z_2093

Figure 4-1057. Alignment Benchmark and Cover (Typical)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Tether Rings Around Mk 82 Director (Index 1062)

AREA OF OCCURRENCE: Zones 10

TYPE OF CORROSION: Moderate

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: Tether Rings Around Mk 82 Director

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Tether Rings Around Director and Covers and Associated Drawings: 611-6595937, 600-6596718, 600-6596730 and 600-6596731.

2. Tether rings shall be fabricated from CRES 316L (System 16).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace as needed.

Index Number 1058

Tether Rings Around Mk 82 Director

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Tether Rings	04 Lvl Frame 292	8
	06 Lvl Frame 150	9
	05 Lvl Frame 280	9

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Sewage Ejection Shore Discharge Fasteners, Brackets
(DDG 78 only)

AREA OF OCCURRENCE: Zone 10

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: Fasteners and brackets are exposed to salt spray and weather.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Sewage Ejection Shore Discharge Fasteners, Brackets (DDG 78 only) and Associated Drawing: 529-6597164

2. Support bracket for each weather deck connection station shall be CRES 304L, CRES 316L, or steel coated with a NAVSEA approved inorganic zinc silicate coating (System 16).
3. Removable brackets and supports shall have CRES 316 fasteners, other fasteners shall be of corrosion resistant material (System 14).
4. Apply anti-seize (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect brackets, supports and fasteners monthly. Touch up or replace as needed.

Index Number 1059

Sewage Ejection Shore Discharge Fasteners, Brackets (DDG 78 only)

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Bracket Support	01 Lvl Frame 113 P/S	2
Fasteners	01 Lvl Frame 113 P/S	2
Sewage Discharge Bracket (Pipe Hanger)	01 Lvl Frame 299 P/S	3
Bracket Support	01 Lvl Frame 299 P/S	3
Fasteners	01 Lvl Frame 299 P/S	3

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Weapon System Launch/Fire Sirens (DDG 78 only)

AREA OF OCCURRENCE: Zone 10

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: Sirens and fasteners are exposed to salt spray and weather.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Weapon System Launch/Fire Sirens (DDG 78 only) and Associated Drawings:
301-6596578, 301-6596616 and 301-6597363.

2. Fasteners shall be of corrosion resistant material (System 14).
3. Anti-seize compound (System 6) shall be applied.
4. Threaded attachment buttons shall be corrosion resistant (System 16).
5. Sirens shall be epoxy powder coated (System 4).
6. Bonding and grounding of foundation faying surface shall be coated with zinc molybdate with polysulfide.

SERVICE REQUIREMENTS (SHIP): Inspect fasteners and buttons monthly. Replace as needed.

Index Number 1060

Weapon System Launch/Fire Sirens

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Siren (Epoxy Powdered Coated)	01 Lvl Frame 110 S	2
Mount Pads, Threaded (CRES 316)	01 Lvl Frame 110 S	2
Fasteners (CRES 316)	01 Lvl Frame 110 S	2
Fasteners Mounting (CRES 316)	01 Lvl Frame 110 S	2
Assembly Fasteners (CRES 316 or Brass)	01 Lvl Frame 110 S	2
Foundation Faying Surfaces	01 Lvl Frame 110 S	2
Siren (Epoxy Powdered Coated)	01 Lvl Frame 110 S	2

Index Number 1060

Weapon System Launch/Fire Sirens - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Mount Pads, Threaded (CRES 316)	01 Lvl Frame 314 P	3
Fasteners (CRES 316)	01 Lvl Frame 314 P	3
Fasteners Mounting (CRES 316)	01 Lvl Frame 314 P	3
Assembly Fasteners (CRES 316 or Brass)	01 Lvl Frame 314 P	3
Foundation Faying Surfaces	01 Lvl Frame 314 P	3

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Vertical Ladders in Weather and in Propulsion and Ship
Service Generator Gas Turbine Intakes and Uptakes and
Ladder Fasteners Subject to Sea Water (DDG 78 only)

AREA OF OCCURRENCE: Zones 10, 18

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: High

FREQUENCY OF CORROSION: High

DESCRIPTION: Ladders and fasteners are exposed to salt water, weather or moisture.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Vertical Ladders in Weather and Wet Spaces and Associated Drawing: 167-6597071

2. Ladders shall be CRES 316 (System 16).
3. Mounting fasteners in tanks, floodable voids, and the floodable portion of the sonar dome shall be MONEL (System 16), otherwise the fasteners shall be CRES 316 (System 14).
4. Anti-seize compound (System 6) shall be applied.

SERVICE REQUIREMENTS (SHIP): Inspect fasteners and ladders monthly. Replace as needed.

Index Number 1061

Vertical Ladders in Weather and Wet Spaces

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Vertical Ladders (CRES 316)	Various Weather Decks	10
Mounting Fasteners (K-MONEL)	Various Weather Decks	10
Foundations (CRES 316L)	Various Weather Decks	10
Vertical Ladders (CRES 316)	Various Tanks, Voids	18
Mounting Fasteners (MONEL)	Various Tanks, Voids	18
Foundations (CRES 316L)	Various Tanks, Voids	18

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Mk 82 Director Foundations (DDG 78)

AREA OF OCCURRENCE: Zone 10

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These foundations are exposed to the weather.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Mk 82 Director Foundations (DDG 78) and Associated Drawings: 180-6597750, 180-6597736 and 180-6597738.
2. Apply metal spray coating (System 2) to foundations and surrounding deck for a 6-inch minimum distance.
3. Fasteners shall be of corrosion resistant material (System 14). Apply polysulfide sealant Type 1.
4. Faying surfaces shall have polysulfide sealant Type 4 applied.
5. DDG 78. RCS fairing plates shall be CRES 316. Sand sweep and prime with AMERON 236 prior to installation

SERVICE REQUIREMENTS (SHIP): Inspect foundations and touch up as required. Replace fasteners as required.

Index Number 1062

Mk 82 Director Foundations (DDG 78)

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Mk 82 Director Foundation	04 Lvl Frame 292	8
Fasteners (K-MONEL)	04 Lvl Frame 292	8
Mk 82 Director Foundation	06 Lvl Frame 150	9
Fasteners (K-MONEL)	06 Lvl Frame 150	9
Mk 82 Director Foundation	05 Lvl Frame 280	9
Fasteners (K-MONEL)	05 Lvl Frame 280	9
RCS Fairing Plates	04 Lvl Frame 290	8
	05 Lvl Frame 276	9
	06 Lvl Frame 160	9

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Miscellaneous Components (DDG 78), See Work Instructions

AREA OF OCCURRENCE: Zones 10, 18

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: Miscellaneous items located primarily on weather decks.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

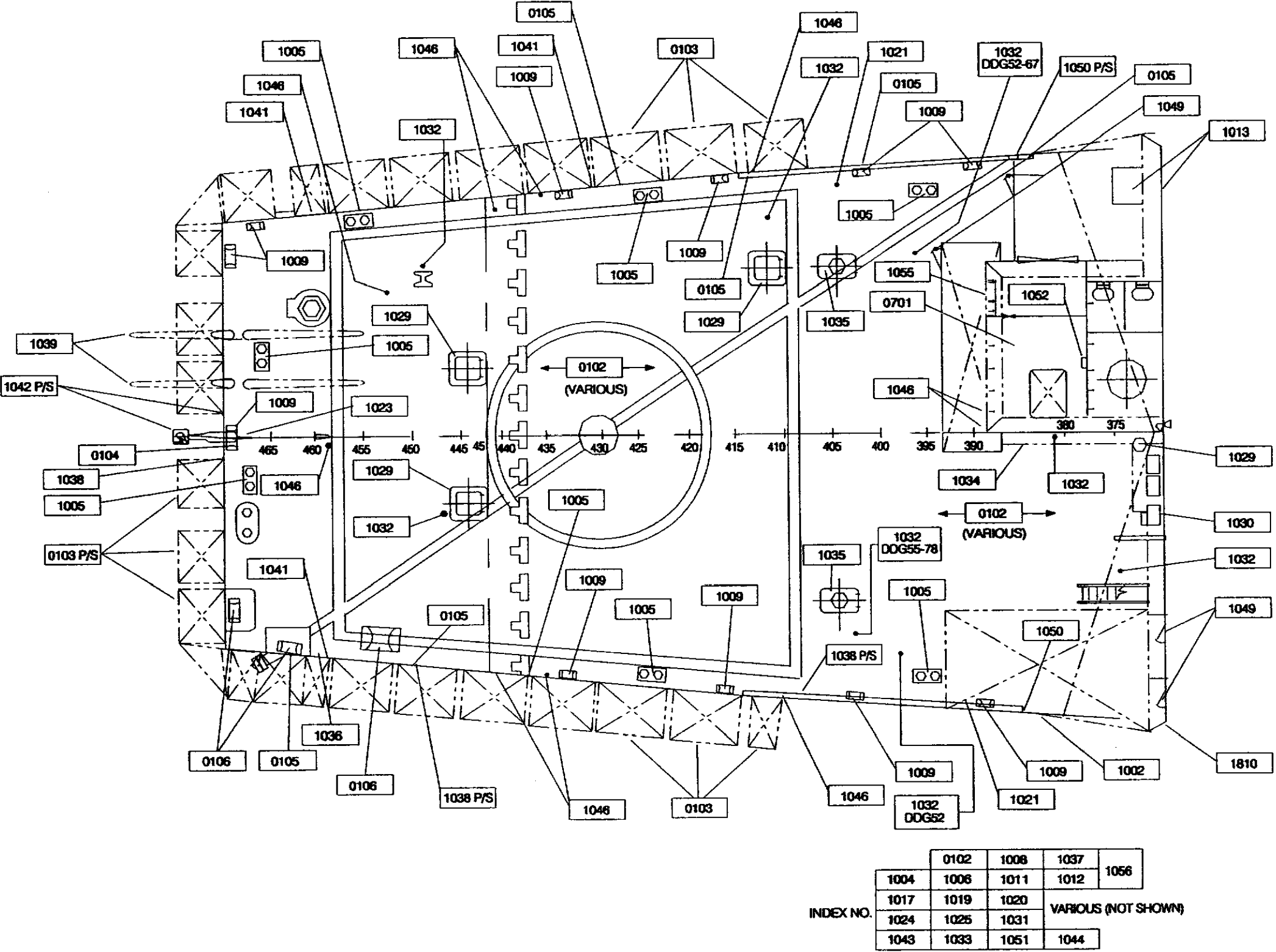
1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Miscellaneous Components, Items and Associated Drawings: 623-6596632, 583-6597074, 572-6596634, 439-6596985, 600-6596681, 301-6596501, 512-6596938, 600-6596722, 600-6596726, 301-6596578 and 301-6596541.
2. Boat Winch Rope Guard and Mounting Brackets (01-228-1) shall be manufactured from CRES 316 and shall be prepared in accordance with NAVSEA Drawing 631-6596633 before installation (System 16).
3. Up/Down Switch Cover, Package Conveyor (01-228-2) shall be manufactured from CRES 316; Package Conveyor Hoffman Enclosure and Panel Piece (01-228-CL) shall be manufactured from CRES 316. Switch cover, Hoffman Enclosure and panel piece shall be sand swept and primed with AMERON 236, one coat at 1-2 mils DFT, prior to topcoating and installation.
4. Vicon Pan and Tilt Unit Foundation (02-110-S, 01-368-S) shall be manufactured from CRES 316 and sand swept and primed with AMERON 236 prior to topcoating and installation. Re-install camera in a wet bed of zinc molybdate and edge seal with polysulfide sealer.
5. Shore Power Cable Arm Support Bracket (01-240-P&S) shall be manufactured from CRES 316 and light sand swept and primed with AMERON 236, 2-4 mils DFT, prior to topcoating and installation.
6. Lighting Arrestor Hoffman Box, and Panels (01-240-P&S) shall be CRES 316 and sand swept and primed prior to topcoating and installation.
7. Vent Screen/Diffusers, 13 each (Wardroom Galley, 02-158-4-Q and Crews, Cop Galley, 1-191-0-Q) shall be powdered polyester coated, haze gray, in accordance with MIL-C-24712.
8. Bolted Equipment Removal Plates (03-182-1, 03-182-3, 02-225-1, 02-281-2, 02-296-2, 02-296-4) shall be CRES 316L.
9. Darkenship Curtain Mounting Brackets (01-118-1-L, 01-118-4-L) shall be CRES 316 and sand swept and primed with AMERON 236 prior to topcoating and installation.

Index Number 1063

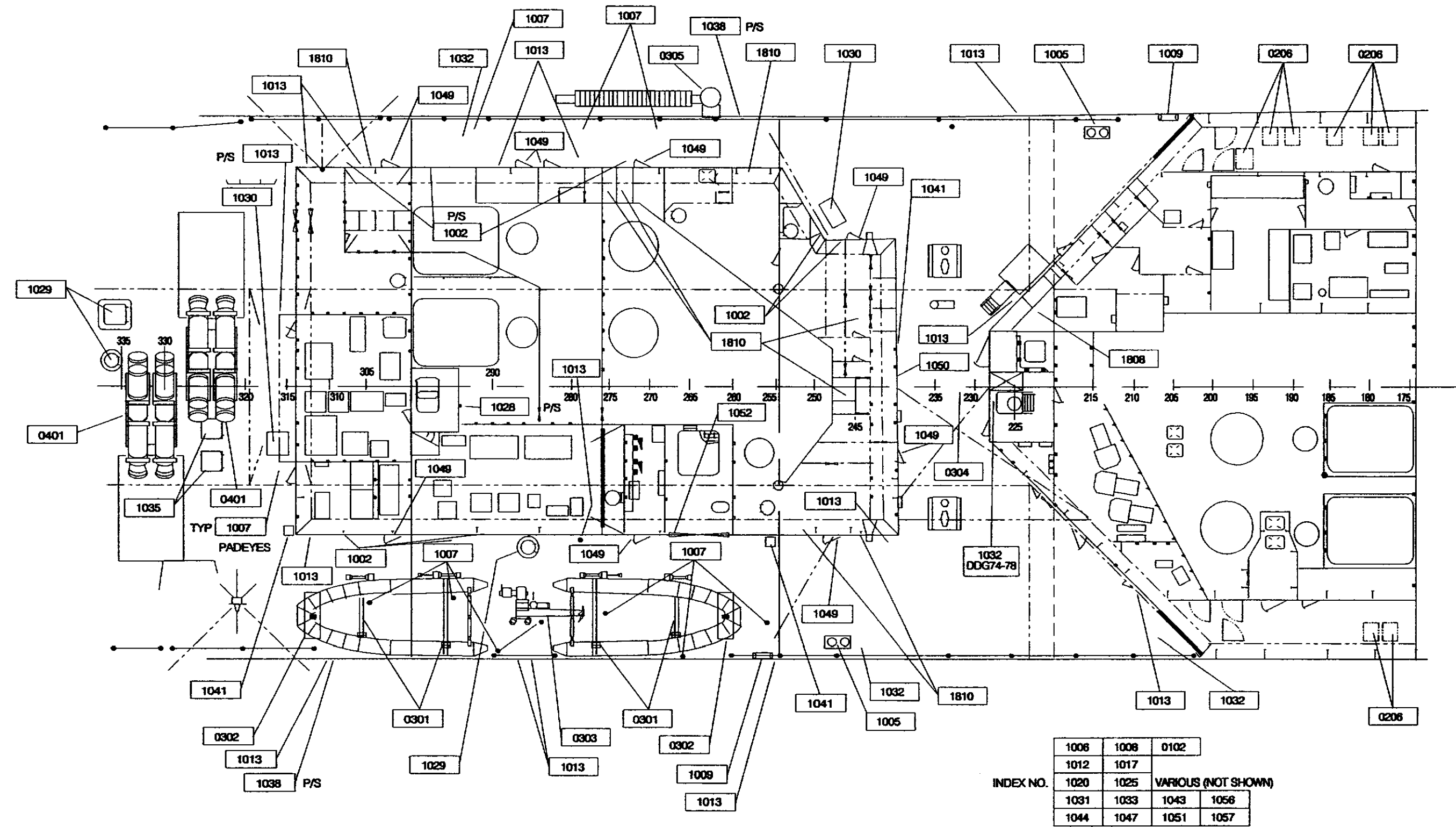
Miscellaneous Components - CONT.

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Lower Shock Mounts	01-118-1-L	2
Fasteners Symbol 112	01-118-4-L	2
Decon Station Electrical	01-113-2-L (3 each)	2
Cable Clips and Studs	01-114-2-L (3 each to speaker)	2
	01-118-2-L (3 each studs, 62 each misc)	2
	01-120-2-L (3 each)	2
	01-354-1-L (3 each to light switch)	17C
	01-357-1-L (14 each misc)	17C
Firemain Valve Protective Covers	MD-380-P	1
Firemain Valve Protective Covers	01-311-P	3
Firemain Valve Protective Covers	02-120-P	5



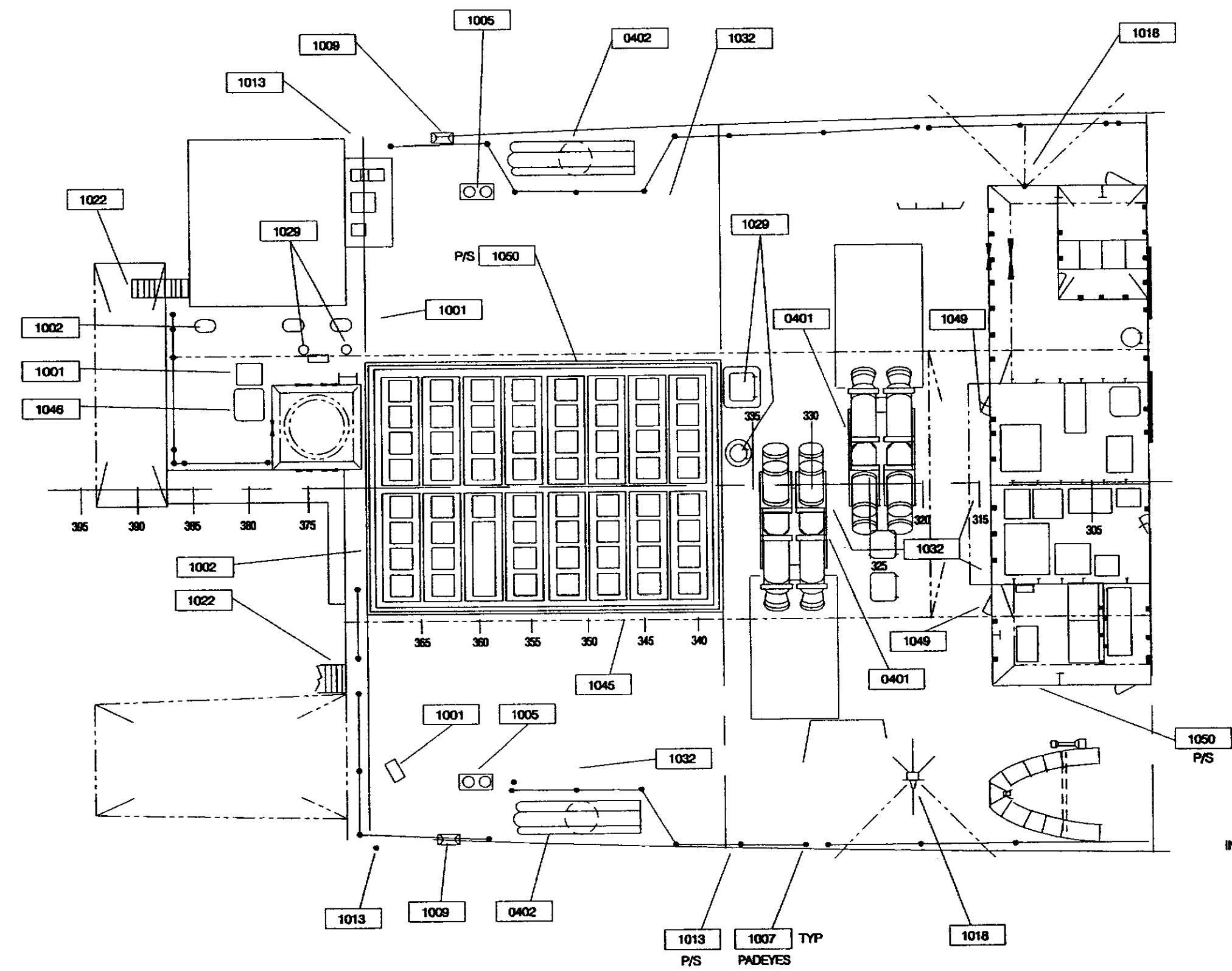
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Figure 4-1. Zone 1, Main Deck Frame 370-Stern



D78_4_3_148

Figure 4-3.1. Zone 3, 01 Level Frames 202-316
(For DDG 59 and Follow)



INDEX NO.	1006	1008	1037
	1012	1017	
	1020	1025	VARIOUS (NOT SHOWN)
	1031	1033	1043
	1044	1047	1057

D78_4_4_149

Figure 4-4. Zone 4, 01 Level Frames 316-388

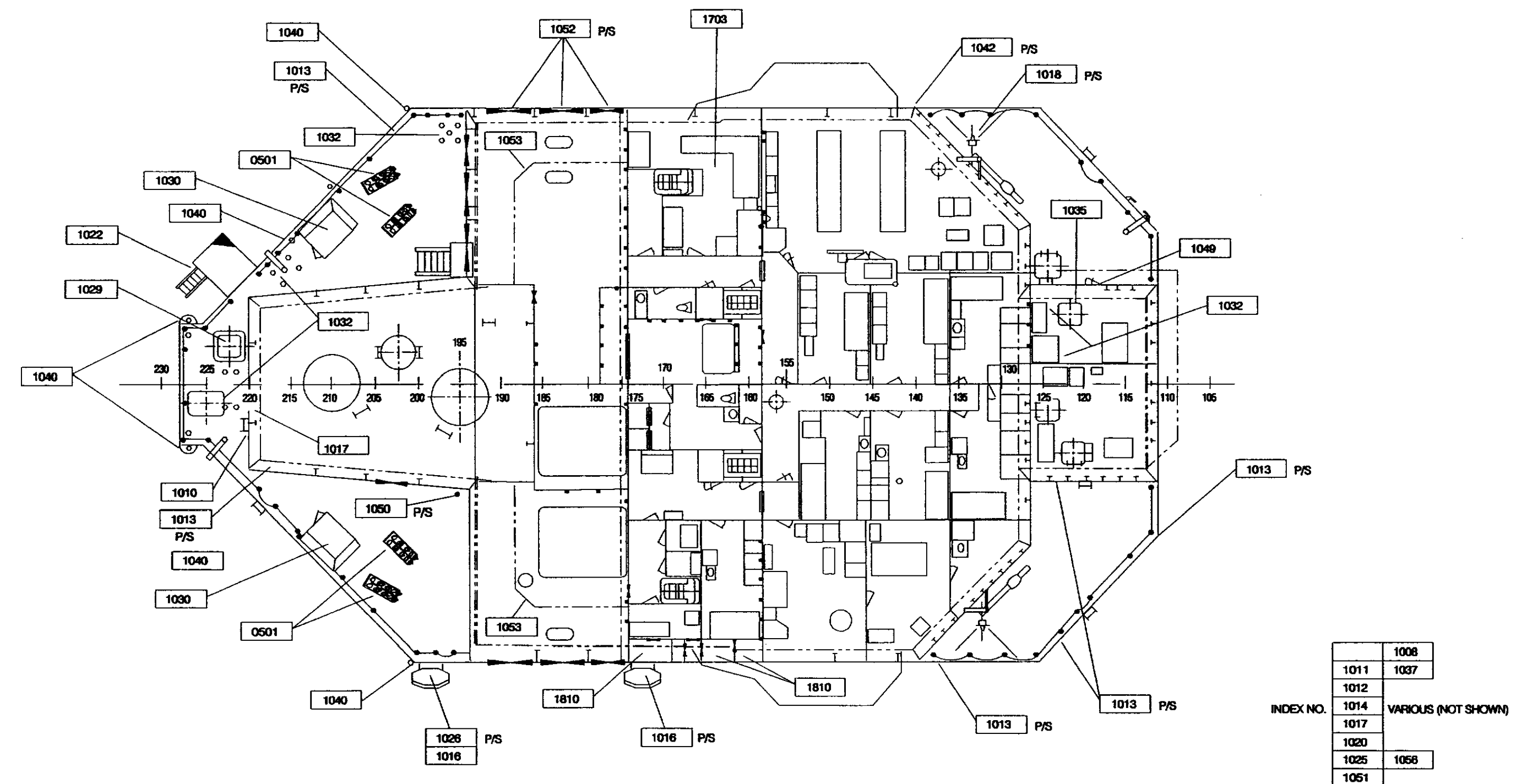
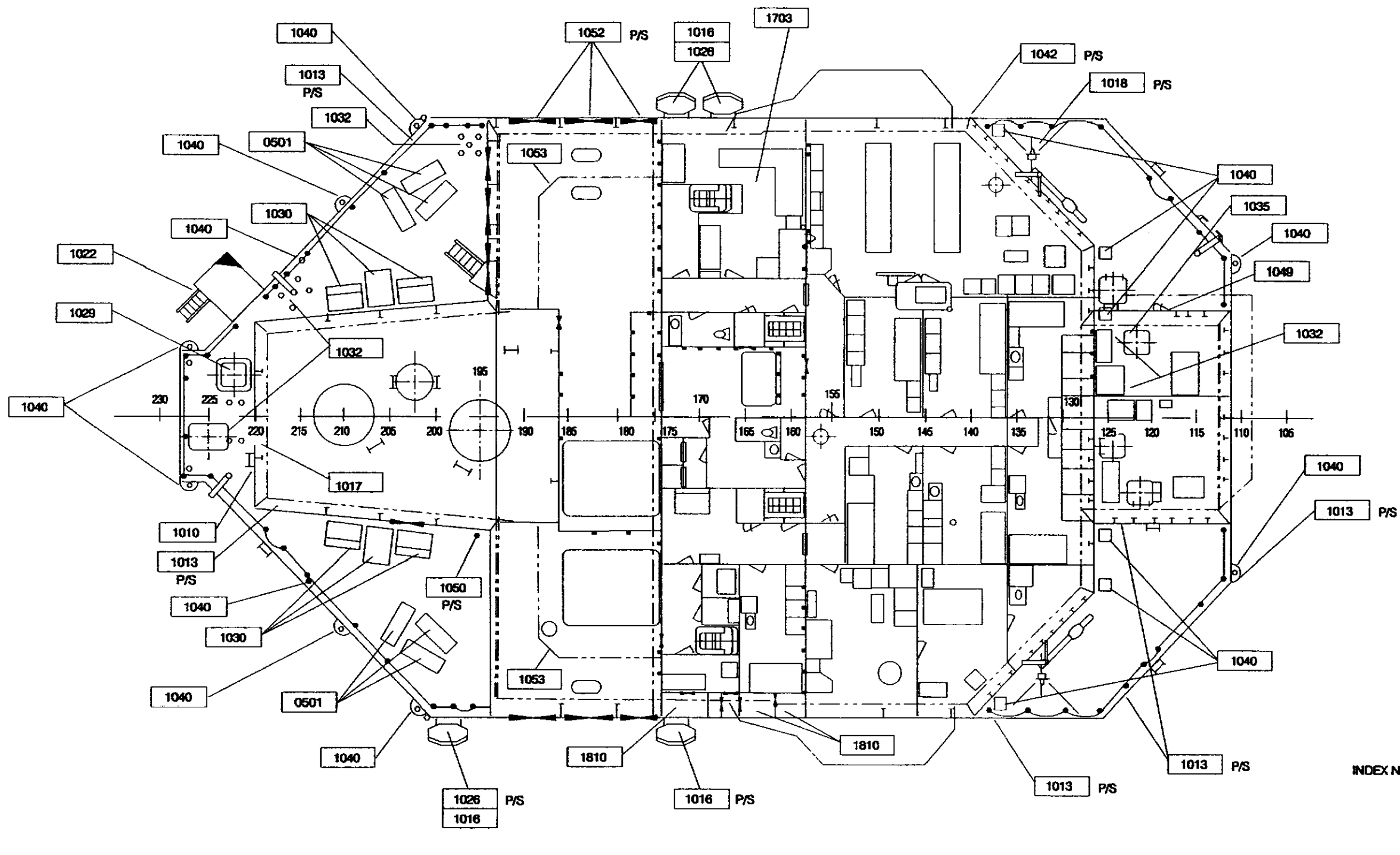


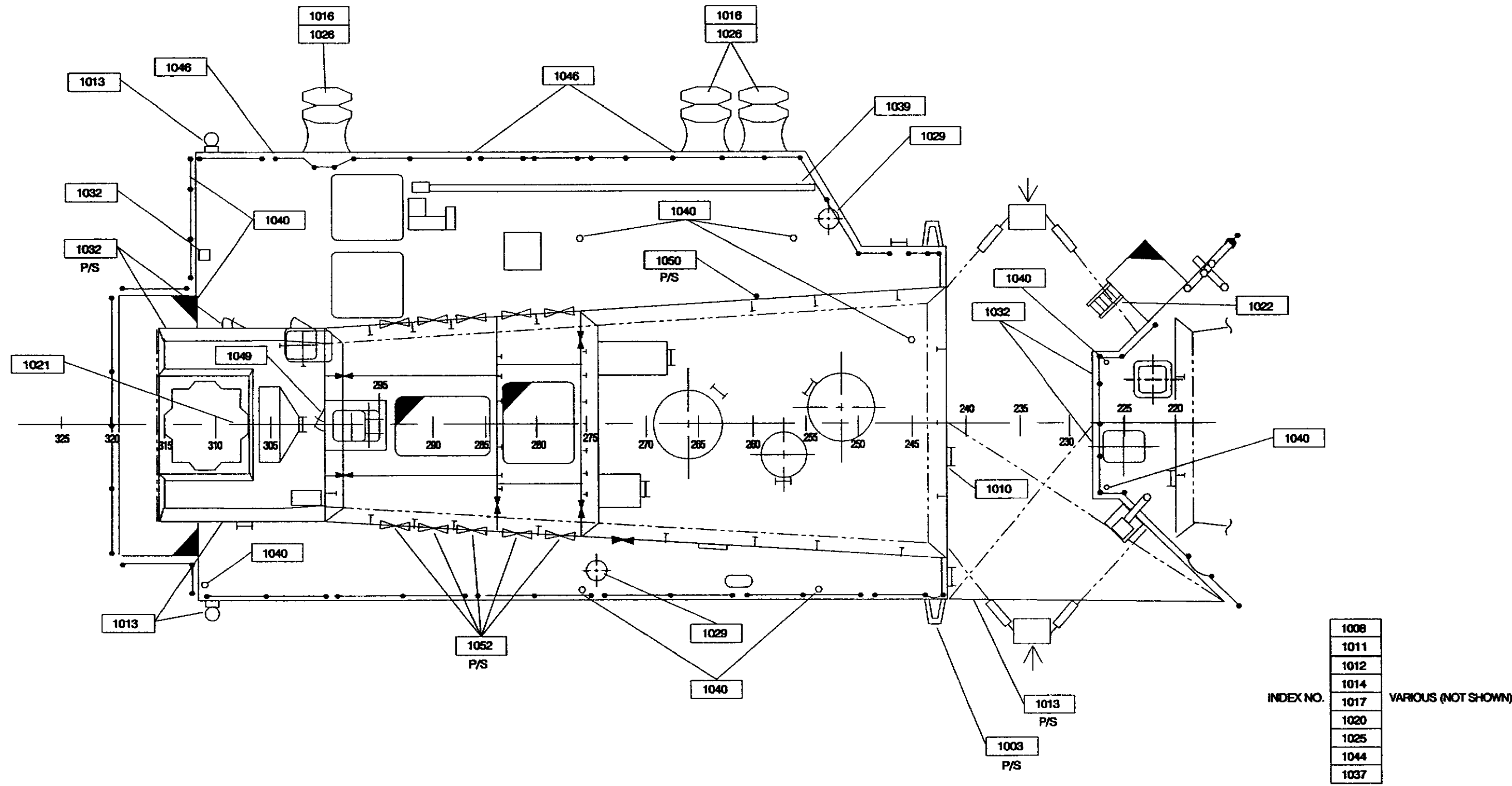
**Figure 4-5. Zone 5, 02 Level Frames 111-228
(For DDG 52 Only)**



	1008
1011	1037
1012	
1014	VARIOUS (NOT SHOWN)
1017	
1020	
1025	1056
1051	

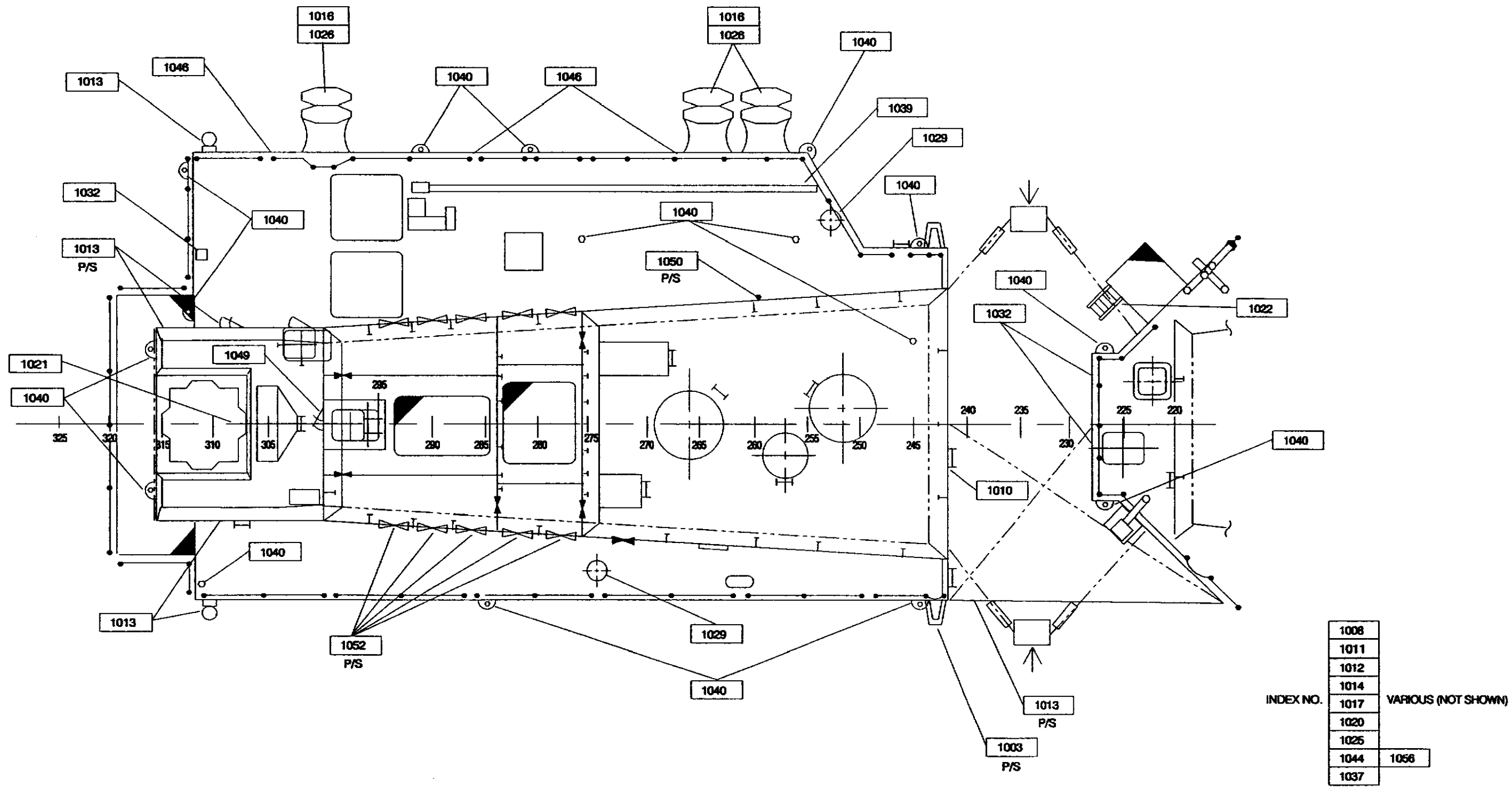
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Figure 4-5.1. Zone 5, 02 Level Frames 111-228
(For DDG 55 Through DDG 67)



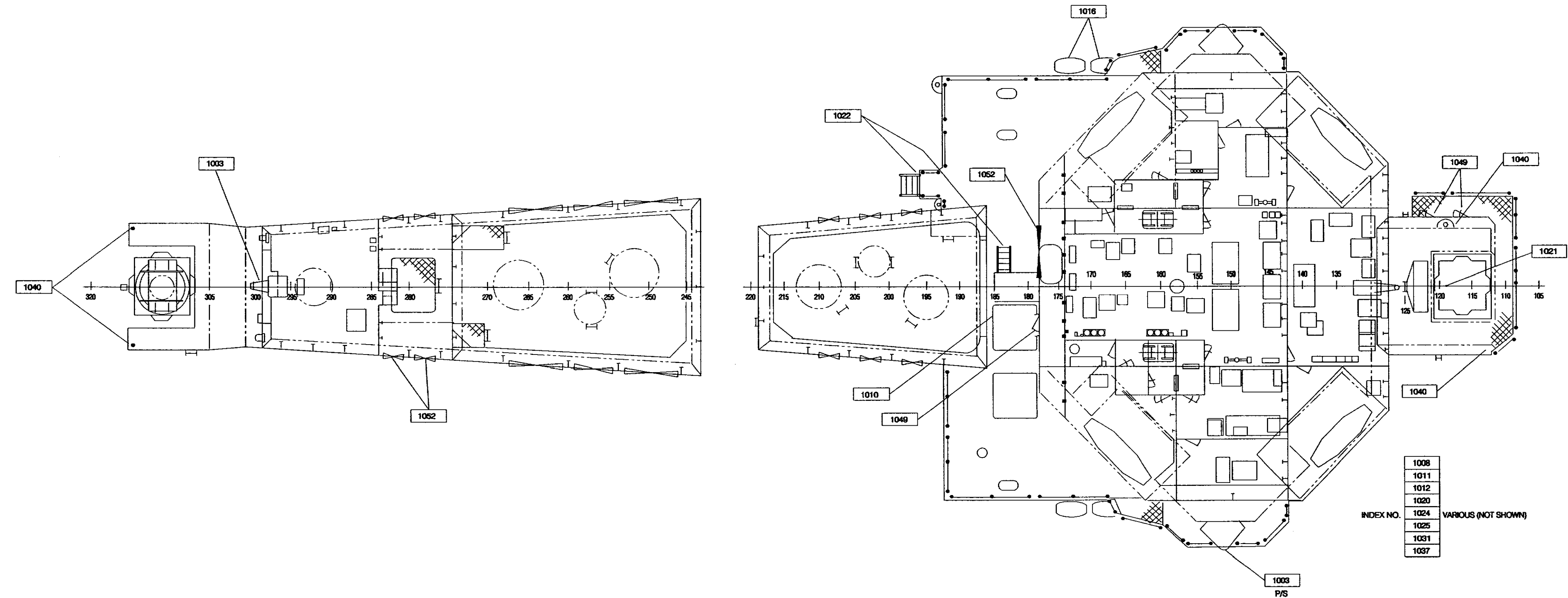
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Figure 4-6. Zone 6, 02 Level Frames 220-320
(For DDG 52 Only)



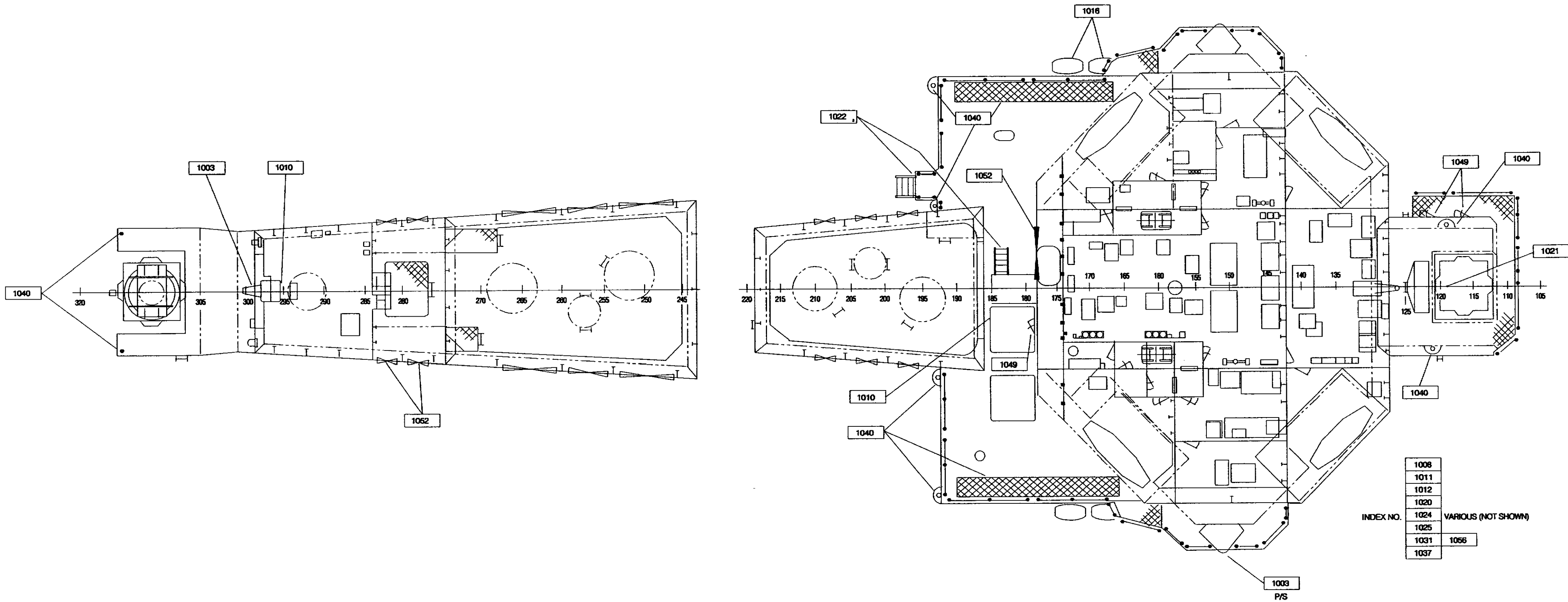
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Figure 4-6.1. Zone 6, 02 Level Frames 220-320
(For DDG 55 and Follow)



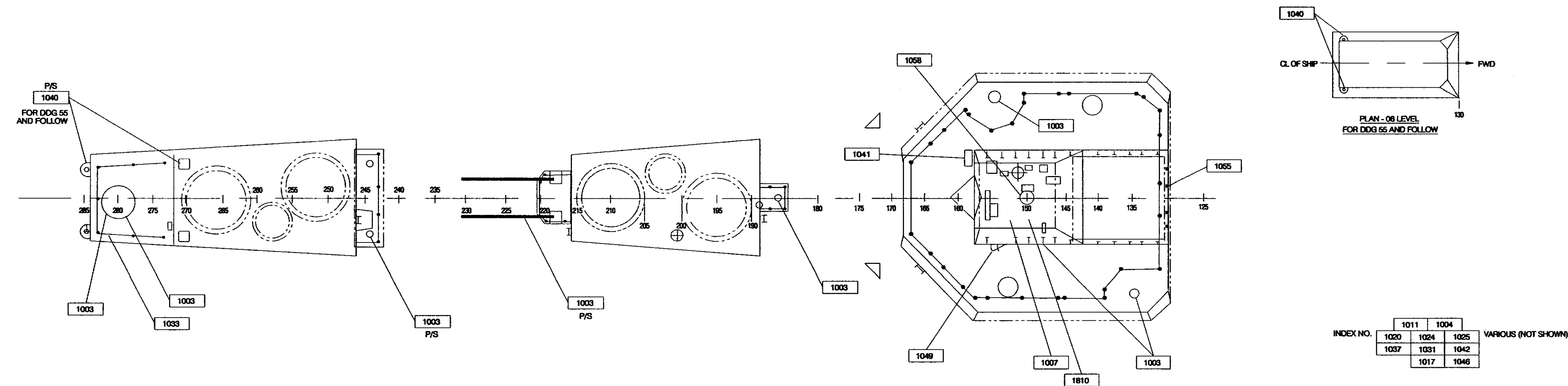
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Figure 4-7. Zone 7, 03 Level Frames 109-315
(For DDG 52 Only)



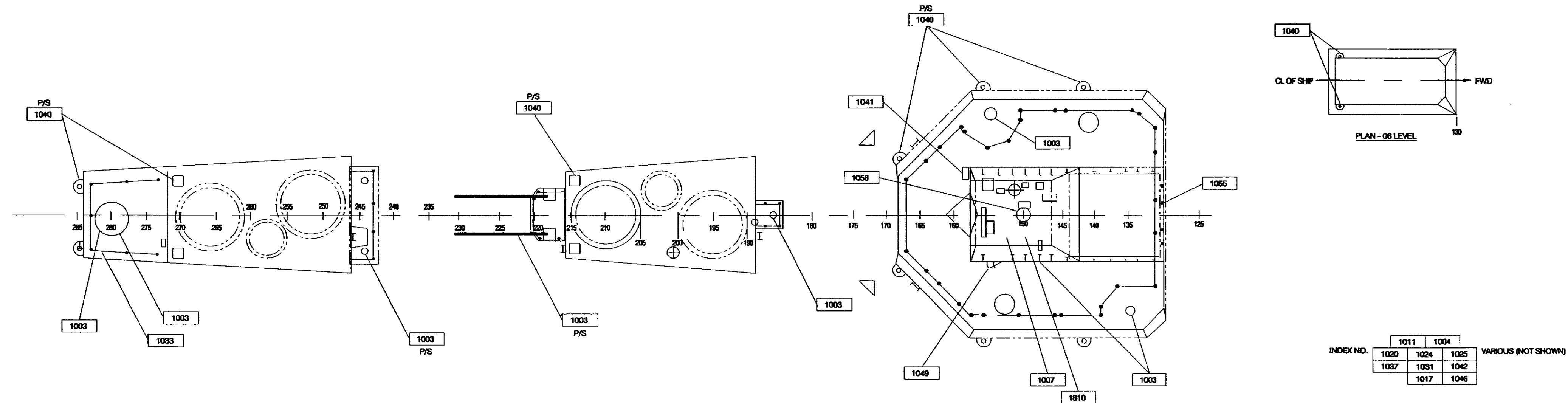
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Figure 4-7.1. Zone 7, 03 Level Frames 109-315
(For DDG 55 and Follow)



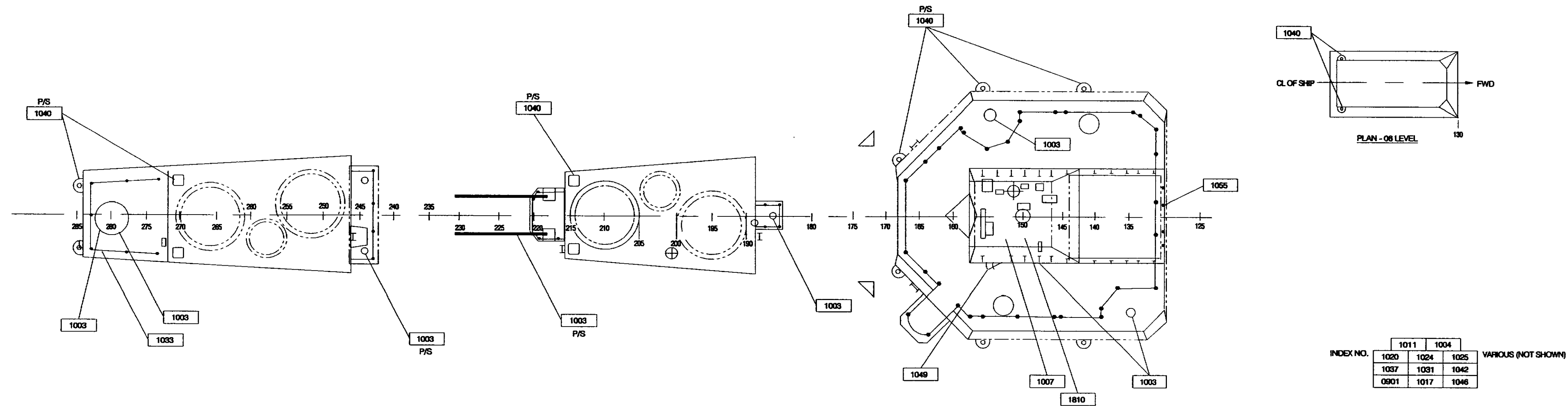
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Figure 4-9. Zone 9, 05 Level and Above
Frames 130-289 (For DDG 52, DDG 55 and DDG 57)



078_4_9.1_160.1

Figure 4-9.1. Zone 9, 05 Level and Above
Frames 130-289 (For DDG 59)



078_4_92_160.3

Figure 4-9.2. Zone 9, 05 Level and Above
Frames 130-289 (For DDG 61 and Follow)

CHAPTER 5

INTERIOR SPACES CORROSION PREVENTION SYSTEM APPLICATIONS

5-1 GENERAL.

This chapter identifies all items of hardware located inside the ship to which corrosion preventive guidelines apply. The interior spaces of the ship have been divided into nine inspection zones (see Table 5-1). All corrosion prone structures, surfaces or equipment in a particular inspection zone are itemized on the index for the zone. Each item on the list is assigned an index number. Items which occur in multiple topside zones are assigned Zone 18 index numbers.

5-1.1 INDIVIDUAL ZONE LINE DRAWING.

The inspection zones are shown in Figures 5-1 through 5-9. Zones 11-17, and 19 are specific areas; Zone 18 covers miscellaneous interior spaces. A plan view for each of zones 11-17, and 19 have been prepared to show locations of the individual corrosion control systems. There is no line drawing for Zone 18 because it covers miscellaneous items which are shown in the individual interior spaces.

5-1.2 INDIVIDUAL ZONE INDEX. This index shows in table form all corrosion control items located in each zone. There are two types of index numbers. Items unique to a zone will have an index number for the zone. Items that occur in more than one zone will have an index number 18XX. Tables 5-2 through 5-10 are an index listing of applications for each individual zone in the interior spaces of the ship.

5-1.3 CORROSION PROBLEM SUMMARY SHEET. A corrosion summary sheet has been prepared for every item. These are located either in the individual zone (if unique) or in Zone 18 (Miscellaneous Interior Areas), if the item appears in more than one zone. The summary

sheet describes each problem area or component and lists exact locations. The type and extent of corrosion is given for a typical case and the frequency of occurrence is indicated in general terms. The sheet describes early signs to look for and gives other guidelines pertinent to performing periodic inspection for corrosion damage. The summary sheet indicates corrective and preventive action that shall be taken and cites pertinent procedures and corrosion preventive systems covered by this manual.

5-1.4 SERVICE REQUIREMENTS AND LIFE CYCLE MAINTENANCE. Service requirements include preventive and corrective maintenance action which can be performed by the ship's force. Life cycle maintenance, other than the service requirements performed by the ship's crew and listed in each corrosion summary sheet, is generally performed at the Depot/IMA Level, the Ship Restricted Availability (SRA) and Regular Overhaul Maintenance (ROM) requirements are also performed at the Depot/IMA Level on an inspect and repair as needed basis.

5-2 INTERIOR SPACES CORROSION PREVENTION SYSTEMS APPLICATIONS.**5-2.1 ZONE NO. 11, 3RD PLATFORM, FRAMES 126 - 220.**

1. Plan view of the zone
2. Index of applications in the zone
3. Corrosion summary sheets for each item, including illustration where possible
4. Ship service requirements.

5-2.2 ZONE NO. 12, 3RD PLATFORM,
FRAMES 220 - 338.

1. Plan view of the zone
2. Index of applications in the zone
3. Corrosion summary sheets for each item, including illustrations where possible
4. Ship service requirements.

5-2.3 ZONE NO. 13, 2ND PLATFORM,
FRAMES 78 - 220.

1. Plan view of the zone
2. Index of applications in the zone
3. Corrosion summary sheets for each item, including illustrations where possible
4. Ship service requirements.

5-2.4 ZONE NO. 14, 2ND PLATFORM,
FRAMES 254 - 420.

1. Plan view of the zone
2. Index of applications in the zone
3. Corrosion summary sheets for each item, including illustrations where possible
4. Ship service requirements.

5-2.5 ZONE NO. 15, 1ST PLATFORM,
FRAMES 175 - 375.

1. Plan view of the zone
2. Index of applications in the zone
3. Corrosion summary sheets for each item, including illustrations where possible
4. Ship service requirements.

5-2.6 ZONE NO. 16, 1ST PLATFORM,
FRAMES 375 - 470.

1. Plan view of the zone
2. Index of applications in the zone
3. corrosion summary sheets for each items, including illustrations where possible
4. Ship service requirements.

5-2.7 ZONE NO. 17.1, MAIN DECK,
FRAMES 70 - 126, ZONE NO. 17.2, MAIN
DECK, FRAMES 126 - 255, ZONE NO. 17.3,
MAIN DECK, FRAMES 255 - 370.

1. Plan view of the zone
2. Index of application in the zone
3. Corrosion summary sheets for each item, including illustrations where possible
4. Ship service requirements.

5-2.8 ZONE NO. 18, MISCELLANEOUS
INTERIOR AREAS.

1. Miscellaneous items shown on plan views of other interior zones
2. Index of applications listed where applicable for other interior zones
3. Corrosion summary sheets for each item, including illustrations where possible
4. Ship service requirements.

5-2.9 ZONE NO. 19, 41'-0" ABOVE BASE
LINE FLAT FRAME NN - 42.

1. Plan view of the zone
2. Index of applications in the zone
3. Corrosion summary sheets for each item, including illustrations where possible
4. Ship service requirements.

Table 5-1. Corrosion Control Zones

Topside/ Interior	Zone	Location	Paragraph	Figure
Interior	11	3rd Platform: Frames 126-220	5.2.1	
Interior	12	3rd Platform: Frames 220-338	5.2.2	
Interior	13	2nd Platform: Frames 78-220	5.2.3	
Interior	14	2nd Platform: Frames 254-420	5.2.4	
Interior	15	1st Platform: Frames 175-375	5.2.5	
Interior	16	1st Platform: Frames 375-470	5.2.6	
Interior	17.1	Main Deck: Frames 70-126	5.2.7	
Interior	17.2	Main Deck: Frames 126-255	5.2.7	
Interior	17.3	Main Deck: Frames 255-370	5.2.7	
Interior	18	Miscellaneous Interior Areas	5.2.8	
Interior	19	41'-0" Above Baseline Flat: Frame Mn-42	5.2.9	

Table 5-2. Corrosion Control Zone 11 (see Figure 5-1)

Zone Number: 11		Location: 3rd Platform	Frames: 126 to 220
Index Number	Description	Index Numbers for Other Zones	
	<u>Problems Common to Other Areas:</u>		
	Air Conditioning Foundations	1802	
	AMR No. 1 and 2 Foundations	1803	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Engine Room No. 1 and 2 Foundations	1806	
	Miscellaneous Foundations	1809	
	Pipe Hangers and Fasteners (Steel Only)	1031	

Table 5-3. Corrosion Control Zone 12 (see Figure 5-2)

Zone Number: 12		Location: 3rd Platform	Frames: 220 to 338
Index Number	Description	Index Numbers for Other Zones	
	<u>Problems Common to Other Areas:</u>		
	Air Conditioning Foundations	1802	
	AMR No. 1 and 2 Foundations	1803	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Engine Room No. 1 and 2 Foundations	1806	
	Pipe Hangers and Fasteners (Steel Only)	1031	

Table 5-4. Corrosion Control Zone 13 (see Figure 5-3)

Zone Number: 13		Location: 2nd Platform	Frames: 78 to 228
Index Number	Description	Index Numbers for Other Zones	
1301	Distilling Plant Foundations/R.O. Desalinator Foundations		
	<u>Problems Common to Other Areas:</u>		
	Air Compressor Foundations	1801	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Countermeasure Washdown Pipe Hangers	1012	
	Engine Room No. 1 and 2 Foundations	1806	
	Pipe Hangers and Fasteners (Steel Only)	1031	
	Reduction Gear Dehumidifier System	1812	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: For DDG 52-DDG 63 Distilling Plant Foundation. For DDG 65 and Follow, Reverse Osmosis Plant Foundation

AREA OF OCCURRENCE: Zone 13, 2nd Platform

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These foundations are subject to heat, humidity, and impact (See Figure 5-1301).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

DISTILLING PLANT

DDG 52 - DDG 63

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

Associated NAVSEA Drawings: 180-6598782, 180-6597687, 505-6596794 and 600-6596673.
2. Apply metal spray coating (System 2) to foundations prior to installation of distilling plant. Do not apply to machined surfaces. Extend System 2 at least 6 inches outward into the surrounding deck.
3. Polysulfide sealer (System 9) shall be applied to faying surfaces prior to installation of plants.
4. Fasteners shall be carbon steel treated with ceramic coating (System 5), if greater than 3/8-inch diameter (Grade 5 and below) or CRES 316 (System 14), if 3/8-inch or less in diameter.
5. Apply anti-seize compound (System 6) to fasteners prior to installation.

REVERSE OSMOSIS PLANT

DDG 65 - DDG 78

1. Surface preparation and system application shall be in accordance with Chapters 3 and 4 of this manual and the references contained therein.

Associated NAVSEA Drawings: 180-6598782, 180-6597687, 505-6596794 and 600-6596673.
2. DDG 65 - DDG 74. Do not apply System 2. Apply zinc rich epoxy primer prior to applying the epoxy coating system and prior to installation of foundations. Do not apply coating system to machined surfaces. In bilge areas, the surrounding deck area and out to a minimum of 6 inches shall be power tool cleaned to SSPC-SP3, feathered edged and then coated with one coat of MIL-P-24441, F-150 (3 mils DFT); a second coat of MIL-P-24441, F151 (3 mils DFT); and a third coat of MIL-P-24441, F-158 (2 mils DFT).

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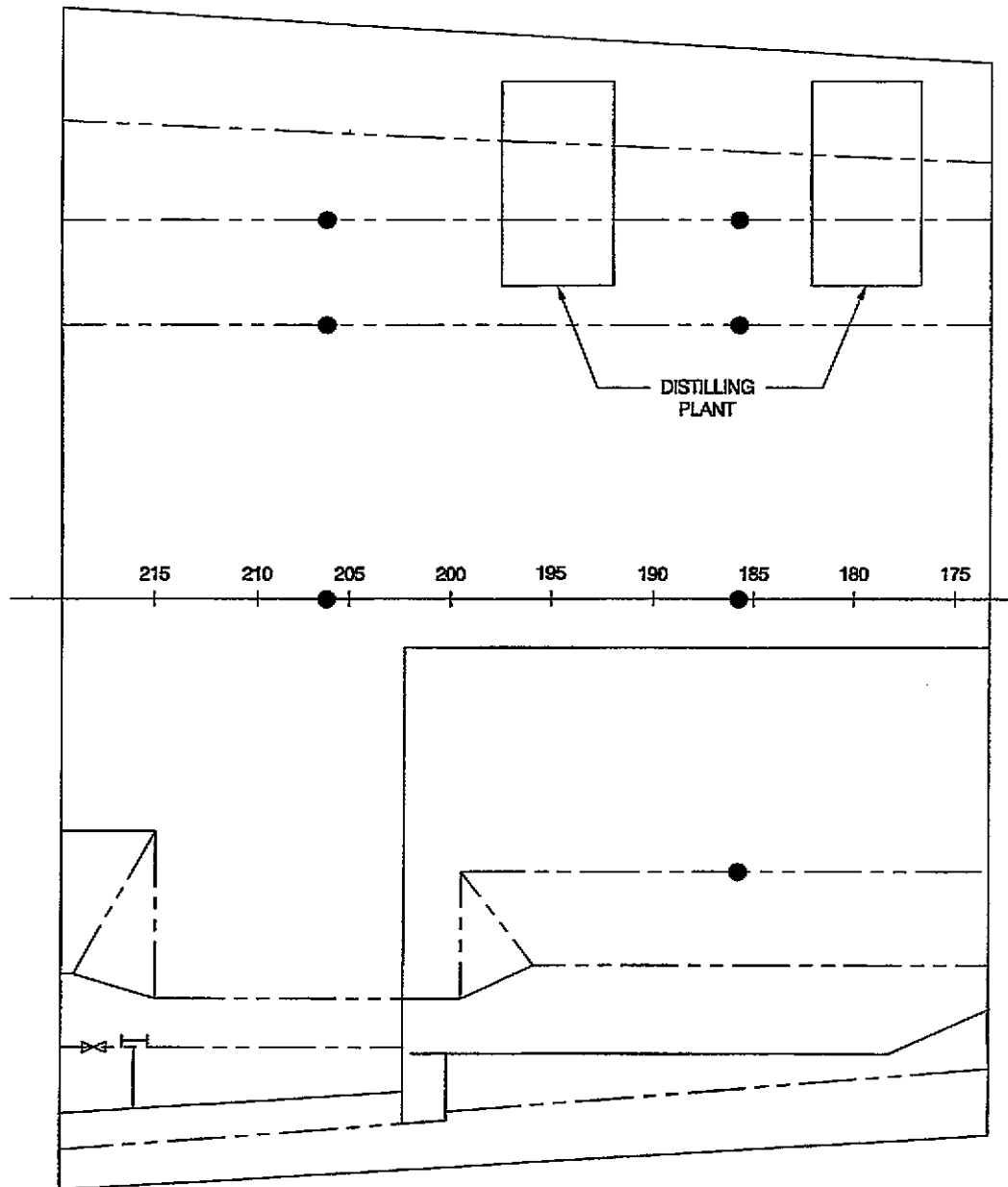
- 2.1. DDG 78. After meeting the surface preparation requirements of SSPC-SP11, the zinc rich epoxy shall be applied only to the weld line areas of foundation/support structures, prior to coating with the epoxy paint system.
3. Polysulfide sealer (System 9) shall be applied to faying surfaces prior to installation of plants.
4. DDG 65 - DDG 74. Fasteners shall be carbon steel treated with ceramic coating (System 5), if greater than 3/8-inch diameter (Grade 5 and below) or CRES 316 (System 14), if 3/8-inch or less in diameter. Fasteners with Grade 5 strength requirements greater than 1-inch in diameter, which utilize self-locking nuts, shall be nickel-copper (Monel, System 16).
5. DDG 78. Fasteners shall be corrosion resistant material CRES 316 (System 14).
6. DDG 74 - DDG 78. Coaming and deck drains for each plant shall be CRES 316 (System 14), including both proportional brominators and seawater reducing stations.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed. Reapply System 6 and System 9 as needed.

Index Number 1301

Distilling Plant Foundation/Reverse Osmosis Plant Foundation

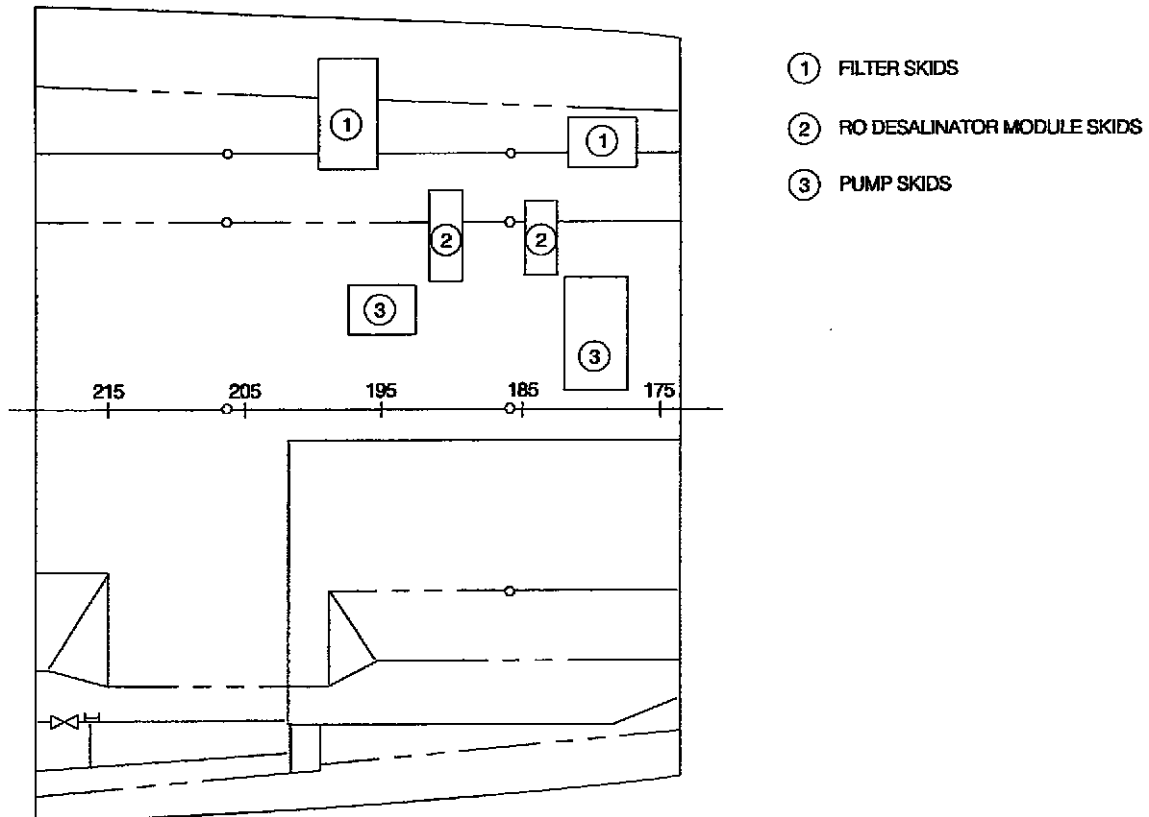
<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Distilling Plant (DDG 52-63)	2nd Platf Frame 177 Port	13
Distilling Plant (DDG 52-63)	2nd Platf Frame 193 Port	13
RO Desalinators	2nd Platf Frame 186 Port	13
Filter	2nd Platf Frame 180 Port	13
Pump	2nd Platf Frame 180 Port	13
RO Desalinators	2nd Platf Frame 194 Port	13
Filter	2nd Platf Frame 195 Port	13
Pump	2nd Platf Frame 195 Port	13



ENGINE ROOM NO. 1 (4-174-0-E)
APPROXIMATE LOCATION OF DISTILLING PLANT FOUNDATIONS

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Figure 5-1301. Distilling Plant Foundation Locations (DDG 52 - DDG 63) (Sheet 1 of 2)



ENGINE ROOM NO.1 (4-174-0-E)
APPROXIMATE LOCATION OF RO DESALINATOR FOUNDATIONS

CD_Z_2095

Figure 5-1301. Reverse Osmosis Desalinator Plant Foundation Locations
(DDG 65 and Follow) (Sheet 2 of 2)

Table 5-5. Corrosion Control Zone 14 (See figure 5-4)

Zone Number: 14		Location: 2nd Platform	Frames: 254 to 420
Index Number	Description	Index Numbers for Other Zones	
1401	JP-5 Pump Foundations		
	<u>Problems Common to Other Areas:</u>		
	Air Compressor Foundations	1801	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Hawser Reels (Mooring Line Reels)	1808	
	Miscellaneous Foundations	1809	
	Pipe Hangers and Fasteners (Steel Only)	1031	
	Reduction Gear Dehumidifier System	1812	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: JP-5 Pump Foundations

AREA OF OCCURRENCE: Zone 14, 2nd Platform

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These foundations are subject to heat, humidity, and impact (see Figure 5-1401).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

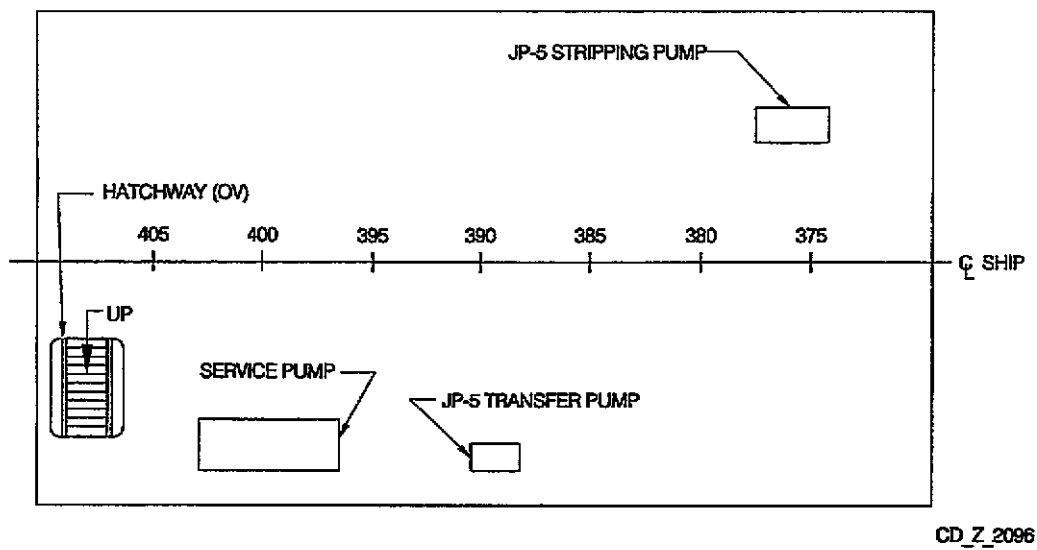
NAVSEA JP-5 Pump Foundations and Associated Drawings: 180-6597714, 600-6596700 and 505-6596845.
2. DDG 52 - DDG 65. Apply metal spray coating (System 2) to foundations prior to installation of pumps. Do not apply to machined surfaces. Extend metal spray coating at least 6 inches outward onto surrounding deck.
3. DDG 67 - DDG 78. Delete metal spray and apply zinc rich epoxy primer to JP-5 stripping pump, JP-5 service pump and JP-5 transfer pump foundations prior to coating with epoxy paint system.
4. DDG 78. After meeting surface preparation cleaning requirements of SSPC-SP11, the zinc rich epoxy shall be applied only to the weld line areas of foundation/support structure.
5. DDG 52 - DDG 74. Fasteners shall be carbon steel treated with ceramic coating (System 5), if greater than 3/8-inch diameter (Grade 5 and below only) or CRES 316 (System 14), if 3/8-inch or less in diameter.
6. DDG 78. Fasteners shall be of corrosion resistant material (System 14).
7. Polysulfide sealant (System 9) shall be applied to faying surfaces prior to installation of pumps.
8. Apply anti-seize compound (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed. Reapply System 6 and System 9 as needed.

Index Number 1401

JP-5 Pump Foundations

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
JP-5 Stripping Pump	2nd Platf Frame 375 Port	14
JP-5 Service Pump	2nd Platf Frame 400 Stbd	14
JP-5 Transfer Pump	2nd Platf Frame 390 Stbd	14



GENERATOR ROOM (3-370-0-E) 2ND PLATFORM
APPROXIMATE LOCATION OF JP-5 PUMPS

Figure 5-1401. JP-5 Pump Foundation Locations

Table 5-6. Corrosion Control Zone 15 (see Figure 5-5)

Zone Number: 15		Location: 1st Platform	Frames: 175 to 375
Index Number	Description	Index Numbers for Other Zones	
	<u>Problems Common to Other Areas:</u>		
	Air Escape Vents	1002	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Compartment Check-off List Holders	1011	
	Pipe Hangers and Fasteners (Steel Only)	1031	

Table 5-7. Corrosion Control Zone 16 (see Figure 5-6)

Zone Number: 16		Location: 1st Platform	Frames: 375 to 470
Index Number	Description	Index Numbers for Other Zones	
1601	NIXIE Room		
1602	Not Used		
1603	TACTAS Hoist Room		
1604	Washing Machine and Sink Foundations		
	<u>Problems Common to Other Areas:</u>		
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Compartment Check-off List Holders	1011	
	Exhaust and Intake Vent Screens	1017	
	Pipe Hangers and Fasteners (Steel Only)	1031	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: NIXIE Room

AREA OF OCCURRENCE: Zone 16, NIXIE Room, 2-450-1-Q

TYPE OF CORROSION: Seawater, Abrasion

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: During inhaul of the NIXIE towed body, the side plates and ramp plates of the transom opening guide the cable into the sheave of the associated fairlead assembly. As cable accumulates on the winch drum, this assembly pivots in response to lateral motions of the fleet angle compensator. Abrasion and seawater make it difficult to maintain corrosion protection of NIXIE room equipment, decks, structures, and foundations (see Figure 5-1601).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Nixie Room, Winch Foundation and Associated Drawings: 180-6597719, 595-6595890, 595-6597237 and 600-6596707.
2. DDG 52 - DDG 61. Apply metal spray coating (System 2) to the NIXIE equipment room decks and bulkheads (to 4 feet above the deck), winch foundation, after installation bolsters, interior and exterior of watertight transom closures.
3. DDG 63 - DDG 74. Apply System 2 to the deck mounted foundations. Prime decks and bulkheads (from deck to 4 feet above the deck), other foundations, bolsters, interior and exterior panes of watertight transom closures with inorganic zinc silicate paint prior to coating with a epoxy paint system.
4. DDG 78. Prime decks and bulkheads (from deck to 4 feet above the deck), other foundations, bolsters, interior and exterior panels of watertight transom closures with a NAVSEA approved epoxy primer prior to coating with the epoxy paint system.
5. DDG 52 - DDG 74. Fasteners used to mount equipment shall be carbon steel coated with ceramic metallic coating (System 5), if greater than 3/8-inch in diameter and CRES 316, if 3/8-inch in diameter or less.
6. DDG 78. Fasteners (System 14) and locking mechanism shall be CRES 316. Hinge pins, door drop bolts, cotter and toggle pins to be CRES 316. Roll, pivot and drop bolt ferrule pins to be CRES 304, Monel or naval brass (System 16).
7. Polysulfide sealant (System 9) shall be applied to all foundations prior to mounting equipment.
8. Where necessary to join dissimilar metals, a dielectric barrier of insulating tape MIL-I-24391 (or equal) shall be provided.

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9. Apply Polysulfide thread sealant (System 8). Apply anti-seize compound (System 6) prior to installation where polysulfide sealant (System 8) is not used.
10. Where corrosion control requirements conflict with bonding and grounding requirements of NAVSEA Drawings 300-6597363 (DDG 52 - DDG 57) and 300-6598108, (DDG 59 - DDG 78) bonding and grounding requirements shall take precedence.

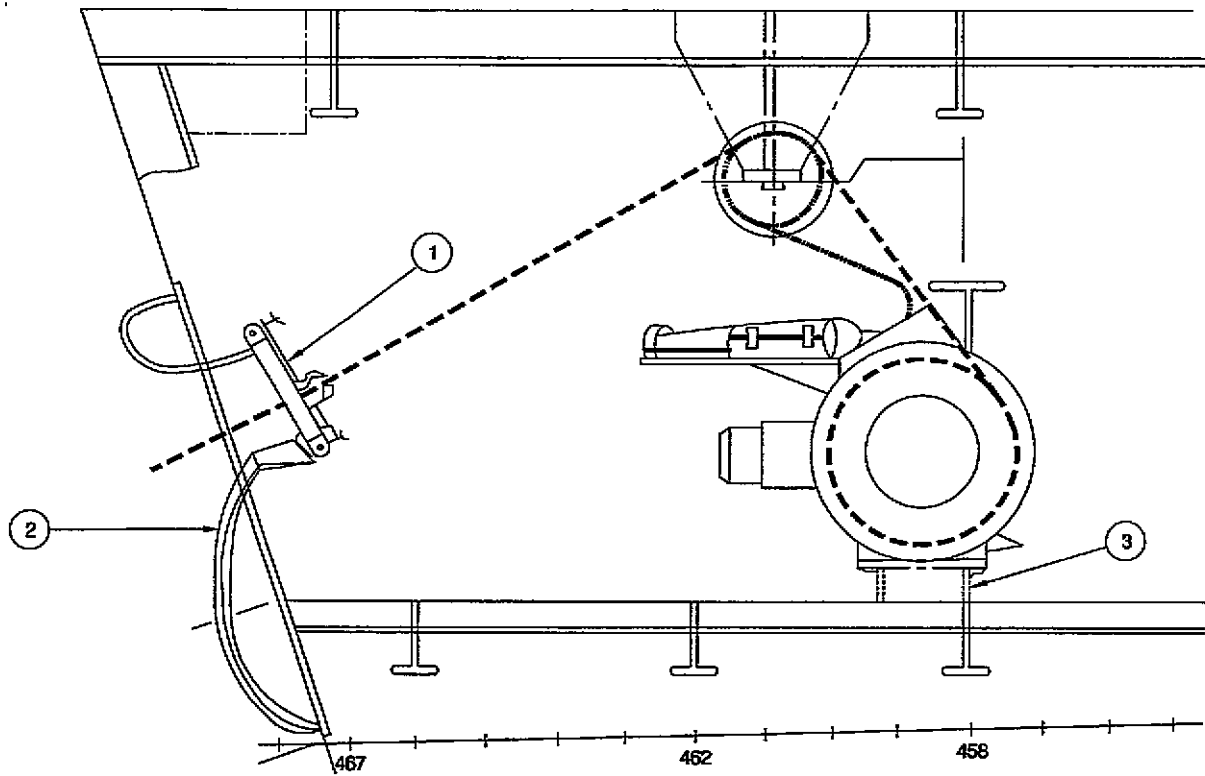
SERVICE REQUIREMENTS (SHIP): Replace fasteners as needed. Inspect and touch up as required. Replace System 9 and dielectric barrier as needed.

Index Number 1601

NIXIE Room

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Fairlead Chock	NIXIE Room Transom	16
Door	NIXIE Room Transom	16
Door Stop	NIXIE Room Transom	16
NIXIE Winch Foundation	NIXIE Room Frame 458	16

1. DOOR
2. FAIRLEAD
3. NIXIE WINCH FOUNDATION



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Figure 5-1601. NIXIE Room and Winch Foundation (Elevation Looking to Port)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: TACTAS Hoist Room

AREA OF OCCURRENCE: Zone 16, TACTAS Room

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: This room and equipment are subject to seawater and abrasion from normal operations (see Figure 5-1603).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapter 3, 4 and 8 of this manual and the references contained therein.

NAVSEA TACTAS Hoist Room and Associated Drawings: 180-6597724 and 600-6596707.
2. DDG 52 - DDG 61. Apply metal spray coating (System 2) to TACTAS hoist room deck and bulkheads (to 4 feet above the deck), winch foundation, fairleads and bolsters, interior and exterior panel of watertight transom closures, the handling drum, storage trough and other miscellaneous deck mounted foundations.
3. DDG 63 - DDG 74. Apply System 2 to the deck mounted foundations. Prime deck and bulkhead (from deck to 4 feet above the deck), bolster, fairleads, handling drum, interior and exterior panels of watertight transom closures and stowage through with inorganic zinc silicate paint prior to finish painting with epoxy paint system.
4. DDG 78. Prime deck and bulkhead (from deck to 4 feet above the deck), bolster, fairleads, handling drum, interior and exterior panels of watertight transom closures, and stowage trough with a NAVSEA approved epoxy primer prior to finish painting with epoxy system.
5. DDG 78. Apply anti-seize System 6 to fasteners prior to installation.
6. DDG 78. Locking mechanisms to be CRES 316. Fasteners to be corrosion resistant material (System 14).
7. Fasteners used to mount equipment shall be steel treated with ceramic metallic coating (System 5), if greater than 3/8-inch in diameter and CRES 316, if less than 3/8-inch in diameter.
8. Polysulfide sealer (System 9) shall be applied to all foundations except the fairlead assembly prior to mounting equipment.
9. Where necessary to join dissimilar metals, a dielectric barrier of insulating tape MIL-I-24391 (or equal) shall be provided.
10. Where corrosion control requirements conflict with bonding and grounding requirements of NAVSEA drawings 300-6597363 (DDG 52 - DDG 57) and 300-6598108 (DDG 59 - DDG 78), bonding and grounding requirements shall take precedence.

SERVICE REQUIREMENTS (SHIP): Replace fasteners and dielectric barrier as needed. Inspect monthly and touch up as needed. Reapply system 9 as needed.

Index Number 1603
TACTAS Hoist Room

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
TACTAS Winch Assembly Foundation	TACTS Room Frame 455	16
Fairlead Assembly	TACTAS Room Transom	16
Handling Drum Assembly Foundation	TACTAS Room Frame 461	16

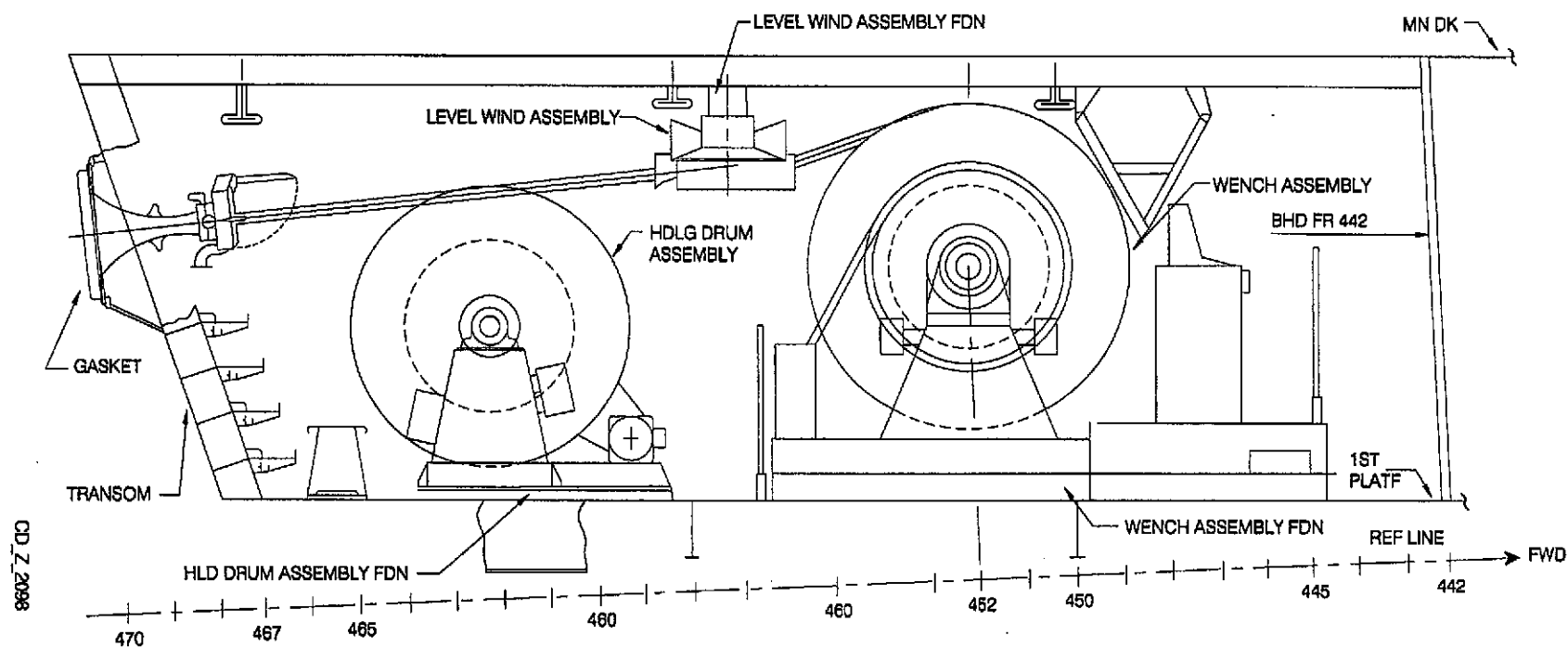


Figure 5-1603. TACTAS Hoist Room

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Washing Machine and Sink Foundations

AREA OF OCCURRENCE: Zone 16, Laundry

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: These foundations are subject to humidity and abrasion (see Figure 5-1604).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Washing Machine and Sink Foundations and Associated Drawings: 180-6597716, 600-6596706, 505-6596857 and 655-6595991.
2. DDG 52 - DDG 74. Apply metal spray coating (System 2) to foundation surfaces prior to installation of equipment. Do not apply to machined surfaces.
3. DDG 78. All machinery equipment foundations handling seawater, brine, chilled water, freshwater and foundations below the floor plate level in bilge areas, and supporting structure within 6 inches shall be primed with zinc rich epoxy and coated with a polyamide epoxy system.
4. DDG 78. Zinc based anti-seize thread compound (System 6) shall be used for CRES 316 and steel (Grade 5) fasteners subjected to temperatures less than 100° F, where polysulfide sealing and coating compound (System 8) is not used. Zinc based anti-seize compound shall not be used for fasteners made of Inconel, Monel, K-Monel, or Grade 8 steel fasteners. Anti-seize compound, MIL-A-907, shall be used with Inconel, Monel or K-Monel fasteners. No metallic based anti-seize compound shall be used on Grade 8 or B16 steel fasteners.
5. DDG 78. After meeting surface preparation cleaning requirements of SSPC-SP11, the zinc rich epoxy shall be applied only to the weld line areas of foundation/support structure.
6. Apply anti-seize compound (System 6) to fasteners prior to installation.

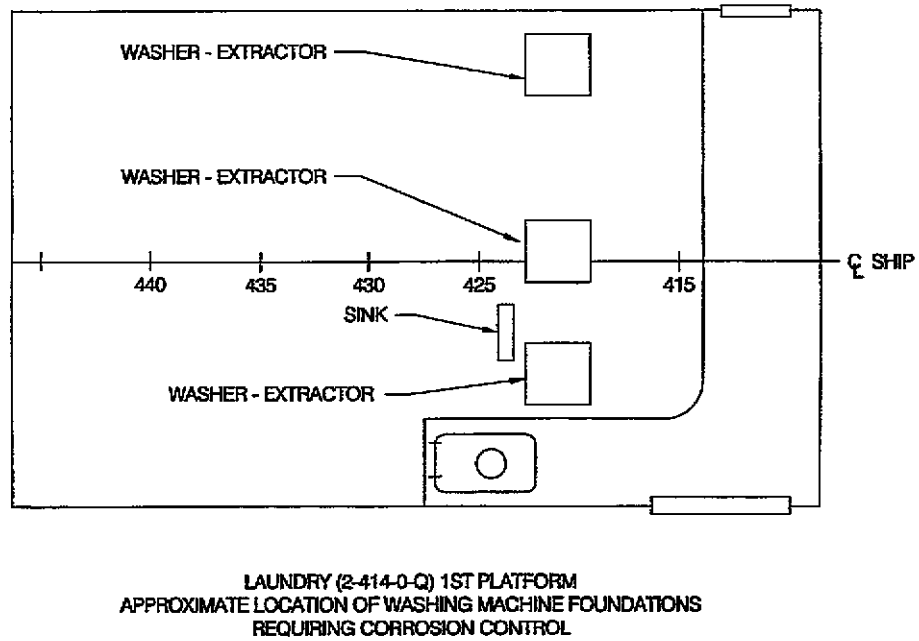
SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

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Index Number 1604

Washing Machine and Sink Foundations

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Washer-Extractor (60 lbs)	1st Plat Frame 417 CL	16
Washer-Extractor (60 lbs)	1st Plat Frame 417 Port	16
Washer-Extractor (20 lbs)	1st Plat Frame 417 Stbd	16
Sink	1st Plat Frame 419 Stbd	16



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Figure 5-1604. Washer-Extractor and Sink Foundation Locations

Table 5-8. Corrosion Control Zone 17 (see figures 5-7, 5-8, and 5-9)

Zone Number: 17		Location: Main Deck	Frames: 70-370
Index Number	Description	Index Numbers for Other Zones	
1701	AFFF Station No. 1		
1702	AFFF Station No. 2		
1703	Food Service Deck Areas		
	<u>Problems Common to Other Areas:</u>		
	Bolted Grounding Straps	1006	
	Bulkhead Mounted Fog Applicator Brackets	1020	
	Compartment Check-off List Holders	1011	
	Exhaust and Intake Vent Screens	1017	
	Gas Turbine Intake and Exhaust Fasteners (Main Deck and Above)	1056	
	Kick Pipes and Stuffing Tubes (Weather Exposed)	1024	
	Label Plates (Weather Exposed)	1025	
	Pipe Hangers and Fasteners (Steel Only)	1031	
	Weather Exposed Meter and Gage Cases	1051	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: AFFF Stations No. 1 and No. 2

AREA OF OCCURRENCE: Zone 17, Main Deck Frames 70 to 370

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: Decks are subject to potential spills of AFFF solution (see figure 5-1701).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance Chapters 3, 4 and 8 of this manual and the references contained therein.

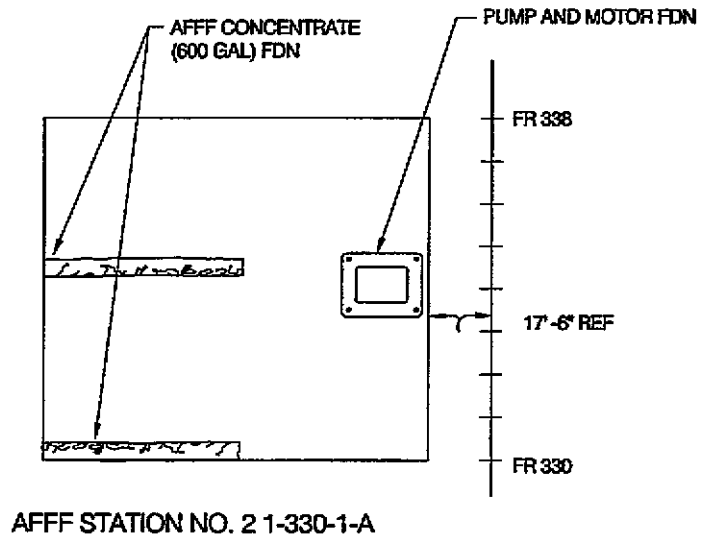
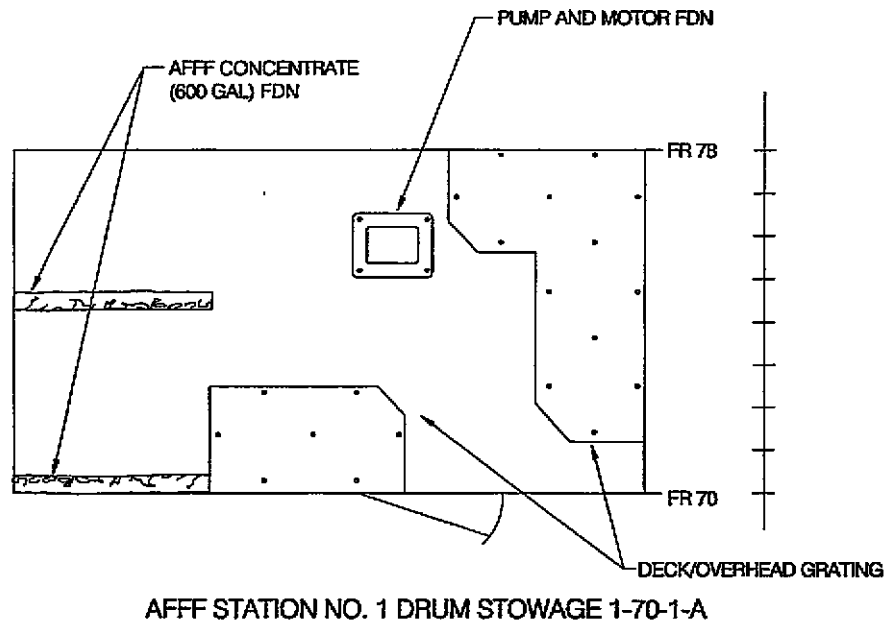
NAVSEA AFFF and Associated Drawings: 555-6597274, 555-6597285, 555-6597121, 300-6595826 and 600-6596658.
2. DDG 52 - DDG 63. Apply metal spray coating (System 2) to the deck surface in AFFF Stations 1 and 2, including the bulkheads to at least 6 inches above the deck. Overhead grating does not require System 2.
3. DDG 63 - DDG 78. Do not apply System 2. Paint decks and bulkheads with an epoxy paint system.
4. DDG 52 - DDG 78. Pipe hangars shall be treated in accordance with Item 1031.
5. DDG 78. All bronze, brass or corrosion resistant steel deck drain strainers shall be dielectrically insulated using polysulfide sealant (System 9).
6. DDG 52 - DDG 74. Deck drain fasteners shall be CRES 316 (System 14).
7. DDG 78. Deck drain fasteners shall be CRES 316 or nickel copper alloy. AFFF concentrate tanks shall be mounted with nickel copper alloy fasteners. Other fasteners to be corrosion resistant material (System 14).
8. DDG 52 - DDG 78. Deck clips shall have three coats of an epoxy paint system (System 4).
9. DDG 52 - DDG 78. Anti-seize thread compound (system 6) shall be applied to fasteners prior to installation.
10. Apply cosmetic coatings (System 15) as required.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Reapply System 6 and System 9 as needed. Replace fasteners and dielectric barrier as required.

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Index Numbers 1701 and 1702
AFFF Stations 1 and 2

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
AFFF Station 1 and Drum Stowage Deck	Mn Dk Frames 70-78 Stbd	17
AFFF Station No. 2 Deck	Mn Dk Frames 300-338 Stbd	17



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Figure 5-1701. AFFF Station Foundation Locations

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Food Service Deck Areas*

AREA OF OCCURRENCE: Zones 5 and 17B

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: The Food Service Deck Areas are subject to stains and corrosion.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS: *Not a Corrosion Control Item for DDG 63 and Follow.

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Food Services Deck Areas and Associated Drawings: 600-6596675, 600-6596715, 600-6596680, 651-6595943, 651-6595942, 651-6595941, 301-6596596 and 600-6596724.

2. For DDG 52, DDG 55, DDG 57 and DDG 59. Apply metal spray coating (MSC, System 2) to carbon steel deck areas of the crew/CPO galley, scullery, and ward room galley. For DDG 61, apply MSC to carbon steel areas of the scullery and ward room galley. For DDG 63 and Follow, do not apply MSC.
3. Apply topcoating in accordance with NAVSEA drawing 631-6596633.
4. Apply cosmetic coatings (System 15) as required.

SERVICE REQUIREMENTS (SHIP): Inspect and repair as needed.

Index Number 1703

Food Service Deck Areas

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Food Service Deck Areas	Mn Dk Frames 191-215 Port (Crew/CPO Galley)	17
Food Service Deck Areas	Mn Dk Frames 238-254 Stbd (Scullery)	17
Food Service Deck Areas	02 Lvl Frames 158-174 Port (Ward Room Galley)	5

Table 5-9. Corrosion Control Zone 18

Zone Number: 18		Location: Miscellaneous Interior Areas Common Problems	
Index Number	Description	Index Numbers for Other Zones	
1801	Air Compressor Foundations		
1802	Air Conditioning Plant Foundations		
1803	AMR No. 1 and No. 2 Foundations		
1804	Not Used		
1805	Not Used		
1806	Engine Rooms No. 1 and No. 2 Foundations		
1807	Not Used		
1808	Hawser Reels (Mooring Line Reels)		
1809	Miscellaneous Foundations		
1810	Ventilation Exhaust and Intake Plenums		
1811	Compressed Gas Bottle Stowage Racks		
1812	Reduction Gear Dehumidifier System		
1813	Sonar Dome (DDG 78)		
	<u>Problems Common to Other Areas:</u>		
	Bolted Grounding Straps	1006	
	Bulkhead Mounted Fog Applicator Brackets	1018	
	Compartment Check-off List Holders	1011	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Air Compressor Foundations

AREA OF OCCURRENCE: Zone 18, Engine Rooms No. 1 and No. 2

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: Machinery Foundations in the Engine Rooms (see Figure 5-1801).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

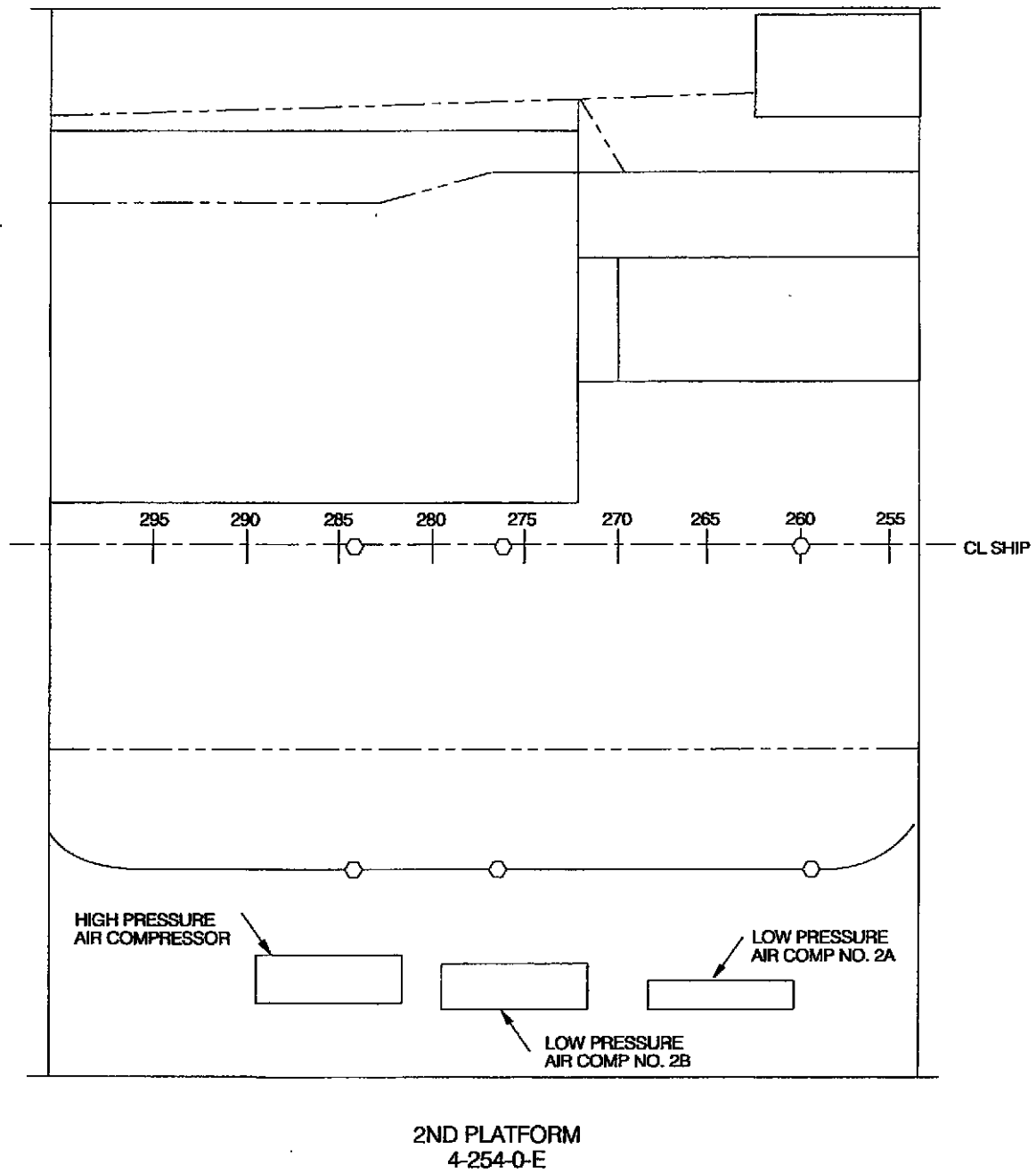
1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Air Conditioning and Associated Drawings: 600-6596684, 600-6596673, 505-6596794, 505-6596824, 180-6597680, 180-6597681, 180-6597694, 180-6597685 and 180-6597686.
2. DDG 52 - DDG 63. Apply metal spray coating (System 2) to foundations prior to installation of air compressors. Do not apply to machined surfaces. Extend System 2 at least 6 inches outward onto the surrounding deck.
3. DDG 65 - DDG 74. Do not apply System 2. Apply zinc rich epoxy primer to air compressor foundations prior to coating with epoxy paint system. Extend coatings at least 6 inches outward onto the surrounding deck.
4. DDG 78. After meeting surface preparation cleaning requirements of SSPC-SP11, the zinc rich epoxy shall be applied to the weld line areas of foundation/support structure only, prior to coating with epoxy paint system.
5. DDG 52 - DDG 74. Fasteners shall be carbon steel, treated with ceramic coating (System 5), if greater than 3/8-inch diameter (Grade 3 and below) or CRES 316 (System 14), if 3/8-inch or less in diameter.
6. DDG 78. Fasteners to be of corrosion resistant material (System 14).
7. Polysulfide sealant (System 9) shall be applied to faying surfaces prior to installation of air compressors.
8. Apply anti-seize compound (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

**Index Number 1801
Air Compressor Foundations**

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
High Pressure Air Compressor	ER 1, 2nd Platf Frame 210 Port	13
Low Pressure Air Compressor	ER 1, 2nd Platf Frame 215 Port	13
Low Pressure Air Compressor	ER 2, 2nd Platf Frame 270 Stbd	14
Low Pressure Air Compressor	ER 2, 2nd Platf Frame 262 Stbd	14
High Pressure Air Compressor	ER 2, 2nd Platf Frame 280 Stbd	14



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Figure 5-1801. Engine Room No. 2 Air Compressor Foundation Locations (Sheet 1 of 2)

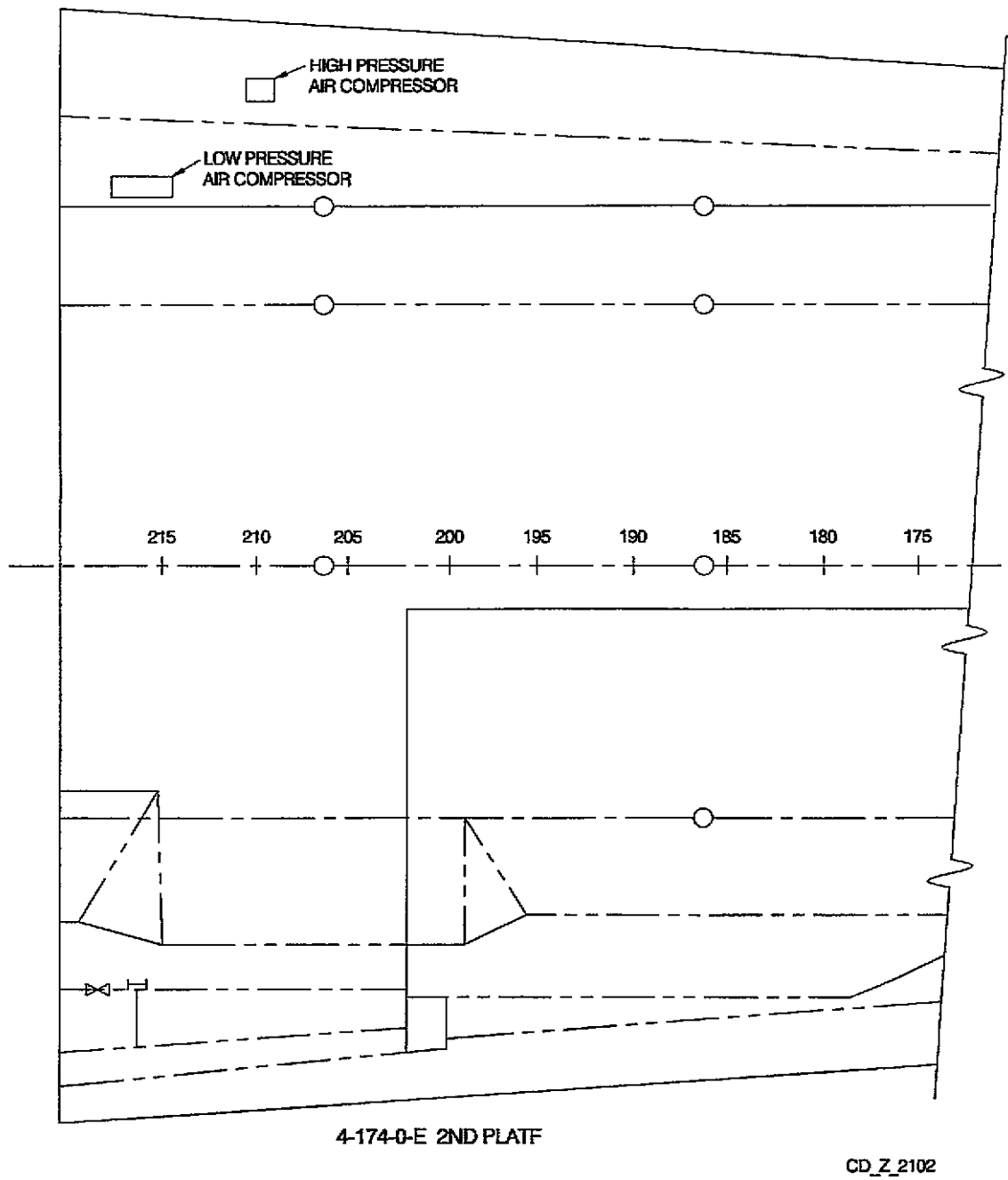


Figure 5-1801. Engine Room No. 1 Air Compressor Foundation Locations (Sheet 2 of 2)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Air Conditioning Plant Foundations

AREA OF OCCURRENCE: Zone 18, AMR No. 1 and No. 2 and A/C Machinery and Pump Room

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: Machinery (pump) foundations subject to heat and humidity (see Figure 5-1802).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

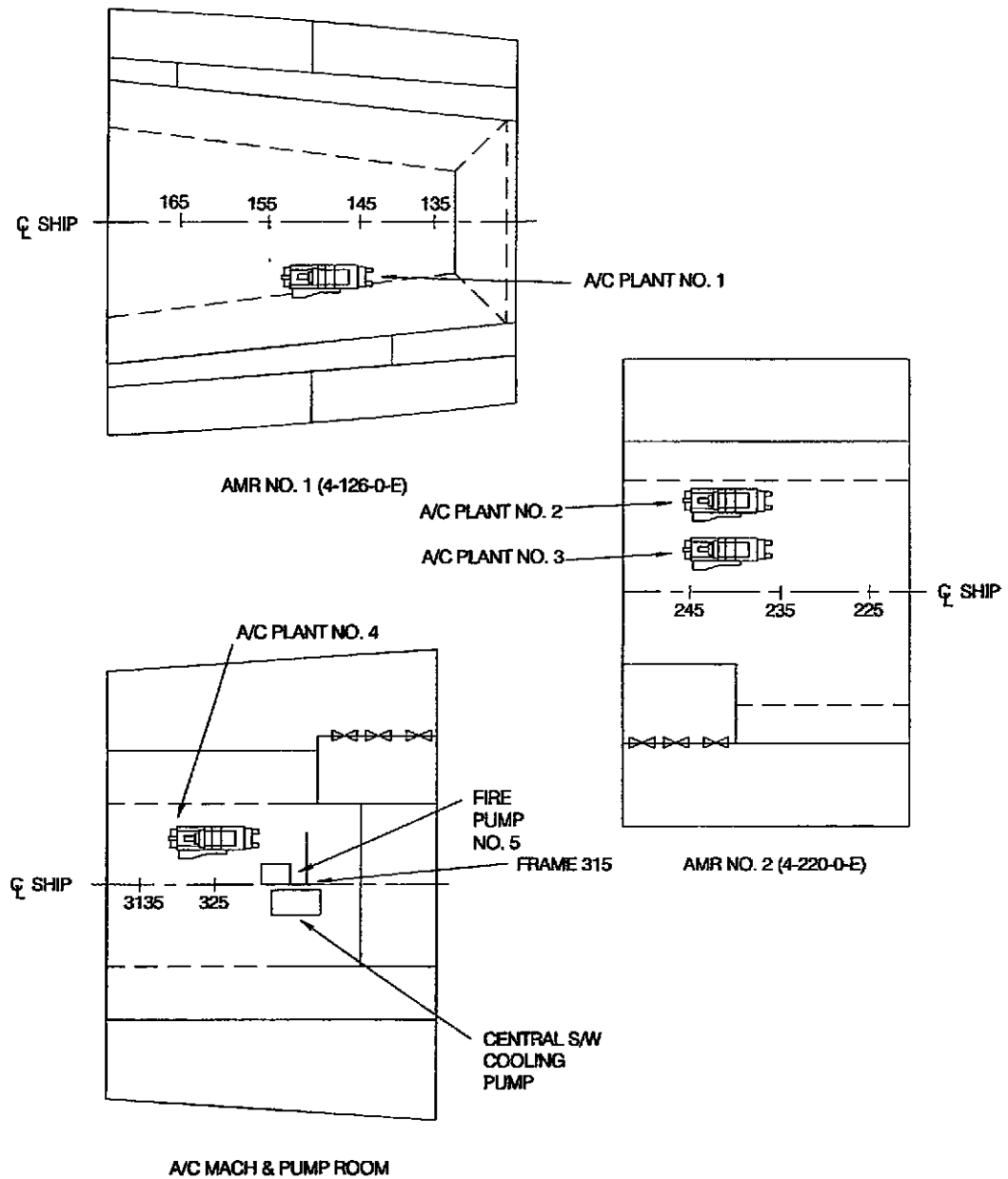
NAVSEA Air Conditioning and Associated Drawings: 600-6596667, 600-6596689, 600-6596677, 505-6596781, 505-6596801, 505-6596824, 180-6597700, 180-6597685, 180-6597686, 180-6597701 and 180-6597665.
2. DDG 52 - DDG 65. Apply metal spray coating (System 2) prior to installation of air compressors. Do not apply to machined surfaces. Extend System 2 at least 6 inches outward onto the surrounding deck.
3. DDG 67. Except for A/C Plant Foundations No. 2 and 3, apply metal spray coating (System 2) prior to installation of air compressors. Do not apply to machined surfaces. Extend System 2 at least 6 inches outward into the surrounding deck. For Air Conditioning Plant Foundations No. 2 and 3, do not apply System 2, apply zinc rich epoxy primer before applying epoxy paint System 3.
4. DDG 69 - DDG 74. Do not apply System 2. Apply zinc rich epoxy primer before applying epoxy paint System 3, to Air Conditioning Plant No. 1 through 4 foundations, Fire Pump No. 5 foundation and Central Seawater Cooling Pump foundations at least 6 inches outward onto the surrounding deck.
5. DDG 78. After meeting surface preparation cleaning requirement of SSPC-SP11, the zinc rich epoxy primer and System 3 shall be applied only to the weld line areas of foundation structures, prior to coating with the epoxy paint system.
6. DDG 52 - DDG 74. Fasteners shall be carbon steels treated with ceramic coating (System 5), if greater than 3/8-inch in diameter (Grade 5 and below only) or CRES 316 (System 14), if 3/8-inch or less in diameter.
7. DDG 78. Fasteners to be of corrosion resistant material (System 14).
8. Apply anti-seize compound (System 6) to fasteners prior to installation.
9. Polysulfide sealant (System 9) shall be applied to faying surface before installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1802

Air Conditioning Plant Foundations

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
A/C Plant	Hold Frame 144 Stbd AMR No. 1	11
A/C Plant	Hold Frame 237 Port AMR No. 2	12
A/C Plant	Hold Frame 318 Port, A/C Machinery and Pump Room	12 12
Fire Pump No. 5	Frame 318 Port, A/C Machinery and Pump Room	12
Central Seawater Cooling Pump	Frame 318 Stbd, A/C Machinery and Pump Room	12



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Figure 5-1802. Air Conditioning Plant Foundation

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: AMR No. 1 and No. 2 Foundations

AREA OF OCCURRENCE: Zone 18, AMR No. 1 and No. 2

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: Machinery foundations. See Figure 5-1803

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA AMR No. 1 and No. 2 Foundations and Associated Drawings: 180-6597685, 180-6597686, 180-6597664, 600-6596677, 600-6596667, 505-6596780, 505-6596781 and 505-6596802.
2. DDG 52 - DDG 67. Apply metal spray coating, System 1 or System 2, to foundations prior to installation of machinery. System 1 shall be used if the foundation temperatures will exceed 175° F. System 2 shall be used if foundation temperature will be 175° F, or less. Do not apply to machined surfaces. Metal spray coating should be extended at least 6 inches outward onto surrounding deck.
3. DDG 69 - DDG 78. Delete metal spray and apply zinc rich epoxy primer to Central Seawater Cooling Pumps, SSGTG No. 1 Circulating Pump, Fire Pump No. 2, Electric Firefighting Pump, Air Conditioning Plant Vacuum Pump foundations prior to coating with epoxy paint system.
4. DDG 69 - DDG 78. Drip pans for duplex seawater strainers in the Seawater Cooling System and the Firemain System shall be CRES 316L. Also, polysulfide sealant, MIL-S-81733, Type IV, shall be applied to the faying surfaces between the seawater strainers, drip pans and their respective foundations. In cases where there are no drip pans for the duplex strainers, the polysulfide sealant will be applied to the faying surfaces between the seawater strainers and their respective foundations.
5. DDG 52 - DDG 74. Fasteners shall be carbon steel treated with ceramic coating (System 5), if greater than 3/8-inch diameter (Grade 5 and below only) or CRES 316 (System 14), if 3/8-inch or less in diameter.
6. DDG 78. Fasteners to be of corrosion resistant material (System 14). When installed in wet or humid spaces or when exposed to the weather, Grade 8 fasteners, nuts and adjacent flange shall be coated with two coats of polysulfide sealant (System 8) after installation is complete. Exposed portions of fasteners shall be primed with paint MIL-P-24441, F-150, prior to application of sealant.

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7. DDG 78. All machinery equipment foundations handling seawater, brine, chill water, fresh water and foundations below the floor plate level in bilge areas, and supporting structure within 6 inches of each foundation shall be primed with 3.0 mils MDFT with zinc rich epoxy (International Paint Co. zinc rich epoxy EP4598H/EPA076 gray or equal) before coating with polyamide epoxy system 8.0 mils MDFT conforming to MIL Specification DOD-P-23236 or MIL-P-24441.
8. DDG 78. After meeting surface preparation cleaning requirements of SSPC-SP11, the zinc rich epoxy shall be applied only to the weld line areas of foundation/support structure.
9. Apply anti-seize compound (System 6) to fasteners prior to installation.
10. Polysulfide sealant (System 9) shall be applied to faying surfaces prior to installation of equipment.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1803

AMR No. 1 and No. 2 Foundations (DDG 52 - DDG 74)

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Cent SW Cooling Pump	Hold Frame 136 Port	11
SSGTG SW Circulating Pump	Hold Frame 170 Port	11
Fire Pump No. 2	Hold Frame 147 Port	11
Cent SW Cooling Pump	Hold Frame 235 Stbd	12
Elec Firefighting Pump	IB Frame 163 Port	11
A/C Plant Vac Pump	IB Frame 147 Port	11
A/C Plant No. 3 CHW Pump	IB Frame 230 Port	12
A/C CHW Pump	IB Frame 230 Port	12
Brominator Recirculation Pump	Shell Frame 139 Port	11

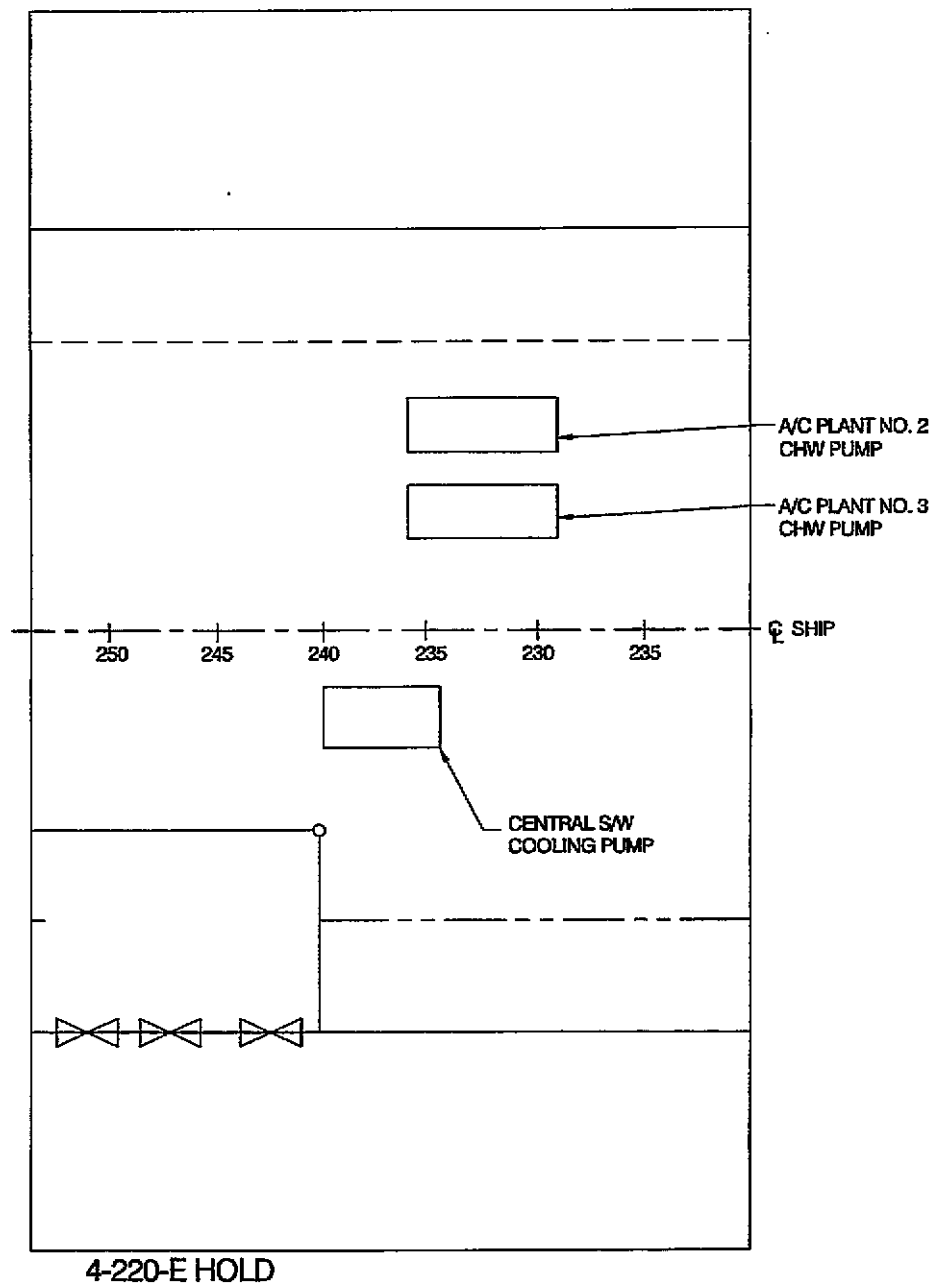
AMR No. 1 Foundations (DDG 78). See Figure 5-1803 for callout locations.

	<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
①	SSGTG No. 1 Seawater Circ Pump	Hold Frame 168 Port	11
②	Potable Water Service Pump No. 1	Hold Frame 142 Port	11
③	Fire Pump No. 2	Hold Frame 142 Port	11
④	Cent Seawater Cooling Pump No. 1	Hold Frame 136 Port	11
⑤	HD-1140/SPY-1D Water Cooler	Hold Frame 161 Stbd	11
⑥	A/C Plant R114 Cylinder	Hold Frame 156 Stbd	11
⑦	A/C Plant No. 1 CHW Pump	Hold Frame 134 Stbd	11
⑧	A/C Plant No. 1 CHW Exp Tank	Hold Frame 128 Stbd	11
⑨	Electric Firefighting Pump	Hold Frame 163 Port	11
⑩	Potable Water Manifold	Hold Frame 152 Port	11
⑪	A/C Plant No. 1 Seawater Dup Strainer	Hold Frame 152 Stbd	11
⑫	AN/SPY-1D FCS Water Cooler	Hold Frame 172 Stbd	11
⑬	Seawater Dup Strainer	Hold Frame 169 Port	11
⑭	Potable Water Pump (Af)	Hold Frame 147 Port	11
⑮	Recirc Brominator Skid	Hold Frame 139 Port	11
⑯	A/C Plant No. 1 Refer Rec	Hold Frame 138 Stbd	11
⑰	A/C Plant Vacuum Pump	Hold Frame 146 Stbd	11
⑱	A/C Plant No. 1 Seawater Duplex Strainer	Hold Frame 152 Stbd	11
⑲	Cathodic Protection	Hold Frame 170 Port	11
⑳	No Break Power Supply	Hold Frame 134 Port	11
㉑	SSTG Start Air Manifold	Hold Frame 166 Port	11
㉒	AFFF Hose Reel	Hold Frame 128 Port	11
㉓	Potable Water Manifold AMR No. 1	Hold Frame 151 Port	11
*	C&D Disposal Excom Sig Proc Water	2nd Platf Frame 132 Stbd	11
*	AFFF Hose Rel	2nd Platf Frame 130 Port	11
*	Demineralizer Foundation	2nd Platf Frame 142 Stbd	11

*(Not shown on Figure 5-1803)

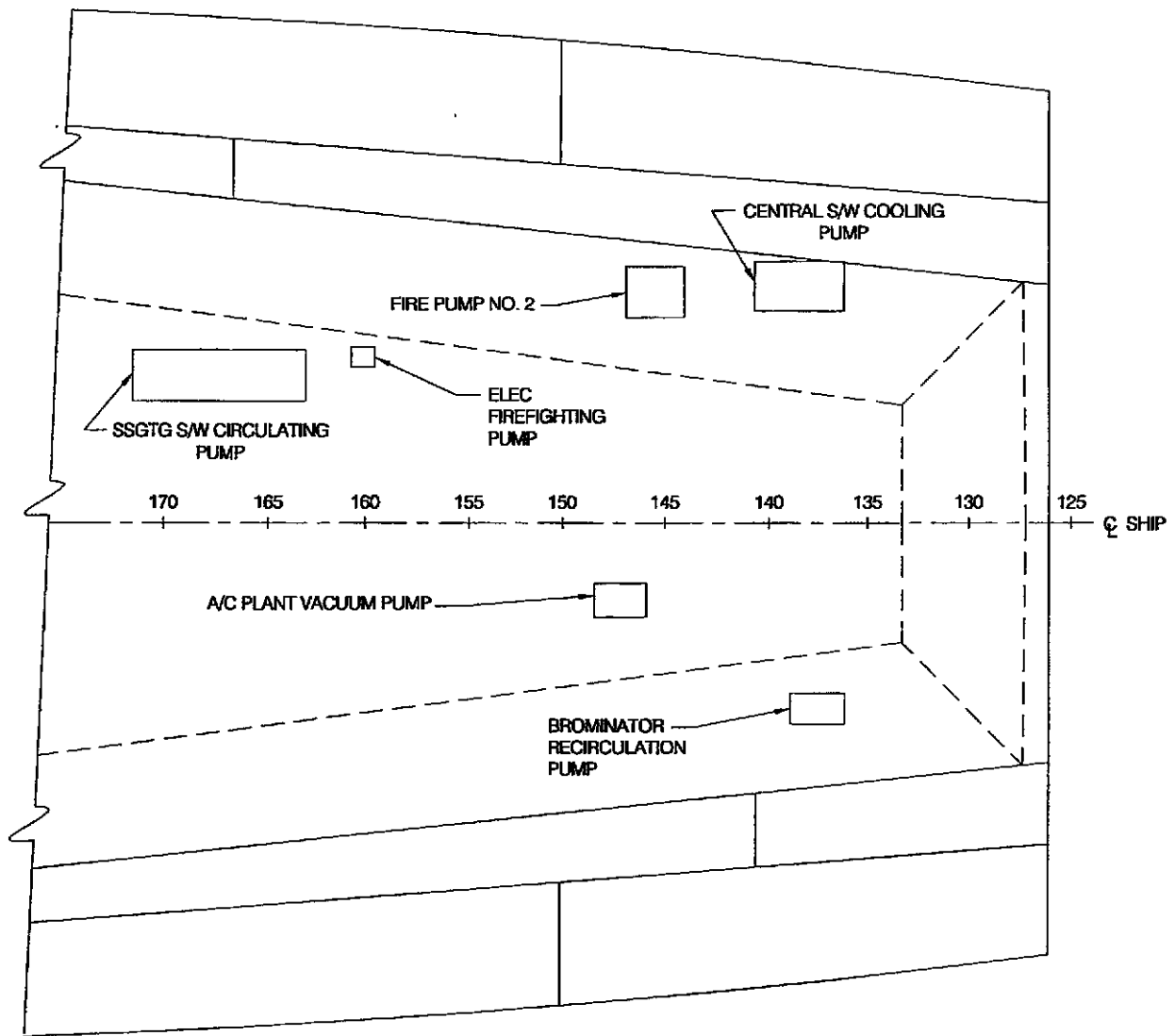
AMR No. 2 Foundations (DDG 78) (CONT.)

	<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
(24)	A/C Plant No. 2 and No. 3 Vacuum Pump	Hold Frame 234 Port	12
(25)	A/C Plant No. 2 CHW Pump	Hold Frame 228 Port	12
(26)	A/C Plant No. 3 CHW Pump	Hold Frame 228 Port	12
(27)	A/C Plant No. 2 and No. 3 CHW Expansion tank	Hold Frame 228 Stbd	12
(28)	A/C Plant No. 2 and No. 3 Refer Rec	Hold Frame 228 Port	12
(29)	Central Seawater Cooling Pump No. 3	Hold Frame 240 Stbd	12
(30)	Oil/Water Separator Pump Stand Assy	Hold Frame 235 Stbd	12
(31)	Oil/Water Separator	Hold Frame 225 Stbd	12
(32)	Refer Drain Collection Tank	Hold Frame 237 Stbd	12
(33)	A/C Plant No. 2 Seawater Duplex Strainer	Hold Frame 229 Port	12
(34)	A/C Plant No. 3 Seawater Duplex Strainer	Hold Frame 223 Port	12
(35)	Suction Strainer 11/2 Oily Waste Separator Pump	Hold Frame 237 Stbd	12
(36)	R114 Cylinder Storage	Hold Frame 233 Stbd	12
(37)	AFFF Hose Reel Type II	Hold Frame 220 Stbd	12
(38)	ABT Power Panel Distribution Box	Hold Frame 225 Stbd	12
(39)	R114 Cylinder Storage	Hold, Frame 241 Stbd	12
(40)	Coupling Storage	Hold, Frame 251 Stbd	12



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Figure 5-1803. AMR No. 2 Foundation Locations (DDG 52 - DDG 74) (Sheet 1 of 4)

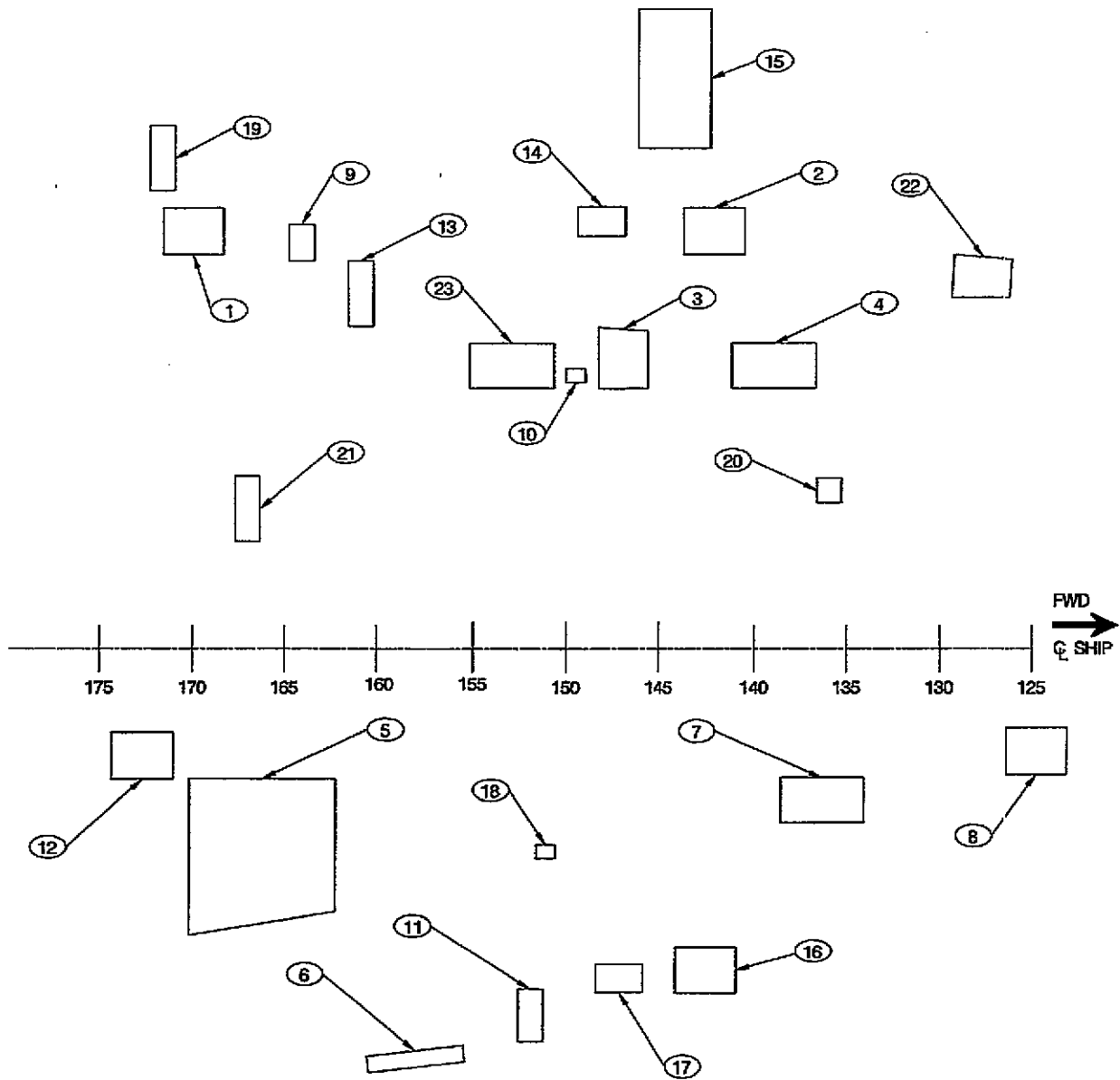


AMR NO. 1 (4-126-0-E) HOLD

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Figure 5-1803. AMR No. 1 Foundation Locations (DDG 52 -DDG 74) (Sheet 2 of 4)

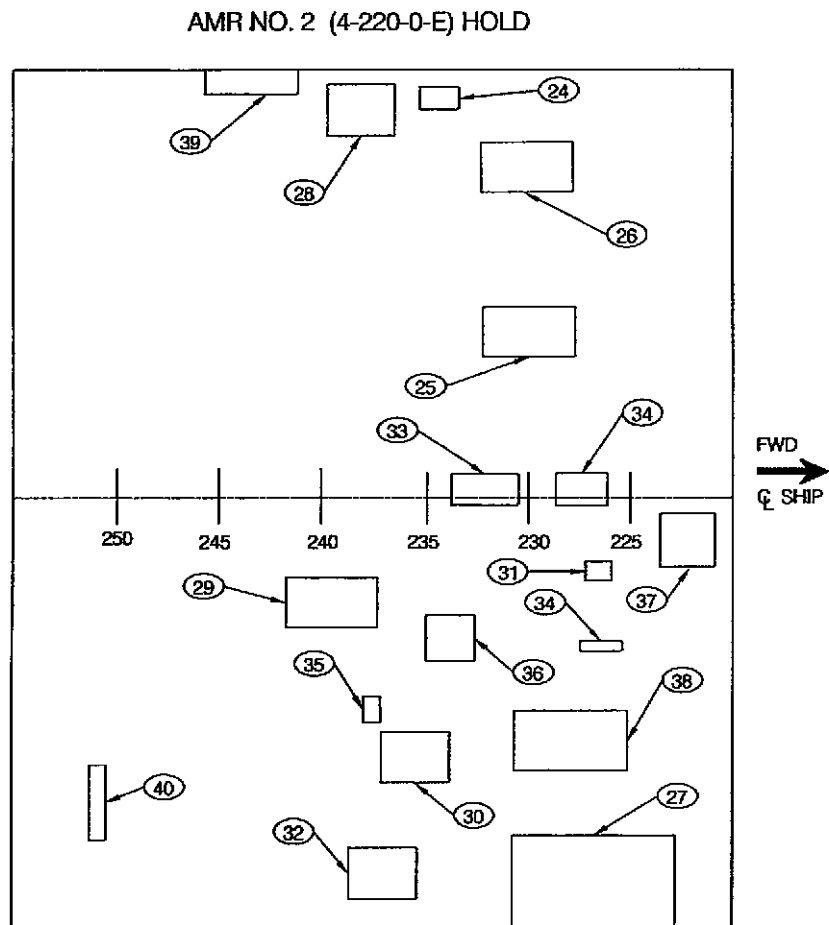
AMR NO. 1 PORT (4-126-0-E) HOLD



AMR NO. 1 STBD (4-126-0-E) HOLD

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Figure 5-1803. AMR No. 1 Foundation Locations (DDG 78) (Sheet 3 of 4)
(See Work Instructions for Callout Identification)



CD_Z_2107

Figure 5-1803. AMR No. 2 Foundation Locations (DDG 78) (Sheet 4 of 4)
(See Work Instructions for Callout Identification)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Engine Rooms No. 1 and No. 2 Foundations

AREA OF OCCURRENCE: Zone 18, Engine Rooms No. 1 and No. 2

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: Machinery foundations subject to heat and impact (see Figure 5-1806).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Engine Rooms No. 1 and No. 2 Machinery Foundations References and Associated Drawings: 180-6597678, 180-6597680, 180-6597692, 600-6596683, 600-6596673, 600-6596672, 505-6596792, 505-6596794 and 505-6596813.
2. DDG 52 - DDG 65. Apply metal spray coating (System 2) to foundations prior to installation of machinery, do not apply to machined surfaces. Extend metal spray coating at least 6 inches outward onto the surrounding deck.
3. DDG 67. Delete metal spray for seawater cooling pump foundations, Fire Pump No. 4 foundation and SSGTG Seawater Pump No. 1 foundation and apply zinc rich epoxy primer prior to coating with epoxy paint system.
4. DDG 69 - DDG 78. Delete metal spray and apply zinc rich epoxy primer to foundations for Central Seawater Cooling Pump, Fire Pumps No. 3 and SSGTG Seawater Circulating Pumps No. 1 and No. 2, Distilled Water Transfer Pump, Hot Water Circulating Pump prior to coating with epoxy paint system.
- 4.1 DDG 78. After meeting surface preparation requirements of SSPC-SP11, the zinc rich epoxy shall be applied only to the weld line areas of foundation/support structure.
5. DDG 69 - DDG 78. Drip pans for duplex seawater strainers in the seawater cooling system and the firemain system shall be CRES 316L. Also, polysulfide sealant, MIL-S-81733, Type IV, shall be applied to the faying surfaces between the seawater strainers, drip pans and their respective foundations. In cases where there are no drip pans for the duplex strainers, the polysulfide sealant will be applied to the faying surfaces between the seawater strainers and their respective foundations.
6. DDG 52 - DDG 74. Fasteners shall be carbon steel treated with ceramic coating (System 5), if greater than 3/8-inch in diameter (Grade 5 and below only) or CRES 316 (System 14), if 3/8-inch or less in diameter.

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7. DDG 78. Fasteners to be of corrosion resistant material (System 14). When installed in wet or humid spaces or when exposed to the weather, Grade 8 fasteners, nuts and adjacent flange shall be coated with two coats of polysulfide sealant (System 8) after installation is complete. Exposed portions of fasteners shall be primed with MIL-P-24441, F-150, prior to application of sealant.
8. DDG 78. All machinery equipment foundations handling seawater brine, chilled water, freshwater and foundations below the floor plate level in bilge areas, and supporting structure within 6 inches shall be primed with a zinc rich epoxy and coated with a polyamide epoxy system.
9. Polysulfide sealant (System 9) shall be applied to faying surfaces prior to installation of machinery.
10. Apply anti-seize compound (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

Index Number 1806

Engine Rooms No. 1 and No. 2 Machinery Foundations (DDG 52 - DDG 74)

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Fire Pump No. 3	Hold Frame 182 Port	11
Cent Seawater Cooling Pump	Hold Frame 189 Port	11
Distilled Water Transfer Pump (2)	Hold Frame 175 Port	11
Hot Water Circ Pump	Hold Frames 178 and 184 Port	13
Cent Seawater Cooling Pump	Hold Frame 275 Stbd	13
SSGTG Seawater Circulating Pump	Hold Frame 280 Stbd	12
Fire Pump No. 4	Hold Frame 265 Stbd	12

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Engine Room No. 1 Machinery Foundations (DDG 78)

See Figure 5-1806 for callout details.

	<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
①	Gas Turbine Waste Drain Pump No. 1	Hold Frame 198 Port	11
②	Gas Turbine Water Wash Tank	1st Platf Frame 216 Port	15
③	Gas Turbine Cleaning Fluid Tank	1st Platf Frame 206 Port	15
③	Gas Turbine Cleaning Fluid Tank	IB Frame 207 CL	15
④	PRAIRIE Air Cooler No. 1	1st Platf Frame 194 Stbd	15
④	PRAIRIE Air Cooler No. 1	1st Platf Frame 196 Stbd	15
⑤	Main Reduction Gear Lubo Cooler No. 1	Hold Frame 217 Stbd	11
⑥	Main Reduction Gear Lubo Serv Str No. 1	Hold Frame 205 Port	11
⑧	Lubo Purifier Freshwater Heater No. 1	Hold Frame 205 Port	11
⑦	Lubo Purifier No. 1	Hold Frame 212 Port	11
⑧	Lubo Purifier Heater No. 1	Hold Frame 207 Port	11
⑨	Lubo Purifier Freshwater Head Tank No. 1	Hold Frame 211 Port	11
⑩	Main Reduction Gear Standby/ Emergency Lubo Serv Pump No. 1A	Hold Frame 200 Port	11
⑪	Main Reduction Standby/ Emergency Lubo Serv Pump No. 1B	Hold Frame 209 Port	11
⑫	CPCH Prop Hydraulic Oil Pump/Motor and Str Assembly No. 1	Hold Frame 207 Stbd	11
⑬	CPCH Prop Hydraulic Oil Distribution Box No. 1	Hold Frame 197 Stbd	11
⑭	Fuel Service Heater No. 1	Hold Frame 212 Port	11
⑮	Fuel Service Pump No. 1A	Hold Frame 212 Port	11
⑯	Fuel Service Pump No. 1B	Hold Frame 217 Port	11
⑰	Fuel Service Prefilter No. 1A	Hold Frame 197 Port	11
⑰	Fuel Service Prefilter No. 1B	Hold Frame 197 Port	11

Index Number 1806

Engine Room No. 1 Machinery Foundations (DDG 78)

See Figure 5-1806 for callout details.

	<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
(17)	Fuel Service Filter/Separator No. 1A	Hold Frame 199 Port	11
(17)	Fuel Service Filter/Separator No. 1B	Hold Frame 199 Port	11
(18)	Fuel Transfer Pump No. 1	Hold Frame 182 Port	11
(19)	Fuel Transfer Purifier No. 1	Hold Frame 187 Port	11
(20)	Fuel Transfer Heater No. 1	Hold Frame 179 Port	11
(21)	Hot Water Circulation Pump No. 1A	2nd Platf Frame 178 Port	13
(21)	Cent Storage Heater No. 1A (Left Hand)	2nd Platf Frame 176 Port	13
(22)	Hot Water Circulation Pump No. 1B	2nd Platf Frame 183 Port	13
(22)	Cent Storage Heater No. 1B (Right Hand)	2nd Platf Frame 182 Port	13
(23)	Fire Pump No. 3	Hold Frame 180 Port	11
(24)	Central Seawater Cooling Pump No. 2	Hold Frame 188 Port	11
(25)	Lubo/Air Cooler Seawater Duplex Strainer No. 1	Hold Frame 198 Port	11
(26)	HP Air Compressor No. 1	2nd Platf Frame 208 Port	13
(27)	Waste Water Drain Collection Pump No. 1	Hold Frame 194 Port	11
(28)	Oily Waste Transfer Pump No. 1	Hold Frame 189 Port	11
(29)	Fuel Stripping Tank Group No. 1	Hold Frame 217 Stbd	11
(30)	Fuel Stripping Tank Group No. 2	Hold Frame 219 Port	11
(31)	HPAC No. 1 Seawater Duplex Strainer No. 1	2nd Platf Frame 207 Port	13
(32)	LP Air Compressor No. 1	2nd Platf Frame 212 Port	13
	(*Not shown on Figure 5-1806)		

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Engine Room No. 1 Machinery Foundations (DDG 78) (CONT.)

See Figure 5-1806 for callout details.

33	LP Air Compressor No. 1 Seawater Duplex Strainer	2nd Platf Frame 210 Port	13
34	RO Desal No. 2 Duplex Strainer	2nd Platf Frame 189 Port	13
35	RO Desal No. 1 Duplex Strainer	2nd Platf Frame 189 Port	13
36	Fuel Service Pump	IB Frame 211 Port	11
37	Reduction Gear Standby Emergency Lubo Service Pump	IB Frame 209 Port	11
38	Reduction Gear Standby Emergency Lubo Service Pump	IB Frame 200 Port	11
39	Lubo Oil Purifier Heater No. 1	IB Frame 206 Port	11
40	Lubo Oil Manifold No. 1 and Lube Oil Strainer	IB Frame 210 Port	11
41	Fuel Service Heater Control	IB Frame 206 Port	11
81	AFFF Hose Reel Type II	2nd Platf Frame 209 CL	13
81	HPAC Duplex Strainer	2nd Platf Frame 208 Port	13
82	Ship Service Air Dehydrator	2nd Platf Frame 215 Port	13
83	Fan Coil Assembly	1st Platf Frame 194 Port	15
*	AMF/CUNO Filter	2nd Platf Frame 200 Port	13
85	Desalinator Brominator	2nd Platf Frame 189 Port	13
*	Vapor Cprsn Distiller Duplex Strainer	2nd Platf Frame 187 Port	13
86	AFFF Hose Reel Type II	Hold Frame 205 Port	11
87	LP Air Dehydrator No. 1A	2nd Platf Frame 203 Port	13
88	LP Air Dehydrator No. 1B	2nd Platf Frame 207 Port	13
89	Fuel Purifier Water Hd Tank	2nd Platf Frame 190 Port	13
90	AMF/CUNO Filter	1st Platf Frame 186 Port	15
91	AFFF Hose Reel Type II	1st Platf Frame 184 Port	15
92	AFFF Hose Reel Type II	1st Platf Frame 186 Port	11

(*Not shown on Figure 5-1806)

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Engine Room No. 1 Machinery Foundations (DDG 78) (CONT.)

See Figure 5-1806 for callout details.

(93)	Reduction Gear Lube Oil Service Strainer	IB Hold Frame 204 Port	11
*	LPAC Duplex Strainer	2nd Platf Frame 208 Port	13
(94)	LO Cooler No. 1	IB Frame 187 Port	11
(94)	Reduction Gear Lubo/PM Air Clean Seawater Duplex Strainer	IB Frame 196 Port	11
(95)	Lube Oil Purifier	IB Frame 212 Port	11
(96)	Fuel Transfer Pump	IB Frame 184 Port	11
(97)	Gas Turbine Waste Drain Pump	IB Frame 198 Port	11
(98)	Fuel Transfer Purifier	IB Frame 187 Port	11
(99)	Oily Waste Transfer Pump	IB Frame 187 Port	11
(100)	Electric Water Heater Str (Lubo Purifier Water Heater)	IB Frame 206 Port	11
(101)	Fuel Service Prefilter (GTRB) Fuel Service Filter/Separator	IB Frame 195 Port	11
(102)	Waste Water Drain Cooling Pump	IB Frame 195 Port	13

(*Not shown on Figure 5-1806)

Engine Room No. 1 Machinery Foundations (DDG 78) (CONT.)

See Figure 5-1806 for callout details.

	<u>Description</u>	<u>Location</u>	<u>Hull Appl</u>	<u>Corrosion Control Zones</u>
(34)	RO Desal No. 2 Duplex Strainer	2nd Platf Frame 189 Port	DDG 65 and Follow	13
(35)	RO Desal No. 1 Duplex Strainer	2nd Platf Frame 189 Port	DDG 65 and Follow	13
*	Vapor Cprsn Dstl Un Duplex Strainer	2nd Platf Frame 187 Port	DDG 69 and Follow	13
*	Vapor Cprsn Dstl Un Duplex Strainer	2nd Platf Frame 187 Port	DDG 69 and Follow	13
(31)	HPAC Duplex Strainer	2nd Platf Frame 208 Port	DDG 69 and Follow	13
*	LPAC Duplex Strainer	2nd Platf Frame 208 Port	DDG 69 and Follow	13
(94)	LO Cooler No. 1	IB Frame 197 Port	DDG 69 and Follow	13

(*Not shown on Figure 5-1806)

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Engine Room No. 2 Machinery Foundations (DDG 78)

See Figure 5-1806 for callout details.

	<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
(31)	HPAC Duplex Strainer	2nd Platf Frame 277 Stbd	14
(42)	Gas Turbine Waste Drain Pump No. 2	Hold Frame 262 Stbd	12
(43)	Main Reduction Gear Lubo Cooler No. 2	Hold Frame 256 Port	12
(44)	Main Reduction Gear Lubo Service Strainer No. 2	Hold Frame 260 Stbd	12
(45)	Main Reduction Gear Standby/ Emergency Pump No. 2A	Hold Frame 266 Stbd	12
(45)	Main Reduction Gear Standby/ Emergency Pump No. 2B	Hold Frame 270 Stbd	12
(46)	Lubo Purifier No. 2	Hold Frame 259 Stbd	12
(47)	Lubo Purifier Freshwater Hd Tank No. 2	Hold Frame 261 Stbd	12
(48)	Lubo Manifold No. 2	Hold Frame 254 Stbd	12
(49)	CPCH Propulsion Hydraulic Oil Pump/Motor No. 2	Hold Frame 262 Port	12
(50)	Fuel Service Pump No. 2A	Hold Frame 291 Stbd	12
(51)	Fuel Service Pump No. 2B	Hold Frame 292 Stbd	12
(52)	Fuel Service Prefilter No. 2A	Hold Frame 284 Stbd	12
(53)	Fuel Service Prefilter No. 2B	Hold Frame 283 Stbd	12
(54)	Fuel Transfer Heater No. 2	Hold Frame 284 Stbd	12
(55)	Fuel Transfer Pump No. 2	Hold Frame 289 Stbd	12
(56)	Fuel Transfer Purifier No. 2	Hold Frame 271 Stbd	12
(57)	Fuel Purifier Freshwater Hd Tank	2nd Platf Frame 278 Stbd	14
(58)	Lubo Purifier Freshwater Heater No. 2	Hold Frame 263 Stbd	12
(59)	Line Shaft Bearing	Hold Frame 293 Stbd	12
(60)	SSGTG Seawater Circulating Pump No. 2	Hold Frame 279 Stbd	12
(61)	Fire Pump No. 4	Hold Frame 264 Stbd	12
(62)	Cent Seawater Cool Pump No. 4	Hold Frame 277 Stbd	12

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Index Number: 1806

Engine Room No. 2 Machinery Foundations (DDG 78) (CONT.)

See Figure 5-1806 for callout details.

	<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
63	Lubo/Air Cooler Seawater Duplex Strainer No. 2	Hold Frame 257 Stbd	12
64	LP Air Dehydrator No. 2A	2nd Platf Frame 256 Stbd	14
*	LP Air Dehydrator No. 2B	2nd Platf Frame 260 Stbd	14
65	WW Dr Coll Pump No. 2	Hold Frame 256 Stbd	12
66	Oily Waste Transfer Pump No. 2	Hold Frame 292 Stbd	12
*	LO Cooler No. 2 Duplex Strainer	IB Frame 256 Stbd	12
67	SS LP Air Dehydrator Cond/Filter	2nd Platf Frame 271 Stbd	14
68	SS LP Air Dehydrator Cond/Filter	2nd Platf Frame 267 Stbd	14
*	LPAC No. 3 Duplex Strainer	2nd Platf Frame 265 Stbd	14
69	Fuel Oil Strip Tank	Hold Frame 257 Stbd	12
70	AFFF Hose Reel Type II	Hold Frame 276, Stbd	12
71	Fuel Oil Strip Tank	Hold Frame 254 Port	12
72	AFFF Hose Reel Type II	2nd Platf Frame 280 CL	14
73	AMF/CUNO Filter	2nd Platf Frame 265 Stbd	14
74	Cont Fuel Transfer Heater	Hold Frame 280 Stbd	12
75	Fuel Service Heater	Hold Frame 286 Stbd	12
76	Reduction Gear Lube Oil Service Strainer	IB Frame 259 Stbd	12
77	SSGTG No. 2 Duplex Strainer	IB Frame 260 Starboard	12
*	LPAC No. 3 Duplex Strainer	2nd Platf Frame 265 Stbd	14
*	LPAC No. 2 Duplex Strainer	2nd Platf Frame 265 Stbd	14

Index Number: 1806

Engine Room No. 2 Machinery Foundations (DDG 78) (CONT.)

See Figure 5-1806 for callout details.

	<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
78	PRAIRIE Air Cooler and Masker Air Cooler	1st Platf Frame 277 Port	15
79	AFFF Hose Reel Type II	1st Platf	15
80	AMF/CUNO Filter	1st Platf Frame 276 Stbd	15
104	AFFF Hose Reel Type II	1st Platf Frame 300 Stbd	15

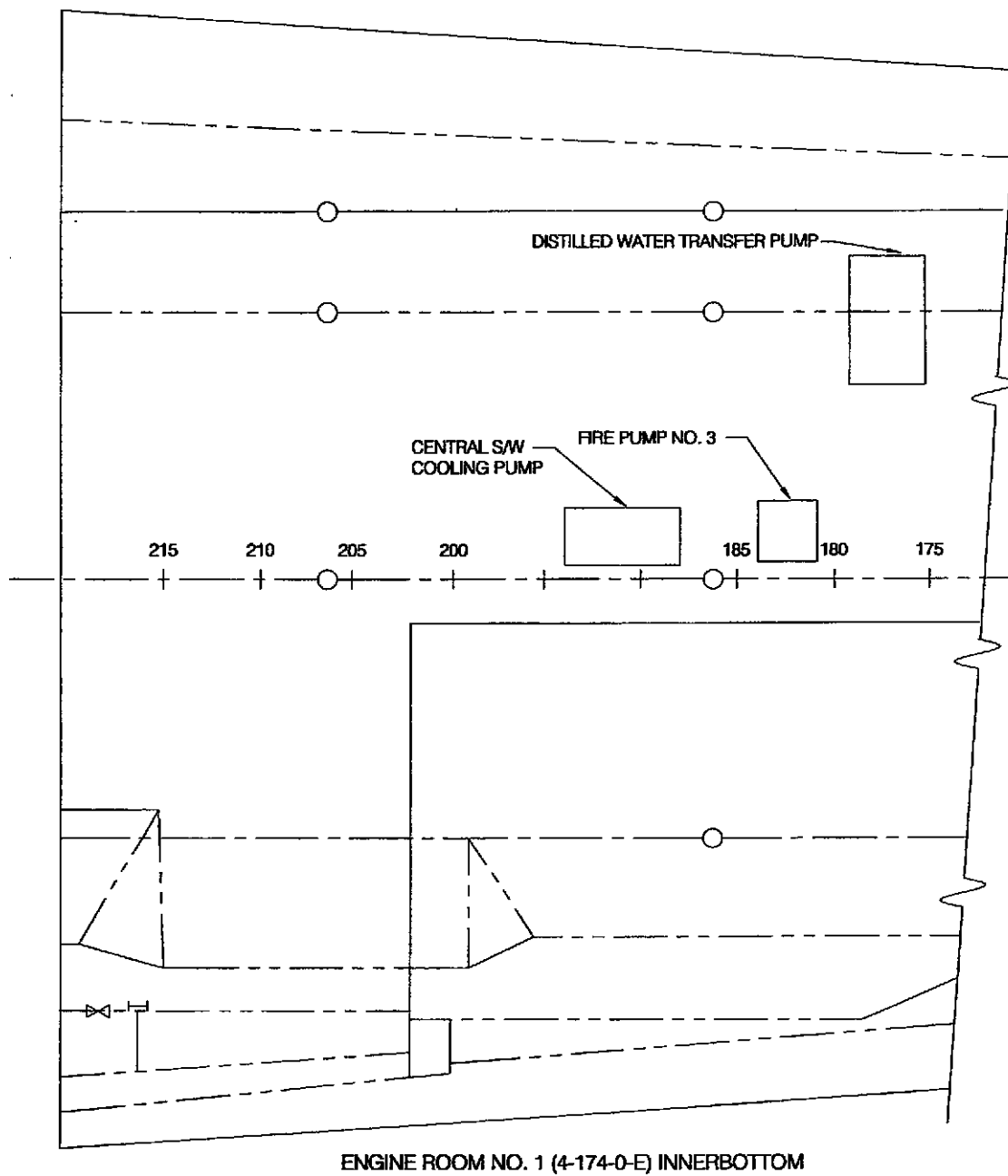
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Engine Room No. 2 Machinery Foundations

See Figure 5-1806 for callout details.

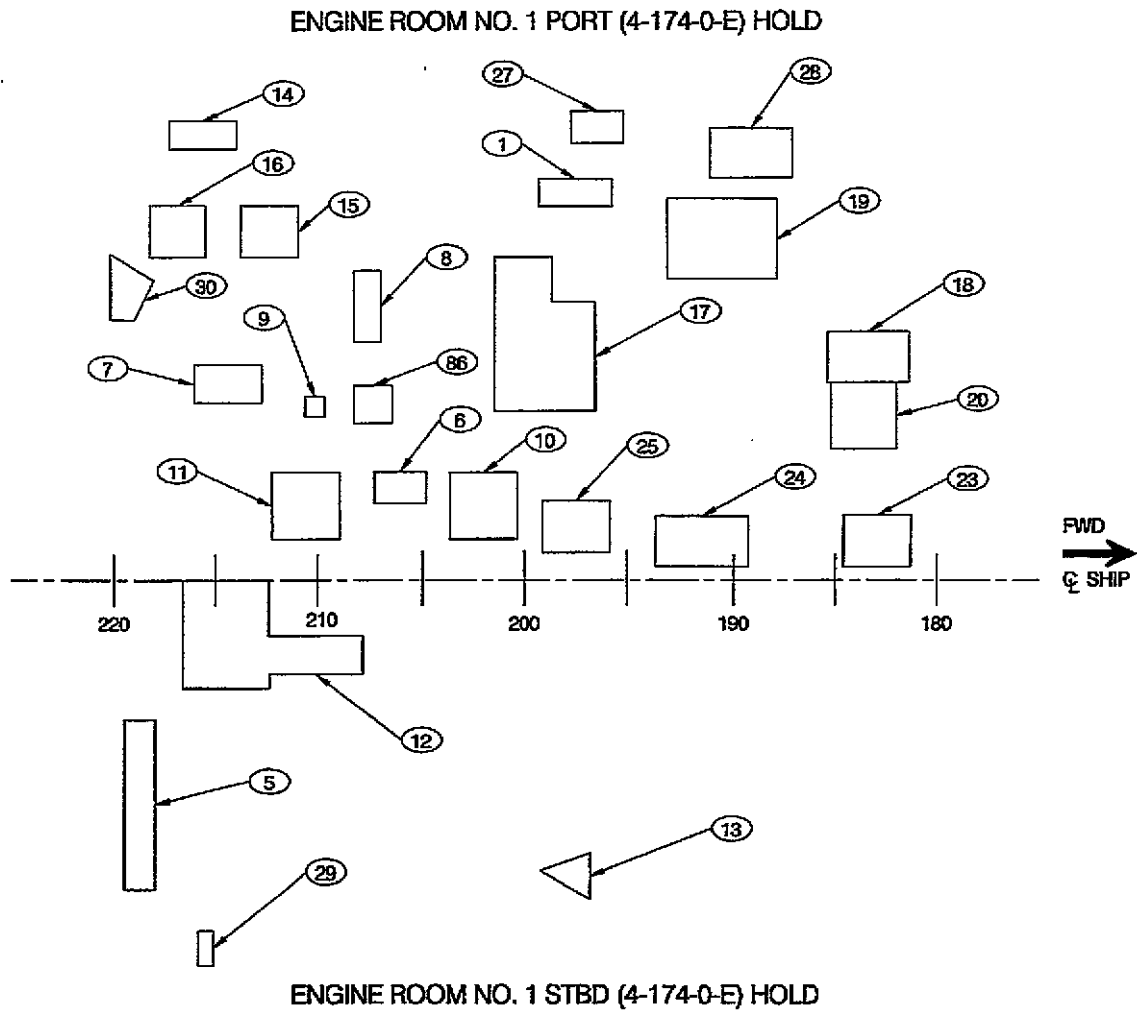
	<u>Description</u>	<u>Location</u>	<u>Hull Appl</u>	<u>Corrosion Control Zones</u>
*	LO Cooler No. 2 Duplex Strainer	IB Frame 256 Stbd	DDG 69 and Follow	11
77	SSGTG No. 2 Duplex Strainer	IB Frame 260 Stbd	DDG 69 and Follow	11
*	LPAC No. 3 Duplex Strainer	2nd Platf Frame 265 Stbd	DDG 69 and Follow	14
*	LPAC No. 2 Duplex Strainer	2nd Platf Frame 265 Stbd	DDG 69 Only	14
*	HPAC Duplex Strainer	2nd Platf Frame 277 Stbd	DDG 69 and Follow	14

(*Not shown on Figure 5-1806)



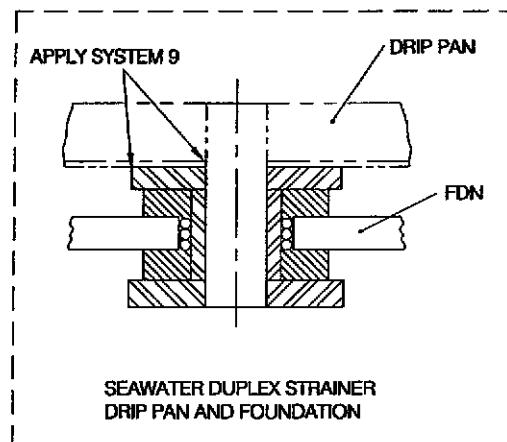
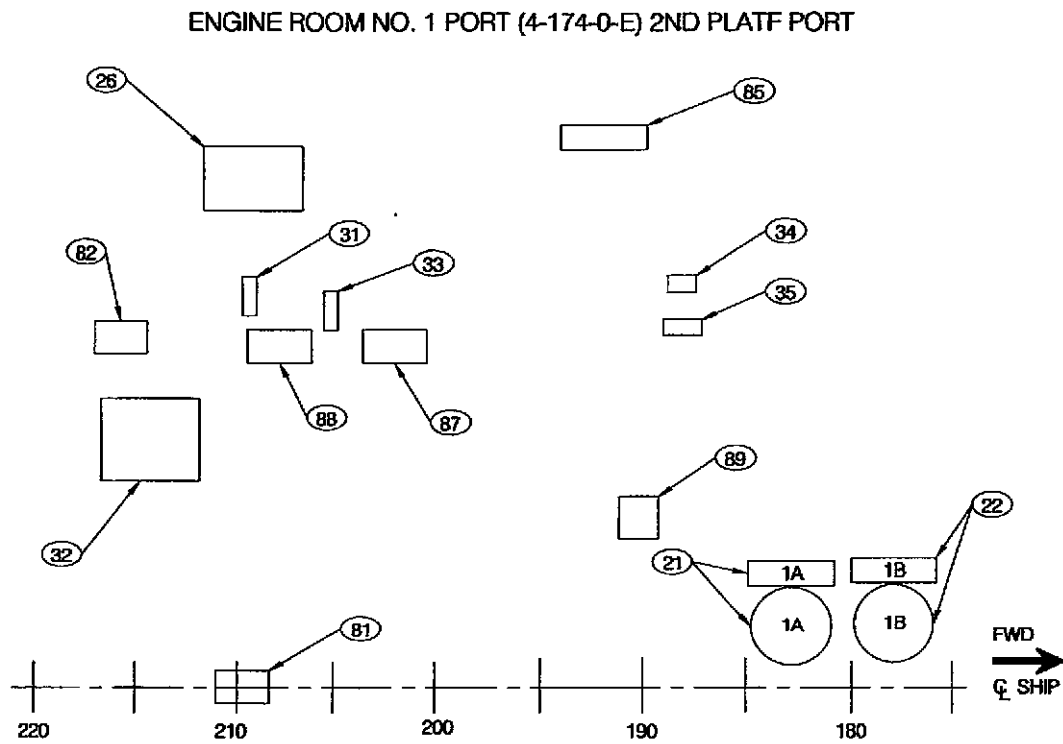
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Figure 5-1806. Engine Room No. 1 Foundation Locations (DDG 52 - DDG 74) (Sheet 1 of 10)



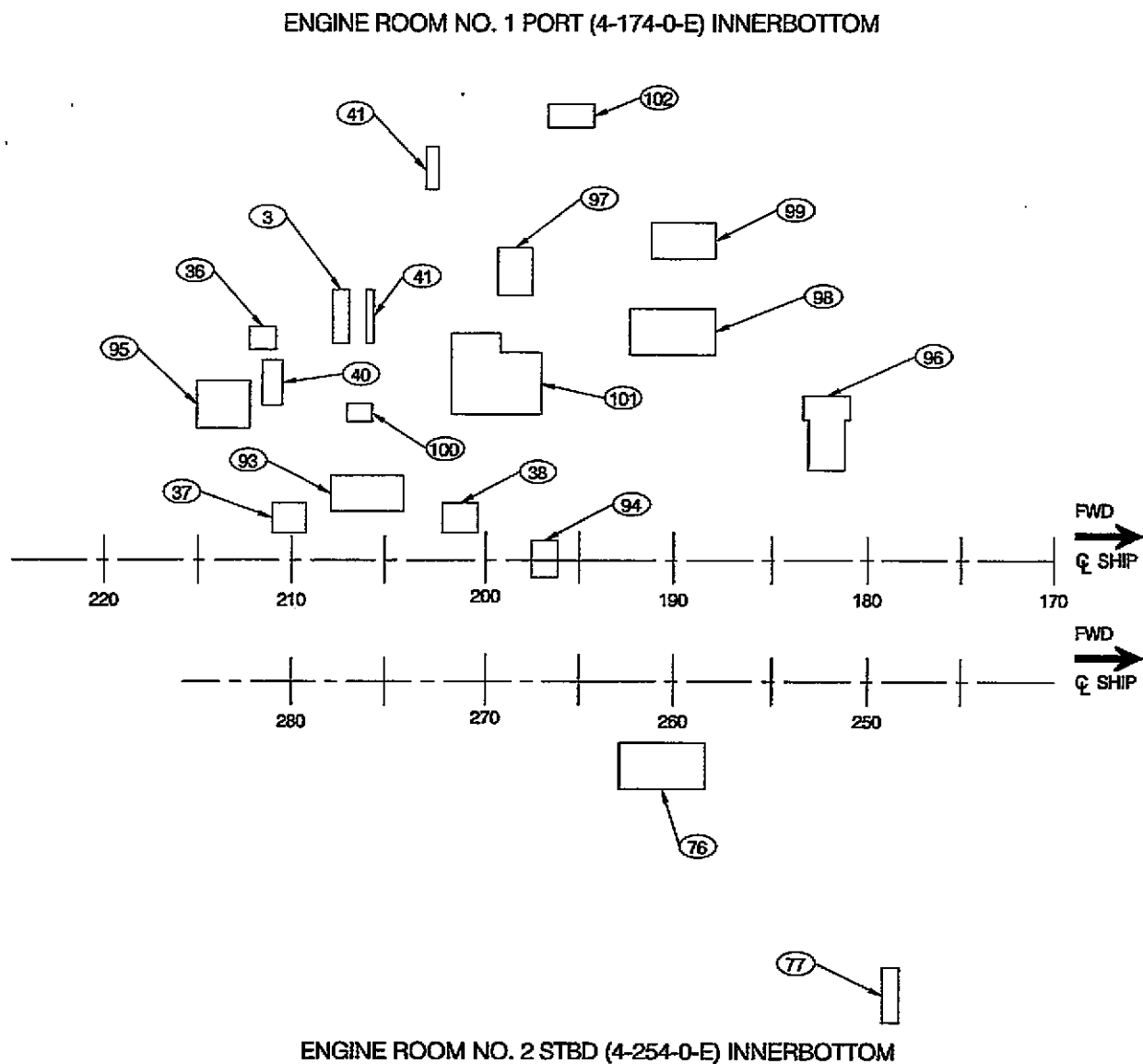
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Figure 5-1806. Engine Room No. 1 Foundation Locations (DDG 78) (Sheet 2 of 10)
(See Work Instructions for Callout Identification)



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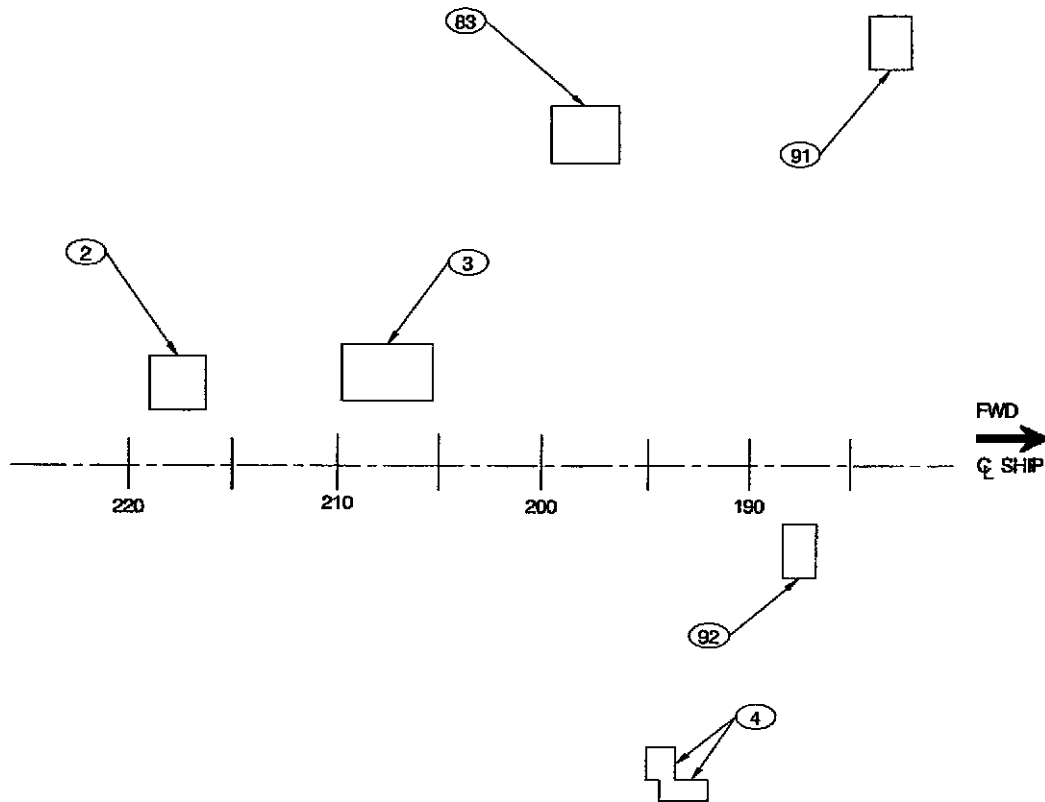
Figure 5-1806. Engine Room No.1 Foundation Locations (DDG 78) (Sheet 3 of 10)
(See Work Instructions for Callout Identification)



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Figure 5-1806. Engine Room No. 1 and No. 2 Foundation Locations (DDG 78) (Sheet 4 of 10)
(See Work Instructions for Callout Identification)

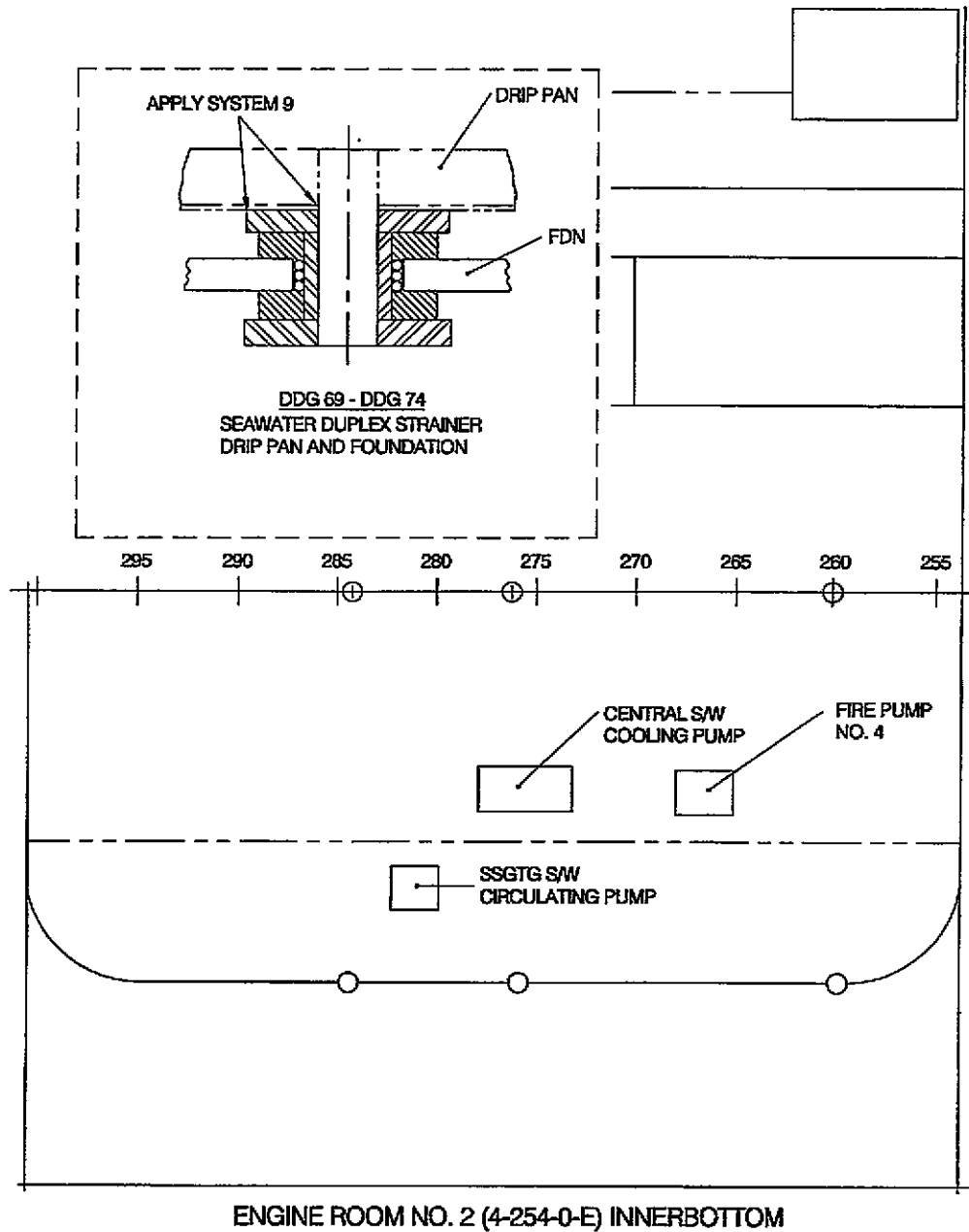
ENGINE ROOM NO. 1 PORT (4-174-0-E) 1ST PLATF



ENGINE ROOM NO. 1 STBD (4-174-0-E) 1ST PLATF

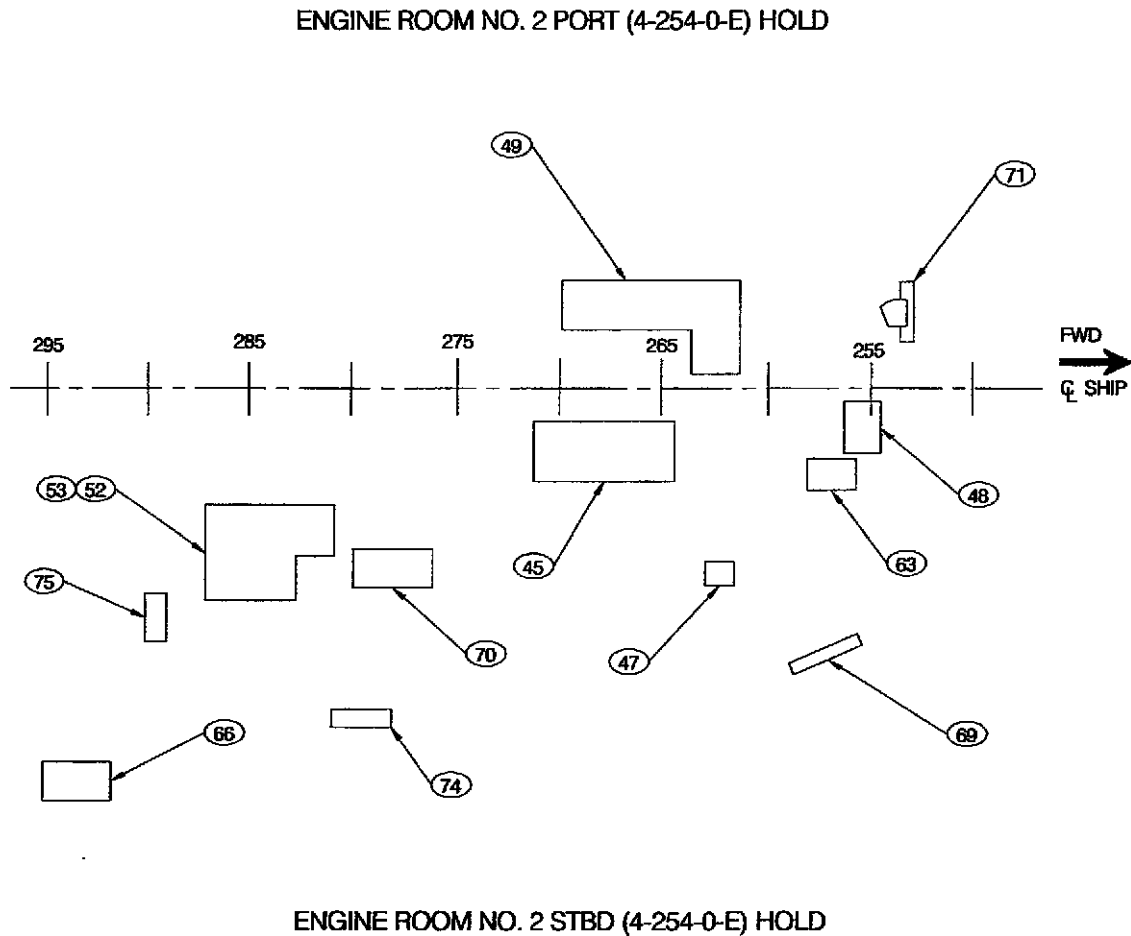
CD_Z_2112

Figure 5-1806. Engine Room No. 1 Foundation Locations (DDG 78) (Sheet 5 of 10)
(See Work Instructions for Callout Identification)



CD_Z_2113

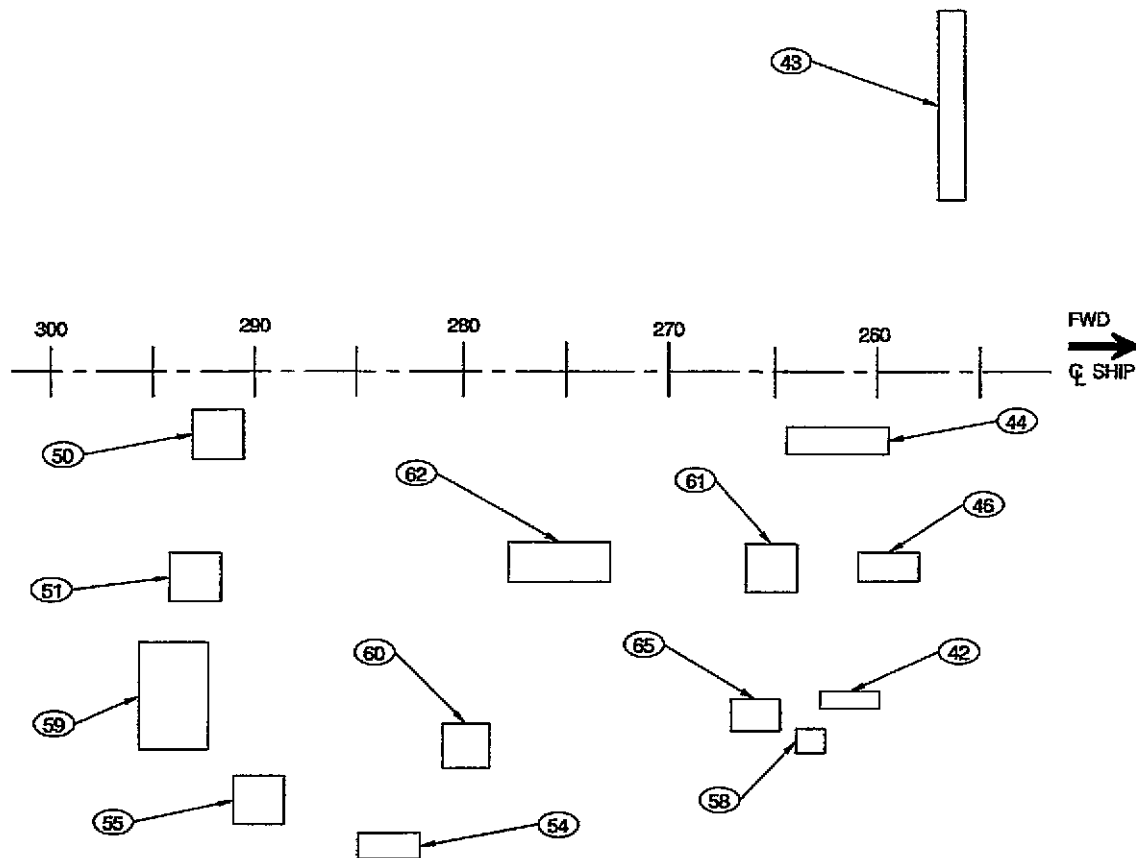
Figure 5-1806. Engine Room No. 2 Foundation Locations (DDG 52 - DDG 74) (Sheet 6 of 10)



CD_Z_2114

Figure 5-1806. Engine Room No. 2 Foundation Locations (DDG 78) (Sheet 7 of 10)
(See Work Instructions for Callout Identification)

ENGINE ROOM NO. 2 PORT (4-254-0-E) HOLD (CONTINUED)

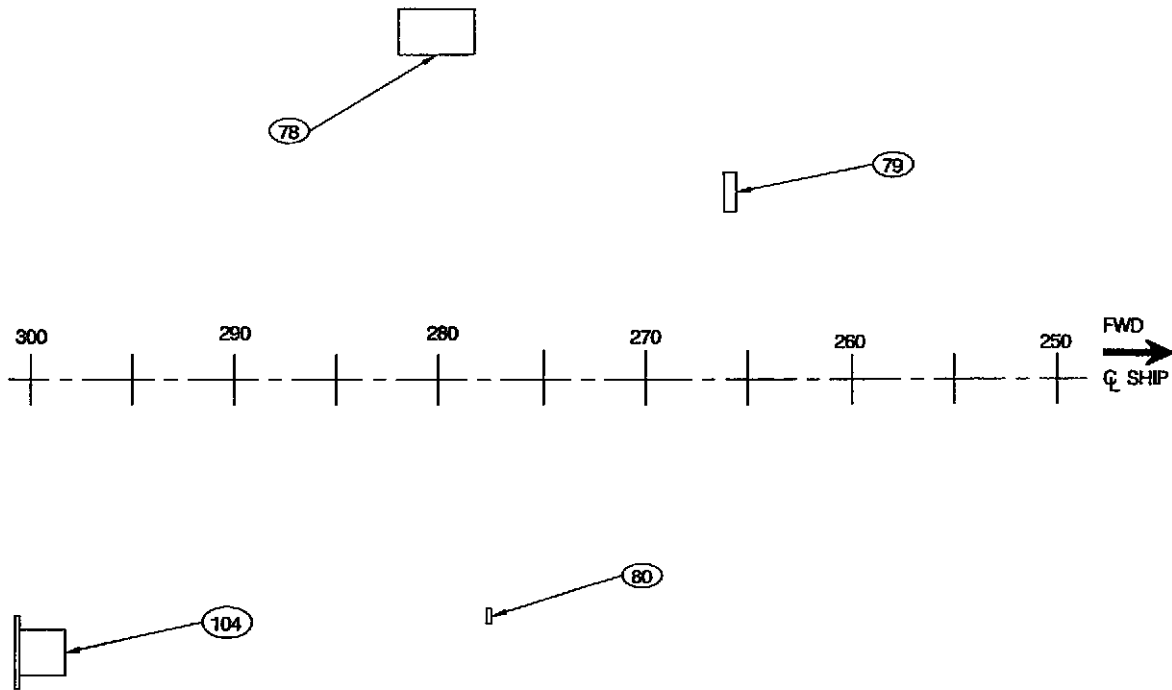


ENGINE ROOM NO. 2 STBD (4-254-0-E) HOLD (CONTINUED)

CD_Z_2115

Figure 5-1806. Engine Room No.2 Foundation Locations (DDG 78) (Sheet 8 of 10)
(See Work Instructions for Callout Identification)

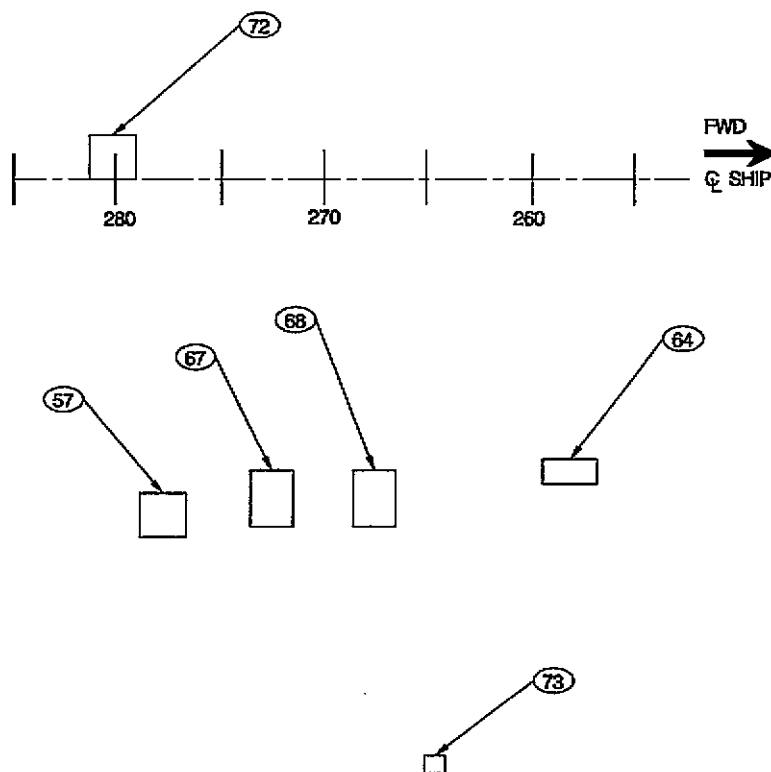
ENGINE ROOM NO. 2 (4-254-0-E) 1ST PLATF



CD_Z_2116

Figure 5-1806. Engine Room No. 2 Foundation Locations (DDG 78) (Sheet 9 of 10)
(See Work Instructions for Callout Identification)

ENGINE ROOM NO. 2 STBD (4-254-0-E) 2ND PLATF



CD_Z_2117

Figure 5-1806. Engine Room No. 2 Foundation Locations (DDG 78) (Sheet 10 of 10)
(See Work Instructions for Callout Identification)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Hawser Reels (Mooring Line Reels)

AREA OF OCCURRENCE: Zone 18, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: These reels are located inside the ship and are subject to wet lines and abrasion. See Figure 5-1808.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Hawser Reels Mooring Lines Reels and Associated Drawings: 600-6596645, 600-6596652, 600-6596705 and 600-6596723.
2. DDG 52 - DDG 74. Apply powdered epoxy coating (System 4) to mooring, warping and towing hawser stowage reels or apply metal spray coating (System 2) as approved.
3. DDG 52 - DDG 74. Apply ceramic-metallic coating (System 5) to storage reel brackets.
4. DDG 52 - DDG 74. Fasteners shall be fabricated out of CRES 316 (System 14).
5. Apply anti-seize compound (System 6) to fasteners prior to installation.
6. DDG 78. Apply metal spray (System 2) to storage reel brackets.
7. DDG 78. Fasteners to be of corrosion resistant material (System 14).
8. DDG 78. Apply powdered epoxy (System 4) to mooring, warping and towing hawser storage reels.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touchup with MIL-P-24441 as needed. Replace fasteners as needed.

Index Number 1808
Hawser Reels (Mooring Line Reels)

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Hawser Reel Type I	01 Level Frame 221 8'-3" off CL Port	3
Hawser Reel Type II	2nd Platf Frame 420 Port	14
Hawser Reel Type II	2nd Platf Frame 413 Port	14
Hawser Reel Type V	2nd Platf Frame 414 Port	14
Hawser Reel Type IV	41'-0 Flat Frame 2 Port	19
Hawser Reel Type V	41'-0 Flat Frame 42 Port	19
Hawser Reel Type II	41'-0 Flat Frame 42 Port	19
Hawser Reel Type I	41'-0 Flat Frame 28 Stbd	19
Hawser Reel Type I	41'-0 Flat Frame 32 Stbd	19

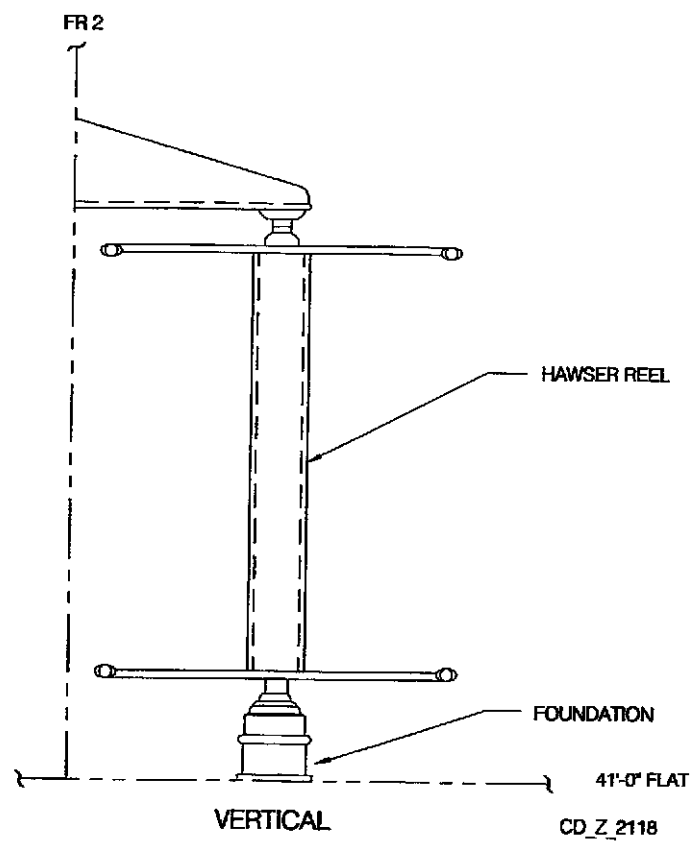
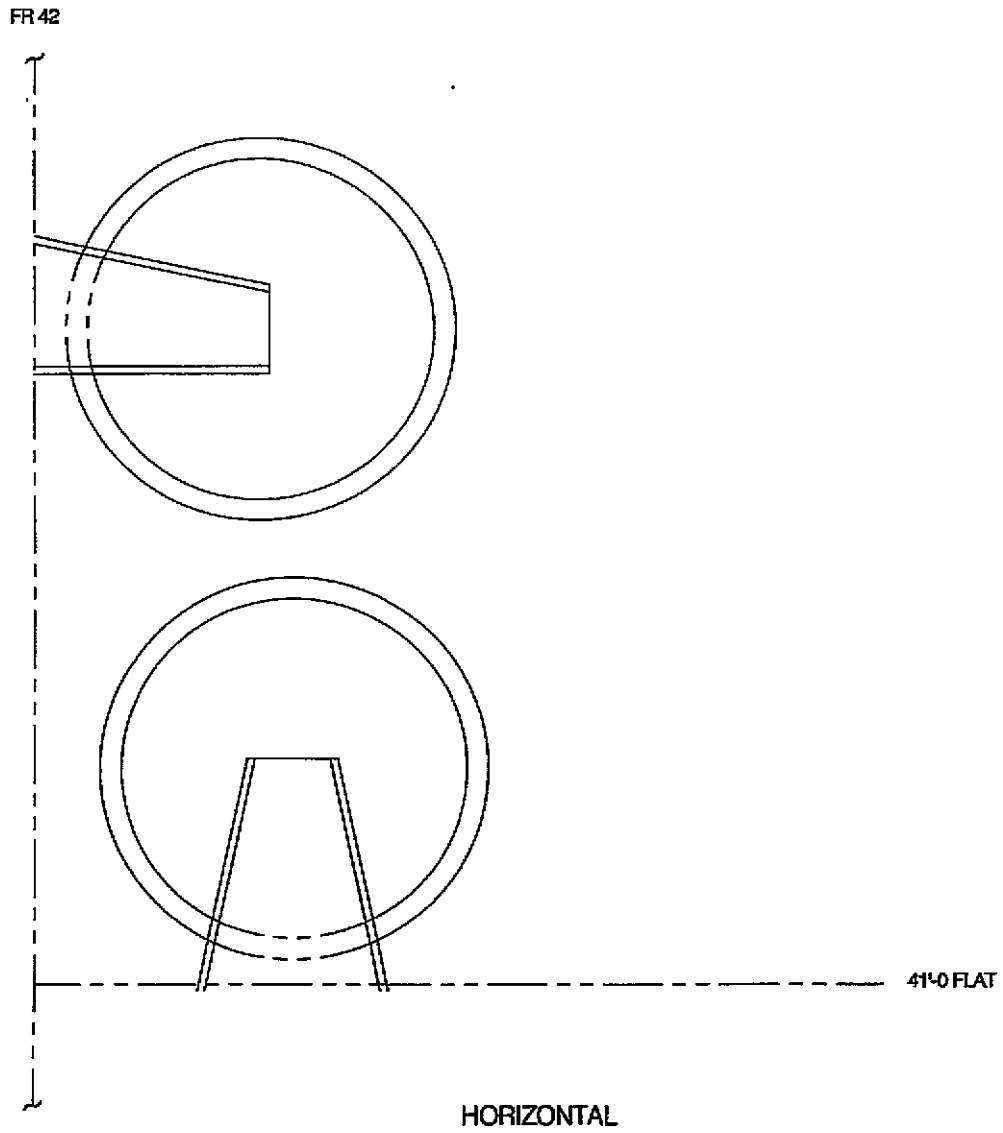


Figure 5-1808. Mooring Line Reel (Sheet 1 of 2)



CD_Z_2119

Figure 5-1808. Mooring Line Reel (Sheet 2 of 2)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Miscellaneous Foundations

AREA OF OCCURRENCE: Zone 18, See Work Instructions and Figures

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: Mast foundations on 04 and 06 levels. Pump foundations subject to fluids and impact (see Figure 5-1809).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Miscellaneous Foundations and Associated Drawings: 180-6597714, 600-6596700, 505-6596845, 180-6597658, 171-6597632, 301-6596596, 600-6596716 and 180-6597733.
2. DDG 52 - DDG 63. Apply metal spray coating (System 2) to foundations prior to installation of equipment. Do not apply to machined surfaces. Extend System 2 at least 6 inches outward onto surrounding deck.
3. DDG 65 - DDG 67. For DDG 65 (Fire Pump No. 6 and SSGTG No. 3 Circulating Pump foundations), for DDG 67 and Follow (Fire Pumps No. 1 and No. 6 and SSGTG No. 3 Circulating Pump foundations), delete metal spray coating (System 2) and prime foundations prior to installation of equipment with zinc rich epoxy paint and coat with epoxy paint system. Do not apply to machined surfaces.
4. DDG 52 - DDG 74. Fasteners shall be carbon steel treated with ceramic coating (System 5), if greater than 3/8-inch in diameter (Grade 5 and below only) or CRES 316, if 3/8-inch in diameter or less.
5. DDG 69 - DDG 78. Drip pans for duplex seawater strainers in the Seawater Cooling System and the Firemain System shall be CRES 316L. Also, polysulfide sealant, MIL-S-81733, Type IV, shall be applied to the faying surfaces between the seawater strainers, drip pans and their respective foundations. In cases where there are no drip pans for the duplex strainers, the polysulfide sealant will be applied to the faying surfaces between the seawater strainers and their respective foundations.
- 5.1 After meeting surface preparation cleaning requirements of SSPC-SP11. The zinc rich epoxy shall be applied only to the weld line areas of foundation/support structure.
6. DDG 69 - DDG 78. Apply polysulfide sealant (System 9) to the contact area between the seawater duplex strainer and drip pans. Also between the drip pans and foundation. If no drip pan is present apply polysulfide sealant (System 9) between the duplex strainer and the foundation. Also coat the mounting fasteners with polysulfide sealant (System 8) after installation.

7. DDG 78. Fasteners to be corrosion resistant material (System 14).
8. DDG 78. Apply metal spray coating (System 2) to foundations located topside.
9. DDG 78. All machinery equipment foundations handling seawater, brine chilled water, freshwater and foundations below the floor plate level in bilge area and supporting structure within 6 inches shall be primed with zinc-rich epoxy and coated with a polyamide epoxy system.
10. Polysulfide sealant (System 9) shall be applied to faying surfaces prior to installation of equipment.
11. Apply anti-seize compound (System 6) to fasteners prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touchup as needed. Replace fasteners as needed.

Index Number 1809

Miscellaneous Foundations

See Figure 5-1809 for callout details.

	<u>Description</u>	<u>Location</u>	<u>Hull Appl</u>	<u>Corrosion Control Zones</u>
①	Fire Pump No. 6	2nd Platf Frame 374 Stbd Generator Room	DDG 52-74	14
②	SSGTG Seawater Circulating Pump	2nd Platf Frame 374 Stbd Generator Room	DDG 52-74	14
③	Fire Pump No. 1	VCHT Room Frame 114 Port	DDG 52-74	11
*	Mast Foundations	04 Lvl Frame 174	DDG 52-78	8
*	Mast Foundations	06 Lvl Frame 158	DDG 52-78	9
*	Flag Boxes	04 Lvl Frame 178	DDG 52-78	8
④	Starboard Shaft Seal Duplex Strainer	Hold Frame 333 Stbd	DDG 69-74	12
④	Port shaft Seal Duplex Strainer	Hold Frame 333 Stbd	DDG 69-74	12
*	AC Plant No. 4 Duplex Strainer	Hold Frame 330 Stbd	DDG 69-74	12
⑤	SSGTG No. 3 Duplex Strainer	2nd Platf Frame 377 Port	DDG 69-74	14
⑥	Steering Gear Cooler No. 2 Duplex Strainer	2nd Platf Frame 448 Port	DDG 69-74	14
⑦	Steering Gear Cooler No. 1 Duplex Strainer	2nd Platf Frame 448 Stbd	DDG 69 & 71	14

(*Not shown on Figure 5-1809)

Index Number 1809

Miscellaneous Foundations (CONT.)

	<u>Description</u>	<u>Location</u>	<u>Hull Appl</u>	<u>Corrosion Control Zones</u>
*	Forward CIWS Duplex Strainer	02 Lvl Frame 113 Stbd	DDG 69-78	5
*	AFT CIWS Duplex Strainer	01 Level Frame 313 Stbd	DDG 69-78	3
*	Ref Plant No. Duplex Strainer	1st Platf Frame 251 Stbd	DDG 69-78	15
*	Ref Plant No. 2 Duplex Strainer	1st Platf Frame 253 Stbd	DDG 69-78	15

(*Not shown on Figure 5-1809)

Index Number 1809

Miscellaneous Foundations (DDG 78)

See Figure 5-1809 for callout details.

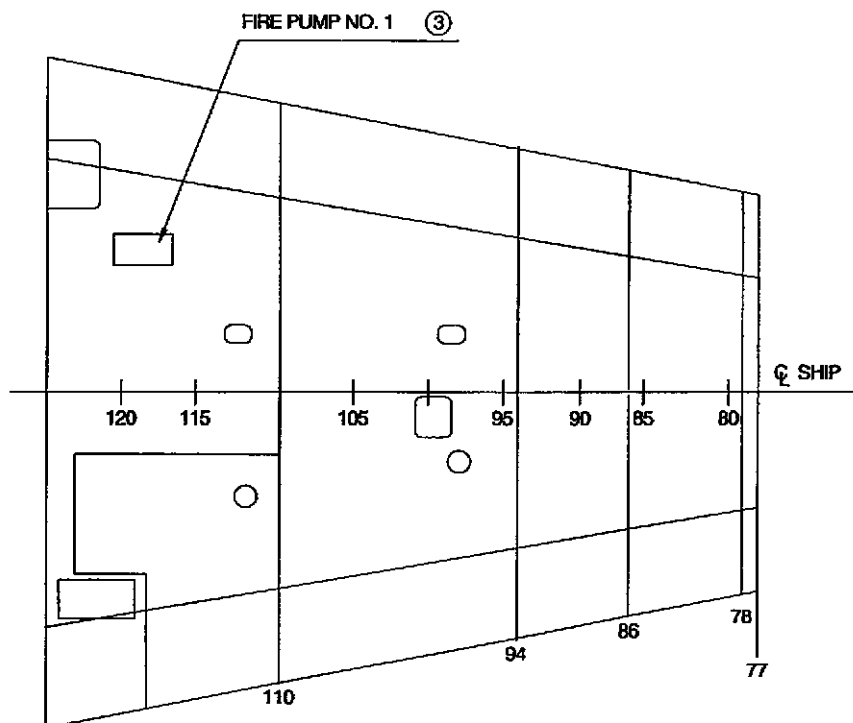
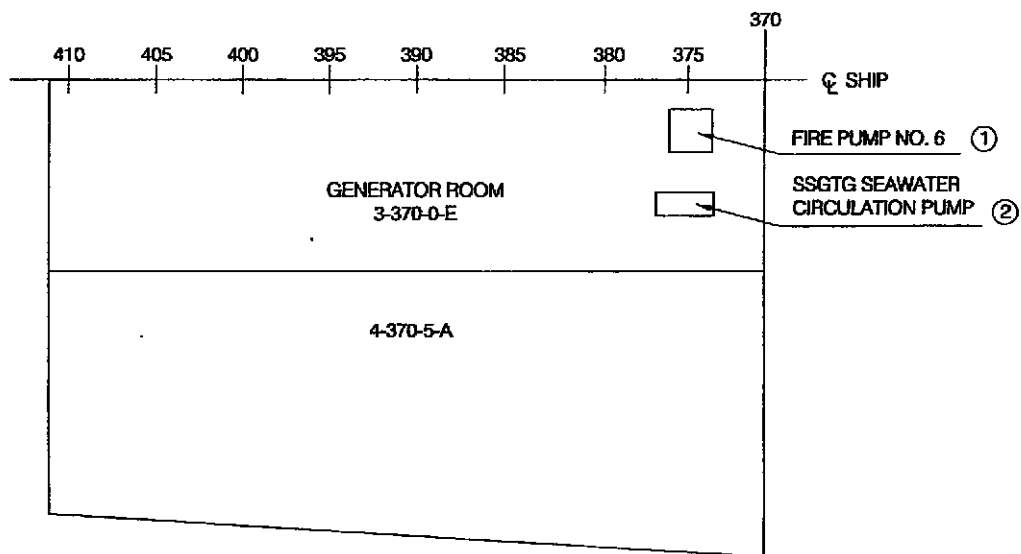
	<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
④	Seawater Strainer (Stbd)	Hold Frame 333 Stbd	12
④	Seawater Strainer (Port)	Hold Frame 333 Port	12
⑤	SSGTG No. 3 Seawater Duplex Strainer	2nd Platf Frame 379 Port	14
⑥	Steering Gear Cooler No. 2 Duplex Strainer	2nd Platf Frame 448 Port	14
⑥	Seawater Duplex Strainer	2nd Platf Frame 447 Port	14
⑦	Steering Gear Cooler No. 1 Duplex Strainer	2nd Platf Frame 448 Stbd	14
⑦	Seawater Duplex Strainer	2nd Platf Frame 447 Stbd	14
⑧	Central Seawater Cooling Pump No. 5 Seawater Duplex Strainer	Hold Frame 330 Stbd	12
⑨	Sewage Discharge Pump No. 2B	Hold Frame 330 CL	12
⑩	Sewage Discharge Pump No. 2A	Hold Frame 305 Stbd	12
⑪	Sewage Ejector Pump No. 2B	Hold Frame 305 Stbd	12
⑪	Sewage Ejector Pump No. 2A	Hold Frame 305 Stbd	12
⑫	Torsion Meter	Hold Frame 322 Stbd	12
⑬	Line Shaft Bearing	Hold Frame 327 Stbd	12
⑭	Line Shaft Bearing	Hold Frame 330 Port	12
⑮	AC Plant No. 4 Vacuum Pump	Hold Frame 336 Port	12
⑯	AC Plant No. 4 CHW Pump	Hold Frame 325 CL	12

Index Number 1809

Miscellaneous Foundations (DDG 78) (CONT.)

See Figure 5-1809 for callout details.

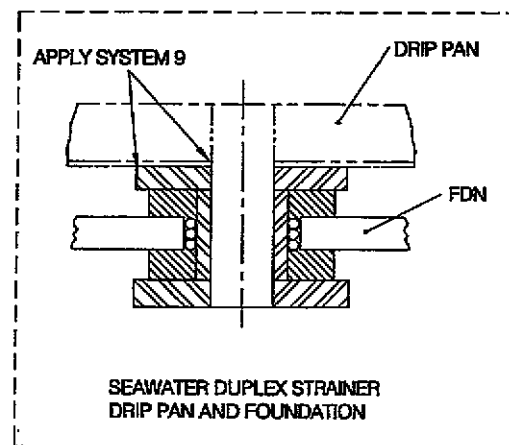
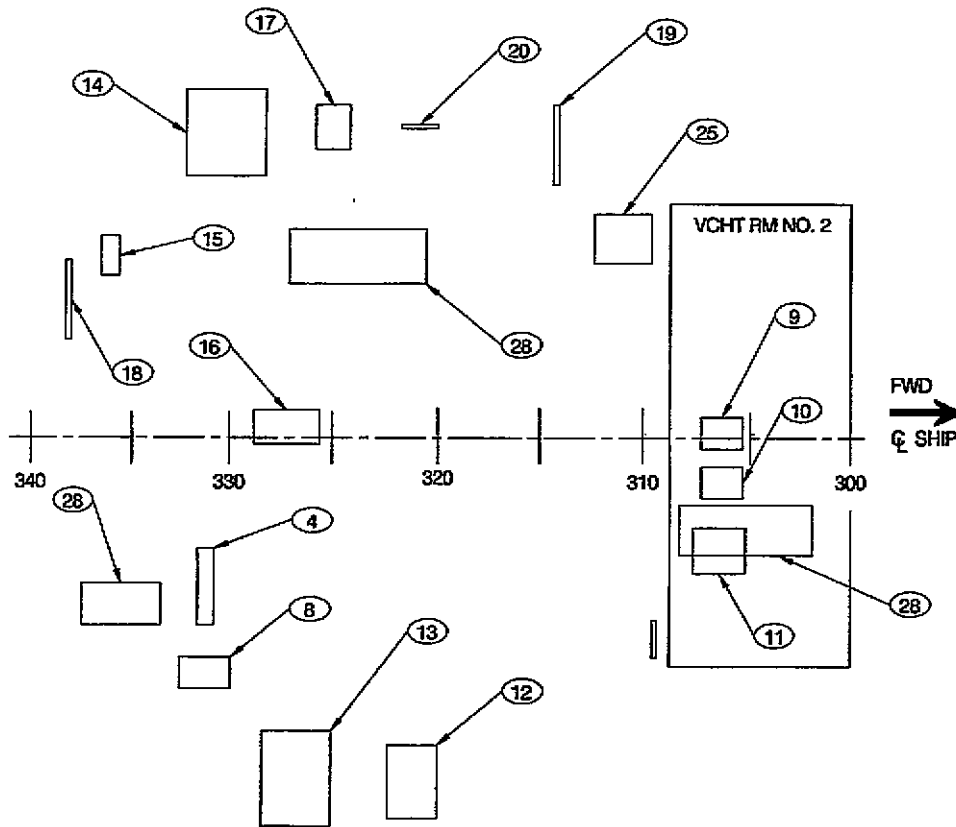
	<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
(17)	Torsionmeter Foundation	Hold Frame 325 Port	12
(18)	Stern Tube Hose Brkt	Hold Frame 338 Port	12
(19)	(2) A/C Plant R114 Cyl 150 lbs Rfgt Replacement Chg	Hold Frame 314 Port	12
(20)	Shaft Horsepower Panel	Hold Frame 321 Port	12
(21)	A/C Plant No. 4 CHW Expansion Tank	IB Frame 308 Stbd	12
(22)	Manual Bus Transfer	IB Frame 328 CL	12
(23)	Auto Bus Transfer	IB Frame 308 Stbd	12
(24)	A/C Plant Controller	IB Frame 312 Port	12
(25)	A/C Plant Receiver	Hold Frame 309 Port	12
(26)	R114 Cylinder Stowage	IB Frame 331 Port	12
(27)	Mounting Panel	Hold Frame 332 Stbd	12
(28)	Air Cooling Coils	Hold Frame 305 Stbd	12
(28)	Air Cooling Coils	Hold Frame 325 Port	12
(29)	Fire Pump No. 1	Hold Frame 113 Port	11
(30)	Sewage Discharge Pump No. 1A	Hold Frame 120 Port	11
(31)	Sewage Discharge Pump No. 1B	Hold Frame 120 Port	11
(32)	Sewage Ejector Pump No. 1A and No. 1B	Hold Frame 119 Port	11
(33)	Plumbing Drain Tank	Hold Frame 116 CL	11
(34)	Sewage Collection Tank	Hold Frame 123 CL	11
(35)	SSGTG Steering Air Cooler	2nd Platf Frame 391 Stbd	14
(36)	Dewatering Pump	2nd Platf Frame 370 CL	14
(37)	Fire Pump No. 6	2nd Platf Frame 372 Stbd	14
(38)	SSGTG No. 3 Seawater Circulating Pump	2nd Platf Frame 372 Stbd	14
(39)	Air Cooling Coil Size 55 (51)	2nd Platf Frame 404 Stbd	14
(40)	JP-5 Service Filter/Separator	2nd Platf Frame 397 Stbd	14



CD_Z 2120

Figure 5-1809. Miscellaneous Locations (Sheet 1 of 5)
(See Work Instructions for Callouts Details)

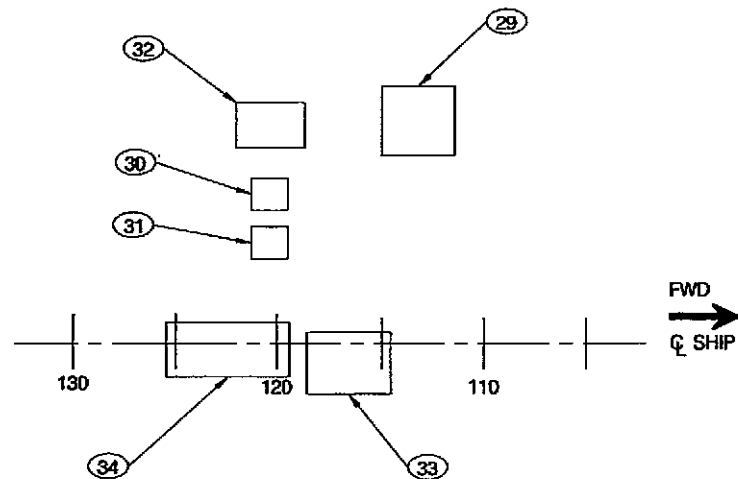
AIR CONDITIONING MACHINERY AND PUMP ROOM (5-300-01-E)
AND VCHT ROOM NO. 2 (4-300-0-E) HOLD



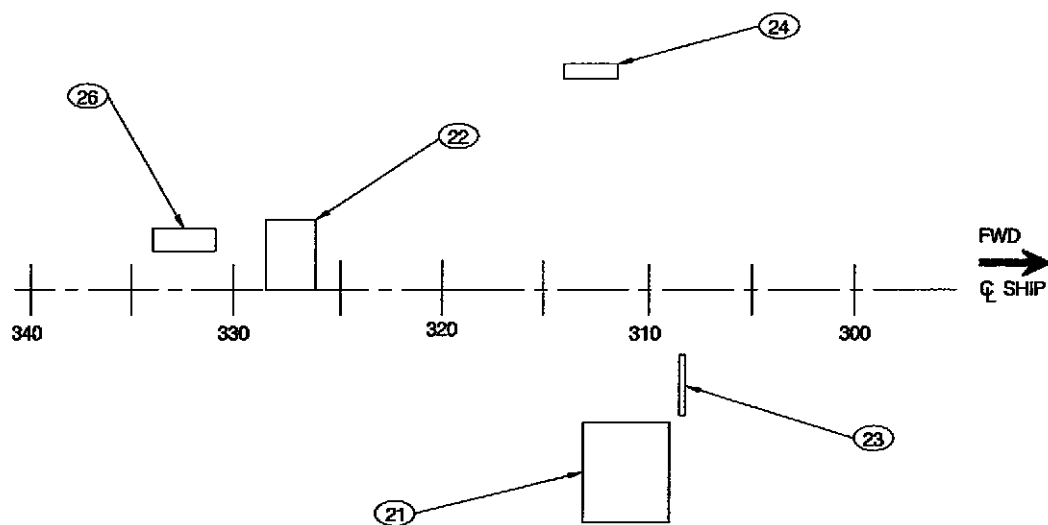
CD_Z_2121

Figure 5-1809. Miscellaneous Foundations (Sheet 2 of 5)
(See Work Instructions for Callout Identification)

VCHT ROOM NO. 1 (4-110-0-E)



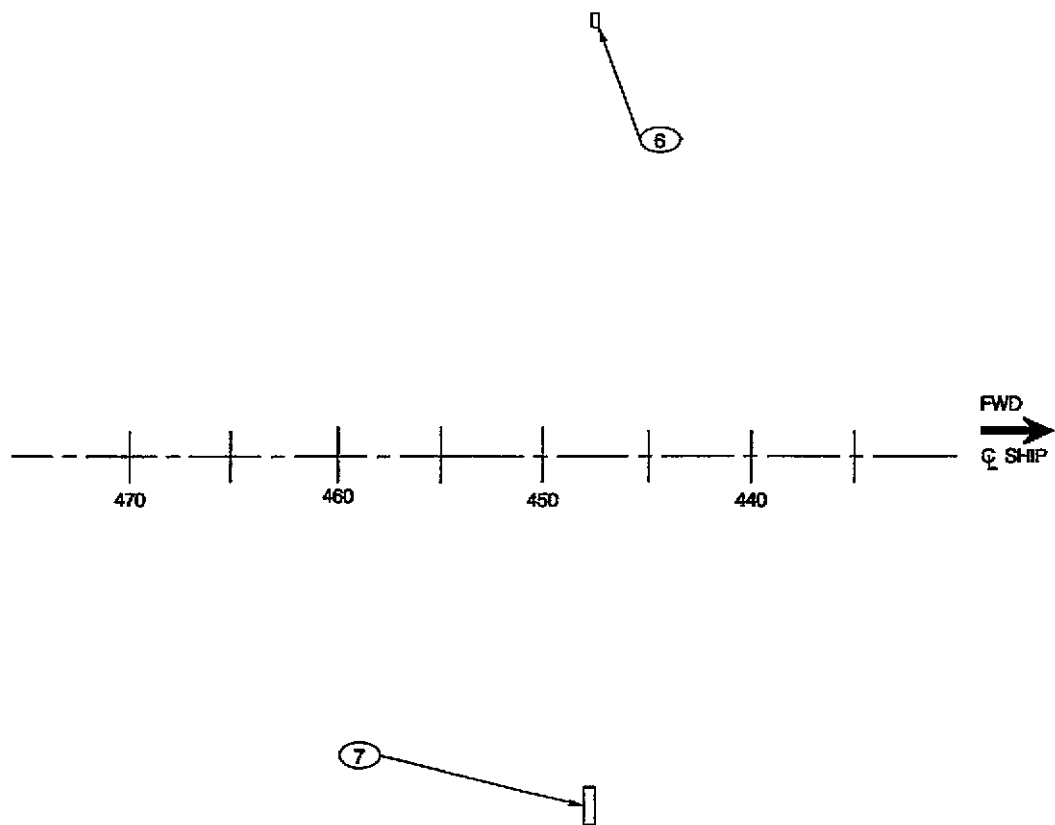
AIR CONDITIONING AND PUMP ROOM (5-300-01-E) INNERBOTTOM



CD_Z_2122

Figure 5-1809. Miscellaneous Foundations (Sheet 3 of 5)
(See Work Instructions for Callout Identification)

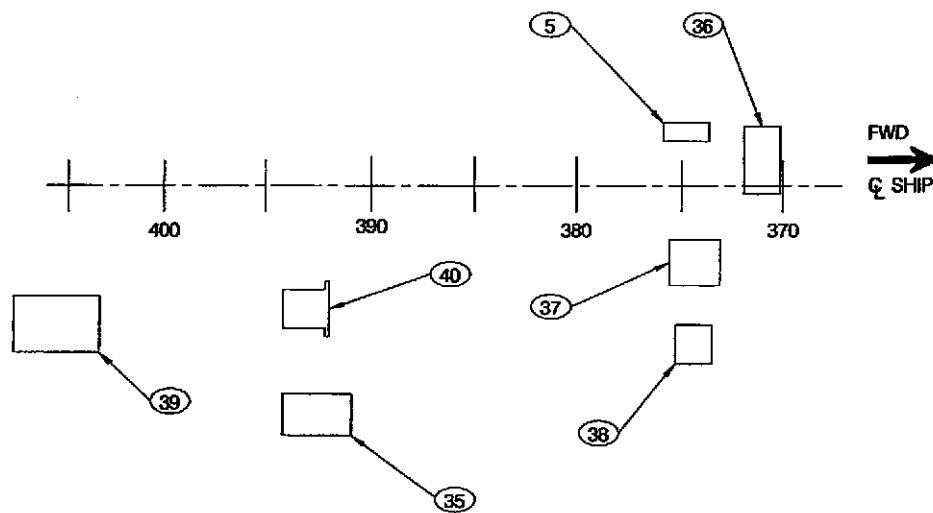
STEERING GEAR ROOM (4-442-0-E) 2ND PLATF



CD_Z_2128

Figure 5-1809. Miscellaneous Foundations (Sheet 4 of 5)
(See Work Instructions for Callout Identification)

GENERATOR ROOM (3-370-0-E) 2ND PLATF



CD_Z_2124

Figure 5-1809. Miscellaneous Foundations (Sheet 5 of 5)
(See Work Instructions for Callout Identification)

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Ventilation Exhaust and Intake Plenums

AREA OF OCCURRENCE: Zone 18, Ship Wide

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: These areas handle moisture and salt laden air (see Figure 5-1810).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

DDG 52 and DDG 55

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 5 of this manual and the references contained therein.

NAVSEA Ventilation Exhaust and Intake Plenums and Associated Drawings: 512-6596368, 512-6596384, 512-6596388, 512-6596890, 512-6596891, 512-6596927, 512-6596934, 512-6596937, 512-6596943, 512-6596928, 512-6597195, 512-6597199, 512-6596387, 512-6596375, 512-6596391, 651-6595941, 301-6596596 and 301-6596603.

2. For Total Protection System (TPS) and Limited Protection System (LPS) Supply systems, metal spray coating (System 2) shall be applied to weather intake openings, airlifts, prefilter bank housings. Dirty side air plenum chambers, and CBR or HEPA filter housings. NAVSEA approved inorganic zinc silicate shall be applied in lieu of System 2 in areas where safety considerations preclude the application of System 2.
3. For all other supply systems, System 2 shall be applied from the weather intake openings to the first ducting joint.
4. For exhaust systems, System 2 shall be applied to airlifts and discharge openings.
5. All fasteners in the areas described in (2 and 3) above and shall be CRES 316 (System 14).

DDG 57 - DDG 78

1. Surface preparation and system application shall be in accordance with Chapters 3 and 4 of this manual and the references contained therein.
2. A NAVSEA approved inorganic zinc silicate coating shall be applied to the following areas:
 - a. TPS and LPS supply system weather intake openings, airlifts, prefilter bank housings, dirty side air plenum chambers, HEPA filter housings, and CBR filter housings where edges weld to the ship's structure.
 - b. All other supply systems from the weather intake openings to 10 feet inboard.
 - c. For exhaust system airlifts and discharge openings.

3. The inorganic zinc silicate coating shall be applied to all carbon steel frame work, fittings and support structure exposed to the environment except all interior surfaces of CPS Fan Rooms which shall be painted with a finish coat of Formula 152, except the deck and bulkhead for a distance of 12 inches above the deck shall have a finish coat of Formula 156.
4. All fasteners used in the areas specified in Item 2a, b, c, and shall be CRES 316 (System 14).
5. Delete frame spray coating to total protection system and low protection supply system weather intake openings, spool pieces, airlifts, prefilter bank housing, dirty side air plenum chambers, HEPA filter housings, and CBR filter housing where edges weld to ship's structure; for all other supply systems form the weather intake opening to 10 feet inboard or the first ducting joint whichever is less; for exhaust system airlifts and discharge openings; and for anti-blast shields. Delete System 2 for non-protected ventilation system. Prime with inorganic zinc silicate paint.
6. DDG 57 - DDG 67. Items that were coated with System 2 shall not be reworked, partial implementation is acceptable.
7. DDG 69. Complete implementation is required.
8. DDG 65 - DDG 74. In lieu of System 2, ventilation plenums shall be cleaned to near white metal in accordance with SSPC-SP10 and painted with 3.0 to 5.0 mils DFT of NAVSEA approved inorganic zinc primer. The primer coat shall be preserved with a 1.0 mil DFT sealer coat of thinned Formula 150, MIL-P-24441, followed by one coat of Formula 150, MIL-P-24441, at 3.0 mils DFT (Type I or Type III) and 5.0 mils, and the final coat of Formula 151, MIL-P-24441 at 3.0 mils DFT (Type IV).
9. DDG 78. In lieu of System 2, ventilation plenums shall be cleaned to near white metal in accordance with SSPC-SP10 and paint with NAVSEA approved epoxy primer. The primer coat shall be preserved with a 1.0 mil DFT sealer coat of thinned Formula 150, MIL-P-24441, followed by one coat of Formula 150, MIL-P-24441, at 3.0 mils DFT (Types I or III) and 5.0 mils, and the final coat of Formula 151, MIL-P-24441 at 3.0 mils DFT (Type IV).
10. DDG 78. Where inorganic zinc silicate primer is specified as an alternate to System 2, NAVSEA approved epoxy paints may be substituted. On the exterior and weather surfaces areas of the ship where the final topcoat paint system is military specification MIL-P-24635A, a single 3-5 mils DFT coat of Amercoat Ameron 385 shall be applied in lieu of inorganic zinc silicate primer. For the interior, in lieu, of inorganic zinc silicate primer, a single 3-5 mils DFT coat of Amercoat Ameron 385, MIL-P-24441 Type IV, or Devoe Coating Rust B 236, MIL-P-23236 Type IV Class 2, shall be applied. Surface preparation of the affected areas where alternate epoxy systems are used shall be SSPC-SP10.
11. DDG 78. Vent plenum welds at 01-109-1, 01-109-3, 01-111-1, and 01-111-3 shall be blasted to SSPC-SP10 and coated with two coats (4-6 mils DFT each coat) of Bar Rust 236 and top coated.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and touch up as needed. Replace fasteners as needed.

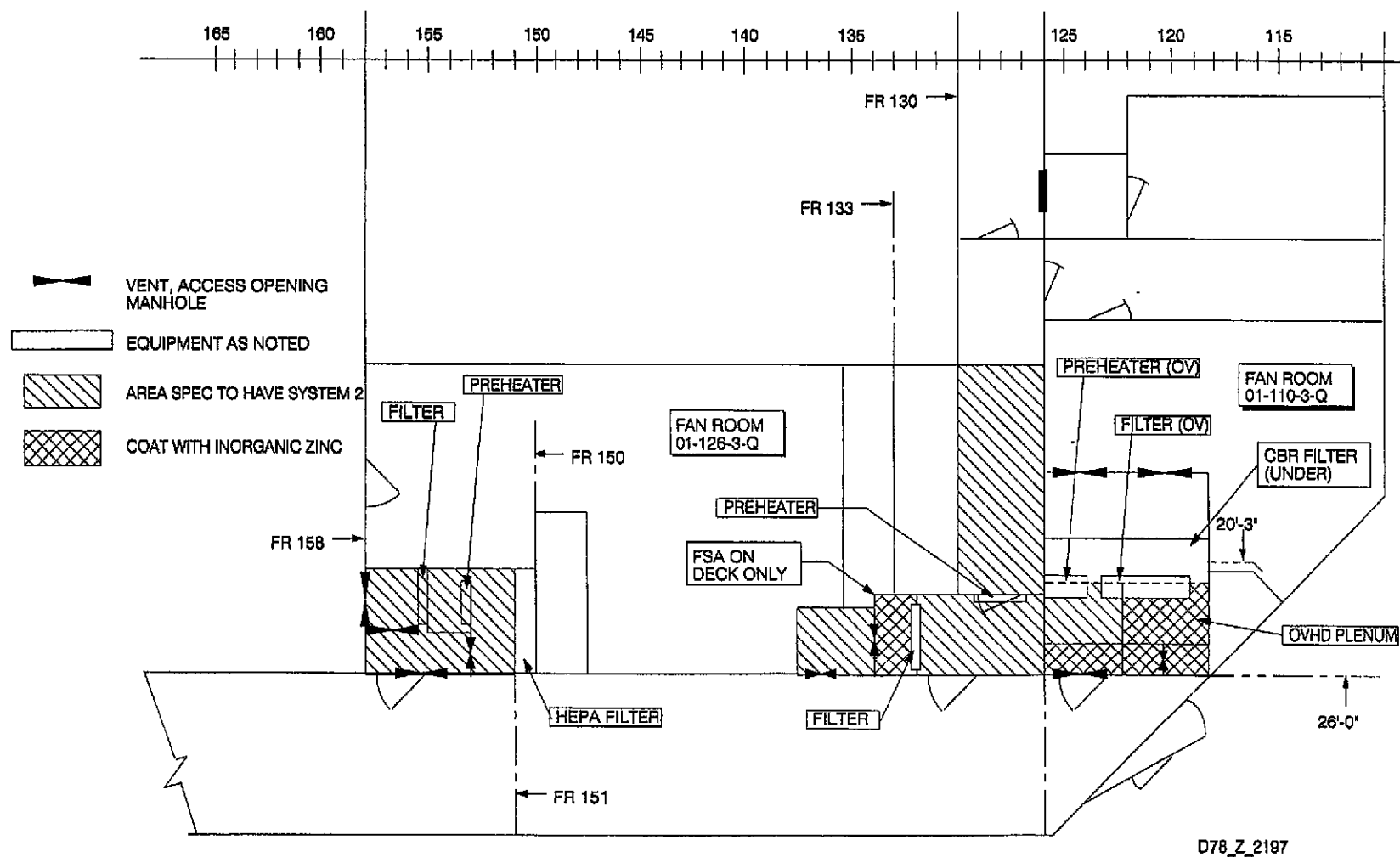
Index Number 1810

Ventilation Intake and Exhaust Plenums

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
TPS Supply	01 Lvl Frame 123 Stbd	18
TPS Supply	01 Lvl Frame 135 Stbd	18
LPS Supply	01 Lvl Frame 153 Stbd	18
TPS Supply	01 Lvl Frame 210 Port	18
LPS Supply	01 Lvl Frame 212 Port	18
TPS Supply	01 Lvl Frame 241 Port	18
LPS Supply	01 Lvl Frame 241 Port	18
LPS Supply	01 Lvl Frame 241 CL	18
LPS Supply	01 Lvl Frame 273 Port	18
TPS Supply	01 Lvl Frame 276 Port	18

<u>Description</u>	<u>Location</u>	<u>Discharge Type</u>	<u>Corrosion Control Zones</u>
Nature Exhaust	05 Lvl Frame 150 Stbd	Type T	18
Nature Exhaust	04 Lvl Frame 138 Stbd	Type T	18
Nature Exhaust	04 Lvl Frame 166 Port	Type G	18
Nature Exhaust	04 Lvl Frame 166 Stbd	Type V	18
Discharge	02 Lvl Frame 162 Stbd	Type W	18
Discharge	02 Lvl Frame 166 Stbd	Type W	18
Nature Exhaust	02 Lvl Frame 172 Stbd	Type Y	18
Nature Exhaust	01 Lvl Frame 110 Stbd	Type AC	18
Discharge	01 Lvl Frame 110 Stbd	Type A	18
Discharge	01 Lvl Frame 110 Stbd	Type H	18

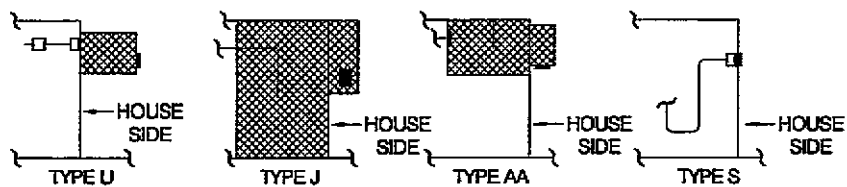
<u>Description</u>	<u>Location</u>	<u>Intake Type</u>	<u>Corrosion Control Zones</u>
Supply	04 Lvl Frame 169 Stbd	Type U	18
Supply	01 Lvl Frame 115 Stbd	Type J	18
Supply	01 Lvl Frame 216 Stbd	Type AA	18
Supply	Mn Dk Frame 370 Stbd	Type S	18



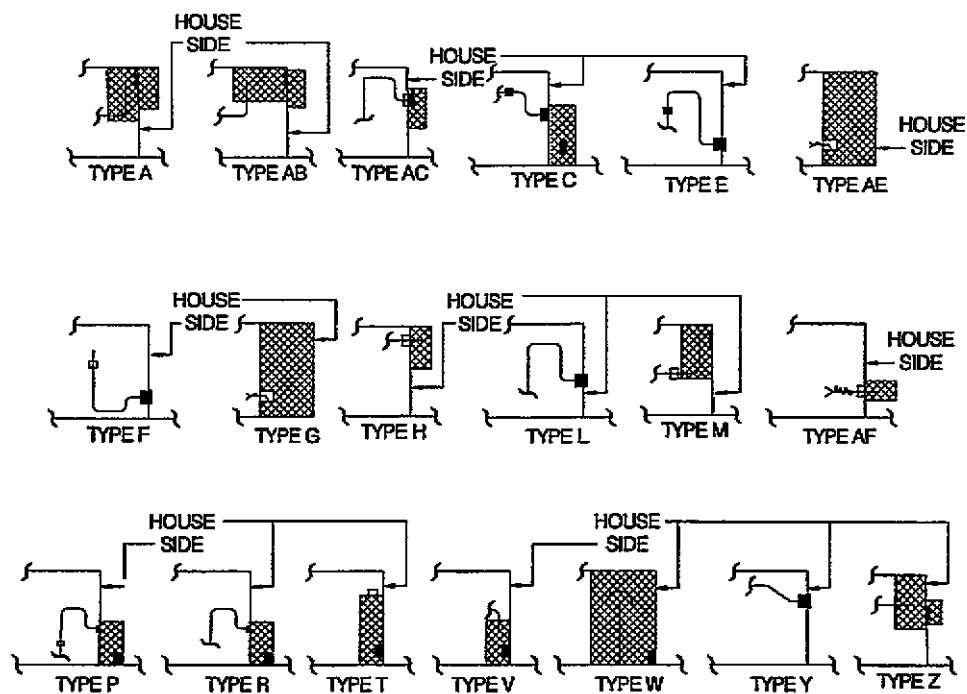
S6360-AM-MMO-010

Figure 5-1810. Ventilation Exhaust and Intake Plenums: Fan Rooms 01-110-3-Q and 01-126-3-Q for DDG 52 and DDG 55 (Sheet 1 of 9). See Work Instructions for Specifics.

CONFIGURATION OF INTAKE TYPES. ALL INTERIOR SURFACES OF SHADED AREAS TO HAVE SYSTEM 2 OR APPLICABLE COATING (SEE WORK INSTRUCTIONS).

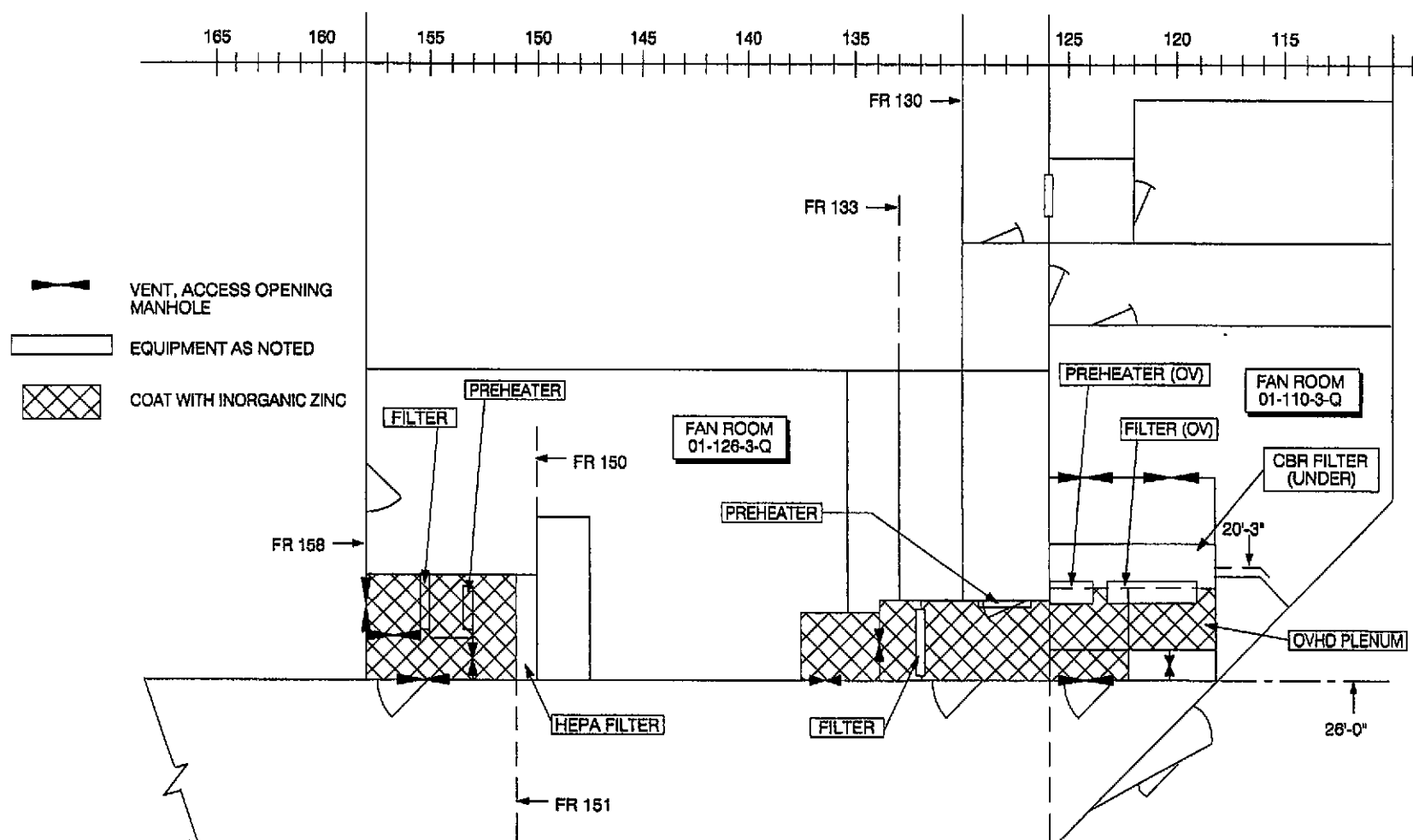


CONFIGURATION OF EXHAUST DISCHARGE TYPES. ALL INTERIOR SURFACES OF SHADED AREAS TO HAVE SYSTEM 2 OR APPLICABLE COATING (SEE WORK INSTRUCTIONS).



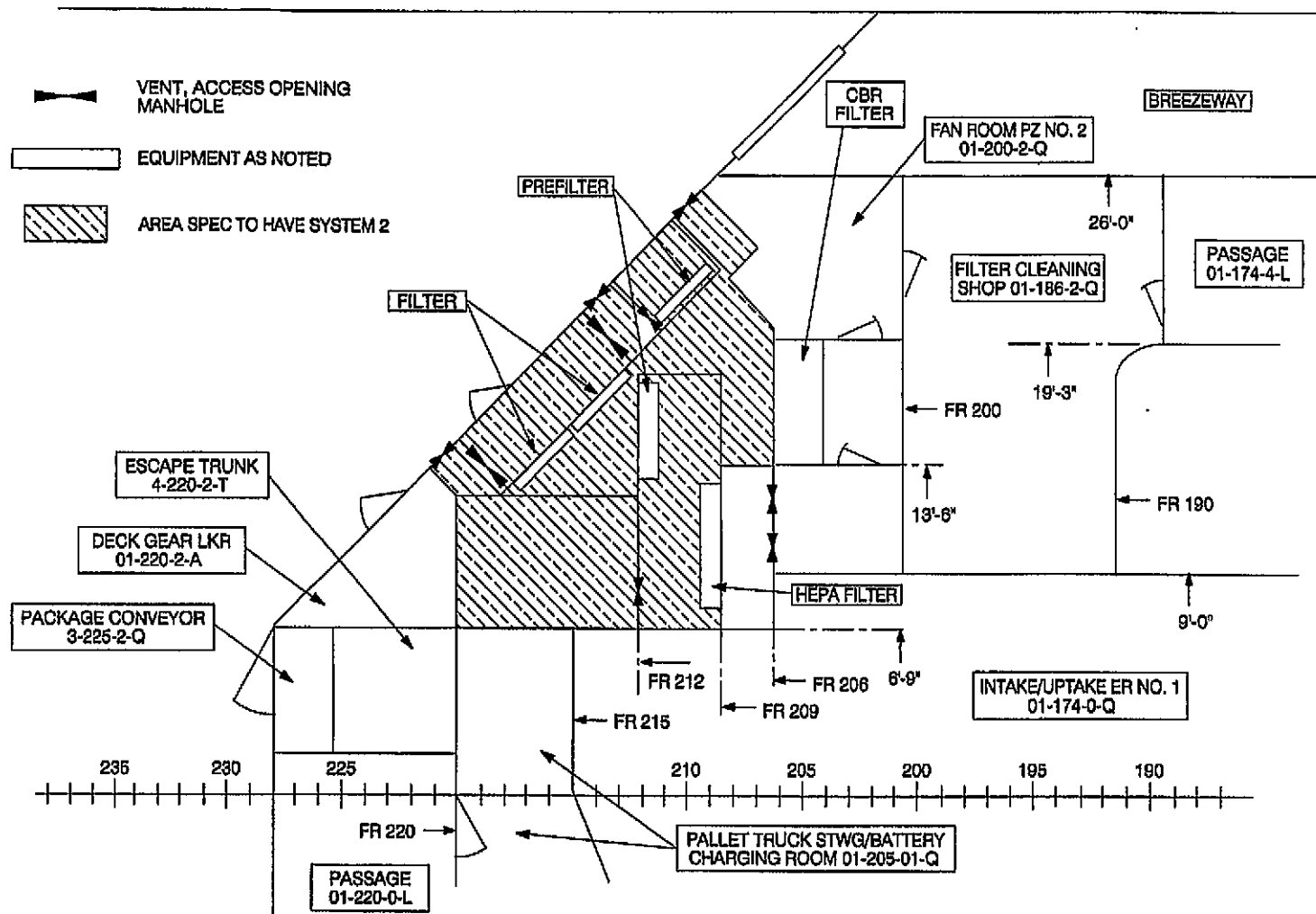
CD_Z_2125

Figure 5-1810. Ventilation Exhaust and Intake Plenums: Intake and Exhaust Discharge Types (Sheet 2 of 9)



D78_Z_2128

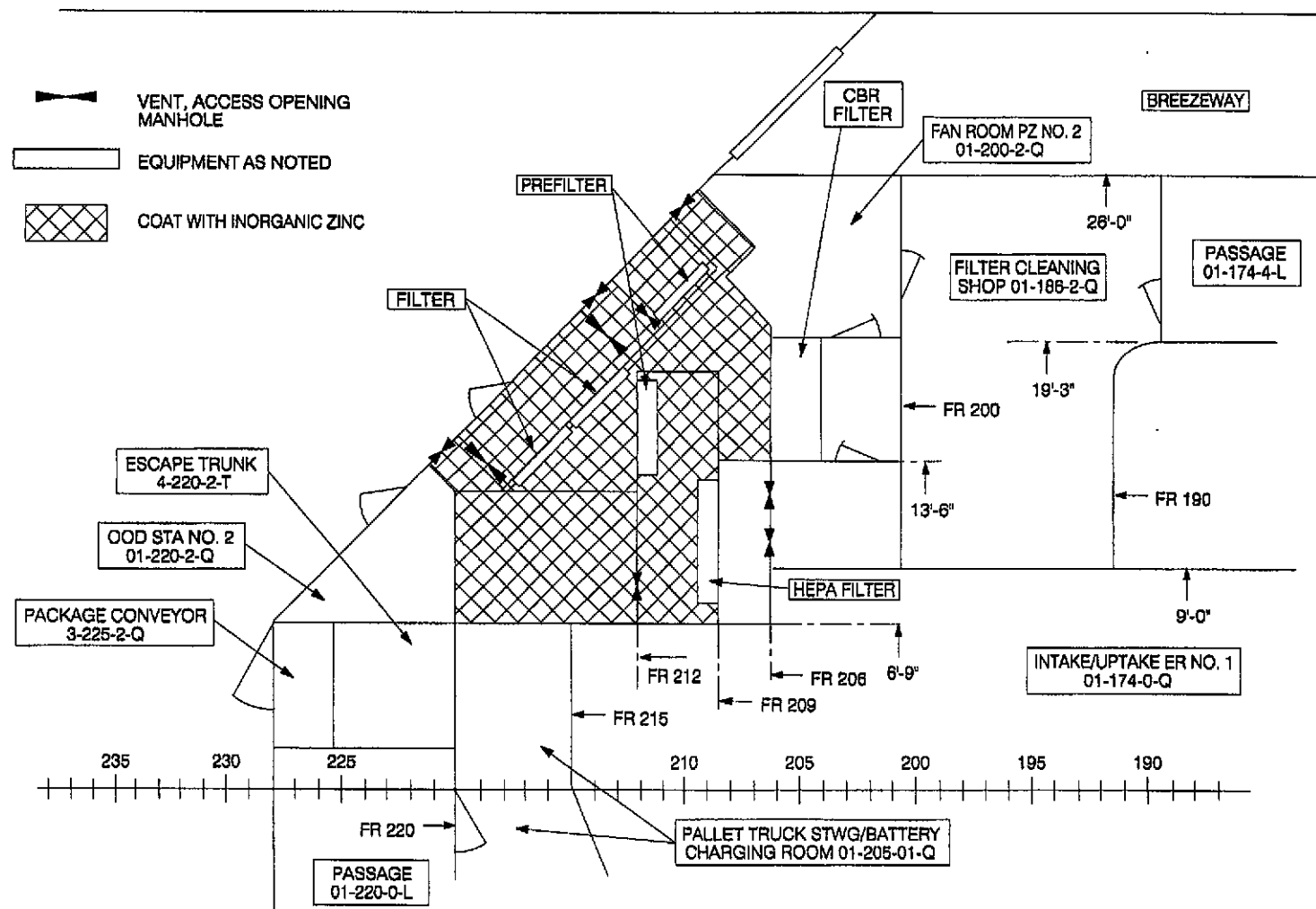
Figure 5-1810. Ventilation and Exhaust Intake Plenums: Fan Rooms 01-240-01-Q and 01-276-2-Q for DDG 57 and Follow (Sheet 3 of 9). See Work Instructions for Specifics.



CD_Z_2127

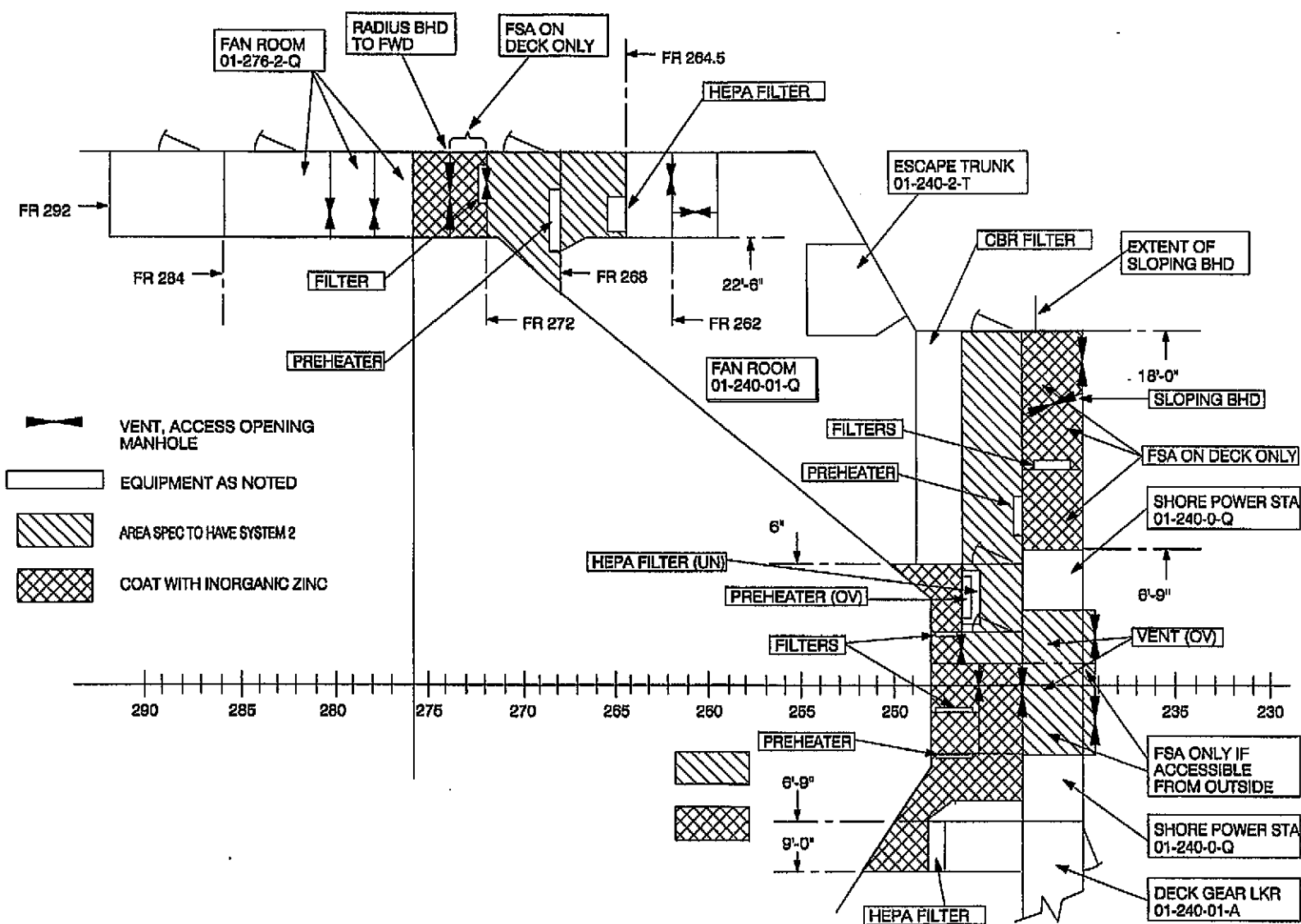
Figure 5-1810. Ventilation and Exhaust Discharge Plenums: Fan Room 01-200-2-Q for DDG 52 and DDG 55 (Sheet 4 of 9). See Work Instructions for Specifics.

S6360-AM-MMO-010



CD_Z_2128

Figure 5-1810. Ventilation Exhaust and Intake Plenums: Fan Room 01-200-2-Q for DDG 57 and Follow (Sheet 5 of 9). See Work Instructions for Specifics.



D78_Z_2129

Figure 5-1810. Ventilation Exhaust and Intake Plenums: Fan Rooms 01-240-01-Q and 01-276-2-Q for DDG 52 and DDG 55 (Sheet 6 of 9). See Work Instructions for Specifics.

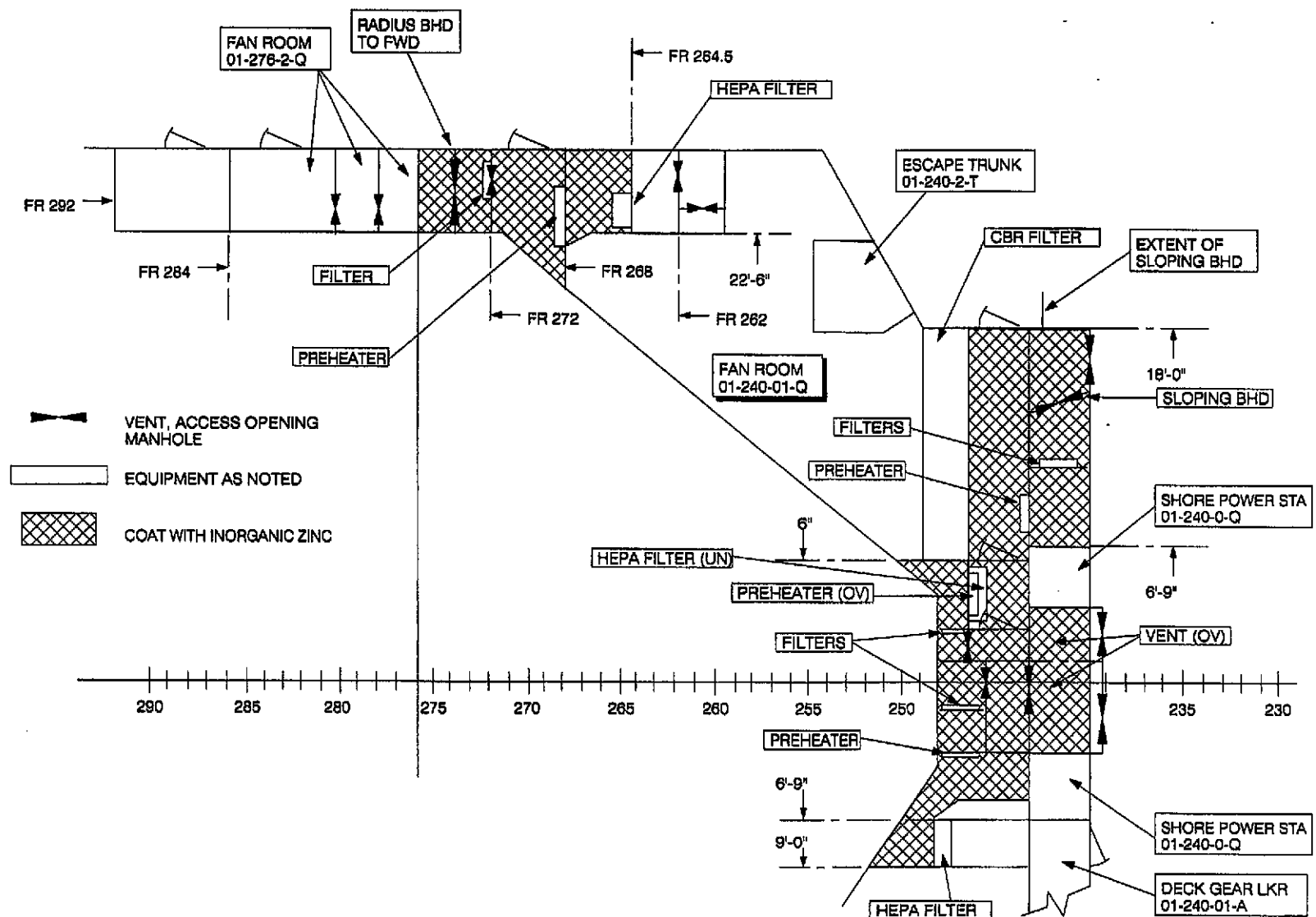
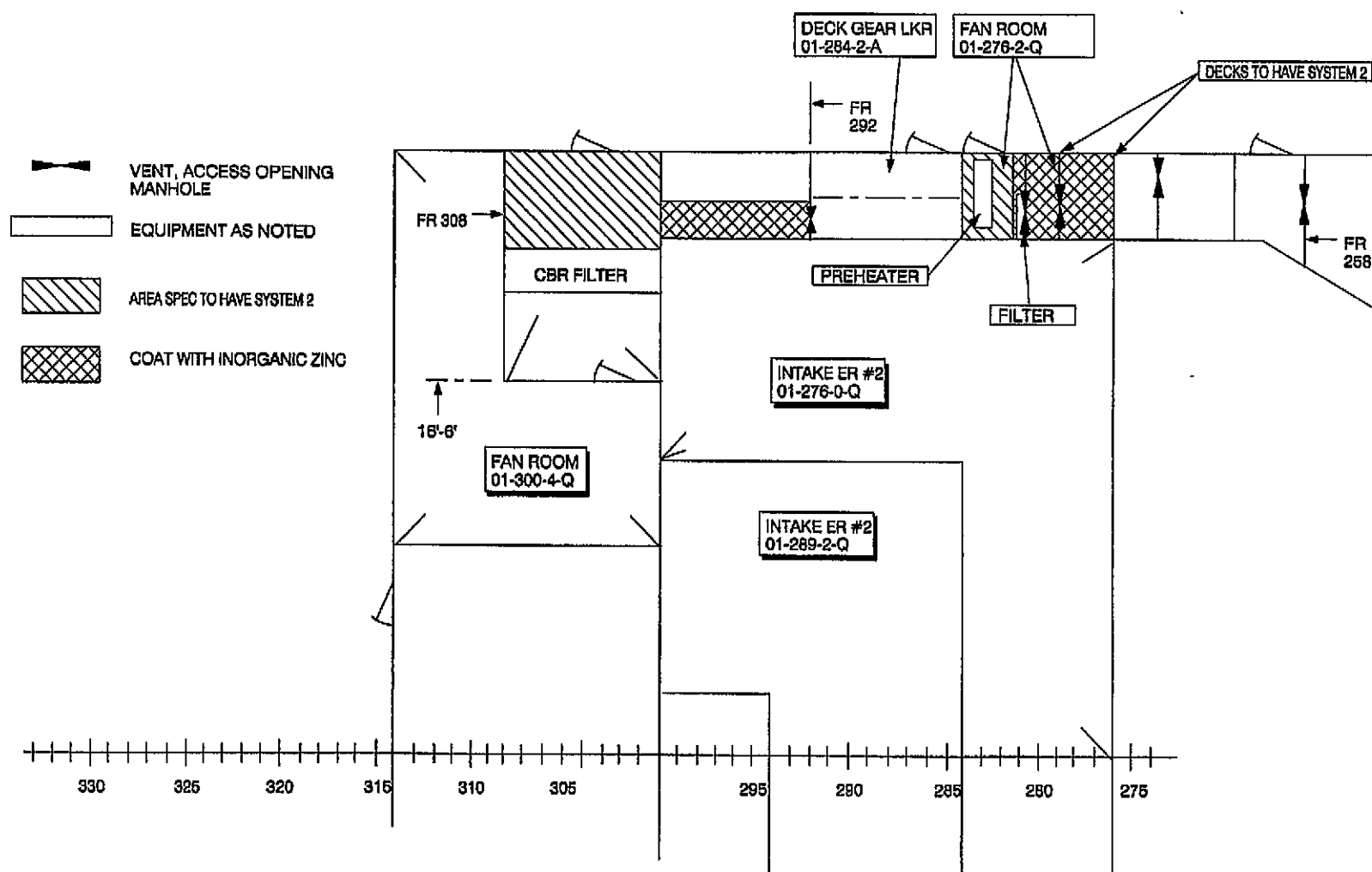
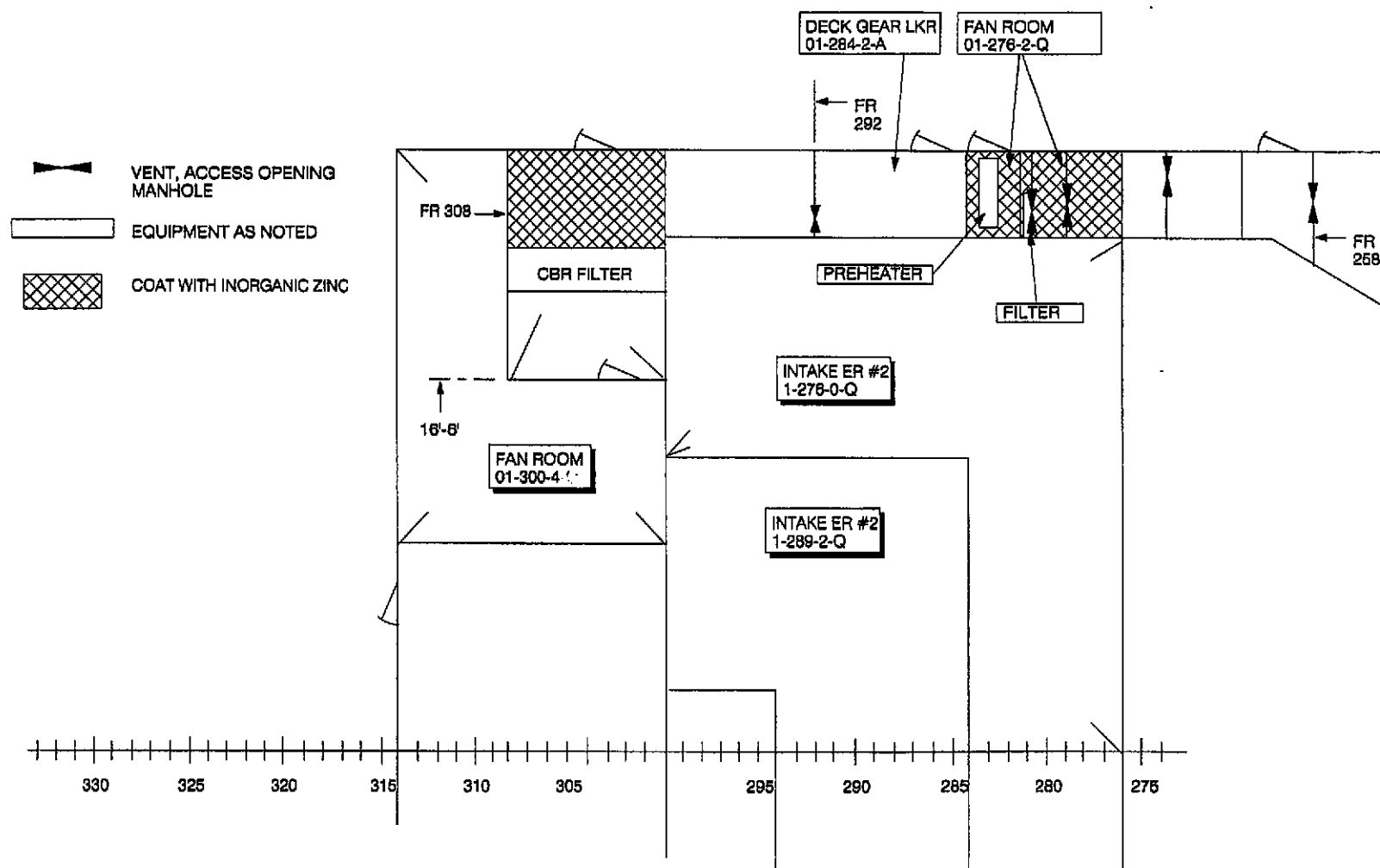


Figure 5-1810. Ventilation Exhaust and Intake Plenums: Fan Rooms 01-240-01-Q and 01-276-2-Q ^{D78_Z_2130}
for DDG 57 and Follow (Sheet 7 of 9). See Work Instructions for Specifics.



D78_Z_2131

Figure 5-1810. Ventilation Exhaust and Intake Plenums: Fan Rooms 01-276-2-Q and 01-300-4-Q for DDG 52 Only (Sheet 8 of 9). See Work Instructions for Specifics.



S6360-AM-MMO-010

Figure 5-1810. Ventilation Exhaust and Intake Plenums: Fan Rooms 01-276-2-Q and 01-300-4-Q for DDG 55 and Follow (Sheet 9 of 9). See Work Instructions for Specifics. D78_Z_2132

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Compressed Gas Bottle Stowage Racks

AREA OF OCCURRENCE: Zone 18

TYPE OF CORROSION: Uniform Attack, Galvanic

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: The compressed gas bottle stowage racks are used to restrain standard size gas cylinders.

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS: *Not a corrosion control item for DDG 74 - 78.

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Compressed Gas bottle Stowage Racks and Foundations and Associated Drawings: 8100-1262-0221, 600-6596674 and 600-6596664.

2. Weather exposed steel gas bottle stowage racks shall be preserved with a metal spray coating (System 2) prior to installation.
3. Aluminum gas bottle stowage racks shall be preserved with a powdered epoxy coating (System 4) prior to installation.
4. Apply metal spray coating (System 2) to weather exposed stowage rack foundations and surrounding deck areas.
5. Apply anti-seize compound (System 6) to fastener prior to installation.

SERVICE REQUIREMENTS (SHIP): Inspect and retouch as needed. Replace fasteners and dielectric barrier as needed.

Index Number 1811

Compressed Gas Bottle Stowage Racks and Foundations

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Compressed Gas Bottle Stowage Racks	Various	18, 10

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Reduction Gear Dehumidifier System

AREA OF OCCURRENCE: Zone 18. Engine Rooms No. 1 and No. 2

TYPE OF CORROSION: Galvanic

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: High

DESCRIPTION: The reduction gear dehumidifier removes moisture when the propulsion system is secured (see Figure 5-1812).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Reduction Gear Dehumidifier System and Associated Drawings: 262-6598965, 505-6596797 and 505-6596816.

2. Install a plastic dielectric barrier (System 11) between the flanges of dissimilar metals. Barrier shall extend 1/4-inch beyond the interface on all sides.
3. CRES 316 fasteners (System 14) coated with polysulfide sealant (System 9) shall be used where fasteners are required.
4. DDG 78. Fasteners shall be of corrosion resistant material (System 14).
5. DDG 78. Apply polysulfide sealant (System 9) where fasteners are required.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace as needed. Replace fasteners as needed.

Index Number 1812

Reduction Gear Dehumidifier System

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Flanges	2nd Platform ER No. 1 Frame 208	13
	2nd Platform ER No. 2 Frame 268	14

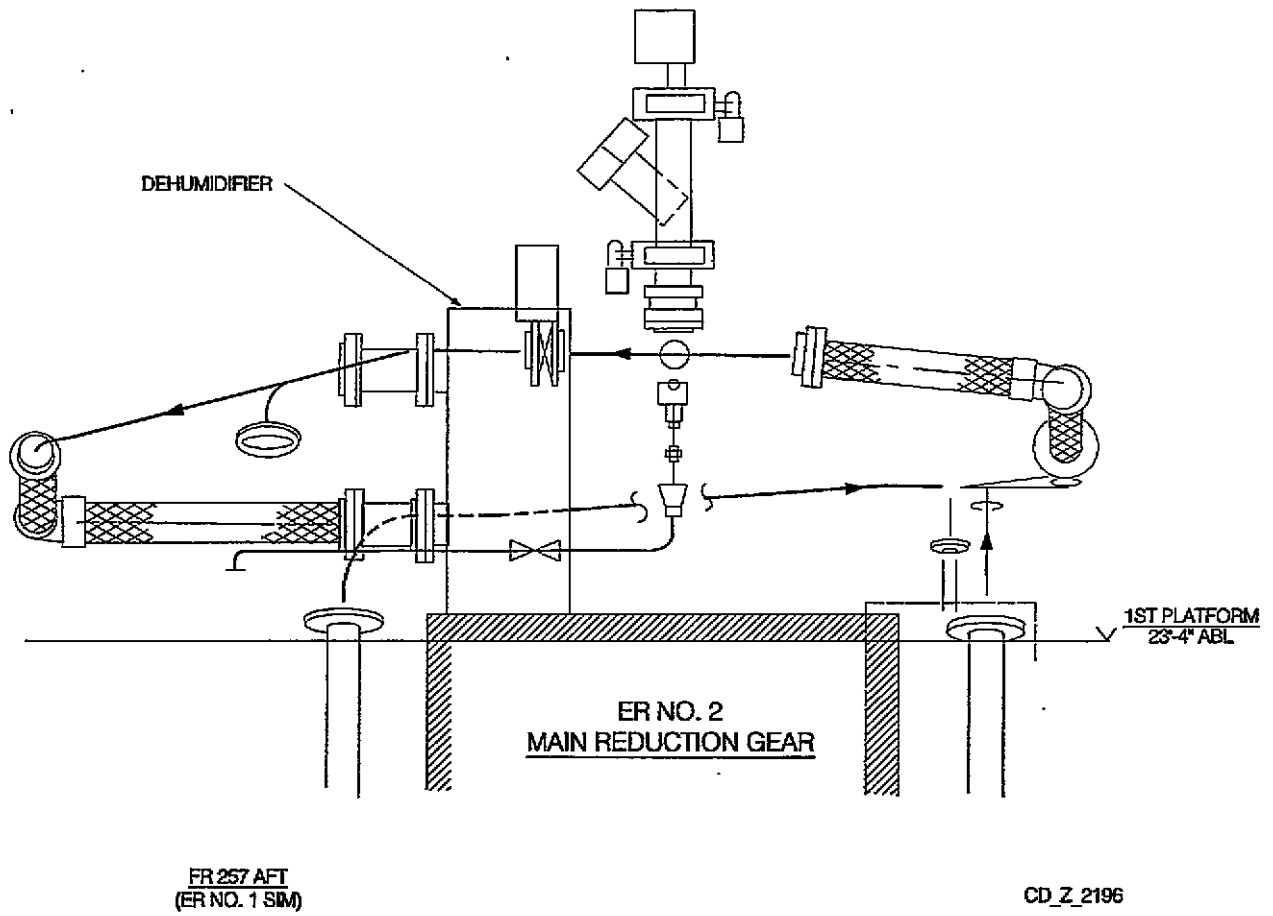


Figure 5-1812. Reduction Gear Dehumidifier

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Sonar dome (DDG 78)

AREA OF OCCURRENCE: Transducer Compartment (6-0-0-Q), Transducer Cylinder (0-10-0-Q),
Sonar dome Access Trunk (5-28-0-T), and Cable Trunk (5-2-0-Q)

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Severe

FREQUENCY OF CORROSION: High

DESCRIPTION: Area is classified as a wet space

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Sonar Dome and Associated Drawings: 101-7059893 and 180-7060449.
2. Replace fasteners for pipe hangers and cable trays at Transducer Compartment (6-0-0-Q) with nickel-copper alloy (Alloy 500) (System 16).
3. Apply anti-seize compound (System 6), premium grade nickel hi-temp, prior to installation of fasteners.
4. Scuttle hinge pads, exposed surfaces on fasteners and faying surfaces of hinges/shims shall be protected with protective sealant, adhesive marine, 3M 5200 or equal (System 8).
 - 4.1. Abrade all surfaces to receive protective sealant with brass/CRES wire brush.
 - 4.2. Clean surfaces with BIO-T-MAX and allow to dry.
 - 4.3. Wipe with clean freshwater all residue from BIO-T-MAX and allow to dry.
 - 4.4. Apply 3M 5200 sealant and allow 7 days to cure.
5. Remove cable stuffing tube gland nut at Transducer Cylinder (6-10-0-Q), Sonar dome Access Trunk (5-28-0-T) and Cable Trunk (5-2-0-Q) from stuffing tube and slide-up wire and apply protective sealant, adhesive marine, 3M 5200 or equal.
 - 5.1. Abade exterior surfaces of stuffing tube gland nut with brass/CRES wire brush.
 - 5.2. Clean surface with BIO-T-MAX and allow to dry.
 - 5.3. Wipe with clean freshwater all residue from BIO-T-MAX and allow to dry.
 - 5.4. Apply anti-seize compound (zinc-duct-petrolatum, MIL-T-22361).
 - 5.5. Apply 3M 5200, or equal, protective sealant to cable and top of bronze gland nut filling all caps allow 7 days to cure.

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NOTE: Adhesion of protective sealant will not occur if contaminated with anti-seize.

SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace fasteners as required. Reapply protective sealant as required.

Index Number 1813 (DDG 78)
Sonar Dome

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Fasteners	6-0-0-Q	18
Scuttle Hinge Pads	6-0-0-Q	18
Gland Nut	6-0-0-Q	18
Gland Nut	5-2-0-Q	18
Gland Nut	5-28-0-7	18

Table 5-10. Corrosion Control Zone 19 (See Figure 5-10)

Zone Number: 19		Location: 41'-0" Above Baseline Flat	Frame: NN to 42
Index Number	Description	Index Numbers for Other Zones	
1901	Anchor Windlass and Brake control		
	<u>Problems Common to Other Areas:</u>		
	Air Escape Vents	1002	
	Hawser Reels (Mooring Line Reels)	1808	
	Pipe Hangers and Fasteners (Steel Only)	1031	
	Retractable Kingposts and Trunk	0205	

CORROSION SUMMARY SHEET

PROBLEM AREA OR COMPONENT: Anchor Windlass and Brake Controls

AREA OF OCCURRENCE: Zone 19 (41' Flat, Windlass Room) and Zone 2 (01 Level, Bow)

TYPE OF CORROSION: General

TYPICAL EXTENT OF CORROSION: Moderate

FREQUENCY OF CORROSION: Moderate

DESCRIPTION: The exterior components are exposed to weather, saltwater and impact (see Figure 5-1901).

RECOMMENDED CORRECTIVE/PREVENTIVE ACTION WORK INSTRUCTIONS:

1. Surface preparation and system application shall be in accordance with Chapters 3, 4 and 8 of this manual and the references contained therein.

NAVSEA Anchor Windlass and Control Stand Fasteners and Associated Drawings:
600-6596645, 611-6597245 and 101-6597094.

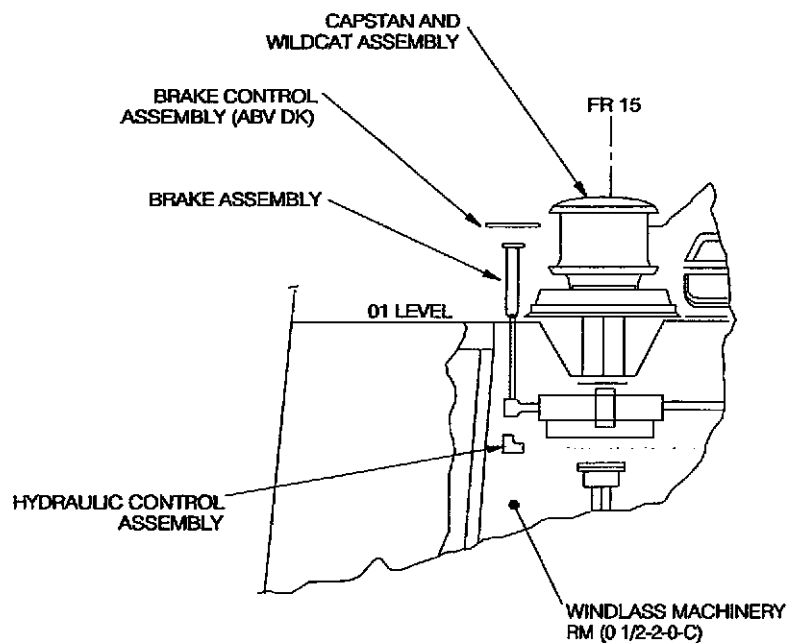
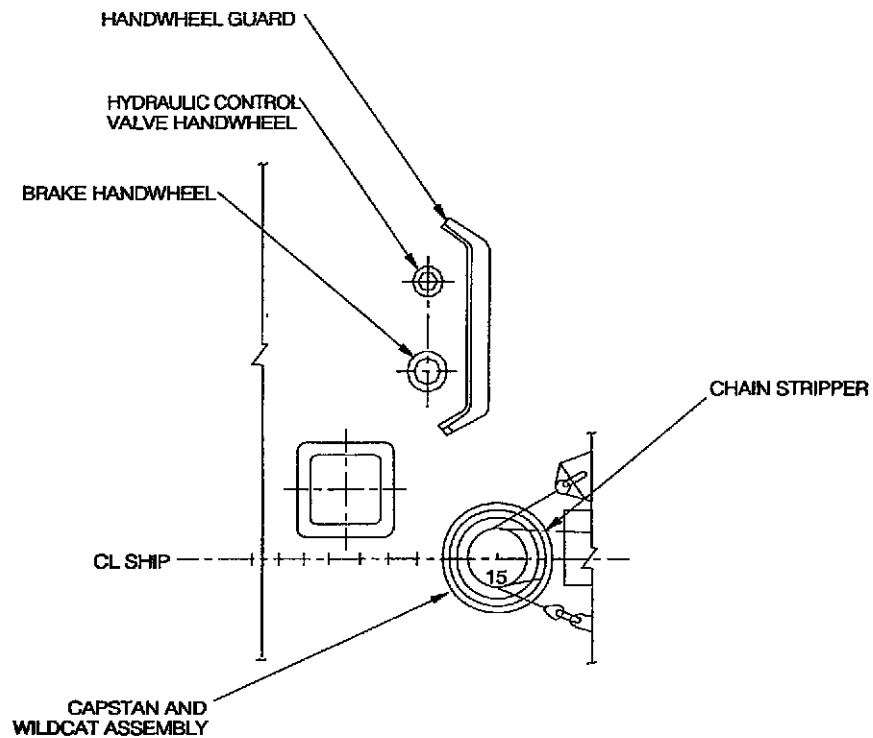
2. DDG 52 - DDG 74. Apply ceramic metallic coating (System 5) to steel fasteners used for mounting and securing the anchor windlass and the fasteners brake and control stands.
3. DDG 78. Mounting, securing and all assembly fasteners shall be of corrosion resistant material (System 14).
4. DDG 67-74. All grease fittings in Anchor Handling Systems are to be CRES 316 (System 14) or MONEL (System 16).
5. DDG 78. Grease fittings shall be made from nickel copper alloy (MONEL).

SERVICE REQUIREMENTS (SHIP): Inspect monthly and replace as needed.

Index Number 1901

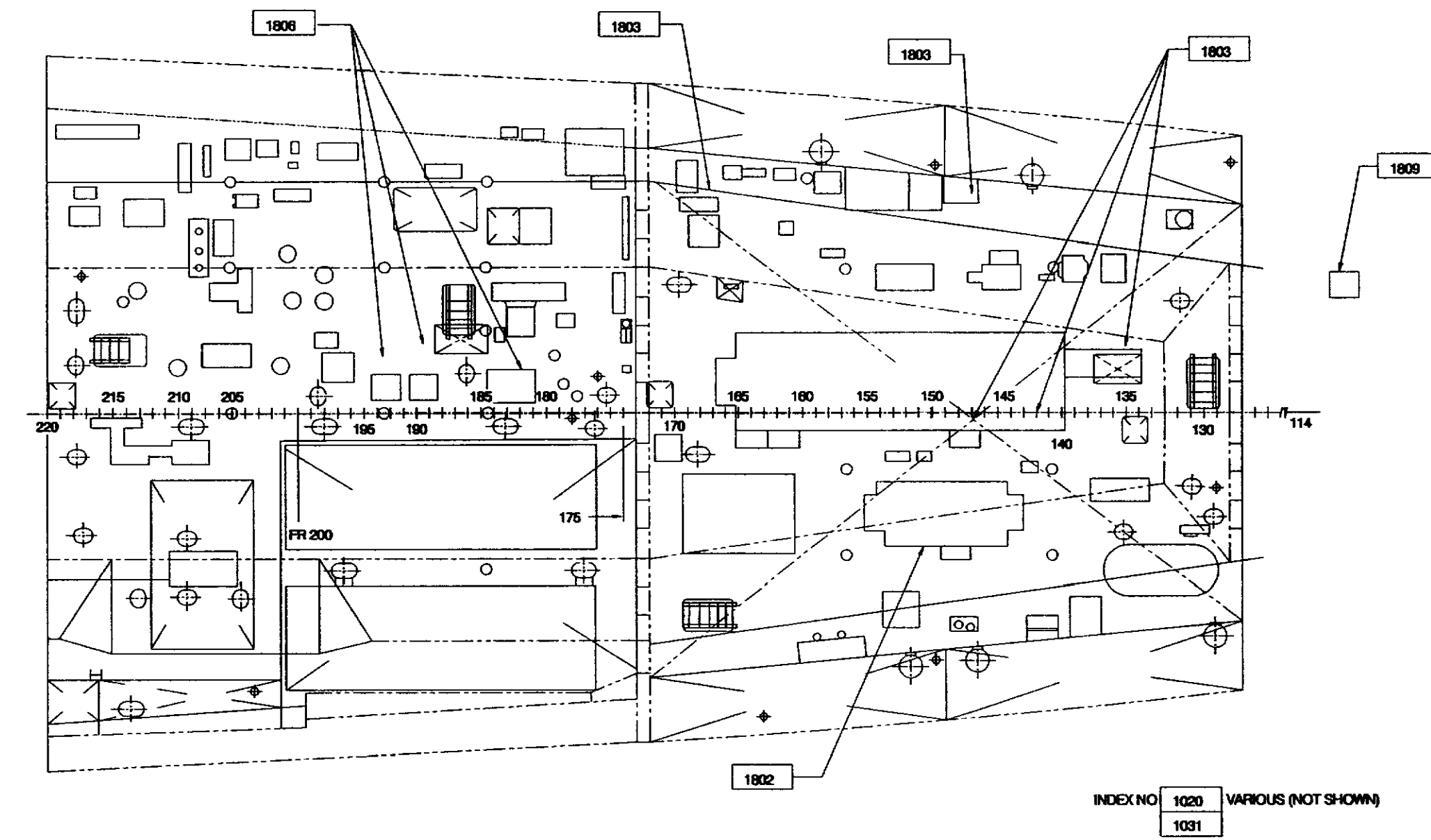
Anchor Windlass and Control Stand Fasteners

<u>Description</u>	<u>Location</u>	<u>Corrosion Control Zones</u>
Anchor Windlass and Brake Controls	01 Lvl Bow and Windlass Room	2, 19



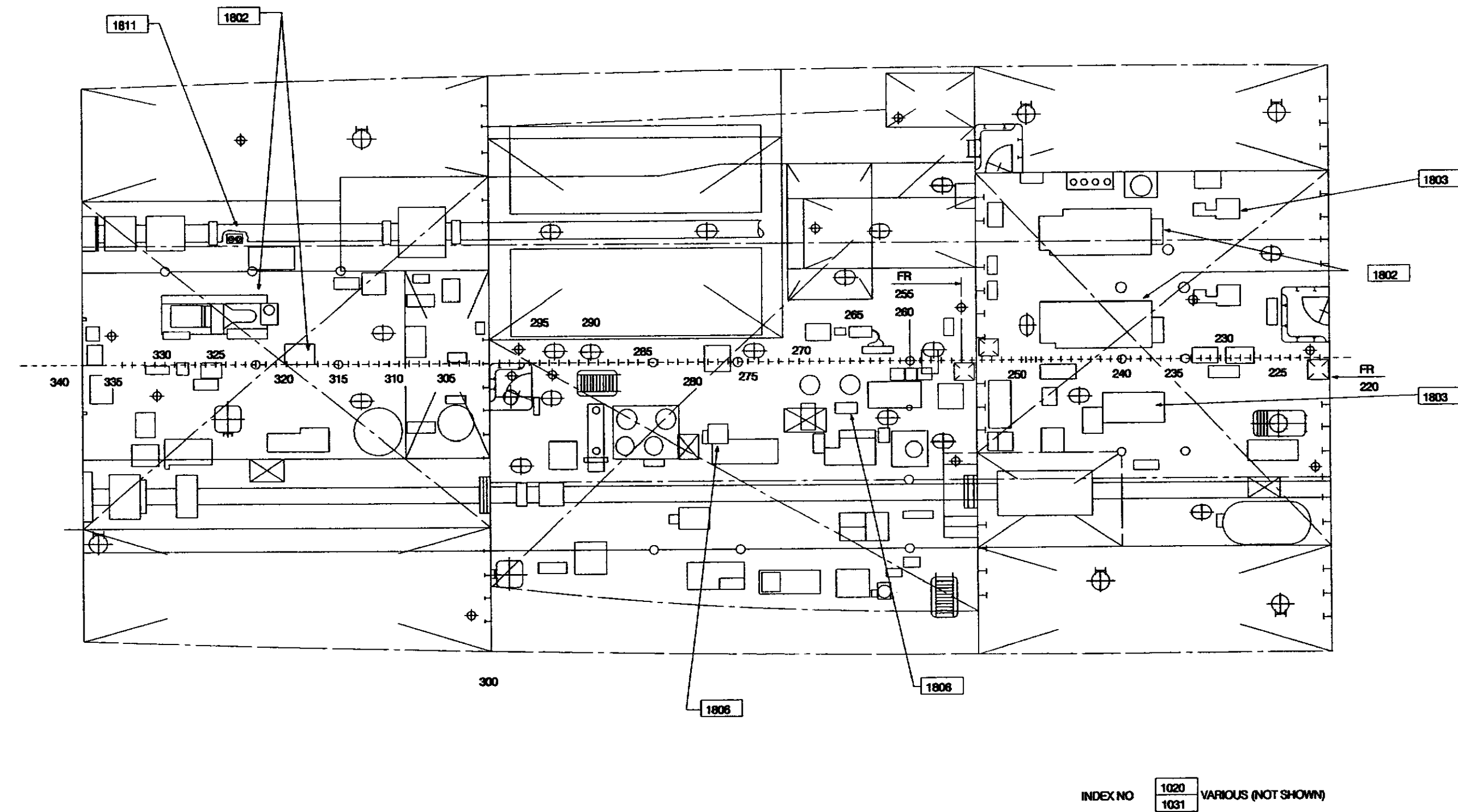
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Figure 5-1901. Anchor Windlass and Control Stand Fasteners



DGM 5_48

Figure 5-1. Zone 11, 3rd Platform
Frames 126 - 220



DGM_5_51

**Figure 5-2. Zone 12, 3rd Platform
Frames 220 - 338**

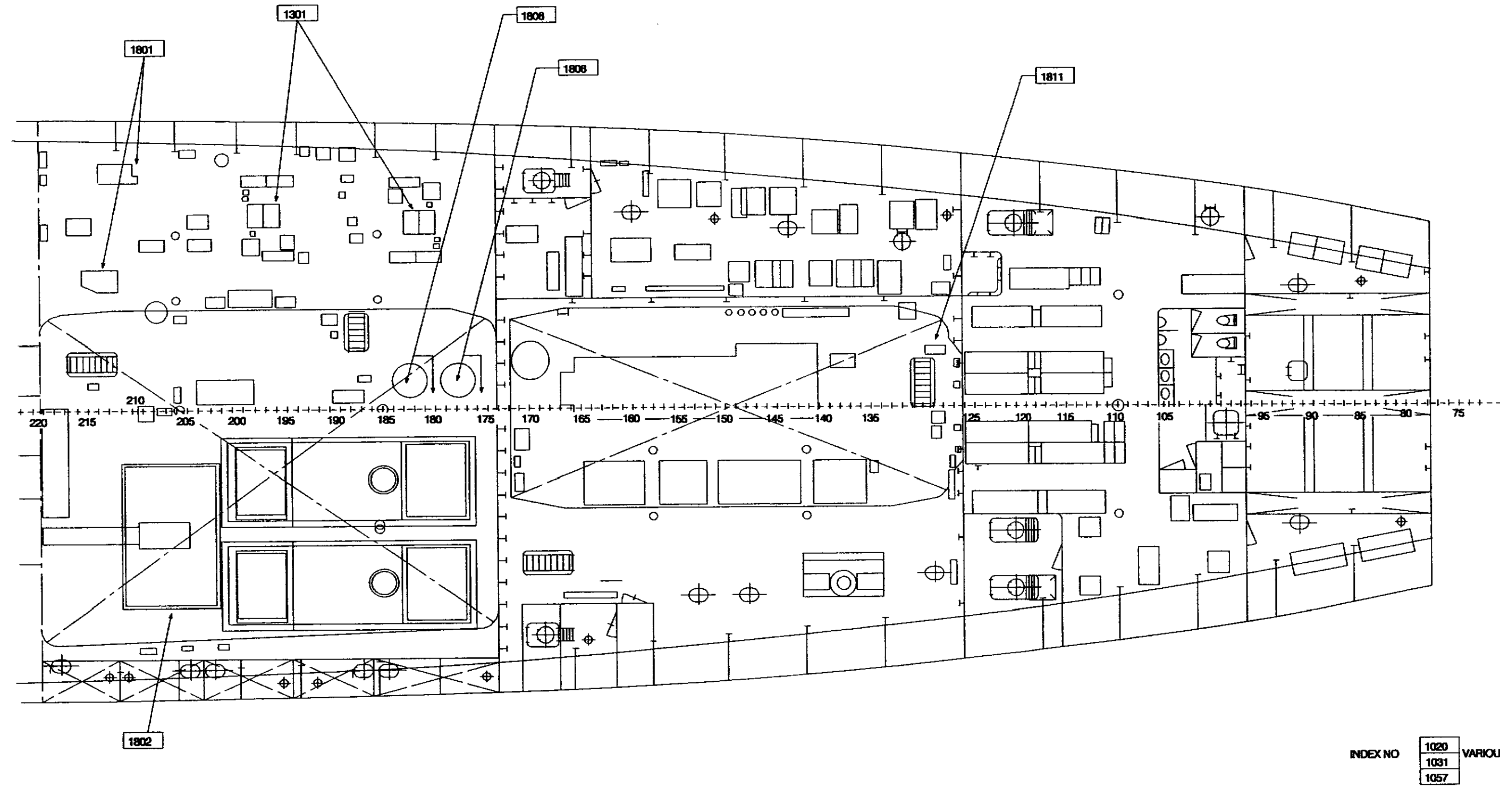
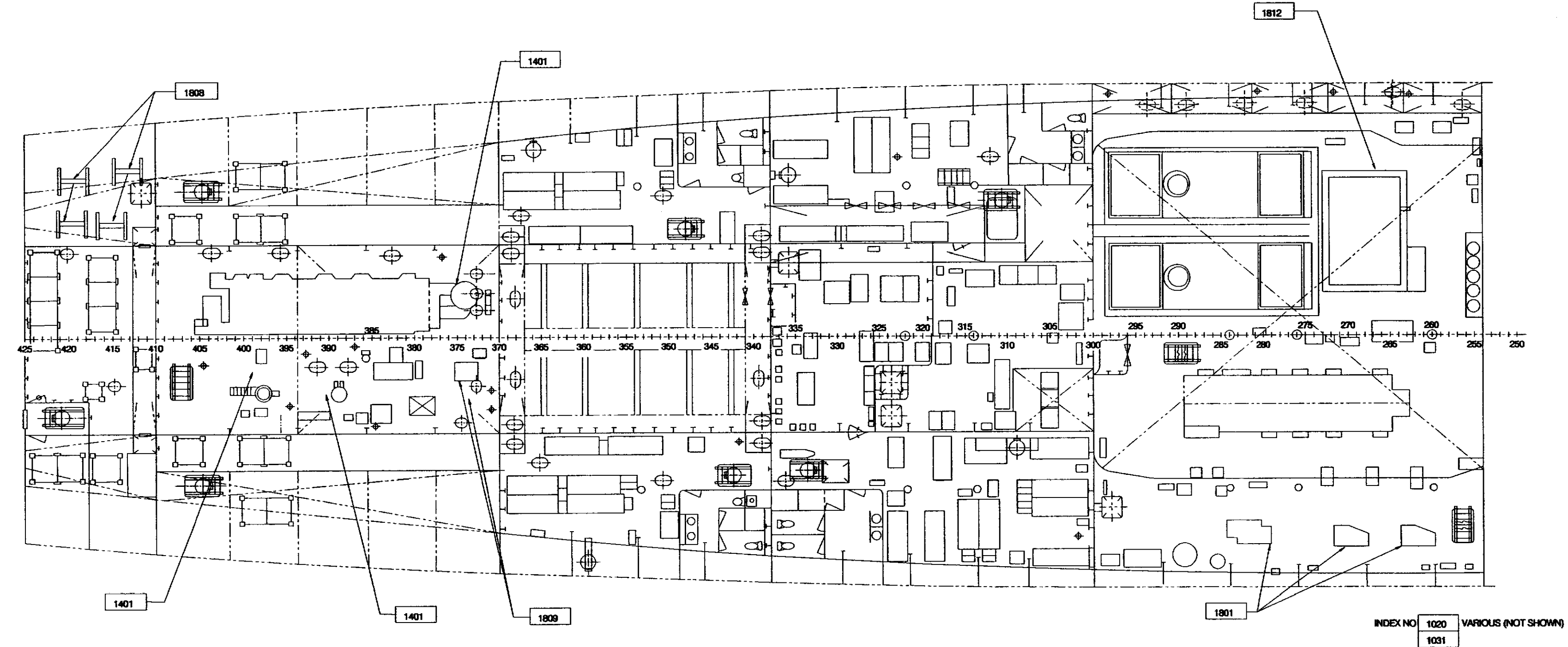


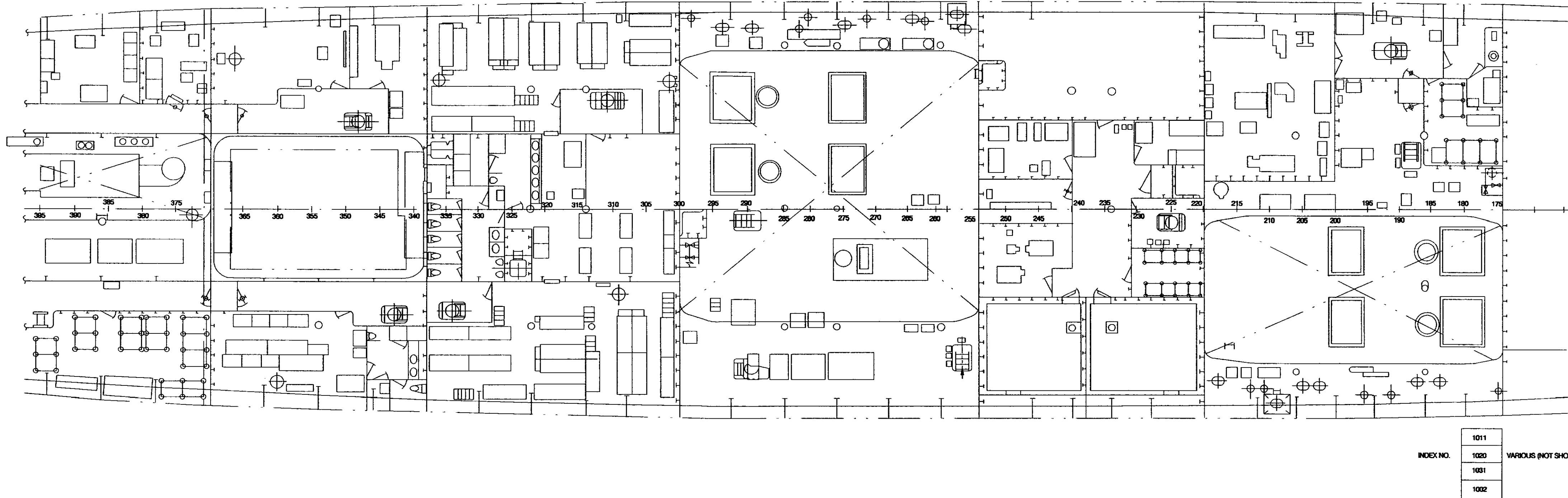
Figure 5-3. Zone 13, 2nd Platform
Frames 78 - 220



DGM_5_55

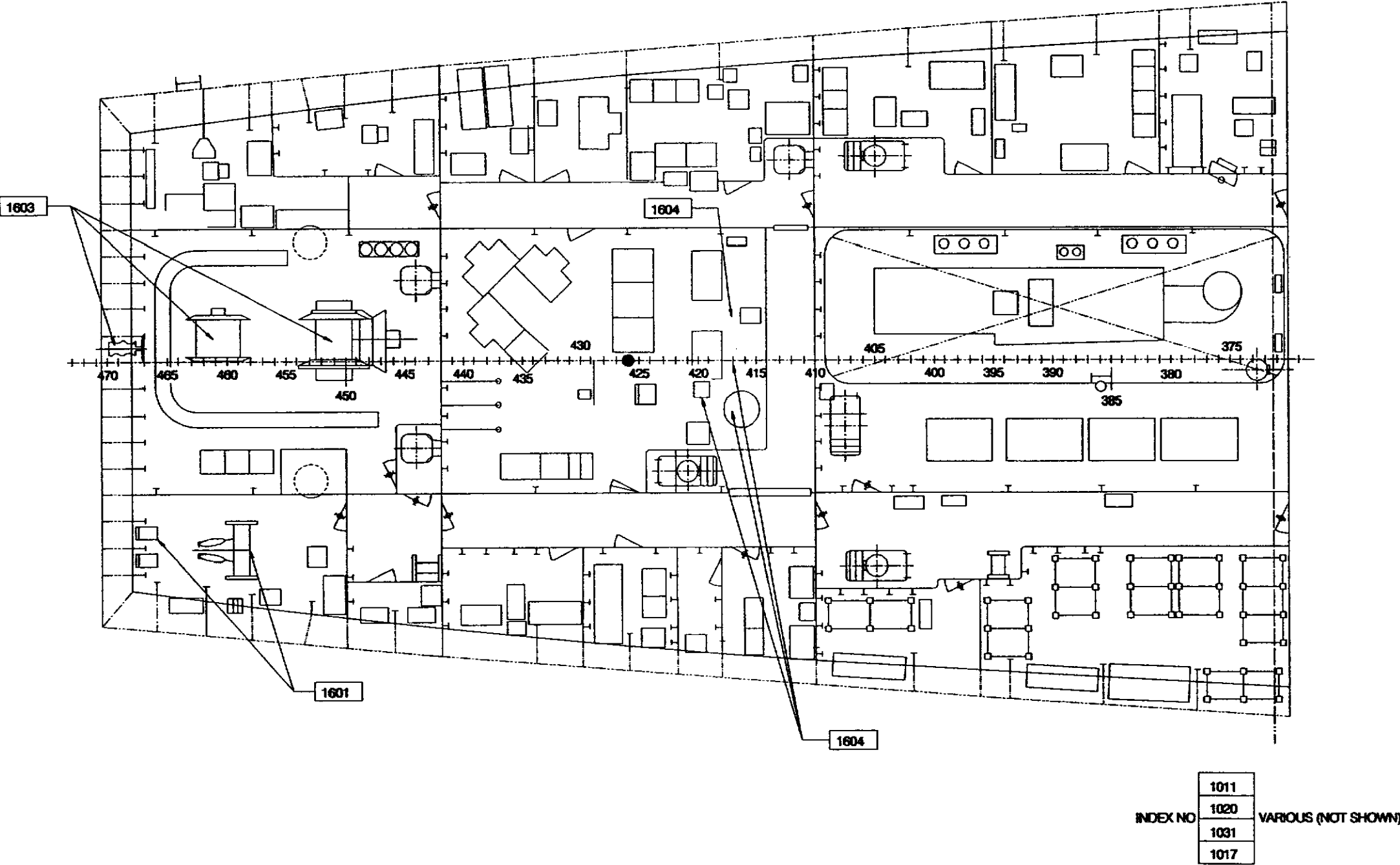
Figure 5-4. Zone 14, 2nd Platform
Frames 254 - 420

5-101/(5-102 blank)



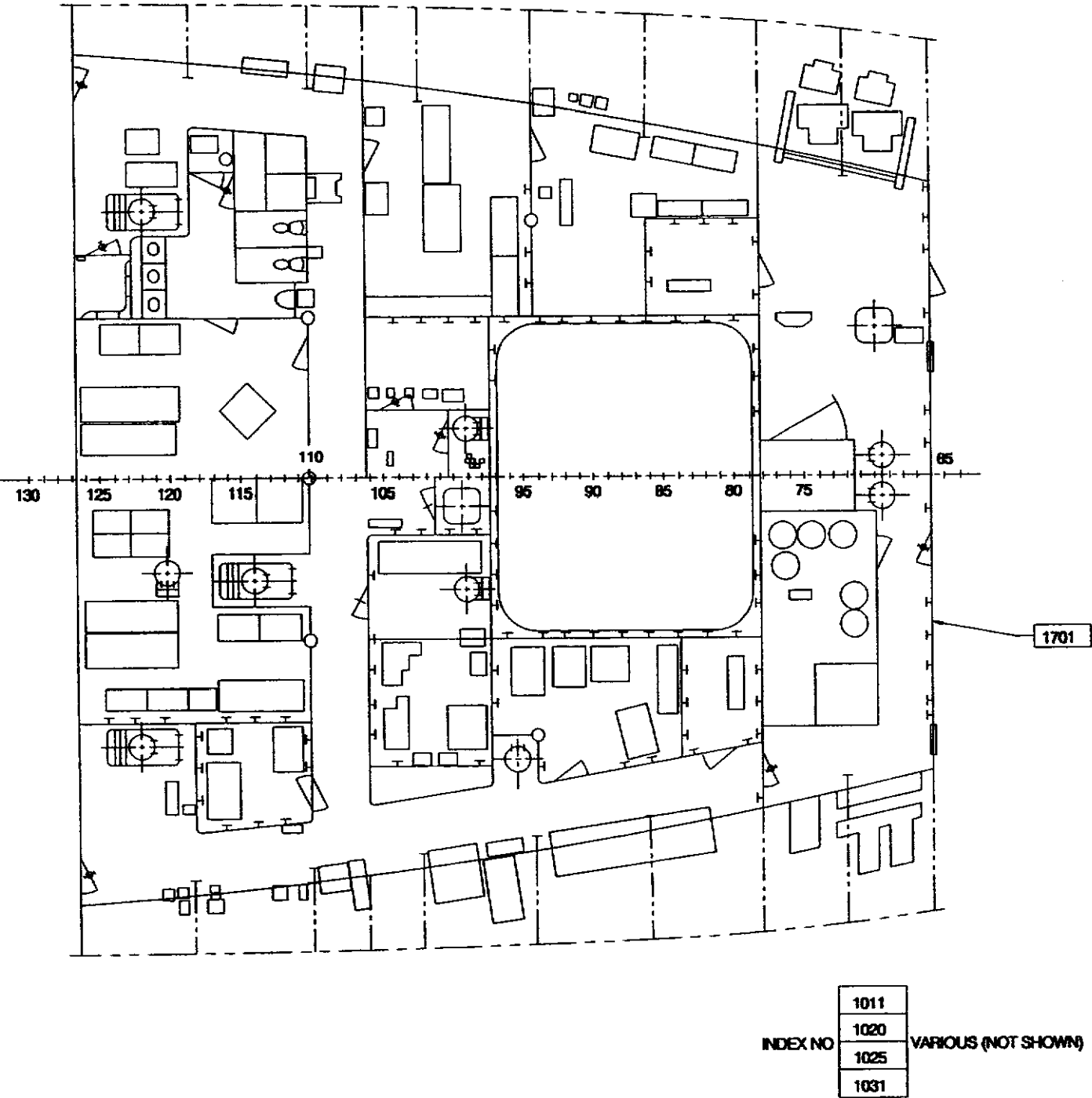
DGM_5_57

Figure 5-5. Zone 15, 1st Platform
(Frames 175-375)



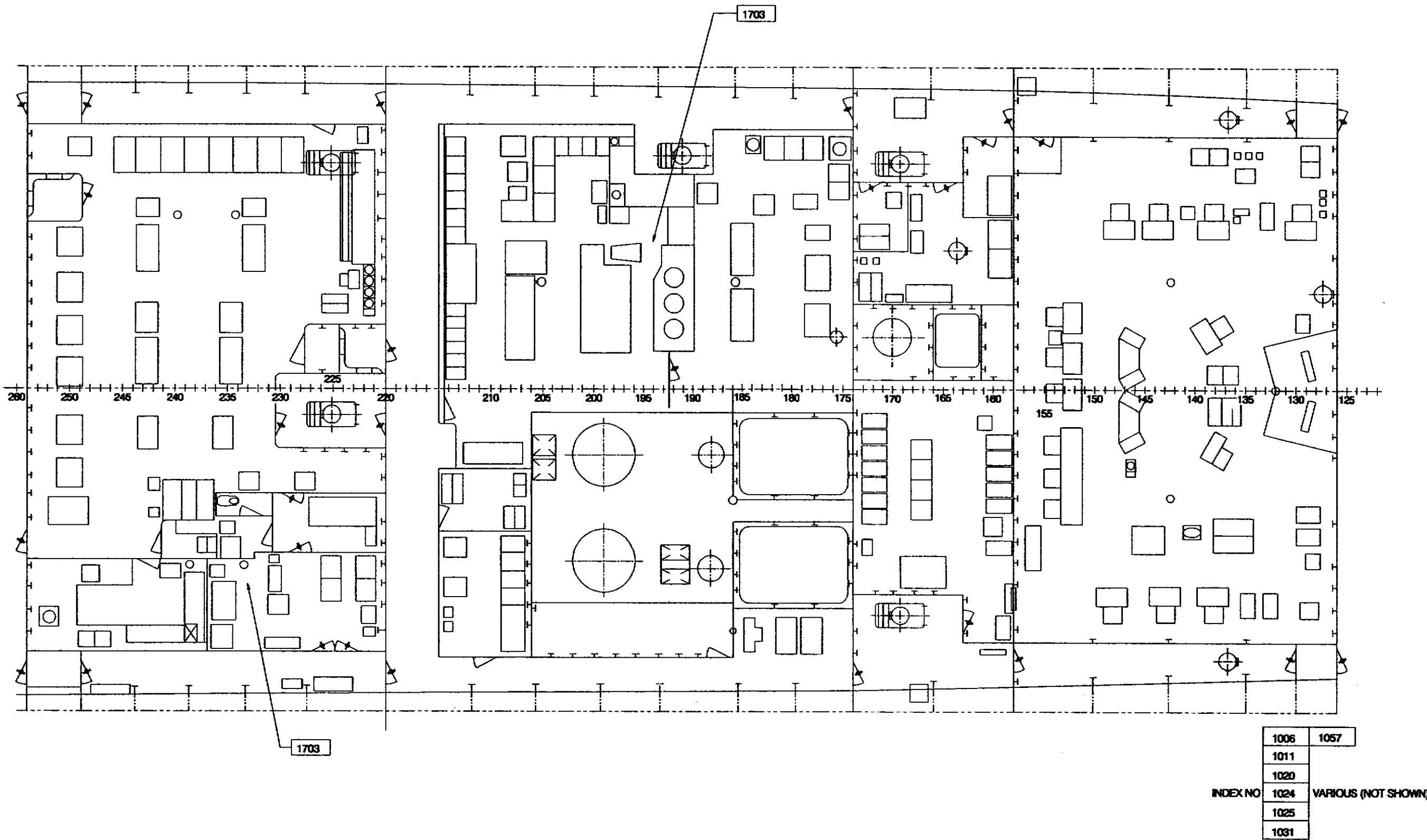
DGM_5_59

Figure 5-6. Zone 16, 1st Platform
Frames 375 - 470



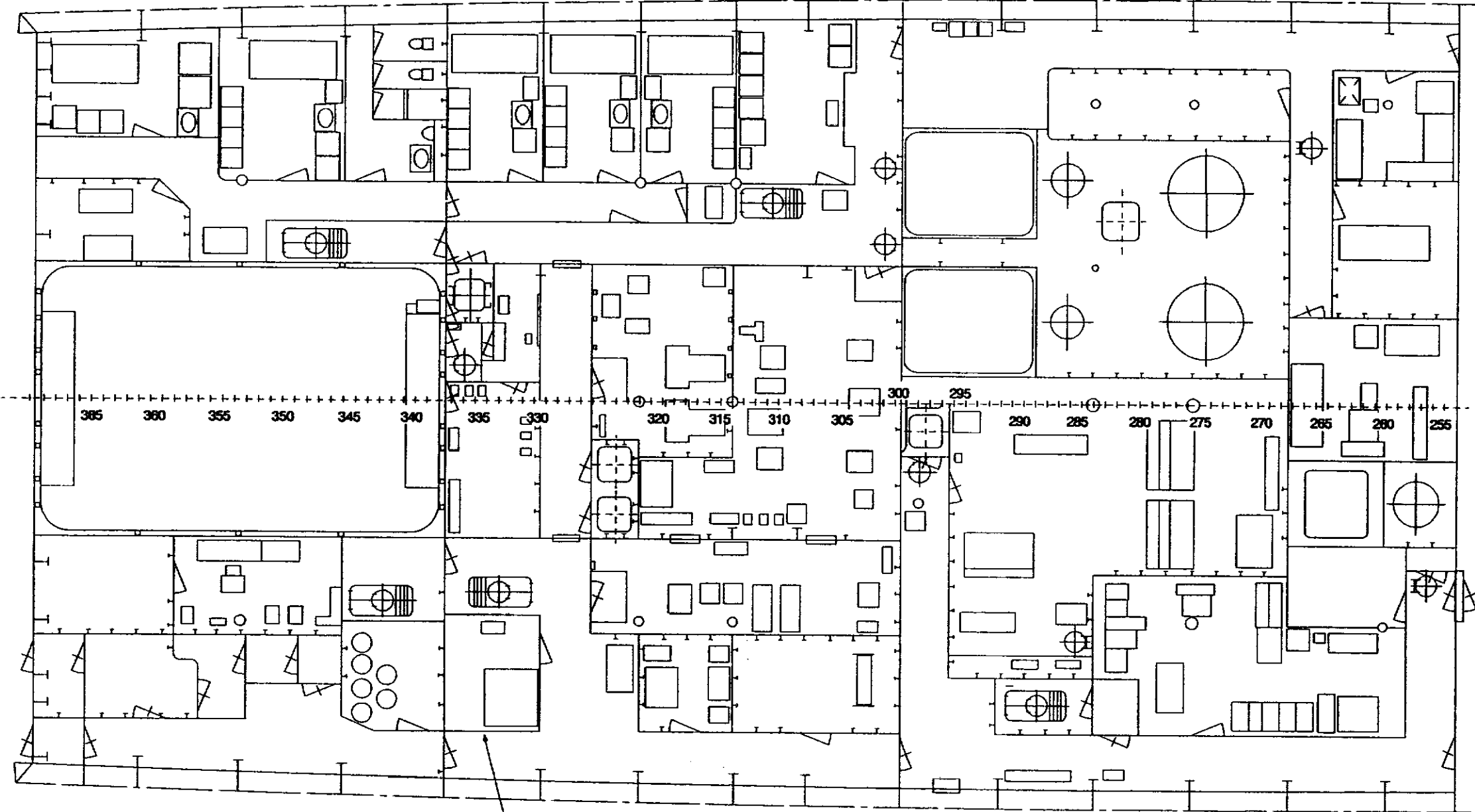
DGM_5_61

Figure 5-7. Zone 17.1, Main Deck
Frames 70 - 126



DGM_5_83

Figure 5-8. Zone 17.2, Main Deck
Frames 126 - 255

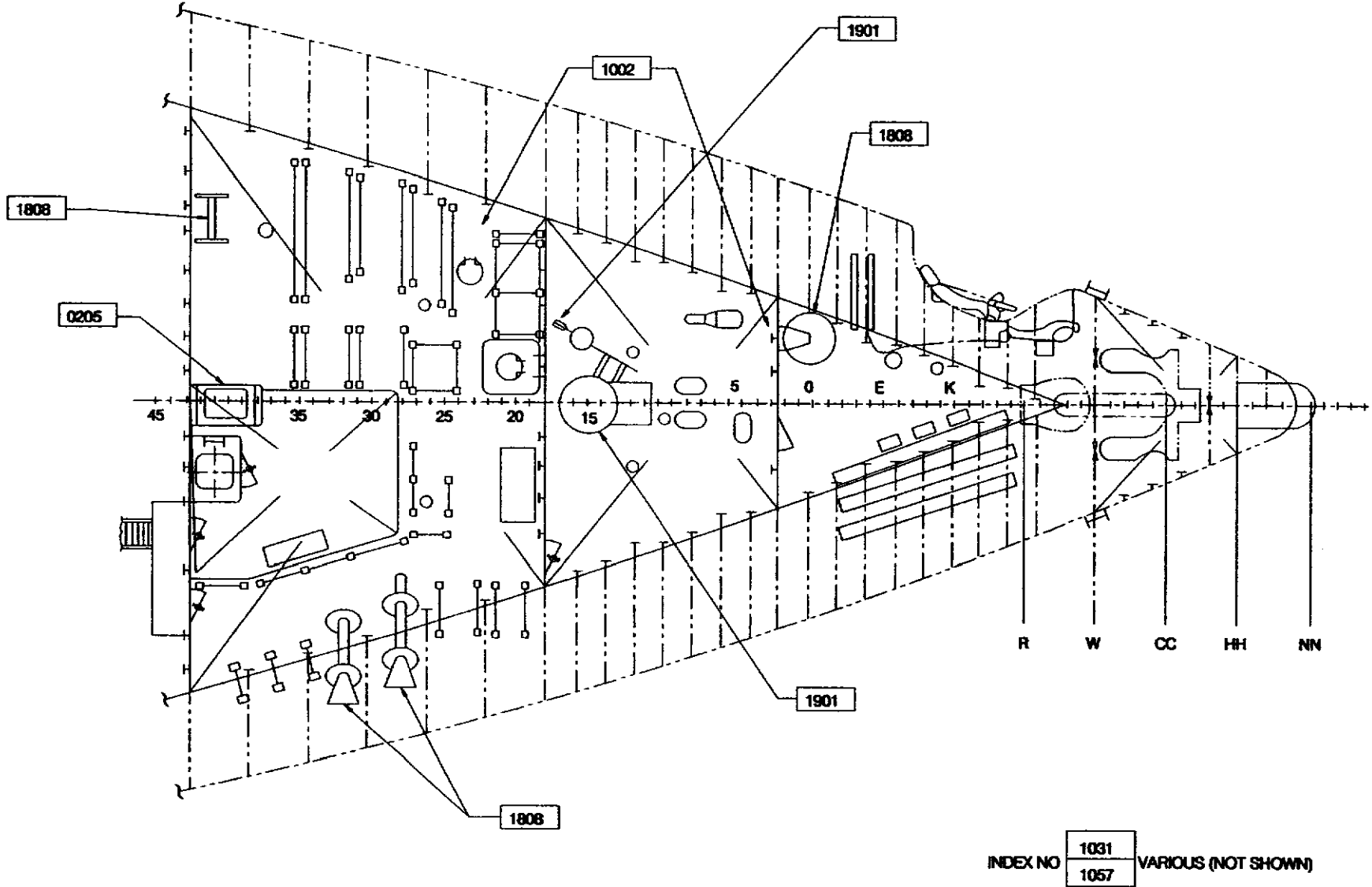


1702

INDEX NO	1011	VARIOUS (NOT SHOWN)
	1017	
	1020	
	1024	
	1025	
	1031	
	1051	
	1058	

DGM_5_65

Figure 5-9. Zone 17.3 Main Deck
Frames 255 - 370



DGM_5_67

Figure 5-10. Zone 19, 41'-0" Abv BL Flat
Frames NN to 42

CHAPTER 6

LOCATION AND IDENTIFICATION OF CORROSION
CONTROL COMPONENTS AND SYSTEMS**6-1 GENERAL.**

Corrosion control was required during the design and construction. These requirements are described in greater detail in Chapters 4 and 5 work instructions, which include the detail instructions that were used by the shipbuilder during the construction. The goal was to reduce and eliminate, if possible, corrosion problems due to bad design, construction and/or material selection. Once the ship has been delivered to the Navy, ship's force is responsible for maintaining corrosion control items as outlined in this manual.

6-2 CORROSION SUMMARY SHEET.

The corrosion summary sheets of Chapters 4 and 5 identify surfaces, structures, fasteners and components requiring corrosion protection. The sheet identifies the zone and frame location of the problem, the type and severity of the corrosion, and designates which systems of protection are applied. Illustrations are provided as an aid in identifying components in an assembly to which different work instructions apply.

Ship's force should use the corrosion problem summary sheets to aid in scheduling and accomplishing inspections and maintenance of the various corrosion control treated items on the ship.

Chapters 4 and 5 contain locations and identification of corrosion control components and systems, both in text descriptions and in illustrations.

Chapter 6, Table 6-1, lists corrosion treated components in alphabetical order. It is convenient for looking up an item by its name and for finding out in which zones a particular item occurs. The matrix lists the page number of the work instructions.

Table 6-2 lists corrosion treated components in alphabetical order and includes their corrosion prevention systems and primary corrosion control zone.

Table 6-1. Component Location Matrix Zones of Occurrence
 (See Figures 4-1 through 4-9 and 5-1 through 5-10 for Zones)
 (See Page No. for Work Instructions)

Index No.	Corrosion Treated Components	Zones																		Page No.	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		19
0305	Accommodation Ladder			X																	4-40
1701	AFFF Station No. 1																	X			5-23
1702	AFFF Station No. 2																	X			5-23
1001	AFFF Hose Reels in the Weather		O		O						X										4-65
1801	Air Compressor Foundations												O	O					X		5-28
1802	Air Conditioning Plant Foundations											O	O					X			5-32
1002	Air Escape Vents	O	O	O	O	O					X					O				O	4-68
1057	Alignment Benchmarks and Covers	O	O	O	O						X				O				O		4-211
1803	AMR No. 1 and No. 2 Foundations											O	O					X			5-35
0201	Anchor Chain Hawse Pipe Covers and Securing Fittings		X																		4-17
1901	Anchor Windlass and Brake Control																			X	5-93
1003	Antenna Foundations (Steel)		O				O	O	O	O	X										4-72
1004	Baxter Bolts	O								O	X										4-74
0801	Binocular Pedestal/Fasteners								X												4-59
1005	Bits	O	O	O	O						X										4-76
0502	Blow-in Door Fasteners					X															4-55
0301	Boat Cradles			X																	4-31
1006	Bolted Grounding Straps	O	O	O	O						X							O			4-80
0202	Bow Anchor Chain Area		X																		4-19
0304	Brow Support			X																	4-39
1007	Bulkhead and Deck Mounted Padeyes, Cleats, and Fairleads		O	O	O					O	X										4-82
1020	Bulkhead Mounted Fog Applicator Brackets										X								X		4-120
0203	Bullnose		X																		4-21
1008	Cable Stand-offs/Clips in Weather	O	O	O	O	O	O	O	O	O	X										4-86
0204	Chain Locker Cover and Securing Fittings		X																		4-23
1009	Chocks	O	O	O	O						X										4-88
1010	Climber Safety Rail Fasteners					O	O	O			X										4-91
1011	Compartment Check-off List Holders	O				O	O	O	O	O	X					O	O	O		X	4-92
1811	Compressed Gas Bottle Stowage Racks and Foundations										X								X		5-87

NOTE: X Designates primary location.
 O Designates other locations.

Table 6-1. Component Location Matrix - Zones of Occurrence - CONT.
 (See Figures 4-1 through 4-9 and 5-1 through 5-10 for Zones)
 (See Page No. for Work Instructions)

Index No.	Corrosion Treated Components	Zones																			Page No.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1012	Countermeasure Washdown Pipe Hangers	O	O	O	O	O	O		O		X			O							4-95
1014	Deck Drain Fasteners					O	O				X										4-105
1013	Deck Lights and Fixtures		O	O	O	O	O		O		X										4-96
0501	Decoy Launcher System Foundations					X															4-51
1301	Distilling Plant/R. O. Desalination Foundations													X							5-5
1015	Electrical Pin Connectors (Weather Exposed)										X										4-107
1016	Encapsulated Life Raft Release Mechanism					O	O				X										4-108
1806	Engine Room No. 1 and No. 2 Foundations											O	O	O					X		5-43
1017	Exhaust and Intake Vent Screens	O	O	O	O	O	O		O	O	X						O	O			4-111
0302	Fender Stowage Racks			X																	4-34
1019	Fire Extinguisher Stowage Brackets	O									X										4-119
1703	Food Service Deck Areas																	X			5-26
1018	Fueling-at-Sea Station (FAS) Valves, etc.		O	O	O	O					X										4-115
1056	Gas Turbine Intake and Exhaust Duct Fasteners	O				O	O	O			X										4-210
1021	Gun Mount Foundations	O	O				O	O			X										4-122
0401	Harpoon Foundations				X																4-46
1808	Hawser Reels (Mooring Line Reels)			O											O				X	O	5-62
1022	Inclined Ladder Brackets				O	O		O	O		X										4-125
1023	Jack and Ensign Staffs	O	O								X										4-128
1401	JP-5 Pump Foundations														X						5-10
1024	Kick Pipes & Stuffing Tubes in the Weather	O						O	O	O	X							O			4-129
1025	Label Plates (Weather Exposed)	O		O	O	O	O	O	O	O	X								O		4-130
0206	Life Jacket Lockers		X																		4-26
1026	Life Raft Stowage Racks					O	O				X										4-131

NOTE: X Designates primary location.
 O Designates other locations.

Table 6-1. Component Location Matrix - Zones of Occurrence - CONT.
(See Figures 4-0102 through 4-0203 and 5-1301 through 5-1801)

Index No.	Corrosion Treated Components	Zones																			Page No.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1027	Life Ring, Marine Location Marker and Light Holder Foundations					O	O				X										4-134
1028	Low Pressure Air Service Stations		O	O							X										4-136
1029	Low Profile Hatches and Scuttles in the Weather	O	O	O	O	O	O				X										4-137
1062	Mk 82 Director Foundations								O	O	X										4-218
1809	Miscellaneous Foundations								O	O		O			O				X		5-66
1063	Miscellaneous Components		O	O	O	O	O	O			X							O			4-219
1601	NIXIE Room																X				5-13
1030	Ordnance and Marine Lockers	O	O	O		O			O		X										4-139
0102	Pallet Staging Area and Helicopter Tiedowns	X		O																	4-5
1031	Pipe Hangers and Fasteners (Steel Only)	O	O	O	O			O	O	O	X	O	O	O	O	O	O	O	X	O	4-142
1032	Portable Davits and Sockets	O	O		O	O					X										4-145
1033	Portable Rigid Liferail Sections	O	O	O	O					O	X										4-148
1052	Propulsion GTRB and SSGTG Air Intake Vanes	O		O		O	O	O			X										4-206
1034	Quarter Deck IC and Alarm Enclosures	O									X										4-155
1035	Raised Deck Hatches in the Weather	O	O		O	O					X										4-156
1812	Reduction Gear Dehumidifier System													O	O				X		5-88
0106	Retractable Chocks and Bitts	X																			4-14
0205	Retractable Kingpost and Trunk		X															O	O		4-25
0103	Safety Net, Helo Deck	X																			4-8
1036	Scuppers	O	O								X										4-159
1037	Seawater Fire Station Hardware	O	O		O	O	O			O	X										4-163
1038	Security Lights and Brackets	O	O	O							X										4-165
1059	Sewage Ejection Shore Discharge Fasteners and Brackets		O	O							X										4-214
0303	Slewing Arm Davit			X																	4-36
0107	SSGTG No. 3 Intake Room	X																			4-15
1813	Sonar Dome																	O	X	O	5-90
0104	Stern Light Foundation	X																			4-11

NOTE: X Designates primary location.
O Designates other locations.

Table 6-1. Component Location Matrix - Zones of Occurrence - CONT.

(See Figures 4-1 through 4-9 and 5-1 through 5-10 for Zones)

(See Page No. for Work Instructions)

Index No.	Corrosion Treated Components	Zones																		Page No.	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		19
1603	TACTAS Hoist Room																X				5-16
1058	Tether Rings Around Mk 82 Director								O	O	X										4-213
1039	Tilting Whip Antenna Foundations	O					O				X										4-170
1040	Topside Deck Drains					O	O	O	O		X										4-175
1054	Topside Deck Washdown Piping Risers		O								X										4-207
1041	Topside Lockers	O	O	O							X										4-178
1042	Topside Navigational Aids	O	O	O		O				O	X										4-180
1043	Topside Telephone Boxes	O	O	O	O					O	X										4-182
0402	Torpedo Tube Foundations				X																4-48
1044	Turnbuckles, Lifeline	O	O	O	O		O				X										4-185
1810	Ventilation Exhaust and Intake Plenums	O	O			O			O	O									X		5-75
1061	Vertical Ladder in Weather/Wet Spaces		O	O							X								X		4-215
1045	Vertical Launching System (VLS)		O		O						X										4-186
0105	VERTREP Line-up Lights	X																			4-12
1046	Visual Landing Aids	O			O		O			O	X										4-189
1604	Washing Machine and Sink Foundations																X				5-19
1047	Waterway Bars		O	O	O						X										4-191
1060	Weapon System Launch/Fire Sirens			O	O						X										4-217
1048	Weather Deck Areas		O								X										4-192
1049	Weather Doors (Steel)	O	O	O		O	O	O	O	O	X										4-194
1050	Weather Exposed Announcing Systems	O	O	O	O	O	O		O		X										4-200
1051	Weather Exposed Meter and Gage Cases	O	O	O		O					X							O			4-202
0901	Whistle									X											4-62
1055	Windows in the Weather	O								O	X										4-208

NOTE: X Designates primary location.
O Designates other locations.

Table 6-2. Corrosion Treated Components Index

Corrosion Treated Components	Corrosion Prevention System*	Corrosion Control Zone
Accommodation Ladders	2, 5, 6, 14, 16	3
AFFF Stations	2, 5, 6, 9, 14, 15	17
AFFF Hose Reels in the Weather	2, 4, 6, 9, 14, 15	10
Air Compressor Foundations	2, 5, 6, 9, 14	18
Air Conditioning Plant Foundations	2, 5, 6, 9, 14	18
Air Escape Vents (Screens, Diffuser and Fasteners)	2, 6, 11, 14, 16	10
Alignment Benchmarks	2, 14, 16	10, 18
AMR No. 1 and No. 2 Foundations	1, 2, 5, 6, 9, 14	18
Anchor Chain Hawse Pipe Covers and Securing Fittings	2, 6, 14, 16	2
Anchor Windlass and Brake Control	5, 14, 16	19
Antenna Foundations (Steel)	2, 5, 6, 8, 9, 14	10
Baxter Bolts	5, 6, 16, 16	10
Binocular Pedestal/Fasteners	2, 6, 8, 14, 16	8
Bitts	2, 11	10
Blow-in Door Fasteners	6, 14, 16	5
Boat Cradles	2, 9	3
Bolted Grounding Straps	6, 8, 14, 16	10, 18
Bow Anchor Chain Area	2, 14, 16	2
Bulkhead and Deck Mounted Padeyes, Cleats and Fairleads	2, 5, 9, 14	10
Bulkhead Mounted Fog Applicator Brackets	6, 14, 16	10, 18
Bullnose	2, 6, 14, 16	2
Cable Stand-offs and Clips in Weather	6, 8, 16	10
Chain Locker Cover and Securing Fittings	2, 6, 14	2
Climber Safety Rail Fasteners	6, 14, 16	10
Compartment Check-off List Holders	14, 16	10, 18
Compressed Gas Bottle Stowage Racks and Foundations	2, 4, 6, 14	18, 10
Countermeasure Washdown Piping Hangers	11, 14	10
Deck Drain Fasteners	6, 14	10

*See Work Instructions for hull limitations and special applications.

Table 6-2. Corrosion Treated Components Index - CONT.

Corrosion Treated Components	Corrosion Prevention System*	Corrosion Control Zone
Deck Lights and Fixtures	2, 4, 6, 8, 11, 14, 16	10
Decoy Launcher System Foundations	2, 5, 6, 8, 9, 14	5
Distilling Plant Foundations, DDG 52-DDG 63	2, 5, 6, 9, 14	13
R.O. Desalinators Foundations, DDG 65 and Follow	5, 6, 9, 14, 16	13
Electrical Pin Connectors (Weather Exposed)	6, 10, 11	10
Encapsulated Life Raft Release Mechanism	2, 5, 6, 9, 14, 16	10
Engine Rooms No. 1 and No. 2 Foundations	2, 5, 6, 9, 14	18
Exhaust and Intake Vent Screens	4, 6, 14, 16	10
Fender Stowage Racks	2, 5, 6, 16	3
Fire Extinguisher Stowage Bracket	2, 14, 16	10
Food Service Deck Areas	2, 9, 15	17
Fueling-at-Sea (FAS) Station Valves, etc.	2, 4, 5, 6, 9, 11, 14, 15, 16	10
Gas Turbine Intake and Exhaust Duct Fasteners	14, 16	10, 18
Gun Mount Foundations	2, 5, 8	10
Harpoon Foundations	2, 5, 8, 16	4
Hawser Reels (Mooring Line Reels)	4, 5, 6, 14	18
Inclined Ladder Brackets	2, 5, 6, 14, 16	10
Jack and Ensign Staffs	2, 6, 14, 16	10
JP-5 Pump Foundations	2, 5, 6, 9, 14	14
Kick Pipes and Stuffing Tubes in the Weather	6, 9, 16	10
Label Plates (Weather Exposed)	6, 11, 16	10
Life Jacket Lockers	2, 4, 6, 9, 14, 16	2
Life Raft Stowage Racks	2, 5, 6, 9, 16	10
Life Ring, Marine Location Marker and Light Holder Foundations	2, 6, 9, 14, 16	10
Low Pressure Air Service Station	6, 14, 16	10
Low Profile Hatches and Scuttles in the Weather	2, 6, 14, 16	10
Miscellaneous Foundations	2, 5, 6, 8, 9, 14	10
Mk Director Foundations	2, 14	10
Miscellaneous Components	14, 16	10, 18

*See Work Instructions for hull limitations and special applications.

Table 6-2. Corrosion Treated Components Index - CONT.

Corrosion Treated Components	Corrosion Prevention System*	Corrosion Control Zone
NIXIE Room	2, 5, 6, 8, 9, 14, 16	16
Ordnance and Marine Lockers	2, 4, 6, 14, 16	10
Pallet Staging and Helicopter Tiedowns	2, (Galv.), 3	1
Pipe Hangers and Fasteners	4, 5, 14, 16	10, 18
Portable Davits and Sockets	2, 9, 16	10
Portable Rigid Liferail Sections	2, 14, 16	10
Propulsion GTRB and SSGTG Air Intake Vanes	2, 14, (Galv.)	10
Propulsion GTRB and SSGTG Air Intake Vanes		
Quarter Deck IC and Alarm Enclosures	2, 4, 6, 11, 12, 14, 16	10
Raised Deck Hatches in the Weather	2, 6, 9, 14, 16	10
Reduction Gear Dehumidifier System	9, 11, 14	18
Retractable Chocks and Bitts	2, 5	1
Retractable Kingpost and Trunk	2, 5, 6, 9, 14, 16	10
Safety Nets, Helo Deck	2, 11, 14	1
Scuppers	2, 6, 14	10
Seawater Fire Station Hardware	2, 14, 16	10
Security Lights and Brackets	2, 4, 14	10
Sewage Ejector Discharge Fasteners and Brackets	6, 14, 16	10
Slewing Arm Davit	2, 5, 6, 9	3
SSGTG No. 3 Intake Room	2	1
Sonar Dome	6, 8, 16	18
Stern Light Foundation	2, 4, 6, 14	1
TACTAS Hoist Room	2, 5, 6, 9, 14	16
Tether Rings	16	10
Tilting Whip Antenna Foundations	2, 5, 6, 8, 9, 14, 16	10
Topside Deck Drains	2, 3, 6, 9, 14, 16	10
Topside Deck Washdown Piping Risers	2, 5	2
Topside Lockers	2, 4, 6, 9, 14, 16	10
Topside Navigational Aids	2, 4, 5, 6, 14, 16	10
Topside Telephone Boxes	2, 4, 11, 12, 16	10

*See Work Instructions for hull limitations and special applications.

Table 6-2. Corrosion Treated Components Index - CONT.

Corrosion Treated Components	Corrosion Prevention System*	Corrosion Control Zone
Torpedo Tube Foundations	2, 5, 8, 14, 16	4
Turnbuckles, Lifeline	6, 14, 16	10
Ventilation Exhaust and Intake Plenums	2, 14	18
Vertical Ladders in Weather and Wet spaces	6, 14, 16	10, 18
Vertical Launching System (VLS)	2, 5, 8	10
VERTREP Line-up Lights	6, 9, 14	1
Visual Landing Aids	2, 4, 6, 14, 16	10
Washing Machine and Sink Foundations	2, 6, 8	16
Waterway Bars	2	10
Weapon System Launch/Fire Sirens	4, 6, 14, 16	10
Weather Deck Area	2	10
Weather Doors (Steel)	2, 6, 14, 16	10
Weather Exposed Announcing Systems	2, 4, 14, 16	10
Weather Exposed Meter and Gage Cases	2, 4, 5, 6, 8, 11, 14, 16	10
Whistle	6, 11, 14, 16	9
Windows in the Weather	14, 16	10

*See Work Instructions for hull limitations and special applications.

CHAPTER 7

CORROSION CONTROL MATERIALS

7-1 GENERAL.

Effective control and prevention of shipboard corrosion is dependent upon the availability of the proper tools and material. Table 7-1 lists some of the material necessary to carry out the

corrosion prevention plans recommended in this guide. Personnel working in corrosion control should become familiar with the materials listed and their uses.

Table 7-1. Corrosion Control Materials

Nomenclature	Specification	National Stock Number	Notes	Safety/Health Hazard
<u>ABRASIVES</u>				
Cloth, abrasive aluminum oxide	P-C-451	5350-00-246-0330 (9" X 11" sleeve)	Used for cleanup on corroded surfaces	
Discs, abrasive Course grit 24 Medium grit 36 Fine grit 100	RD-455	5435-00-881-2962 5435-00-881-8377 5435-00-881-7580	Used with disc sander in power tool cleaning	
Mats, abrasive, nonwoven Nonmetallic Very fineFine	MIL-A-9962	5350-00-967-5089 5350-00-967-5093	Aluminum oxide impregnated nylon webbing used for removal of corrosion products, paint scuffing prior to touch up and feathering edges	
<u>CERAMIC-METALLIC COATINGS</u>	MIL-C-81751		System 5	
<u>CLEANING SOLUTIONS</u>				
Detergent	MIL-D-16791	7930-00-531-9715	Used to mix cleaning solution for System 3	
Detergent, nonionic, general purpose, liquid, Type I, water soluble (5-gallon pail)	MIL-D-16791 Type I	7930-00-531-9716	Part of cleaning solution, surface preparation	
Detergent, nonionic, general purpose, liquid, Type II, oil soluble (5-gallon pail)	MIL-D-16791 Type II		Part of cleaning solution, surface preparation	
Sodium Metasilicate			Used to mix cleaning solution for System 3	

Table 7-1. Corrosion Control Materials - CONT.

Nomenclature	Specification	National Stock Number	Notes	Safety/Health Hazard
<u>CLEANING SOLUTIONS</u> (Continued)				
Sodium metasilicate Penetahydrate, technical (100-pound drum)		6810-00-240-2121	Part of cleaning solution, surface preparation	
Sodium phosphate, tribasic dodecahydrate (100-pound drum)		6810-00-240-2116	Part of cleaning solution, surface preparation	
<u>PAINTS</u>				
Epoxy-Polyamide	MIL-P-24441		Used with Systems 2 are 3	
Formula 150 (1-gallon)		8010-00-410-8452	Primer	Health
Formula 151 (1-gallon)		8010-00-410-8458	Haze gray	Health
Formula 152 (1-gallon)		8010-00-410-8461	White	Health
Formula 153 (1-gallon)		8010-00-410-8463	Black	Health
Formula 154 (1-gallon)		8010-00-410-8465	Very dark gray	Health
Formula 156 (1 gallon)		8010-00-410-8470	Red	Health
Low Solar Absorbing (LSA)	MIL-E-24635 Type 2, Class 2		Used with Systems 3 & 15	Health
Silicone alkyd	TT-E-490		Finish coat in System 3	
Inorganic zinc	NAVSEA Approved	8010-00-145-0190	Used with System 3	
Primer, zinc chromate	TT-P-645 F-84	8010-00-161-7419 (1 gallon)		Health
Thinner	MIL-T-19544		For thinning epoxy primer	Safety/Health
<u>SEALER/SEALANTS</u>				
Aluminum, heat-resistant	TT-P-28		Used as a sealer over FSA, System 1	

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Table 7-1. Corrosion Control Materials - CONT.

Nomenclature	Specification	National Stock Number	Notes	Safety/Health Hazard
<u>SEALER/SEALANTS</u> (Continued)				
Polysulfide sealant	MIL-S-81733 Type 1-1/2		Corrosion inhibitive sealing compound, System 8	Health
Polysulfide sealant	MIL-S-81733 Type IV-12-24-40 and -48		Corrosion inhibitive sealing compound, System 9	Health
Insulation Tape	MIL-1-17695		Part of System 10	
Heat Shrinkable, Insulation Sleeving	MIL-1-23053		Part of System 10	
<u>SOLVENTS</u>				
Ethylene Glycol Monobutyl ether	TT-E-781	6810-00-281-2001	Used for removing contamination prior to applying topcoat, System 3	Health
Isopropyl alcohol, technical		6810-00-983-8551	Used for cleaning surfaces prior to applying topcoat, System 3	Safety/Health
Methyl ethyl ketone	TT-M-261	6810-00-281-2785 (1-gallon can) 6810-00-281-2762 (5-gallon pail)	Used for cleaning surfaces prior to applying topcoat, System 3	Health - not safe for storage or use on board ship
MIKB - Methyl isobutyl Ketone	TT-M-268	6810-00-281-2761 (55 gallons)	Used for cleaning surfaces prior to applying topcoat System 3	Health - not safe for storage or use on board ship

Table 7-1. Corrosion Control Materials - CONT.

Nomenclature	Specification	National Stock Number	Notes	Safety/Health Hazard
<u>SOLVENTS</u> (Continued)				
Solvents, chlorinated		Commercially available from El Dorado Chemical Company, San Antonio, Texas; Pennwalt Corp., Los Angeles, CA; Turco Products, Inc., Los Angeles, CA; Wyandotte Chemicals Corp., Wyandotte, MI.	Used for cleaning polysulfide sealant, System 8 and System 9, from tools	Health
1, 1, 1, Trichloroethane technical (methyl chloroform)	O-T-620	6810-00-292-2625 (1-quart) 6810-664-0397 (1-Gallon)	Used for "refreshing" primer coats between applications of System 8	Health
Acetylene, compressed	BB-A-10	6830-00-264-6751 (225 cubic feet)	Highly flammable dissolved gas, with cylinder, use for flame-sprayed aluminum System 1 and System 2	Safety
Anti-seize thread compound	MIL-T-22361	8030-00-292-1102	System 6	
Apron, laboratory, rubber	ZZ-A-6-5	8415-00-634-5023	For protection during paint mixing (45" X 35")	
Boot, black rubber, general purpose, knee		8430-00-753-5938 8430-00-753-5939 8430-00-753-5940 (last digit indicates size, i.e., 5940 is (size 10)	Protection equipment for use with solvent cleaning, surface preparation	

Table 7-1. Corrosion Control Materials - CONT.

Nomenclature	Specification	National Stock Number	Notes	Safety/Health Hazard
<u>TOOLS AND ACCESSORIES</u>				
Brush, paint flat	H-B-420-3" H-B-420-4"	8020-00-245-4517 8020-00-245-4519		
Brush, scrub	H-B-1490	7920-00-240-7174	For use with solvent cleaning surface preparation	
Brush, wire		5120-00-926-5175	For use with solvent cleaning surface preparations	
Brush, wire, stainless	H-B-178	7820-178-8310	Used for cleanup of aluminum surfaces	
Cloth, cleaning, fabric woven	CCC-C-46C14	7920-00-292-9204		
Corrosion preventive Compound, clear, water displacing	MIL-C-85054 (AS)		Part of System 7	
Coveralls, green		8405-00-131-6507 8405-00-131-6508 8405-00-131-6509 8405-00-131-6510 8405-00-131-6511	Small Medium Large X Large XX Large	
Electric Disc Sander		5130-00-857-8526	Power tool cleaning, surface preparation	
Fasteners studs nuts washers screws bolts	Various	Various	See table 3-2 (Chapter 3) for detailed ordering information on all fasteners	

Table 7-1. Corrosion Control Materials - CONT.

Nomenclature	Specification	National Stock Number	Notes	Safety/Health Hazard
TOOLS AND ACCESSORIES (Continued)				
Gloves, rubber, industrial	ZZ-G-381	4240-00-226-8677	Pair	
Goggles, chippers		4240-00-269-7912	For eye protection	
Gun, arc spray	MIL-M-80266		For metal sprayed coating, System 1 and System 2	
Gun wire, spray	MIL-M-3800		For metal sprayed coating, System 1 and System 2	
Mixer, Jiffy blade		Used for mixing		
Oxygen, compressed	BB-0-925	6830-00-169-0805 (200 cubic feet)	Nonflammable gaseous oxygen	
Pneumatic disc sander		5130-00-857-8528	Power tool cleaning, surface preparation	
Pneumatic needle gun		5130-00-537-3394	Power tool cleaning, surface preparation	
Rags, wiping cotton	DDD-R-C12 GR 8	7920-00-205-1711		
Respirator, filter type		4240-00-276-8935	For protection during spraying operations (cartridges and filters included)	
Roller, paint		8020-00-753-4915 8020-00-682-6491	9-inch roller applicator Replacement 9-inch roller	
Scrapers, hand	GGG-S-116	5110-00-240-3094	For use with solvent cleaning, surface preparation	

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Table 7-1. Corrosion Control Materials - CONT.

Nomenclature	Specification	National Stock Number	Notes	Safety/Health Hazard
<u>TOOLS AND ACCESSORIES</u> (Continued)				
Shield, face	LF-36	4240-00-202-9437	Face and eye protection	
Tape, electricians, silicone	MIL-1-19166	5970-00-933-1406	Part of System 12	
Tape, masking, manila	UU-T-106	7510-00-266-6712 (1-inch)	For protection of surfaces during painting	
Trowel, mastic		5120-00-540-0754	Used for applying nonskid coatings	
Wire, aluminum	MIL-W-6712		For flame-sprayed aluminum, System 1 and System 2	

CHAPTER 8

SURFACE PREPARATION AND GENERAL PAINTING GUIDELINES

8-1 INTRODUCTION.

This chapter provides surface preparation and general painting guidelines. It includes an introduction to surface preparation and painting along with detailed information concerning abrasive blasting, power tool cleaning, hand tool cleaning, solvent degreasing and paint application by brush a roller and spray. This chapter also includes procedures to be followed, health and safety precautions and maintenance and repair of equipment.

8-2 GENERAL SURFACE PREPARATION.

Good surface preparation must be done before a surface can be coated with any hope for a lasting job. The decision to recoat a surface cannot be made lightly. You must consider the following:

1. Evidence of corrosion of the underlying metal surface
2. Unsatisfactory condition of existing paint, such as excessive chalking, peeling, flaking, blistering or cracking
3. Unsatisfactory condition of paint as shown by adhesion testing (an X is scored in the paint with a knife and tape is applied over the cut. If a good straight-back yank pulls the paint off, the paint is not adhering properly and should be replaced)
4. Whether or not paint can be restored to satisfactory appearance by thorough washing or scrubbing. If a decision to recoat is made, spot repainting is generally more desirable than stripping a whole deck or bulkhead. Even if the paint is a little faded, but is intact, it is serving its purpose and should not be replaced.

The surface preparation phase of the coating process is by far the most critical. The quality of surface preparation is the predominant factor in determining the effectiveness of the coating applied. To ensure that a metal surface will support the anti-corrosive coat for an extended period, it is necessary that the surface first be free from contamination and roughened to the degree necessary for holding the coating to be applied. This roughened profile, known as the "anchor tooth," varies considerably according to the coating, the original condition of the surface, and the method of surface preparation.

The clean, roughened surface you need can be made using various methods. Carefully choose the one that will match the metal and the primer. Next to safety and health, the most important consideration in surface preparation is getting the right tool for the type of surface being stripped. The wrong tool or chemical can result in wasted manhours and effort or even in damage to the surface. For example, if a deck crawler is used on an aluminum deck, it will not only remove the paint or nonskid, but some of the metal as well. If a needle gun is used on a joiner (thin gauge metal) bulkhead, it will dent the metal and leave an unsightly appearance. If hand chipping hammers and paint scrapers are used to chip the ship's sides, a great many more manhours will be required than with the use of rotary-peening machines or needle guns. If steel brushes or shot blast is used on aluminum, it will imbed small bits of steel in the aluminum and set up electrolytic corrosion that will be impossible to halt or cover up.

The simplest procedure is hand chipping, which is not recommended for large jobs since it will not make a uniform anchor pattern, will not clean the surface fully, and in fact will drive oil and dirt

into the metal. Power-assisted tools do an adequate job if proper care is taken. Contamination such as oil and grease should be removed by solvent degreasing. Grit blasting is the most effective method of surface preparation and is most often cited as the choice for most coating systems.

Other important considerations in selecting a surface preparation technique are the safety of personnel, protection of surrounding surfaces and equipment from spent abrasives or corrosion products, the portability of the equipment, and environmental protection regulations related to air or water pollution.

8-2.1 ABRASIVE BLASTING.

8-2.1.1 Procedure Description. Abrasive-blasting or grit blasting is a process of bombarding the surface to be coated with small particles of an abrasive. This method is the most effective way to remove scale and rust and is preferred for steel surfaces. Equipment for abrasive-blasting is normally available at the depot and intermediate level maintenance facilities.

Compressed air is usually the medium that carries the abrasive to the surface. Dry blasting may be done directly, with an air stream carrying the abrasive through the nozzle, or by the centrifugal method, in which the abrasive is thrown against the target by a vaned wheel.

Various abrasives are used. For steel surfaces, mineral abrasive, angular silica sand, chilled iron, steel slag and aluminum oxide are used. For aluminum surfaces, the abrasive material may be aluminum oxide, silica sand, walnut shells, or crushed garnet. For fiberglass surfaces such as boats, vertical ladders and stanchions near antennas, a sweep blast with normal grit (60 to 80 grit sand) is recommended. The size of the abrasive and the pressure at the nozzle are varied according to the surface and abrasive material.

It is important to remove grease, oil and other contaminants by solvent cleaning before blasting.

Surfaces that are not to be blasted, such as knife edges, keyways, bearing surfaces or tapped holes, should be heavily masked or plugged before blasting. Care must be taken to protect the interior of machinery, hydraulic equipment and other components to prevent contamination by the abrasive or the removed rust particles.

The blasting operation is performed by making repeated passes until the surface condition meets the requirement of the coating to be applied. Surface quality is normally rated according to industry standards. The coating systems described in the class corrosion manual require either near-white-metal-blast cleaning (SSPC SP10) or white-metal-blast cleaning (SSPC-SP5). These are defined as follows:

- a. A Near-White-Blast Cleaned Surface
 1. When viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining as noted below
 2. Staining shall be limited to no more than 5 percent of each square inch of surface area and may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale or stains of previously applied paint.
- b. A White-Metal-Blast Cleaned Surface
 1. When viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust paint, oxides, corrosion products and other foreign matter
 2. Acceptable variations in appearance that do not affect surface cleanliness as defined above include variations caused by type of steel, original surface

condition, thickness of the steel, weld metal, mill or fabrication marks, heat treating, heat affected zones, blasting abrasive and differences in the blast pattern.

The near-white-metal standard can be achieved with a 10 to 35 percent lower cost than the white-metal standard and is specified where the performance of the coating will not be affected.

Sweep-blasting is a surface cleaning technique used to brighten the appearance of unpainted metal, but also used to provide an oxide-free surface for painting fiberglass or for priming unpainted metal. Use 60 to 80 grit sand (no metallic grit or shot) and set air pressure at 50 to 60 psig. Remove the blasting nozzle for sweep-blasting.

Abrasive-blasting equipment may be available for use by ship's force in some locations on a loan basis from a fleet tool issue room. Use of equipment such as a sandblaster requires strict adherence to operating instructions and extreme caution to avoid damage to the blasted surface, particularly where the surface is not steel but a softer metal such as aluminum, or injury to personnel. The equipment should be certified as meeting local environmental protection regulations.

8-2.1.2 References. Before using abrasive blasting equipment, the following references should be thoroughly reviewed:

- a. Procedure - NSTM Chapter 631
- b. Precautions - NSTM Chapter 631.

8-2.2 POWER TOOL CLEANING.

8-2.2.1 Procedure. This procedure includes the use of several kinds of power-driven equipment commonly available to ship's force, either as an on-board allowance item or on a loan basis from a depot, intermediate level maintenance activity, or fleet tool issue room. Wirebrushes, sanding

discs, grinders, chippers, scalers, needle guns, and rotary descenders are available. The tools are predominantly air-powered, although some electrically driven models may be found. Use of these tools is preferred over abrasive blasting in some applications, because there is less risk of contamination, no grit removal problem, and less damage to the sound coating in the surrounding area. The environmental pollution hazard is also less. It is true, however, that portable pneumatic and electric-powered tools are probably responsible for more accidents and injuries than any other single category of shipboard equipment.

Of primary importance is the selection of the appropriate tool for the type of surface to be prepared. It is not possible to prescribe exact choices because the results obtained will vary with the type and thickness of the coating, the way the coating was originally applied, the surface hardness of the metal, and other factors. As a general rule, select the fastest method of removal which will cause the least damage to the underlying metal surface. The only sure way to determine this is by trial and error, starting with the least abrasive or lightest cutting action tool or attachment that you think will do the job.

Preparation requirements call for either near-white-metal power tool cleaning (SSPC-SP3) or white-metal power tool cleaning (SSPC-SP11).

a. A Power Tool Near-White-Metal Cleaned Surface (SSPC-SP3) is accomplished when the surface viewed without magnification is free of loosely adherent materials

b. A Power Tool White-Metal Cleaned Surface (SSPC-SP11) is accomplished when the surface viewed without magnification is free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter. Slight residues of rust and paint may be left in the lower portion of pits if the original surface is pitted.

To remove all paint and corrosion down to SSPC-SP3 or SSPC - SP11, the tools should be operated in accordance with the procedures given in paragraph 8-2.2.2. When preparing for a touch-up instead of complete repainting, remove the old paint around the edges of the spot or area until an area of completely intact and adhering paint film, with no rust or blisters underneath, is obtained. Feather the edges of the area with sandpaper so there is a smooth transition from the old paint to bare metal (see Figure 8-1). Painting over an unfeathered spot is a waste of time. As the paint dries, it will shrink and crack minutely at the "cliff." This will lead to early failure and the need to redo the job. A properly feathered and recoated area is a permanent repair. Remove all dust and debris from the area by vacuuming, sweeping, or dusting. Wash the area with detergent or solvent, as appropriate, and apply a pretreatment or primer coat within 2 hours to prevent reformation of corrosion.

8-2.2.2 Procedures for Common Equipment. For the four most common surface preparation power tools - the power disk sander, the portable grinder with wirebrush, the needle gun and the deck crawler - procedural guidance will be given in the following areas:

- a. Description and technical data
- b. Uses
- c. Operation
- d. Safety precautions
- e. Maintenance and repair
- f. Care and stowage.

(The information in paragraphs 8-2.2.2 through 8-2.2.4 has been taken from David Taylor Naval Ship Research and Development Center Final Report on Shipboard Facilities Maintenance Development Study Program, Volume 2.)

8-2.2.2.1 Power Disk Sander.

8-2.2.2.1.1 Description and Technical Data.

The power disk sander is a portable electric tool with high-speed rotating, hard rubber disk backing, and attached abrasive disk (see Figure 8-2).

8-2.2.2.1.2 Uses. The disk sander is used for removing paint and light surface corrosion and for final smoothing after chipping. It is especially useful on light gauge metal which would be damaged by shipping. It is faster and more effective than the portable grinder with wirebrush, but requires more attention and skill to use. If improperly used, the sander will remove base material as well as coating and can leave unsightly gouges and half-moon marks. The disk sander should not be used on aluminum; use a portable grinder if needed.

8-2.2.2.1.3 Proper Operating Procedures.

- a. Check the sander for electrical
- b. Put on goggles or a full face shield, rubber insulating gloves, and a dust respirator. Connect the sander to the power outlet
- c. Attach the sanding disk. Start with a medium grit. Shift to a coarser grit if the selected grit is not working well
- d. Start the sander by depressing the trigger and apply the top semicircle of the rotating disk to the surface at a very shallow angle. Use light pressure and move the disk smoothly across the surface until bare metal starts to show. Do not allow the sander to stay in one place or tilt too much as it will dig into the metal and make gouges
- e. Shift to a finer grit disk for the final coating removal and smoothing.

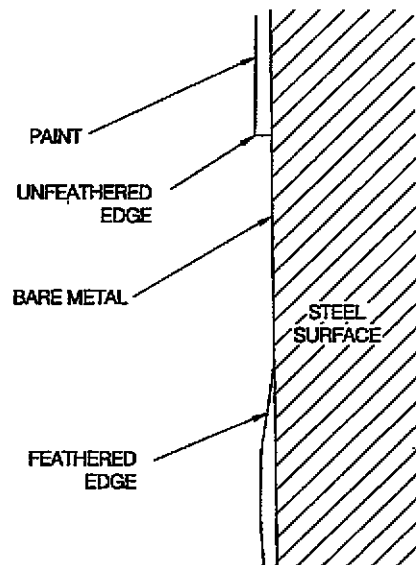
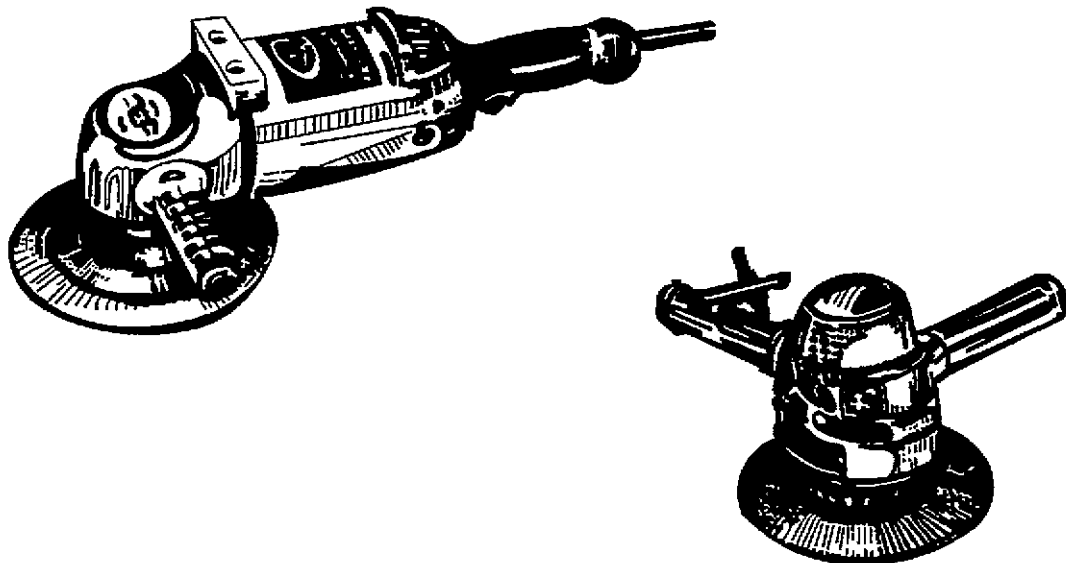


Figure 8-1. Feathering Edges of Old Paint



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Figure 8-2. Disk Sanders, Typical

8-2.2.2.1.4 Safety Precautions.

- a. Check electric-powered disk sanders for a current electrical safety tag and check that the cord and plug are in good condition
- b. Wear goggles or a full face shield and dust respirator
- c. Wear rubber insulating gloves.

8-2.2.2.1.5 Maintenance and Repair. The required periodic preventive maintenance of portable electrical power tools is covered under Planned Maintenance Subsystem (PMS). The principal maintenance requirements which are performed by designed work centers are:

- a. Monthly inspection and measurement of circuit resistance to ground
- b. Semiannual inspection including lubrication as required.

8-2.2.2.1.6 Care and Stowage. After each use:

- a. Wipe off all dust and dirt with a dry rag
- b. Coil the cord neatly and fasten it to the tool with a piece of wire or string
- c. Stow tool neatly in designated locker, bin or drawer.

8-2.2.2.2 Portable Grinder with Wirebrush.

8-2.2.2.2.1 Description and Technical Data.

This equipment is a pneumatic or electrically powered, portable tool with high-speed rotating mandrel with an attached grinding wheel, wirebrush or nylon-web abrasive disk.

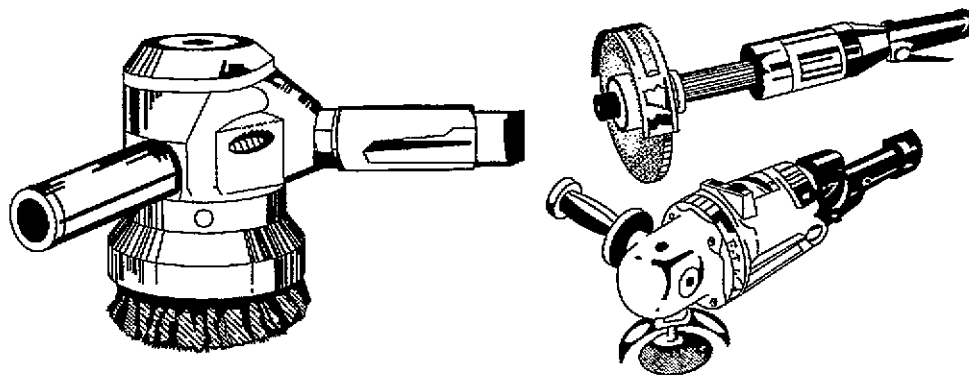
Wirebrushes are available in either wheel or cup shapes and in either plain steel or stainless steel material. Nylon-web abrasive disks are described later in this paragraph. A variety of electric pneumatic grinder/wirebrush combinations are available as standard stock items or from commercial sources. They come in horizontal,

right angle and vertical configurations, as shown in Figure 8-3.

8-2.2.2.2.2 Uses. The portable grinder with wirebrush or nylon-web abrasive disk attachment is used to remove paint and corrosion. It is also used to remove any residual paint or corrosion after chipping and scaling and to smooth the surface before painting. For aluminum, only the stainless steel wirebrush or nylon-web abrasive disk attachment should be used.

8-2.2.2.2.3 Proper Operating Procedures.

- a. If the grinder is electrically powered, check it for electrical safety
- b. If grinder is pneumatically powered:
 - 1. Check that an air filter-lubricator is installed at the low-pressure air outlet and that it has a sufficient supply of oil, add symbol 2110TH oil if necessary
 - 2. Check the air filter for the presence of water and drain if necessary
 - 3. Place a few drops of symbol 2110TH oil in the air inlet of the grinder
 - 4. Connect the hose to the tool and to the air outlet
 - 5. Open the air supply valve and set the pressure regulator at 80 psig.
- c. Compare the operating speed stamped on the body of the grinder with the operating speed stamped on the wirebrush
- d. The wirebrush speed must equal or exceed that of the grinder
- e. Put on goggles or a full face shield, gloves and a dust respirator



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Figure 8-3. Portable Grinders and Wirebrushes, Typical

f. Start the tool operating. Hold firmly with both hands and apply the wirebrush to the surface. Move it slowly over the surface. Be careful to keep the air hose or electric cord clear of the work area

g. When finished with the pneumatic grinder, again place a few drops of symbol 2110TH oil in the air inlet.

8-2.2.2.2.4 Safety Precautions. Check electric-powered grinders for current electrical inspection safety tag and check the condition of the cord and plug before using.

- a. Wear goggles or a full face shield and dust respirator
- b. Wear insulating rubber gloves if using an electric-powered grinder. Wear leather gloves if using a pneumatic grinder, to protect hands from flying particles

c. Check the operating speed stamped on the body of the grinder against the RPM rating of the wirebrush. The RPM rating of the wirebrush must equal or exceed that of the grinder.

8-2.2.2.2.5 Maintenance and Repair. The required periodic preventive maintenance of portable electric power tools is covered under PMS. The principal maintenance requirements which are performed by designated work centers are:

- a. Monthly inspection and measurement of circuit resistance to ground
- b. Semiannual inspection including lubrication as required.

Periodic preventive maintenance of portable pneumatic tools is also covered under PMS. The

principal maintenance requirements, addition to lubrication before and after each use are:

- a. Inspection weekly and before and after each use
- b. Quarterly test of operation
- c. Semiannual inspection of hoses and fittings.

8-2.2.2.2.6 Care and Storage. After each use:

- a. Wipe off all dust and dirt with a dry rag
- b. Coil the cord or hose neatly and secure with string or wire
- c. Stow tool neatly in designated locker, bin or drawer.

8-2.2.2.2.7 Nylon Web Abrasive Disk.

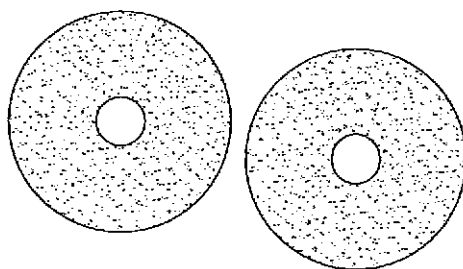
8-2.2.2.2.7.1 Description and Technical Data.

The nylon web abrasive disks are used with the portable grinder described above. They are made of a nylon web material impregnated with a silicon-carbide abrasive grit (See Figure 8-4.). Two types in various sizes are available.

The disks are more flexible than the wheels and are recommended for uneven surfaces. The wheels are more rigid but have a longer life. By use of various mandrels, the disk/wheels can be attached to powered rotary tools such as portable grinders and portable drills. Table 8-1 lists the maximum speed to safely operate a portable grinder with the diameter of various sizes of disks and wheels.

8-2.2.2.2.7.2 Uses.

The abrasive disks are used to remove paint and corrosion from steel or aluminum and to remove corrosion from pitted areas after roto-peening.



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Figure 8-4. Abrasive Disks

Table 8-1. Portable Grinder Disks and Wheels

Disks Diameter* (Inches)	Wheels Diameter** (Inches)	Maximum RPM
2	2	12,000
3	3	8,000
4	4	6,000
6	6	4,000
8	8	3,000
10		2,400
12		2,000
14		1,600
16		1,300
* 5/8-inch thick		
** 1/4, 1/2, 3/4, 1-inch thick		

8-2.2.2.2.7.3 Safety Precautions.

- Pieces of the wheel or disk may fly off during operation and a considerable quantity of dust is created. Wear goggles, dust respirator, and gloves when using
- Do not operate disks in excess of specified maximum RPM
- Use a tool with a wheel guard
- Mount the disk wheels between two rigid flanges that are at least one-third the diameter of the disk wheel.

8-2.2.2.3 Needle Gun.

8-2.2.2.3.1 Description and Technical Data. The needle gun is a hand-held pneumatic tool containing a number of small needles which are driven against a metal surface to remove paint and corrosion. Several different types, styles and models are available as shown in Figure 8-5.

8-2.2.2.3.2 Uses. The needle gun is used to remove paint, nonskid coatings and corrosion from heavy gauge steel surfaces. It is particularly effective in removing paint and rust from irregularly contoured surfaces and small

structural surfaces. It should not be used on aluminum or light gauge steel.

8-2.2.2.3.3 Proper Operating Procedures.

- Select the proper size needle for the job. Use 2 mm size for light scale, paint removal and a sandblast-like finish prior to painting. Use 3 mm size for heavy scale. Use 4 mm size for extra heavy scale and nonskid (see Figure 8-6).
- Connect pneumatic hose. Do not use more than two 25-foot lengths of 3/8-inch air hose to supply air to the gun. If a longer hose is required, use 1/2-inch inside-diameter hose
- Check that an air filter-lubricator is installed at the low pressure air outlet and that it has a sufficient supply of oil; add symbol 2110TH oil, if necessary
- Check the air filter for the presence of water and drain if necessary
- Place a few drops of symbol 2110TH oil in the air inlet of the needle gun
- Connect the hose to the tool and the air outlet

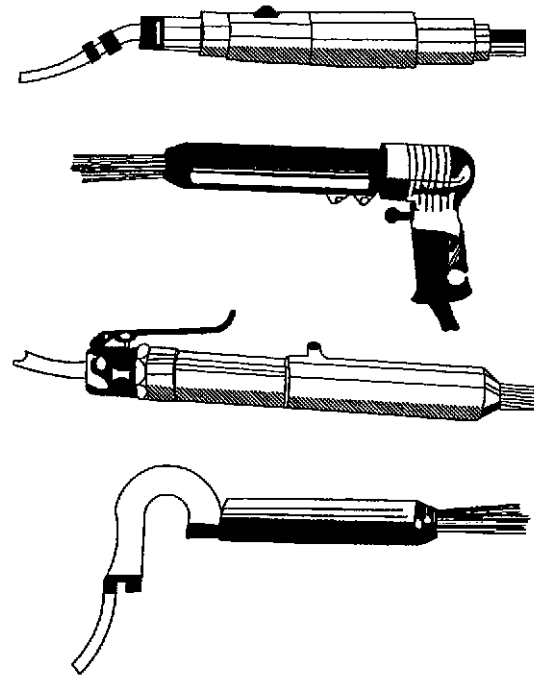
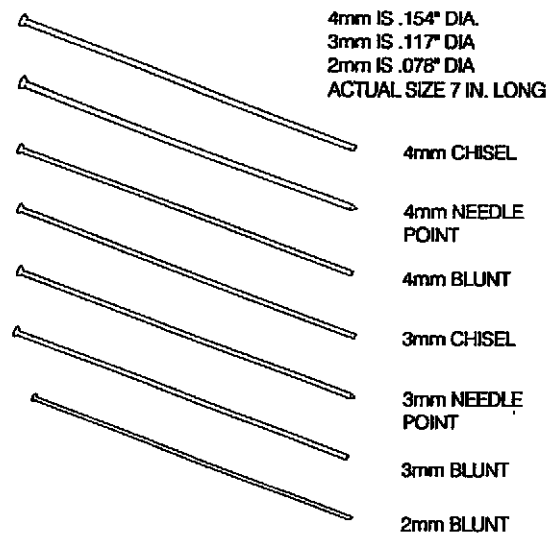


Figure 8-5. Needle Guns, Typical



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Figure 8-6. Choices of Needles for Needle Guns

- g. Open the air supply valve. Set the pressure regulator at 90 psig

NOTE

Needle descalers are designed to operate efficiently between 80 to 100 psig. Adjust the air pressure to approximately 90 psig for best operation. Too high a pressure will bottom the spring and cause damage to the piston, intermediate tube, anvil and needle holder. Pressure below 80 psig will greatly reduce the descaling efficiency of the tool.

- h. Hold the needles firmly against the surface and squeeze the trigger. Move the needles slowly over the surface until surface coatings and rust are removed and bare steel is exposed

- i. Put on goggles or full face shield, gloves, and hearing protectors. If working in a confined space wear a dust respirator

- j. To change needles (See Figure 8-7):

1. Disconnect the gun from the air supply
2. Loosen the alien screw on the intermediate tube and remove the tube assembly with the return spring inside
3. Remove the anvil from the needle holder and change needles
4. Inspect the condition of the spring and replace if it appears worn. A broken spring can cause damage to more expensive parts such as the needle holder, anvil, piston or
5. Reassemble the parts and tighten the alien screw.

- k. As the needles become worn, expose additional needle length as follows:

1. Loosen the alien screw on the front tube
2. Move the front tube back on the intermediate tube until approximately a 1/2-inch length of needle is exposed.
3. When finished, place a few drops of symbol 2110th oil in the air inlet of the needle gun.

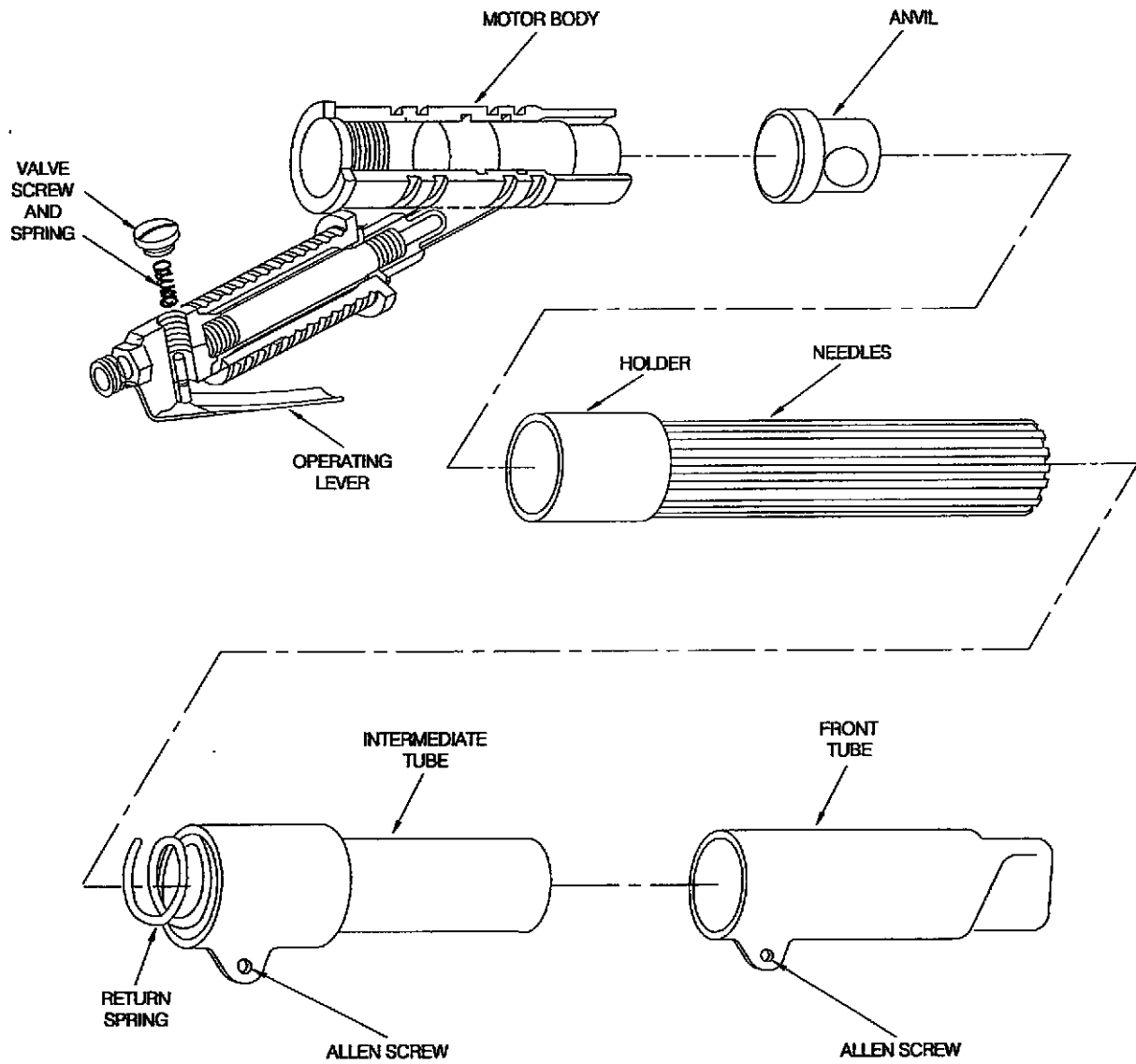
8-2.2.2.3.4 Safety Precautions.

- a. Wear goggles or full face shield and ear protectors. The use of leather gloves is also advisable to protect hands
- b. If working in a confined space, wear a dust respirator.

8-2.2.2.3.5 Maintenance and Repair. The required periodic preventive maintenance of portable pneumatic tools is covered under PMS. The principal maintenance requirements, in addition to lubrication by the operator before and after each use, are:

- a. A weekly inspection and inspection before and after each use
- b. Quarterly test of operations
- c. Semiannual inspection of hoses and fitting.

These inspections and tests are performed by the designated work center. The front mechanism of the needle gun can be repaired by ship's force by replacing worn parts. If the air motor becomes inoperable, return the gun to the manufacturer or the tool issue room.



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Figure 8-7. Needle Gun, Exploded View

8-2.2.2.3.6 Care and Storage. After each use:

- a. Wipe off all dust and dirt with a dry rag
- b. Coil hose neatly and secure with wire or string
- c. Stow neatly in designated locker, bin or drawer.

8-2.2.2.4 Deck Crawler (Jitterbug).

8-2.2.2.4.1 Description and Technical Data.

The deck crawler is also known as a "jitterbug." It is a portable electric or pneumatic-powered tool with rotating wheels having sharp, hardened teeth called chippers or cutters. Replacement sets of cutter wheels are available. See Figure 8-8.

8-2.2.2.4.2 Uses. The deck crawler is used to remove heavy paint coating, rust or nonskid from steel decks. It should not be used on aluminum decks.

8-2.2.2.4.3 Proper Operating Procedures.

- a. Check the condition of cutter wheels. Replace them if they are worn
- b. If the deck crawler is electrically powered, plug into a 115-Volt outlet (have it checked for electrical safety)
- c. If the deck crawler is pneumatically powered:
 1. Check that an air filter-lubricator is installed at the low-pressure air outlet and that it has sufficient a supply of oil; add symbol 2110TH oil if necessary. Check the air filter for the presence of water and drain if necessary
 2. Place a few drops of symbol 2110TH oil in the air inlet of the crawler

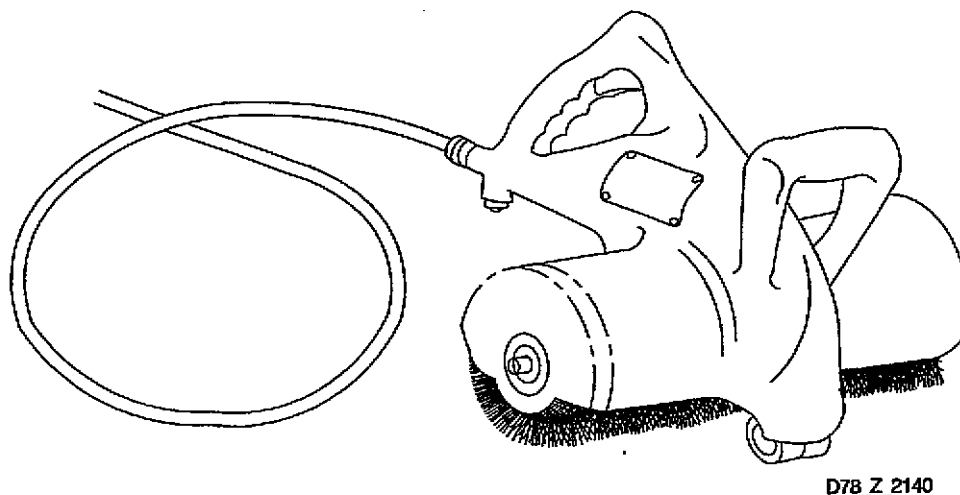


Figure 8-8. Deck Crawler, Typical

3. Connect the hose to the tool and air outlet
4. Open the air supply valve. Set the regulator at 90 psig.

d. Put on goggles or a full face shield, gloves and ear protection. If working in a confined space, put on a dust respirator

e. Be sure the air hose or cord is clear of the area. Hold the crawler firmly and start it. Move it slowly forward and backward over the deck until all surface coating and corrosion is removed. Use care when preparing urethane systems for renewal by only removing the top, nonskid layer. Do not allow the crawler to remain in one spot as it will remove metal unnecessarily and dull the cutters

f. When finished, place a few drops of symbol 2110TH oil in the air inlet of the deck crawler.

8-2.2.2.4.4 Safety Precautions.

- a. Wear goggles or a full face shield and ear protectors. Wear leather gloves to protect the hands. Wear a dust respirator in confined spaces
- b. Wear rubber insulating gloves when using an electrically powered deck crawler
- c. Keep the air hose or the electric cord clear of working area at all times.

8-2.2.2.4.5 Maintenance and Repair. The Required periodic preventive maintenance of portable pneumatic tools is covered under PMS. The principal maintenance requirements, in addition to lubrication by the operator before and after each use, are:

- a. Electric Deck Crawler. Periodic preventive maintenance of portable electric power tools is covered under PMS. The principal maintenance requirements which

are performed by designated work centers are:

1. Monthly inspection and measurement of circuit resistance to ground
2. Semiannual inspection including lubrication as required.

b. Pneumatic Deck Crawler. Periodic preventive maintenance of portable pneumatic tools is also covered under PMS. The principal maintenance requirements, in addition to lubrication by the operator before and after uses, are:

1. Inspection weekly and before and after each use
2. Quarterly test of operation
3. Semiannual inspection of hoses and fittings.

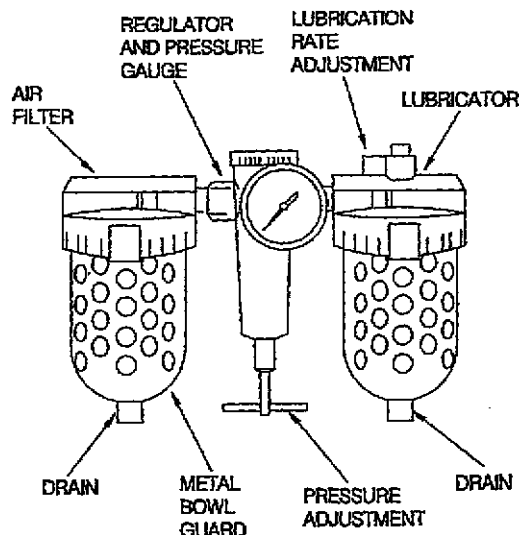
These inspections and tests are performed by the designated work center.

8-2.2.2.4.6 Care and Storage. After each use:

- a. Wipe off all dust and dirt with a dry rag
- b. Coil the cord and air hose neatly and secure it with a piece of wire or string
- c. Stow deck crawler neatly in the designated locker, bin or drawer.

8-2.2.3 Air Filter-Regulator-Lubricator.

8-2.2.3.1 Description and Technical Data. This is a device to filter, regulate and lubricate low pressure, compressed air used by pneumatic tools. Representative models consist of a clear plastic centrifugal air filter with a drain cock, and air pressure gage with a range of from 0 to 160 psig, an air pressure regulator, and a lubricator with a clear plastic oil reservoir. See Figure 8-9.



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Figure 8-9. Air Filter-Regulator-Lubricator, Typical

8-2.2.3.2 Uses. The air filter-regulator-lubricator is installed at compressed air outlets to pneumatic tools to provide proper lubrication, to filter out water, and to regulate air pressure. The proper use of this device will add months to the life of heavily used tools.

8-2.2.3.3 Proper Operating Procedures.

a. Check to be sure that the lubricator is at least half full. If not, add oil Symbol 2110TH as follows:

1. Shut off the air supply to the filter-regulator-lubricator unit
2. Bleed the air pressure from the unit
3. Remove the oil fill cap or bowl
4. Fill the bowl with oil

5. Reinstall the oil fill cap or bowl.

b. Check the air filter bowl for the presence of water. If water is present, drain it through the petcock (or other valve)

c. Connect the tool's air hose to the filter-regulator-lubricator.

1. Connect the tool to the hose
2. Open the air supply valve
3. Turn the regulator adjustment handle until the proper pressure is reached
4. Adjust the lubrication rate to 1-3 drops per minute
5. Drain water from the air filter every hour.

8-2.2.3.4 Safety Precautions.

- a. If the unit is equipped with metal guards around the plastic bowls, do not operate the unit unless they are in place
- b. Always shut off the air supply and bleed pressure from the unit before attempting to replenish the oil.

8-2.2.3.5 Maintenance and Repair. Maintenance procedures are as follows:

- a. Adjust the lubricator to inject one bowl of oil per 80 operating hours into the pneumatic system (about 1-3 drops per minute). Turn the adjusting screw in the direction indicated on the body of the lubricator.
- b. When 90 psi of air pressure cannot be maintained at the tool, clean the air filter element and bowl as follows:
 1. Shut the air supply valve to the unit and bleed pressure in the line to atmospheric pressure
 2. Remove the guard and bowl
 3. Remove and inspect the filter element
 4. Clean or replace the filter element as directed by the manufacturer's instructions
 5. Clean the bowl and guard with a clean, dry rag, or if necessary, with a detergent solution, and dry with rags (Do not use any type of cleaning solvent on the plastic bowls)
 6. Inspect the bowl for cracks, crazing or other damage and replace the bowl if defects are found

7. Reinstall the filter element
8. Reinstall the bowl and guard
9. Pressurize the filter and inspect for leakage.

8-2.2.4 Personnel Protective Equipment. The use of the surface preparation power tools described in the preceding paragraphs creates a number of safety hazards for the operator. These hazards, summarized in Table 8-2, can be protected against by using the proper protective gear. (The protective gear will be described later in this section.)

8-2.2.4.1 Full-Face Shield and Goggles.

8-2.2.4.1.1 Description and Technical Data. There are three types of protective devices for eyes (Figure 8-10).

a. Full Face Shield

1. Tilting type: Black vulcanized fiber visor support with forehead and semi-skull guard. Replaceable clear plastic visor projects beyond face to permit the wearing of glasses
 2. Non-tilting type: Used for protection of Eyes against wind, dust, rain, glare and minor chemical splashes - 3-17/32 inches long, 4-3/16 inches wide, 0.010 inches thick.
- b. Goggles, chippers. Used to protect eyes from flying objects: Plastic frame ventilated with adjustable nose bridge. Double aperture with two round, clear, hardened, unpolarized lenses secured by retaining rings. Designed to be worn over personal spectacles.

Table 8-2. Surface Preparation Tool Hazards

Tool Type	Hazard	Protective Gear
All electric-powered tools	Electrical Shock	Rubber insulating gloves
All surface preparation tools	Lying debris	Goggles/full face shield Gloves - rubber with electric tools, leather with pneumatic tools
All powered surface preparation tools	Dust	Dust respirator - not a vapor respirator as for painting
Needle gun Deck Crawler	Excessive noise (sufficient to damage hearing)	Ear protectors

8-2.2.4.1.2 Uses. The devices are worn when using surface preparation tools to protect eyes and face from flying particles.

8-2.2.4.1.3 Care and Storage. After each use, wash in soap and warm water and dry with a clean, soft rag. Store neatly in designated bin, locker or drawer.

8-2.2.4.2 Protective Gloves.

8-2.2.4.2.1 Description and Technical Data. There are two types of protective gloves available for use in surface preparation (Figure 8-11).

- a. Leather gloves: Chipper's gauntlet or heavy duty work gloves made of cattle hide or horsehide with gauntlet cuffs. These offer no electrical protection.
- b. Rubber gloves (insulated): Electrical workers, made of black natural rubber, 14 inches long.

CAUTION

Do not use on apparatus of circuits exceeding 5000 volts to ground.

NOTE

Rubber gloves (insulated) may be distinguished from rubber gloves (chemical) by the legend "Insulated 5000 volts."

8-2.2.4.2.2 Uses. The gloves are used to protect the operator's hand from electrical shock (rubber gloves only) and flying debris. Wear leather gloves when using pneumatic and manual tools, and rubber gloves (insulated) when using electrical power tools.

8-2.2.4.2.3 Safety Precautions. The following safety precautions apply.

- a. Do not use insulated gloves for work with chemicals or chemical gloves for work with electric tools. They will not protect adequately. Use gloves only for intended purposes
- b. Before each use, inspect gloves for holes, tears or rips. Discard or repair gloves if any defects are found. Pin holes in electrical rubber gloves can be detected by inflating the gloves with air, or rolling from the cuffs.

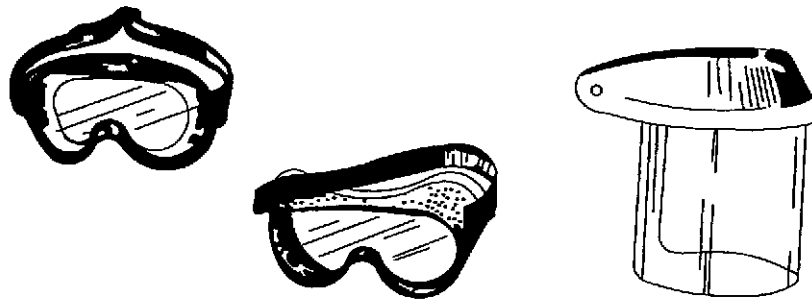
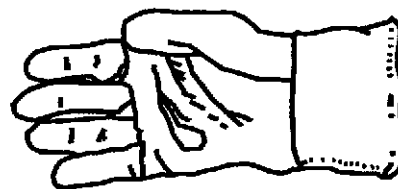


Figure 8-10. Goggles and Full Face Shield



RUBBER (ELECTRICAL)



LEATHER

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Figure 8-11. Protective Gloves

8-2.2.4.2.4 Care and Storage. After each use, wash the rubber gloves with detergent-sanitizer solution inside and out, hang them to dry. Talcum powder on the inside of rubber gloves will ease chafing during long periods of wear. Clean leather gloves with saddle soap. Store them neatly in designated locker, bin or drawer.

8-2.2.4.3 Hearing Protectors.

8-2.2.4.3.1 Description and Technical Data. There are several types of hearing protectors, as shown in Figure 8-12. The principal features of each type are as follows:

- a. Circumaural muff. Plastic encased sound attenuators attached to headband. Muffs cover the entire ear. No fitting is required. They provide the best overall protection of any type of hearing protector
- b. Headband earplugs. These are self-adjusting earplugs attached to a headband, pressed with the fingers to fit into the ears
- c. Insert earplugs (sized). These are single and triple flange plugs. They must be fitted to individuals by trained personnel
- d. Insert earplugs (self-adjusting). These are soft plastic plugs which are pressed to fit into the ear with the fingers
- e. Wax earplugs (disposable). These are pressed to fit into the ears with the fingers. They are disposed of after one use.

8-2.2.4.3.2 Uses. The hearing protectors are used to prevent loss of hearing from exposure to high-intensity noise. Hearing protectors are worn when operating or in close vicinity of a needle gun, deck crawler, or rotary-peening machines.

8-2.2.4.3.3 Care and Storage. Hearing protectors are usually provided on a personal custody basis. The protectors should be washed in mild soap or detergent solution at least once a week or after being used in a dirty environment. Bands should always be washed before inserting earplugs. Headbands should be kept in a plastic bag. Earplugs should be stored in the special containers.

8-2.2.4.4 Dust Respirators.

8-2.2.4.4.1 Description and Technical Data. Typical respirators for protection against dust are half-facepiece masks with replaceable single or dual filter pads for protecting against dust (see Figure 8-13). The masks are usually supplied with 50 extra filter pads. The respirators are designed to be discarded when the supply of filters is exhausted.

8-2.2.4.4.2 Uses. Dust respirators are to be worn when using a power sander or wire brush. In addition, they are to be worn when using any type of powered surface preparation tool in a confined space. They will provide no protection for painters or solvent cleaners.

8-2.2.4.4.3 Care and Storage. After each use, the respirator should be damp wiped with a detergent-sanitize solution and dried with a clean cloth. The filter pad is to be replaced. The respirator should be stored neatly in the designated locker, bin or drawer.

8-2.2.4.5 References. Before using power tools for surface preparation, the following references must be thoroughly reviewed:

- a. Procedure - NSTM Chapter 631
- b. Precautions - NSTM Chapter 631.

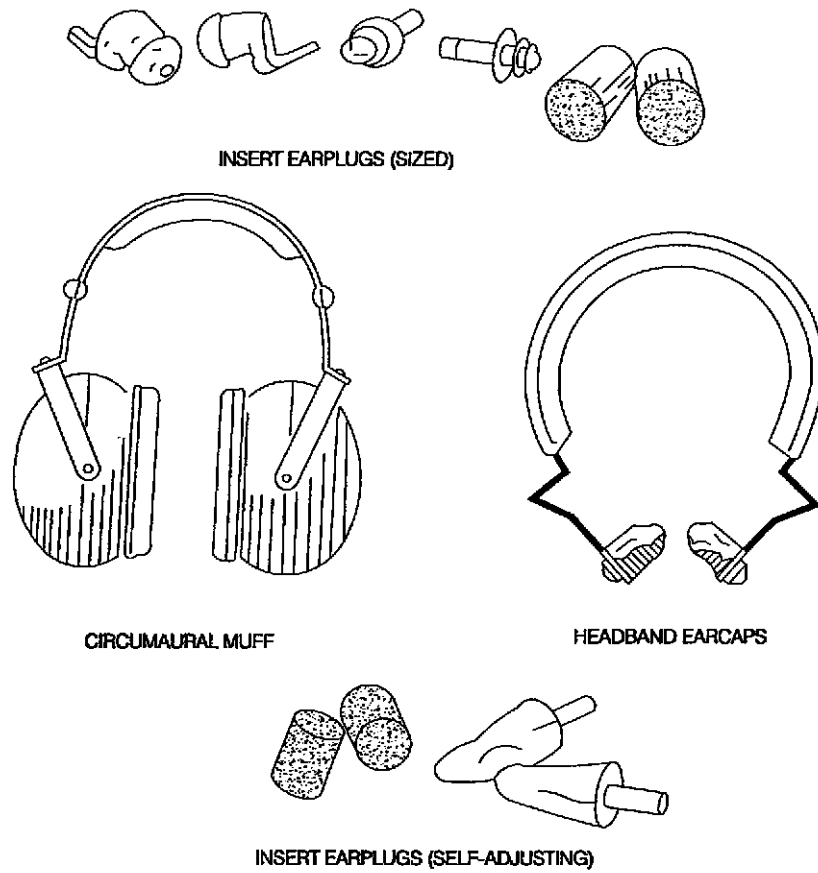
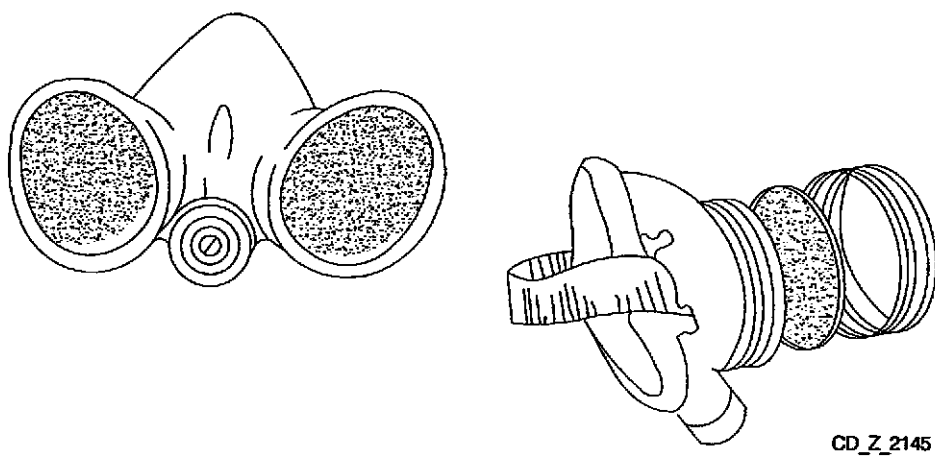


Figure 8-12. Hearing Protectors



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Figure 8-13. Dust Respirators, Typical

8-2.3 Hand Tool Cleaning.

8-2.3.1 General. Hand Tool Cleaning is the method of preparing surfaces using non-power hand tools. Hand tool cleaning will remove only loose or loosely adhering surface contaminants including rust, scale, loose mill scale, loosely adhering paint and other loose foreign matter. Hand tool cleaning is not appropriate for removing adherent mill scale, rust or paint. Mill scale, rust and paint are considered adherent if they cannot be removed by lifting with a dull putty knife. Hand tool cleaning is primarily recommended for spot cleaning in areas where corrosion is not a serious factor.

CAUTION

Removal of contaminants by hand cleaning must be done carefully to avoid deep tool marks or gouges on the surface.

8-2.3.2 Preparation. Before hand tool cleaning, the surface must be free of oil, grease, dirt, chemicals and water soluble contaminants. The surface can be cleaned using solvent cleaners and freshwater rinsing (see paragraph 8-2.4).

8-2.3.3 Hand Tool Cleaning. Impact tools, such as chipping hammers, chisels and scalers are used to remove rust scale and any heavy buildup of foil coatings. Hand wire brushes, hand abrading (sanding), hand scraping and similar non-impact methods are used to remove loose mill scale, loose or non-adherent rust and loose paint.

After hand tool cleaning and prior to painting, dirt, dust and similar contaminants shall be removed using methods such as brushing, vacuum cleaning or blowing off with clean, dry air.

8-2.4 SOLVENT DEGREASING (SSPC-SP1).

8-2.4.1 Procedure Description. Solvent cleaning is a procedure for removing detrimental foreign matter such as oil, grease, soil, and other contamination from surfaces by wiping or scrubbing the surface with rags or brushes wetted

with solvent. When this method is used as the sole preparation for a coating system, special care must be taken, since almost invisible contamination left on the surface can interfere with coating adhesion and may be a source of future corrosion. Approved solvents are listed in Chapter 7.

8-2.4.2 Procedure.

- a. The surface is wiped with clean rags soaked in solvent and wiped dry with clean rags while it is still wet
- b. The solvent will become contaminated, so fresh solvent must be used constantly. The rags should be turned often and replaced as soon as there is no fresh rag area on which to wipe the surface. Place the soaked rags in a bucket of water for disposal later
- c. The last wash should be made with clean solvent to avoid a film residue that could interfere with the paint bond
- d. Inaccessible areas such as tapped holes or crevices can be cleaned by working a solvent-soaked rag into them and drying with a clean rag. If the opening is too small for a rag, solvent may be poured in and then blown dry with compressed air. Wear goggles
- e. The following procedure is for removing oil traces left after a solvent cleaning. This is essentially a hand cleaning procedure using two chemical solutions; one solution is an emulsifiable solvent, the other an alkaline water-base cleaner. The emulsifiable solvent is used to penetrate and loosen oil-saturated dirt that is then emulsified and washed away with a stream of fresh water. After solvent cleaning, all surfaces are hand cleaned to remove rust, loose paint, and oily incrustations. Any material that can be removed by brushing, chipping, or scraping must be removed because the new paint will bond only to clean metal or clean, sound, existing paint. Solvent cleaning, although

very good for removal of oil, grease and grime, leaves an oily film on the surface that could interfere with paint adhesion. To prevent this occurrence, the just-cleaned surfaces must be recleaned with the alkaline solution to remove the last traces of oil. This treatment leaves the surface in an excellent condition for paint coating and is an inexpensive and very successful technique. It may, in a diluted (10:1) and reduced version, be safely used for general cleaning of epoxy and urethane topcoats, or other general, exterior or bilge cleaning.

This method differs from methods used for maintenance cleaning, because it is done solely to prepare surfaces for repainting. The treated surface must be absolutely clean and free of any soil and loosely adhering paint or the new paint will not adhere.

8-2.4.3 Materials and Equipment Required:

- a. Fuel oil, diesel or JP-5; 5 gallons
- b. Sodium Phosphate, tribasic* dodecahydrate, FSN 6810-00-240-21 16; 100-pound drum
- c. Sodium Metasilicate pentahydrate technical, NSN 6810-00-240-2121; 100-pound drum
- d. Detergent, nonionic, general purpose, liquid Type I, water soluble, NSN 7930-00-531-9715; 5-gallon pail
- e. Detergent, nonionic, general purpose, liquid Type II, oil soluble, NSN 7930-00-531-9716; 5-gallon pail
- f. Non-atomizing spray equipment
- g. Scrub brushes
- h. Paint brushes
- i. Hand scrapers, wire brushes, chipping tools.

NOTE

These ingredients are the working chemicals in the general household cleaner, Proctor and Gamble's "Spic and Span."

8-2.4.4 Safety Equipment.

- a. Tight fitting goggles (chemical type)
- b. Fume and mist respirators
- c. Rubber gloves
- d. Rubber boots.

8-2.4.5 Safety Precautions.

- a. There shall be no smoking, welding, burning or other sources of ignition such as hot metal surfaces in the compartment or deck area being cleaned
- b. Rubber gloves and boots must be worn to prevent skin contact with chemicals
- c. Space being cleaned shall be adequately ventilated.

8-2.4.6 Detailed Cleaning Procedures.

- a. Remove all debris from the areas to be cleaned
- b. With non-atomizing spray, spray surface to be cleaned with a solution prepared by thoroughly dissolving one part oil soluble nonionic detergent (MIL-D-16791, Type II) by volume in nine parts of diesel fuel oil (or JP-5)
- c. Scrub surface with a stiff bristle brush to remove heavy soil and permit better penetration of solvent. Use a paint brush to reapply solvent where needed
- d. Permit solvent to dwell for a minimum of 30 minutes
- e. Power rinse all surfaces with a high-velocity stream of warm, fresh water.

Remove emulsified soil by continuous vacuum stripping while rinsing, or flush over the side depending on local EPA regulations

f. Remove all remaining loose paint, corrosion products, or soil by brushing, chipping or scraping. This step is of the utmost importance to the success of this method since the paint will not adhere to other than clean metal or sound existing paint

g. Spray all surfaces with a solution prepared by dissolving the following:

1. Three pounds of sodium phosphate tribasic
2. Three pounds of sodium metasilicate.
3. Three pints of water-soluble nonionic detergent (MIL-D-16791, Type I) in 50 gallons freshwater.

h. Brush as necessary to loosen and remove any remaining soil

i. Rinse all surfaces with freshwater. Vacuum strip while rinsing. Continue rinsing and stripping until the rinse waters fail to give a positive test for alkalinity when tested with phenolphthalein. All boiler-water testers can perform this test. Blow dry tiedowns, comers and recesses with low-pressure air

j. Dry surfaces immediately to prevent rusting

k. Prime surfaces as soon as dry.

8-2.4.7 Health and Safety Precautions. Solvents are flammable and toxic. They should be used only in well-ventilated areas. They should not be used near any source of flame or sparks such as welding operations or disk sanders. Prolonged contact with the skin must be avoided.

8-2.4.8 References. Prior to using, the following references must be thoroughly reviewed.

- a. Procedures - NSTM Chapter 631
- NAVSHIPS NOTE 9190
- b. Precautions - NSTM Chapter 631
- NAVSHIPS NOTE 9190.

8-3 GENERAL PAINTING PROCEDURES.

Ships are delivered to the Navy with the topside surfaces painted to protect them from corrosion, and to provide a smooth surface that is easily cleaned. A ship, with the topside clean of rust stains, and properly spotted out, presents a smart appearance. The color and gloss is specified to provide camouflage at sea. Paint coatings are eventually damaged, break down and wear away. When this happens, it is essential that the surface be properly prepared and repainted as soon as practical to prevent corrosion. In this section, correct painting procedures will be described. Most of the information in this section has been taken from the David W. Taylor Naval Ship Research and Development Center Final Report on the Shipboard Facilities Maintenance Demonstration Study Program, Volume II. This section is divided into three parts Manual Painting Tools, Paint Spraying Equipment and Paints.

8-3.1 MANUAL PAINTING TOOLS. Two basic stools for manual application of paint are rollers and brushes. Rollers are more efficient and effective for large, flat, unobstructed surfaces such as decks and bulkheads. The application rate with rollers is approximately 50 percent faster than with brushes. Brushes are slower, but are often necessary when painting small objects or areas that cannot be coated with a roller; for example, when cutting in an edge or when stenciling or lettering.

8-3.1.1 Paint Rollers.

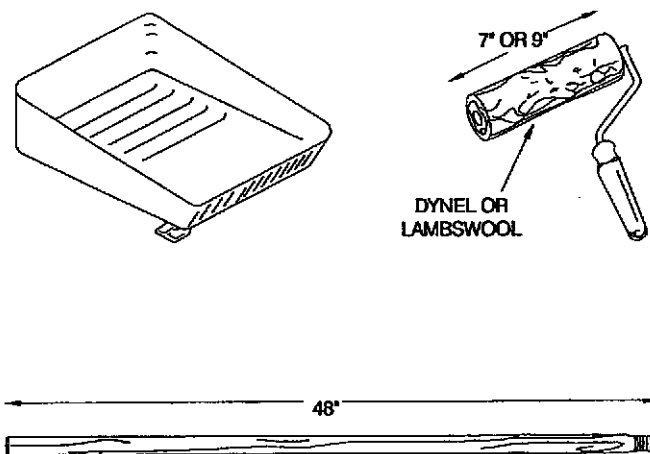
8-3.1.1.1 Description and Technical Data.

Standard sizes for rollers are 7 and 9 inches. Extension handles, four feet in length, are available to extend the painter's reach. Roller trays are made to match the 7- and 9-inch rollers (Figure 8-14). The roller covers are usually Dynel or lamb's wool with 3/8- or 7/8- inch pile depth. The flatter and newer the pile, the smoother the finished surface.

8-3.1.1.2 Instructions for Use. To prepare the roller, pour the paint into the tray to about one half the depth of the tray. Immerse the roller completely, then roll it back and forth along the tray ramp to fill the cover completely and to remove any excess paint. As an alternative to using the tray, a specially designed wire screen may be fitted into a 5-gallon can of paint. The screen attaches to the can and remains at the correct angle for loading and spreading paint on the roller (Figure 8-15).

Work the first load of paint out of the roller by rolling it on newspaper, cardboard or other dry, scrap material in order to remove entrapped air from the roller cover. The roller is now ready for use. Apply the paint by first painting the letter W or X with the roller and then filling in the unpainted areas (Figure 8-16).

Roll from the unpainted area onto the freshly painted area. Always roll paint onto the surface, working from the dry area into the painted area. Roll back and forth to cover evenly. Use light even strokes, do not roll too fast. Avoid spinning the roller at the end of each stroke. Always "feather out" final strokes to pick up any excess paint on the surface. This is accomplished by rolling out the final stroke with minimal pressure.



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Figure 8-14. Roller, Tray and Extension Handle

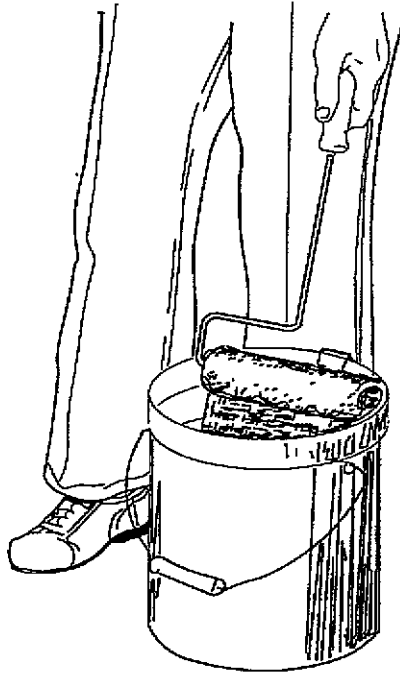
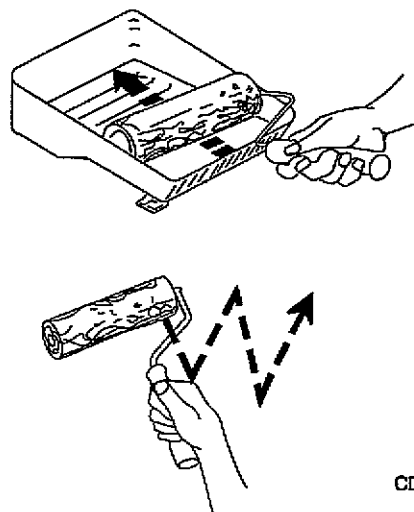


Figure 8-15. Roller and Wire Screen Attachment to Can



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Figure 8-16. Spreading Paint Evenly

8-3.1.1.3 Cleaning and Storage. Clean the roller covers immediately after use as follows:

- a. Remove the roller cover and wash it in the proper thinner at least three times. Squeeze out any excess thinner using rags or paper towels
- b. Wash roller in general purpose detergent solution and rinse in freshwater
- c. Reinstall the cover on the roller and hang up to dry.

8-3.1.2 Paint Brushes.

8-3.1.2.1 Description and Technical Data. The main types and sizes of brushes used in shipboard painting are (Figure 8-17):

- a. Wall Brushes. Flat, square-edged brushes ranging in widths from 3 to 6 inches, used to paint large, continuous surfaces such as bulkheads and decks
- b. Sash and Trim Brushes. Small oval, round or flat brushes used for painting small objects, difficult to reach areas, and cutting in borders and corners and stenciling
- c. Varnish or Enamel Brushes. Flat square-edged or chisel-edged brushes available in widths from 1-1/2 to 3 inches. The select, fine natural bristles are comparatively shorter in length, cause relatively high viscosity gloss finishes, and lay paint down in a smooth, even film. Used for applying varnishes and enamels and for painting small areas or objects not accessible to a roller

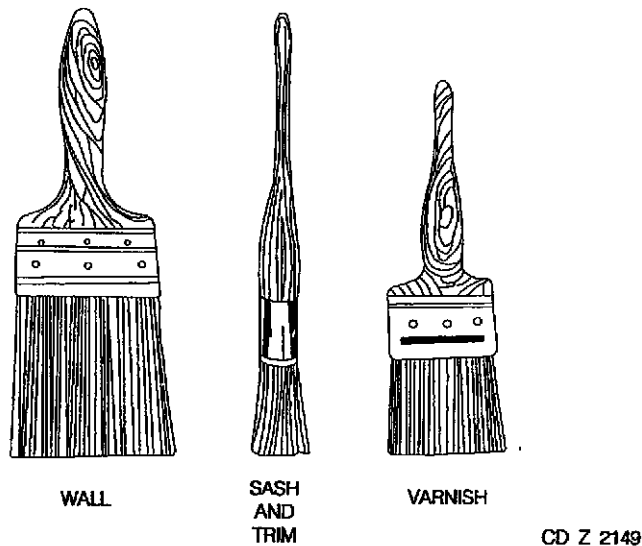


Figure 8-17. Types of Paint Brushes

d. Lettering Brushes. Flat or chisel-edged with round handle ranging in width from 1/6- to 3/8- inch, used for lettering, striping and stenciling.

8-3.1.2.2 Instructions for Use.

a. Use the right size brush for the job; use the right bristle (natural for oil base paints). Avoid a brush that is too small or too large. The latter is particularly important. A large area job does not necessarily go faster with an over-size brush. If the brush size is out of balance for the type of painting being done, the user tends to apply the coating at an uneven rate, general workmanship declines, and the applicator actually tires faster because of the extra output required per stroke

b. Soak natural bristle brushes in mineral spirits. This process makes the bristles more flexible and swells the bristles in the metal band (ferrule) so that fewer bristles are apt to work loose when the brush is used

c. The two most useful brushes are the wall brush and the sash and trim brush. Wall brushes are wide and thick, carry a large quantity of paint, and provide a maximum of brush action. Use them on large flat areas or objects. Use sash and trim brushes for painting small items, hard to get at places and cutting in corners

d. Hold the brush firmly but lightly using one of the grips shown in Figure 8-18. Do not put fingers on the bristles below the metal band (ferrule). Hold the brush in a way that permits easy wrist and arm motion

e. When using a wall brush, paint with the full width of the brush, not with the narrow edge. This practice wears the corners down and spoils the shape and efficiency of the brush. When using an oval brush, do not let it

rotate in your hand. An oval brush that has been revolved too much soon wears to a pointed shape and becomes useless. Do not poke oversized brushes into corners and small openings. This bends the bristles and ruins the brush. Instead, use a smaller brush that fits into such areas. Do all small areas first; then do the broadbrush work

f. Prepare the brush before beginning to apply paint, working the paint well into the brush. This can be done by holding the mixing paddle tightly over the paint bucket, dipping the brush into the paint, then drag the brush clean across the paddle. Do this several times

g. To load the brush, dip it into the paint up to one-half of the bristle length. Then withdraw and tap against the inside of the bucket to remove excess paint on brush as shown in Figure 8-19

h. Hold the brush at an angle of 45 degrees to the surface being painted, with the ends of the brush just touching the surface. Lift the brush clear of the surface before starting the return stroke. Do not bear down on the brush. Brush from unpainted area into the wet edge of the painted area

i. For complete coverage, follow the Navy method and first "lay on," then "lay off" (Figure 8-20). "Laying on" means apply the paint first in long strokes in one direction. "Lay off" means crossing your first strokes by working in the other direction. By using this method, the paint is distributed evenly over the surface, the surface is completely covered, and a minimum amount of paint is used. A good rule is to "lay on" the paint the shortest distance across the area and "lay off" the longest distance. When painting bulkheads, or any vertical surface, "lay on" in horizontal strokes, "lay off" vertically

j. When painting an entire compartment, start with the overhead first and work from the far corner. By working the overhead first, you can keep the bulkhead free of drippings by wiping up as you go along. When painting pipes, stanchions, narrow straps, beams and angles, lay the paint on diagonally as shown in Figure 8-21. Lay off along the long dimension. Always carry a rag for wiping dripped or smeared paint. Carefully remove loose bristles sticking to the painted surface.

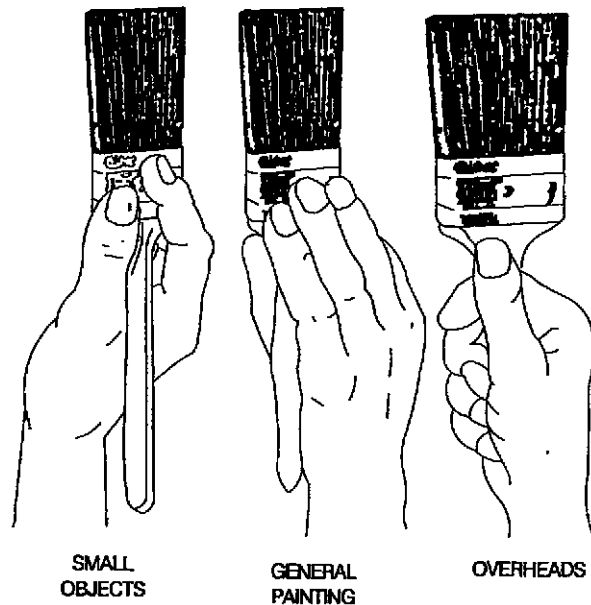
k. "Cutting in" is the process of painting a border. A painter who has learned to cut in properly can do a job in less time than it takes another painter to apply masking tape. Cutting in is not hard and anyone with a fairly steady hand can learn to do it quickly. To cut in the angle between the overhead and a bulkhead, as shown in Figure 8-22, start in one corner. Hold the brush at an angle of about 75 to 80 degrees from the bulkhead and about 10 degrees from the overhead. Draw the brush along in fairly swift, long, smooth

strokes. This is one job where working slowly will not produce better results. The slower the stroke, the wavier the line will be.

l. If there is no definite break, such as the angle between bulkhead and overhead or deck, draw a line to follow. This can be done either with a straightedge or by snapping a chalk line. To snap a chalk line, first mark a couple of reference points, one at each end where the line will be. Then chalk the line and stretch it taut between the reference points. Pull the center of the line about 1-inch out from the surface and let it snap back against the surface. This leaves a neat, straight line. Cut in as already described. Cut in first, then paint out from that line.

8-3.1.2.3 Cleaning and Stowage. Brushes should be cleaned immediately after use as follows:

a. Remove as much of the paint as possible by brushing the paint out on paper or using a



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Figure 8-18. Paint Brush Grips

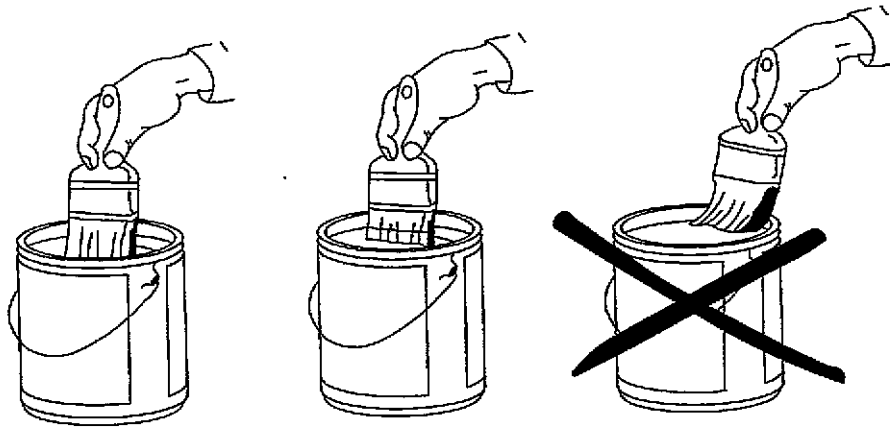
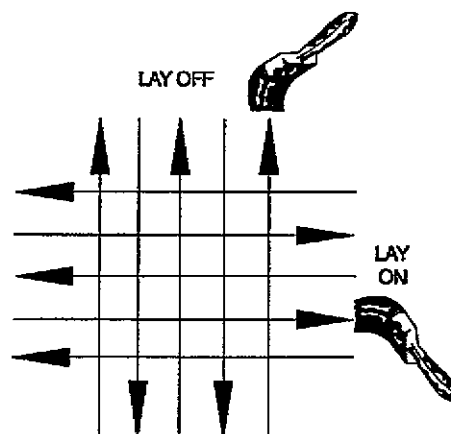


Figure 8-19. Loading a Paint Brush



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Figure 8-20. Laying On and Laying Off

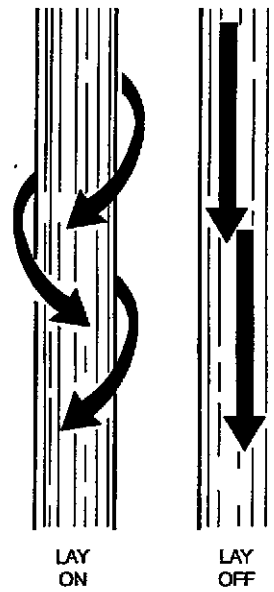
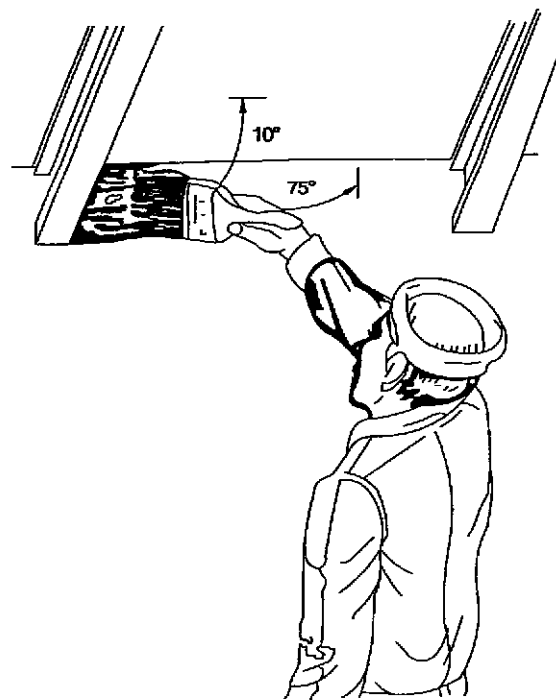


Figure 8-21. Painting Pipes and Stanchions



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Figure 8-22. Cutting In

putty knife to squeeze the paint out and wiping the bristles thoroughly with paper towels or rags

b. Brushes to be used the following day should be cleaned in the appropriate thinner and placed in a brush container with bristles immersed in thinner or linseed oil, as shown in Figure 8-23. This container is not safe for use at sea. The racks for holding the brushes should be positioned so that the entire length of the bristles and the lower part of the ferrule are covered by the thinner. The brush bristles should not touch the bottom of the container. If they touch, the bristles will become distorted and unusable

c. Brushes that are not to be used the next day should be cleaned by at least three washings in thinner, followed by washing in a solution of general purpose detergent and water, and then hung to dry

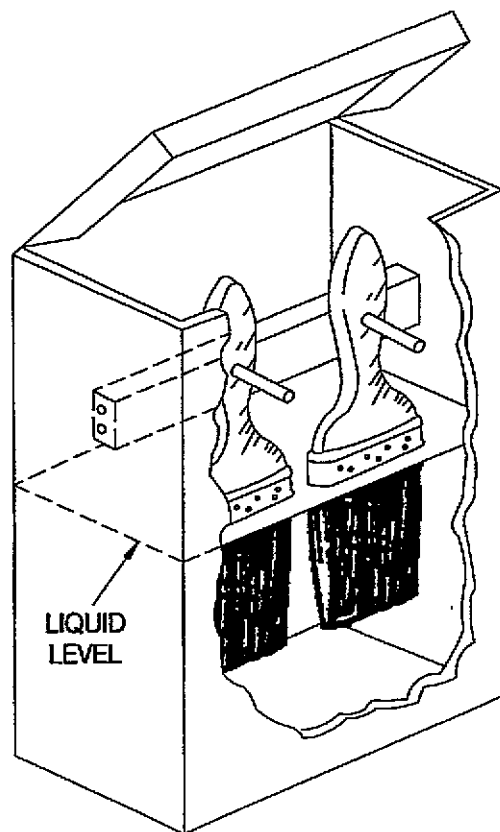
d. After brushes are dry, they should be suspended from racks, or wrapped in paper or cloth and stowed flat

e. Do not leave a brush soaking in water. This will cause the bristles to separate into bunches, to flare, and to become bushy

f. If a brush has been stored overnight in thinner or linseed oil, drain it and wipe the bristles dry with a rag before using it

g. Brushes should never be left in an open can of paint, or left exposed to the air. They must be cleaned immediately after use and stored properly.

8-3.2 PAINT SPRAYING EQUIPMENT. Spray painting is the most efficient method of applying paint for large jobs. It is particularly effective for repainting compartments or large topside areas. However, spray paint equipment must be kept



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Figure 8-23. Brush Container

absolutely clean in order to function properly. Immediately upon completion of a spray painting job, the equipment must be partially disassembled and thoroughly cleaned in paint solvent. Failure to do so will allow the paint to harden in small passage ways of the gun and make it almost impossible to restore it to satisfactory working condition.

There are two basic types of paint spraying equipment: compressed air and airless. In the first type, compressed air and paint are fed to a nozzle in a spray gun where the paint is atomized and sprayed out. The disadvantage of this type is that it tends to create excessive overspray because of the high ratio of air to paint. In airless spray equipment, paint is pumped at a very high pressure through a small orifice in the nozzle which causes the paint to atomize. The absence of air turbulence minimizes overspray and allows more uniform coverage.

Successful spray painting requires thorough knowledge of the equipment and its adjustment, understanding of the various techniques that can be used with each type of equipment, and considerable practice and experience.

8-3.2.1 Compressed Air Paint Spray Equipment.

8-3.2.1.1 Description and Technical Data. Conventional spray painting equipment uses low-pressure compressed air to propel and atomize paint. Several different types and manufacturers' models are in use in the Navy. The following description and operating instructions may have to be modified slightly to fit the particular model aboard your ship.

The principal components of compressed air paint spray equipment are spray gun, nozzles, paint container and air and fluid hoses.

a. **Spray Gun.** The basic parts of a spray gun are shown in Figure 8-24.

1. The air nozzle directs air jets to atomize the paint to give the particles velocity to reach the surface being sprayed
2. The fluid nozzle controls the quantity of paint delivered. Fluid nozzles with different sizes of orifices are available for different types of paints
3. The needle assembly acts as a stop-start valve for the paint flow through the spray gun
4. The trigger activates and controls air and paint movement to the nozzles
5. The fluid control assembly provides mechanical pressure on the needle valve so that it will close when the trigger is released
6. The air valve controls air movement through the spray gun
7. The pattern (side port) control or fan control regulates the spray pattern width by controlling the air supply to the "horns" of the air nozzle
8. The horns of the air nozzle can be rotated to change the orientation of the spray pattern axis from vertical to horizontal
9. The air inlet provides a connecting point for the air hose, normally 1/4-inch diameter (National Pipe Standard).

b. **Nozzles (Figure 8-25).** Air nozzles may be of the external-mix or internal-mix type. The external-mix nozzle is best for most shipboard spray painting because it gives the

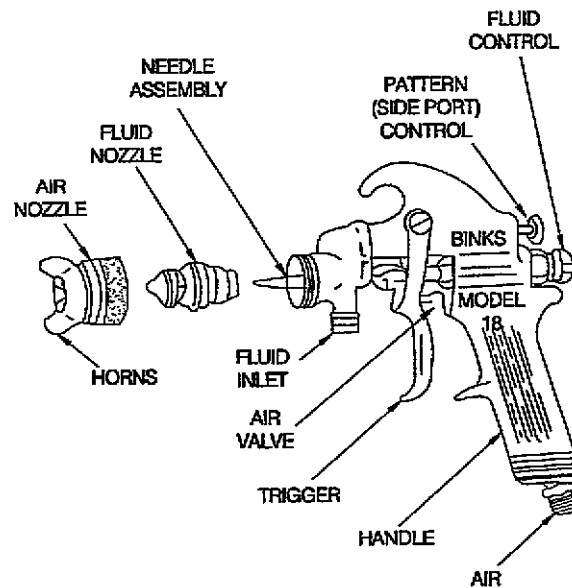
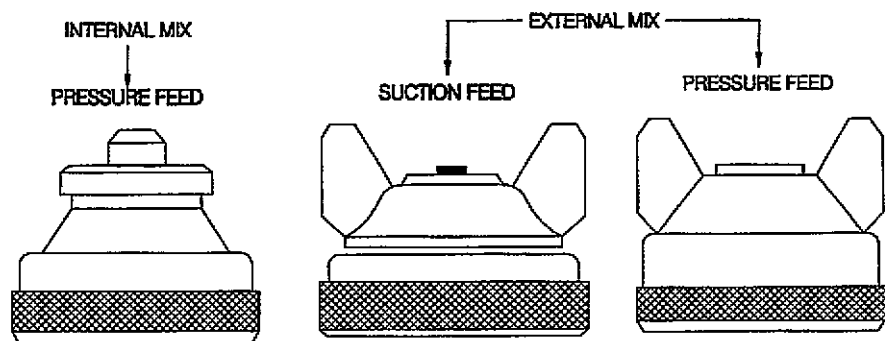


Figure 8-24. Compressed Air Spray Gun Parts



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Figure 8-25. Types of Nozzles

finest atomization and most easily controlled spray pattern. External-mix nozzles may be either suction-feed or pressure-feed type. Suction-feed nozzles are used when the gun is connected to a suction-feed cup. Pressure-feed nozzles are used when the gun is connected to either a pressure-feed cup or pressure tank. Suction-feed nozzles can be distinguished from pressure-feed nozzles by the letter "S" or "P" stamped on the nozzle. The fluid nozzle meters and directs the fluid (paint) into the air stream. It also forms a seat for the fluid needle which shuts off the fluid flow. Fluid nozzles have different size orifices in order to work with paints of different viscosities. Also, all air nozzles will not physically fit over all fluid nozzles. The correct air and fluid nozzles to use for any job must be determined by consulting charts provided by the spray gun manufacturer.

c. Containers and Their Uses

1. Suction-Feed Cup. The 1-quart suction-feed cup and the air-hose attach directly to the spray gun. Venturi action draws the paint from the cup into the nozzle. A suction-feed nozzle must be used. Spray pattern control is limited with this hookup which is used for small jobs and touch-up work (Figure 8-26)
2. Pressure-Feed Cup. Pressure feed cups (with capacities of one or two quarts) are also attached directly to the spray gun. The air hose is connected to the spray gun and to the pressure cup via a small regulator. Paint is fed to the gun by air pressure. A pressure-feed nozzle is used and full spray pattern control is possible. This hookup is used for small jobs when the fine control of the spray is needed (Figure 8-26)
3. Pressure Tank (Figure 8-27). For most shipboard painting jobs such as spraying a compartment, the spray gun is connected by a fluid hose to a large paint container called a pressure tank. Pressure tanks are available in all sizes from 2 to 60 gallons, the usual size for shipboard use being 5 gallons. The air hose may be connected directly from a regulator at the air outlet to the spray gun or may be connected to a regulator on the spray tank. Pressure tanks are fitted with a safety valve, a pressure-release valve, an air inlet valve, and a fluid outlet valve. Some types may also have one or two regulators
4. Air Supply. Air pressure for spray equipment is normally supplied from the ship's low pressure air system, either through the regulator installed on the pressure tank or a regulator installed in the line.

To spray paint properly, the air should be dry and free from dust. Because all air contains moisture and dust in varying amounts, some means must be provided to remove them. This is done by an air filter. The air filter should be checked for the presence of water and drained if necessary prior to use. During use it should be drained every hour. See Paragraph 8-2.2.3 for detailed instructions on operation and maintenance of air filter-regulator-lubricator.

8-3.2.1.2 Instructions for Use. Compressed air spray equipment is primarily used for rapid application of paints to relatively large areas. The equipment provides rapid coverage with good control of thickness but relatively poor control of over-spray, thus requiring extensive masking before painting.

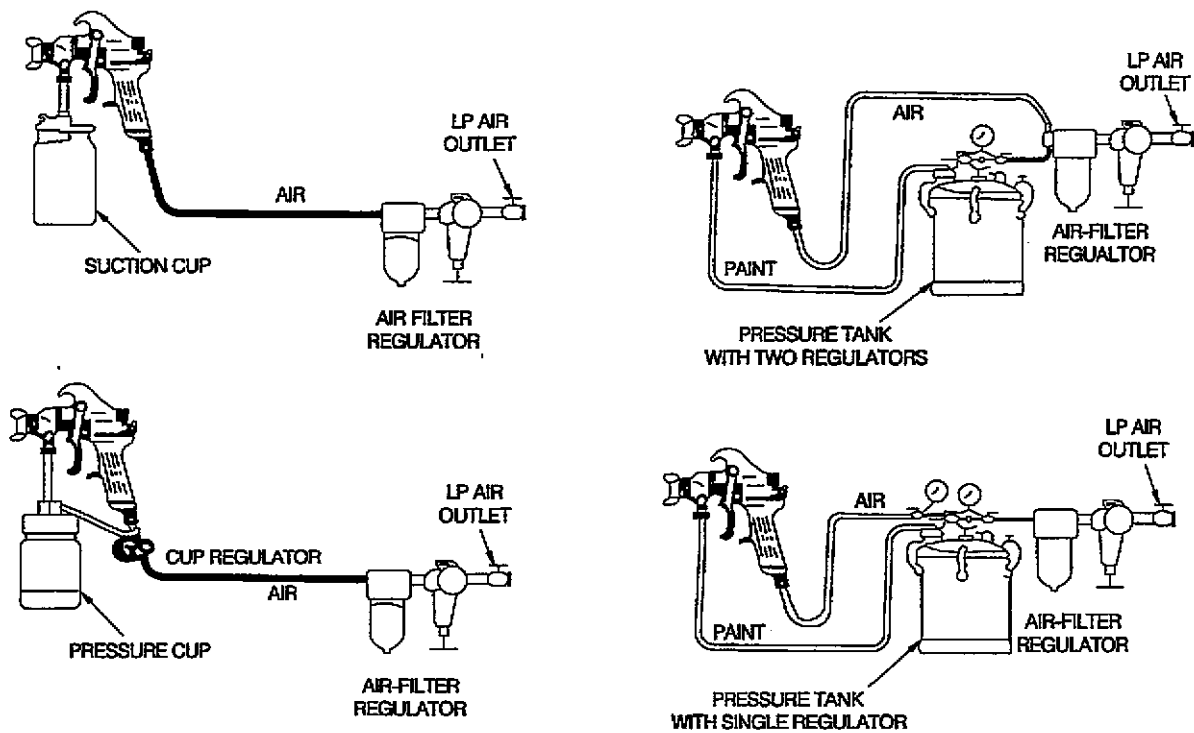


Figure 8-26. Spray Painting Equipment Hookup

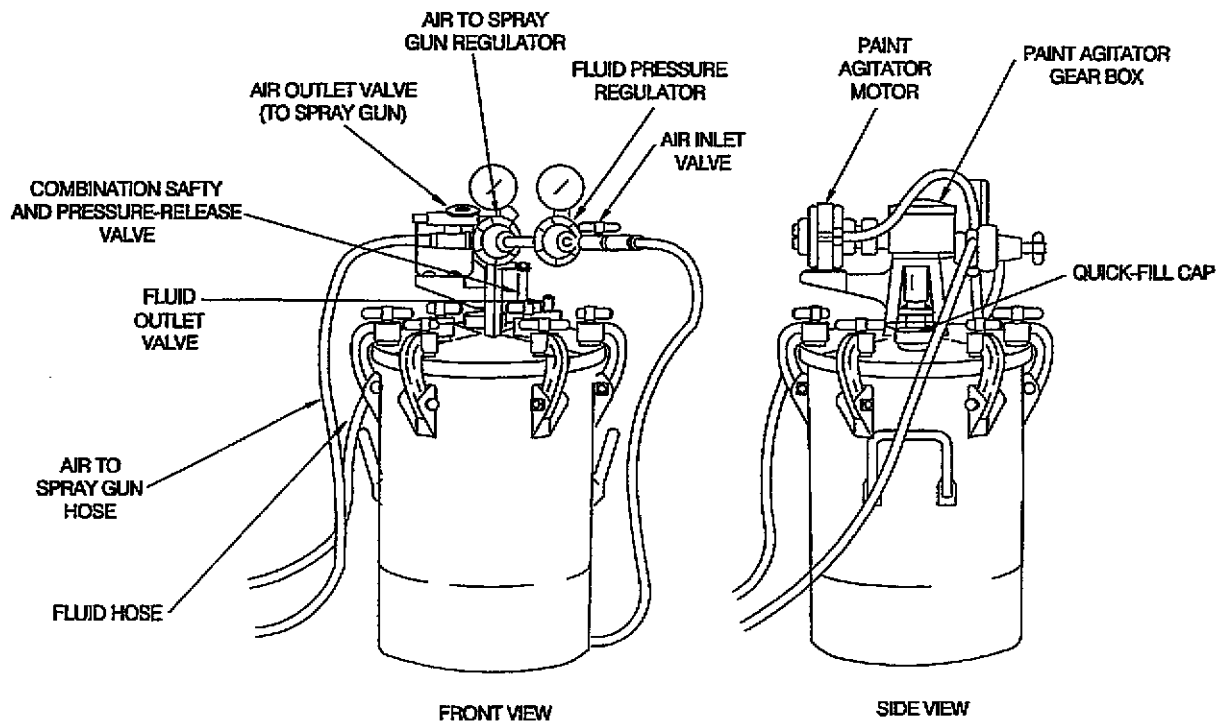


Figure 8-27. Pressure Tank (Typical)

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a. Preparation for Use. To prepare compressed air spray equipment for use, perform the following:

1. Mix paint thoroughly. If using a pressure tank, paint can be mixed directly in the tank using the attached mechanical agitator, if installed, or a hand paddle. If necessary, thin according to manufacturer's instructions. For polyurethane and epoxy two-part systems, temperatures and "sitting in" time are critical

Talk to Navy or paint company experts and review directions before using these expensive, long-lasting but sensitive coating systems. Mix only what will be used in 2 hours
2. Move equipment to space to be painted and locate nearest low pressure air outlet. Install a regulator and an air filter at outlet, if not already installed. Position pressure tank so that all surfaces can be reached without moving the tank
3. If using a suction or pressure feed cup, fill cup and attach to gun. If using a pressure tank, fill and install cover end clamp in place. Be sure all contact surfaces are free of paint before clamping cover in place.
4. Attach hoses between spray gun and pressure tank
5. Connect air supply to air-filter regulator. Connect other end of hose to spray gun or pressure tank
6. Open the low-pressure air outlet valve. Open the inlet valve on tank
7. Set the atomization air pressure regulator (either at the pressure tank or at the low pressure air outlet) at 50 psi. Set the fluid pressure regulator (at pressure tank) at about 25 psi
8. Turn the fluid control on the spray gun counterclockwise to the full open position
9. Test the spray pattern. If it is too coarse, increase the atomization air pressure
10. Adjust the spray to obtain the desired pattern using the pattern control knob. To make the pattern round in shape, turn the knob counterclockwise. To make it fan shaped, turn the knob counterclockwise. Variations in spray patterns that can be obtained are shown in Figure 8-28.
11. Adjust the orientation of the spray pattern axis by turning the horns on the air nozzle. When the horns are vertical, the long axis will be horizontal. When the horns are horizontal, the long axis will be vertical
12. If the spray pattern is too thin (not covering the surface), increase the fluid pressure setting to obtain a greater quantity of paint



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Figure 8-28. Spray Pattern Variations

13. Continue adjustments until the desired spray pattern and finish are achieved. To reduce over-spray and obtain maximum efficiency, use the lowest possible atomization air pressure and the lowest possible fluid pressure that will produce the desired results
 14. See Table 8-3 for the causes of and corrections for typical faulty spray patterns.
 1. Keep the fluid nozzle orifice clean, as buildup of fluid in the fluid nozzle may cause the spray gun to deposit a heavy "blob" of paint on the work
 2. Reduce paint loss
 3. Prevent heavy buildup of paint on the corners and edges of the work
 4. Prevent runs and sags at the beginning and end of the stroke.
- b. Triggering. Triggering is a fundamental technique used with the compressed air spray gun. Triggering is needed to:

Table 8-3. Typical Faulty Air Nozzle Spray Patterns

PATTERN	CAUSE	CORRECTION
	1. DRIED PAINT IN ONE OF THE SIDE PORT HOLES OF AIR NOZZLE	1. DISSOLVE PAINT IN SIDE PORT HOLE WITH THINNER; DO NOT PROBE IN ANY OF THE HOLES WITH A TOOL HARDER THAN BRASS.
	1. FLUID BUILD UP ON SIDE OF NOZZLE 2. DAMAGED FLUID NOZZLE BECAUSE SPRAY GUN WAS DROPPED.	1. REMOVE AIR NOZZLE AND WIPE OFF FLUID NOZZLE 2. REPLACE DAMAGED FLUID NOZZLE.
	1. AIR PRESSURE TOO HIGH 2. SPRAY PATTERN TOO WIDE 3. FLUID PRESSURE TOO LOW	1. REDUCE AIR PRESSURE 2. REDUCE FAN WIDTH 3. INCREASE FLUID SUPPLY
	1. AIR PRESSURE TOO HIGH 2. EXCESSIVE FLUID VELOCITY OR TOO MUCH FLUID.	1. REDUCE AIR PRESSURE 2. USE SMALLER FLUID NOZZLE ORIFICE. LOWER FLUID PRESSURE.
	1. AIR ENTERING THE FLUID SUPPLY COULD BE CAUSED BY: A. LOOSE FLUID NOZZLE, OR NOT SEATING PROPERLY DUE TO DIRT B. LOOSE OR MISSING PACKING NUT OR DRIED FLUID PACKING. C. FLUID CONNECTION LOOSE.	A. TIGHTEN FLUID NOZZLE, OR CLEAN FLUID NOZZLE SEAT AREA. B. TIGHTEN PACKING NUT, OR REPLACE MISSING OR DRIED FLUID PACKING. C. TIGHTEN ALL FLUID SUPPLY CONNECTION LEADING TO SPRAY GUN.

c. The procedure for triggering is as follows:

1. Start each stroke off the work. Pull the trigger when the gun is opposite the edge of the work
2. Release the trigger when the outer edge of the work is reached, but continue the stroke for a few inches before reversing for the next stroke.

d. General Guidelines.

1. Always have the spray gun in motion before triggering
2. Keep the spray gun at the same distance from the work (Figure 8-29)

3. Move the spray gun across the work at a constant speed
4. Always trigger the spray gun at the beginning and end of each stroke
5. Start the first stroke at the same point of each similar object
6. Put on a full wet coat whenever possible
7. Always overlap the previous stroke by the same amount
8. On similar pieces of work, always use the same number of strokes or passes.

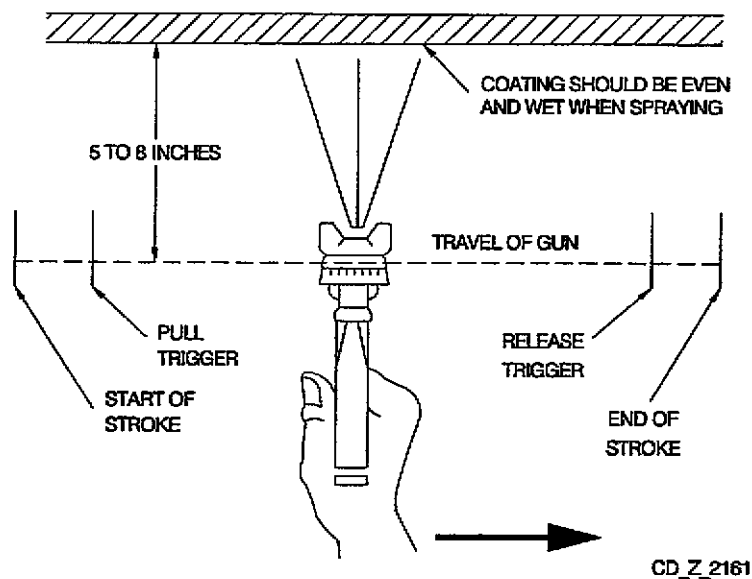


Figure 8-29. Correct Triggering

e. Spray Gun Distance (Figure 8-30).

1. Hold spray gun approximately 6 to 8 inches from work
2. Move gun closer for a wet, dark, heavy film build
3. Move away from the work for a dry, light film build or for a mist or dust coat.

4. Cross-hatch overlap for a uniform coat when required. Use vertical strokes first, then horizontal strokes over the same area
5. Slow gun travel gives a heavy, wet film
6. Fast gun travel gives a dry, light film
7. Overlap a portion of the previous stroke approximately 50 percent (Figure 8-33).

f. Stroking.

1. Move the spray gun parallel to the work (Figure 8-31)
2. Keep the spray gun at a right angle to the work surface
3. Avoid arcing the spray gun (Figure 8-33). Move your arm so that the gun stays perpendicular to the work surface

g. Techniques for Covering Typical Surfaces.

1. Banding. The edges of the area to be painted should be "banded" first (include corners and pronounced contours). On flat panels, spray bands at the edges, then finish the panels with horizontal strokes (Figure 8-34)

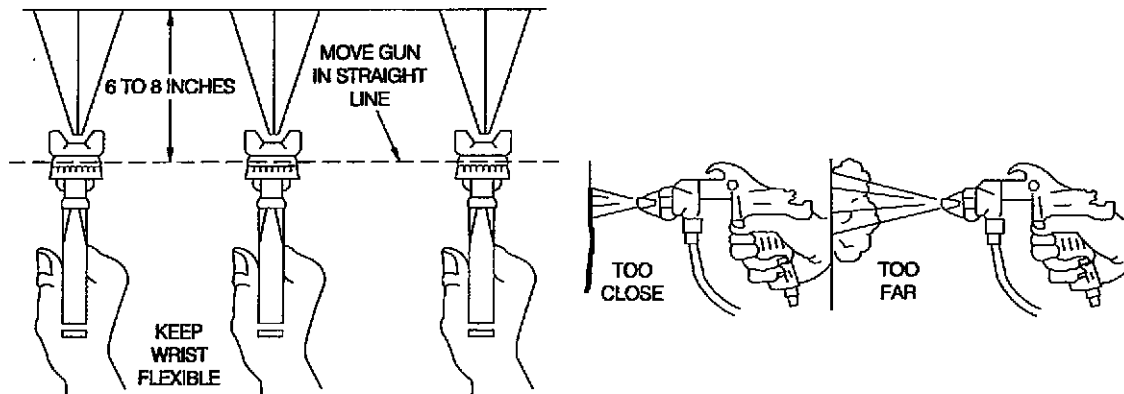
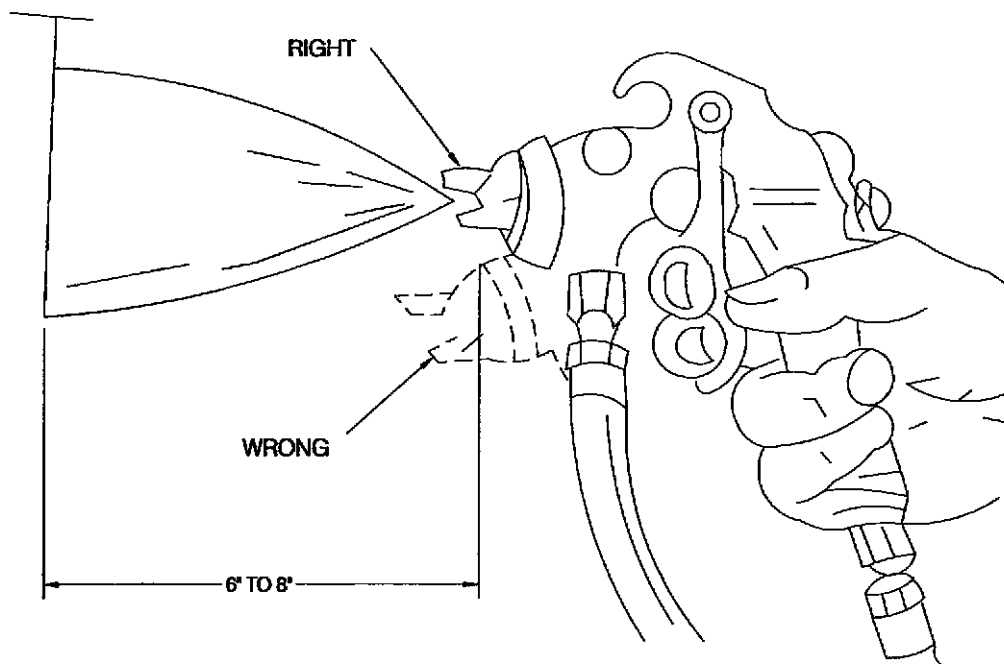


Figure 8-30. Correct Spray Gun Movement



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Figure 8-31. Holding Gun Perpendicular to Surface

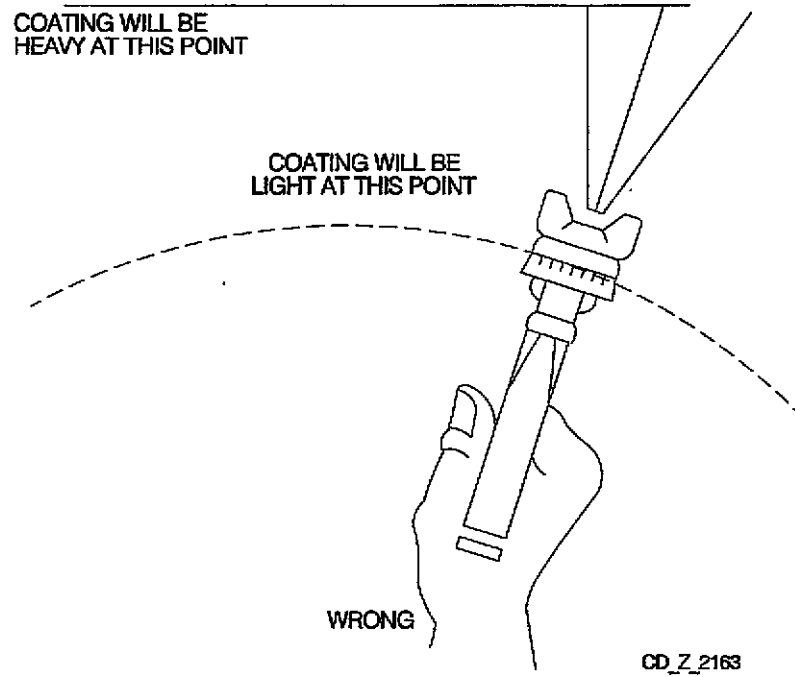


Figure 8-32. Arcing the Spray Gun

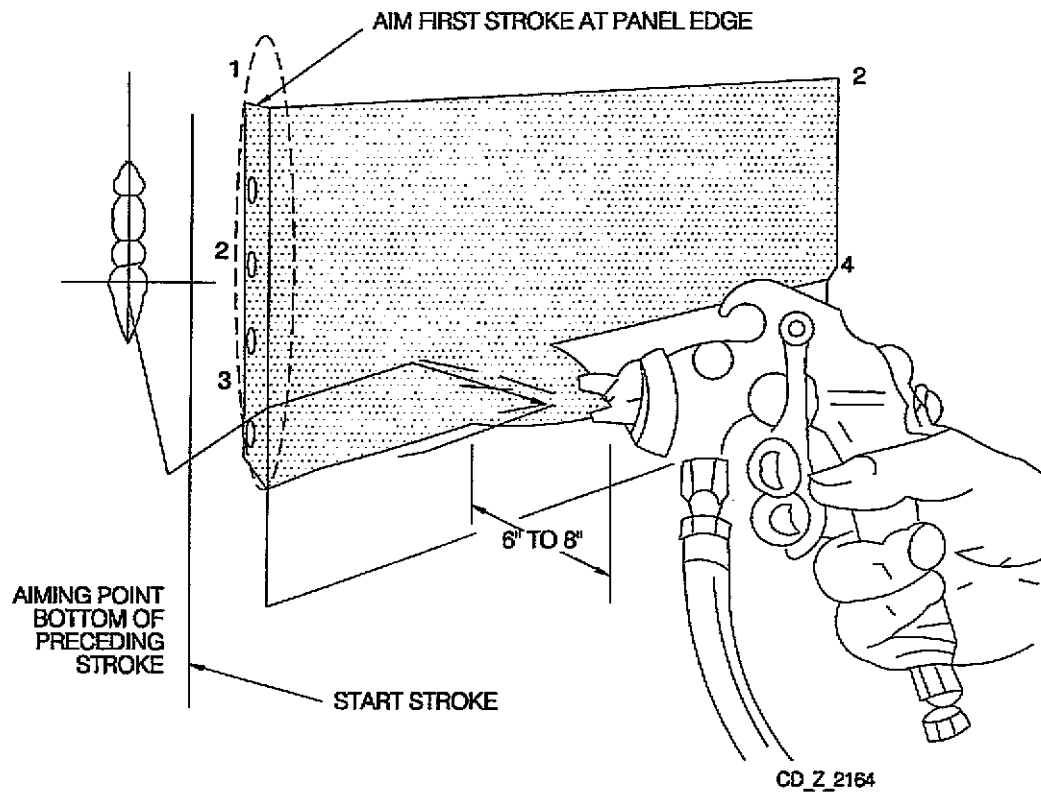


Figure 8-33. Overlapping Strokes

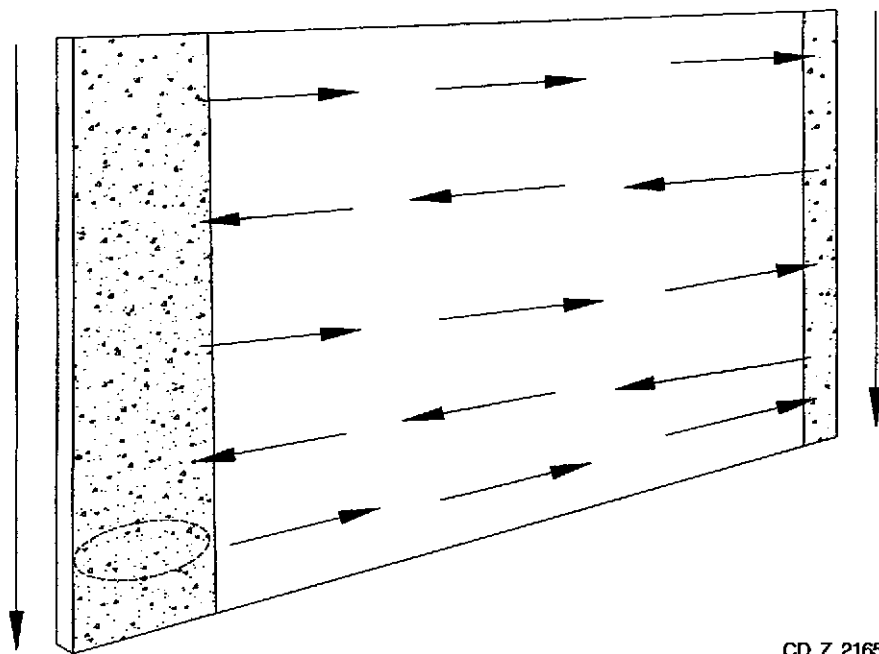


Figure 8-34. Banding

2. Exterior corners should be banded first as shown in Figure 8-35. To band at the edges, as shown in Figure 8-36, work out of, not into, corners and do not spray directly into the corner
3. Long Work. On long horizontal surfaces (Figure 8-37) break the distance down into 18- to 36-inch strokes. Remember to trigger the spray gun at the end of each stroke and to overlap the edge of the pattern
4. Air Movement. Air movement over the area and carryover of the over-spray and rebound should be toward the unpainted surface as shown in Figure 8-38
5. Open Work and Stanchions. Not all shapes can be coated the same way. Each object must be analyzed and the simplest, most direct method should be used. Two typical problem shapes - open work and stanchions - and the way they should be handled are shown in Figures 8-39 and 8-40.

8-3.2.1.3 Safety Precautions. The application of paints, varnishes, lacquers, enamels and other flammable liquids by the spray process is more hazardous than brush or roller applications because of the high volume and concentration of the paint mixed with air. Health hazards due to the toxicity of paints and thinners are also present in paint spraying operations. Spraying polyurethane paints is not allowed by ship's force (except aircraft touch-up) because of the unique health hazards associated with the isocyanates. In addition to the normal precautions for paint mixing and brushing, the following safety precautions are applicable when spray painting:

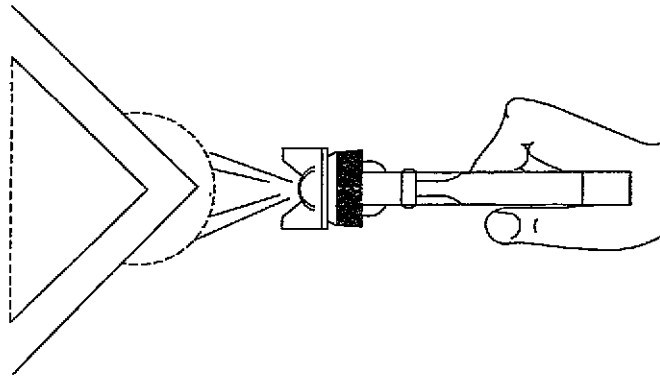
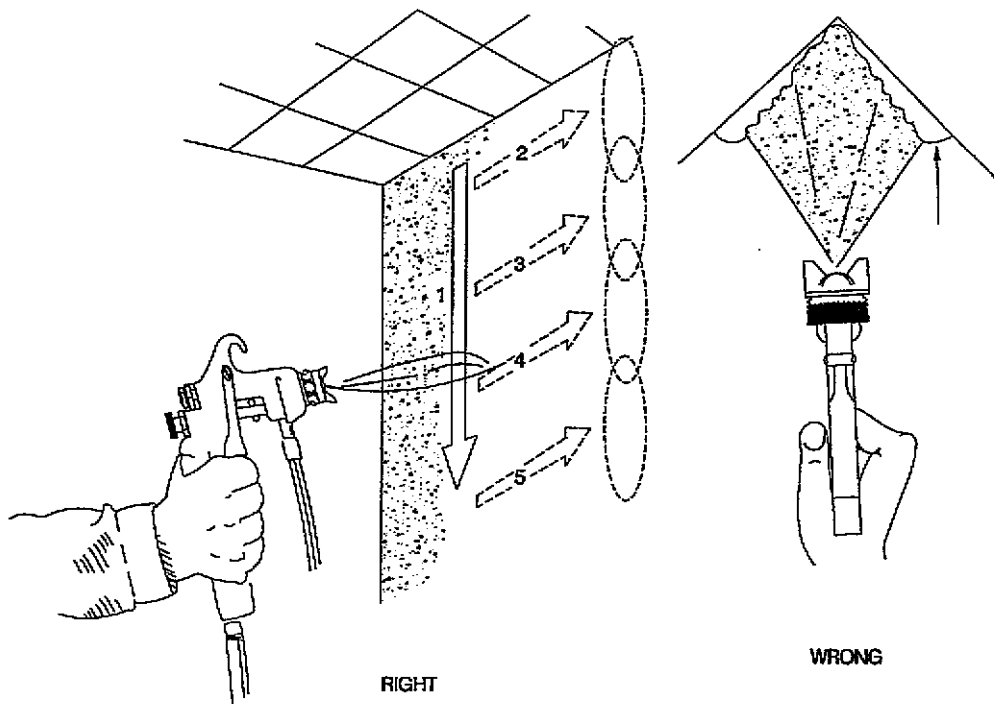


Figure 8-35. Exterior Corners



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Figure 8-36. Interior Corners

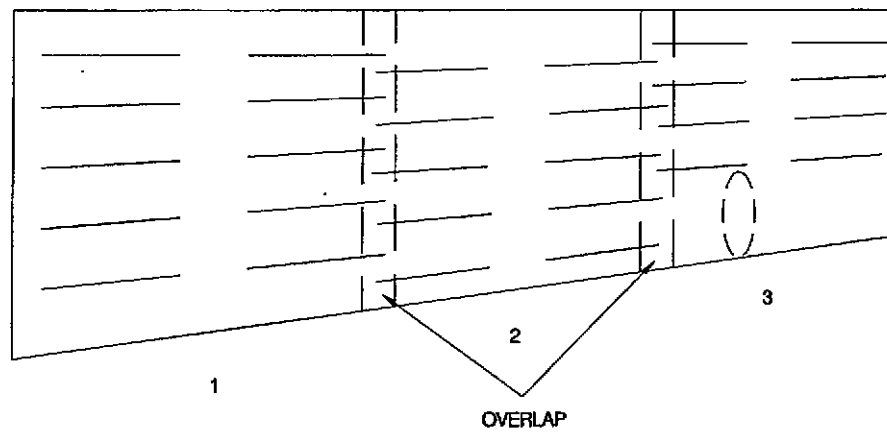
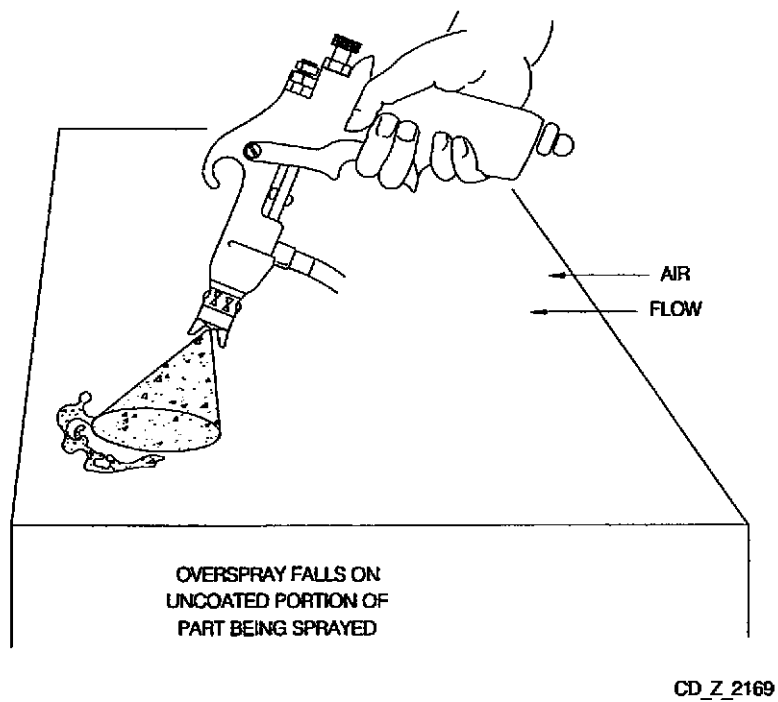


Figure 8-37. Method of Spraying Long Work



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Figure 8-38. Overspray of Horizontal Surface

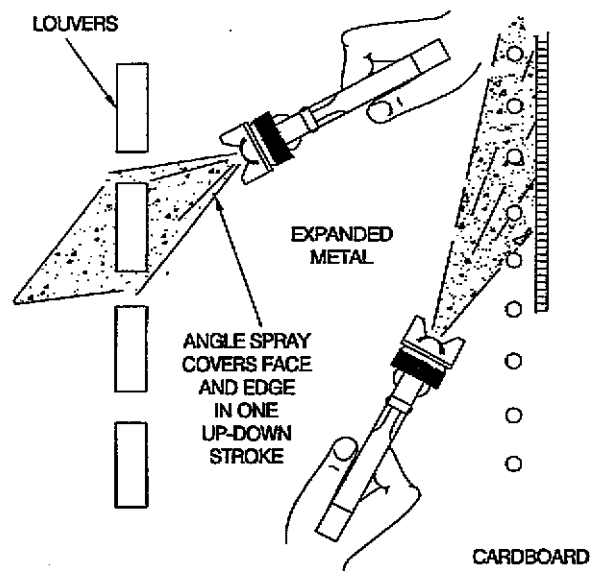
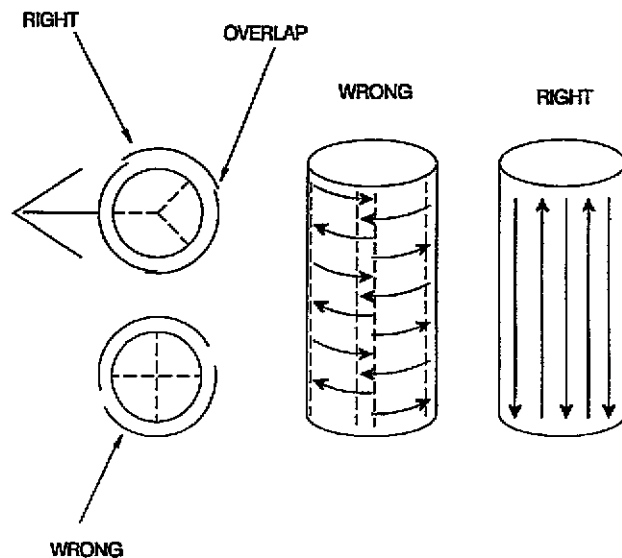


Figure 8-39. Open Work



SMALL STANCHION NEEDS AT
LEAST THREE STROKES TO COVER

CD_Z_2171

Figure 8-40. Stanchions

a. Wear protective garments that fit snugly at the ankles, neck and wrists. Cover the head and apply protective cream to exposed skin

b. Wear goggles and proper type respirator (an air line respirator is required for epoxy and vinyl paints; a cartridge respirator is required for all other paints)

c. Never inhale the mist from the spray gun. Do not smoke during paint spraying operations.

8-3.2.1.4 Cleaning Equipment and Procedures. Compressed-air spray equipment must be thoroughly cleaned and lubricated after each use. If the small apertures and hoses are not cleaned immediately and completely, they will become obstructed with hardened paint.

a. Obtain the following tools materials:

1. Appropriate thinner/solvent for type of paint used
2. Two empty clean, 5-gallon containers
3. Small, clean paint brush
4. Clean rags
5. Light machine oil
6. Petrolatum
7. Hose cleaner
8. Rubber gloves.

b. Observe the following safety precautions:

1. Do not use paint thinner to remove paint from hair or skin
2. Ensure area is well ventilated
3. Do not smoke
4. Wear rubber gloves when washing parts with thinner.

c. To clean a spray gun that has been connected to a pressure tank:

1. Bleed air pressure from air supply line and disconnect the lineman
2. Release pressure from the pressure tank by means of the relief valve
3. Back up the fluid needle adjusting screw on the gun and loosen the air nozzle. Place a folded rag over the air nozzle and pull the trigger - the air will backup through the fluid nozzle and force most of the paint in the hose back into the pressure tank
4. Remove the cover from the tank and pour any remaining paint into a paint container
5. Pour 1 to 2 inches of paint thinner into the pressure tank, and wipe out the tank with a rag
6. Pour the used thinner into a container
7. Pour 1 to 2 inches of clean paint thinner into the pressure tank and replace the tank top
8. Reconnect the air supply hose and open the air supply and air inlet valves
9. Spray the paint thinner into the container of used paint thinner
10. When all of the thinner has been sprayed, shut the supply and inlet valves, bleed pressure from the air supply line and disconnect it from the air supply
11. Remove the cover from the tank and wipe the cover and the tank dry
12. Remove the hoses from the gun

13. Disassemble the spray gun, and remove the spray head by holding and loosening the locking bolt as shown in Figure 8-41
14. Push the trigger forward and remove spray head
15. Remove the air nozzle from the spray head
16. Wash the fluid tip air nozzle and spray head in clean thinner (Use a stiff bristle brush to scrub paint off parts)

CAUTION

Do not attempt to clean spray gun by soaking assembled gun in thinner. Thinner will dissolve the oils in the leather packings and other lubrication points.

17. Inspect the holes to be sure they are clean - if the air holes are clogged, use a match stick, toothpick or broom straw to clean them
 18. Reassemble the gun.
- d. If the pressure-feed or suction-feed cup was used with the spray gun, follow the basic cleaning procedures outlined for the pressure tank above with the following modifications:
1. After disconnecting the air supply, remove and clean the cup
 2. Partially fill the cup with clean thinner

3. Reinstall the cup on the gun, connect the air supply, and spray thinner through the gun (Figure 8-42)
 4. After all thinner has been sprayed through the gun, disconnect the air supply and remove spray head from the gun
 5. Disassemble spray head and clean it as previously described.
- e. The spray gun should be lubricated (after cleaning) at least once a week. Oil the following parts (Figure 8-43) with light machine oil:

1. Fluid needle packing
 2. Air valve packing
 3. Pattern (side port) control packing
 4. Trigger pivot points
 5. Coat the fluid needle spring with petroleum.
- f. After cleaning the spray gun:
1. Coil air and paint hoses neatly, hang them up, or stow them flat in a bin or on a shelf
 2. Wrap spray gun in clean rags and stow it in a locker or drawer
 3. Stow pressure tank, pressure cup or suction cut in their designated locations.

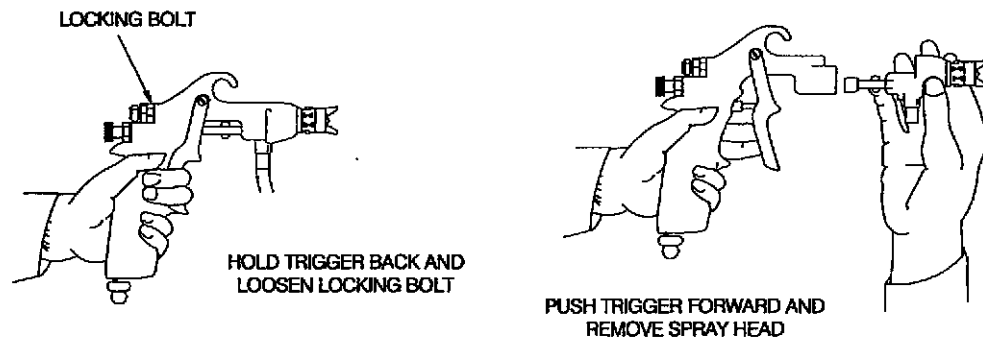
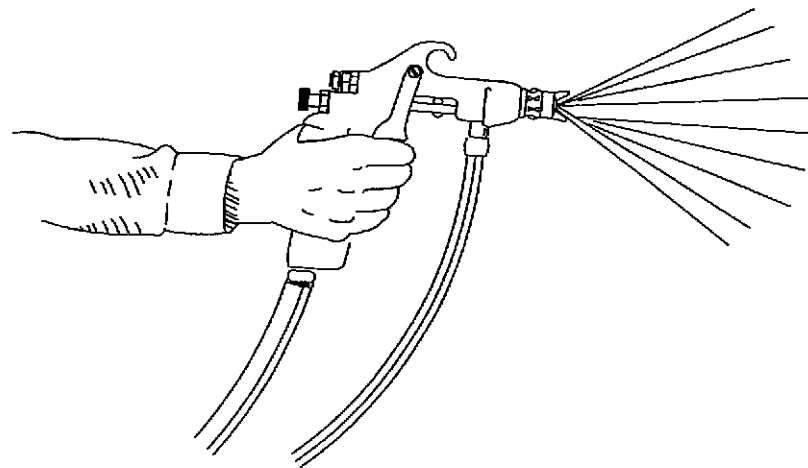


Figure 8-41. Removing Spray Head



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Figure 8-42. Cleaning Spray Gun with Pressure or Suction Feed Cup

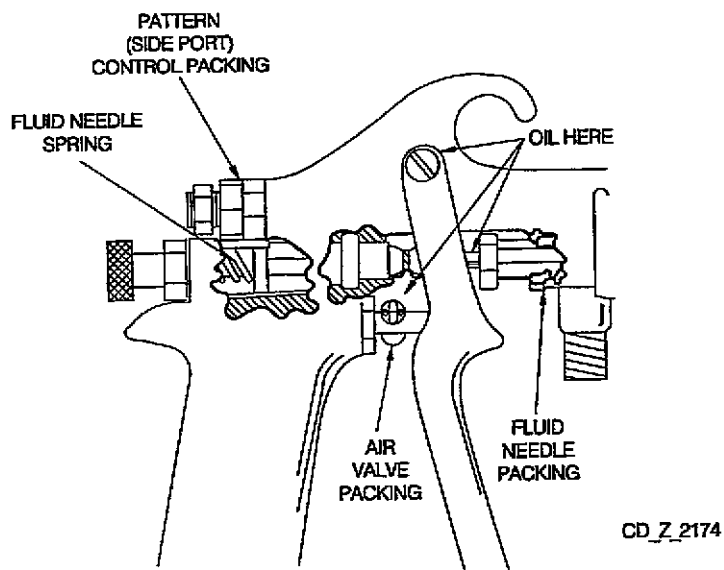


Figure 8-43. Lubrication Points of a Spray Gun

8-3.2.2 Airless Cup Spray Gun.

NOTE

Information in this section is applicable to the "Spray Tech" model ST350 airless cup spray gun. However, the general operation and techniques apply to any similar type of airless spray equipment.

8-3.2.2.1 Description and Technical Data. The airless cup spray gun, Figures 8-44 and 8-45, is a hand-held, electrically-powered, spray painter. An electromagnetic motor driving a high-speed piston pump atomizes paint by forcing it through a nozzle at high pressure.

- a. Cup (container) capacity: 1.58 qt. (1500 ccm)
- b. Weight: 3.75 pounds (1.75 kg)
- c. Power: 115 Vac 60 Hz, 2.2A, 85W.

d. Spray rate: Approximately 10-3/4 oz/min (330 cc/min)

e. Accessories: (Figure 8-46).

1. 5-foot suction tube
2. Flexible extension nozzle
3. 0.7 mm spray nozzle (general purpose)
4. 0.6 spray nozzle (oils and lacquers).

8-3.2.2.2 Uses. The airless cup spray gun (Figure 8-44) will spray latex or oil-based paints, solvents, lacquers, stains and varnishes. It feeds from either the attached 1-1/2 quart cup or from a larger detached container via a 5-foot suction tube. Its coverage rate is higher than a brush or roller but lower than compressed air spray equipment.

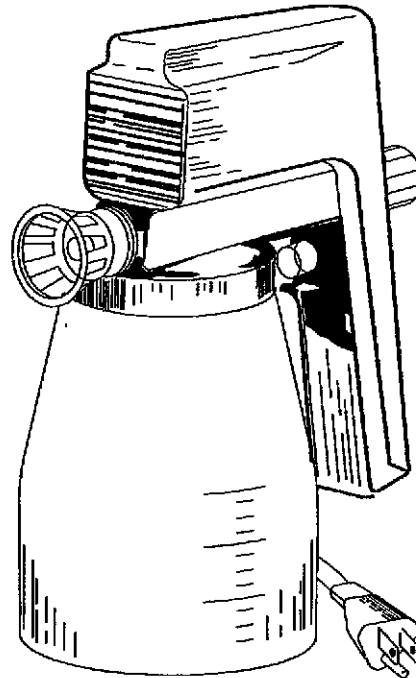
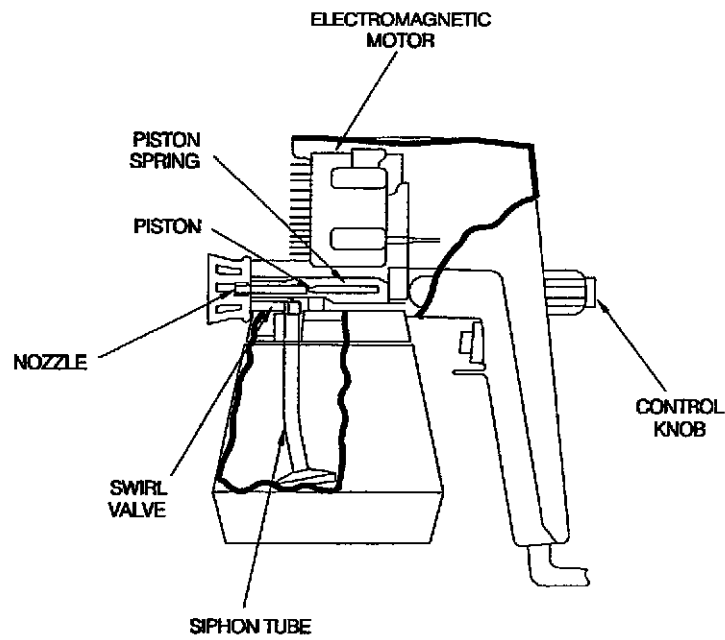
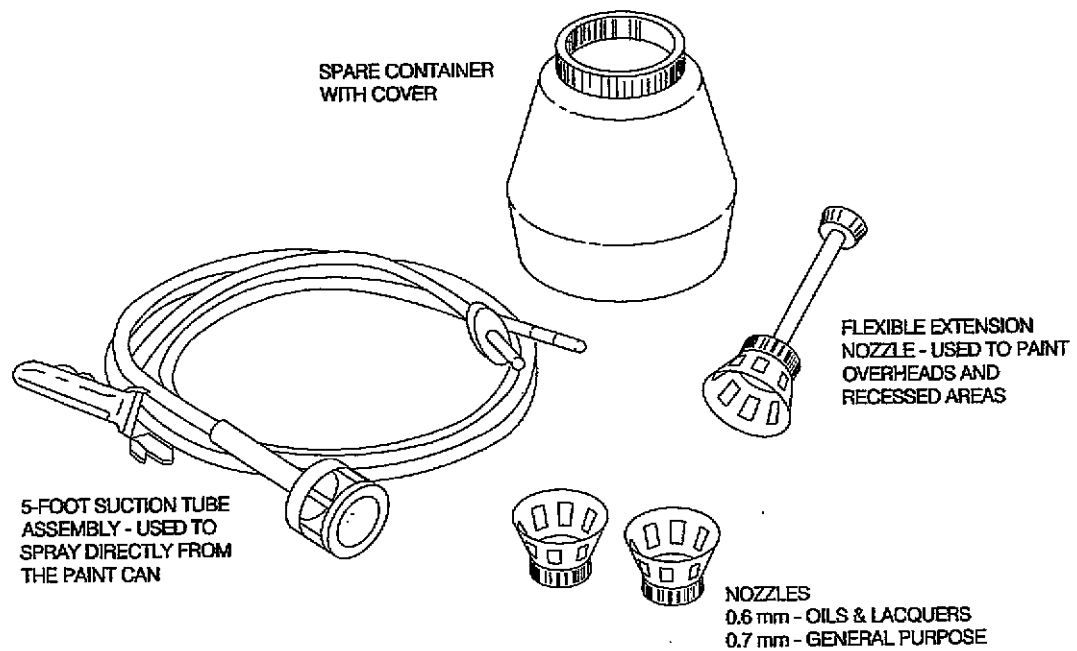


Figure 8-44. Airless Cup Spray Gun



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Figure 8-45. Airless Cup Spray Gun, Cutaway View



CD_Z_2177

Figure 8-46. Airless Cup Spray Gun Accessories

It sprays a more finely focused pattern, resulting in less overspray and requiring less masking than an air spray gun. It is especially useful for spraying compartments and furnishings.

8-3.2.2.3 Safety Precautions. The following safety precautions must be observed whenever operating the airless cut spray gun.

WARNING

Airless spray equipment sprays paint at very high pressure - sufficiently high to force paint through the skin. Never direct the spray at any part of your body or at another person. The safety guard on the nozzle is designed to protect you against paint injection but never put your hand or fingers or any part of your body over the nozzle.

a. Check for presence of a current electrical safety tag and examine condition of electrical cord and plug before using

CAUTION

Never operate the sprayer without paint or fluid in it.

b. Do not operate the sprayer if the pump drive is clogged. (If pump clogs, the sound will change to a low hum and the gun will heat up quickly)

c. Do not spray abrasive materials such as paints containing lime, ground chalk or cement, red lead, glazes, etc. All these increase the wear on pump and nozzle

d. Never leave sprayer uncleaned or allow paint to dry in the pump mechanism

e. Never leave sprayer stored without running oil through the pump. (This prevents rusting of the piston and cylinder)

NOTE

Spraying polyurethane paints is not allowed by ship's force (except aircraft touch-up) because of the unique health hazards associated with the isocyanates.

8-3.2.2.4 Preparation for Use.

a. Thin the paint in accordance with the spray gun and paint manufacturer's instructions

b. Select and install the proper size nozzle for the type of paint being used:

1. 0.7 mm nozzle - general painting
2. 0.6 mm nozzle - thin paints such as lacquers.

c. Fill and screw the cup onto the body of the gun or attach the 5-foot suction tube and place the end of the tube in the paint container.

NOTE

When using the 5-foot suction tube, thin the paint approximately 5 percent more than when spraying from the attached cup.

d. Plug the electric cord into a 115 Vac outlet

e. Test the spray pattern. Adjust as follows (Figure 8-47):

1. Turn the spray adjustment knob clockwise for a narrow spray and low output
2. Turn counterclockwise for a wide spray and high output.

8-3.2.2.5 Spraying Techniques with the Airless Cup Spray Gun.

a. Hold the gun in a vertical position at right angles to the surface and about 6 to 10 inches away for a narrow spray or 10 to 14 inches away for a wide spray

b. Depress the trigger and hold it depressed continuously while painting a single surface. Use a cross-hatch pattern as shown in Figure 8-48

c. Do not move the gun by flexing the wrist. Move the gun with a smooth swing of the whole arm to maintain uniform spacing between gun and surface (Figure 8-49)

d. When painting non-vertical surfaces such as overheads and decks, replace the standard nozzle with the flexible extension nozzle. Bend the nozzle tube to point in the desired direction while still holding the gun vertical (Figure 8-50)

e. If a very large area is to be painted, such as an entire compartment, use the 5-foot suction tube inserted in a large paint container as shown in Figure 8-51

f. To prevent paint runs when spraying a vertical surface, spray first with a thin coat, then apply a second thin coat.

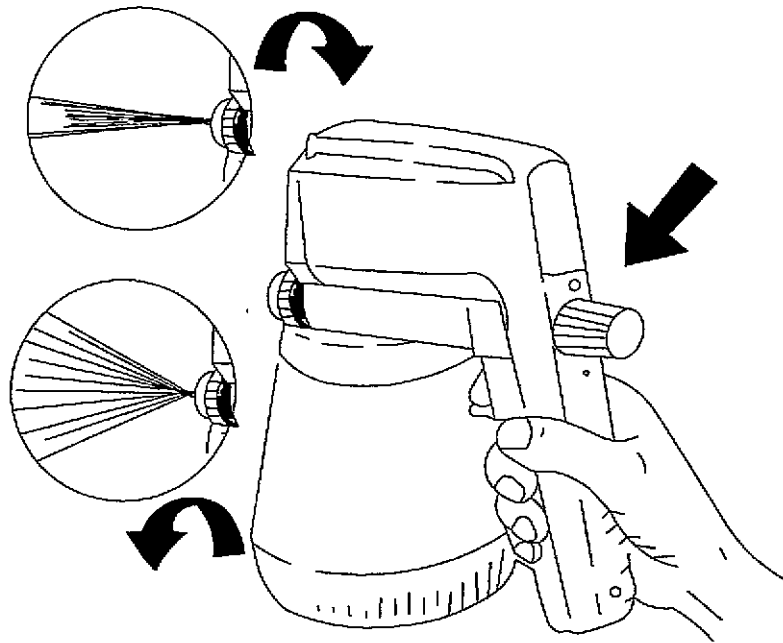
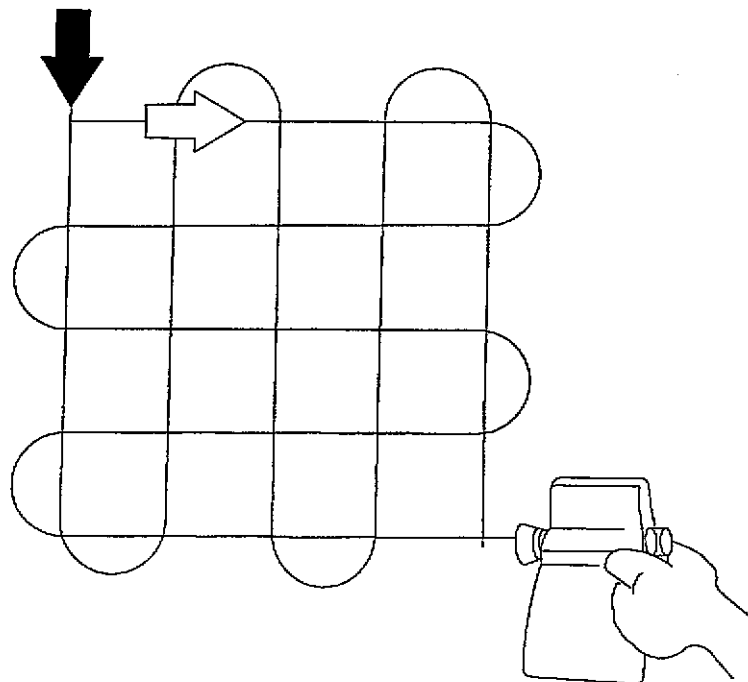


Figure 8-47. Adjusting Spray Pattern



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Figure 8-48. Cross-Hatch Pattern for Airless Sprayer

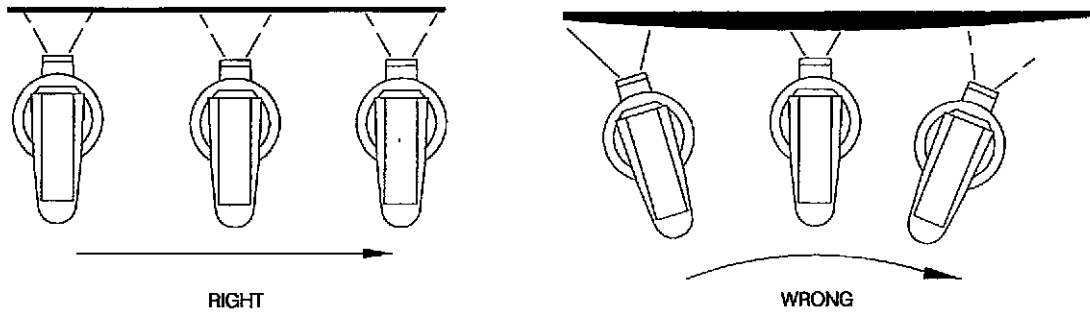
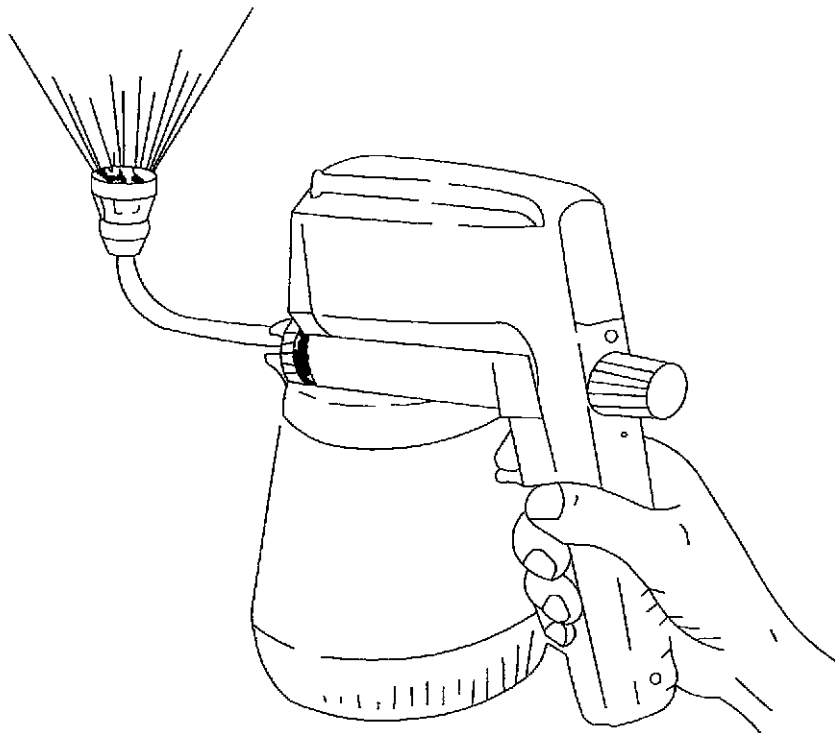
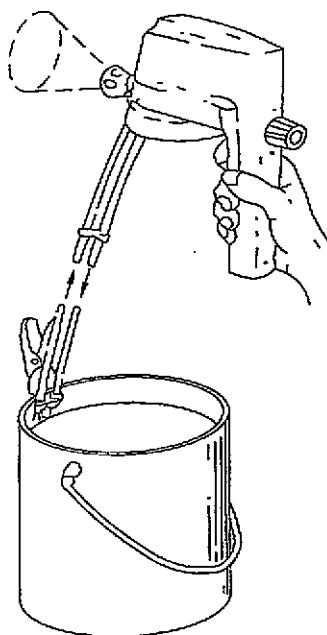


Figure 8-49. Proper Movement of Spray Gun



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Figure 8-50. Using the Flexible Extension Nozzle



CD_Z_2182

Figure 8-51. Using the 5-Foot Suction Tube

8-3.2.2.6 Cleaning.

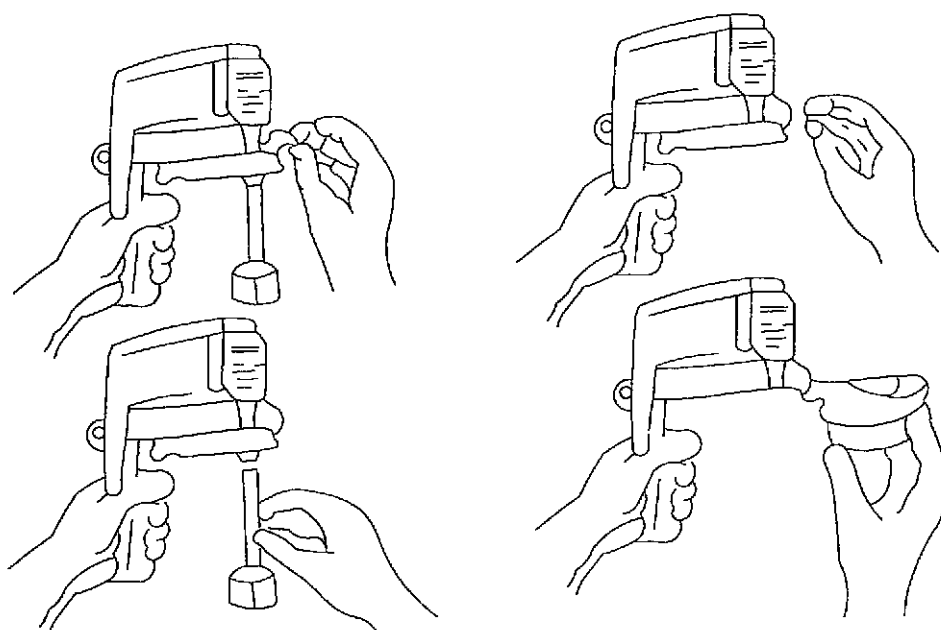
a. Draw the following tools and materials:

1. Correct thinner for the type paint used
2. Two empty containers
3. Clean rags
4. Special spanner wrench supplied with sprayers
5. Small paint brush
6. Light machine oil
7. Rubber gloves.

b. Unplug the electric cord from the outlet

c. Disassemble and clean the pump as follows (Figure 8-52):

1. Remove the paint container and pour the unused paint into one of the containers
2. Unscrew the nozzle guard and silver locking screw with the special spanner wrench
3. Withdraw the pump assembly from the spray gun cover
4. Remove the swirl valve piston spring and piston from the pump housing
5. Put on the rubber gloves and wash all parts removed from the gun with thinner and a paint brush. Rinse in clear thinner
6. Reassemble the parts in the reverse order of disassembly.



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Figure 8-52. Disassembling the Pump

NOTE

When replacing the suction tube in the pump housing, insert the tube into the hose closest to the spray nozzle. The rear hole is for drainage overflow. The tube should fit snugly to prevent air leakage.

d. Turn the gun upside down and plug in the electrical cord

e. Put a small amount of light machine oil in the suction hole and spray it through the gun. (This leaves a film on the piston and cylinder and protects them from rusting.)

8-3.2.2.7 Troubleshooting. Proper maintenance and cleaning are essential for the effective operation of the sprayer. Table 8-4 lists the causes and remedies for common problems.

8-3.2.3 Mechanical Paint Mixers.

The two most commonly used types of mechanical mixers are those that vibrate the full, sealed container, and those that use rotating paddles inserted into the paint. Vibrating shakers are used for full unopened containers up to 5 gallons. Manual mixing is less efficient than mechanical methods and should be used only when mechanical means are not available. Pour half of the paint into a clean, empty container and then stir contents of both containers. Be sure to scrape off and break up any settled matter on the bottom of lower sides of the original container. When both containers are thoroughly mixed, pour the contents of the second container slowly back into the original container. The mixture must be completely blended, with no lumps or evidence of varicolored swirls at the top indicating incomplete mixing of pigment.

8-3.2.3.1 Description and Technical Data. Several types of mechanical paint mixers are available as shown in Figure 8-53.

8-3.2.3.2 Use. Paint mixers are used to prepare paint for use. They mix more completely and in less time than manual mixing.

8-3.2.3.3 Procedures. Mixing procedures vary with different types of paints. (Regardless of the procedure used, take care to avoid the incorporation of excess air through overmixing.)

8-3.2.4 Respirators.

8-3.2.4.1 Description and Technical Data. Cartridge respirators, Figure 8-54, above, used in paint mixing and paint spraying operations consist of a hose, mouth mask and strap fitted with single or double cartridge filters. The replaceable cartridge filters consist of a filter pad and a chemically-treated charcoal cartridge.

Table 8-4. Troubleshooting Chart

Problems	Cause	Remedy
Sprayer spits	- Control knob set too low - Paint too viscous - Loose suction tube draws in air - Worn nozzle - Worn swirl valve - Plugged vent hole	Adjust Use proper thinning Tighten Replace* Replace* Clean hole with toothpick
Machine will not spray	- Control knob set too low or high - Filter not totally immersed in paint - Paint too viscous - Suction tube in drainage hole - Loose or damaged suction tube - Plugged nozzle or swirl valve - Plugged vent hole on pump housing - Scored piston - Frozen piston	Adjust Add paint Use proper thinning Replace to front hole Tighten or replace Clean thoroughly Unplug Replace Disassemble and clean pump

*Some paints are more abrasive than others and will cause quicker wear of parts. Both the nozzle and swirl valve are wear parts. The life of these parts will depend on the abrasiveness of the paint sprayed.

8-3.2.4.2 Requirements for Use. A cartridge respirator with chemical cartridge installed must be worn when spray painting and when mixing paint if ventilation is not adequate. The cartridge type respirator is not approved for mixing or spraying epoxy or vinyl paints. Epoxy or vinyl paint spraying requires the use of air line respirators that are not authorized for use by ship's force. However, the cartridge respirator may be substituted for the air line respirator when spraying vinyl paints in open exterior areas.

Refer to NSTM Chapter 631 for additional guidance.

Thorough mixing of paints is mandatory before adding thinners or other additives, and these must be thoroughly blended into the paint after being added. Manufacturers' directions regarding proper mixing should be followed exactly.

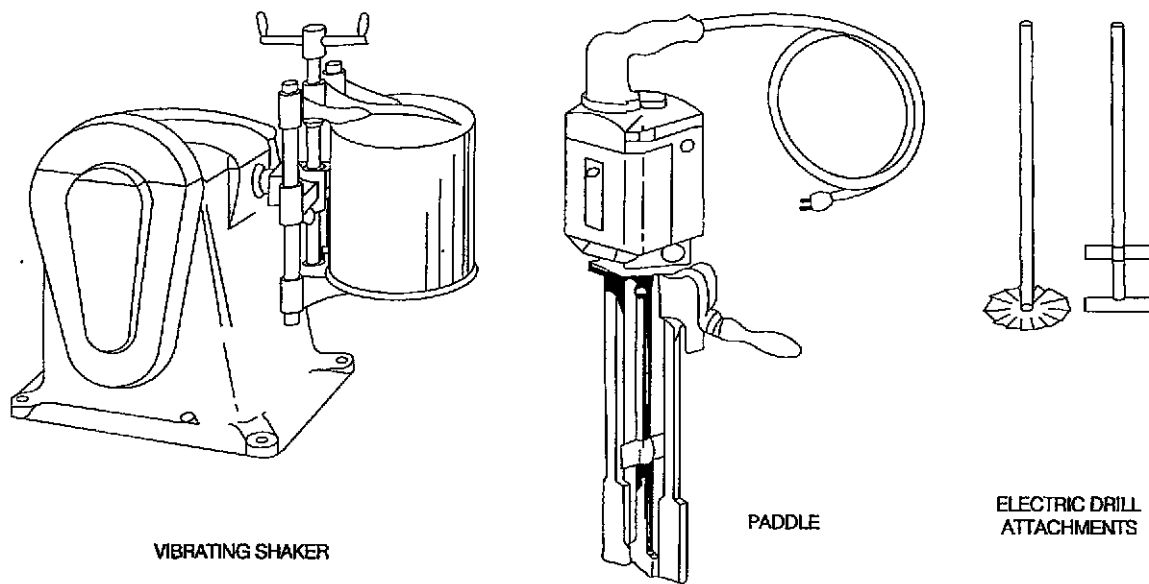
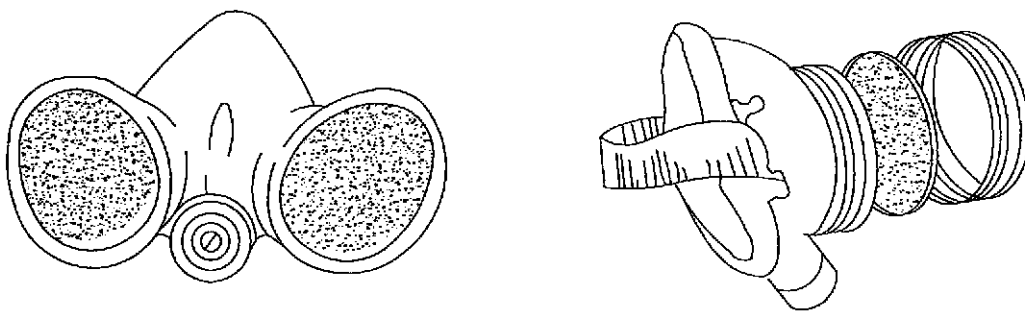


Figure 8-53. Types of Mechanical Paint Mixers



CD_Z_2186

Figure 8-54. Single and Double Cartridge Respirators

8-3.2.4.3 Proper Wearing Procedures.

- a. Make sure the mask fits tightly around the face
- b. Use only breathing-quality air with an air line respirator
- c. Replace the charcoal cartridges after 2 to 4 hours of use in a toxic atmosphere.

8-3.2.4.4 Cleaning and Stowage. Clean and inspect respirators after each use.

- a. Wipe the exterior of the respirator with a rag dampened with paint thinner. Remove all traces of paint
- b. Damp-wipe all interior and exterior surfaces of the respirator with a clean cloth and detergent-sanitizer solution
- c. Dry all metal parts with a clean cloth to prevent rusting
- d. If a cartridge respirator has been used in a heavily sprayed area for more than two hours, or if the wearer notices the smell of paint fumes, replace the cartridge.

8-3.3 PAINTS. This section provides detailed technical data on paints used in topside preservation. It also provides guidance on special topside preservation techniques and on the stowage of paint.

8-3.3.1 Topside Coating Systems. The designated paint systems approved for use on exterior surfaces are given in the Class Paint Schedule. Table 8-5, provides technical data for comparing various paint characteristics and lists topside coatings in descending order of priority based upon durability and appearance. In any case of conflict with this manual, NAVSEA's Shipboard Corrosion Control Advisories (usually by message) and the Naval Ship's Technical Manual Chapter 631 take precedence, respectively, Recoating of topside problem areas will usually be done in accordance with the rule

that exterior fittings are painted to match the structure surrounding their stowed position. Therefore, the recoating information provided in Table 8-5 for vertical and horizontal steel surfaces will cover all but a few exceptional cases.

8-3.3.2 Painting Topside Areas.

8-3.3.2.1 Introduction. The weather is a major factor in planning and carrying out topside painting jobs.

- a. The weather forecast should indicate stable conditions with no rain forecast for at least 12 hours
- b. Never paint if the temperature is at the freezing point or below
- c. The preferable temperature range is 60 to 80 degrees F; however, satisfactory results can be obtained with 45 to 95 degrees F range, if painting cannot wait
- d. The humidity should be below 80 percent
- e. The wind should not be over 12 knots
- f. When spray painting, the wind direction must be considered and preventive measures taken to ensure that spray will not be blown onto surfaces or objects (such as automobiles on the pier, or ventilation openings that should not be painted).

8-3.3.2.2 Procedure. Most topside painting during operating periods consists of spot painting or painting of relatively small areas where corrosion has occurred or paint has failed. Strong, but bleach-free, cleaners should be used first to remove rust stains and surface soils. A correctly cleaned, feathered, primed and topcoated spot will be a permanent repair. As often happens between batches of paint, and after exposure to the sun, the colors change. If a small quantity of haze gray is to be used for spotting, make every attempt, by adding white or black, to match the

new color to the old color. This will make for a much smarter looking ship and avoid a "dip ship" just for the overall appearance. If an entire area is to be painted, follow these general guidelines:

a. Preparation

1. Estimate the area to be painted and determine the required types and quantities of paint
2. Draw the required paint and painting equipment from the Paint Mix and Issue Room and assemble them in the area to be painted.

b. Preliminary Coatings

1. Cover any objects and equipment that are not to be painted, or are of a different color, with a drop cloth, or heavy kraft paper, and masking tape. Include the following:

- (a.) Stainless steel and brightwork items
- (b.) Equipment
- (c.) Resilient elements of isolation mounts
- (d.) Dogs/operating gear, gaskets, and knife edges, doors, hatches, and scuttles
- (e.) Identification and damage control markings
- (f.) Electrical outlets
- (g.) Light fixtures
- (h.) Light switches
- (i.) Valve handwheels and stems
- (j.) Label plates
- (k.) Ventilation openings.

Table 8-5. Coating Systems, Listed in Descending Order of Durability

SYSTEM DESIGNATION	SPECIFICATION	CORROSION PROTECTION PROVIDED	BARE METAL PREPARATION REQUIREMENT	LEVEL OF WORK	EASE OF APPLICATION	DURABILITY OF PRIMARY	SERVICE LIFE OF TOPCOAT	MAINTAINABILITY OF TOPCOAT	TOPCOAT RECOATING SUMMARY
SUBSTRATE/BASE METAL: COPPER-BASE ALLOYS (E.G., BRASS, BRONZE, COPPER)									
C 1 "ALL EPOXY"		EXCELLENT	ABRASIVE BLAST TO REMOVE SURFACE OXIDES AND TO ESTABLISH PROFILE	DEPOT OR ORGANIZATIONAL	MODERATE	2 YEARS IF UNTOPCOATED	SERVICE 2 TO 3 YEARS (EST)	GOOD (CHALKS AND FADES)	CLEAN, ABRASION AND REPAIR, 0 LEVEL
PRIMER: FORMULA 150 GREEN PRIMER	P: MIL-P-24441								
TOPCOAT: FORMULA 151-156 EPOXY POLYAMIDE	T: MIL-P-24441								
C2 "STANDARD SPECIFICATION"		GOOD	ABRASIVE BLAST TO REMOVE SURFACE OXIDES AND TO ESTABLISH PROFILE	DEPOT OR ORGANIZATIONAL	MODERATE	1 YEAR IS UNTOPCOATED	2 YEARS (EST)	EXCELLENT	CLEAN AND REPAIR, 0 LEVEL
PRIMER: FORMULA 117 WASH PRIMER	P: MIL-P-15328								
INTERMEDIATE: FORMULA 84 ZINC CHROMATE TT-P-645	I: DOD-P-17545								
TOPCOAT: COLOR TO MATCH SURROUNDINGS OR AS SPECIFIED	T: TT-E-489								
SUBSTRATE/BASE METAL: STEEL									
S1 STANDARD SPECIFICATION:		EXCELLENT	ABRASIVE BLAST TO NEAR-WHITE METAL MINIMUM	DEPOT OR ORGANIZATIONAL	ONLY PRIMER IS DIFFICULT	5 YEARS IF UNTOPCOATED	2 TO 3 YEARS	EXCELLENT	CLEAN AND REPAIR, 0 LEVEL
PRIMER: INORGANIC ZINC	P: NAVSEA APPROVED								
INTERMEDIATE: VER. FORMULA 151 EPOXY	I: MIL-P-24441								
ABBREVIATIONS: P = PRIMER COAT C = CONVERSION COAT I = INTERMEDIATE OR TIE COAT T = TOPCOAT HOR. = HORIZONTAL SURFACE VER. = VERTICAL SURFACE 0 LEVEL = ORGANIZATIONAL LEVEL									

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Table 8-5. Coating Systems, Listed in Descending Order of Durability - CONT.

SYSTEM DESIGNATION	SPECIFICATION	CORROSION PROTECTION PROVIDED	BARE METAL PREPARATION REQUIREMENT	LEVEL OF WORK	EASE OF APPLICATION	DURABILITY OF PRIMARY	SERVICE LIFE OF TOPCOAT	MAINTAINABILITY OF TOPCOAT	TOPCOAT RECOATING SUMMARY
SUBSTRATE/BASE METAL: STEEL									
HOR. FORMULA 150 EPOXY TOPCOAT: VER. SILICONE ALKYD HOR. DECK ENAMEL FORMULA 20	T: VER. TT-E-490 HOR. DOD-E-699								
S2 "EPOXY POLYAMIDE, HAZE GRAY" PRIMER: FORMULA 150 EPOXY INTERMEDIATE: FORMULA 151 TOPCOAT: VER. SILICONE ALKYD HOR. DECK ENAMEL FORMULA 20	P: MIL-P-24441 I: MIL-P-24441 T: VER. TT-E-490 HOR. DOD-E-699	EXCELLENT	ABRASIVE BLAST TO NEAR-WHITE METAL MINIMUM	DEPOT OR ORGANIZATIONAL	MODERATE	5 YEARS IF UNTOPCOATED	2 TO 3 YEARS	EXCELLENT	CLEAN, AND REPAINT, 0 LEVEL
S3 "EPOXY POLYAMIDE, NON-HAZE GRAY" PRIMER: FORMULA 152-156 (2 COATS) (COLOR TO MATCH SURROUNDINGS OR AS SPECIFIED)	P: MIL-P-24441 I: MIL-P-24441	EXCELLENT	ABRASIVE BLAST TO NEAR-WHITE METAL MINIMUM	DEPOT OR ORGANIZATIONAL	NOT DIFFICULT	2 YEARS IF UNTOPCOATED	2 TO 3 YEARS	GOOD (CHALKS AND FADES)	CLEAN, AND REPAINT, 0 LEVEL
SUBSTRATE/BASE METAL: ALUMINUM									
A1 "CHEMICAL CONVERSION, SILICONE ALKYD" CONVERSION COST: PRIMER: FORMULA 150 INTERMEDIATE: FORMULA 150 INTERMEDIATE: FORMULA 151 EPOXY TOPCOAT: SILICONE ALKYD	C: MIL-C-81706 P: MIL-P-24441 I: MIL-P-24441 T: TT-E-490	EXCELLENT	ABRASIVE BLAST TO REMOVE SURFACE OXIDES AND TO ESTABLISH PROFILE	DEPOT OR ORGANIZATIONAL WITH SUPERVISION	MODERATE	1 YEAR IF UNTOPCOATED	2 TO 3 YEARS	EXCELLENT	CLEAN, AND REPAINT, 0 LEVEL

ABBREVIATIONS:

P = PRIMER COAT
C = CONVERSION COAT

I = INTERMEDIATE OR TIE COAT
T = TOPCOAT

HOR. = HORIZONTAL SURFACE
VER. = VERTICAL SURFACE

0 LEVEL = ORGANIZATIONAL LEVEL

Table 8-5. Coating Systems, Listed in Descending Order of Durability - CONT.

SYSTEM DESIGNATION	SPECIFICATION	CORROSION PROTECTION PROVIDED	BARE METAL PREPARATION REQUIREMENT	LEVEL OF WORK	BASE OF APPLICATION	DURABILITY OF PRIMARY	SERVICE LIFE OF TOPCOAT	MAINTAINABILITY OF TOPCOAT	TOPCOAT RECOATING SUMMARY
SUBSTRATE/BASE METAL: ALUMINUM									
A3 "STANDARD SPECIFICATION" PRIMER: FORMULA 117 WASH PRIMER INTERMEDIATE: ZINC CHROMATE TOPCOAT: SILICONE ALKYD	P: MIL-P-15328 I: FORMULA 84 T: TT-E-490	FAIR	GRIT BLAST TO NEAR-WHITE METAL	DEPOT OR ORGANIZATIONAL	NOT DIFFICULT	1 YEAR IF UNTOPCOATED	2 TO 3 YEARS	EXCELLENT	CLEAN, AND REPAINT, 0 LEVEL
SUBSTRATE/BASE METAL: STEAM PIPING AND VALVES, BARE METAL, OR COATING WITH SYSTEM 1 (MSC)									
SP1 "HEAT RESISTING ALUMINUM PAINT" PRIMER: NONE TOPCOAT: HEAT-RESISTING ALUMINUM PAINT	T: TT-P-2B	FAIR	FOR BARE STEEL, GRIT BLAST TO NEAR-WHITE METAL	DEPOT OR ORGANIZATIONAL	NOT DIFFICULT	N/A	6 TO 12 MONTHS	GOOD	CLEAN AND REPAINT, 0 LEVEL
W1 "EPOXY POLYAMIDE" PRIMER: FORMULA 150 EPOXY INTERMEDIATE: FORMULA 151 EPOXY TOPCOAT: VER. SILICONE ALKYD HOR DECK ENAMEL FORMULA 20	P: MIL-P-24441 I: MIL-P-24441 T: TT-E-490 HOR. DOD-E-699	EXCELLENT	ABRASIVE BLAST TO REMOVE SURFACE OXIDES AND TO ESTABLISH PROFILE	DEPOT OR ORGANIZATIONAL	NOT DIFFICULT	2 YEARS IF UNTOPCOATED	2 TO 3 YEARS	EXCELLENT	CLEAN, AND REPAINT, 0 LEVEL
SUBSTRATE/BASE METAL: STAINLESS STEEL, 300 SERIES AND 400 SERIES									
SS1 PASSIVATION	QQ-P-35A	FAIR	DEGREASE AND SWEEP BLAST TO REMOVE SURFACE OXIDES	DEPOT	NOT DIFFICULT	1 YEAR IF UNTOPCOATED	2 TO 3 YEARS	GOOD	CLEAN AND REPAINT, 0 LEVEL

ABBREVIATIONS:

P = PRIMER COAT
C = CONVERSION COAT

I = INTERMEDIATE OR TIE COAT
T = TOPCOAT

HOR. = HORIZONTAL SURFACE
VER. = VERTICAL SURFACE

0 LEVEL = ORGANIZATIONAL LEVEL

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2. Cover the deck with a drop cloth or heavy kraft paper taped in place. Apply masking tape at the junction of the deck end bulkheads
3. Remove any portable equipment in the overall area to be painted. Stow it securely in a temporary location
4. Rig scaffolding or staging as necessary
5. Pressure wash or hose wash the entire area to be painted

Prior to the commencement of any painting, the supervisor should inspect all surfaces stripped to bare metal to be sure they have been properly prepared and are free of dust, corrosion, grease, oil and moisture.

6. Apply the preliminary coatings with a brush roller or spray to all areas stripped to bare metal as follows: pretreatment coat, primer coat and first finish coat.

c. **Final Finish Coating.** The choice of method to apply the final finish coat depends on the size of the area, its location, the type of surface and the equipment available. Topside overhangs and overheads usually have complex surfaces and are best spray painted if spray equipment is available. Bulkheads may be rolled or sprayed, while rollers are the simplest method of painting the decks. The procedure is as follows:

1. Post "Secured" signs at all approaches to area
2. Post "Flammability Hazard" signs in adjacent compartments, passageways, and topside areas
3. Put on protective clothing. Wear clean clothing, coveralls if

available, free of rips and tears. Apply protective cream to exposed skin. If spray painting, button, tape, or tie garments at wrists, ankles and neck. Cover head with hood or cloth

WARNING

Cartridge respirator must be worn when spray painting.

4. Put on cartridge respirator
5. Do not spray urethane based paints (depot level job)
6. Fill, connect and test spray equipment in accordance with paragraph 8-3.2.1 (compressed air equipment) or paragraph 8-3.2.2 (airless equipment)
7. Spray the finish coat on the overhead with spray gun. If the overhead and bulkheads are of different colors, carry the overhead color down the bulkhead to approximately 6 inches below level of the overhead framing
8. If the overhead and the bulkhead are of the same color, spray the finish coat on the bulkhead with a spray gun after completing the overhea
9. If the overhead and the bulkheads are of different colors, snap a chalk line at the top of the bulkhead at the level of the overhead framing, and cut in borders at the chalk line, deck edge, and around other masked areas. Use a paint brush, and paint a border about 6 inches wide. Paint the bulkhead with a spray gun or roller

10. Clean and stow all painting equipment used up to this step
11. When the paint on the bulkhead is dry (approximately 8 hours), remove the masking from objects on the bulkhead
12. Depending on the size and surface configuration, paint the unmasked objects in the bulkhead area with an airless spray gun, roller or brush. If a spray gun is used, mask the surrounding areas as necessary
13. Remove the masking tape from identification, markings, label plates, door gaskets, light fixtures, etc
14. Repaint the identification and damage control markings as necessary using stencils, stencil brushes, lettering brushes, and stripping paint as appropriate
15. Remove the drop cloth or kraft paper from deck
16. Cut in the borders around the nonskid and the border between the deck and bulkhead with a paint brush and finish coat
17. Apply the finish coat to the remaining deck area with a roller. (Plan application so as to end at an exit point)
18. Clean all paint equipment and return it to proper stowage. Return any unused paint to the Paint Mix and Issue Room
19. When the paint on the deck is dry, return all portable equipment to the original locations

20. Remove the "Secured" and "Flammability Hazard" signs.

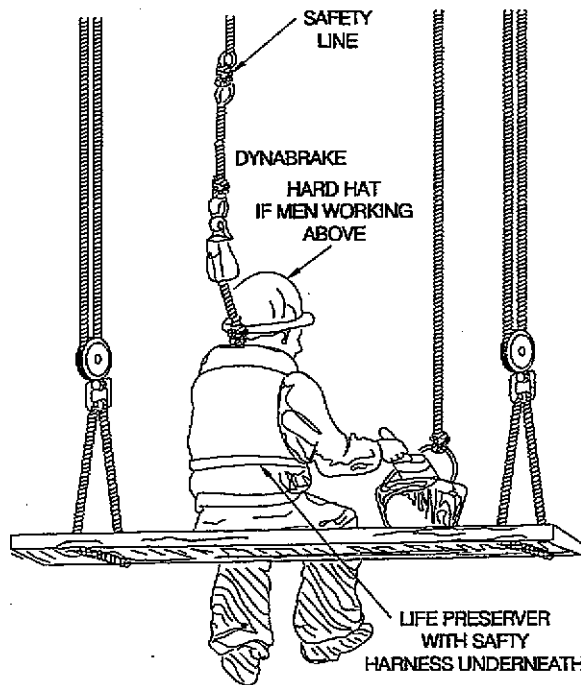
8-3.3.3 Painting Ship's Sides.

8-3.3.3.1 Instructions. Painting the sides of the ship is a major undertaking and requires careful planning and preparation. Normally an entire side is painted at one time to present a uniform appearance. The job can be a waste of time if the sources of running rust are not tackled first. Use Chapter 4 of this manual to make lasting corrections to problems such as scuppers, overboard drains, rigging clips, exhausts, guards, etc. To ensure a uniform appearance, the finish coat should be batched following the procedures listed below:

- a. Estimate total amount of paint needed for the job
- b. Mix the individual cans of paint
- c. When all cans are well mixed, pour all in one large can (a clean trash can may be used). Mix thoroughly with a paddle-type mixer or a large wooden paddle
- d. If batched paint must be stored overnight, pour it back into the cans and seal them until needed
- e. Label any leftover paint and keep it for touchup of the area.

Advanced arrangements must be made to obtain the use of necessary staging, pontoons, punts, and scaffolding. Navy safety precautions for working of the side should be reviewed. The principal precautions are:

- f. The petty officer in charge shall be responsible for the safe and secure rigging of staging, boatswain's chairs, work floats (with or without staging) and the tending of lines for his men (Figure 8-55)



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Figure 8-55. Proper Equipment for Working Over the Side

- g. All men over the side must wear a tested, standard Navy safety harness underneath the life jacket with a safety line attached to the "D" ring and tended by a man on deck
- h. The line tender must be present at all times and is responsible to the petty officer in charge for the proper execution of his assigned task
- i. If work is going on simultaneously on the deck above, the men working over the side shall wear hard hats.
- j. Permission must be obtained from the Officer of the Deck (OOD) before proceeding over the side
- k. All OODs in a nest must be notified before men may work over the side. The OOD of the outboard ship is responsible for clearing the sides of all ships in the nest

before allowing another vessel to come alongside

- l. Men shall not work over the side in a nest of ships without a camel between ships. (Usually consists of one or more logs)
- m. The supervisor should ensure that the Engineering Department is informed by the OOD to secure overboard discharges in the vicinity of painting operations.

8-3.3.3.2 Preliminary Preparations, Priming and Application of the First Final Coat.

- a. Rig staging, boatswain's chairs, work floats or punts are necessary
- b. Put on protective clothing. Wear clean clothing; coveralls if available, free of rips and tears. Apply protective cream to skin

c. Inspect, prime and apply the first finish coat to all the areas stripped to bare metal following the same procedures as set forth for topsides in paragraph 8-3.3.2

d. Paint the ships name and number with black and white paints and 4-inch flat brushes.

8-3.3.3.3 Preparations for Application of Final Finish Coat.

a. Estimate the quantity of paint required.

b. Batch the paint as described in paragraph 8-3.3.3.1

c. When preliminary coatings are dry, pressure-wash or hose-wash the sides

d. Post "Flammability Hazard" signs in the vicinity of painting on topside decks and on the pier

e. Put on protective clothing and cream

f. Cut in around the ship's name and number. Cut in top of boot top. Use 3-inch flat brushes

g. Paint the side using rollers. Use extension handles to extend reach. Work from the deck edge down and from forward to aft. Where staging are used, have no more paint on the stage than that which is necessary to cover the area during one movement of the stage from the deck edge to the boot topping

h. When the paint is dry, remove "Flammability Hazard" signs

i. Clean all paint equipment and return it with any unused painting to the paint Mix and Issue Room. Clean and stow all other gear.

8-3.3.4 Care and Stowage of Paint.

8-3.3.4.1 Stowage Locations. Paints and solvents needed to meet daily issue requirements are kept in the paint Mixing and Issue Room. All other paint and solvents must be stowed in the Flammable Liquids Storeroom.

8-3.3.4.2 Procedure

a. Stow pain containers with labels visible, largest containers on the bottom shelves, and oldest paint in front

b. Always use the oldest paint first. Paint tends to deteriorate with age

c. At least once every 3 months, upend paint containers to prevent the pigment from hardening at the bottom of the container.

d. Cover opened containers tightly to prevent the formation of a surface scum

e. Do not mix thinned paint with unthinned paint. If a significant amount of thinned paint is left over, label the container with the mixture percentage and save it for future use

f. Do not go to sea without tightly securing lids and emptying brush containers (Figure 8-23).

CHAPTER 9

REFERENCES

Atkinson, J. T. N. and Van Droffelaar, H., Corrosion and Its Control, National Association of Corrosion Engineers, Houston, 1982.

Corrosion - Source Book, ed. Seymour K. Coburn, American Society for Metals, Metals Park, Ohio, 1984.

Corrosion Control Manual, CG 47 Class, NAVSEA S6360-AC-MMO-010.

Corrosion in Marine Environment, ed. Derek H. Deere, Hemisphere Publishing, Washington, D.C., 1977.

DDG 52 Corrosion Control Drawing - NAVSEA Drawing Number 630-6597083.

DDG 51 Corrosion Control Design Manual, Bath Iron Works, 1985.

DDG 52 Paint Schedule - NAVSEA Drawing Number 631-6596633.

DOD-STD-2138(SH) - Military Standard - Metal Sprayed Coating Systems For Corrosion Protection Aboard Naval Ships.

Guide for Cruiser/Destroyer Corrosion Control Naval Ship Systems Command, March 1973.

Guide to U. S. Government Paint Specifications, National Paint and Coatings Association, Washington, D.C. February 1980.

Ingham, H. S. and Shepard, A. P., Flame Spray Handbook, METCO INC., Westbury, New York, 1964.

Laque, Francis L., Marine Corrosion Causes and Prevention, John Wiley and Sons, New York, 1975.

MIL-C-81751 B - Military Specification - Coating, Metallic-Ceramic.

MIL-S-8802E - Military Specification - Sealing Compound, Temperature - Resistant, Integral Fuel Tanks and Fuel Cell Cavities, High-Adhesion.

Metals Handbook - Desk Edition, ed by Boyer, Howard E. & Gall, Timothy L., American Society for Metals, Metals Park, Ohio.

Metric Fastener Standards, Industrial Fasteners Institute, Cleveland, Ohio, 1976.

Military Standardization Handbook, MIL-HDBK-721 (MR), Corrosion and Corrosion Protection of Metals, November 1965.

NSTM, Chapter 075 - Threaded Fasteners, S9086-CJ-STM-000.

NSTM, Chapter 631 - Preservation of Ships in Service (Surface Preparation and Painting), S9086-VD-STM-000

Naval Air Engineering Center, Lakehurst, New Jersey, Final Report, Control of Corrosion in Ground Support Equipment, March 1978.

Naval Ships' Technical Manual, NAVSEA 0901-LP-190-0007, Chapter 9190, Preservation of Ships in Service (Paints and Cathodic Protection), Change 5, October 1978.

Paint and Surface Preparation, Training Program for Shipyard Personnel, National Shipbuilding Research Program, U.S. Department of Commerce, Maritime Administration, 1979.

Shreir, L. P., Corrosion Volume 1 Metal/Environment Reactions, Newnes-Buttersworth, London, Boston, 1976.

Shreir, L. P., Corrosion Volume 2 Corrosion Control, Newnes-Butterworth, London, Boston, 1976.

Technical Manual, NAVAIR 01-1A-509, Aircraft Weapons systems Cleaning and Corrosion Control, Change 3, March 1978.

Technical Manual, NAVAIR 51-5-32, NAVSEA 0919-LP-008-8010, Corrosion Control for Shipboard Launch and Recovery Systems, April 1976.

Technical Manual, NAVAIR 16-1-540, Avionic Cleaning and Corrosion Prevention/Control, Organizational and Intermediate, February 1978.

Technical Manual, NAVDOCKS MO-306, Corrosion Prevention and Control June 1964.

Technical Manual, NAVSEA S6435-AE-MMA-010/N Sprayed OTT, External Preservation of Steam Valves Using Wire Sprayed Aluminum Coatings, January 1979.

Technical Manual, T.O., 1-1-684, Prevention and Control of Corrosion and Fungus in Communication, Electronic, and Meteorological Equipment, August 1969.

Wilson, C. L. and Oates, J. A., Corrosion and the Maintenance Engineer, Hart Publishing Company Inc., New York, 1968.

GLOSSARY

ABRASIVE - The material used for wearing away corrosion products and old coating systems in preparation for application of a new preservation system. May be used in abrasive blasting (such as sand, grit, steel shot), abrasive disks, or sandpaper.

ACTIVE METAL - A metal in a condition in which it tends to corrode. The less noble of two dissimilar metals in contact (see Anode).

ADHESION - Bonding strength; the attraction between a coating and the surface to which it is applied.

ALLOY - Metallic material composed of two or more metals.

ANCHOR PATTERN - A roughness pattern of peaks and valleys on a metal surface caused by the abrasive blasting of the surface. This roughness improves the ability of the coating to adhere to the surface (also called anchor tooth or surface profile).

ANCHOR TOOTH - Same as anchor pattern.

ANION - A negative ion that migrates in an electrolyte toward an anode.

ANODE - The part of a galvanic cell where corrosion occurs. Where dissimilar metals form a galvanic cell, the anode is the metal being attacked, because it has a greater tendency to go into solution. The anode may also be a small area on a surface where a pit develops (see Active Metal).

ANODIZING - Coating process used on some metals, primarily aluminum. By this process, an oxide coating is formed by making the metal the anode in a controlled electrolytic cell. The oxide coating, in itself, is not sufficient for corrosion protection in a marine environment.

ANTI-SEIZE COMPOUND - A zinc dust/petrolatum mixture applied by dipping or brushing to the threads of many fasteners. It retards corrosion thereby aiding fastener removal.

BARRIER FILM - An obstruction that interrupts the flow of electrical current in a corrosion cell. Commonly a coat of paint that insulates a metal surface from saltwater or other electrolyte, protecting it against corrosion.

BURNISH - To make a metal shiny by rubbing or polishing too much. A burnished surface is poor for paint adhesion. Burnishing can occur when power tools are used for surface preparation.

CAMBER - The curvature of a ship's deck from a higher level on the centerline to a lower level at the outboard edges. Camber causes water to run off to the scuppers.

CATHODE - The part of a galvanic cell where corrosion does not occur. Where dissimilar metals form a galvanic cell, the cathode is the metal that is protected. The cathode is the more noble of the two metals and has less tendency to go into solution.

CATHODIC PROTECTION - The process of preventing corrosion on a metallic surface by making that surface the cathode in the electrochemical reaction process.

CATION - A positive ion that migrates in an electrolyte toward a cathode. (Example: sodium in seawater.)

CELL - An electrochemical system consisting of an anode and a cathode immersed in an electrolyte and in electrical contact with each other.

CERAMIC COATING - See Metallic Ceramic Coating (also called Ceramic Metallic Coating).

CHALKING - A coating characterized by the presence of a loose powder evolved from the film itself, at or just beneath the coating surface.

CHEMICAL CONVERSION COATING - A coating produced by the reaction of a metal (usually an aluminum alloy) with chemical solutions. This coating provides some protection from corrosion and is a good base for paint.

CHLORIDES - Compounds made up of chlorine and another element. (Example: salt.)

COATING SYSTEM - A combination of substances applied to a surface in layers to provide protection of the surface. (Examples: primer paint with topcoat paint, or wire sprayed aluminum with low-temperature sealer and a topcoat paint.)

COMBUSTION PRODUCTS - Materials present in the stack gas that may be a source of corrosion by themselves or when combined with water.

CONCENTRATION CELL - An electrolytic cell where the anode and cathode are indifferent areas of the same metal. The difference in potential between the anode and cathode is the result of a difference in the concentration of ions (most often metal ions) or oxygen at different points.

CORROSION - The gradual destruction of a material, such as metal, due to chemical or electrochemical reaction with the environment.

CORROSION FATIGUE - Exposure of a metallic part to a corrosive environment when the part is repeatedly stressed.

CORROSION-PRONE - Describes a metallic component or fitting that is potentially very likely to corrode due to its bimetallic nature, its lack of protective coating, or other factors.

CORROSION RATE - The rate at which a metal or alloy corrodes or deteriorates.

CREVICE CORROSION - Corrosion that occurs in or near a crevice formed by near contact between two metals. When this occurs, the severity of the corrosion is greater in the crevice than in the surrounding area.

CURING - Hardening or setting up of a paint coating, normally used with a catalyzed coating such as epoxy.

CURRENT DENSITY - The current flowing per unit of cross-sectional area. Usually expressed in milliamperes per square foot.

DELAMINATION - Separation of a coating system into its separate layers.

DEPOT-LEVEL MAINTENANCE - Maintenance that is normally performed by a naval or private shipyard.

DIELECTRIC - A material that does not conduct electric current. A high dielectric coating provides a barrier between a metal and the corrosive environment.

DIRECT SURFACE OR UNIFORM ATTACK - The simplest and most commonly found form of corrosion that results when a surface is exposed to corrosive elements, such as salt water, and the surface corrodes uniformly without any special effects such as crevice corrosion or concentration cell corrosion.

DRY FILM THICKNESS - The thickness of a paint coating, measured after the paint has set up. Usually expressed in mils (thousandths of an inch). In metric measure, microns (millionths of a meter) are used.

DUCTILITY - A characteristic of a metal or metallic coating that describes its ability to be fashioned into a new form or hammered thin (Ductile).

DURABILITY - The characteristics of a metal or coating that describes its ability to last for a long time without much deterioration.

ELECTROCHEMICAL CORROSION - Galvanic deterioration of a metal by current flow in conjunction with ionic reactions at an electrolytic interface.

ELECTROLYTE - A chemical mixture, usually a liquid, that contains electrically charge atoms (ions) that make the mixture capable of conducting an electric current. (Example: seawater.)

ELECTROMOTIVE FORCE - Developed in a cell, accumulator, or generator, the force that causes an electric current to flow. The unit of electromotive force is the volt.

ELECTROMOTIVE FORCE (EMF) SERIES - A list of elements arranged according to their standard electrode potentials. Elements whose potentials are cathodic to hydrogen are identified as "positive," and elements whose potentials are anodic to hydrogen are identified as "negative."

ELECTROSTATIC - Having to do with the attraction or repulsion of electric charges. In one painting technique, a spray where the particles are electrically charged is used to get complete coverage of complicated shapes.

EROSION - Destruction of metal or other material by the abrasive action of liquid or gas.

FASTENERS - The general term applied to devices such as bolts, nuts, studs, screws, and washers used to attach metal pieces.

FAYING SURFACES - The surfaces in a joint where two mating surfaces are joined closely together.

FEATHERING (FEATHERED) - Sanding broken edges of an existing coating to provide a smooth, tapered interface between the coating and the substrate. Feathering allows touch-up recoating or spotting out of small areas with minimum potential for cracking at the interface between the old and new coatings.

FERROUS - A metal or alloy containing iron.

FILM - A thin, often translucent or transparent layer of material.

FLAME SPRAY COATING - A coating process in which molten or semi-molten metal is deposited on a metallic substrate. Compressed air may be used to disperse the deposited metal. Typically, aluminum wire is used to provide the coating, although other metals may be used (also called metal spray coating, flame spray aluminum, wire spray aluminum).

FLASH RUST - Rust that occurs in a very short time following the abrasive blasting of a surface (also called rust bloom).

FLUIDIZED BED - Part of a coating process in which a base metal is coated with powders such as polyvinyl chloride, nylon, or epoxies. The powder is placed on a perforated shelf in a dip tank and low-pressure air is fed under the shelf, thereby creating a cloud of powder in which the particles do not stick together but behave as a fluid.

FRETTING CORROSION - Corrosion at the junction of two loaded contacting surfaces.

GALVANIC CELL - A cell consisting of two dissimilar metals in contact with an electrolyte.

GALVANIC CORROSION - Accelerated corrosion that occurs when electric current flows between dissimilar metals in a corrosive environment.

GALVANIC SERIES - A list of metals and alloys arranged in order of their relative potentials in a certain environment. (For example, flowing seawater.)

GRIT - Hard, sharp granules, such as sand, whose structure makes them useful for grinding. Used in abrasive blasting of surfaces in preparation for painting (see Abrasive).

HIGH DIELECTRIC - A material with good electrical insulation properties or high resistance to the flow of electric current.

HYDROGEN EMBRITTLEMENT - The process by which a metal, usually high-strength steel, becomes brittle, caused by hydrogen entering the metal's lattice during acid pickling, electroplating, etc.

IMPINGEMENT ATTACK - Localized corrosion resulting from turbulent or impinging flow of liquids.

INHIBITOR - A chemical substance or mixture that, when added to an environment, usually in small concentrations, effectively decreases corrosion (commonly used in closed cooling systems).

INORGANIC - Term used to classify coatings such as metal spray, plating, or galvanizing applied to prevent corrosion.

INTERGRANULAR CORROSION - Corrosion along grain boundaries. (Also called intercrystalline corrosion.)

INTERMEDIATE-LEVEL MAINTENANCE - Maintenance performed by tenders and shore intermediate maintenance activities (SIMAs). The maintenance level between organizational (ship's force) and depot (shipyard).

IONS - Atoms or groups of atoms carrying a positive or negative charge and capable of conducting an electric current.

METALLIC-CERAMIC COATING - An inorganic coating consisting of an aqueous binder solution with aluminum powder added to provide sacrificial protection. These coatings are applied in multiple coats requiring an oven cure at 650° F between coats.

METAL SPRAY COATING - See flame spray coating.

MICRON - Dimension equal to one millionth of a meter. Used in referring to the size of particles and occasionally to the thickness of a coating approximately 25 microns equal 1-mil.

MIL - One one-thousandth of an inch (0.001-inch or 1/1000-inch). Used to measure the dry film thickness (DFT) of paint, or other coating.

MILL SCALE - A layer of iron oxide, bluish in appearance, formed on the surface of steel during the manufacturing process. A form of corrosion.

MOTTLED - Used to describe the appearance of a metal surface, usually aluminum, that is marked with different shades of a color or blotches.

MSC - Metal Sprayed Coating, for example flame sprayed aluminum.

NEAR-WHITE METAL - An industry standard used to describe a surface of which at least 95 percent of each square inch is free of all dirt, oil, mill scale, rust, paint, or other foreign matter. (SSPC SP10.)

NIOSH - National Institute of Safety and Health.

NOBEL METAL - A metal that is highly resistant to corrosion. Such a metal is so inert that it is found uncombined in nature. (Examples: gold, silver, and platinum.)

ORGANIC - A term used to classify coatings such as paint, lacquer, plastic, grease, or preservatives which are derived from plants or animals.

ORGANIZATIONAL-LEVEL MAINTENANCE - The lowest level of maintenance, normally used to describe the ship's force level of maintenance.

OXIDATION - The reaction of a metal with oxygen. The destruction of a metal or alloy as a result of the direct action of oxygen on the metal, such as the scaling of steel at a high temperature.

PASSIVATION - The process used to make a metal more resistant to corrosion. (Example: chromates will limit the corrosion of steel by water.)

PASSIVE METAL - A metal in a condition in which it does not tend to corrode. The more noble of two dissimilar metals in contact (see cathode).

PIGMENTS - The solid portion of paint. Pigments provided color, resist weathering, increase a paint's adhesion, and decrease its degree of moisture penetration.

PITTING - Localized corrosion that tends to penetrate rather than spread out. Deep cavities of small diameter may result.

POLLUTANTS - Impurities or contaminants present in the environment, air, or water that may react to cause corrosion.

POLYSULFIDE SEALANTS - These products are used to seal bolted faying surfaces in corrosive environments, then coated with MIL-P-24441 epoxy when they dry. These sealants are applied to threaded surfaces, bolt heads, nuts and faying surfaces.

POROSITY - The characteristic of a coating that describes its ability to resist the passage of a liquid through it. If there are enough minute openings in a coating so that a path exists to the metal being protected, there is said to be through porosity.

POT LIFE - The time between when a paint is mixed up and when it no longer remains usable.

POWDER COATING - A general designation that encompasses either electrostatic deposition or fluidized bed process of fusing powder on a metal surface.

PRIMER - The first coat of paint to be applied when two or more coats are used. Usually a rust-preventive coating when used on steel.

PROFILE HEIGHT - The height of the hills and valleys created on a surface that has been blast-cleaned, as seen from the edge. A profile contour helps the paint to bond well to the surface.

RESILIENCY - The ability of coating to form a seal that can take strain or movement without breaking (Resilient).

RESIN - One of the major ingredients of paint that serves to bind the other ingredients together and also give protective properties.

RUST - Corrosion products found on the surface of iron or iron-based alloys, consisting primarily of hydrated iron oxide.

SACRIFICIAL - Describes an anode or coating that is applied as part of a system where it is expected to corrode and deteriorate instead of another part of the system that is thereby protected. (Example: zinc anodes installed to protect the underwater body of a ship.)

SERMETAL - Trade name for metallic-ceramic coating.

SSPC - Steel Structures Painting Council.

STEEL, CARBON - A steel alloy that contains up to about 2 percent carbon. Also known as "ordinary steel" and "straight carbon steel." Designated with the letters CS.

STEEL, CORROSION-RESISTANT - A general designation given to those steel alloys which have a powerful resistance to corrosion. (Examples: 18-8 stainless steel, an alloy of chromium and nickel; CRES 304 alloy; and CRES 316 alloy.)

STEEL, STRESSED - Corrosion that is accelerated by the acting of tensile stress.

SUBSTRATE - The base metal for application of coating systems. (Example: sandblasted steel hull.)

TACK COAT - A thin coating applied to a cured coating surface to provide a partially cured surface for improving adhesion of coatings subsequently applied (also called mist coat).

THERMOPLASTIC - A characteristic of coatings, applied by the fluidized bed electrostatic process, that describes those powders which are capable of softening or fusing when heated, and hardening again when cooled. (Example: nylon.)

THERMOSETTING - A characteristic of coatings, applied by the fluidized bed electrostatic process, that describes those powders which are capable of becoming permanently rigid when cured. (Example: epoxy coatings.)

TOPCOAT - The final coat of paint or other preservative applied in a system of two or more coats.

VAPOR PHASE INHIBITOR - A corrosion preventive method used for metals in closed or low airflow spaces, such as electrical equipment boxes. When VPI material is exposed, it sublimates into vapor which penetrates throughout the space to all exposed metallic surfaces. On contact with the surface the vapors condense into a highly protective invisible film.

WET FILM THICKNESS - The thickness of a paint coating, measured immediately after the paint has been applied. Usually expressed in mils (thousandths of an inch). In metric measure, microns (millionths of a meter) are used.

WHITE METAL - An industry standard used to describe a surface that is completely free of all foreign matter. Steel has a gray-white uniform metallic color and is slightly roughened to form an anchor pattern (SSPC SP5).

WIRE SPRAY ALUMINUM - See flame spray coating.

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