RECREATION VEHICLE AND BOAT WIRING (NONPERMANENT TYPE) DESCRIPTION

1. GENERAL

1.01 This practice provides wiring information for use in providing telephone service to recreational vehicles and boats at marinas and does not apply to permanent-type installations such as mobile homes. Refer to section 461-220-100 for wiring of permanent installations.

1.02 This practice is reissued to:

(a) Add information on the B template assembly AT-8731

(b) Change type of fastening hardware for B water-proof chrome male jack

(c) Revise B and C weatherproof cord tip and ring colors, and add additional lengths.

Revision arrows are used to emphasize the more significant changes.

1.03 ***DANGER: Hazardous voltage may be present on body or chassis of vehicle.*** Before making contact with any metal portion of a recreational vehicle, check for the presence of hazardous voltage on the body or chassis using the 188A test set.

1.04 A recreational vehicle (RV) is a unit mounted on a chassis designed for travel, camping, semipermanent home, vacationing, and other outdoor use. Wiring methods in this section cover travel trailers, truck-mounted campers, camping trailers, motor homes, and vans converted to campers and boats docked at marinas.

1.05 The same methods and procedures apply to the wiring of recreational vehicles as apply to mobile homes with the exception of the method of establishing a connection between the protector or terminal and the vehicle and the necessity of providing a ringer simulator (or equivalent) as required for test purposes. Refer to section 460-100-400 for additional information on station protection and grounding.

1.06 Prior to proceeding with installation, necessary arrangements should have been made for the installation of jacks on vehicles or boats and provision of cable or wire facilities in the trailer park or on the dock.

1.07 Where attachments are made on joint-use poles and posts, the standard separations between power and telephone wires must be maintained as provided for permanent residences (see paragraph 3.13).

2. SELECTION

2.01 The equipment used to provide telephone service to recreational vehicles is identified and described in the following ordering guide.

A. Ordering Guide

2.02 Order as follows:

(a) Adapter, Jack, Female, Weatherproof, B (for use with existing KS-8421 jack housing on docks, Fig. 1 and 2).

(b) Box, Outlet, B (for mounting male or female jacks on land, dock, or recreational vehicle, Fig. 3).

(c) Bracket, Mounting, B (for mounting outlet box on recreational vehicle, Fig. 4).

(d) Cord, Weatherproof, B (used with recreational vehicle and boats, Fig. 5) can be ordered as follows:

- 401246509 WP B 50 feet
- 402220032 WP B 100 feet
- 402220040 WP B 150 feet.

(e) Cord, Weatherproof, C (used with recreational vehicle or boat for direct connection from telephone set to jack, Fig. 6) can be ordered as follows:

- 401686787 WP C 50 feet
- 402220057 WP C 100 feet
- 402220065 WP C 150 feet.

(f) Jack, Male, Weatherproof, B (for use on recreational vehicles and boats, Fig. 7, 8, 9, 10, 14, and 15).

(g) Jack, Female, Weatherproof, B (for use at trailer service pad or dock area, Fig. 11 and 13).

(h) Adapter, Plate, B (used to adapt the B weatherproof jack to a boat where the KS-8420 jack had previously been mounted, Fig. 12).

(i) Ringer, Simulator (or equivalent) as required.

(j) Template, B (for use on boat, Fig. 16).

(k) Template, C (for use on RV, Fig. 17).

B. Description

2.03 The B weatherproof female jack adapter (Fig. 1 and 2) is mounted on an existing KS-8421 jack housing after the old jack and front plate are removed. It will receive the male plug of the B weatherproof cord to provide service to recreational vehicles or boats. A spring-loaded hinged cover protects the jack from weather when not in use. A rubber boot on the mating connector of the cord provides a weatherproof seal when in use. Three screw terminals stamped T, R, and GR are provided for connection to tip, ring, and ground, respectively. Four mounting screws and a cover gasket are provided.

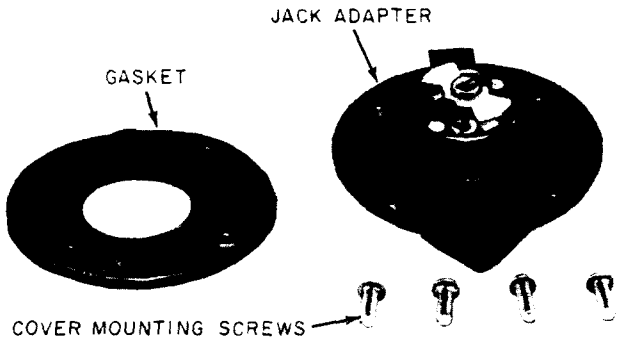

Fig. 1—B Weatherproof Female Jack Adapter

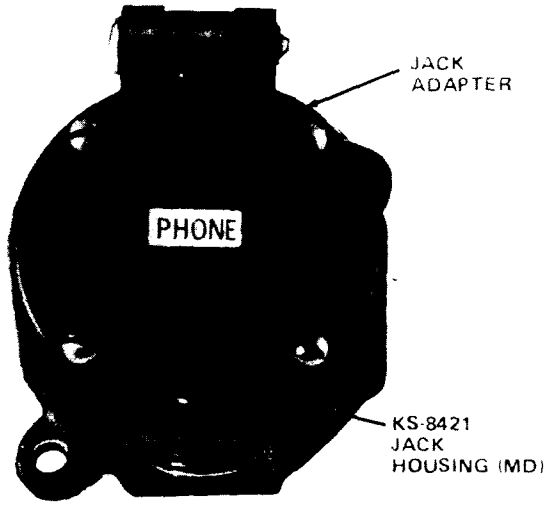

Fig. 2—B Weatherproof Female Jack Adapter Mounted on KS-8421 Jack Housing

2.04 The B outlet box (Fig. 3) is a molded box intended for mounting the B weatherproof male or female jack. It has a threaded knockout entrance at each end for use with a plastic (PVC) cord grip assembly or polyvinyl chloride (PVC) conduit adapter. The cord grip assembly and conduit adapter come with the outlet box.

2.05 The B mounting bracket (Fig. 4) is used to mount the B outlet box on recreational vehicles. It consists of a stainless steel angle bracket with three clearance holes on one side for mounting to trailer tongue and two threaded holes on the other side for mounting the B outlet box. Included are three stainless steel thread cutting screws for mounting

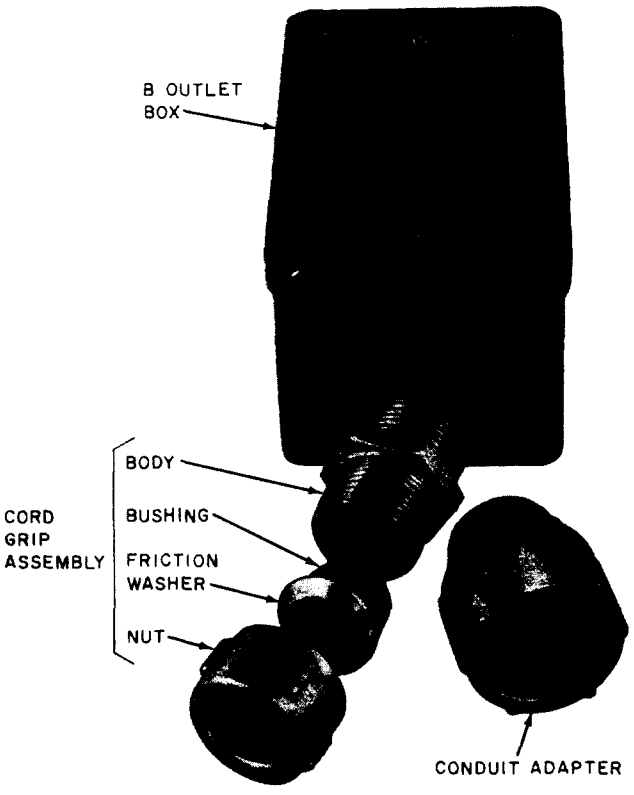

Fig. 3—B Outlet Box

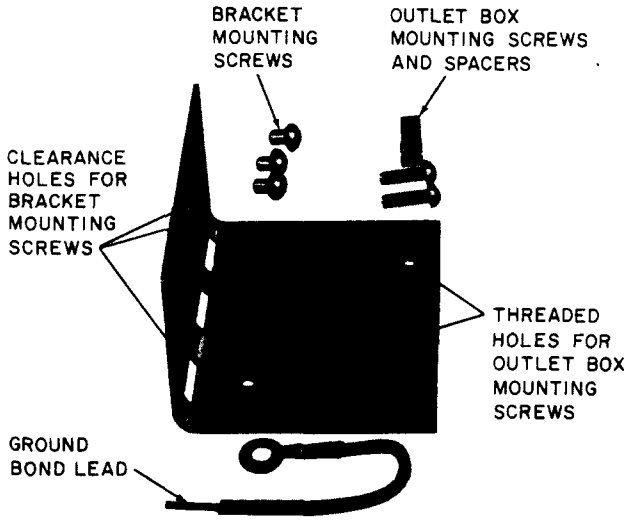

Fig. 4—B Mounting Bracket

the bracket and two stainless steel screws with spacers for mounting the B outlet box on the B mounting bracket. ◗The bracket can also be connected to the trailer frame or tongue using two stainless steel straps. The straps pass through the slots in the mounting bracket and connect around the frame.◖ A pigtail lead is included to connect between the center ground terminal of the B weatherproof male jack and one of the outlet box mounting screws to provide a ground bond to the vehicle frame (Fig. 10).

2.06 The B weatherproof cord (Fig. 5) is used to provide a telephone connection between the post-mounted jack at the service pad and the jack on the recreational vehicle in a trailer park or between the dock and boat in a marina. ◗It consists of a 16-gauge, 3-wire [(BK) ring, (W) tip, and (G) ground] yellow PVC insulated flexible cord. Lengths of 50, 100, and 150 feet are available with PHONE stamped on the cord at 1-foot intervals for identification.◖ The cord is terminated at one end in a male plug which engages a female jack at the service pad or dock. The other end is terminated in a female plug which engages a male jack on the recreational vehicle or boat. Rubber boots on the plugs mate with their respective jacks to provide weather protection. The 50-, 100-, and 150-foot length have been adopted as the AT&T standards. As the cords are reusable, no attempt should be made to shorten them.

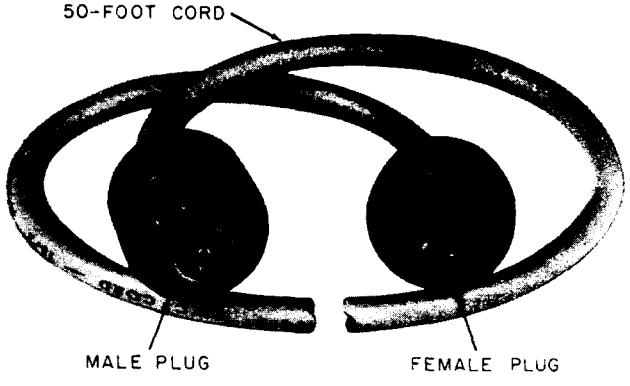

Fig. 5—B Weatherproof Cord

2.07 The C weatherproof cord (Fig. 6) is the same as the B weatherproof cord except that the female plug on the recreational vehicle or boat end is replaced with spade-tipped leads for terminating the cord directly in a 500- or 2500-type telephone set.

▶Cord lengths of 50, 100, and 150 feet are available.◀ An S hook assembly is provided for fastening the cord via the ringer mounting screw. ▶Terminate leads (BK) for ring, (W) for tip, and (G) for ground.◀

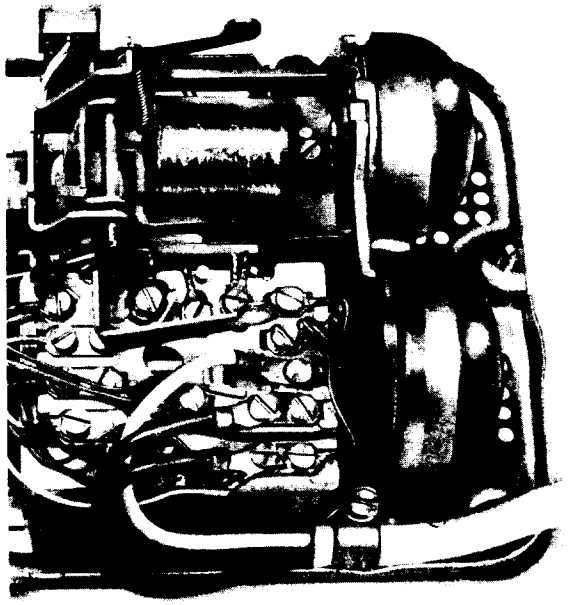

Fig. 6—Securing C Weatherproof Cord in Telephone Set

2.08 The B weatherproof male jack (Fig. 7, 8, 9, and 10) mounts in the B outlet box on the recreational vehicles or boats and is compatible with the female plug of the B weatherproof cord to provide telephone service. The jack has a spring-loaded hinged cover to make it weatherproof when not in use. Three screw terminals stamped R, T, and GR on the rear of the jack provide connection to ring, tip, and ground, respectively.

2.09 The B weatherproof female jack (Fig. 11 and 13) mounts in the B outlet box located at the trailer service pad or on the dock at the marina. It receives the male plug of the B weatherproof cord. The jack has a spring-loaded hinged cover to make it weatherproof when not in use. Three screw terminals stamped R, T, and GR on the rear of the jack provide connection to ring, tip, and ground.

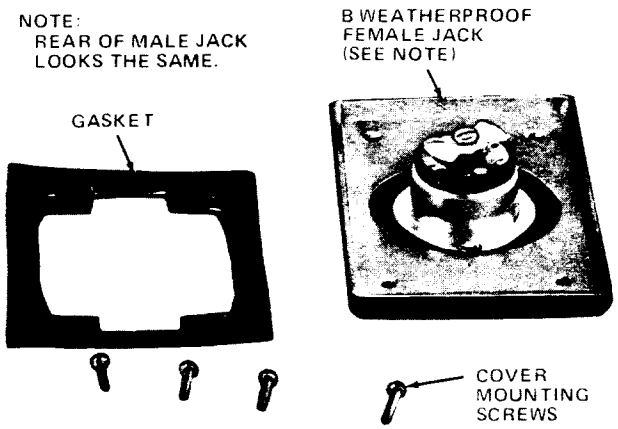

Fig. 7—B Weatherproof Male Jack

2.10 The B waterproof male jack (Fig. 14 and 15) is mounted on a boat using stainless steel screws. These screws replace the chromeplated brass screws which had a tendency to snap off when screwed into fiberglass. The jack is compatible with the female plug of the B weatherproof cord to provide telephone service. It is chrome plated with a hinged screw cover which makes the jack waterproof when not in use. Three screw terminals stamped R, T, and GR on the rear of the jack provide connection to ring, tip, and ground. A rubber boot covers the screw terminals on the rear of the jack to minimize the possibility of accidental contact with these terminals.

2.11 The B adapter plate (Fig. 12) is used to adapt the B waterproof jack to a boat where the KS-8420 jack had previously been mounted.

> ***Note:*** The B adapter plate has two sets of mounting holes. Only one set of holes is used. The second set is available in case the holes from the old KS-8420 jack interfere with adequate mounting of the adapter plate. The rubber gasket is made so when placed between the boat and the adapter plate, the holes in the gasket line up with one set of holes in the adapter plate. Turning the gasket over causes the gasket holes to line up with the second set of adapter plate holes. This provides a watertight seal.

2.12 The B template (Fig. 16) is used on boats to locate the pilot holes for the mounting screws and the clearance hole for the body of the B waterproof male jack. The template has been redesigned to

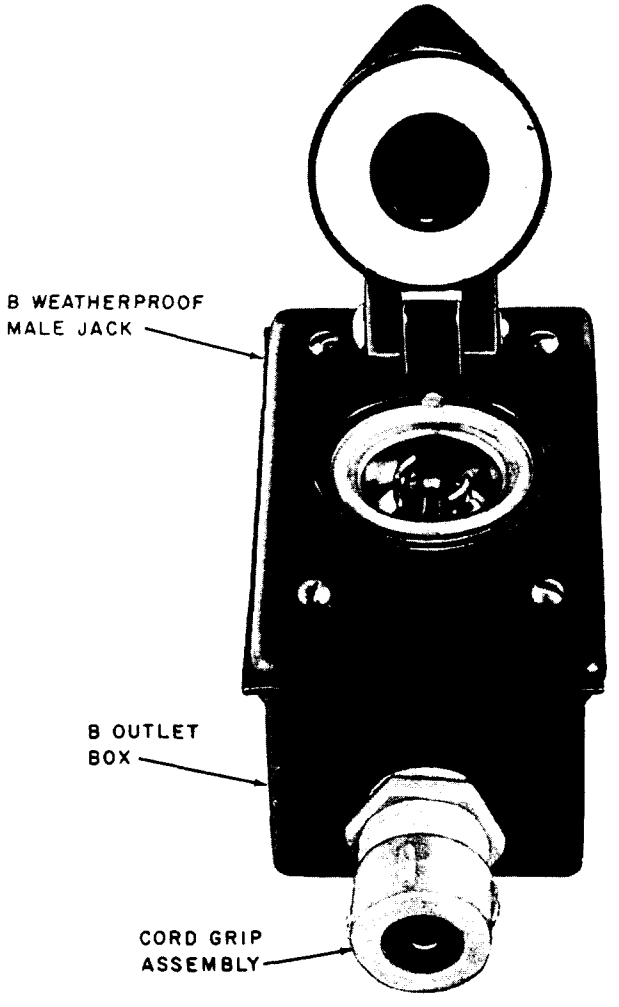

Fig. 8—B Weatherproof Male Jack on B Outlet Box (Cover Open)

ensure proper clearances when used in a recessed location. The template is printed on index card stock and packed separately from the jack so that mounting holes may be prepared prior to jack installation.

2.13 The C template (Fig. 17) is used by the customer to locate the pilot holes on the recreational vehicle for the three thread cutting screws used to mount the B mounting bracket. The template is printed on index card stock and packed separately from the B mounting bracket so that mounting holes may be prepared prior to bracket installation. This template is not needed if the bracket is mounted using the stainless steel bands.

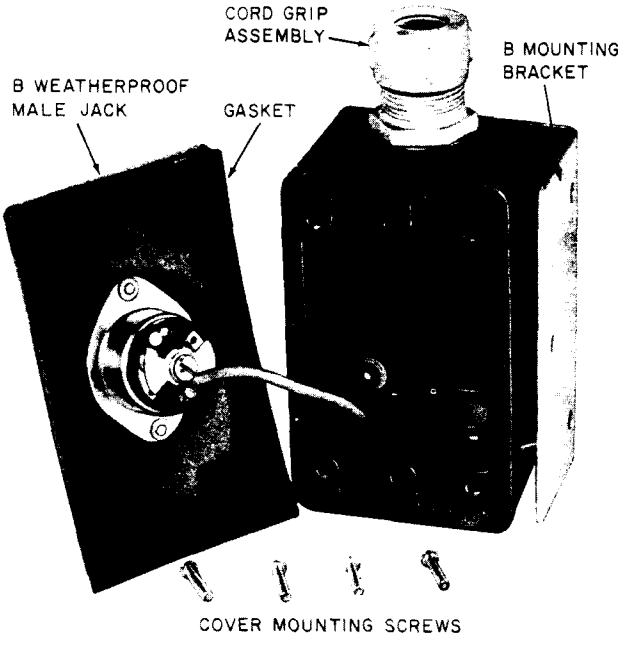

Fig. 9—B Weatherproof Male Jack on B Outlet Box Showing Ground Lead Connected to B Mounting Bracket

3. INSTALLATION

A. Recreational Vehicles

3.01 ***DANGER: Hazardous voltage may be present on body or chassis of vehicle.*** Before making contact with any metal portion of a recreational vehicle, check for the presence of hazardous voltage on the body or chassis using the 188A test set.

3.02 ***DANGER: Crawling under vehicle could result in personal injury.*** Do not install telephone in a location that will require wiring under vehicle and do not crawl under vehicle.

3.03 Installation of the service wire and station protector is the same as for mobile home wiring and is covered in section 461-220-100.

3.04 The following items are required for a vehicle installation:

- One B weatherproof female jack (mounted on post at protector, Fig. 11)

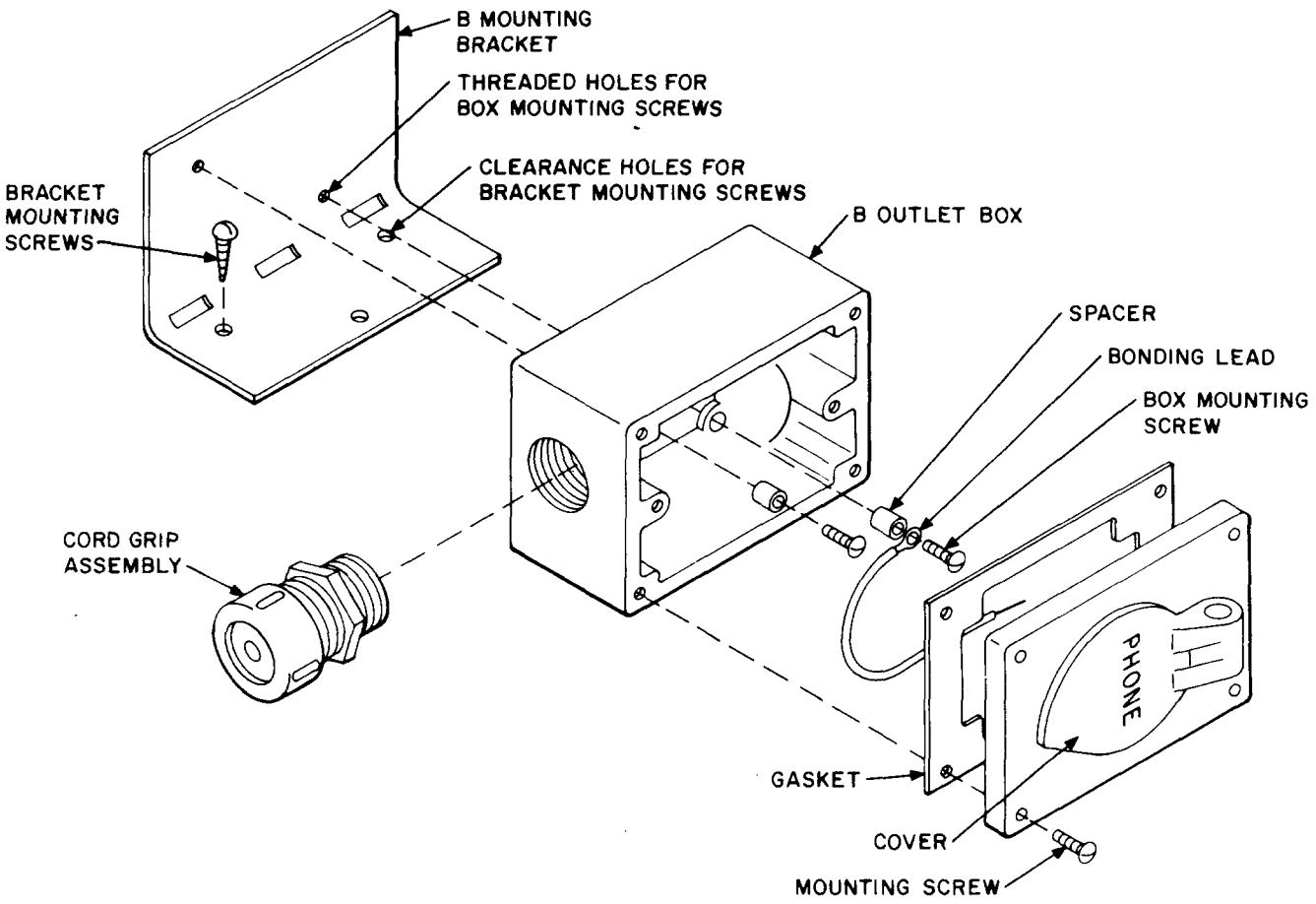

Fig. 10—Assembly of B Weatherproof Male Jack to B Outlet Box and B Mounting Bracket

- One B weatherproof male jack mounted on recreational vehicle (Fig. 7)
- Two B outlet boxes used to mount male and female jacks (Fig. 8 and 13)
- One B mounting bracket used to mount outlet box on vehicle (Fig. 10)
- One C template used to drill holes for mounting bracket on vehicle (Fig. 17)
- One B weatherproof cord (for making connection between post and vehicle, Fig. 5)
- One ringer simulator or equivalent (if required).

Note: If existing KS-8421 jack housing at utility pad is to be used, one B weatherproof female jack adapter (Fig. 1) is required instead of the B female jack, and only one B outlet box is required.

3.05 The cord will become the responsibility of the vehicle owner. The owner will connect and disconnect service at their convenience and keep the cord stored in the vehicle when away from location.

3.06 The B outlet box and B mounting bracket should be mounted on the vehicle by the installer using either the mounting holes provided by the customer or the stainless steel straps. For trailers, the customer will use the C template to drill holes for the mounting bracket on top of the vehicle hitch as close to vehicle as possible. The box should be

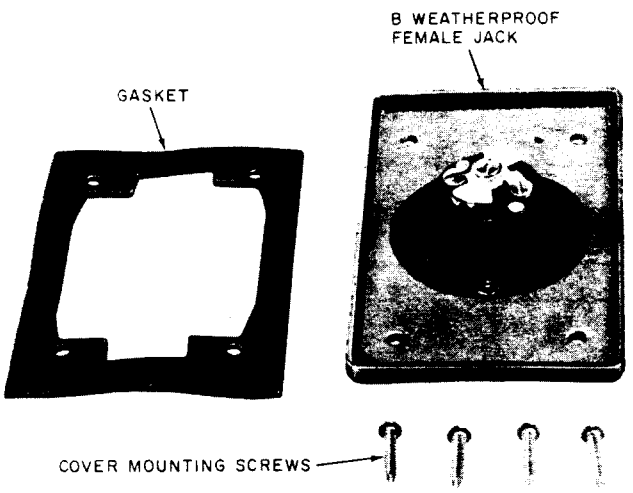

Fig. 11—B Weatherproof Female Jack

mounted on the same side as the other utilities with the jack on the outside (Fig. 18 and 19). ***Warning: Bumpers on some recreational vehicles are used to store sewage hoses. Mounting screws that extend beyond the bumper surface may damage the hose or prevent the hose from entering.*** For truck campers and motor homes, the customer will use the template to drill holes on the left side of the rear bumper (see Fig. 20). The outlet box should be mounted so it does not extend beyond the edge of the bumper. The cord grip assembly may be attached to either end depending on existing space. The telephone installer will wire from the connecting block or the telephone set in the vehicle to the B outlet box on the trailer hitch or bumper. The bonding lead provided with the bracket must be connected as shown in Fig. 10 to provide a ground bond to the vehicle chassis.

3.07 Always install the telephone set on an outside wall if possible. The floor area along the outside walls are usually clear for drilling for station wire entry. The connecting block should be mounted on the baseboard or a stud, if possible, as the thin material used for recreational vehicle walls may not hold fasteners. Wall sets must also be mounted on a stud. Do not attempt to fish wire through trailer walls as side rails and insulation will cause interference. Drill the station wire entrance hole straight down through the floor avoiding outriggers and other obstructions. Use care when penetrating the soft insulating board covering the bottom of the trailer as it tears easily. Seal holes around station wire with duct seal or tape to prevent entrance of air, water, and insects. Run the D station wire to the jack so it will be protected and fasten securely every 12 inches. The D station wire must not come loose when the trailer is on the road.

3.08 Mount the B weaterproof female jack close to the protector on the post at the utility pad and provide a ringer simulator if required. Wire tip and ring of jack to tip and ring terminals of protector. Connect a 12-gauge ground wire from ground terminal of protector to center ground terminal of jack. Use similar wiring when retrofitting a B female jack adapter in an existing housing.

B. Boats

3.09 For boat installations, the following equipment is required:

- One B waterproof male jack (mounted on boat to accept cord, Fig. 14 and 15)
- One B template (for cutting mounting holes for jack on boat, Fig. 16)
- One B weatherproof female jack (mounted on post on dock or pier to accept other end of cord, Fig. 11 and 13)
- One B outlet box (for mounting jack on dock or pier, Fig. 13)
- One B weatherproof cord (for connection between boat and dock, Fig. 5)
- One ringer simulator (or equivalent), if required.

Note: If existing KS-8421 jack housing at dock is to be used, one B weatherproof female jack adapter (Fig. 1 and 2) is required instead of the B weatherproof female jack and the B outlet box is not required.

3.10 The owner of the boat should be given the B template to drill the mounting and clearance holes for the B waterproof male jack adjacent to the power plugs in the cockpit coaming or in the outer hull of the boat (see Fig. 21 through 24). The installer should not drill any holes on boats either for mounting or running wire.

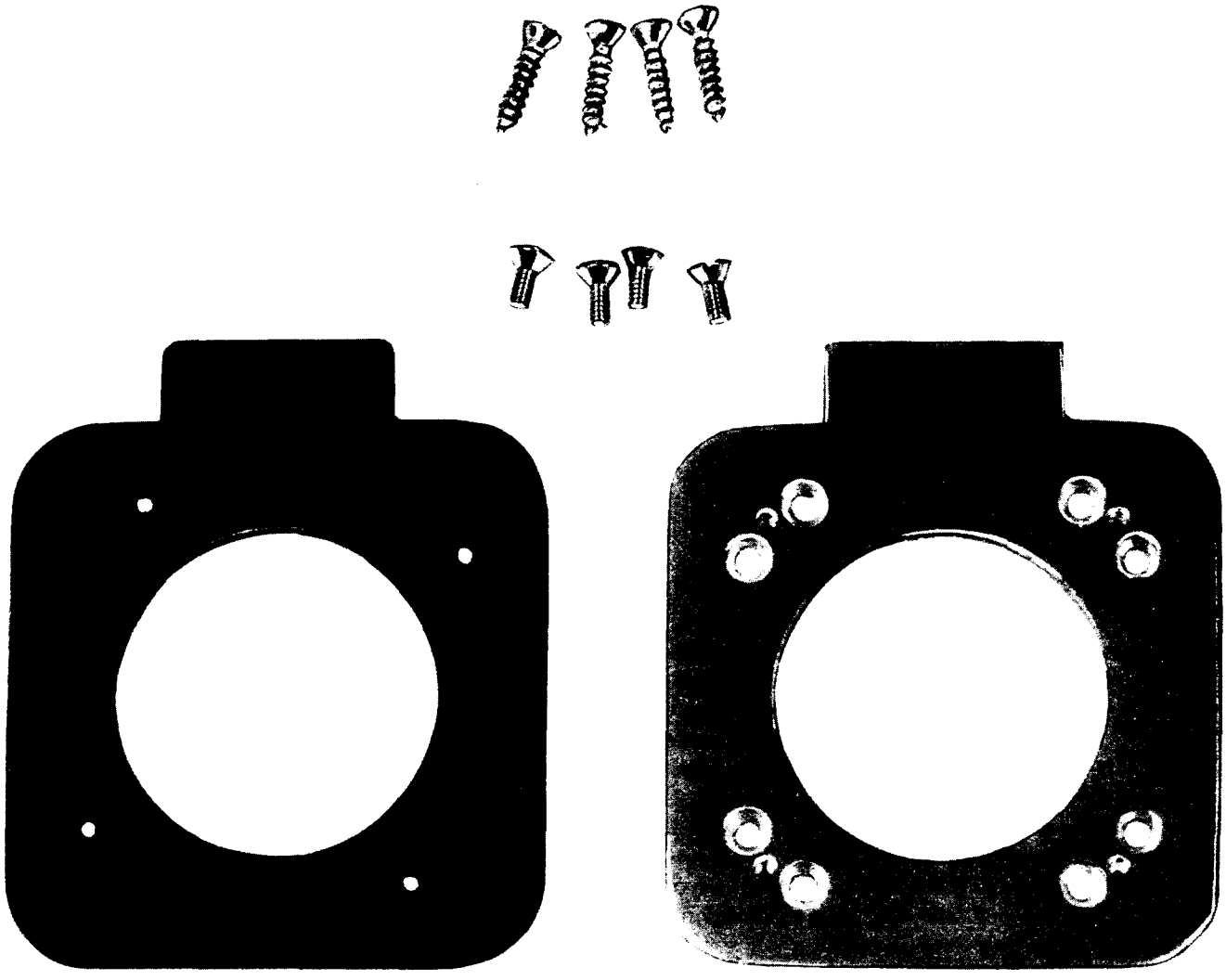

Fig. 12—B Adapter Plate

3.11 ***DANGER: When working on boats, consideration should be given to the type of footwear worn, both for safety reasons due to slippery decks and to avoid marking highly varnished teak or fiberglass decks.*** The installer will mount the B waterproof jack and wire from the jack to the telephone set connecting block in the boat.

> ***Note:*** Do not bond ground wire to boat ground as undesirable electrolysis reaction may develop.

3.12 If holes are required, they must be provided by the boat owner (seal holes to prevent seepage if necessary). In most cases, there will be sufficient room to run concealed wiring to the telephone location without drilling holes or without attaching fasteners to the boat. The wire should be run between the hull and inside bulkhead. If wires require fastening, use B-cord clips (AT-8598, Section 461-210-200) fastened to inside dry surfaces. Use size 1 cord clips for D station wire and size 2 for B, F-59307 rated MD, BSW-2/22-C, or BSW-2/22-GRE service wire. Use B, F-59307 rated MD, BSW-2/22-C, or BSW-2/22-GRE service wire for wire runs exposed to saltwater, brackish water, and oil. Do not use staples to fasten

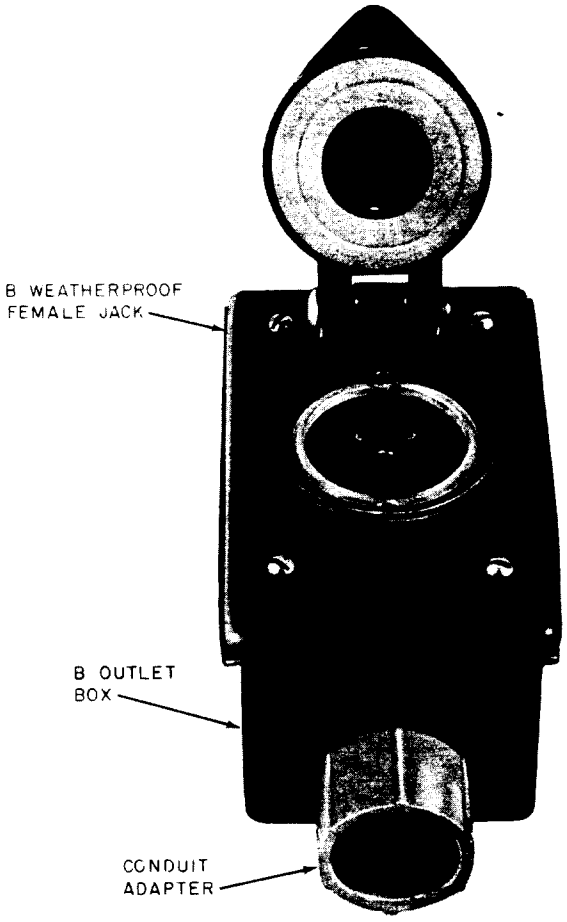

Fig. 13—B Weatherproof Female Jack on B Outlet Box (Cover Open)

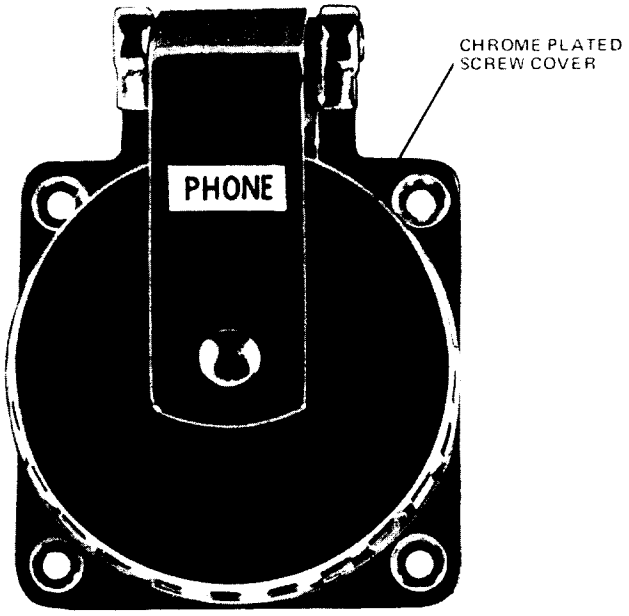

Fig. 14—B Waterproof Male Jack (Front View)

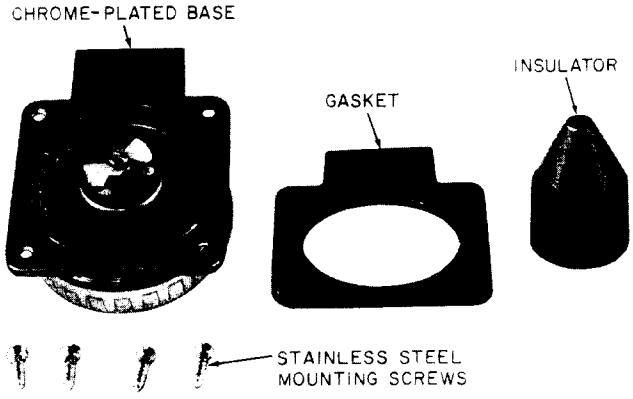

Fig. 15—B Waterproof Male Jack (Rear View, Gasket, and Insulator Removed)

wire in boats. Conduit may be used when provided. When disconnecting service, do not remove wiring, cord clips, or connecting blocks.

C. Marinas (Fig. 25 and 26)

3.13 Jacks on docks should be mounted on posts or in wells provided by the marina owner. To prevent damage, do not mount the jack on the water or walkway side. Usually the post or pedestal will be the same one on which power is mounted. No station protector or bonding is to be placed on the boat. Mount the protector at the last permanent terminal or housing (which will usually be ashore) so an adequate ground may be obtained. Refer to the sections on station protection and grounding in Division 460. Where individual protectors are required, use the 123- or 128-type with the 305A mounting (or equivalent). Provide a ringer simulator or equivalent at the dock jack if required.

3.14 The marina owner should provide rigid nonmetallic conduit for wiring to the dock jacks. Where conduit is not provided, a wire run will have to be made in a location not subject to damage. This may be adjacent to water pipes, power conduit, or in

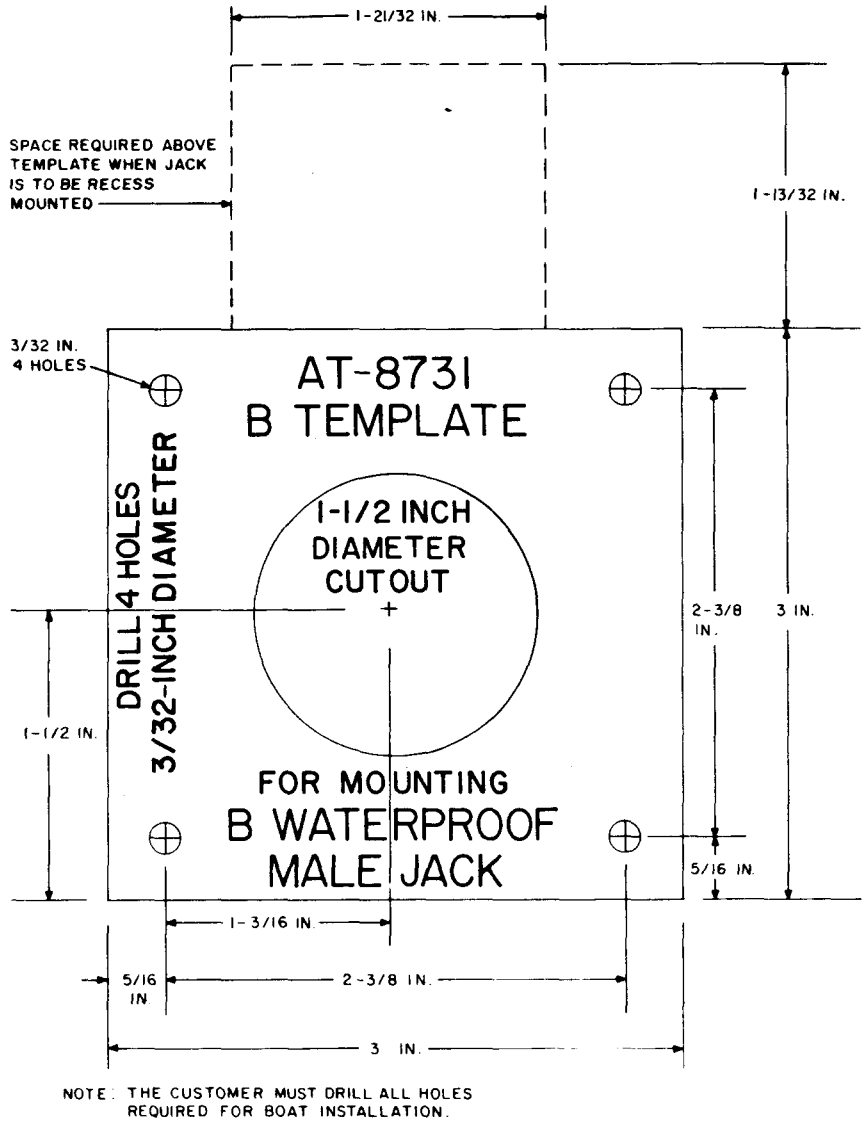

Fig. 16—B Template for Use on a Boat

some cases, beneath the dock. If marina owners will not provide conduit, request raceways in which wires may be fastened. Use only galvanized brass, bronze, or stainless steel hardware; other types deteriorate too rapidly. When establishing a run, use bridle rings or galvanized wire or cable clamps. Use B, F-59307 rated MD, BSW-2/22-C, or BSW-2/22-GRE service wire for all individual wire runs. Entrance of the service wire into the outlet box containing the jack should be through conduit. If conduit is not provided, protect the wire run from the deck of the dock to the box with a U guard or short piece of nonmetallic conduit.

3.15 If cable and terminals are not provided from the shore to the docks, wiring should be attached to the gangway. A typical method for floating docks is shown in Fig. 26. Rigid nonmetallic pipe should be fastened to the gangway. Flexible metal conduit should be used at the shore and dock ends to allow for motion due to rise and fall of docks. Where

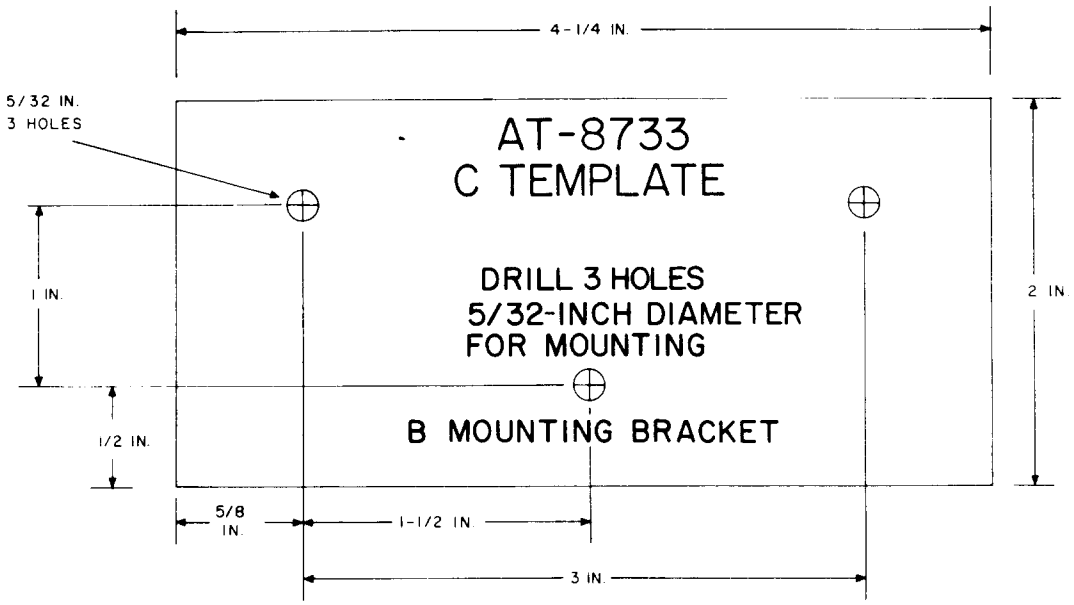

Fig. 17—C Template for Use on a Recreational Vehicle

the docks are rigid, no flexible metal conduit is required.

3.16 At piers designed for large ships, telephone jacks should be located in the covered wells used to protect water and electrical connections. Conduit must be used into the wells to prevent water damage. The wells protect the jacks and the portable telephone cord to the ship is protected since it is adjacent to the larger power cables.

3.17 Service to a boat may be PBX Station Service, Centrex Service, individual line, or extension service on an individual line. The type of service usually depends on the extent to which the marina owner wishes to become involved in providing service to boat owners.

3.18 When providing new telephone service to a dock, plan for more than the initial service required. It may be desirable to cable the dock to reduce the number of individual wires run from dock to shore and allow for future expansion.

3.19 Due to the many types of boats, docks, piers, marinas, trailer parks, and camp grounds, no attempt is made to establish one procedure to be followed. Good planning of cabling facilities, conduit, and local installation procedures will determine what is best for each installation.

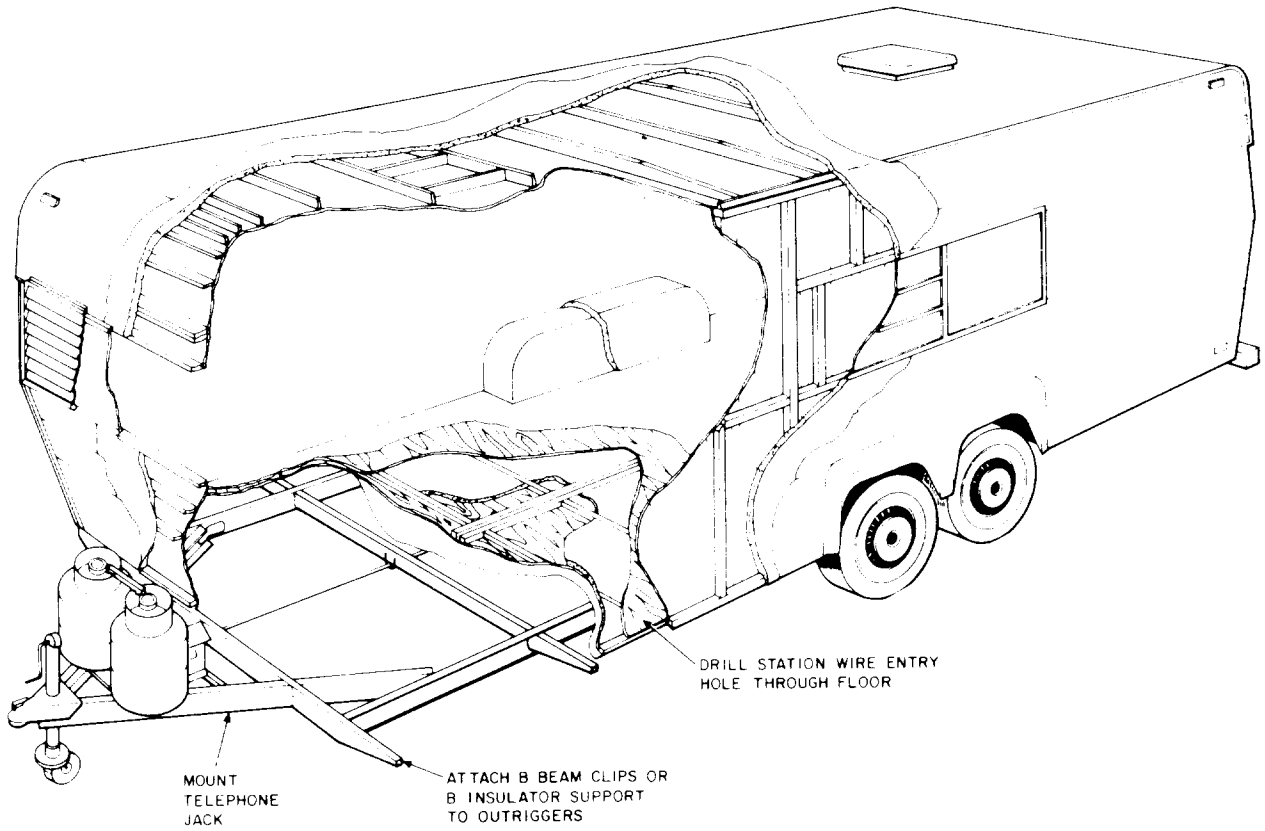

Fig. 18—Typical Recreational Trailer Construction

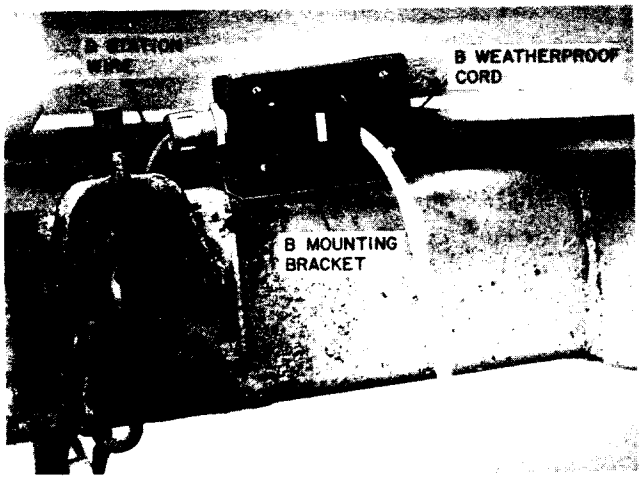

Fig. 19—B Weatherproof Male Jack Mounted on Trailer Hitch

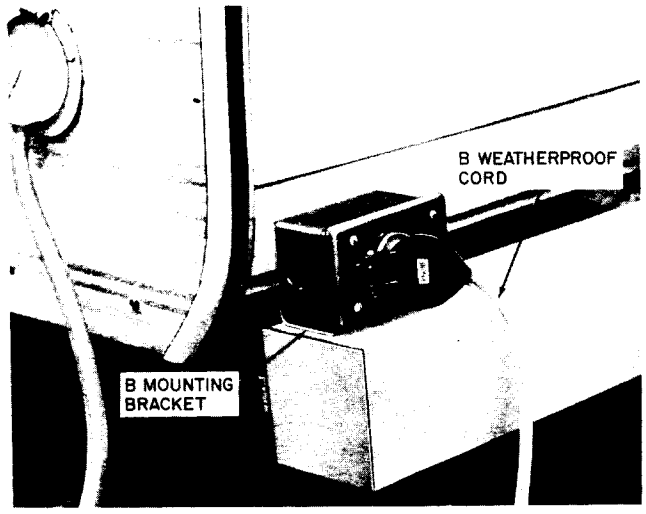

Fig. 20—B Weatherproof Male Jack Mounted on Rear Bumper of Trunk Camper or Motor Home

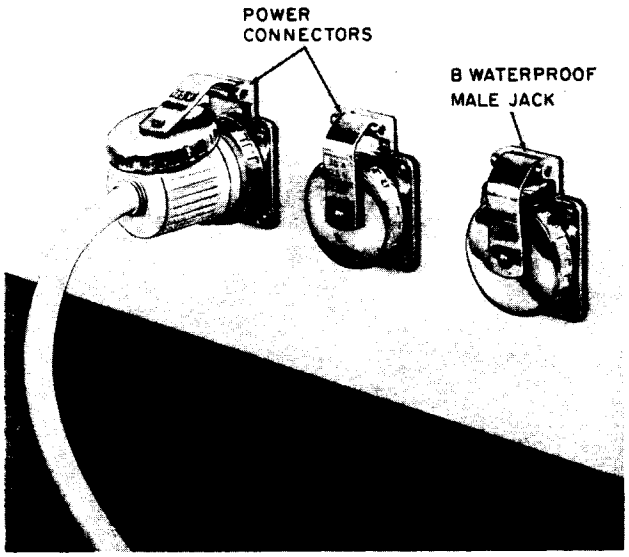

Fig. 21—B Waterproof Male Jack Mounted on Boat—Typical Installation

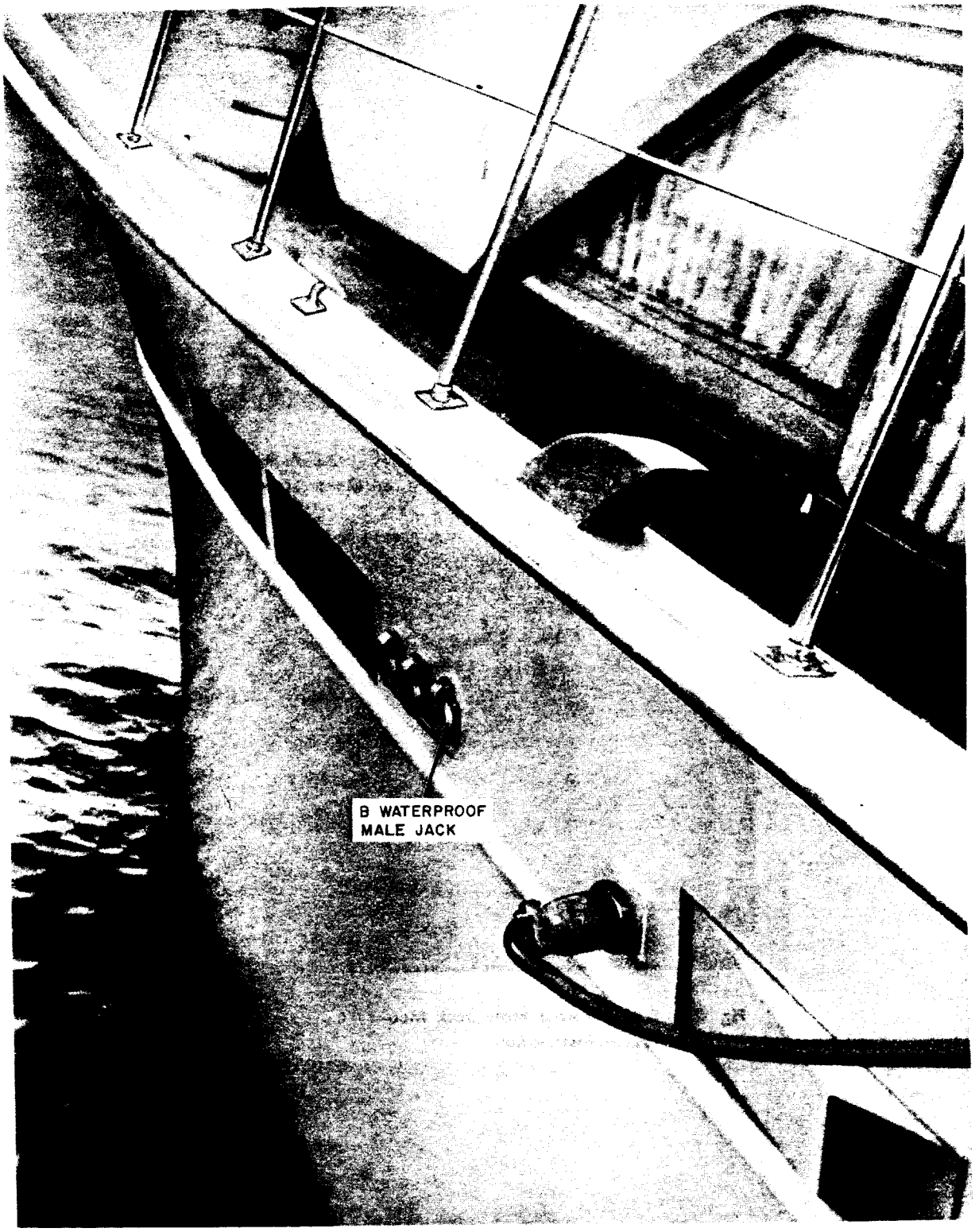

Fig. 22—Typical Outer Hull B Waterproof Male Jack Installation

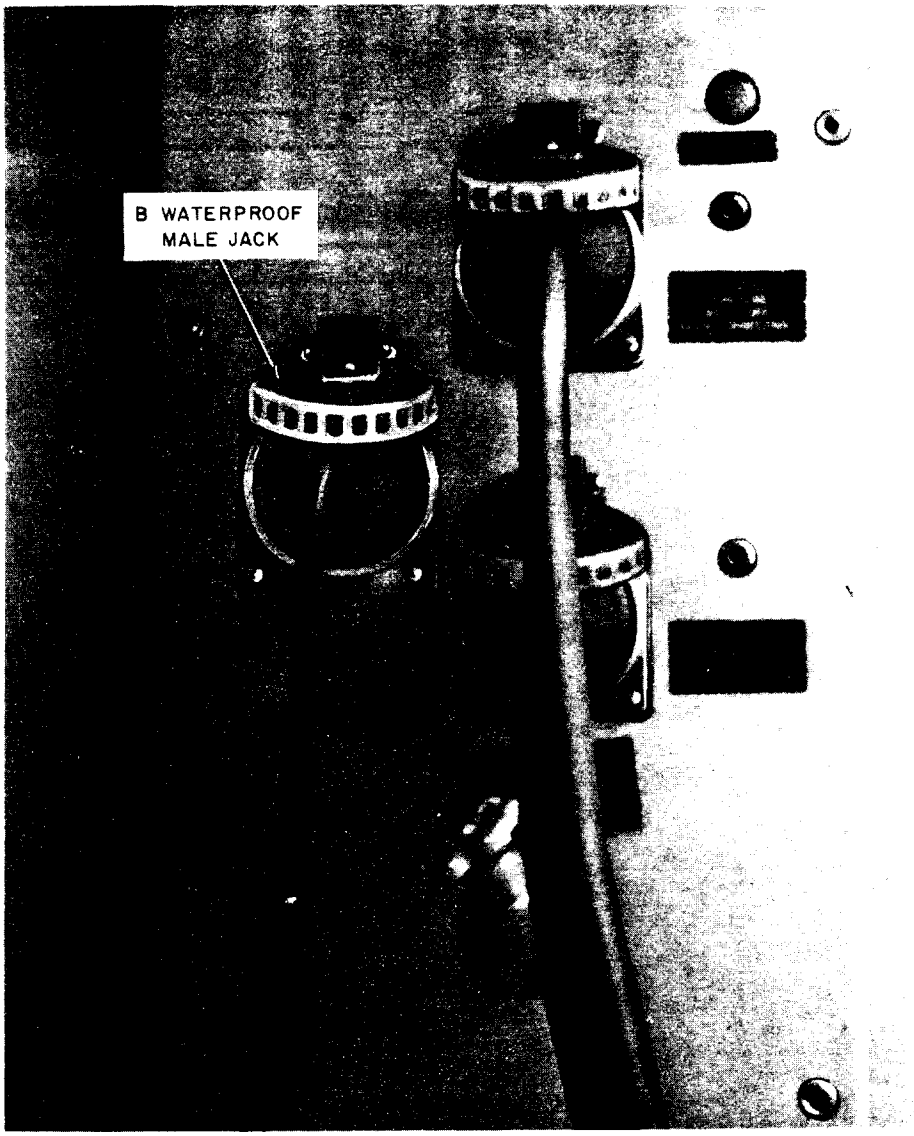

Fig. 23—Typical Cockpit Coaming B Waterproof Male Jack Installation

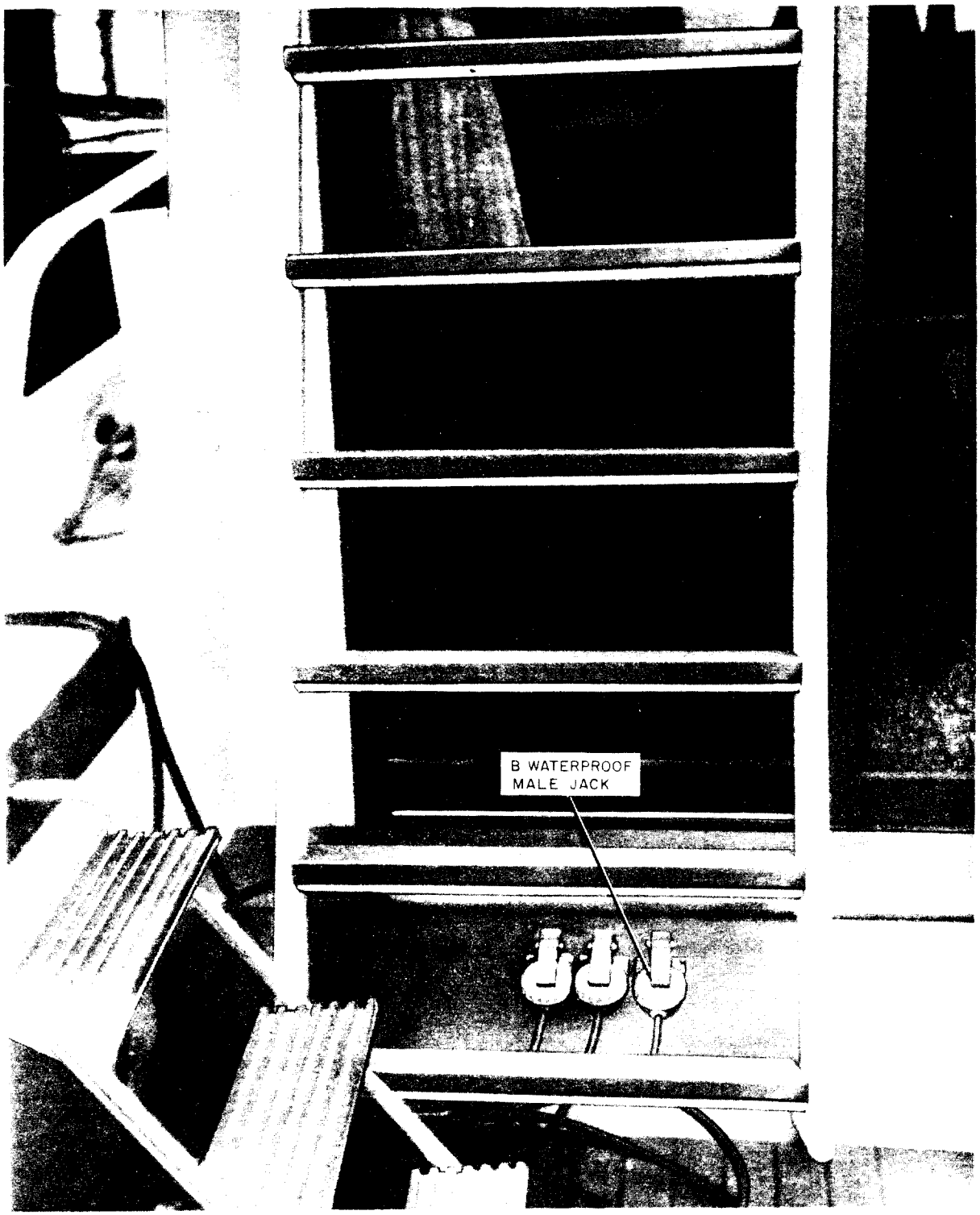

Fig. 24—Typical Boat Coaming B Waterproof Male Jack Installation

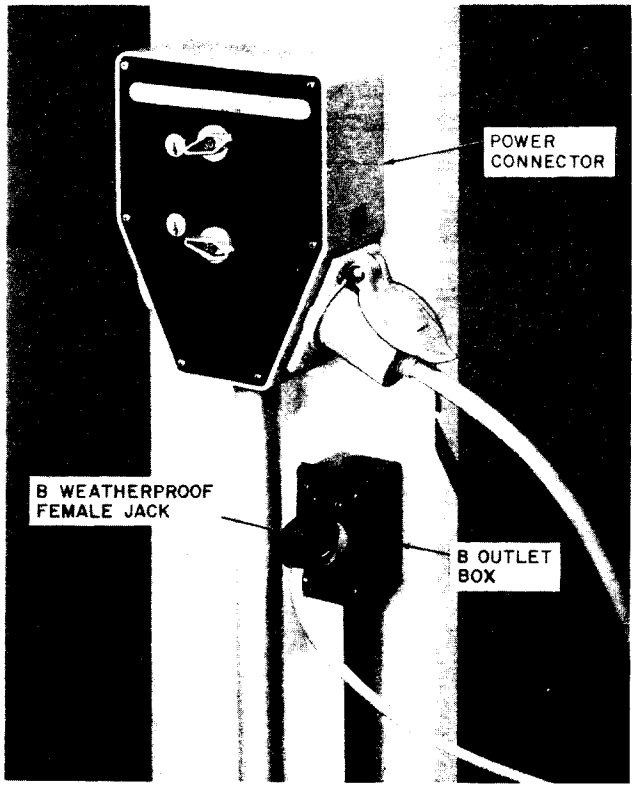

Fig. 25—B Weatherproof Female Jack on B Outlet Box Mounted on Post at Dock—Typical Installation

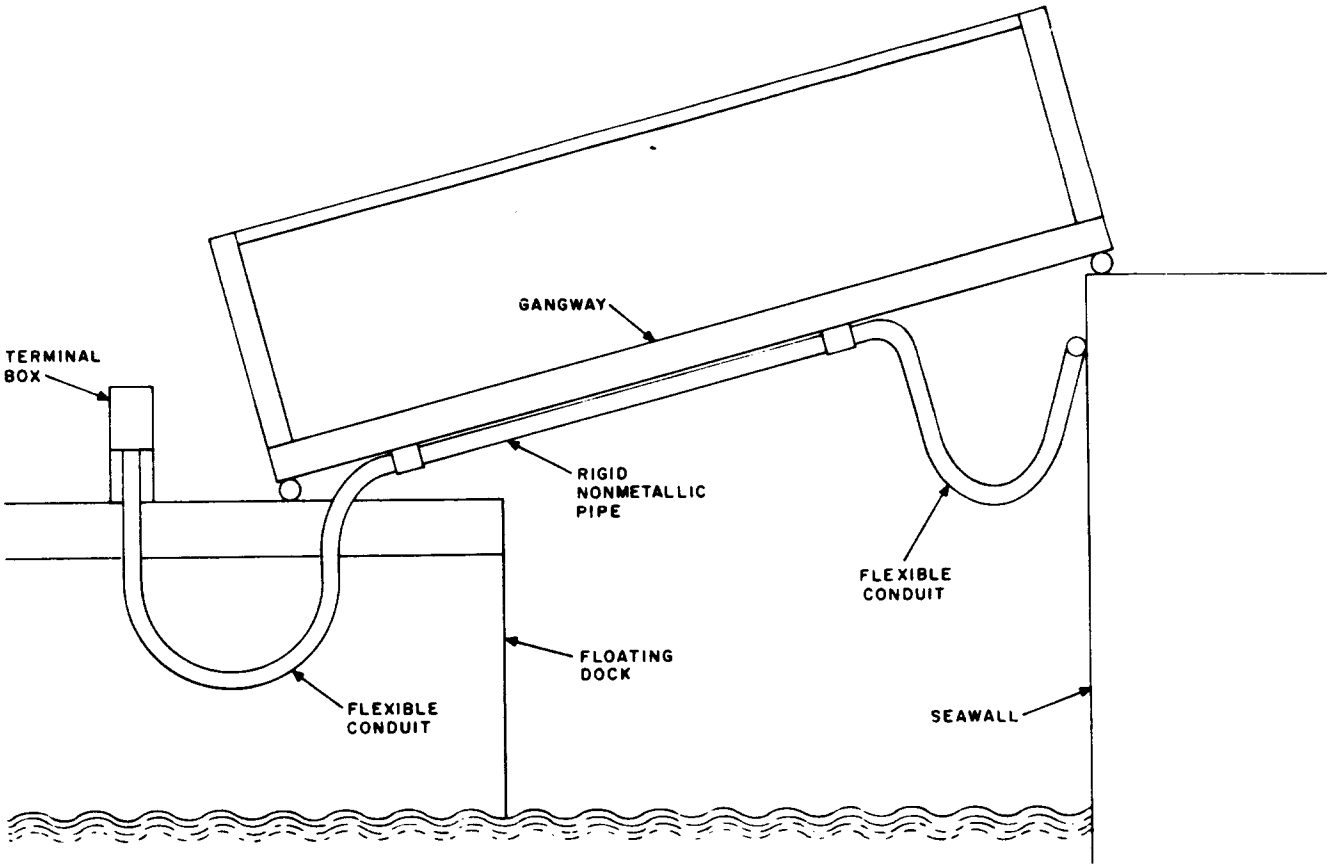

Fig. 26—Typical Shore to Dock Installation