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STANDARDS PUBLICATION/NO. OS 1-1984

nema

Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports

NEMA

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION • 2101 L STREET, N.W., WASHINGTON, D.C. 20037

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Foreword

The purpose of this standards publication is to provide a guide to the types and sizes of metal outlet boxes, device boxes, covers, and supports which are in general use or suggested for future design, or both. The standards present dimensional data needed for the safety and convenience of interchangeability with associated equipment. All items when properly installed and properly used contribute to safety.

Properly manufactured boxes and covers are, however, only one factor in minimizing the hazards which may be associated with the use of electricity. The reduction of hazard involves the joint efforts of the various equipment manufacturers, the system designer, the installer, and user. Information is provided herein to assist users and others in the proper selection of boxes and covers.

The manufacturer has limited or no control over the following factors which are vital to a safe installation.

1. Environmental conditions.
2. System design.
3. Equipment selection and application.
4. Installation.
5. Operating practices.
6. Maintenance.

This publication is not intended to instruct the user of the boxes and covers with regard to these factors except insofar as suitable equipment to meet needs can be recognized in this publication.

These standards are necessarily limited to defining the construction requirements for the products covered herein. The publication has been promulgated with a view towards reducing the hazard to persons and property when boxes and covers conforming with these standards are properly selected and installed in accordance with the *National Electrical Code.**

This standards publication has been reviewed with an input obtained from independent testing laboratories and major consumer representatives.

The publication will be reviewed periodically by the Outlet and Switch Box Section of NEMA so that it will be kept up to date with advancing technology. Comments will be welcomed and should be sent to:

Manager, Engineering Department
National Electrical Manufacturers Association
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Washington, D.C. 20037

OS 1-1984 revises and supersedes OS 1-1973 (R 1983). New or revised portions of the text are followed by their appropriate designations (NEMA Standard, Authorized Engineering Information, or Suggested Standard for Future Design) and the approval date of 5-16-1984. Unrevised portions were reaffirmed on 5-16-1984 but carry their initial dates of approval.

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Scope

This Standards Publication covers those general-purpose metal outlet boxes, device boxes, covers, and supports that are widely used by the consumer. These items (covered by Underwriters Laboratories Inc. *Metallic Outlet Boxes,* UL 514A-1983*) are designed to facilitate the pulling of wires, to protect and facilitate wiring splices and taps, to provide a means of mounting and protecting wiring devices, and to provide a connection for rigid conduit, electrical metallic tubing, armored cable, nonmetallic sheathed cable, flexible metallic conduit and knob-and-tube wiring systems.

Excluded from this Standards Publication are: "conduit bodies" and similar types of boxes; cabinets or cutout boxes; pull boxes; floor boxes; flush device plates; boxes, plates and covers designed for use with surface metal raceway systems only; and boxes larger than 100 cubic inches in volume except multiple-gang device boxes.

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SHEET-STEEL OUTLET BOXES, DEVICE BOXES, COVERS, AND BOX SUPPORTS

Section 1
DEFINITIONS

A *box support* is a means of securing an outlet or device box to the building structure. Supports shall be permitted to be an integral part of the box, attached to the box, or entirely separate.

NEMA Standard 11-16-1972.

A *device box* is a box which is designed to receive and support switches, receptacles, and similar devices. The term "device box" includes the following specific types:

1. A *gangable device box* is a device box which is designed to permit the removal of one or both sides of the box to join (or gang) as many sections as required, while maintaining a high degree of strength and rigidity.
2. A *nongangable device box* is a device box with permanently fixed sides.
3. A *thru-wall box* is a device box which is open at both front and back to permit the mounting of a flush device on each side of a partition.
4. A *tile-wall box* is a device box with square corners and no ears for use in tile, masonry, or marble walls.

NEMA Standard 11-16-1972.

An *extension ring* is a ring (which need not be round) intended to extend the sides of an outlet box or flush device box to increase the box depth.

NEMA Standard 11-16-1972.

An *outlet box* is a box used in an electrical wiring system for containing wire, taps, splices, or devices. It has provisions for the entry of conduit or cable assemblies and for the attachment of a separate cover which is used to close the box or provide support for devices or fixtures. With the cover in place, the enclosure guards live parts against accidental contact and protects the environment from faults occurring within the enclosure.

NEMA Standard 11-8-1973.

NOTE: An outlet box is made of metal or suitable nonmetallic material. The function of an outlet box when completely closed by a cover, which may or may not be part of a wiring device, is to guard live parts against outside accidental contact, to protect the surrounding environment from faults occurring within the enclosure, to permit inspection of the wiring system and to provide a safe means for replacement of wiring devices. Normally, outlet boxes have provisions in the side, ends, and bottom for the entrance of conductors through conduit, cable, or tubing. Outlet boxes also have provision for fastening covers which are separate or a part of a wiring device. The fastening means is not a hinge and provides for future removal. An outlet box also provides one or more of the following:

a. Support for fixture assemblies and lamp holders.
b. Access to the raceway system for which it is designed.
c. Extension of existing raceway or wiring system.
d. Ground continuity through the raceway or wiring system for which it is designed.
e. Utilization of accessories like fixture studs, clamps, bar hangers, extension rings, and so forth.

Authorized Engineering Information 11-8-1973.

The term "outlet box" includes the following specific types:

1. A *cable box* is an outlet which is provided with clamps for use with cable or flexible nonmetallic tubing.
2. A *concrete box* is an outlet box which is especially intended for support in concrete. It shall be permitted to be constructed to allow end-to-end extension and the application of covers on two sides. This box is not intended for floor installation.
3. A *conduit box* is an outlet box which is designed for connection to rigid metal conduit, electrical metallic tubing, flexible metal conduit, cable, or flexible nonmetallic tubing.

NEMA Standard 11-16-1972.

4. A *floor box* is an outlet box specifically designed for flush installation in a floor.

NEMA Standard 5-28-1981.

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5. A *gang box* is an outlet box which has provisions for the installation of one or more removable metal partitions.

6. A *hung-ceiling box* is an outlet box which consists of a ring and a back plate with supporting bars (see 2.4.4) for use with rigid metal conduit, electrical metallic tubing, flexible metallic conduit, armored cable, flexible nonmetallic tubing, or nonmetallic sheathed cable above suspended ceilings.

NEMA Standard 11-16-1972.

An *outlet box cover* is a cover which is intended to provide enclosure for the face of a box. The cover may or may not support or be provided with means for support of a wiring device, pendant cord, and so forth.

NEMA Standard 11-16-1972.

Section 2
GENERAL

2.1 MATERIAL

The thickness of boxes and covers of flat rolled sheet steel shall be not less than 0.0625 inch except that:

1. The minimum thickness at or within ¼ inch of any right-angle bend in a drawn sheet-steel box shall be 0.041 inch.

2. The average thickness of the sides and ends (see 2.9) of a drawn box shall be permitted to be 0.058 inch based on three measurements made on the side and end of the box not less than ⅜ inch from a right-angle bend. The three measurements are to be made in a line perpendicular to the front of the box at a point ¼ inch from the front, at a point ¼ inch from the right-angle bend at the back, and at a point equidistant between the two.

NEMA Standard 5-16-1984.

2.2 CORROSION PROTECTION

All surfaces of sheet-steel boxes, covers, and supports, except tapped holes, the area under the heads of screws securing the sides of a gangable device box, pierced holes and cut edges formed from zinc-coated stock, and bar hangers made of steel bar stock, shall be thoroughly and evenly protected against corrosion by either a zinc or a cadmium coating.

2.2.1 Outside Surfaces

The minimum thickness of the coating shall be not less than 0.0005 inch at any point on box supports, external clamps, and the outside surface of outlet boxes or covers.

2.2.2 Inside Surfaces

The minimum thickness of the coating shall be not less than 0.00015 inch at any point on internal clamps and the inside surface of outlet boxes or covers.

2.2.3 Screws

Screws of ferrous material shall be protected against corrosion by a zinc or a cadmium coating.

NEMA Standard 5-16-1984.

2.3 OPENINGS

2.3.1 Conduit Knockouts

Conduit knockout openings which are provided in boxes or covers for the entrance of conduit shall be effectively closed to afford protection practically equivalent to that of the box walls; however, the knockouts shall be so cut that they can be removed without deforming the box or cover in which they are located. Such knockout openings shall be located in flat surfaces of the boxes so that locknuts, bushings, or connectors, when in position, shall be permitted to be seated against these surfaces.

NEMA Standard 11-16-1972.

The drawings in this publication illustrate the minimum number of conduit knockouts considered adequate in a side, end, bottom, or cover of a box. These drawings illustrate typical knockout locations but are not intended to show required locations. Additional knockouts may be provided.

Authorized Engineering Information 11-16-1972.

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2.3.2 Cable-Size Knockouts

Cable-size knockout openings which are provided in boxes for the entrance of tubing or cable shall be effectively closed to afford protection practically equivalent to that of the box walls; however, the knockouts shall be so cut that they can be removed without deforming the box in which they are located. Such openings shall be located in flat surfaces. Clamps shall be installed in all boxes to firmly secure the cable or tubing. Cable-size knockouts shall have slots not more than 0.040 square inch in area.

NEMA Standard 11-16-1972.

The drawings shown in this publication illustrate the minimum number of cable-size knockouts considered adequate. Additional knockouts may be provided.

Authorized Engineering Information 11-16-1972.

2.3.3 Diameters of Knockouts

The actual diameters for five nominal sizes of knockouts shall be as shown in Table 2-1.

NEMA Standard 5-16-1984.

Table 2-1
DIAMETER OF KNOCKOUTS

Trade Size of Knockout	Diameter, Inches		
	Nominal	Minimum	Maximum
Cable Size	0.656[1]	0.651[1]	0.661[1]
½"	0.875	0.859	0.906
¾"	1.109	1.094	1.141
1"	1.375	1.359	1.406
1¼"	1.734	1.719	1.766

2.3.4 Open Holes

No dimension of an open hole in a box shall exceed 1 7/64 inch. The total area of open holes shall not exceed the values shown in Table 2-2.

In computing the area of openings, the oblique portion of a bevel-cornered box shall be considered as a part of the integral end.

NEMA Standard 11-16-1972.

[1]The maximum dimension of a horseshoe-shaped cable-size knockout, perpendicular to a flat side, shall be considered its diameter.

Table 2-2
AREA OF OPEN HOLES

Type of Box	Maximum Area of Openings, Square Inches		
	Total for Box	In Bottom (See 2.9)	In Any End or Side (See 2.9)
Single unit or two to four multiple-gang units	0.452	0.332	0.200
Five to seven multiple-gang units	0.784	0.664	0.200
Eight or more multiple-gang units	1.116	0.996	0.200

2.4 SUPPORTS

Outlet boxes shall be so designed that they can be securely fastened in place without depending on the support furnished by any system of wiring. A box support which is provided as a part of a box shall be so designed and constructed as to provide ample strength and rigidity.

Provision for supporting a device within the box shall be independent of the means used to support the box.

2.4.1 Supporting Ears

Supporting ears shall be of flat-rolled sheet steel not less than 0.036 inch (No. 19 Manufacturer's Standard Gauge) in thickness and suitably attached to the box.

2.4.2 Stud Face Brackets

The steel of stud face brackets at the prong line shall be not less than 1½ inches wide and not less than 0.0625 inch thick, or of such other dimensions as will furnish equivalent rigidity. Such brackets shall be capable of supporting a 50-pound weight for 5 minutes without breaking or pulling loose from box.

2.4.3 Stud Side Brackets

The steel of stud side brackets shall be not less than ¾ inch wide and not less than 0.054 inch thick, or of such other dimensions as will furnish equivalent rigidity. Such brackets shall be capable of supporting a 50-pound weight for 5 minutes without breaking or pulling loose from box.

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2.4.4 Bar Hangers (Adjustable or Fixed)

Bar hangers shall be made of steel $\frac{3}{16} \times \frac{1}{2}$ inch in cross section or be so constructed as to be capable of supporting a 200-pound weight for 5 minutes without breaking or pulling loose from its box.

NEMA Standard 5-16-1984.

2.5 COVER SCREWS

Cover screws shall be long enough to engage at least two full threads in the metal of the ears but not so long that, when the covers are clamped securely in position, they extend into the outlet box more than $\frac{1}{8}$ inch.

NEMA Standard 11-16-1972.

2.6 MARKINGS

2.6.1 Boxes and Covers

Boxes and covers shall be plainly marked with the name or trademark of the manufacturer and cubic capacity as required by the *National Electrical Code.*[1] The markings shall be readily visible after installation.

2.6.2 Clamps

A clamp which is furnished as part of an outlet box shall be marked to indicate the type of material with which it is intended to be used—"A" for armored cable, "N" for nonmetallic sheathed cable, and "T" for flexible nonmetallic tubing. Clamps which are suitable for use with all three types of material require no marking.

NEMA Standard 11-16-1972.

[1]ANSI/NFPA 70-1984. Copies are available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, or from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

2.7 GROUNDING

At least one 10-32 tapped ground screw hole shall be provided in all boxes designed for use with nonmetallic raceway and nonmetallic cable systems.

NEMA Standard 5-16-1984.

2.8 DIMENSIONAL TOLERANCES

Fractional dimensions shall be held to $\pm \frac{1}{32}$ inch and decimal dimensions shall be held to $\pm$ 0.010 inch unless otherwise indicated on the drawings.

NEMA Standard 11-16-1972.

2.9 FIGURES (SEE 2.3)

Figures 70 through 400 (see Table 2-3) give the sizes, dimensions, location and arrangement of knockouts, as well as other details pertaining to outlet boxes, covers, and supports. Overall dimensions of drawn boxes are the dimensions at the point of tangency of the radius from the bottom of the box to the sides or ends, or both, of the box and not at the open face of the box.

Certain noncritical construction and functional details are purposely avoided; for example, construction differences between assembled and drawn boxes, or the functional differences between screw holes, notches, keyhole slots, or straight slots in box covers are not covered by the drawings. Dimensions applicable to screw holes in box covers represent the final installed positions of cover screws.

Figures 2-1 and 2-2 illustrate the nomenclature used when referring to the sides, bottoms, and ends of boxes.

Authorized Engineering Information 5-16-1984.

Figure 2-3 illustrates minimum box/cover face opening.

Suggested Standard for Future Design 5-16-1984.

Figure 2-4 illustrates clearances between device box plaster ear mounting screws.

NEMA Standard &
Suggested Standard for Future Design 5-16-1984.

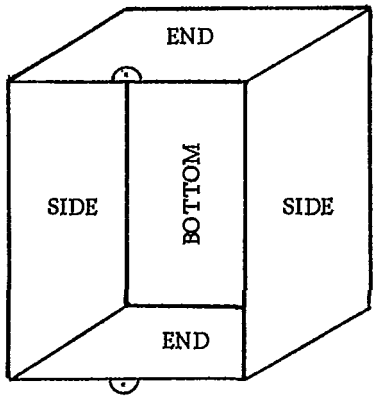


Figure 2-1
DEVICE BOX

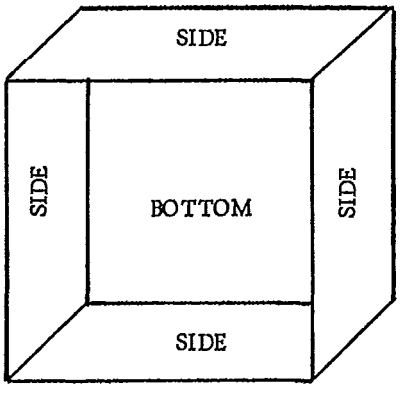
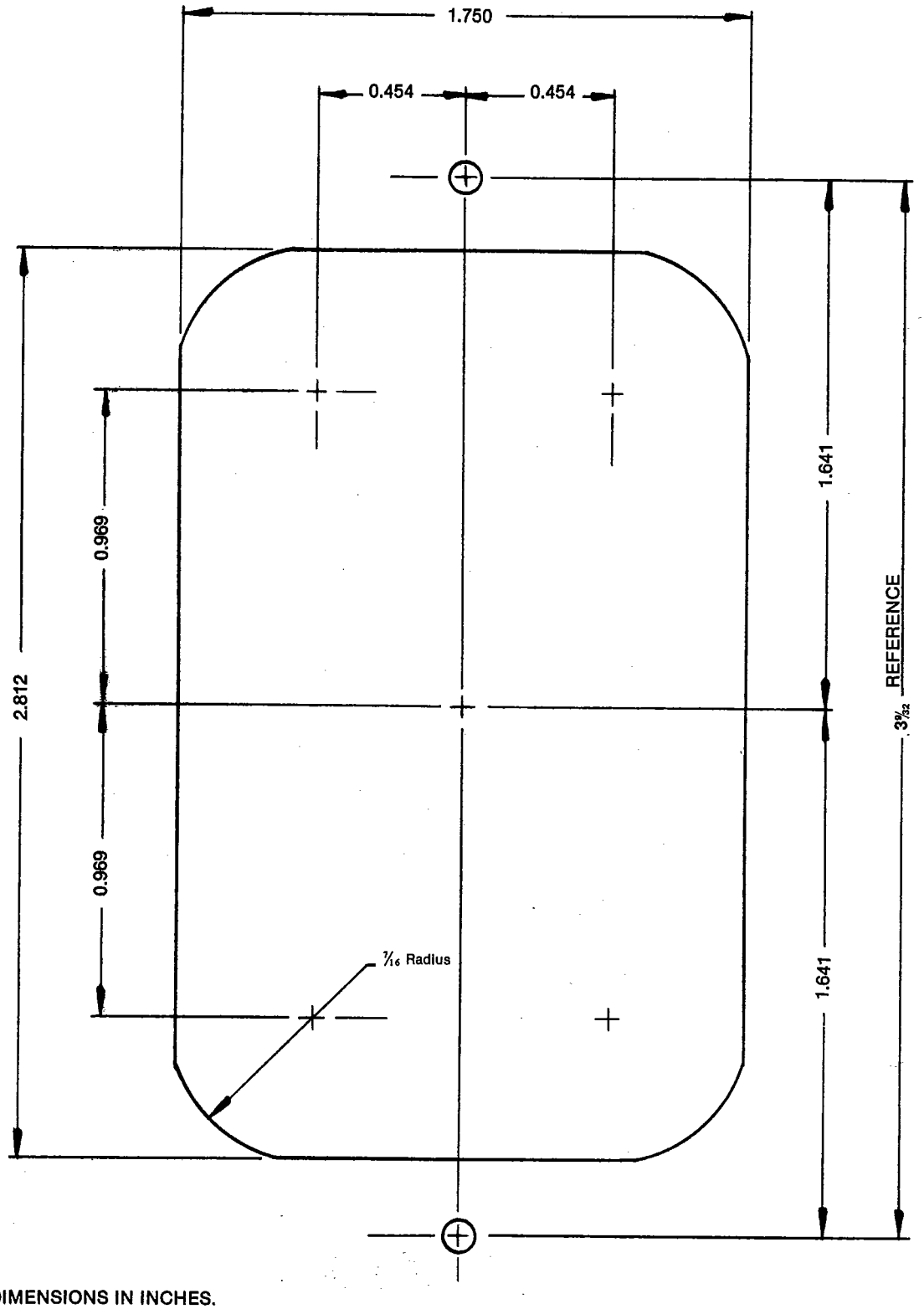


Figure 2-2
OUTLET BOX

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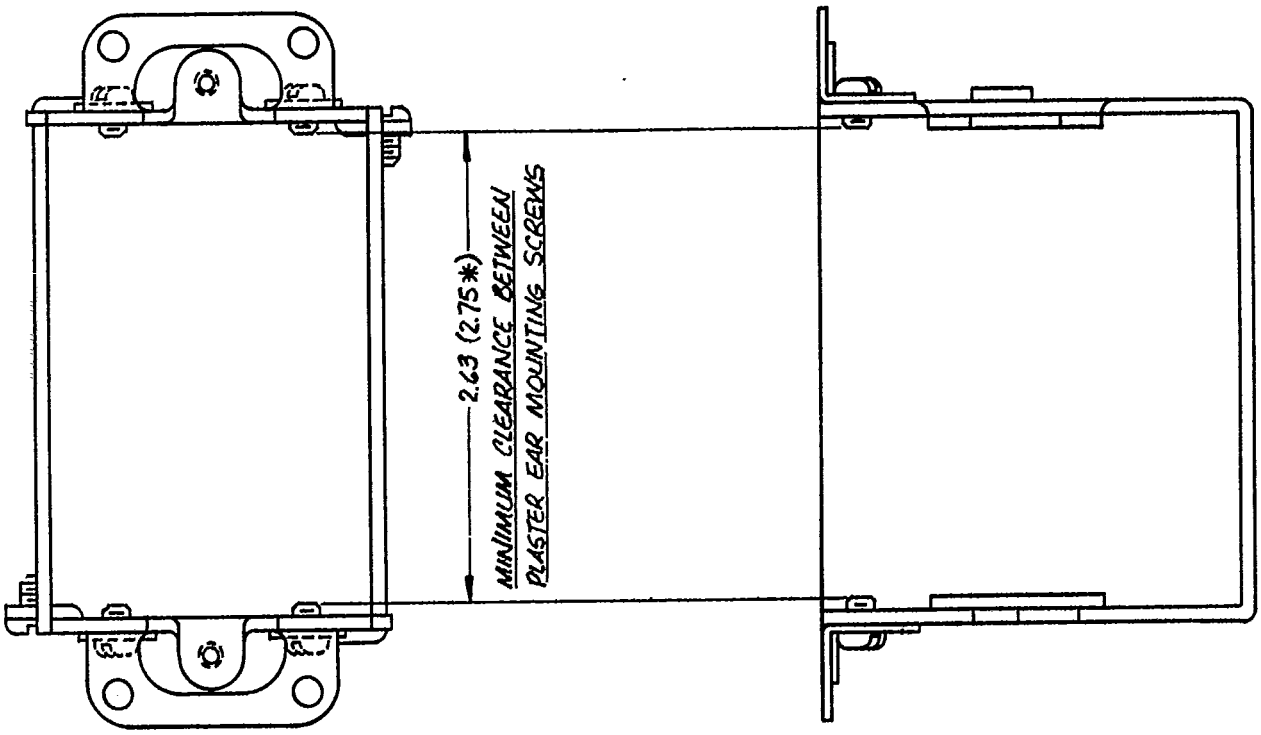
Figure 2-3
MINIMUM BOX/COVER FACE OPENING

Suggested Standard for Future Design 5-16-1984.

NOTE: This standand corresponds to the Wiring Device Maximum Envelope Dimensions illustrated in NEMA Standards Publication WD 6-1983 *Wiring Devices—Dimensional Requirements.* Available space at depths within the box may be further reduced by accessory hardware such as machine screws, nails, cable clamps, fixture studs, and so forth.

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Figure 2-4
CLEARANCE BETWEEN DEVICE BOX PLASTER EAR MOUNTING SCREWS
NEMA Standard 5-16-1984.

*Dimension in parentheses is approved as a Suggested Standard for Future Design.

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(Continued)

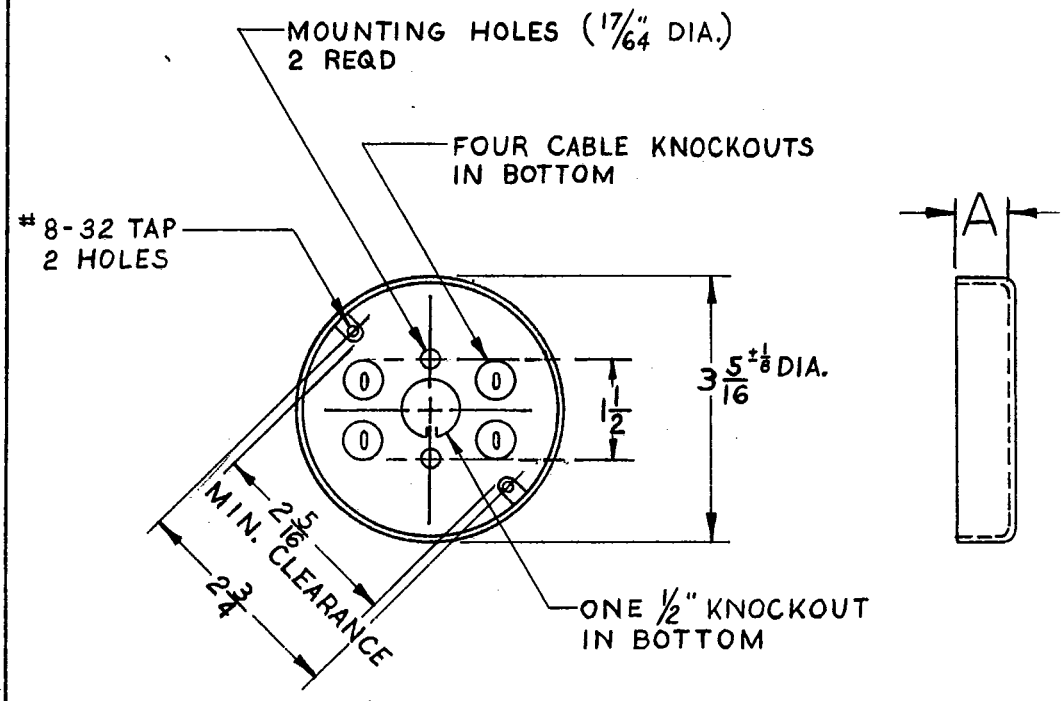
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Box and Conduit Support	400	90

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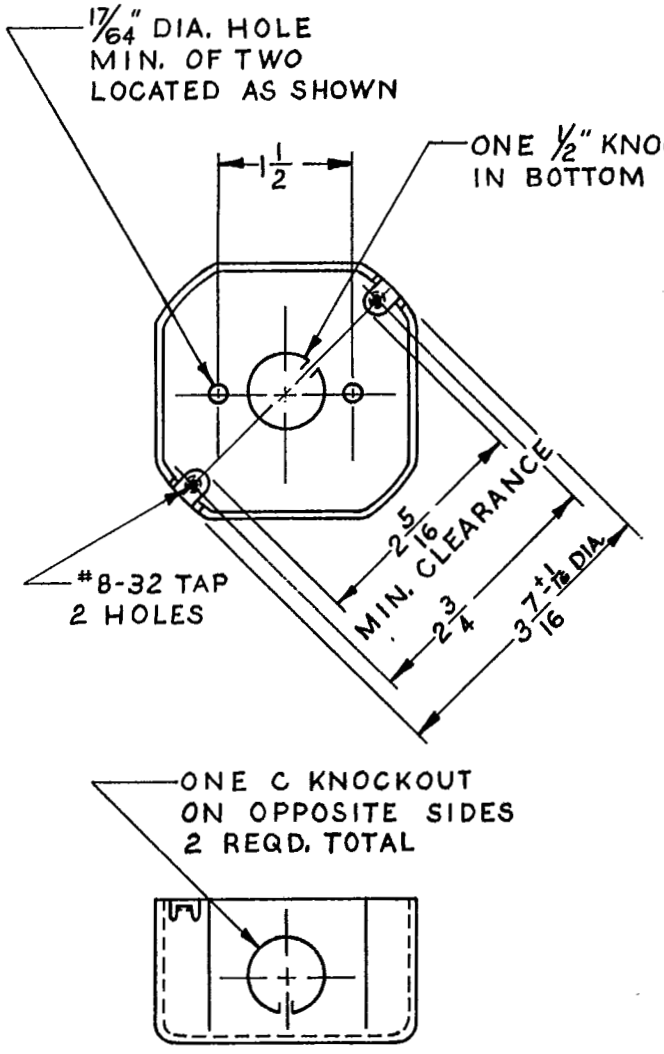
ITEM	A
1	1/2
2	3/4

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 70
3¼" ROUND CABLE BOX

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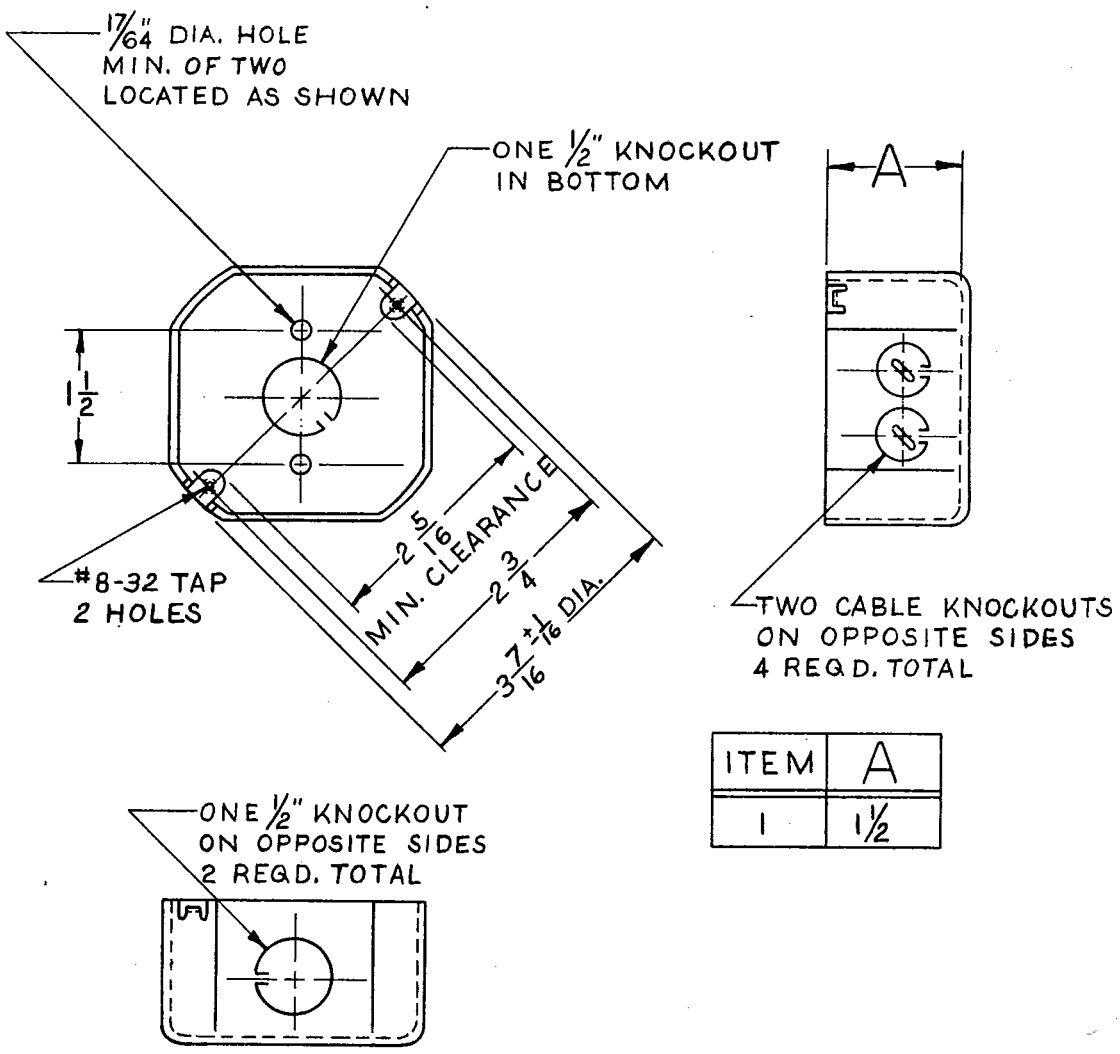
ITEM	A	B	C
1	1½	½	½
2	1½	½	¾

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 80
3½" OCTAGON BOX, 1½" DEEP, ½", AND ½" AND ¾" KNOCKOUTS

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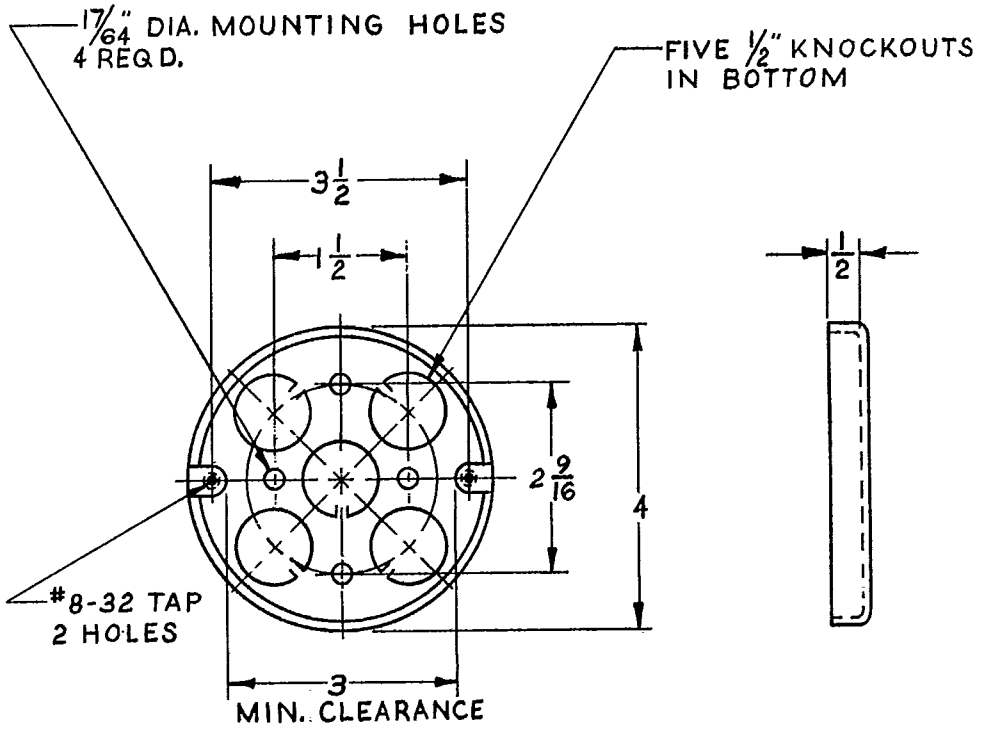
ITEM	A
1	1 1/2

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 81
3½" OCTAGON CABLE BOX, 1½" DEEP

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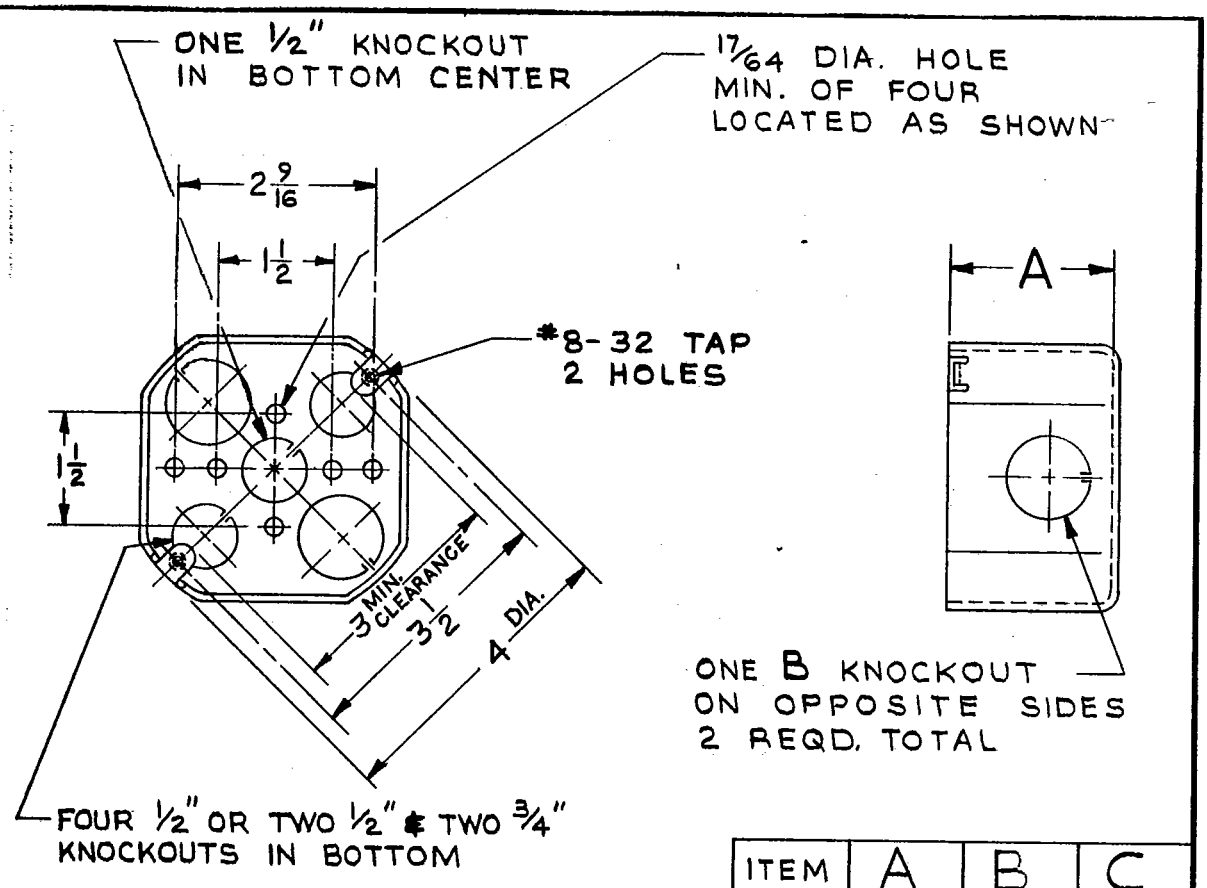


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 90
4″ ROUND BOX, ½″ KNOCKOUTS

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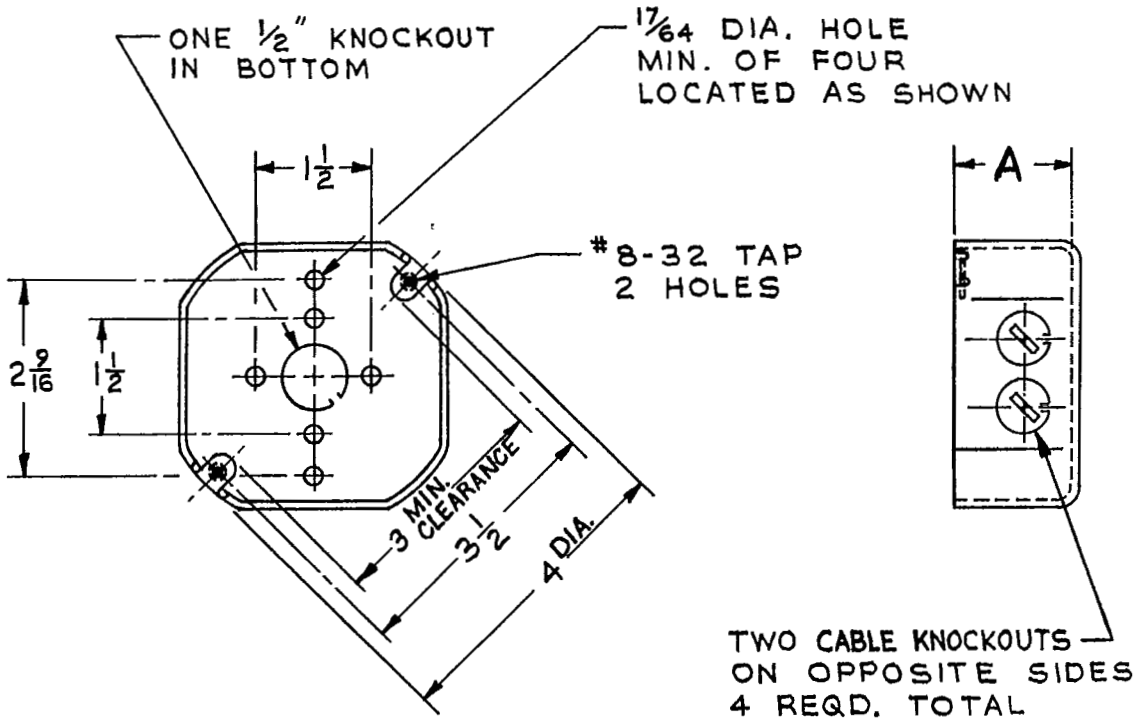
ITEM	A	B	C
1	1 1/2	1/2	1/2
2	1 1/2	3/4	3/4
3	1 1/2	1/2	3/4
4	2 1/8	1/2	1/2
5	2 1/8	3/4	3/4
6	2 1/8	1	1
7	2 1/8	1/2	3/4
8	2 1/8	3/4	1

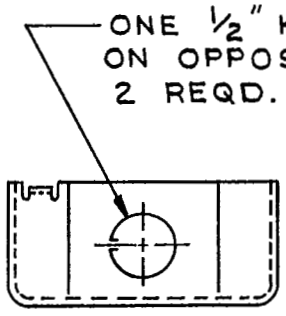
ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 100
4" OCTAGON BOX, 1½" AND 2⅛" DEEP, ½, ¾", or 1" KNOCKOUTS

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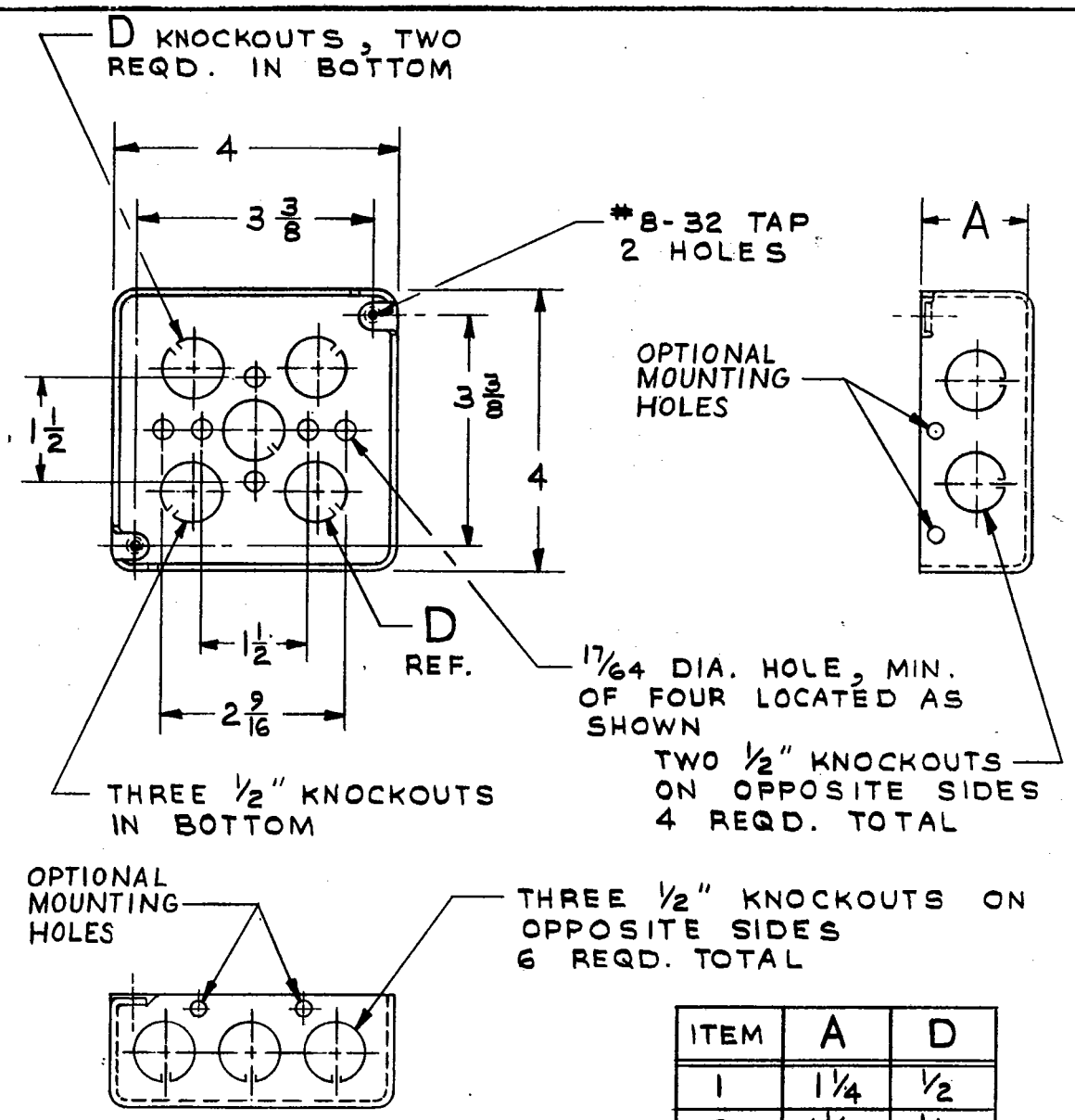
ITEM	A
1	1½
2	2⅛

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 101
4" OCTAGON CABLE BOX, 1½" AND 2⅛" DEEP

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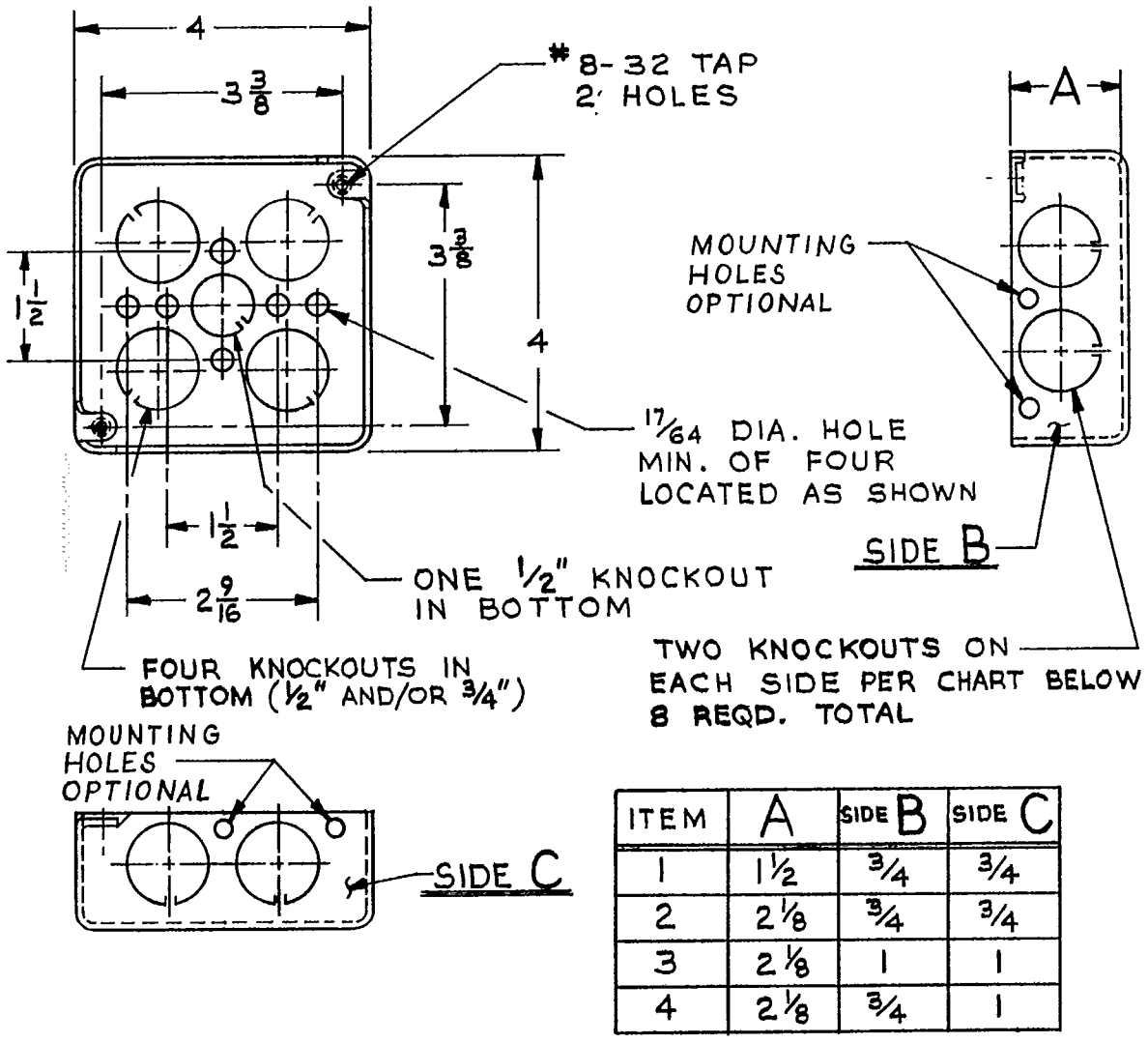
ITEM	A	D
1	1 1/4	1/2
2	1 1/2	1/2
3	2 1/8	1/2 OR 3/4

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 110
4" SQUARE BOX, 1¼", 1½", AND 2⅛" DEEP, ½" KNOCKOUTS

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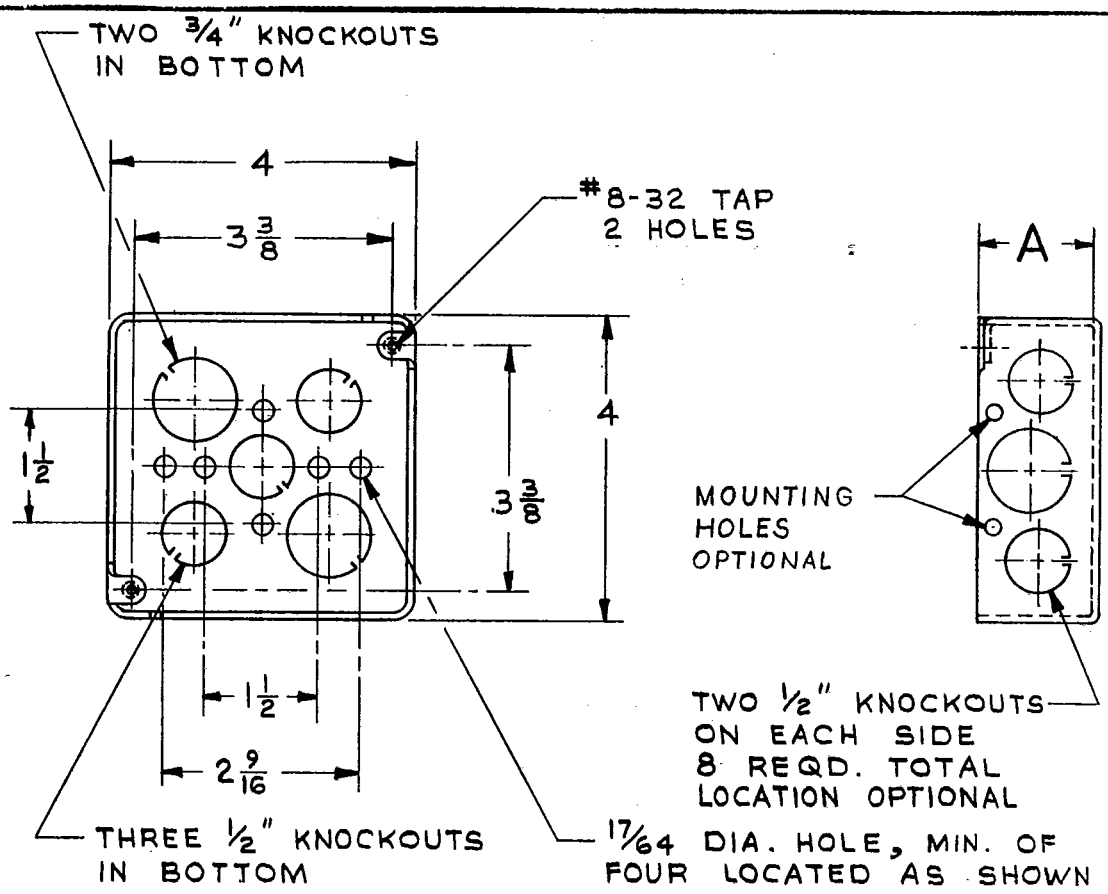
ITEM	A	SIDE B	SIDE C
1	1 1/2	3/4	3/4
2	2 1/8	3/4	3/4
3	2 1/8	1	1
4	2 1/8	3/4	1

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 111
4″ SQUARE BOX, 1½″ AND 2⅛″ DEEP, ¾″ AND 1″ KNOCKOUTS

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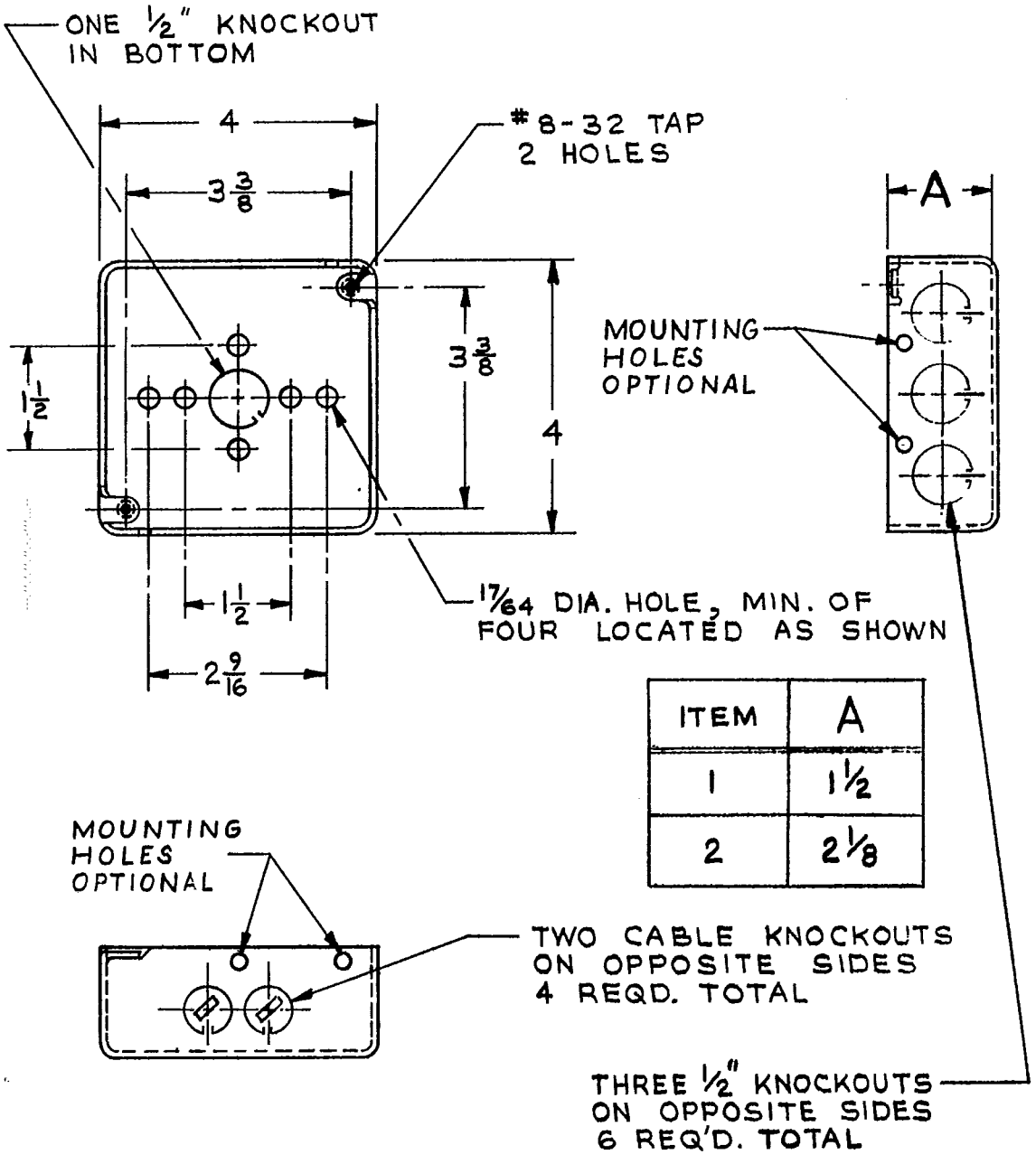
ITEM	A
1	1 1/2
2	2 1/8

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 112
4" SQUARE BOX, 1½" AND 2⅛" DEEP, COMBINATION ½" AND ¾" KNOCKOUTS

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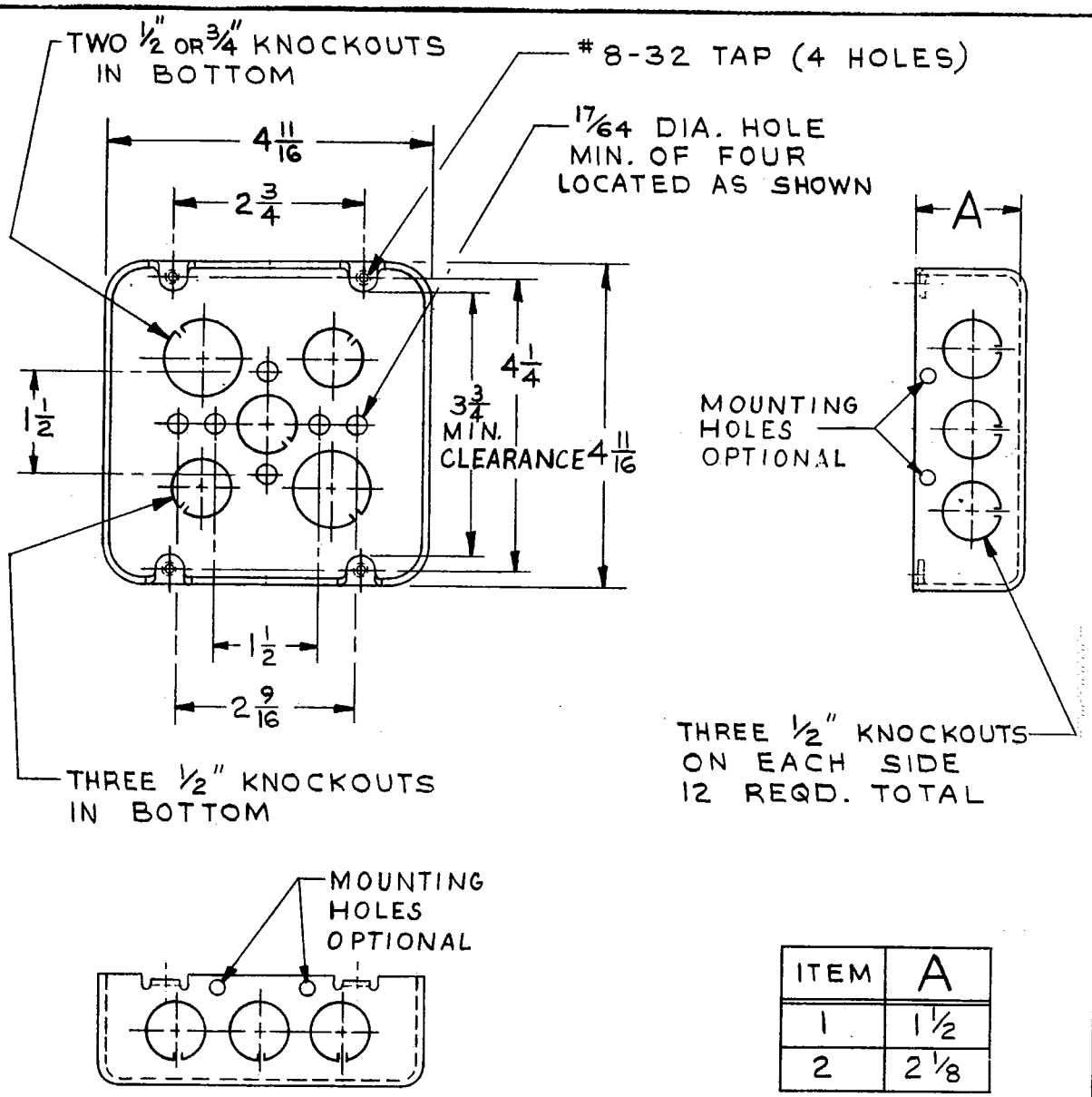
ITEM	A
1	1½
2	2⅛

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 113
4" SQUARE CABLE BOX, 1½" AND 2⅛" DEEP

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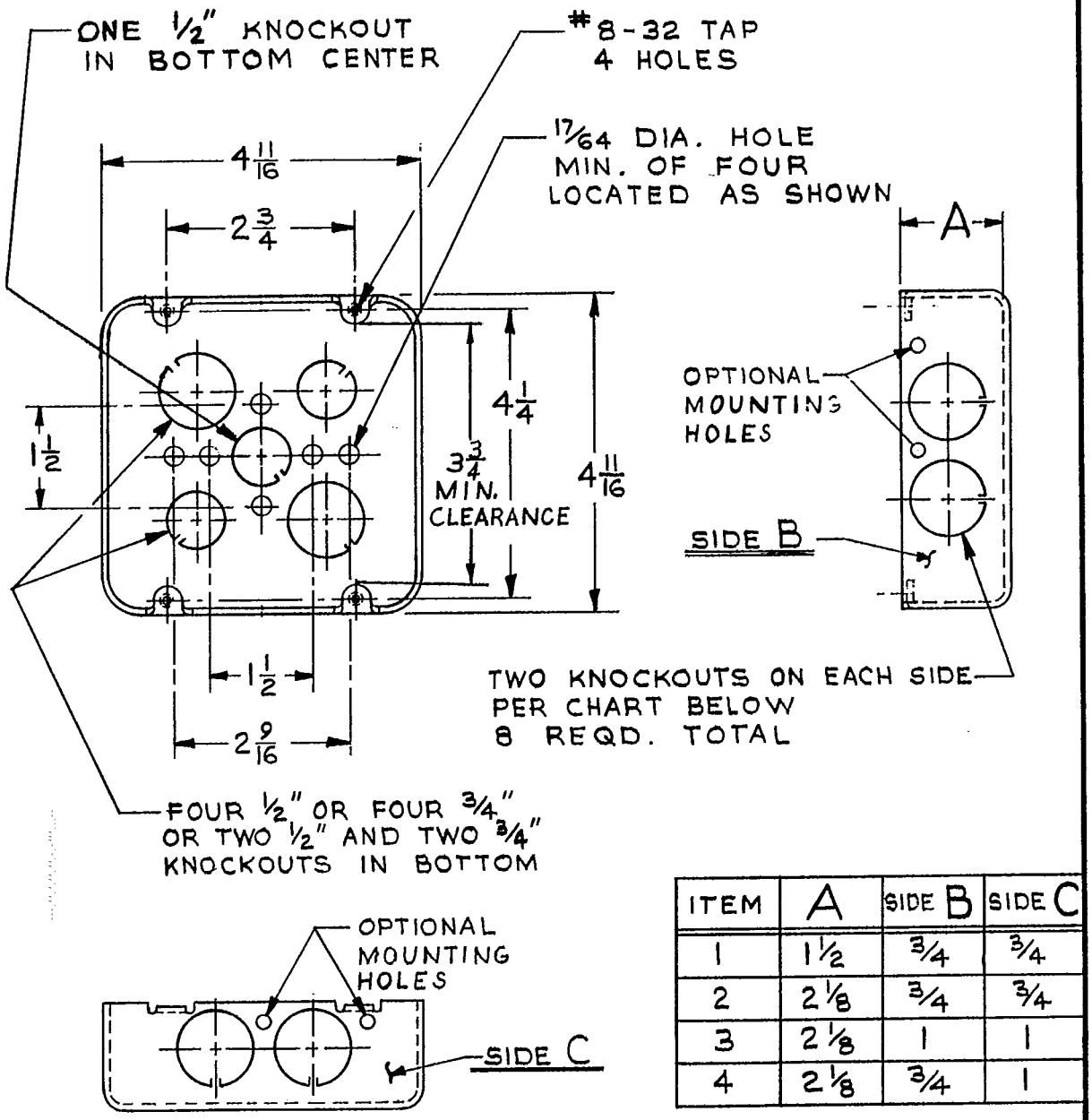
ITEM	A
1	1 1/2
2	2 1/8

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 120
4 1/16" SQUARE BOX, 1½" AND 2⅛" DEEP, ½" KNOCKOUTS

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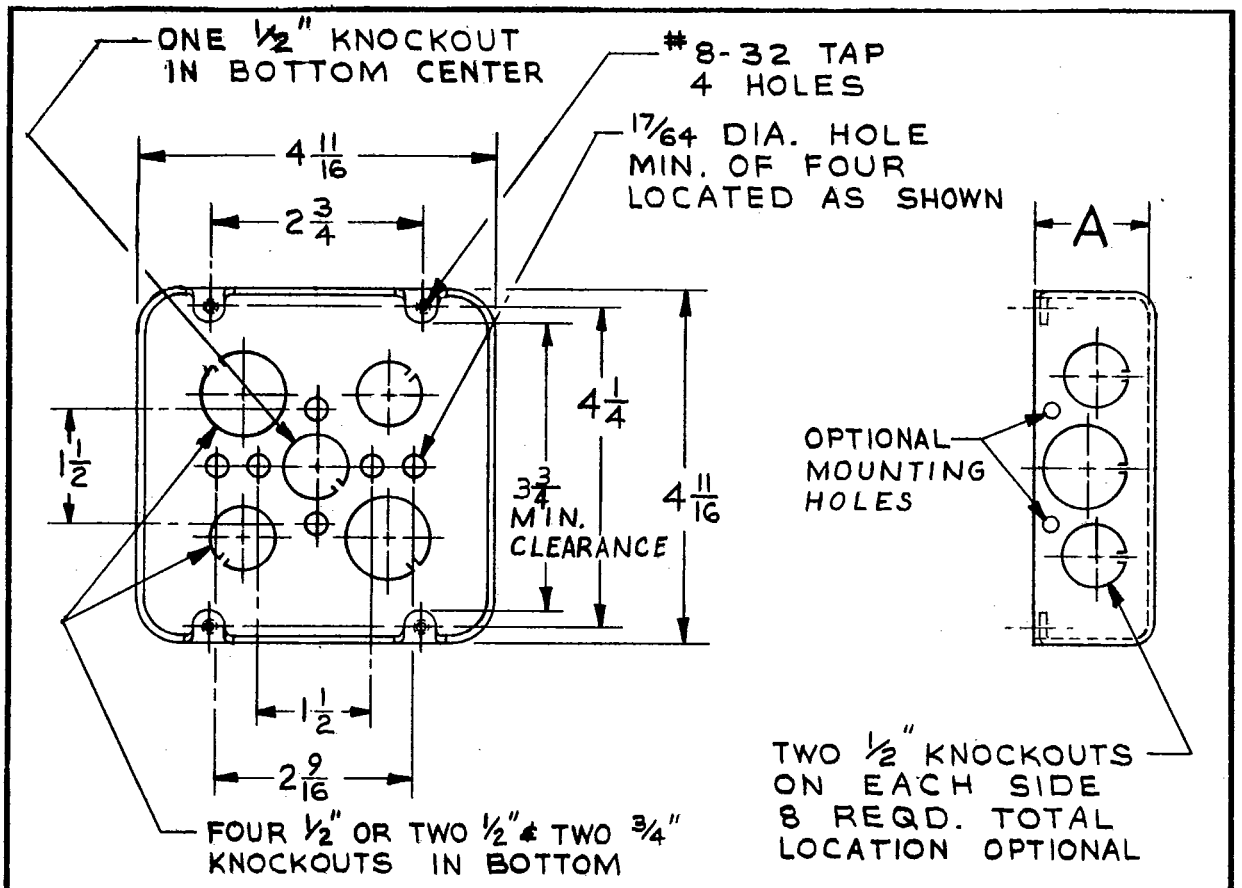
ITEM	A	SIDE B	SIDE C
1	1 1/2	3/4	3/4
2	2 1/8	3/4	3/4
3	2 1/8	1	1
4	2 1/8	3/4	1

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 121
4 11/16" SQURE BOX, 1½" AND 2⅛" DEEP, ¾" AND 1" KNOCKOUTS

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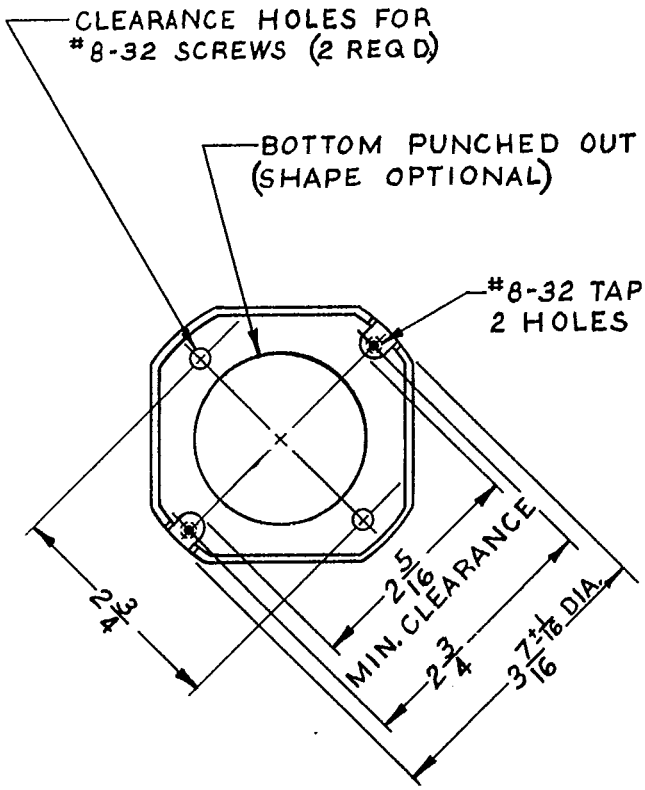
ITEM	A
1	1 1/2
2	2 1/8

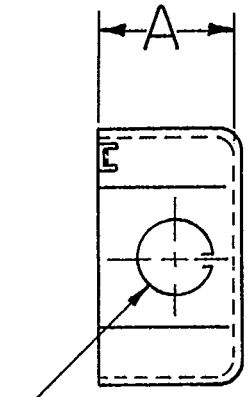
ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

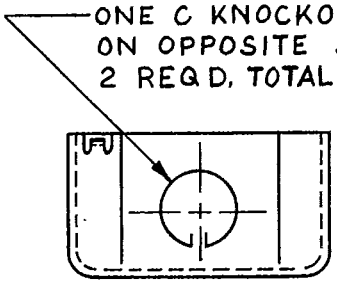
Figure 122
4 11/16" SQUARE BOX, 1½" AND 2⅛" DEEP, COMBINATION ½" AND ¾" KNOCKOUTS

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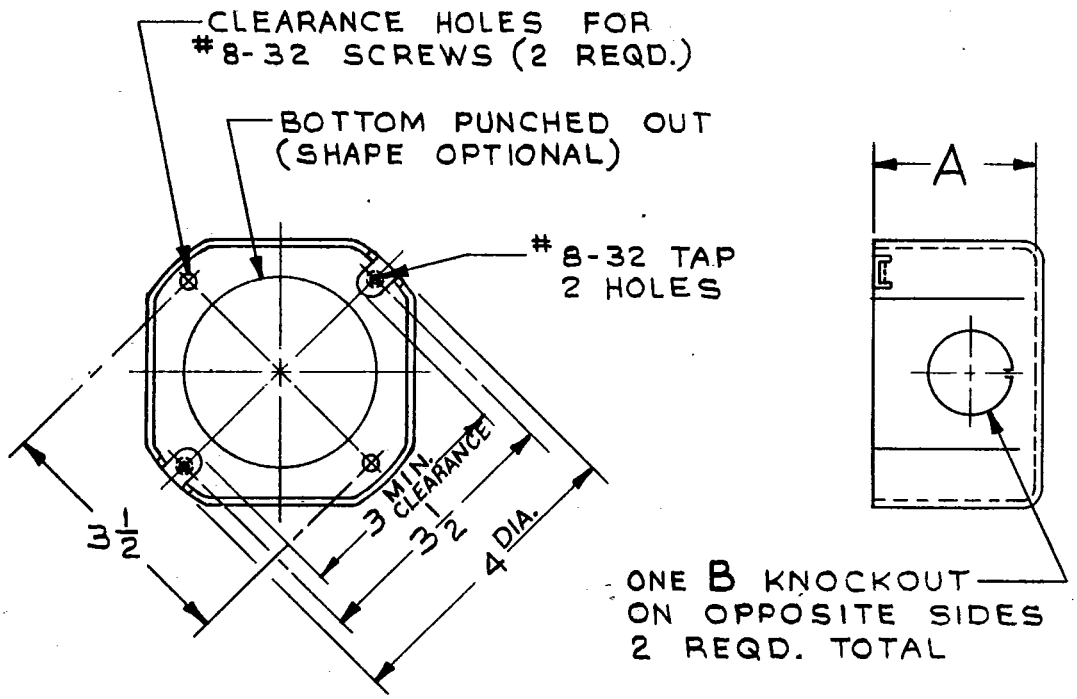
ITEM	A	B	C
1	1½	½	½

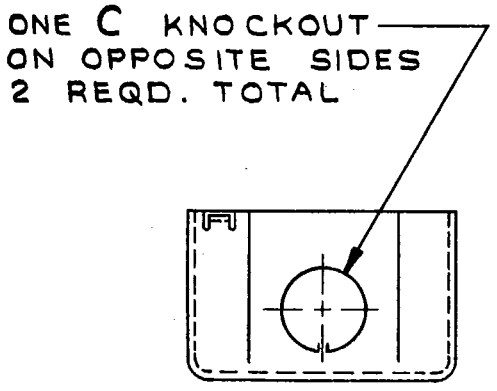
ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 125
3½" OCTAGON BOX EXTENSION, 1½" DEEP, ½" KNOCKOUTS

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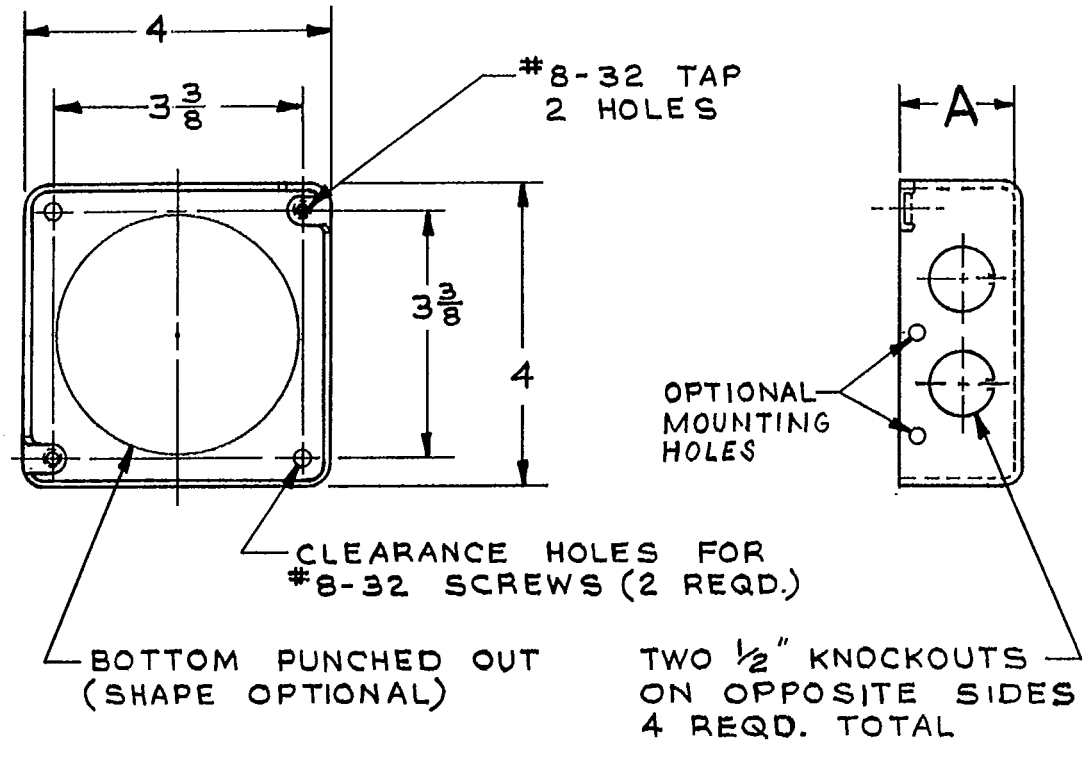
ITEM	A	B	C
1	1 1/2	1/2	1/2
2	1 1/2	3/4	3/4
3	1 1/2	1/2	3/4
4	2 1/8	1/2	1/2
5	2 1/8	3/4	3/4
6	2 1/8	1	1
7	2 1/8	1/2	3/4

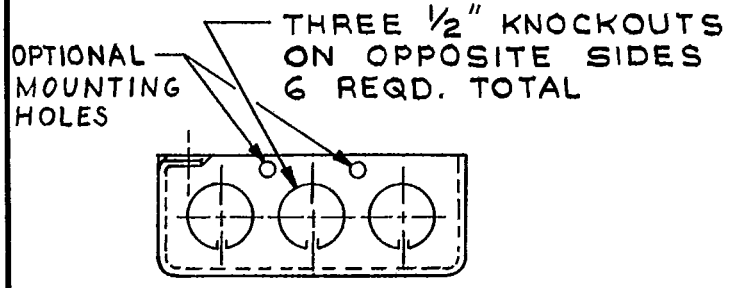
ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 130
4″ OCTAGON BOX EXTENSION, 1½″ AND 2⅛″ DEEP, ½″, ¾″, AND 1″ KNOCKOUTS

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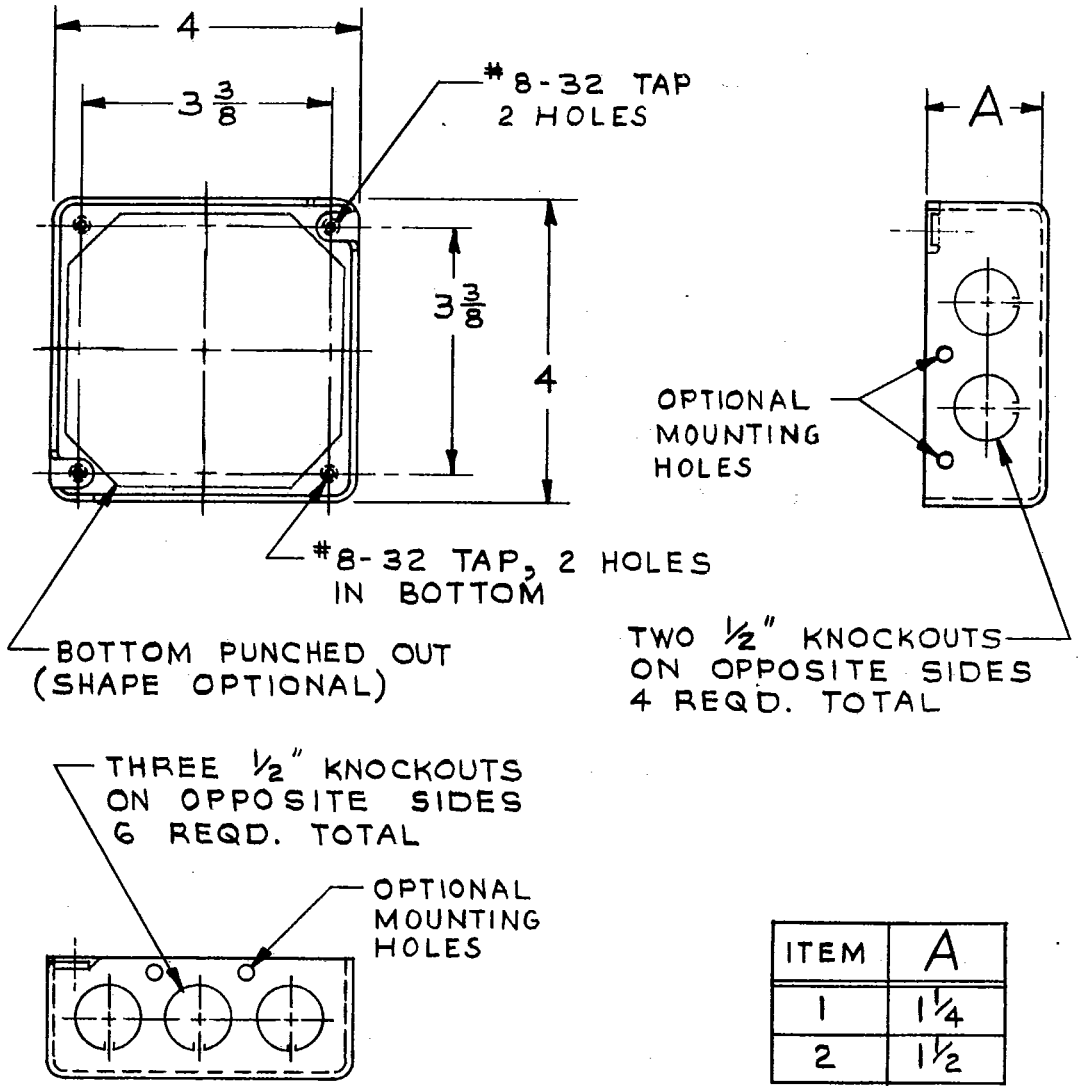
ITEM	A
1	1 1/2
2	2 1/8

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 140
4" SQUARE BOX EXTENSION, 1½" AND 2⅛" DEEP, ½" KNOCKOUTS

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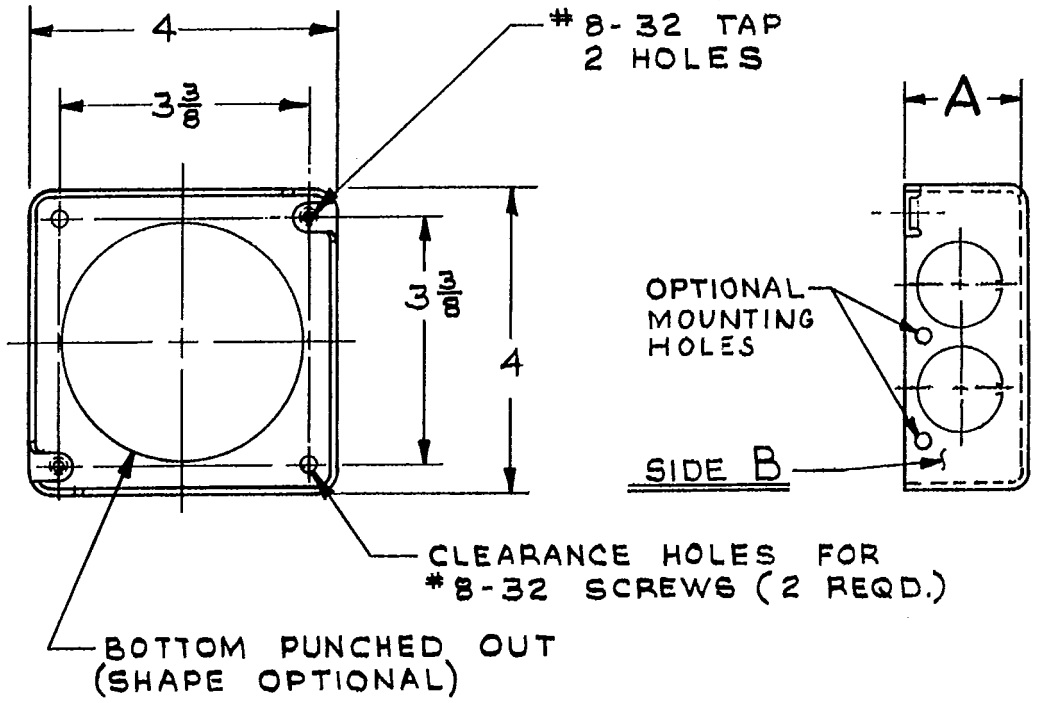
ITEM	A
1	1 1/4
2	1 1/2

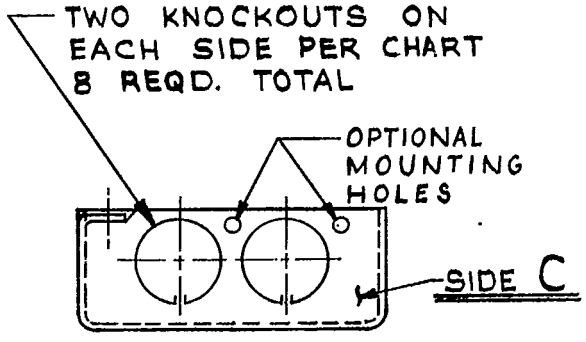
ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 141
4" SQUARE THRU-WALL BOX, 1¼" AND DEEP, ½" KNOCKOUTS

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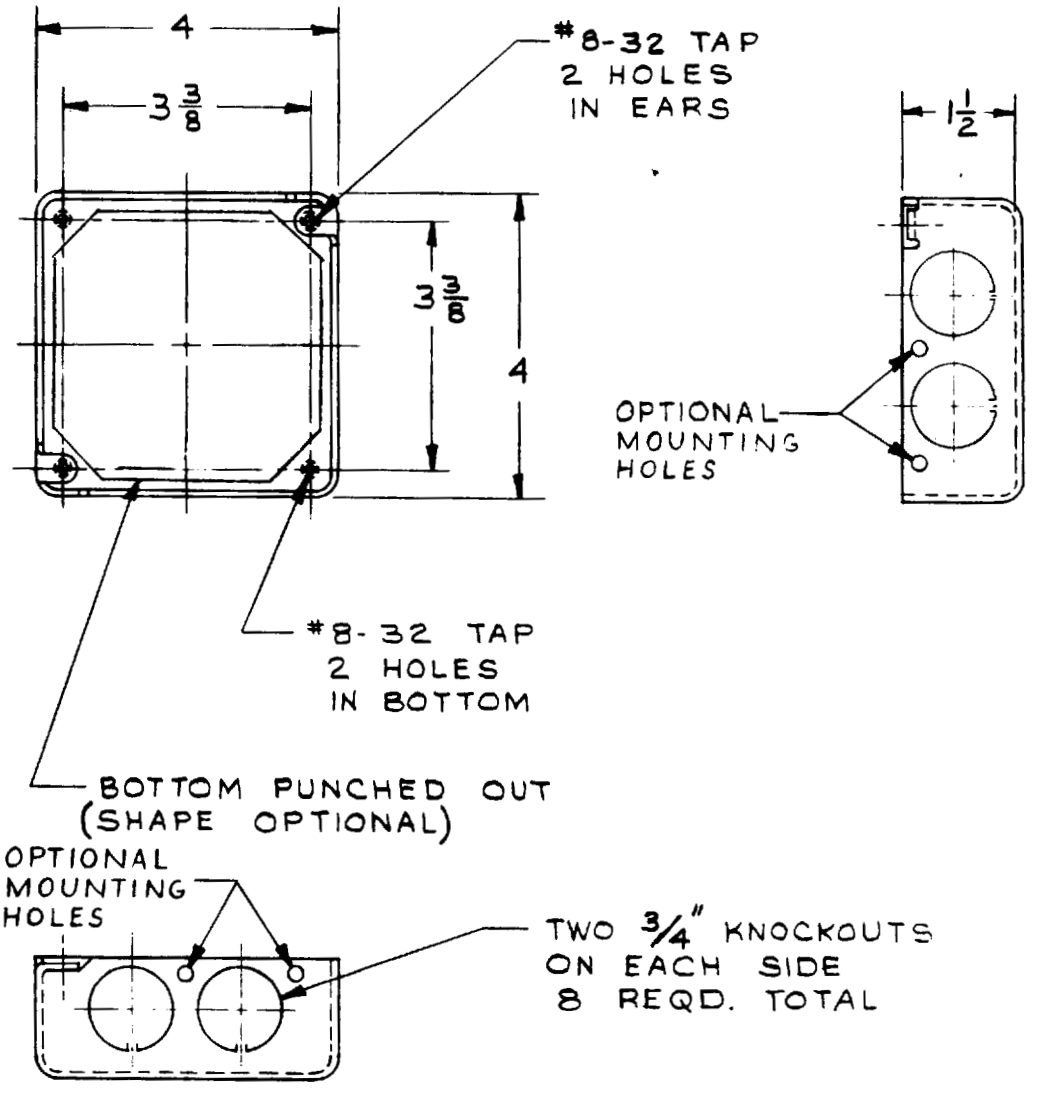
ITEM	A	SIDE B	SIDE C
1	1 1/2	3/4	3/4
2	2 1/8	3/4	3/4
3	2 1/8	1	1
4	2 1/8	3/4	1

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 142
4″ SQUARE BOX EXTENSION, 1½″ AND 2⅛″ DEEP, ¾″ AND 1″ KNOCKOUTS

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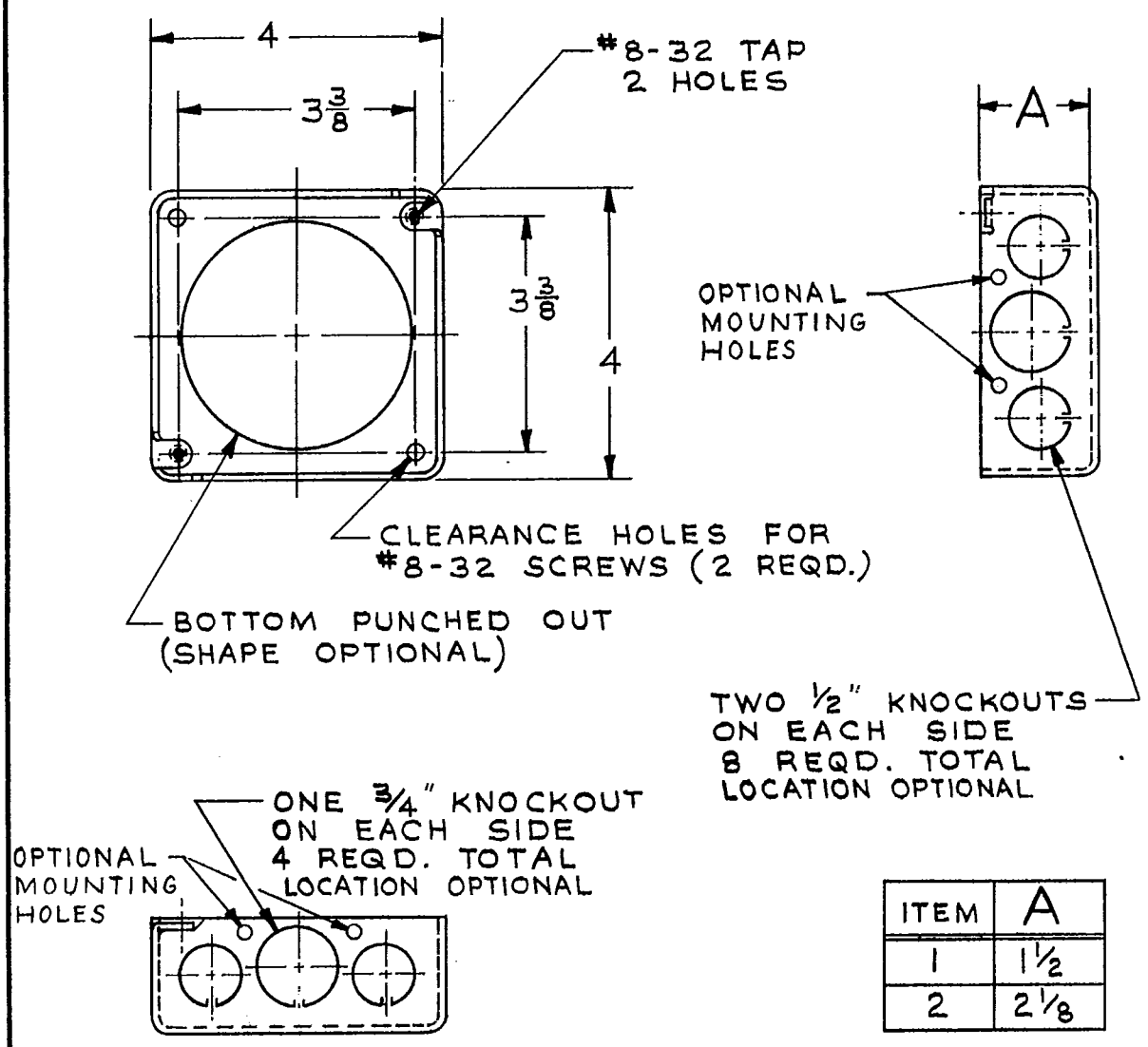


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 143
4″ SQUARE THRU-WALL BOX, 1½″ DEEP, ¾″ KNOCKOUTS

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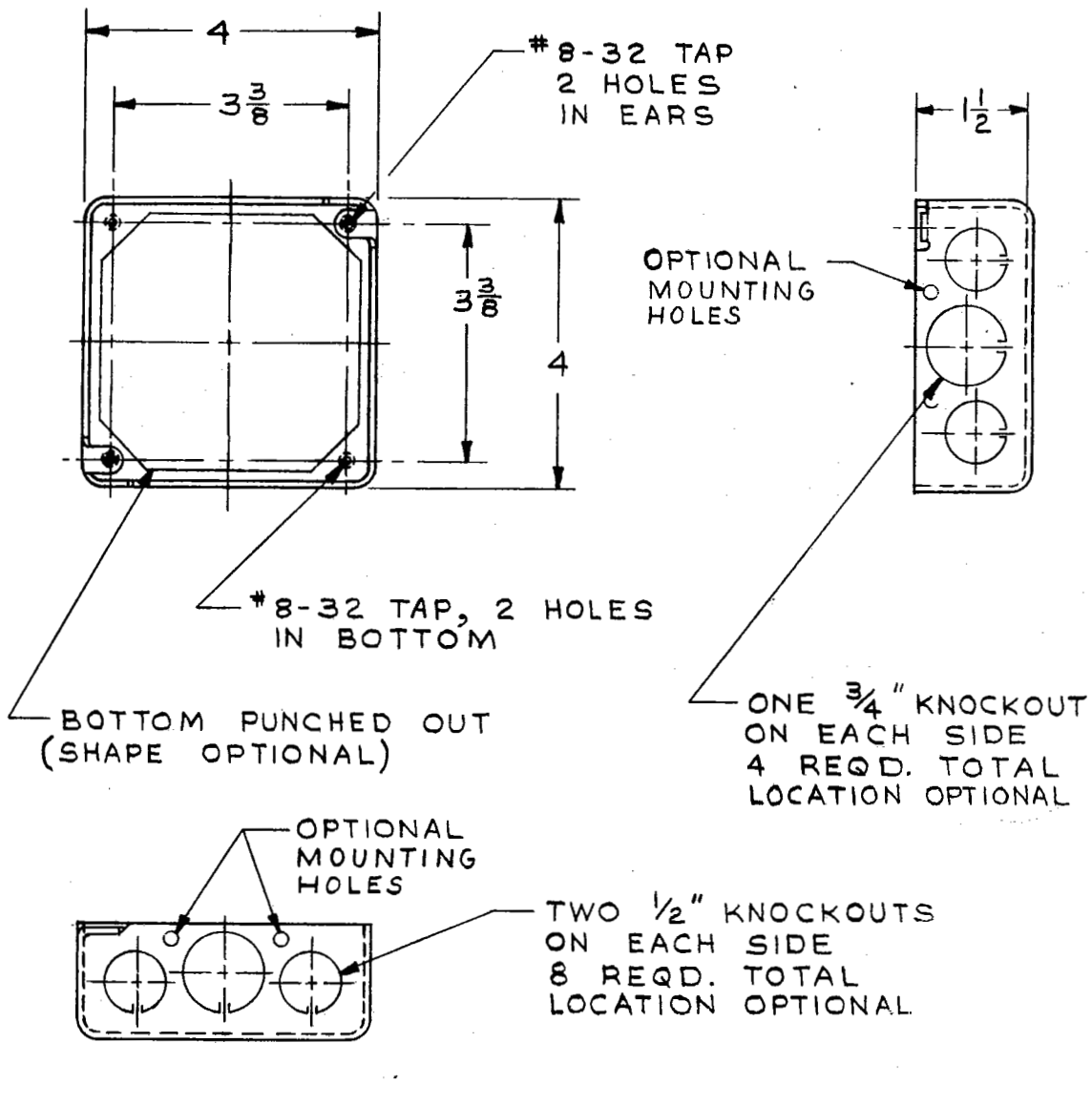
ITEM	A
1	1 1/2
2	2 1/8

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 144
4" SQUARE BOX EXTENSION, 1½" AND 2⅛" DEEP, COMBINATION ½" AND ¾" KNOCKOUTS

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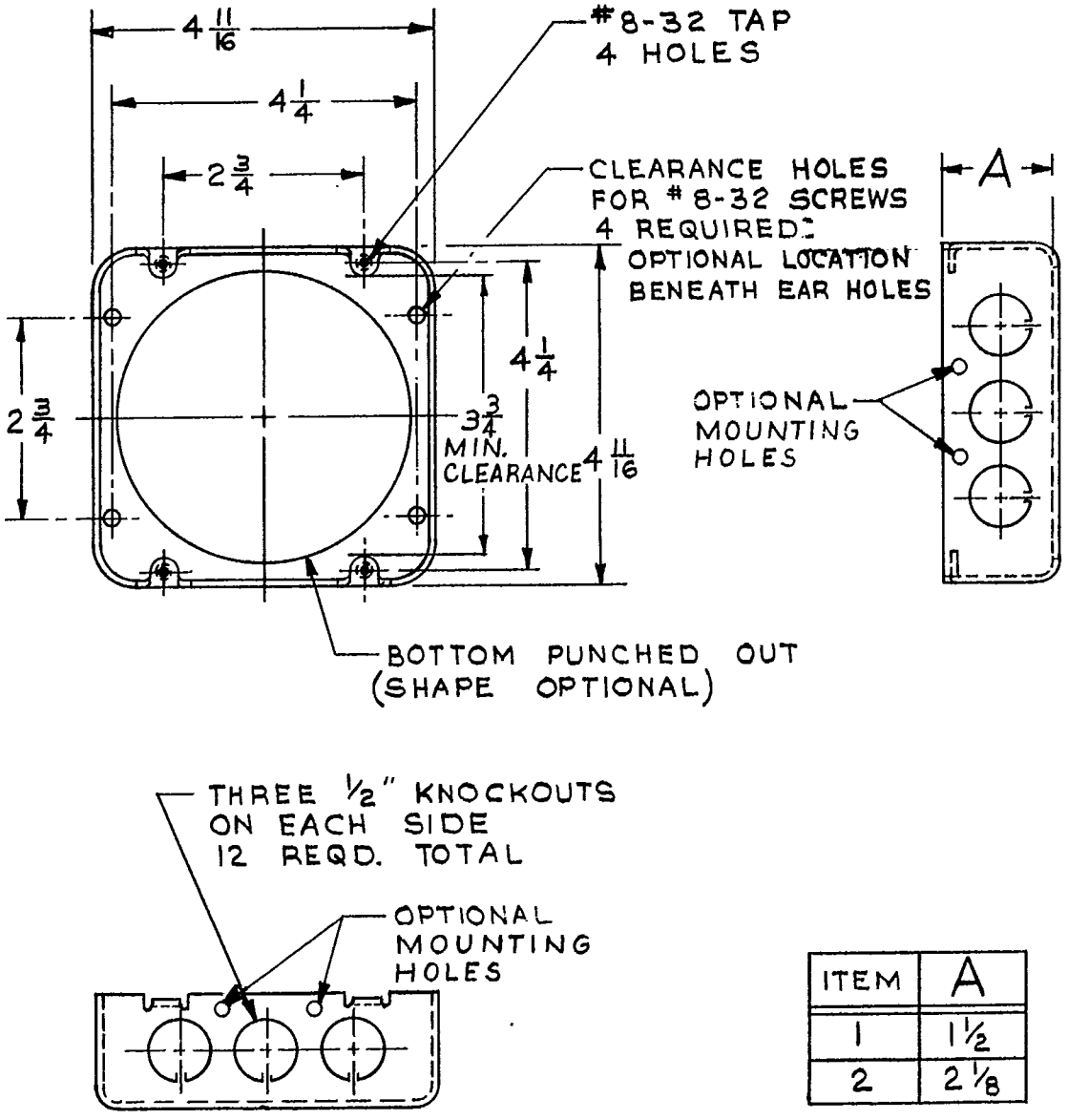


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 145
4″ SQUARE THRU-WALL BOX, 1½″ DEEP, COMBINATION ½″ AND ¾″ KNOCKOUTS

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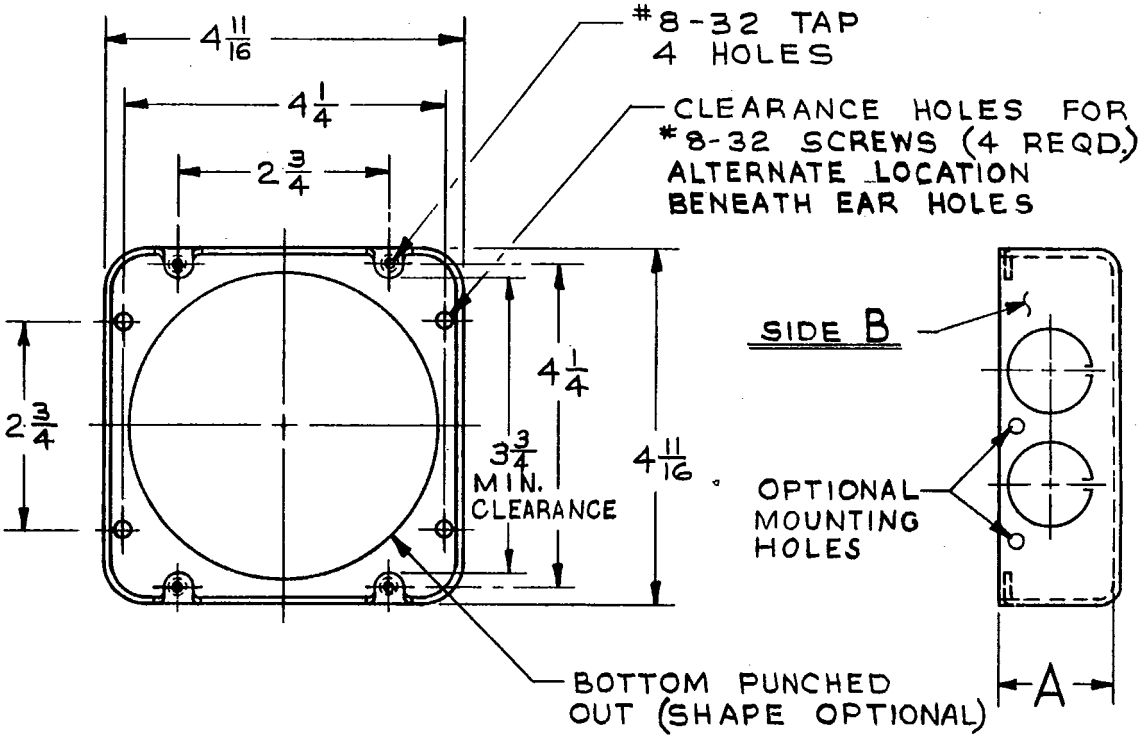
ITEM	A
1	1½
2	2⅛

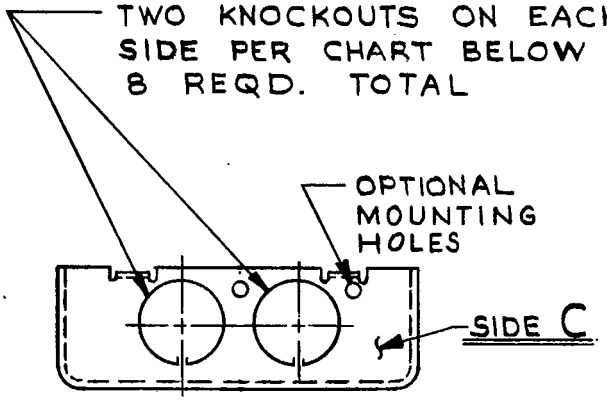
ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 150
4 11/16" SQUARE BOX EXTENSION, 1½" AND 2⅛" DEEP, ½" KNOCKOUTS

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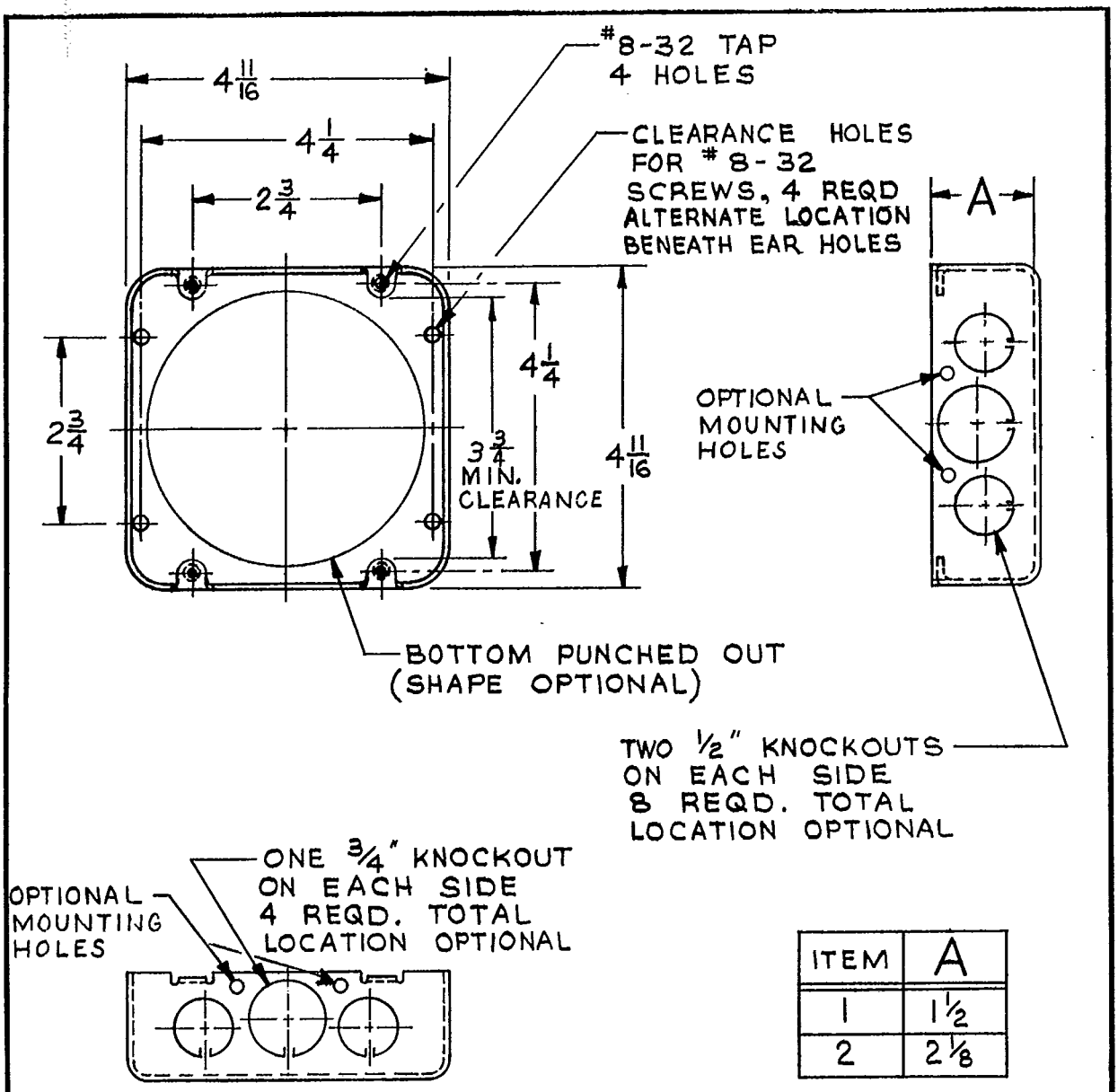
ITEM	A	SIDE B	SIDE C
1	1½	¾	¾
2	2⅛	¾	¾
3	2⅛	1	1
4	2⅛	¾	1
5	2⅛	¾ & 1	¾ & 1

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 151
4 11/16″ SQUARE BOX EXTENSION, 1½″ AND 2⅛″ DEEP, ¾″ AND 1″ KNOCKOUTS

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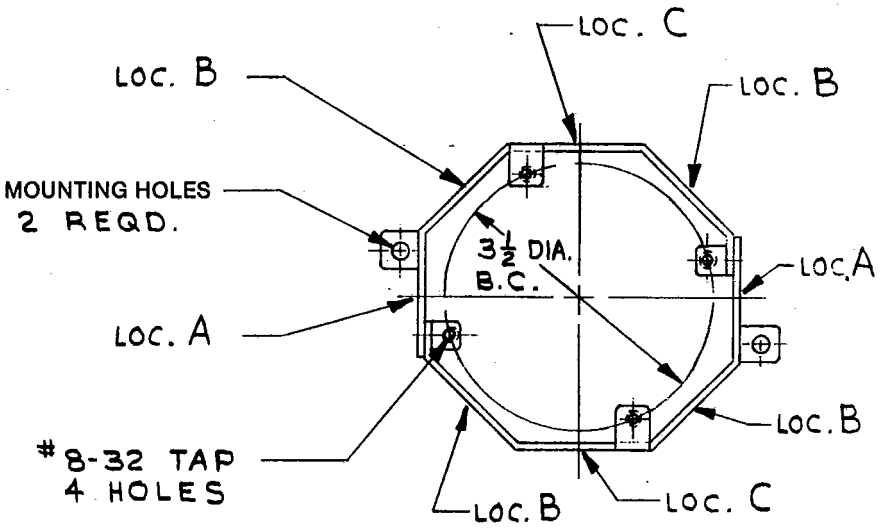
ITEM	A
1	1 1/2
2	2 1/8

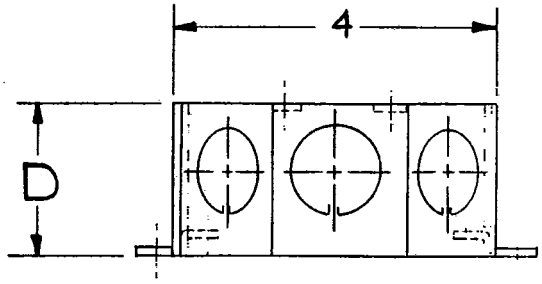
ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 152
4 11/16" SQUARE BOX EXTENSION, 1½" AND 2⅛" DEEP, COMBINATION ½" AND ¾" KNOCKOUTS

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ITEM	D
1	2
2	2½
3	3
4	3½
5	4
6	5
7	6

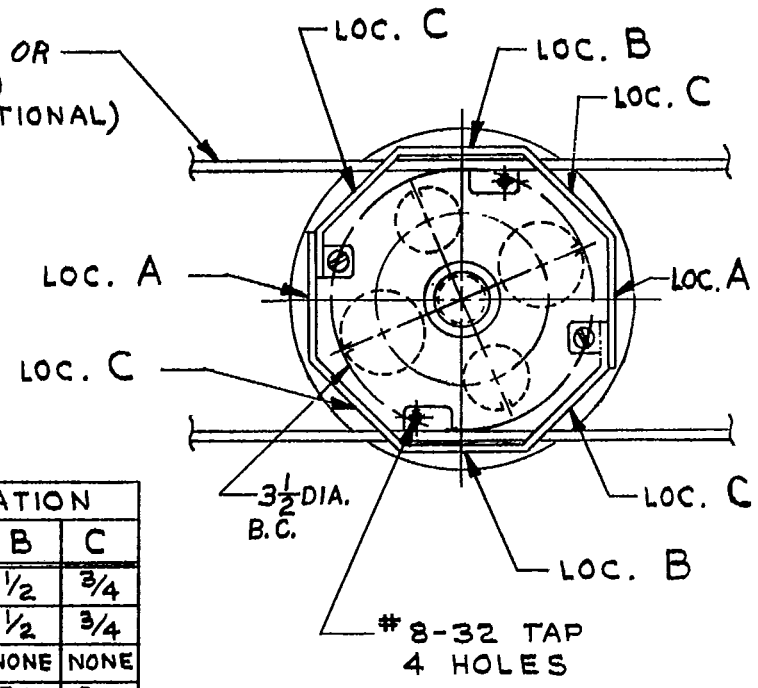
	KNOCKOUT INFORMATION			
STYLE	AMOUNT & SIZE	A	B	C
A	EIGHT ½"	½	½	½
B	SIX ¾"	NONE	¾	¾
C	FOUR ½", FOUR ¾"	½	¾	½
D	FOUR ¾", TWO 1"	NONE	¾	1

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 160
CONCRETE RING, ½", ¾", AND 1" KNOCKOUTS

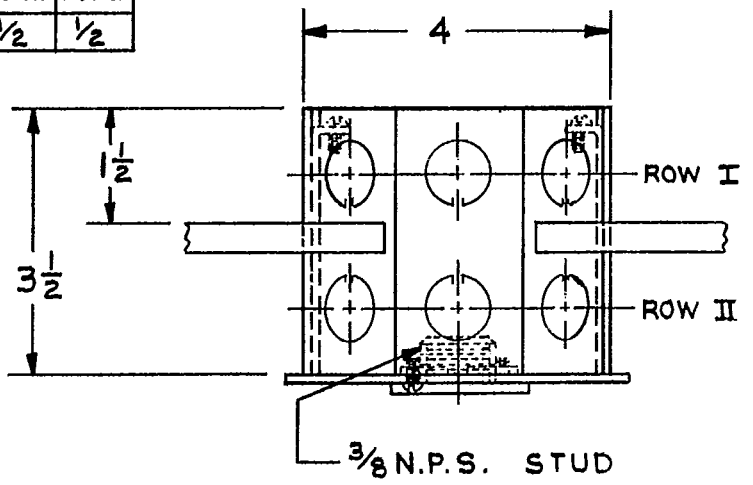
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ITEM	KNOCKOUT INFORMATION				
	AMOUNT & SIZE	ROW	A	B	C
1	EIGHT 1/2"	I	1/2	1/2	3/4
	EIGHT 3/4"	II	1/2	1/2	3/4
2	SIX 3/4"	I	NONE	NONE	NONE
		II	NONE	3/4	3/4
3	EIGHT 1/2"	I	NONE	NONE	NONE
		II	1/2	1/2	1/2

ITEM	BAR LENGTH (2 REQ'D. PER BOX)
4	18
5	24
6	30

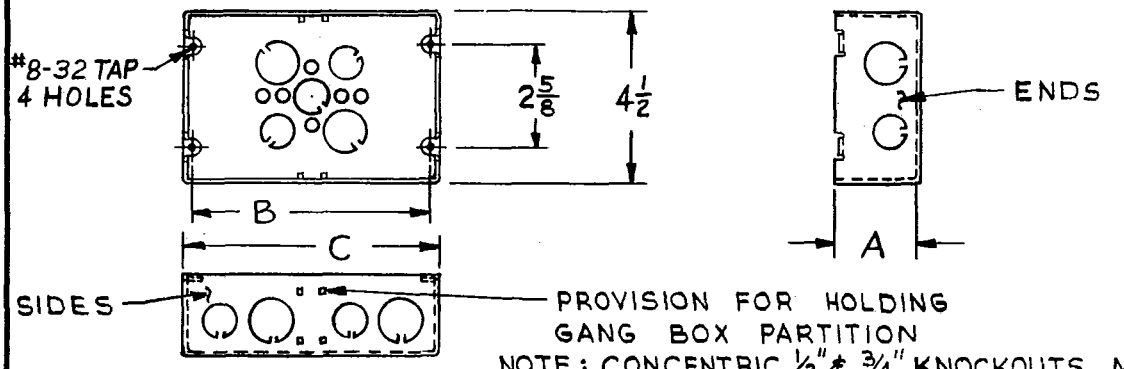


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 161
HUNG CEILING BOX, ½" AND ¾" KNOCKOUTS

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NOTE: CONCENTRIC ½" & ¾" KNOCKOUTS MAY BE SUBSTITUTED FOR ½" OR ¾" KNOCKOUTS
(This note is approved as Authorized Engineering Information.)

ITEM	No. OF GANGS	A	B	C	KNOCKOUTS							
					SIDES			ENDS			BOTTOM	
					½	¾	1	½	¾	1	½	¾
1	2	1 5/8	6 3/8	6 13/16	4	4	–	2	2	–	3	2
2	2	2 1/2	6 3/8	6 13/16	–	4	2	–	2	2	3	2
3	3	1 5/8	8 3/16	8 5/8	6	4	–	2	2	–	6	4
4	3	2 1/2	8 3/16	8 5/8	–	8	2	–	2	2	6	4
5	4	1 5/8	10	10 7/16	6	6	–	2	2	–	6	4
6	4	2 1/2	10	10 7/16	–	4	4	–	2	2	6	4
7	5	1 5/8	11 13/16	12 1/4	8	6	–	2	2	–	6	4
8	5	2 1/2	11 13/16	12 1/4	–	6	4	–	2	2	6	4
9	6	1 5/8	13 5/8	14 1/16	8	8	–	2	2	–	6	4
10	6	2 1/2	13 5/8	14 1/16	–	6	6	–	2	2	6	4
11	7	1 5/8	15 7/16	15 7/8	10	8	–	2	2	–	6	4
12	7	2 1/2	15 7/16	15 7/8	–	8	6	–	2	2	6	4
13	8	1 5/8	17 1/4	17 11/16	10	10	–	2	2	–	6	4
14	8	2 1/2	17 1/4	17 11/16	–	8	8	–	2	2	6	4
15	9	1 5/8	19 1/16	19 1/2	12	10	–	2	2	–	6	4
16	9	2 1/2	19 1/16	19 1/2	–	10	8	–	2	2	6	4
17	10	1 5/8	20 7/8	21 5/16	12	12	–	2	2	–	6	4
18	10	2 1/2	20 7/8	21 5/16	–	10	10	–	2	2	6	4

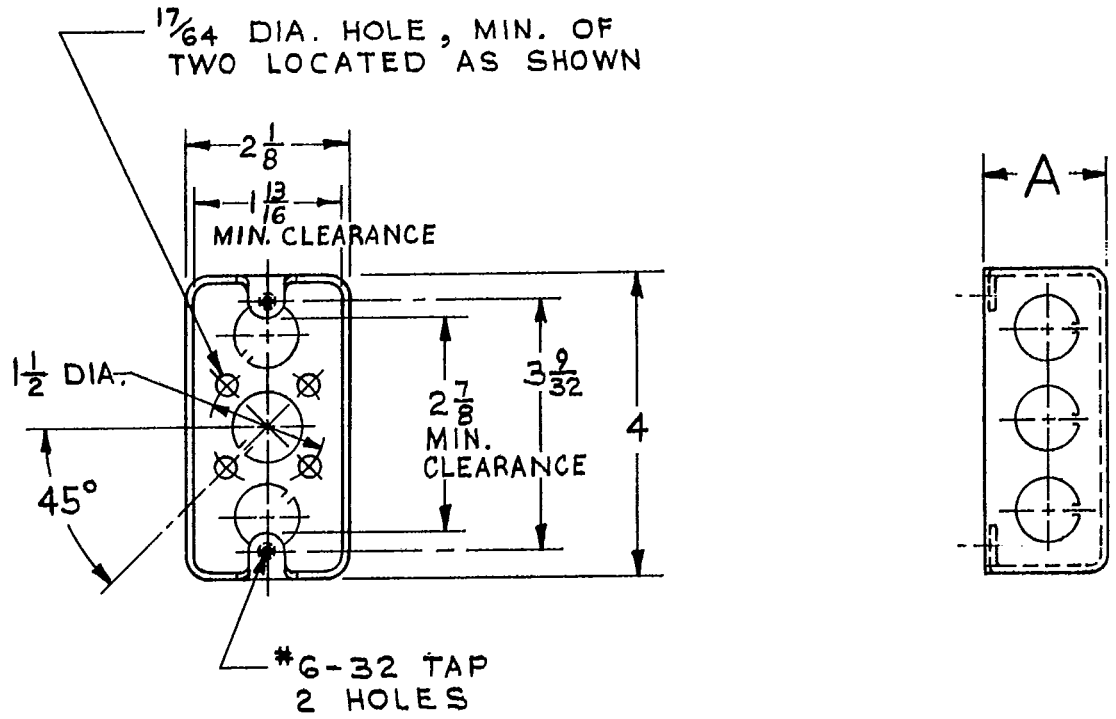
ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

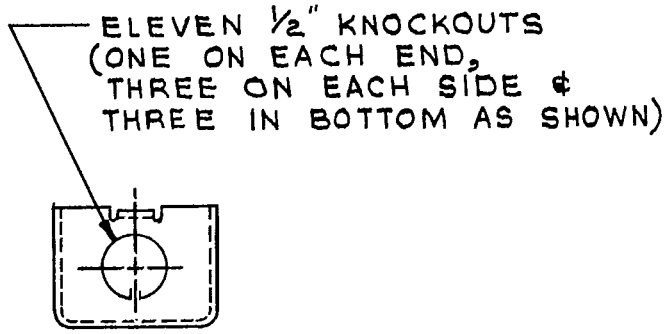
Figure 170

GANG BOXES, 1⅝" AND 2½" DEEP, ½", ¾" AND 1" KNOCKOUTS

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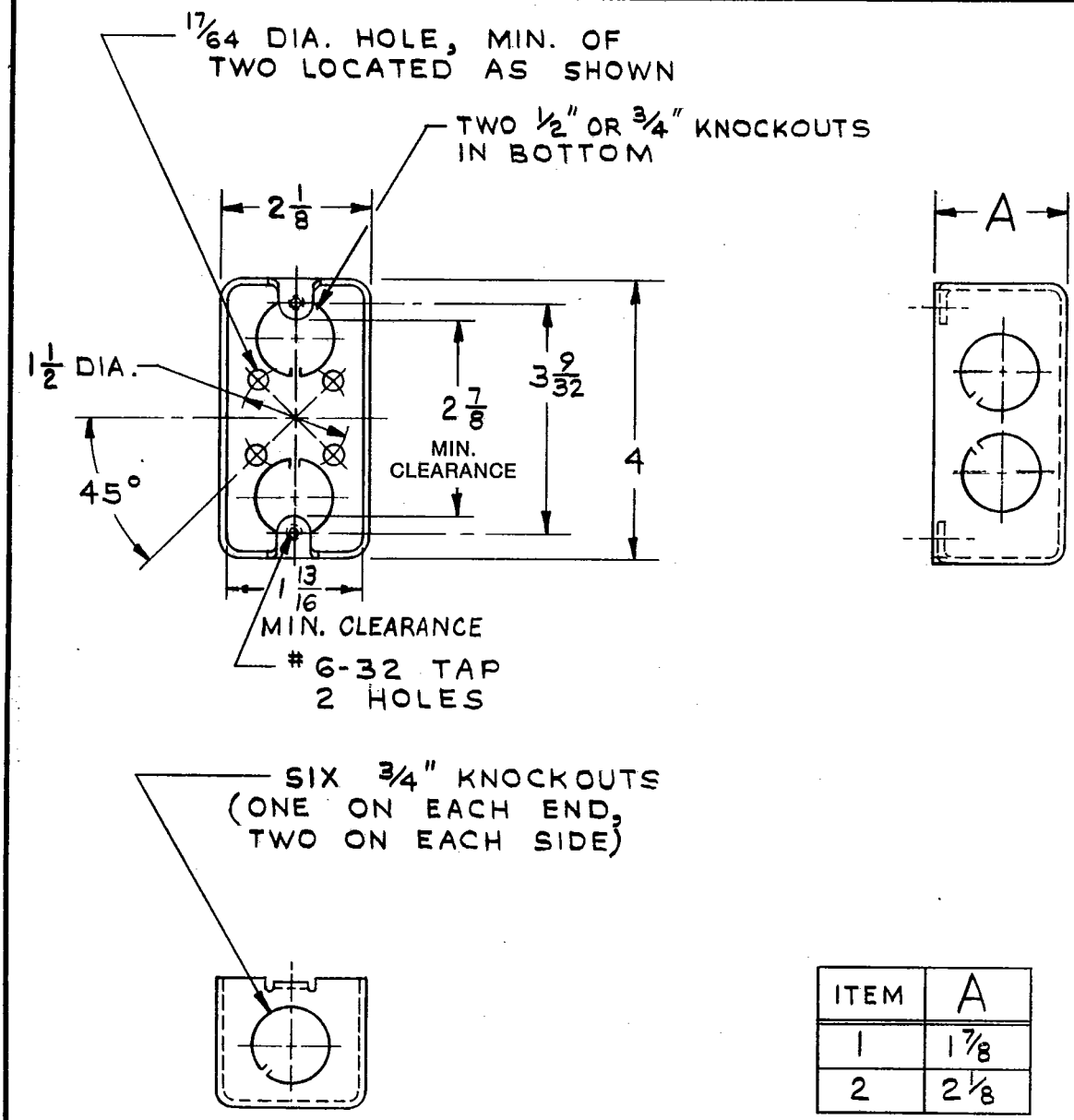
ITEM	A
1	1 1/2
2	1 7/8
3	2 1/8

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 200
NONGANGABLE DEVICE BOXES, ½" KNOCKOUTS

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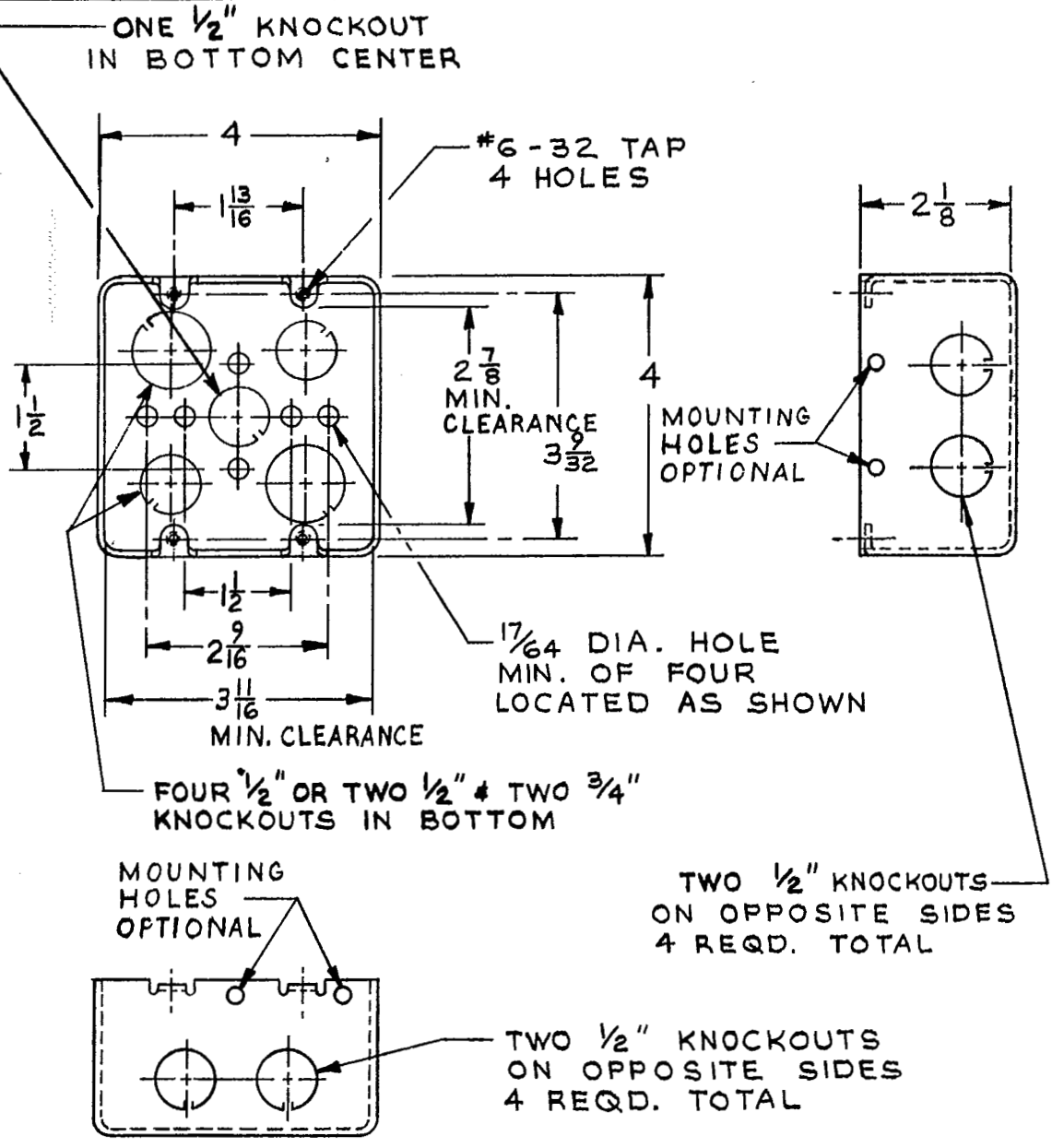
ITEM	A
1	1 7/8
2	2 1/8

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 201
NONGANGABLE DEVICE BOXES, ¾" KNOCKOUTS

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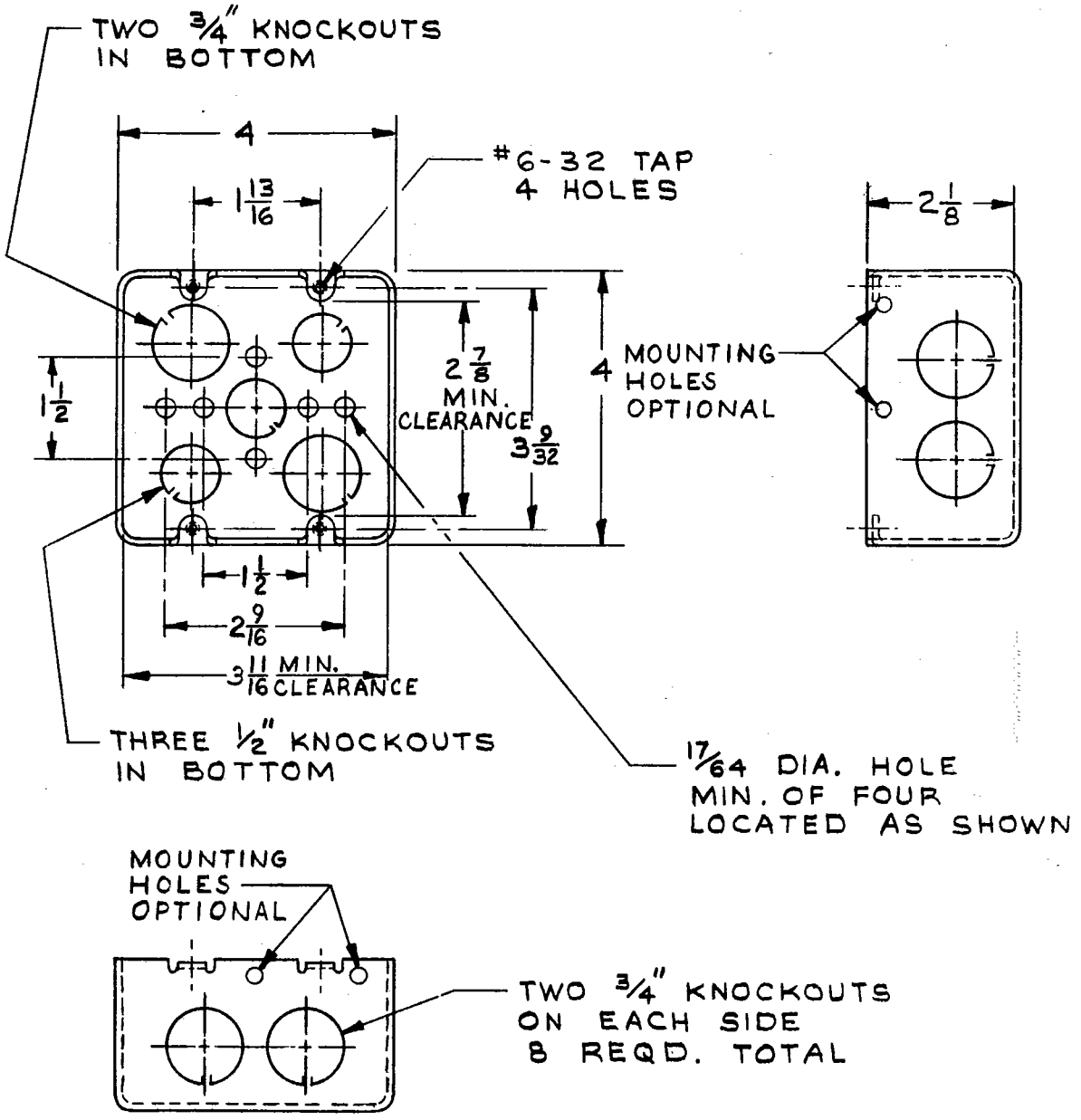


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 210
4" SQUARE BOX FOR TWO DEVICES, ½" KNOCKOUTS

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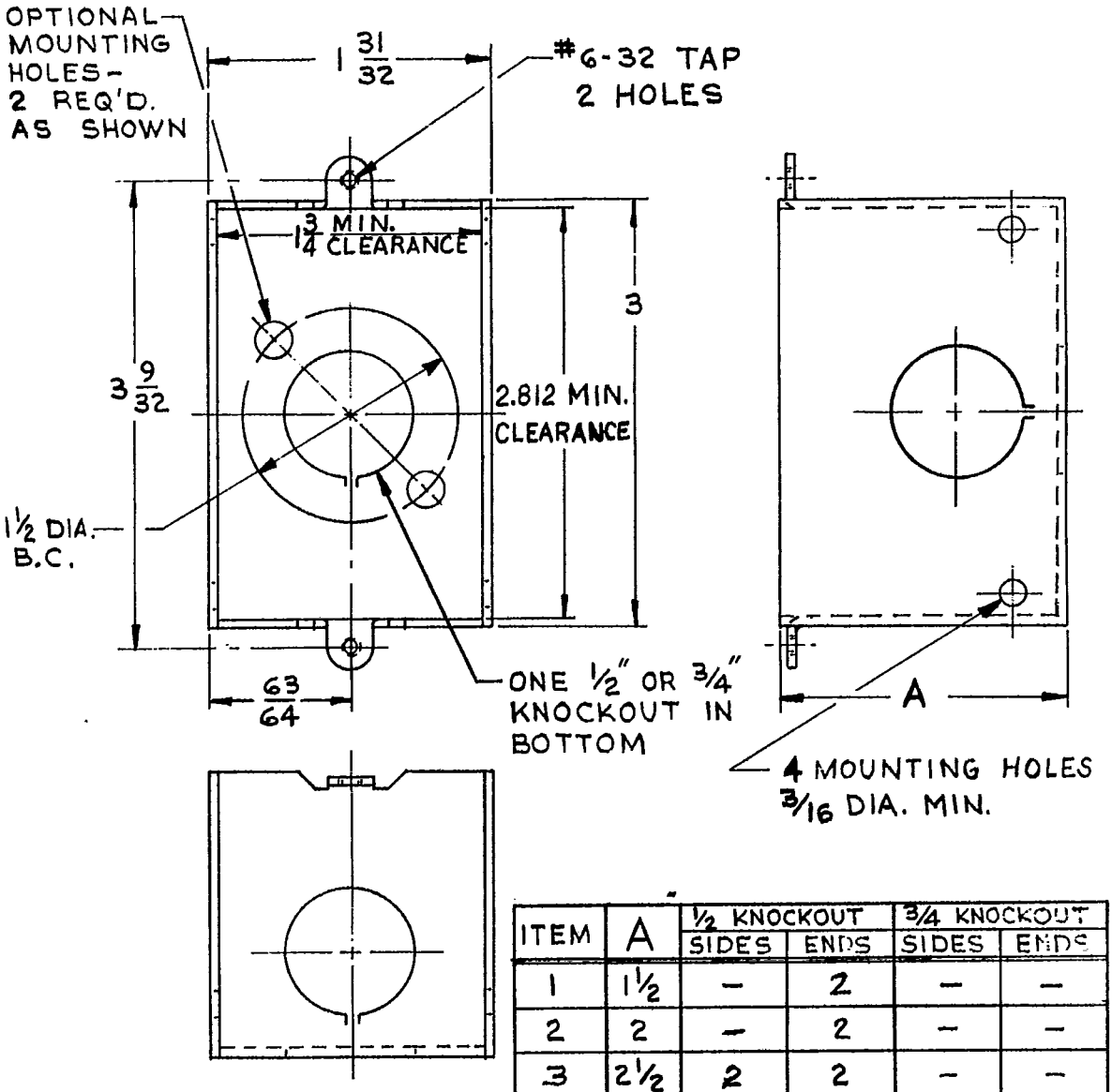


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 211
4" SQUARE BOX FOR TWO DEVICES, ¾" KNOCKOUTS

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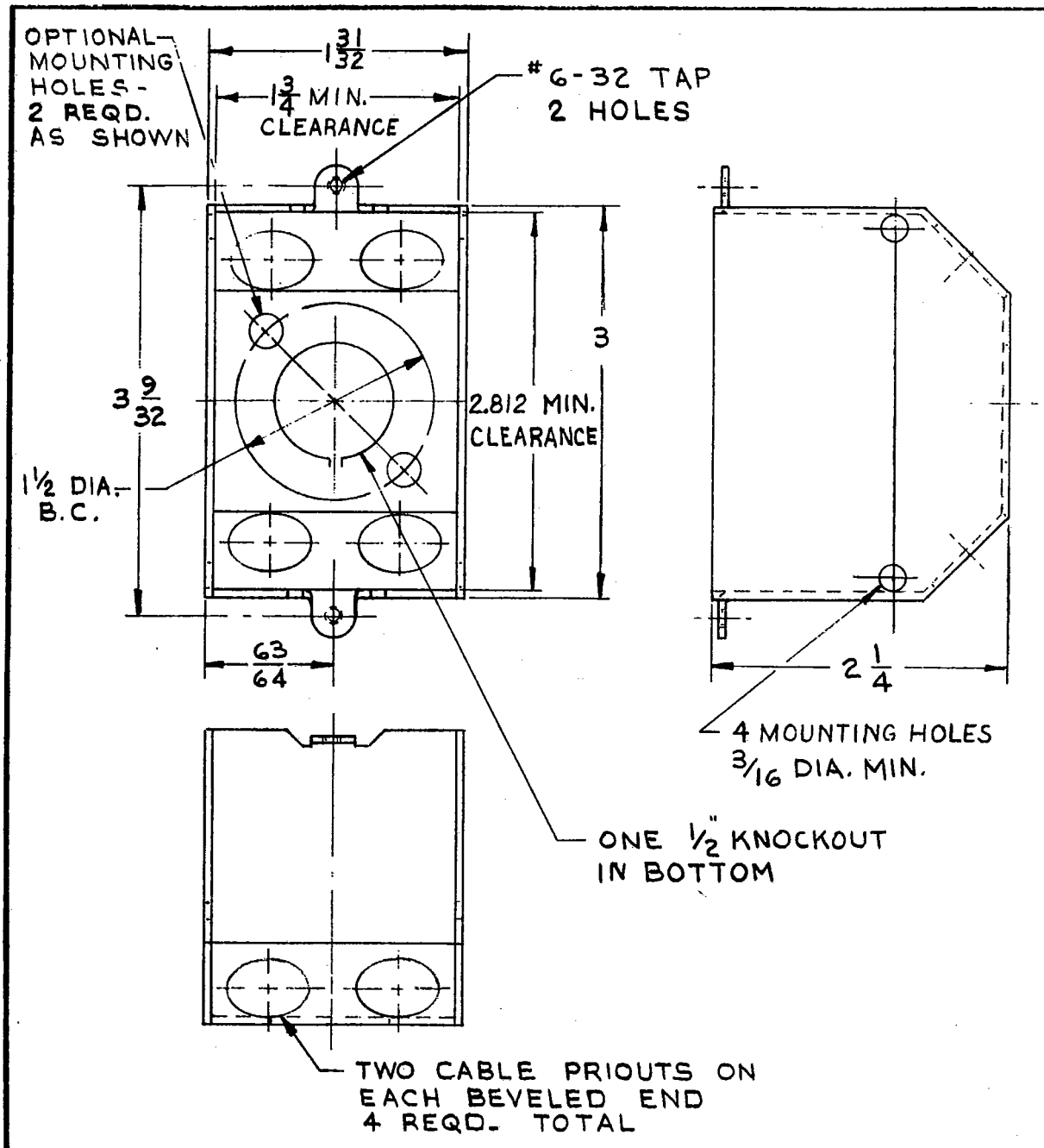
ITEM	A	1/2 KNOCKOUT		3/4 KNOCKOUT	
		SIDES	ENDS	SIDES	ENDS
1	1 1/2	–	2	–	–
2	2	–	2	–	–
3	2 1/2	2	2	–	–
4	2 1/2	–	–	2	2
5	2 3/4	2	2	–	–
6	2 3/4	–	–	2	2
7	3 1/2	4	4	–	–
8	3 1/2	–	–	4	4

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 220
SINGLE DEVICE BOX FOR ½" OR ¾" KNOCKOUTS

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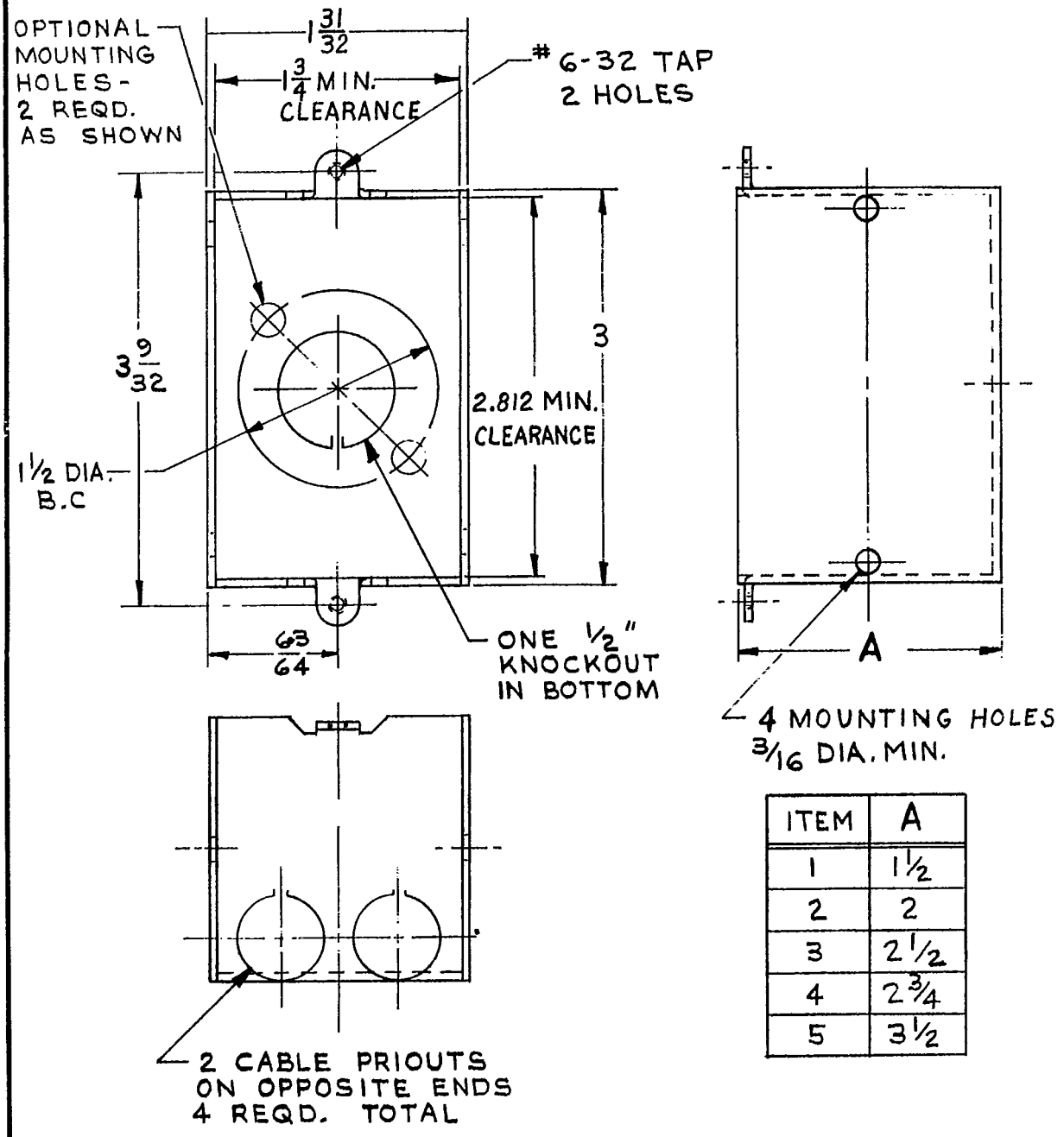


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 221
GANGABLE DEVICE BOX FOR CABLE, 2¼" DEEP, WITH BEVEL CORNER

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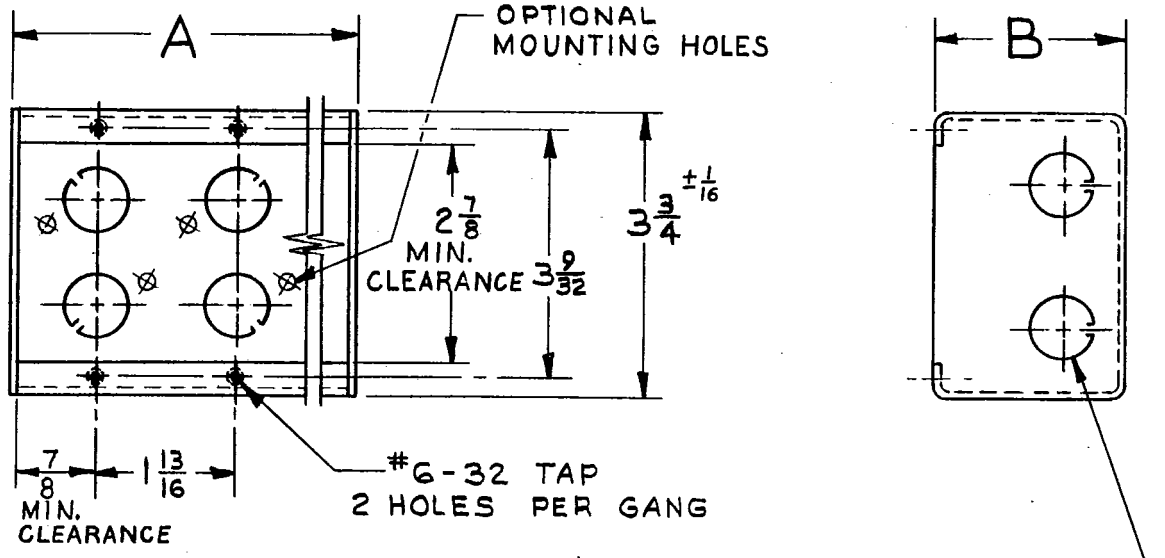
ITEM	A
1	1 1/2
2	2
3	2 1/2
4	2 3/4
5	3 1/2

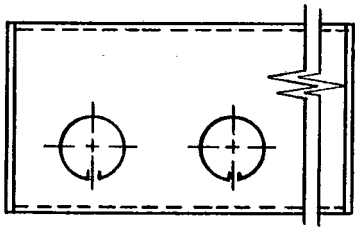
ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 222
SINGLE DEVICE BOX FOR CABLE

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TWO ½" KNOCKOUTS ON EACH SIDE, ONE (PER GANG) ON EACH END, & ONE OR MORE (PER GANG) ON BOTTOM TOTAL NO. REQD. (PER GANG) AS SHOWN IN CHART BELOW

TYPE OF BOX	A ±1/16	B SHALLOW	B DEEP	TOTAL K.O.'S REQ'D.
1 GANG	2	2½ ITEM 1	3½ ITEM 2	7
2 GANG	3 13/16	2½ ITEM 3	3½ ITEM 4	10
3 GANG	5 5/8	2½ ITEM 5	3½ ITEM 6	13
4 GANG	7 7/16	2½ ITEM 7	3½ ITEM 8	16
5 GANG	9 1/4	2½ ITEM 9	3½ ITEM 10	19
6 GANG	11 1/16	2½ ITEM 11	3½ ITEM 12	22
7 GANG	12 3/4	2½ ITEM 13	3½ ITEM 14	25
8 GANG	14 9/16	2½ ITEM 15	3½ ITEM 16	28
9 GANG	16 3/8	2½ ITEM 17	3½ ITEM 18	31
10 GANG	18 3/16	2½ ITEM 19	3½ ITEM 20	34

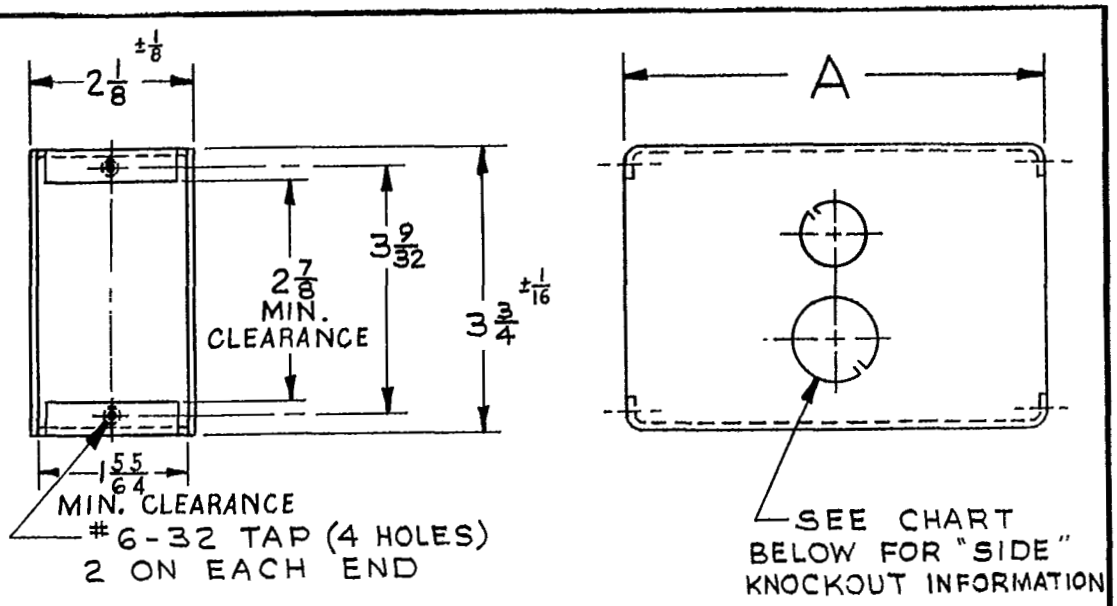
NOTE:
CONCENTRIC 1/2" & 3/4" KNOCKOUTS MAY BE SUBSTITUTED FOR ½" KNOCKOUTS (This note is approved as Authorized Engineering Information.)
3 GANG THROUGH 10 GANG HAVE ONE KNOCKOUT PER GANG IN BOTTOM

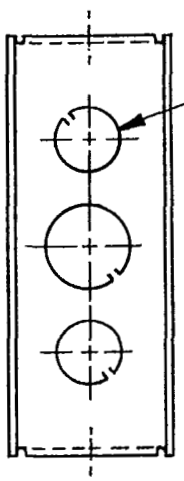
ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 240
TILE WALL BOXES, ½" KNOCKOUTS, SINGLE AND MULTIGANG

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ITEM	A	KNOCKOUT INFORMATION SIDES REQ'D	SIDES SIZE	TOP & BOTTOM REQ'D	TOP & BOTTOM SIZE
1	$3\frac{1}{2}$	1 EA.	$\frac{1}{2}$	1 EA.	$\frac{3}{4}$
		1 EA.	$\frac{3}{4}$	—	—
2	$5\frac{1}{2}$	1 EA.	$\frac{1}{2}$	2 EA.	$\frac{1}{2}$
		1 EA.	$\frac{3}{4}$	1 EA.	$\frac{3}{4}$
3	$7\frac{1}{2}$	1 EA.	$\frac{1}{2}$	2 EA.	$\frac{1}{2}$
		1 EA.	$\frac{3}{4}$	1 EA.	$\frac{3}{4}$

NOTE:
CONCENTRIC $\frac{1}{2}$" & $\frac{3}{4}$" KNOCKOUTS MAY BE SUBSTITUTED FOR EITHER $\frac{1}{2}$" OR $\frac{3}{4}$" KNOCKOUTS

(This note is approved as Authorized Engineering Information.)

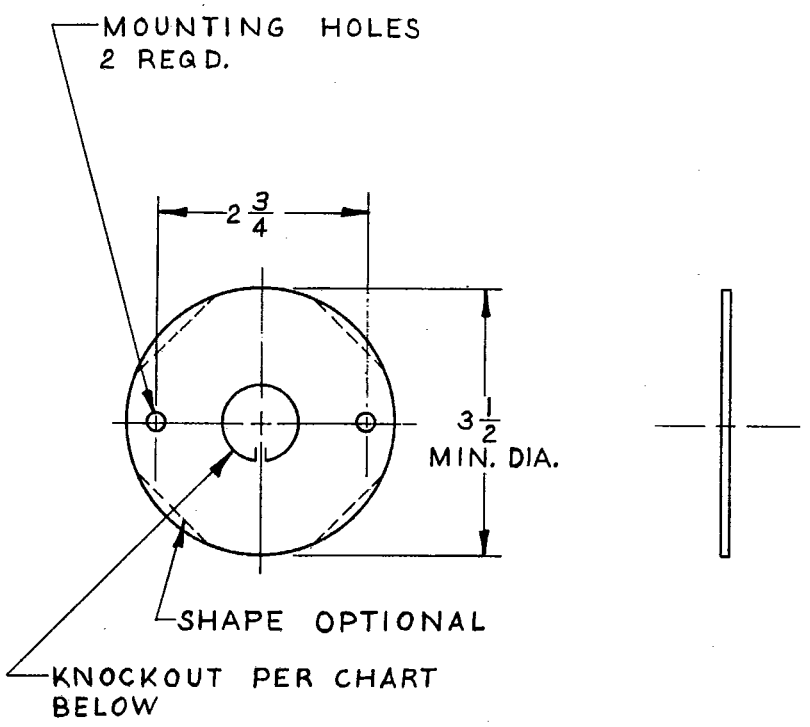
ALL DIMENSIONS IN INCHES.

SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 241
MASONRY THRU-WALL BOXES, ½" AND ¾" KNOCKOUTS, SINGLE GANG

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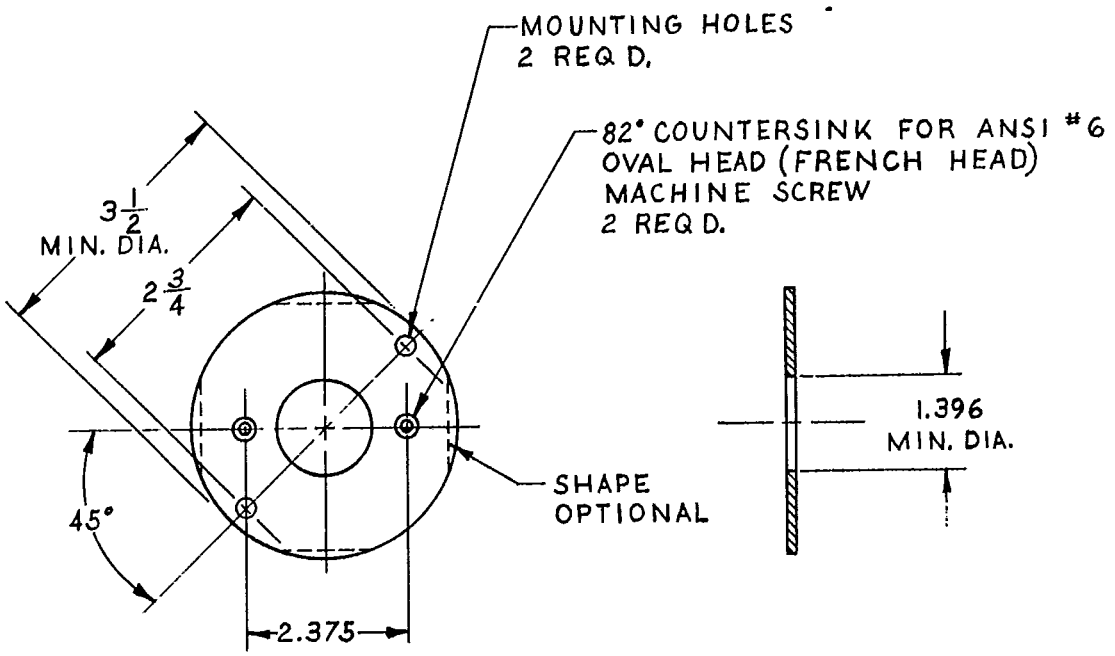
ITEM	KNOCKOUT
1	NONE
2	1/2

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 280
FLAT COVER FOR 3½″ OCTAGON BOX, WITH OR WITHOUT ½″ KNOCKOUT

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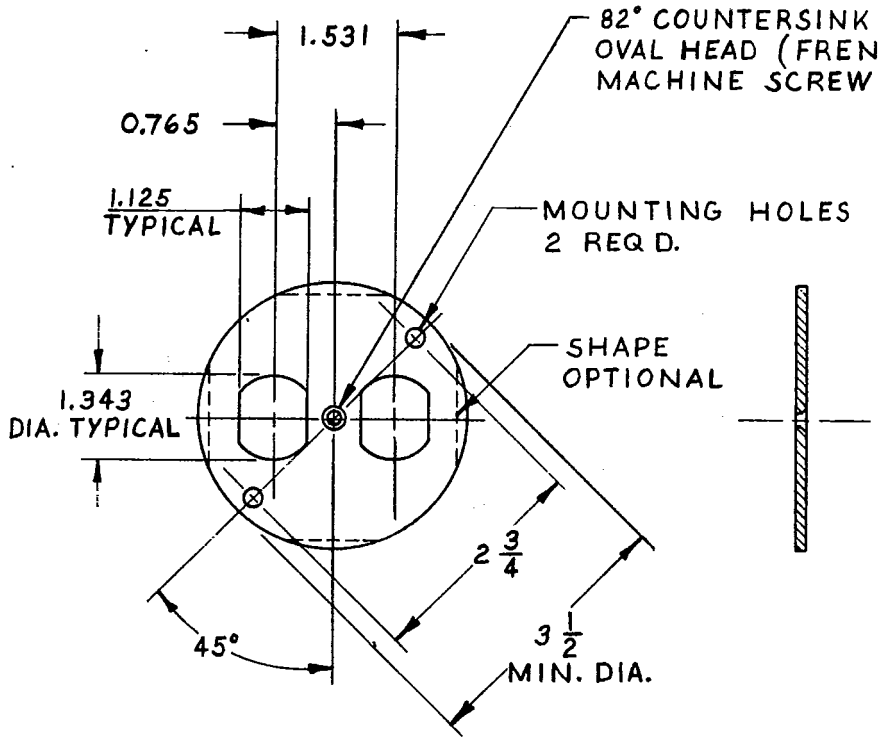


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 281
FLAT COVER FOR SINGLE CONVENIENCE OUTLET FOR 3½" OCTAGON BOX

NEMA Standard 5-16-1984.

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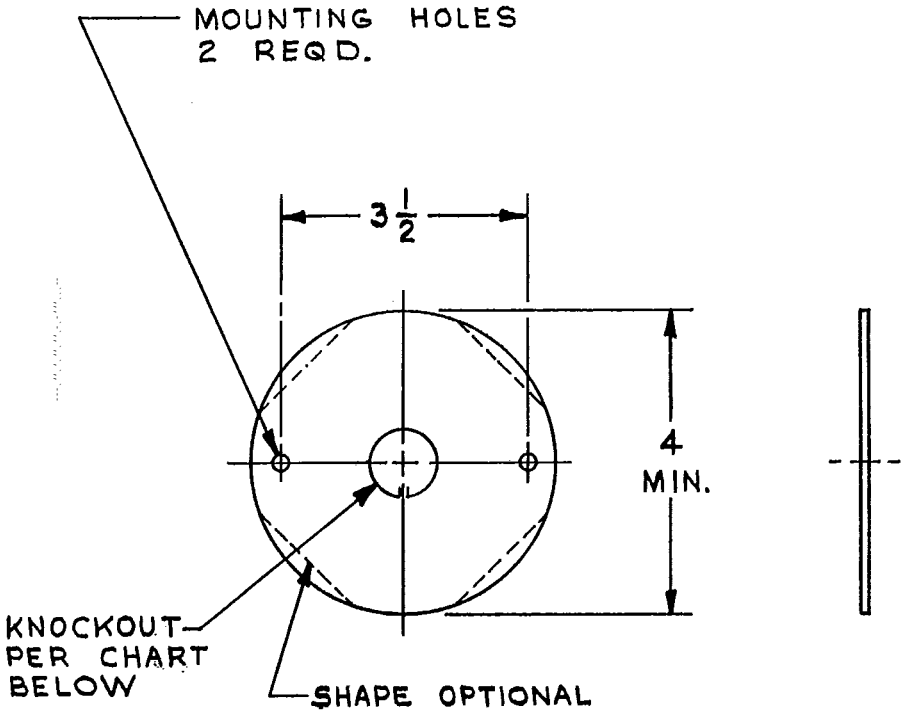


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 282
FLAT COVER FOR DUPLEX CONVENIENCE OUTLET FOR 3½" OCTAGON BOX

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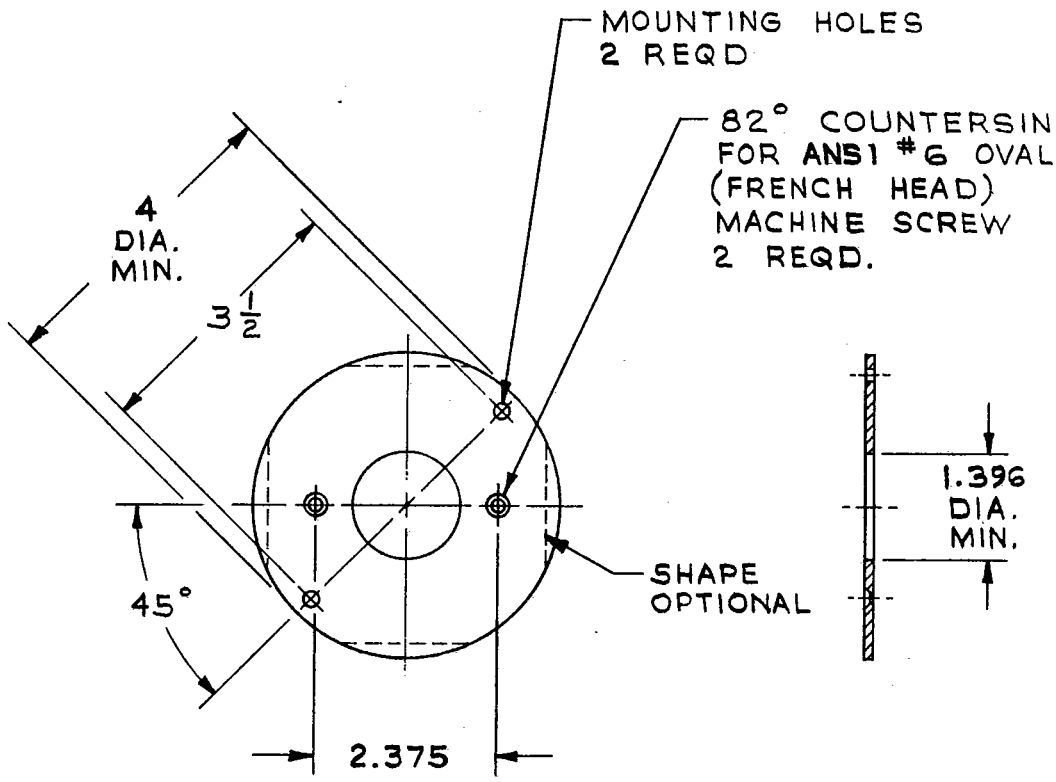
ITEM	KNOCKOUT
1	NONE
2	½

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 300
FLAT COVER FOR 4″ OCTAGON BOX, WITH OR WITHOUT ½″ KNOCKOUTS

NEMA Standard 11-16-1972.

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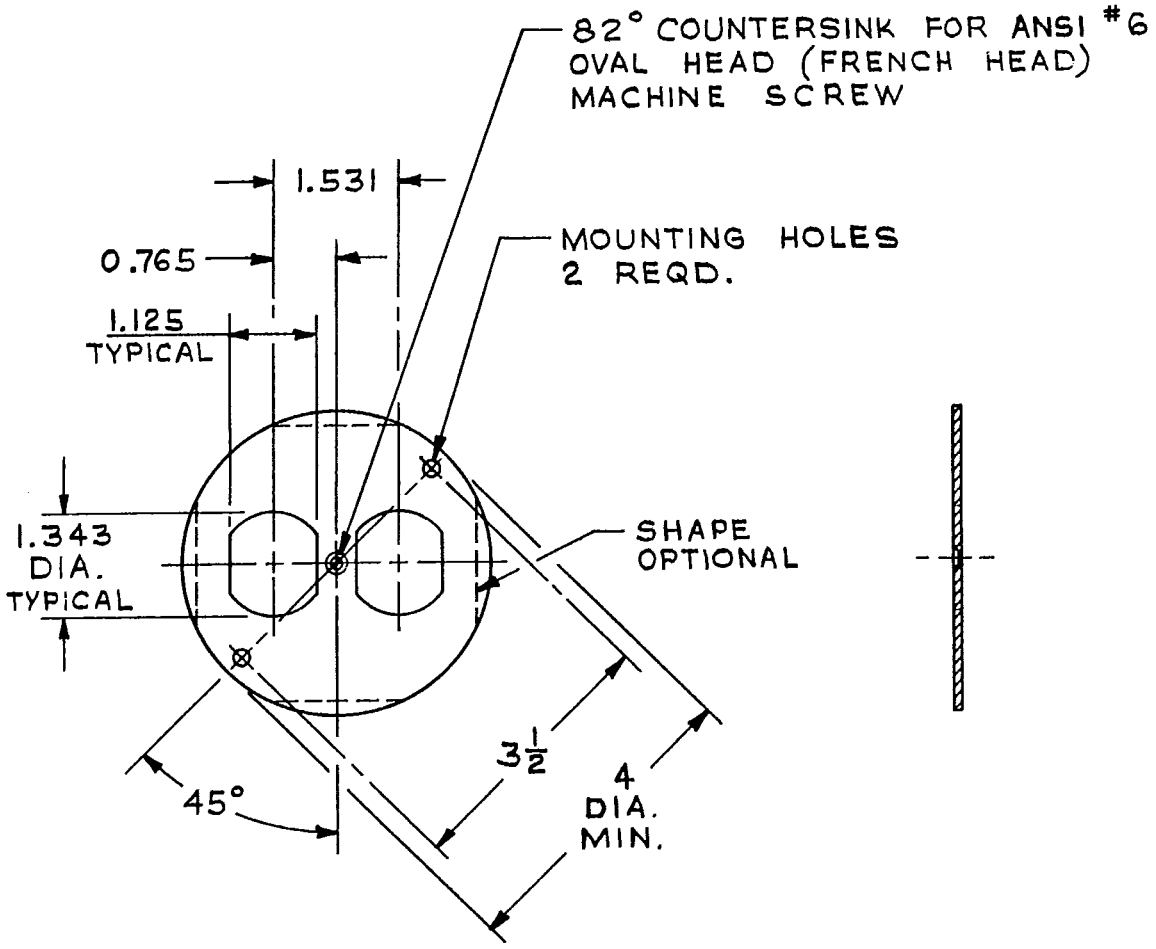


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 301
FLAT COVER FOR SINGLE CONVENIENCE OUTLET FOR 4″ OCTAGON BOX

NEMA Standard 11-16-1972.

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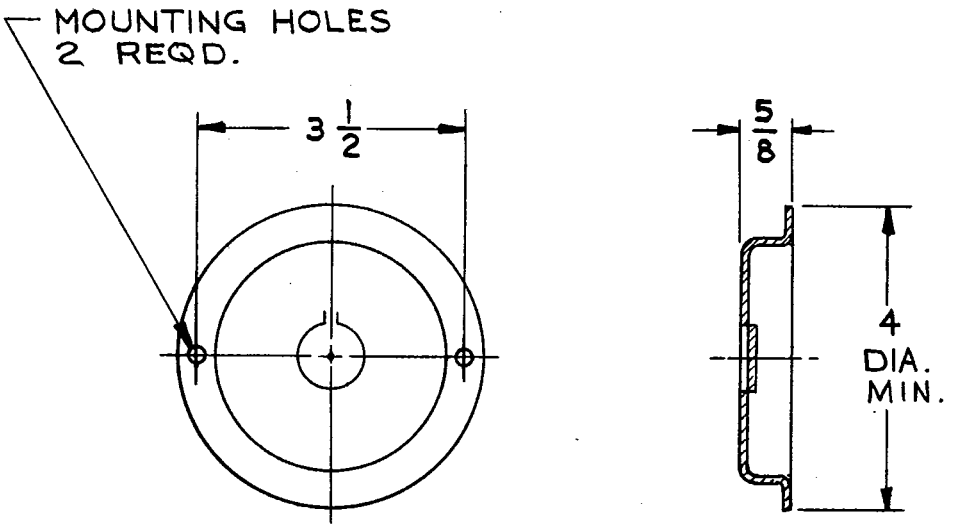


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 302
FLAT COVER FOR DUPLEX CONVENIENCE OUTLET FOR 4″ OCTAGON BOX

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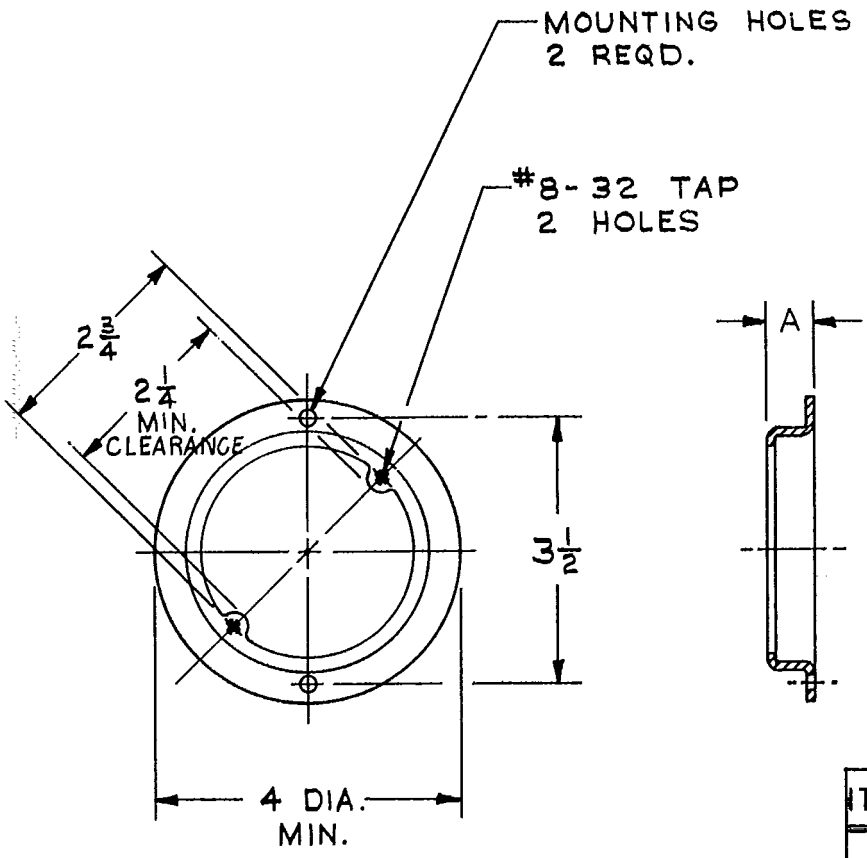


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 303
RAISED COVER WITH ONE ½″ KNOCKOUT FOR 4″ OCTAGON BOX

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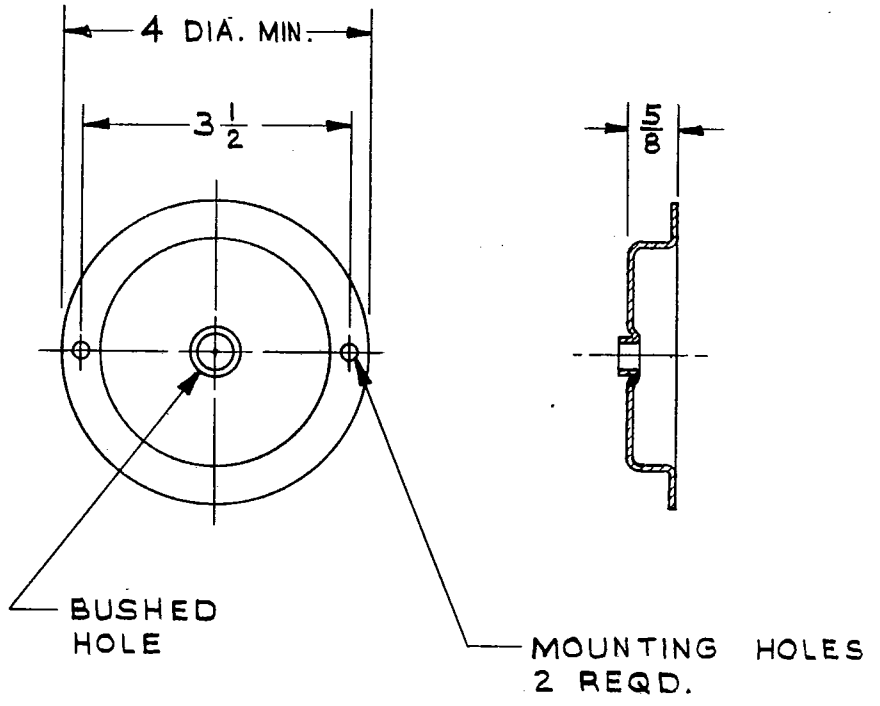
ITEM	A
1	1/2
2	5/8
3	3/4
4	1
5	1 1/4

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 304
RAISED COVER WITH CENTER BLANKED OUT FOR 4″ OCTAGON BOX

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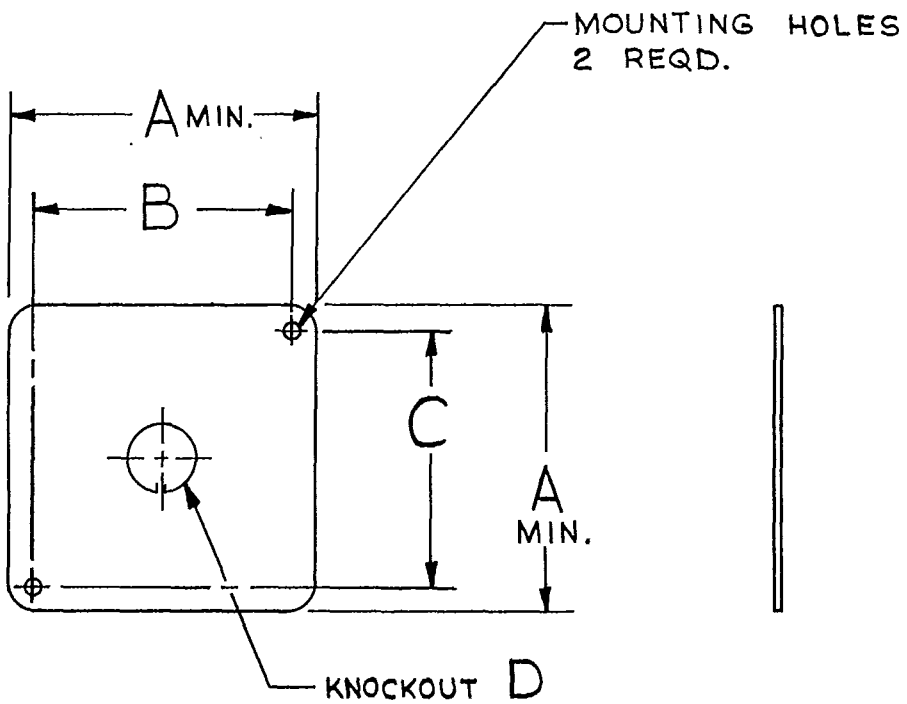


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 305
RAISED COVER FOR DROP CORD FOR 4″ OCTAGON BOX

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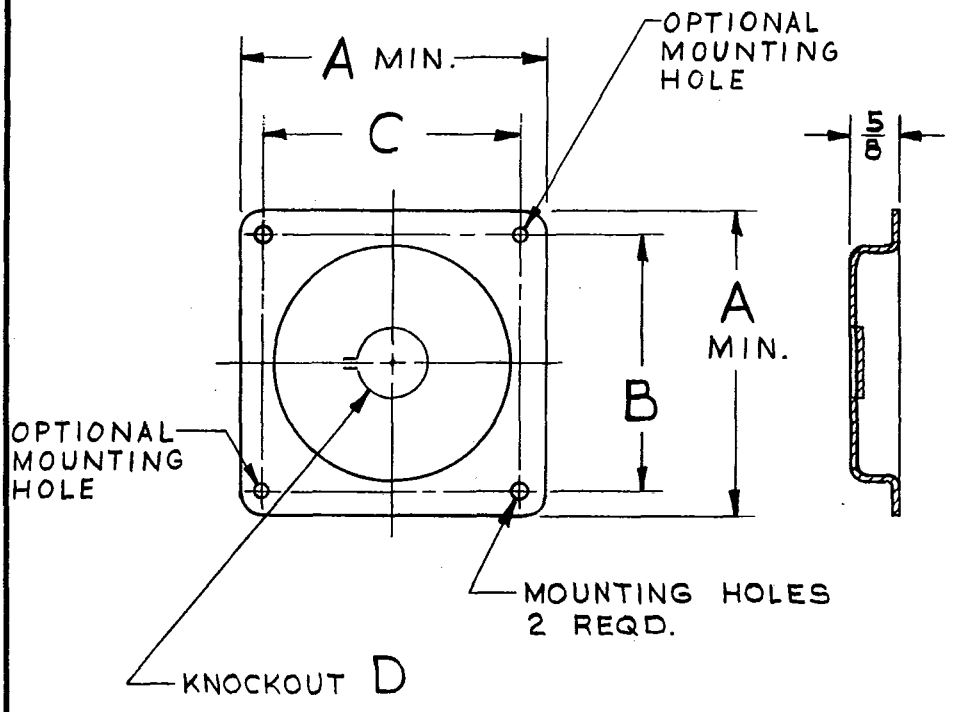
ITEM	A MIN.	B	C	KNOCKOUT D
1	4	3 3/8	3 3/8	NONE
2	4 11/16	4 1/4	2 3/4	NONE
3	4	3 3/8	3 3/8	1/2
4	4 11/16	4 1/4	2 3/4	1/2

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 310
FLAT COVER FOR 4″ AND 4 1/16″ SQUARE BOX, WITH OR WITHOUT ½″ KNOCKOUTS

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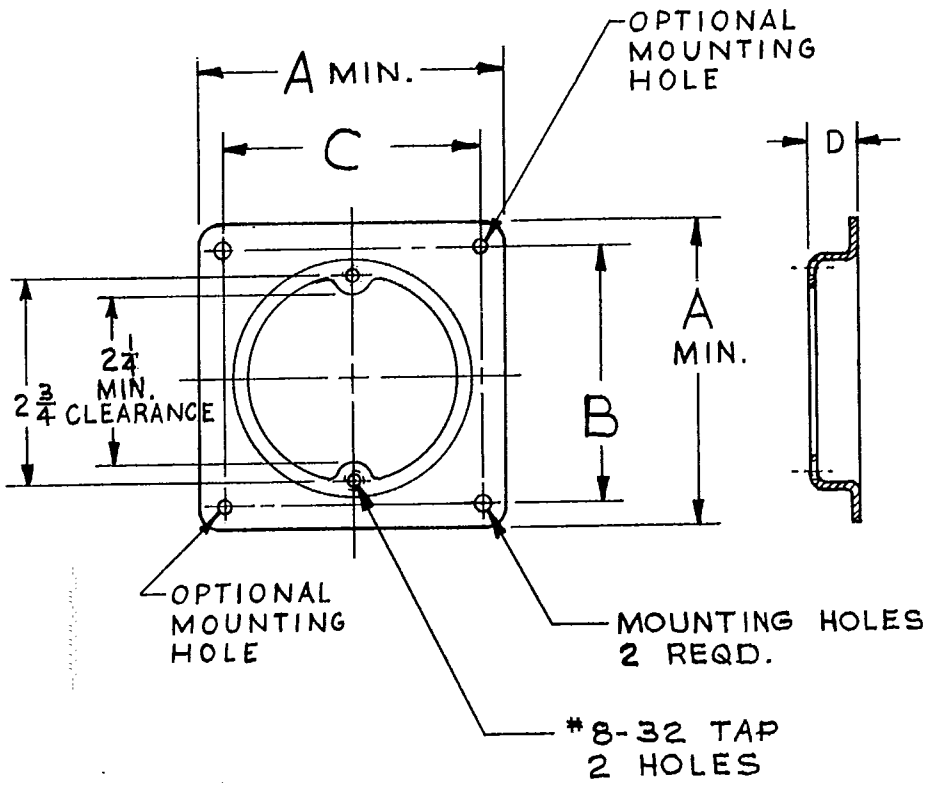
ITEM	A MIN	B	C	KNOCKOUT D
1	4	3 3/8	3 3/8	NONE
2	4 11/16	4 1/4	2 3/4	NONE
3	4	3 3/8	3 3/8	1/2
4	4 11/16	4 1/4	2 3/4	1/2

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 311
RAISED COVER FOR 4″ AND 4 1/16″ SQUARE BOX WITH ½″ KNOCKOUT

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ITEM	A	B	C	D
1	4	3 3/8	3 3/8	1/2
2	4	3 3/8	3 3/8	5/8
3	4	3 3/8	3 3/8	3/4
4	4	3 3/8	3 3/8	1
5	4	3 3/8	3 3/8	1 1/4

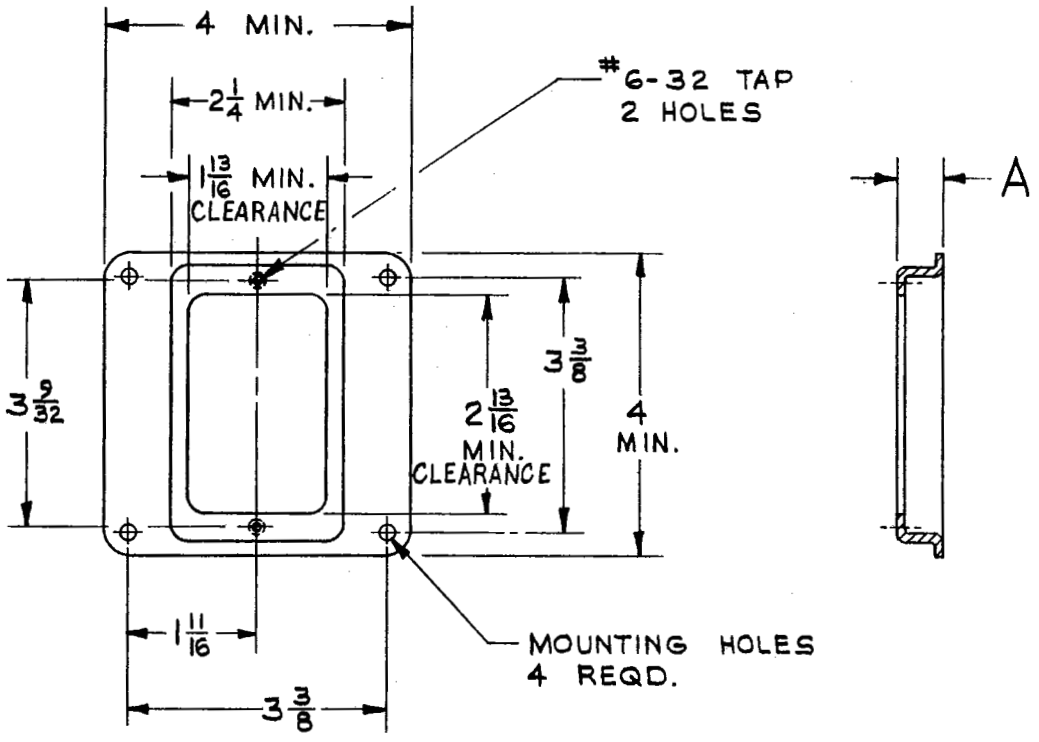
ITEM	A	B	C	D
6	4 11/16	4 1/4	2 3/4	1/2
7	4 11/16	4 1/4	2 3/4	5/8
8	4 11/16	4 1/4	2 3/4	3/4
9	4 11/16	4 1/4	2 3/4	1
10	4 11/16	4 1/4	2 3/4	1 1/4

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 312
RAISED COVER WITH CENTER BLANKED OUT FOR 4″ AND 4 11/16″ SQUARE BOX

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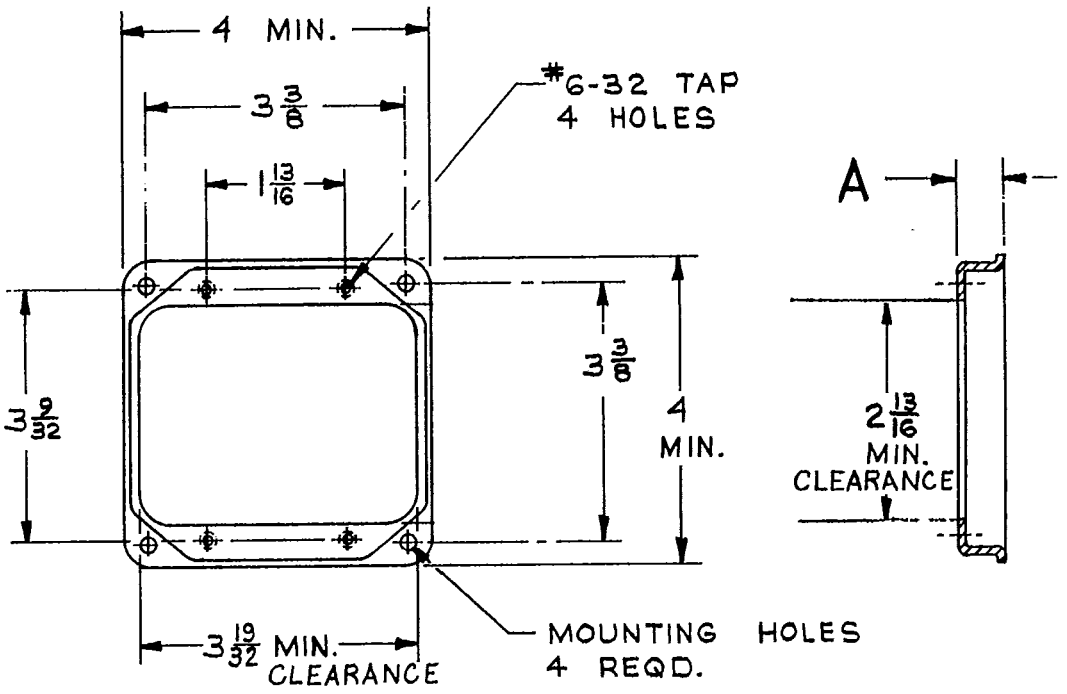
ITEM	A
1	FLAT
2	1/4
3	1/2
4	5/8
5	3/4
6	1
7	1 1/4

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 313
ONE-DEVICE COVER FOR 4″ SQUARE BOX

NEMA Standard 5-16-1984.

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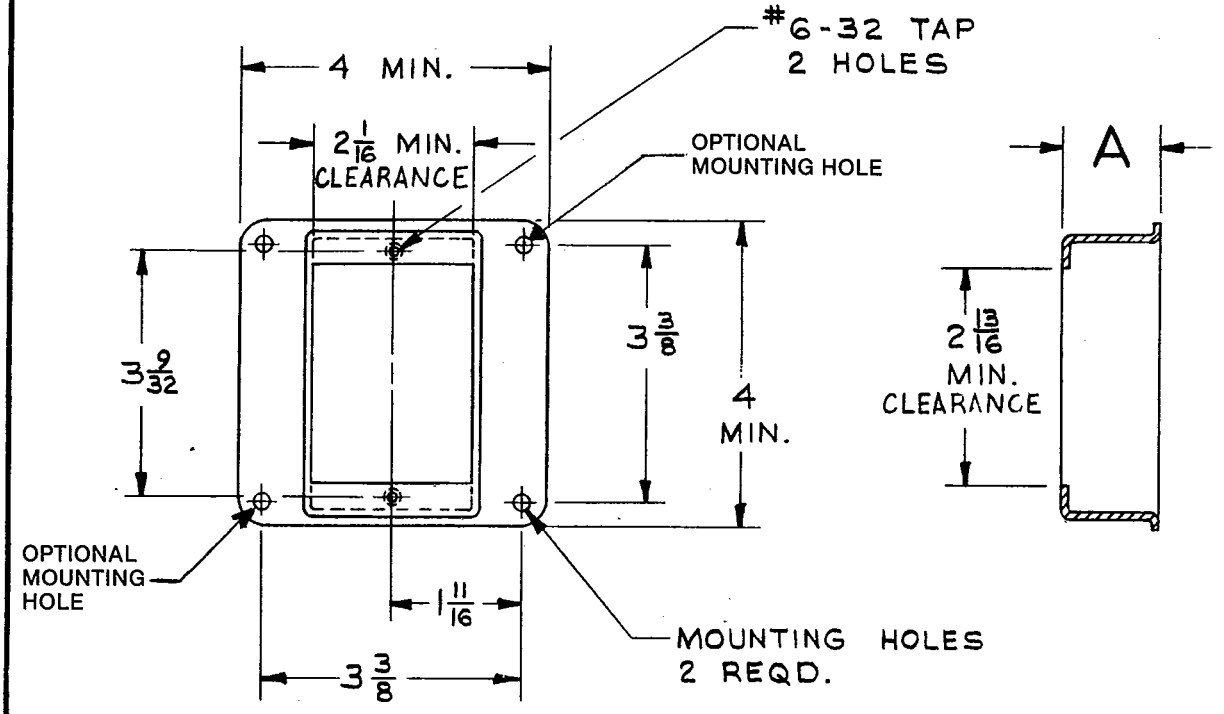
ITEM	A
1	FLAT
2	1/4
3	1/2
4	5/8
5	3/4
6	1
7	1 1/4

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 314
TWO-DEVICE COVER FOR 4″ SQUARE BOX

NEMA Standard 5-16-1984.

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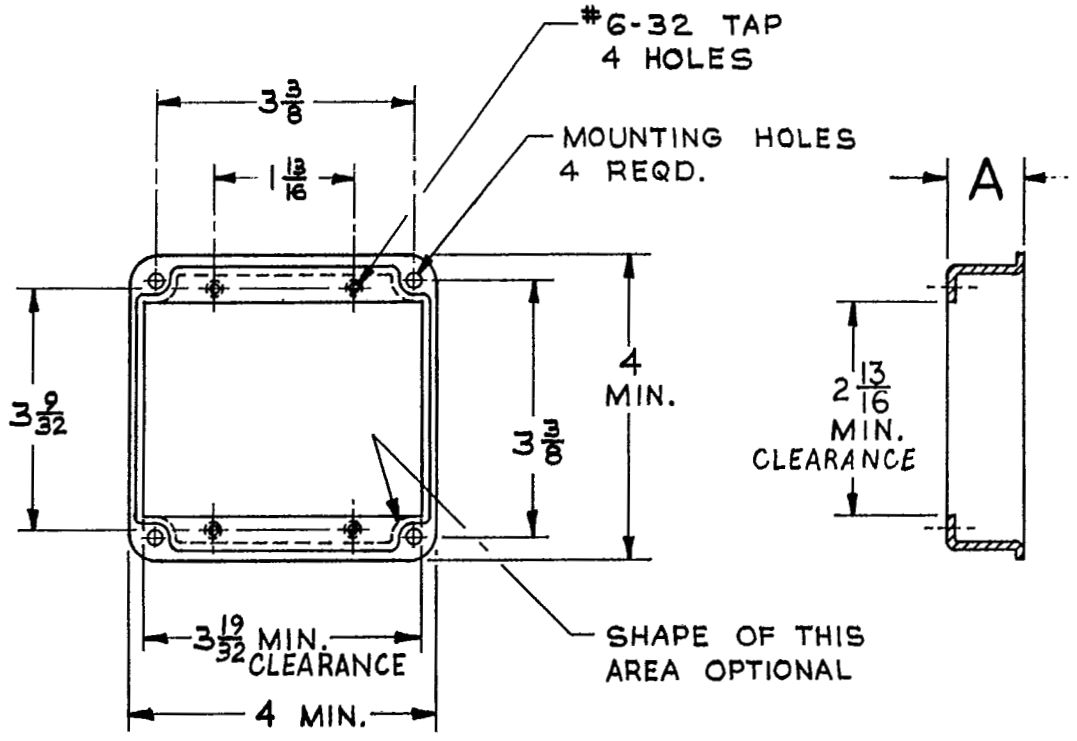
ITEM	A
1	1/2
2	5/8
3	3/4
4	1
5	1 1/4
6	1 1/2
7	2

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 315
ONE-DEVICE TILE COVER FOR 4″ SQUARE BOX

NEMA Standard 5-16-1984.

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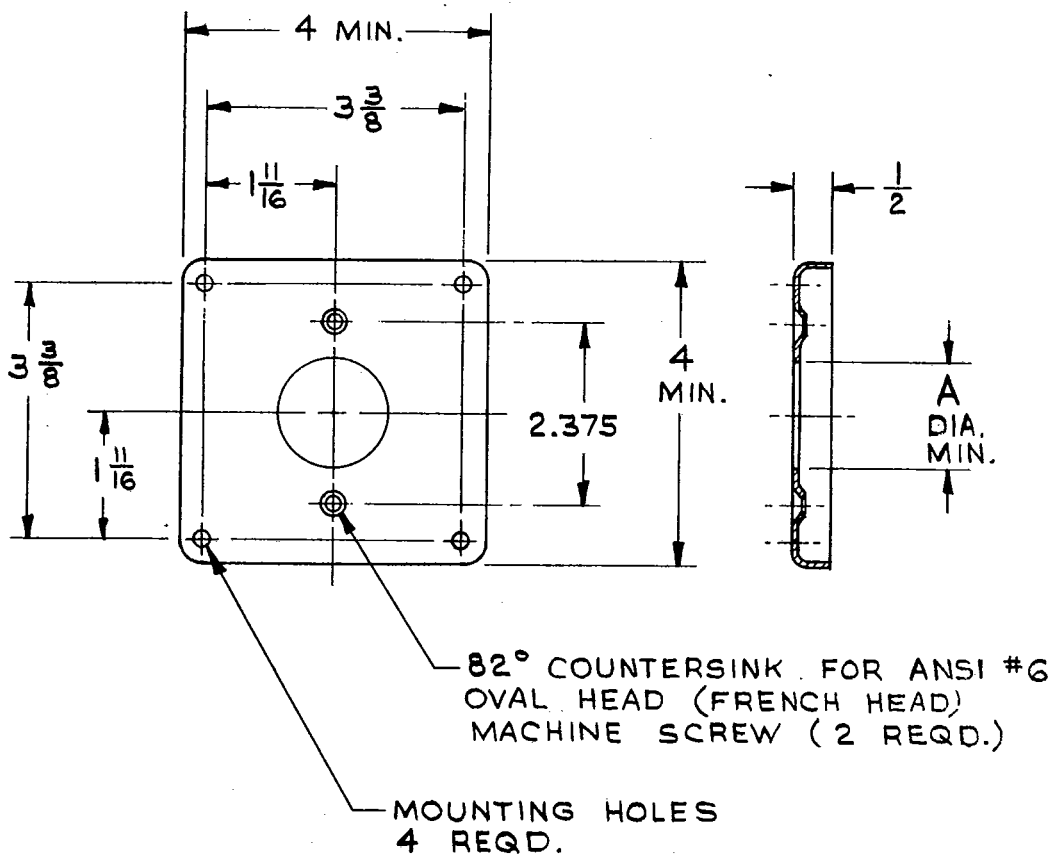
ITEM	A
1	1/2
2	5/8
3	3/4
4	1
5	1 1/4
6	1 1/2
7	2

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 316
TWO-DEVICE TILE COVER FOR 4″ SQUARE BOX

NEMA Standard 5-16-1984.

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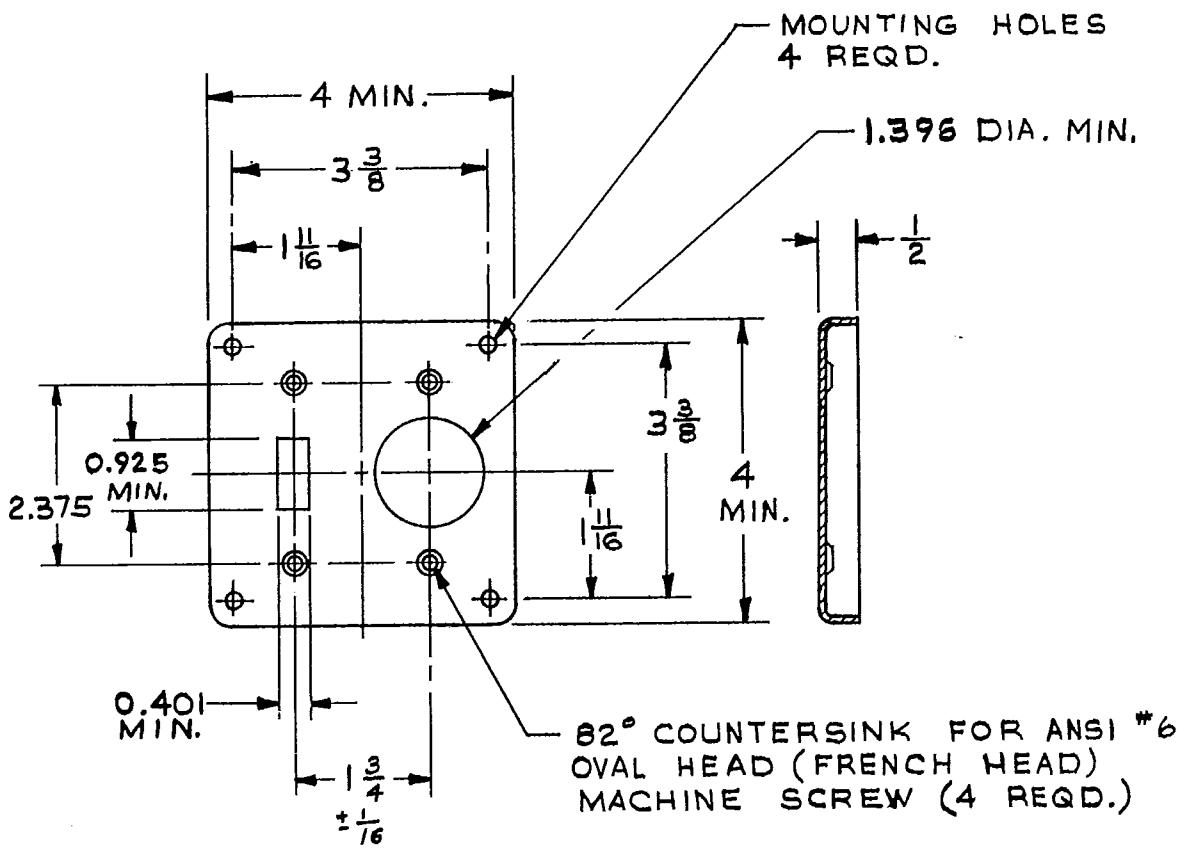
ITEM	$A^{MIN.}$
1	1.396
2	1.586
3	1.711

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 320
SURFACE COVER FOR SINGLE RECEPTACLE FOR 4″ SQUARE BOX

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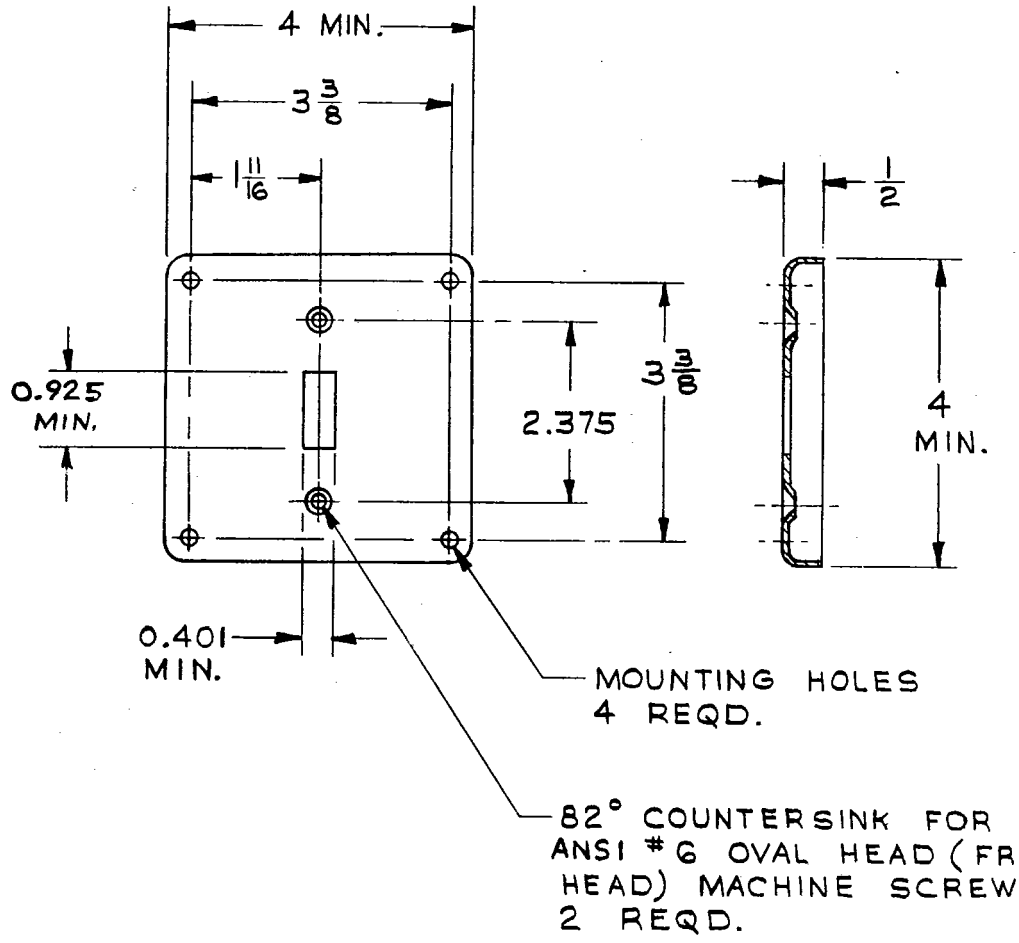


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 321
SURFACE COVER FOR ONE TOGGLE SWITCH AND ONE SINGLE RECEPTACLE FOR 4″ SQUARE BOX

NEMA Standard 5-16-1984.

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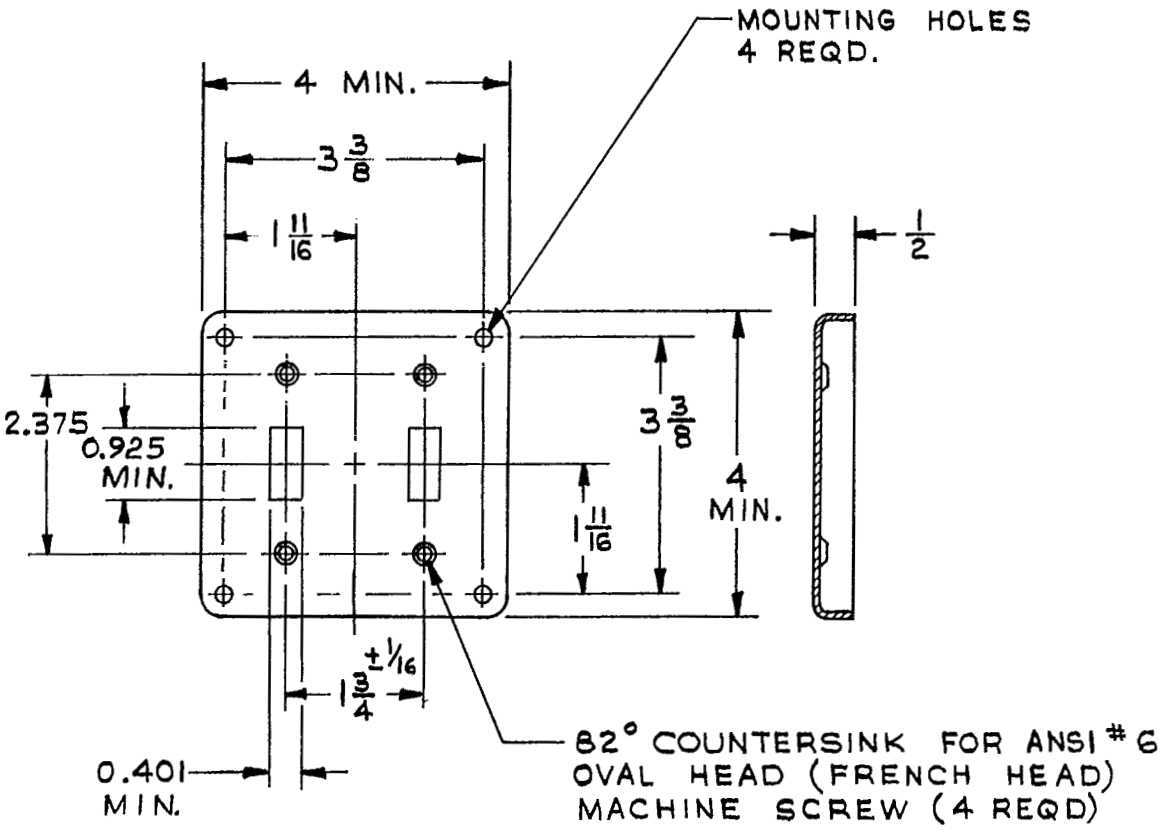


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 322
SURFACE COVER FOR ONE TOGGLE SWITCH FOR 4″ SQUARE BOX

NEMA Standard 5-16-1984.

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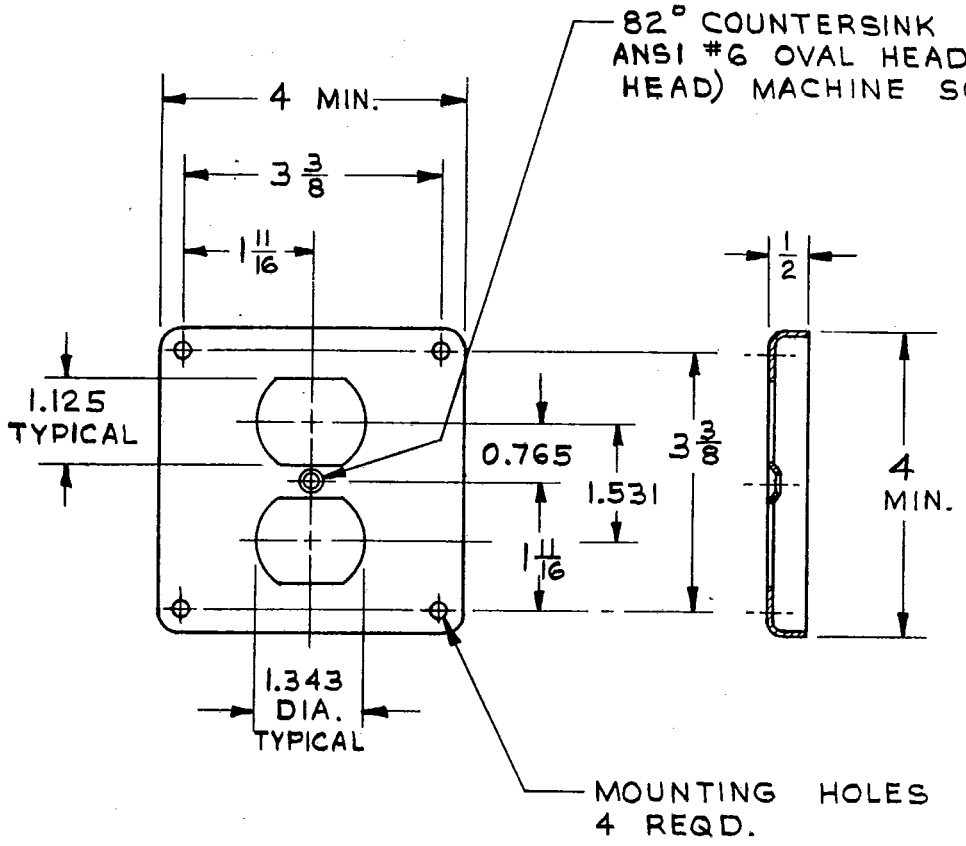


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 323
SURFACE COVER FOR TWO TOGGLE SWITCHES FOR 4″ SQUARE BOX

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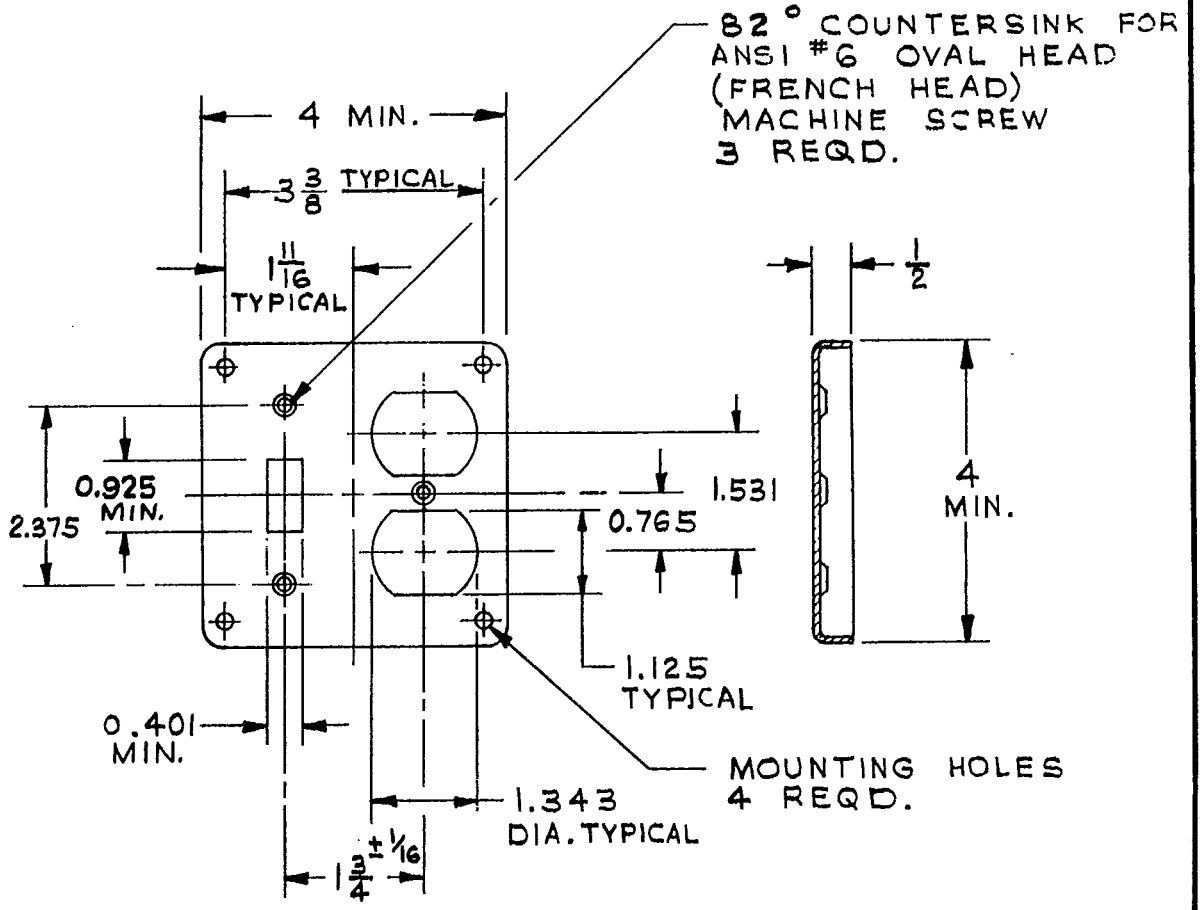


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 324
SURFACE COVER FOR ONE DUPLEX RECEPTACLE FOR 4″ SQUARE BOX

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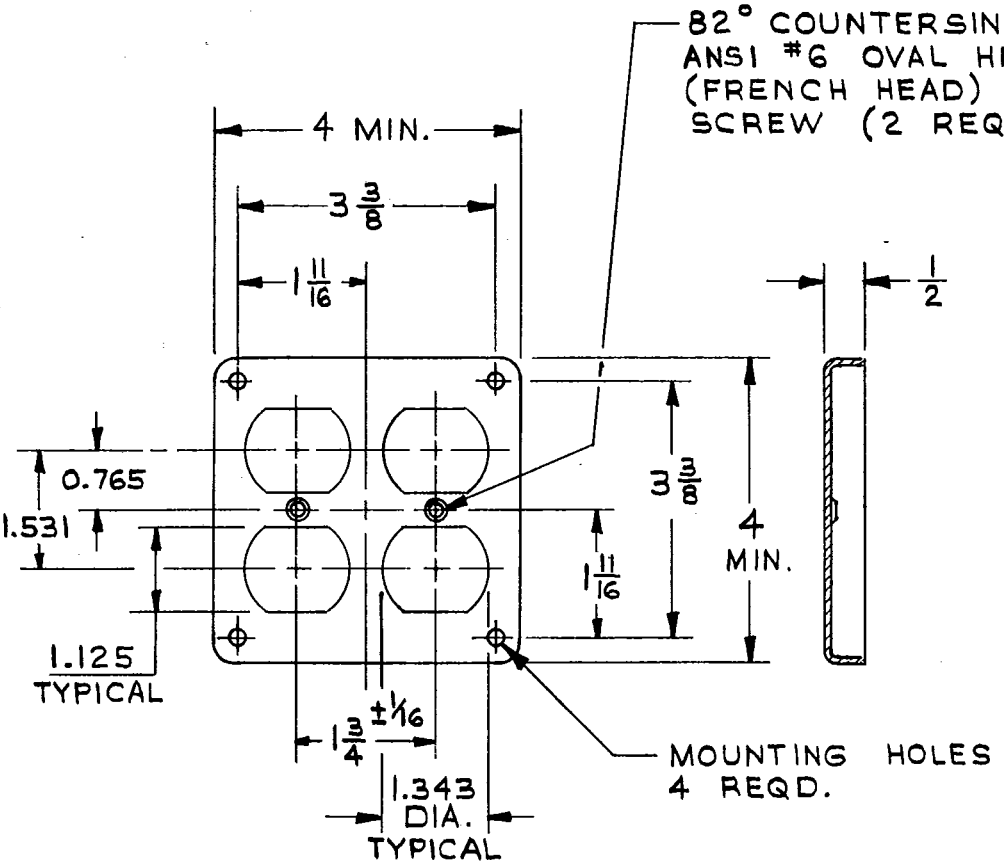


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 325
SURFACE COVER FOR ONE TOGGLE SWITCH AND ONE DUPLEX RECEPTACLE
4" SQUARE BOX

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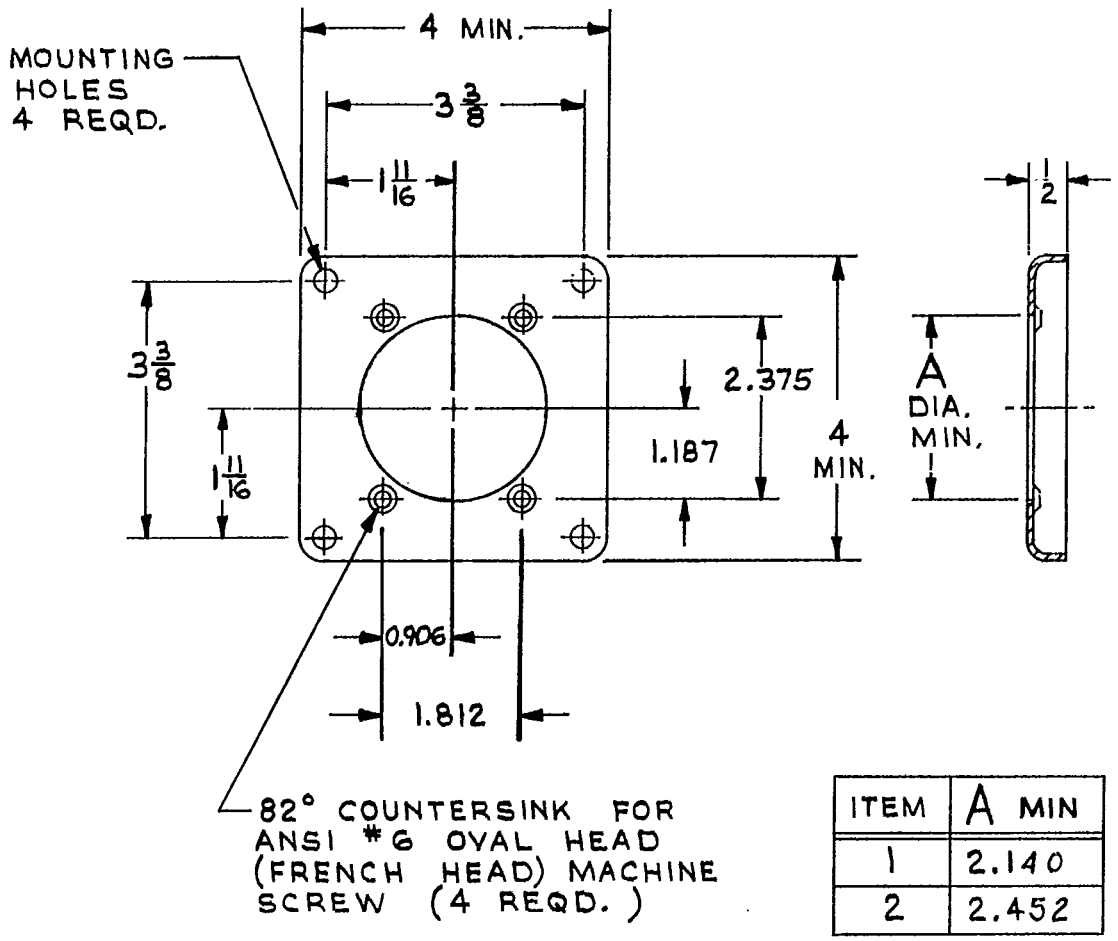


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 326
SURFACE COVER FOR TWO DUPLEX RECEPTACLES FOR 4″ SQUARE BOX

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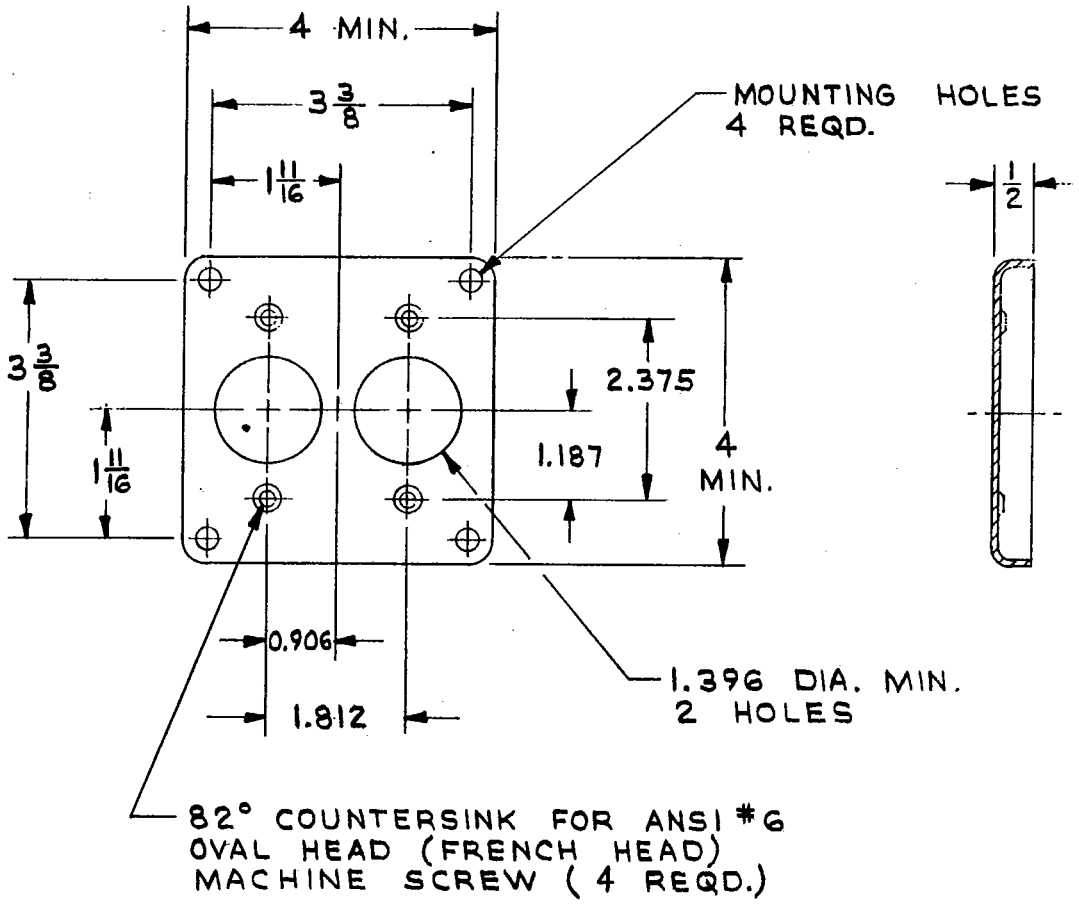
ITEM	A MIN
1	2.140
2	2.452

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 327
SURFACE COVER FOR 30-50-60 AMPERE AND 3-WIRE RECEPTACLE FOR 4″ SQUARE BOX

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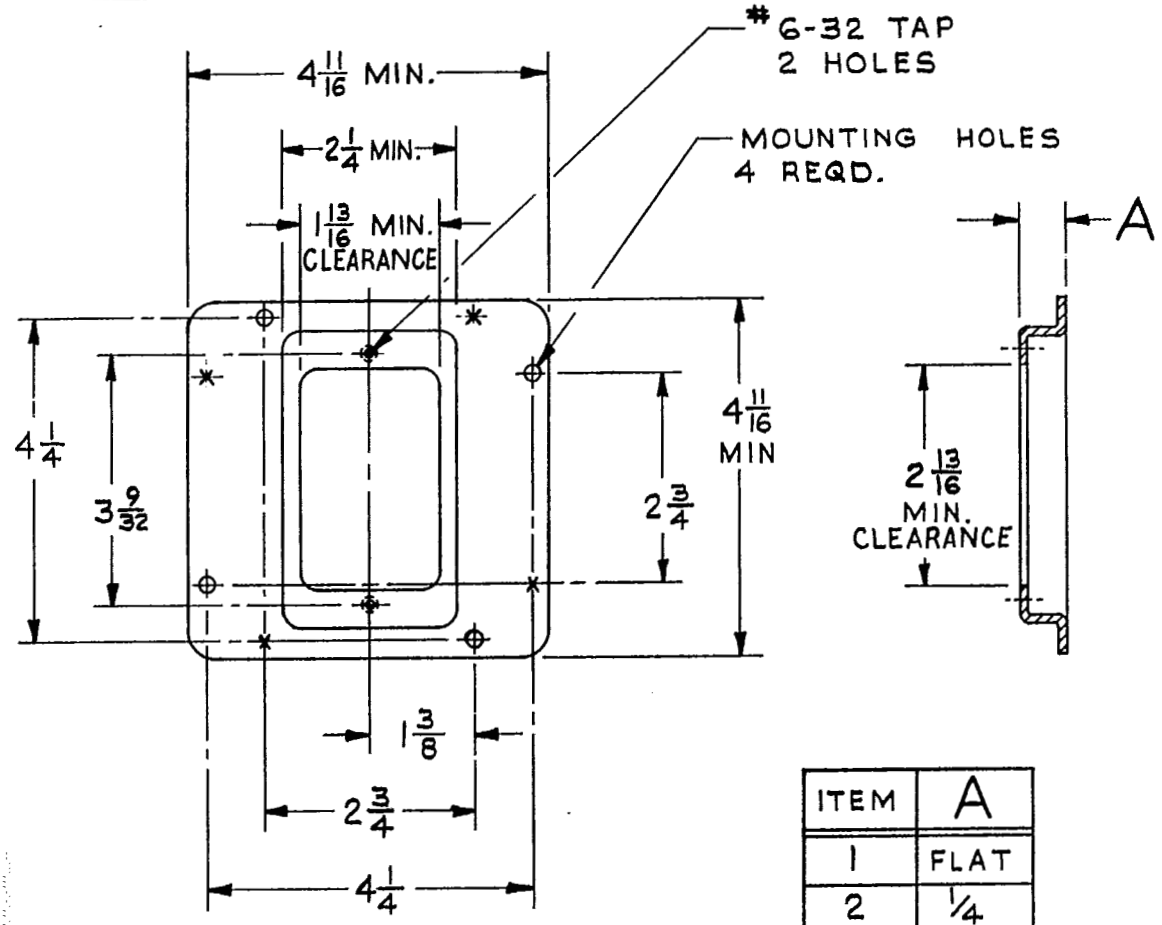


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 328
SURFACE COVER FOR TWO SINGLE RECEPTACLES FOR 4″ SQUARE BOX

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ITEM	A
1	FLAT
2	1/4
3	1/2
4	5/8
5	3/4
6	1
7	1 1/4

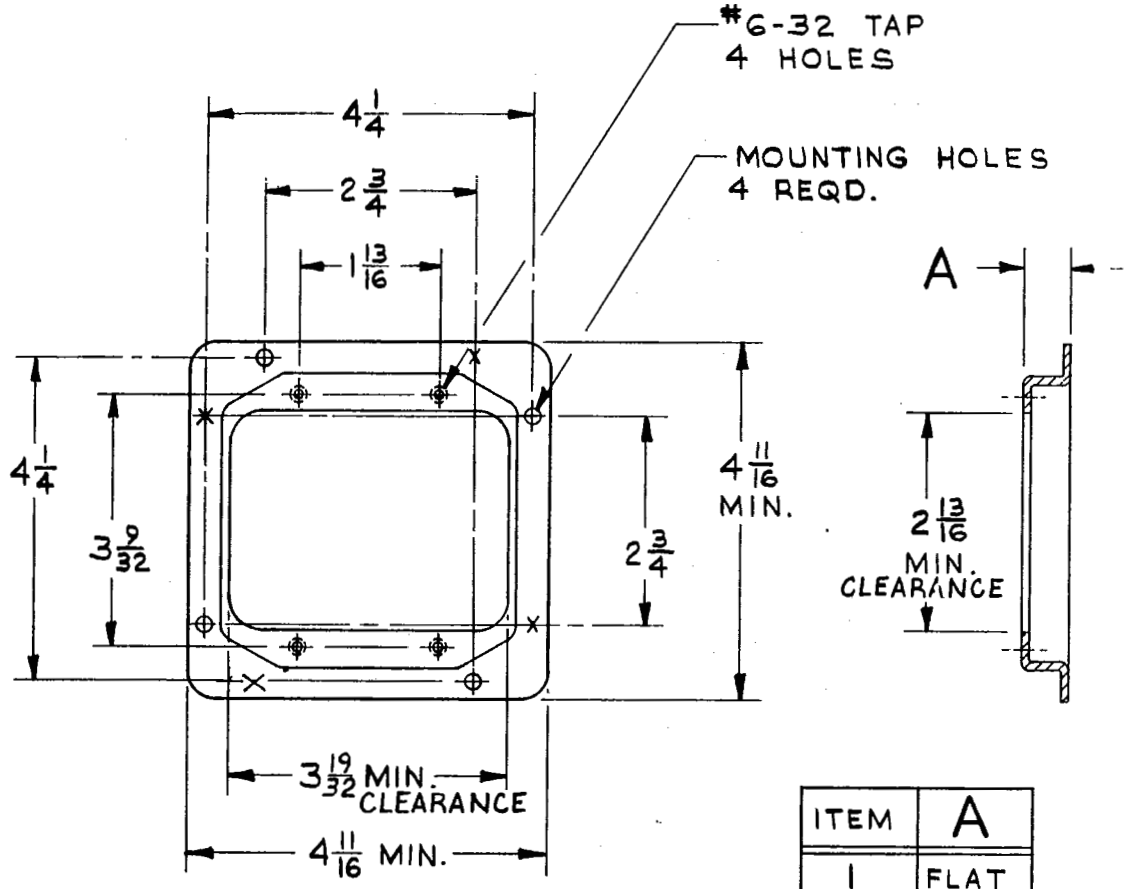
x–ALTERNATE MOUNTING HOLE LOCATION

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 330
ONE-DEVICE COVER FOR 4 1/16" SQUARE BOX

NEMA Standard 5-16-1984.

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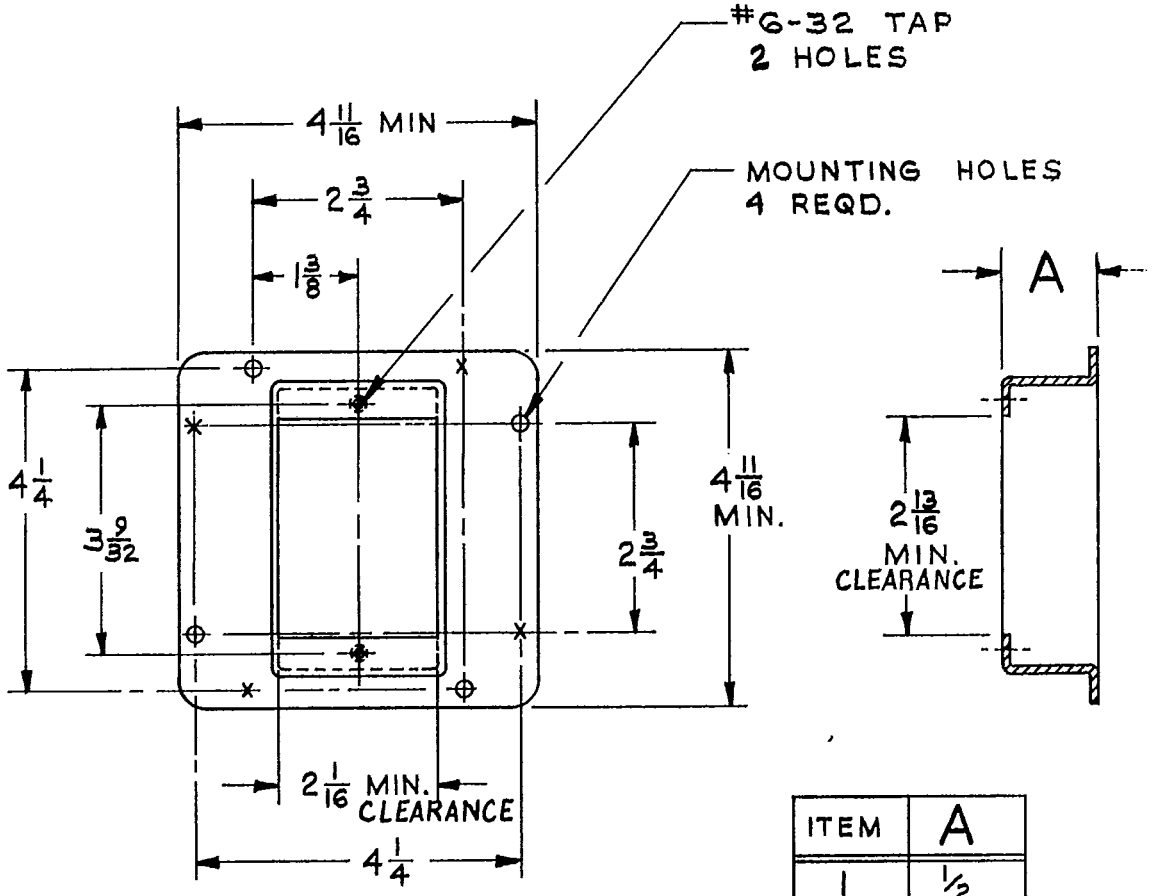
ITEM	A
1	FLAT
2	1/4
3	1/2
4	5/8
5	3/4
6	1
7	1 1/4

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 331
TWO-DEVICE COVER FOR 4 11/16" SQUARE BOX

NEMA Standard 5-16-1984.

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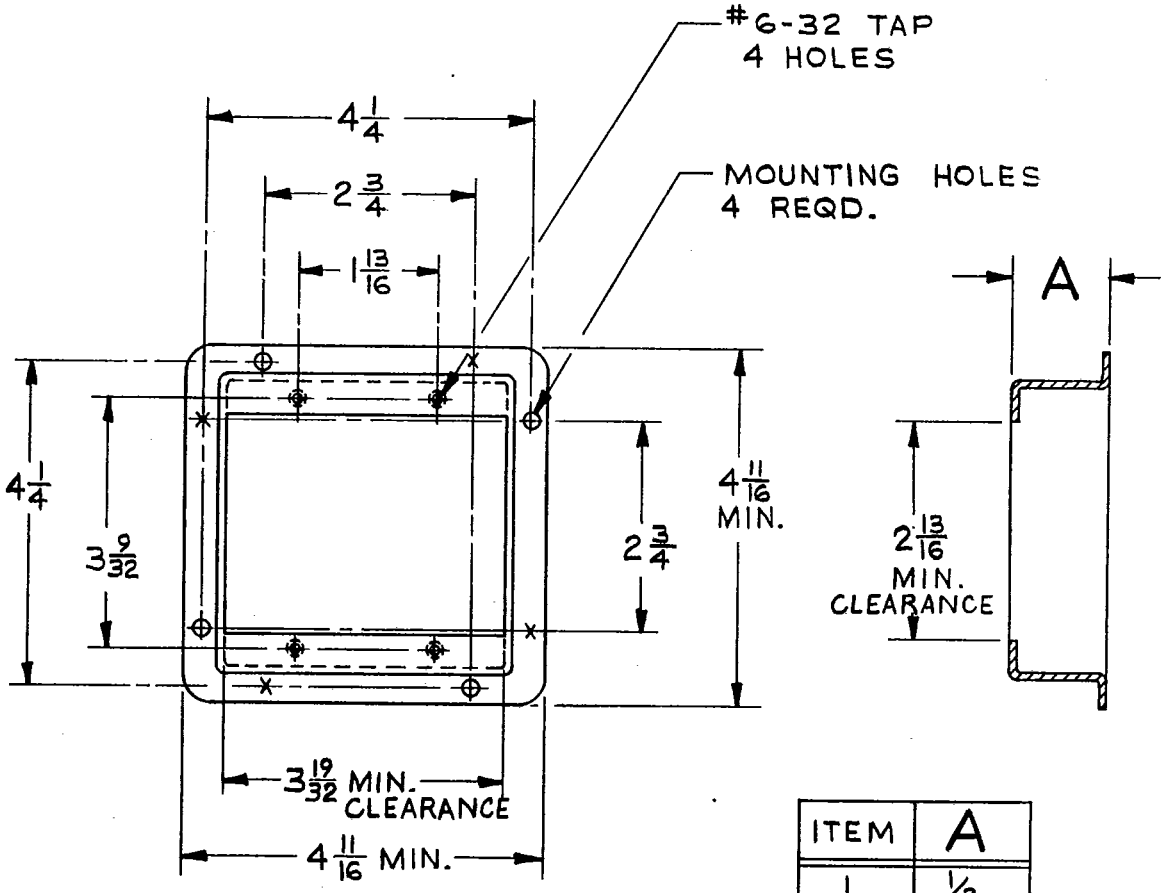
ITEM	A
1	1/2
2	5/8
3	3/4
4	1
5	1 1/4
6	1 1/2
7	2

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 332
ONE-DEVICE TILE COVER FOR 4 1/16" SQUARE BOX

NEMA Standard 5-16-1984.

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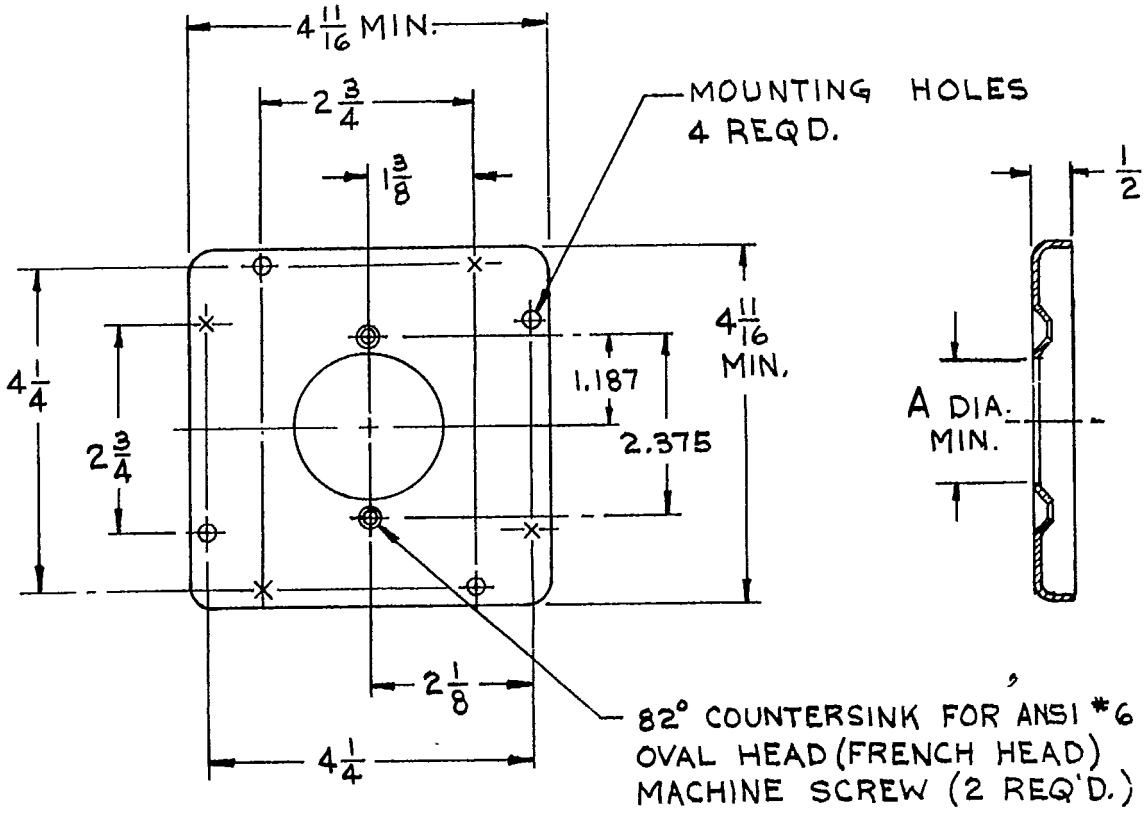
ITEM	A
1	1/2
2	5/8
3	3/4
4	1
5	1 1/4
6	1 1/2
7	2

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 333
TWO-DEVICE TILE COVER FOR 4 1/16" SQUARE BOX

NEMA Standard 5-16-1984.

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ITEM	A MIN.
1	1.396
2	1.586
3	1.711

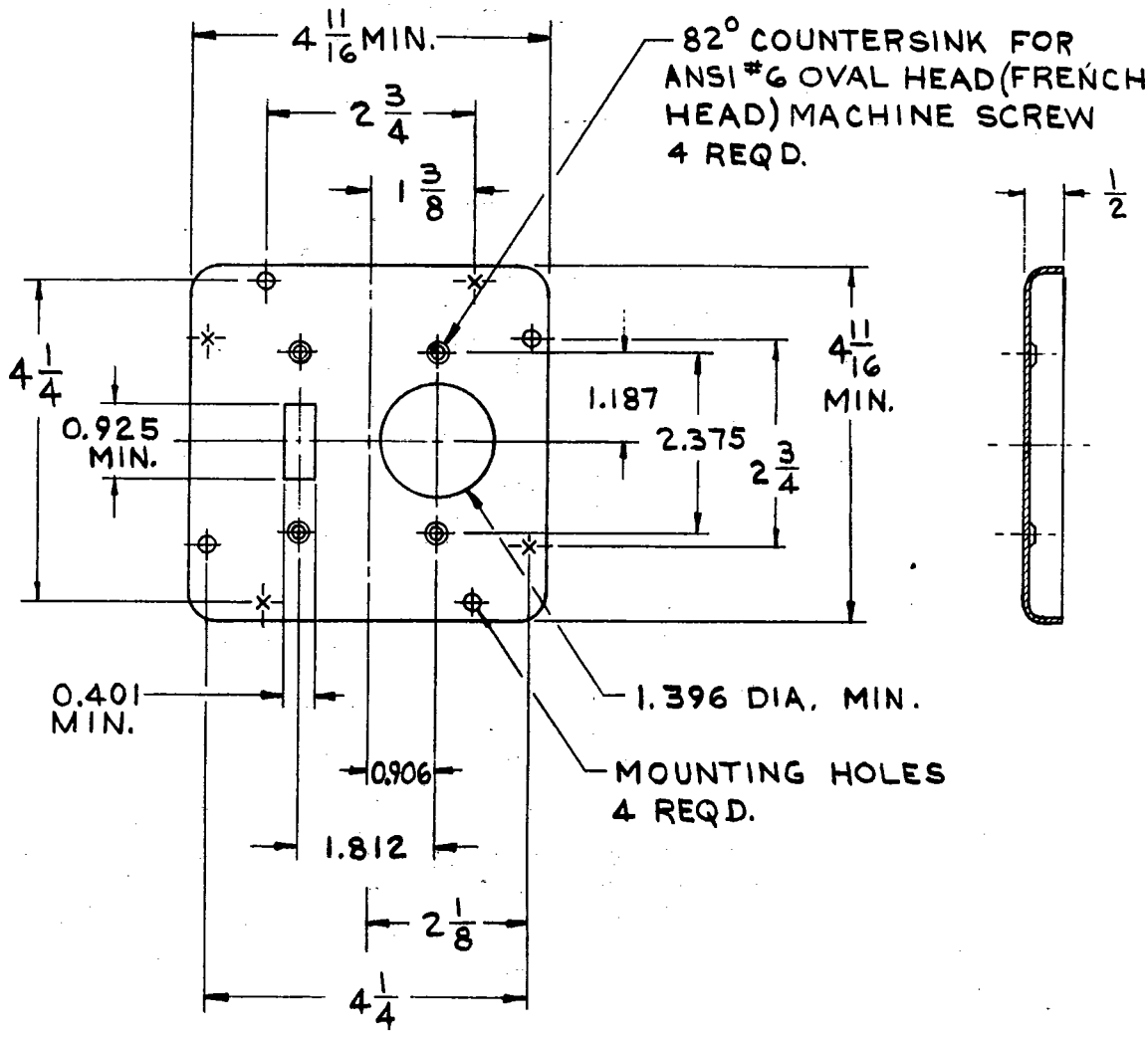
X - ALTERNATE MOUNTING HOLE LOCATION

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 340
SURFACE COVER FOR SINGLE RECEPTACLE FOR 4 11/16" SQUARE BOX

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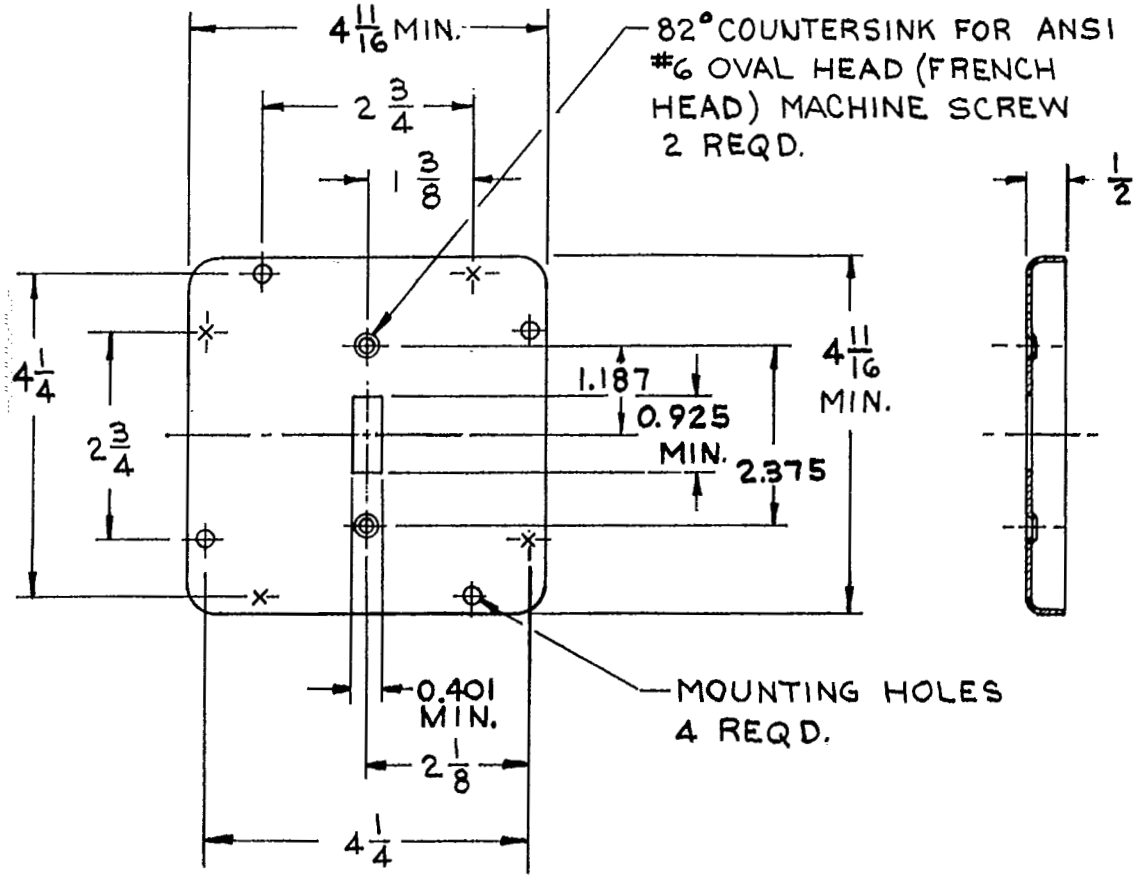


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 341
SURFACE COVER FOR ONE TOGGLE SWITCH AND ONE SINGLE RECEPTACLE FOR 4 11/16" SQUARE BOX

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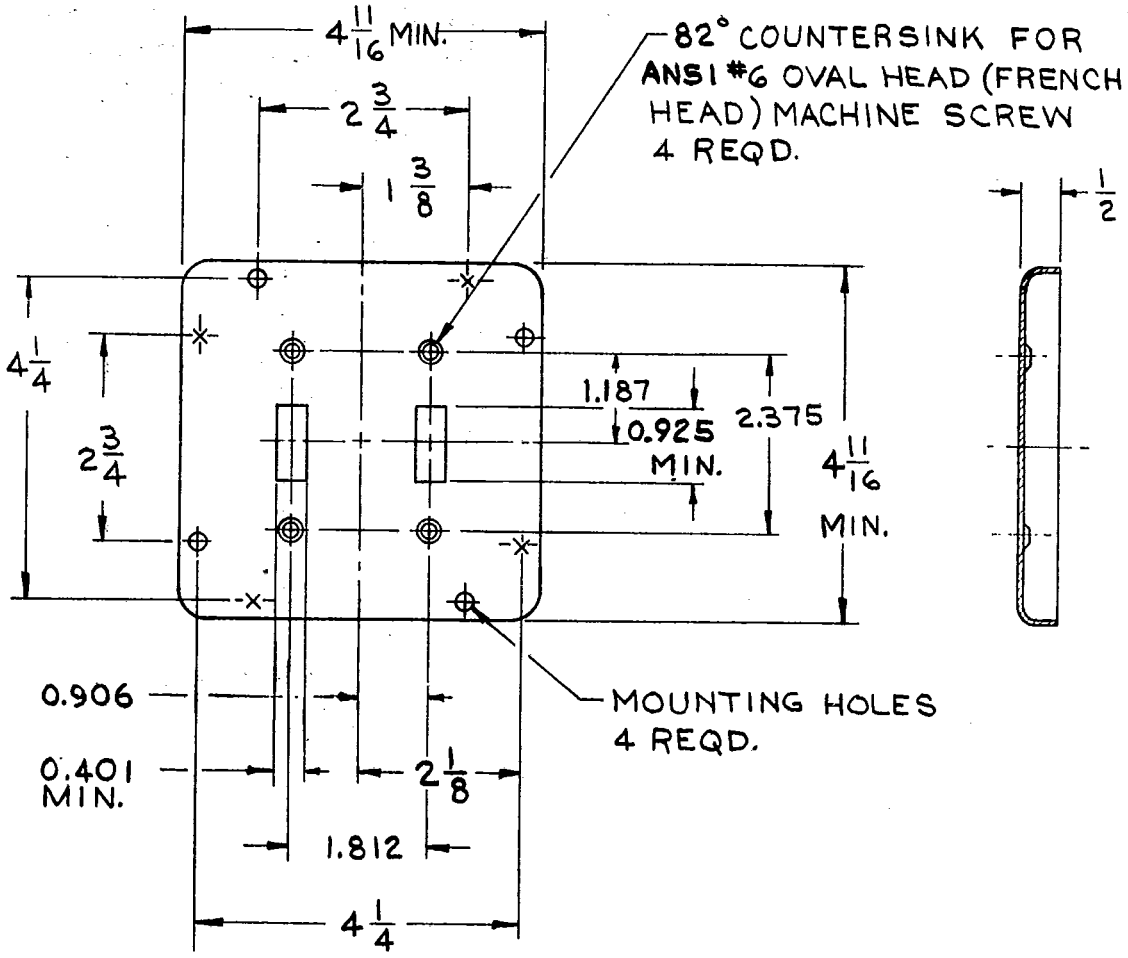


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 342
SURFACE COVER FOR ONE TOGGLE SWITCH FOR 4 11/16" SQUARE BOX

NEMA Standard 5-16-1984.

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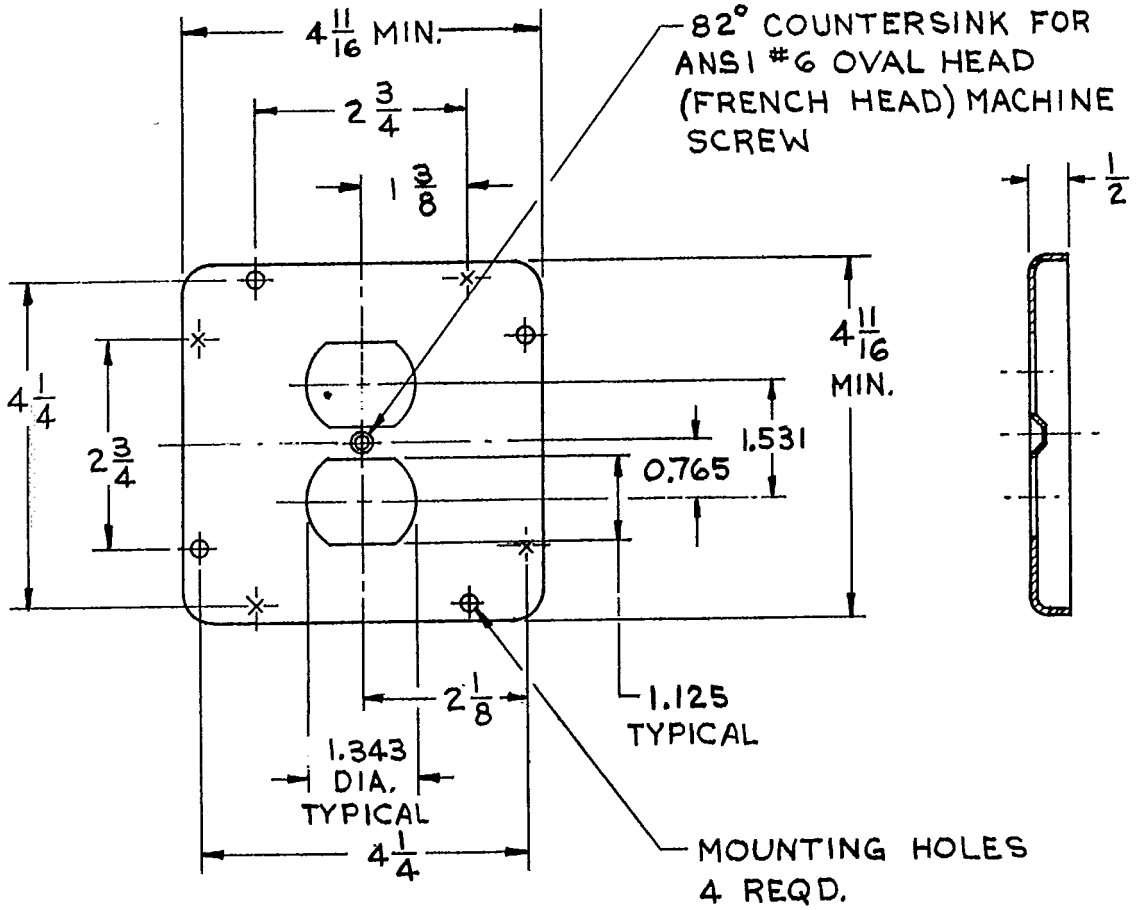


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 343
SURFACE COVER FOR TWO TOGGLE SWITCHES FOR 4 11/16" SQUARE BOX

NEMA Standard 5-16-1984.

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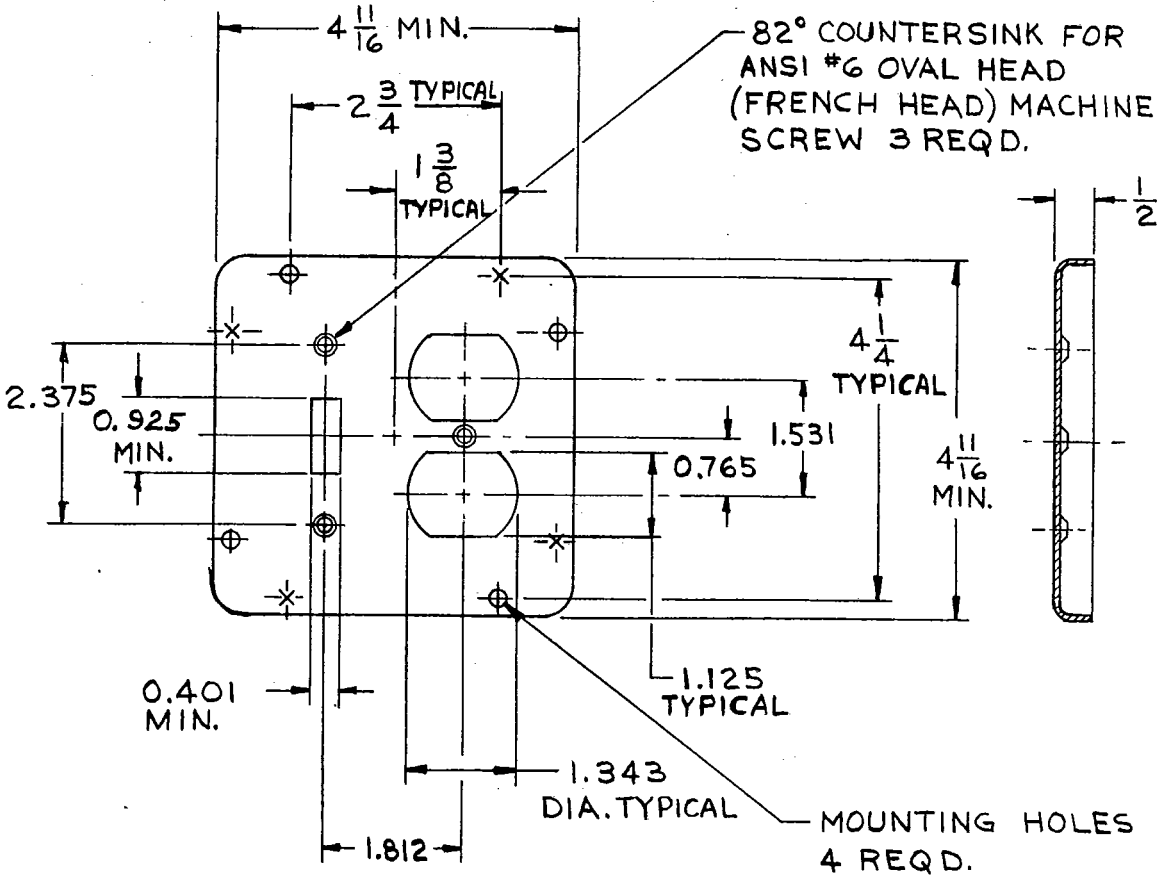


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 344
SURFACE COVER FOR ONE DUPLEX RECEPTACLE FOR 4 11/16" SQUARE BOX

NEMA Standard 11-16-1972.

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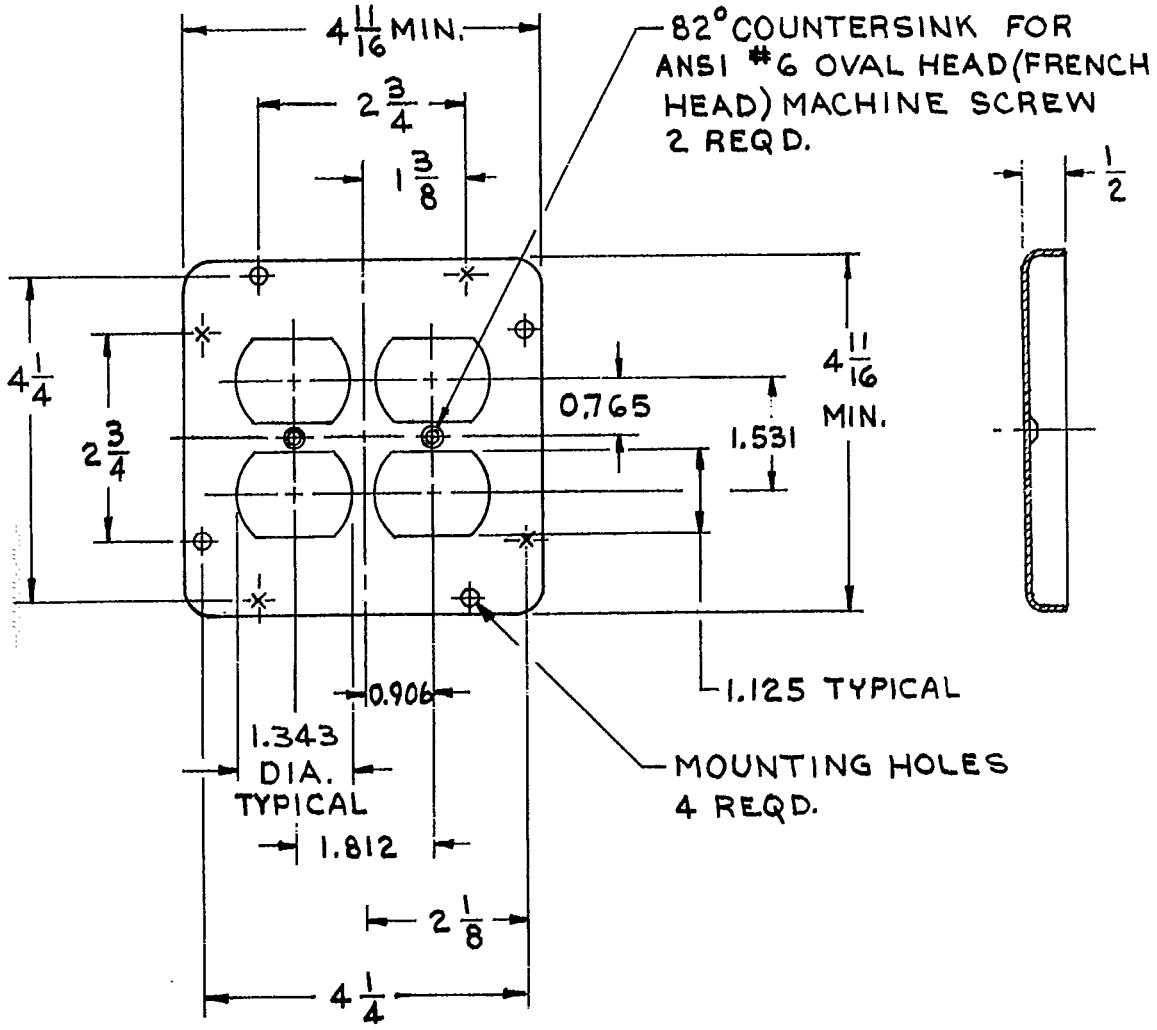


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 345
SURFACE COVER FOR ONE TOGGLE SWITCH AND ONE DUPLEX RECEPTACLE FOR 4 1/16" SQUARE BOX

NEMA Standard 5-16-1984.

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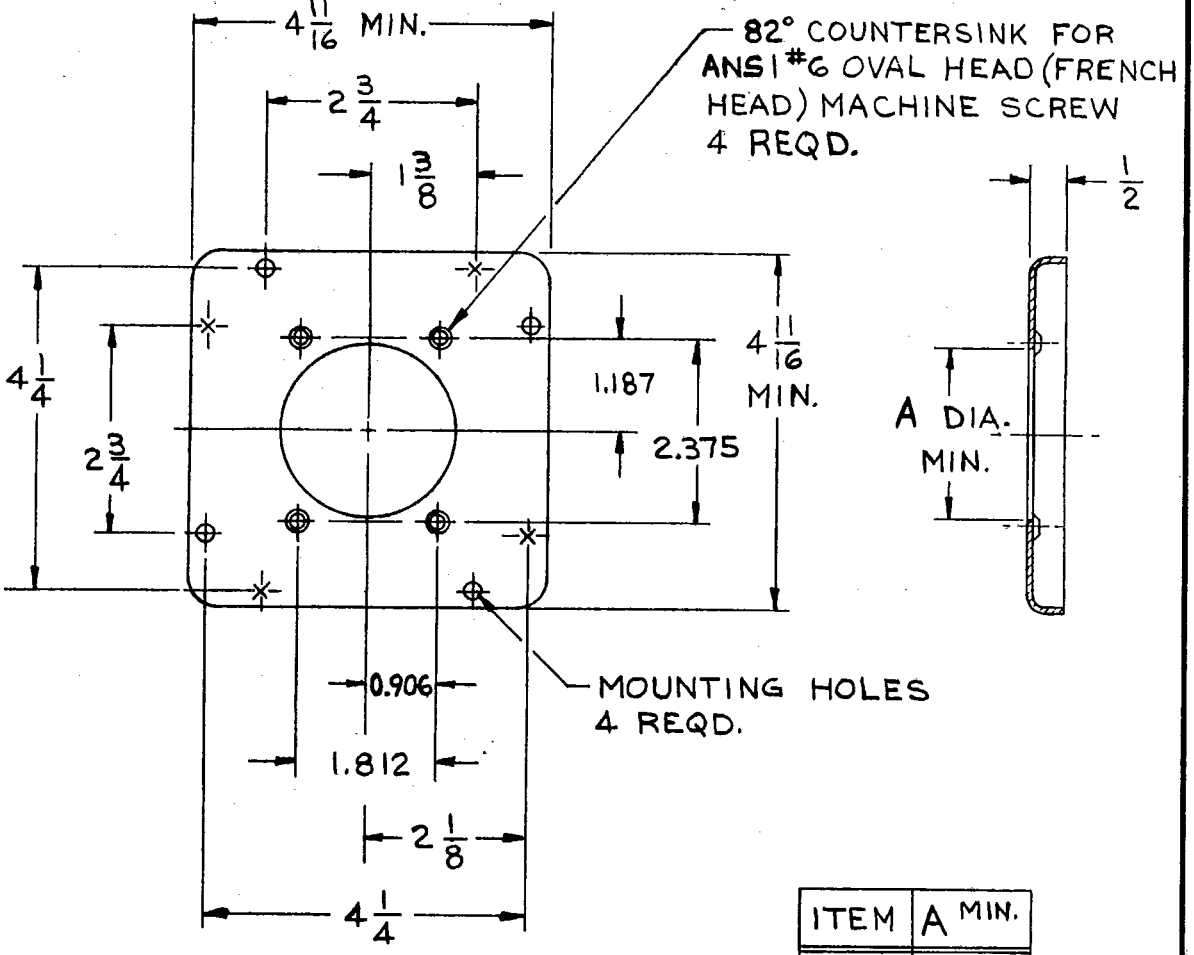


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 346
SURFACE COVER FOR TWO DUPLEX RECEPTACLES FOR 4 11/16" SQUARE BOX

NEMA Standard 5-16-1984.

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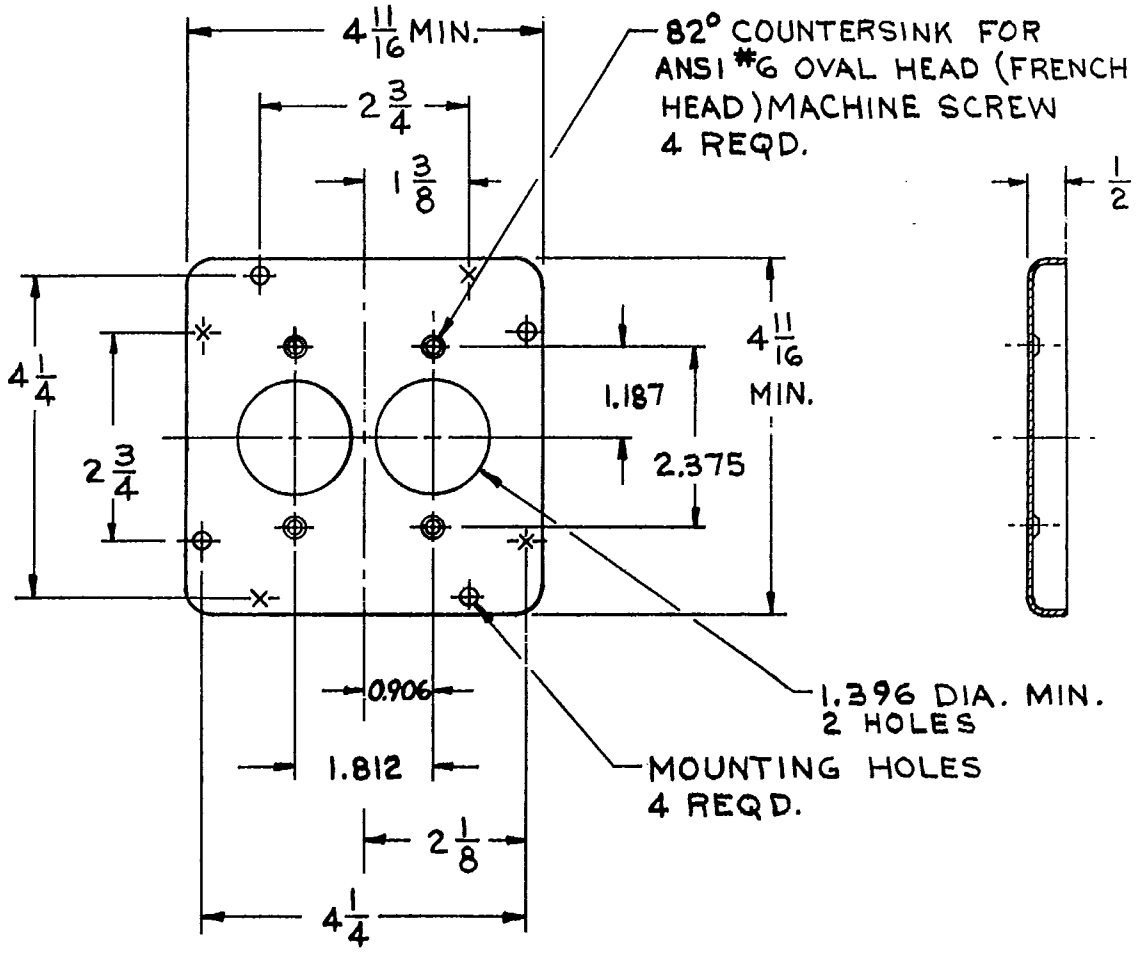
ITEM	A MIN.
1	2.140
2	2.452

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 347
SURFACE COVER FOR 30-50-60 AMPERE AND 3-WIRE RECEPTACLE 4 1/16" SQUARE BOX

NEMA Standard 5-16-1984.

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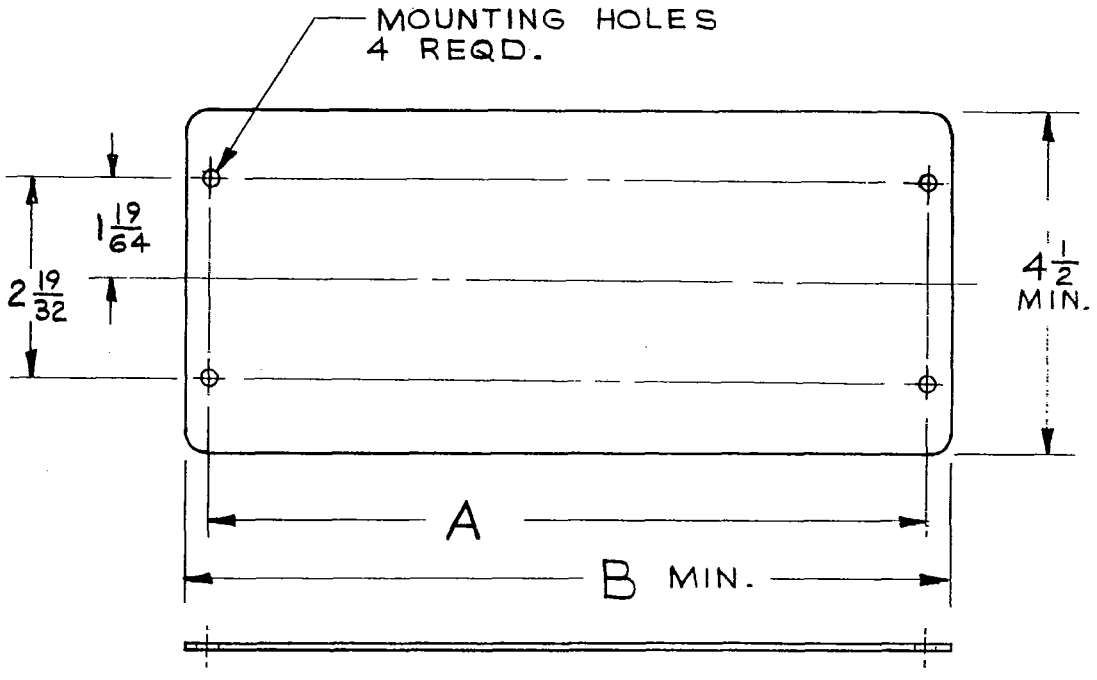


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 348
SURFACE COVER FOR TWO SINGLE RECEPTACLES FOR 4 11/16" SQUARE BOX

NEMA Standard 11-16-1972.

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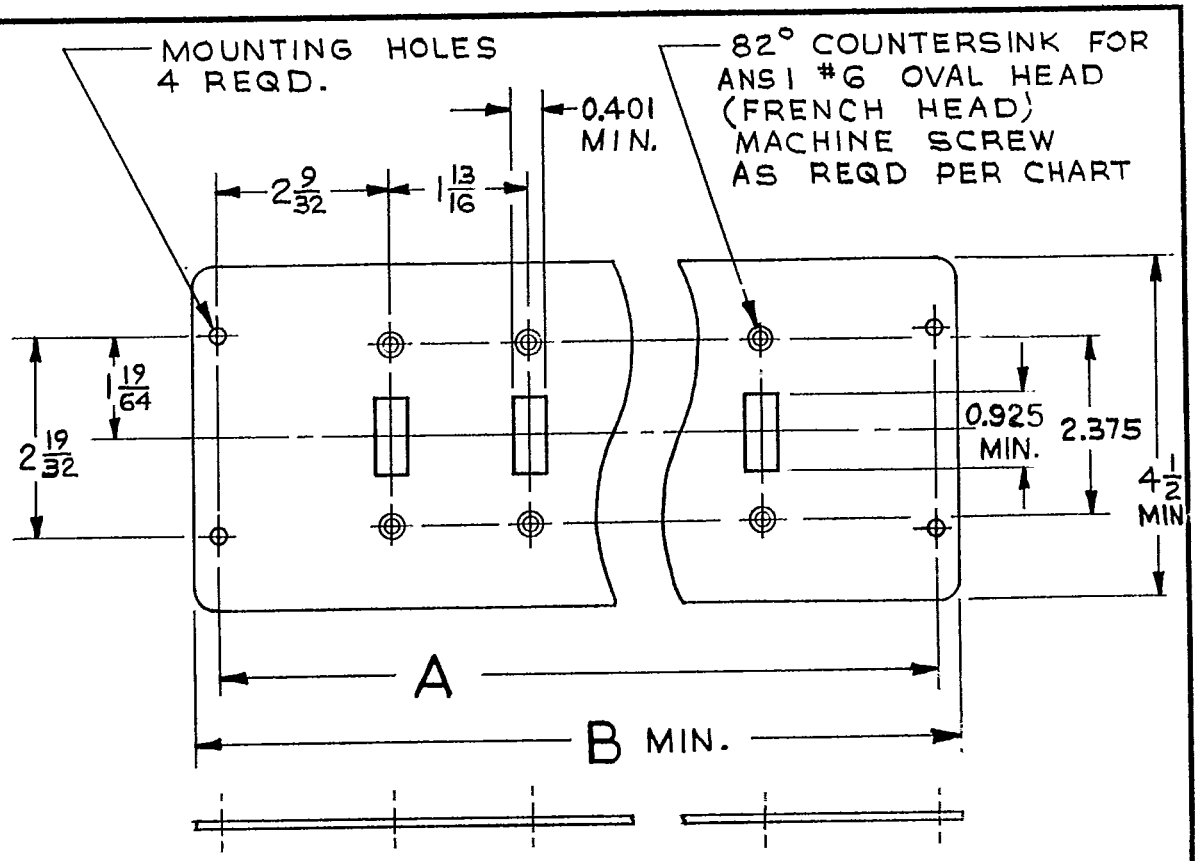
ITEM	NO. OF GANGS	A	B MIN.
1	2	6 3/8	6 13/16
2	3	8 3/16	8 5/8
3	4	10	10 7/16
4	5	11 13/16	12 1/4
5	6	13 5/8	14 1/16
6	7	15 7/16	15 7/8
7	8	17 1/4	17 11/16
8	9	19 1/16	19 1/2
9	10	20 7/8	21 5/16

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 350
FLAT BLANK COVERS FOR GANG BOXES

NEMA Standard 11-16-1972.

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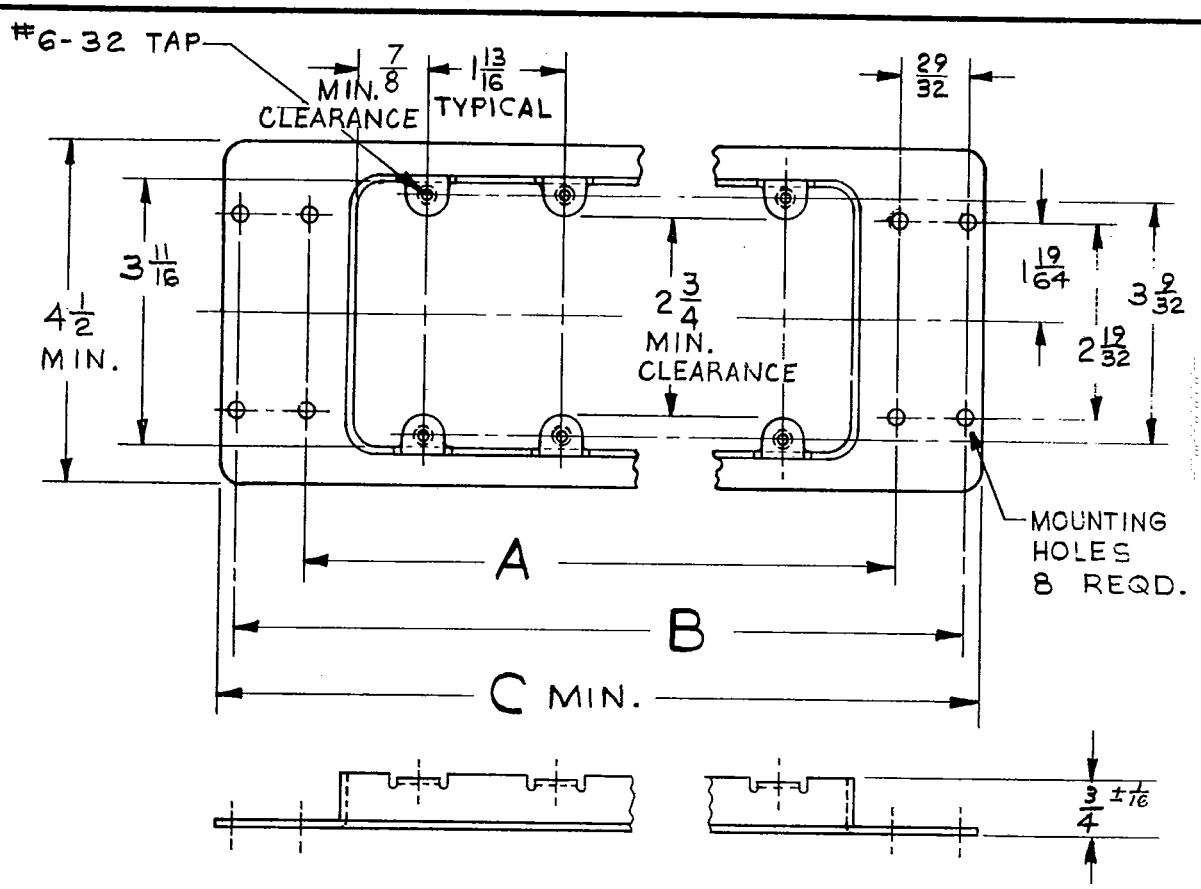
ITEM	NO. OF GANGS	A	B MIN
1	2	6 3/8	6 13/16
2	3	8 3/16	8 5/8
3	4	10	10 7/16
4	5	11 13/16	12 1/4
5	6	13 5/8	14 1/16
6	7	15 7/16	15 7/8
7	8	17 1/4	17 11/16
8	9	19 1/16	19 1/2
9	10	20 7/8	21 5/16

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 351
FLAT TOGGLE SWITCH COVERS FOR GANG BOXES

NEMA Standard 5-16-1984.

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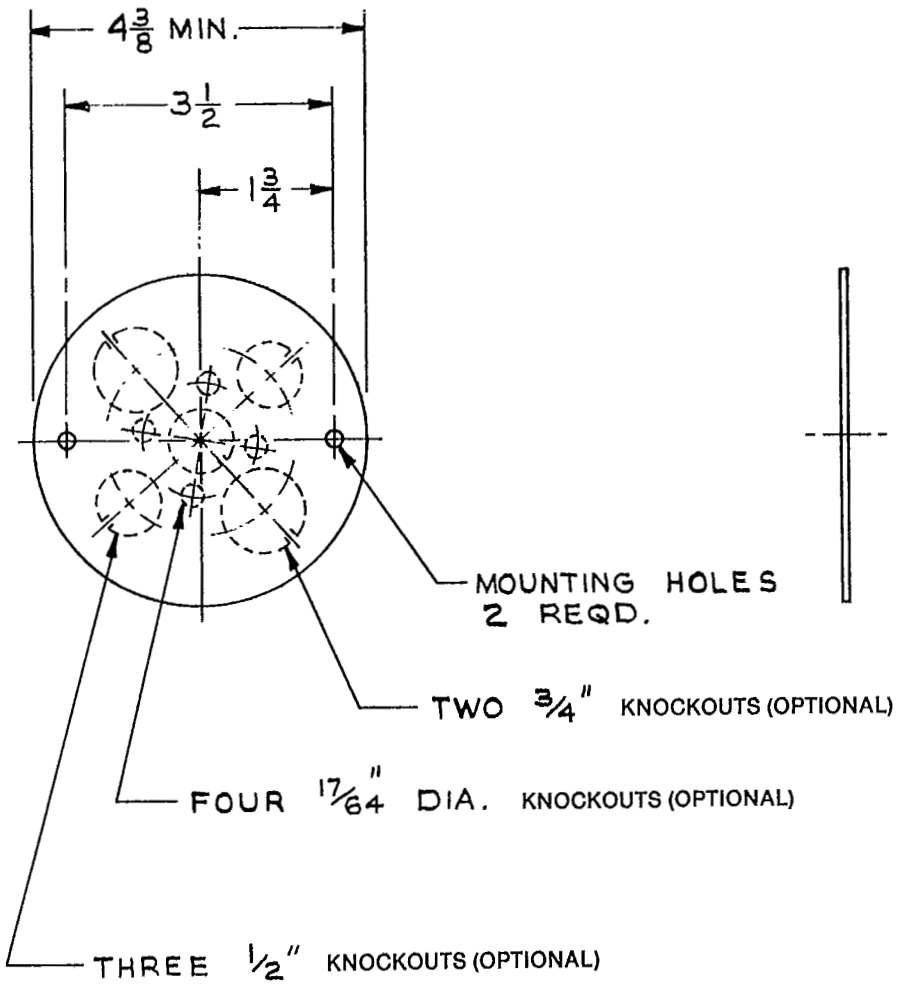
ITEM	NO. OF GANGS	A	B	C MIN.
1	2	4 9/16	6 3/8	6 13/16
2	3	6 3/8	8 3/16	8 5/8
3	4	8 3/16	10	10 7/16
4	5	10	11 13/16	12 1/4
5	6	11 13/16	13 5/8	14 1/16
6	7	13 5/8	15 7/16	15 7/8
7	8	15 7/16	17 1/4	17 11/16
8	9	17 1/4	19 1/16	19 1/2
9	10	19 1/16	20 7/8	21 5/16

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 352
RAISED COVERS FOR GANG BOXES

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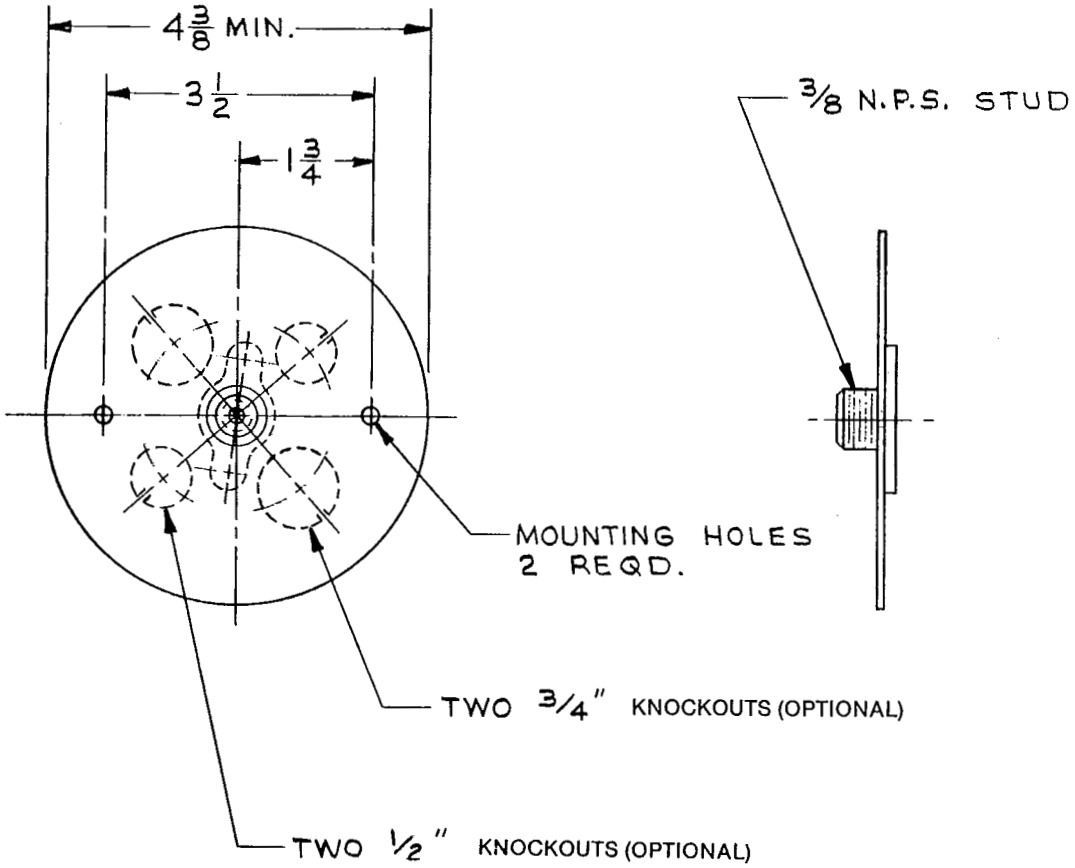


ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 360
CONCRETE BACKPLATE COMBINATION ½" AND ¾" KNOCKOUTS (OPTIONAL)

NEMA Standard 11-16-1972.

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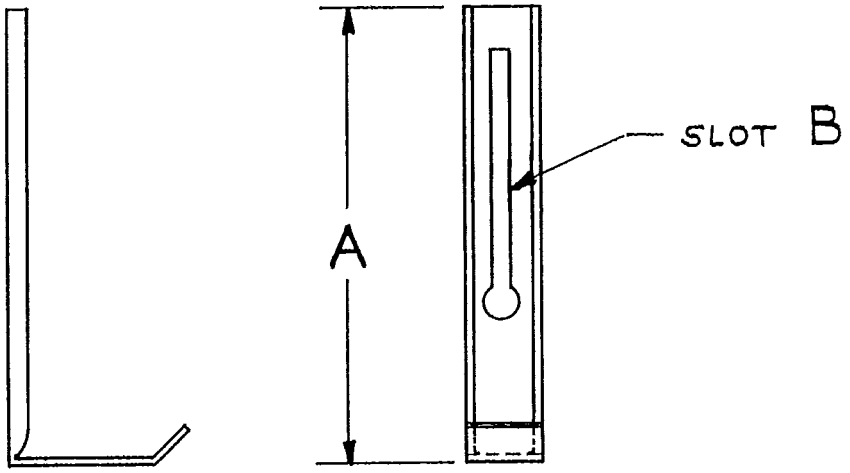
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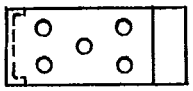
Figure 361
CONCRETE BACKPLATE WITH STUD, ½" and ¾" KNOCKOUTS (OPTIONAL)

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ITEM	A	B
1	12	YES
2	12	NONE
3	20	YES
4	20	NONE
5	30	YES

ALL DIMENSIONS IN INCHES.
SEE 2.1 THROUGH 2.9 FOR ADDITIONAL DETAILS AND VARIATIONS.

Figure 400
BOX AND CONDUIT SUPPORT

NEMA Standard 11-16-1972.

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NEMA STANDARDIZATION

The purpose of NEMA Standards, their classification and status are set forth in certain clauses of the NEMA Bylaws, which are quoted below:

Purpose of Standards

National Electrical Manufacturers Association Standards are adopted in the public interest and are designed to eliminate misunderstandings between the manufacturer and the purchaser and to assist the purchaser in selecting and obtaining the proper product for its particular need. Existence of a National Electrical Manufacturers Association Standard does not in any respect preclude any member or nonmember from manufacturing or selling products not conforming to the standard.

(Bylaw—Art. V, Sec. 1)

Definition of a Standard

A standard of the National Electrical Manufacturers Association defines a product, process or procedure with reference to one or more of the following: nomenclature, composition, construction, dimensions, tolerances, safety, operating characteristics, performance, rating, testing, and the service for which they are designed.

(Bylaw—Art. V, Sec. 2, Subsection A)

Dimensions

Where dimensions are given for interchangeability purposes, alternate dimensions satisfying the other provisions of the standards publication may be capable of otherwise equivalent performance.

(NEMA Policy Memorandum 84-2, dated June 7, 1984)

Classes of Standards

National Electrical Manufacturers Association Standards are of two classes:

1. NEMA Standard, which relates to a product commercially standardized and subject to repetitive manufacture, which standard has been approved by at least 90 percent of the members of the Subdivision eligible to vote thereon;
2. Suggested Standard for Future Design, which may not have been regularly applied to a commercial product, but which suggests a sound engineering approach to future development, which standard has been approved by at least two-thirds of the members of the Subdivision eligible to vote thereon.

(Bylaw—Art. V, Sec. 2, Subsection B)

Authorized Engineering Information

Authorized Engineering Information consists of explanatory data and other engineering information of an informative character not falling within the classification of NEMA Standard or Suggested Standard for Future Design.

(Bylaw—Art. V, Sec. 6, 1st Sentence)

Official Standards Proposal

An Official Standards Proposal is an official draft of a proposed standard which is formally recommended to an outside organization(s) for consideration, comment and/or approval.

(Bylaw—Art. V, Sec. 4, Subsection A)

Identification of Status

Standards in NEMA Standards Publications are identified in the foreword or following each standard as "NEMA Standard" or "Suggested Standard for Future Design." These indicate the status of the standard. These words are followed by a date which indicates when the standard was adopted in its present form by the Association.

The material identified as "Authorized Engineering Information" and "Official Standards Proposal" is designated similarly.

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