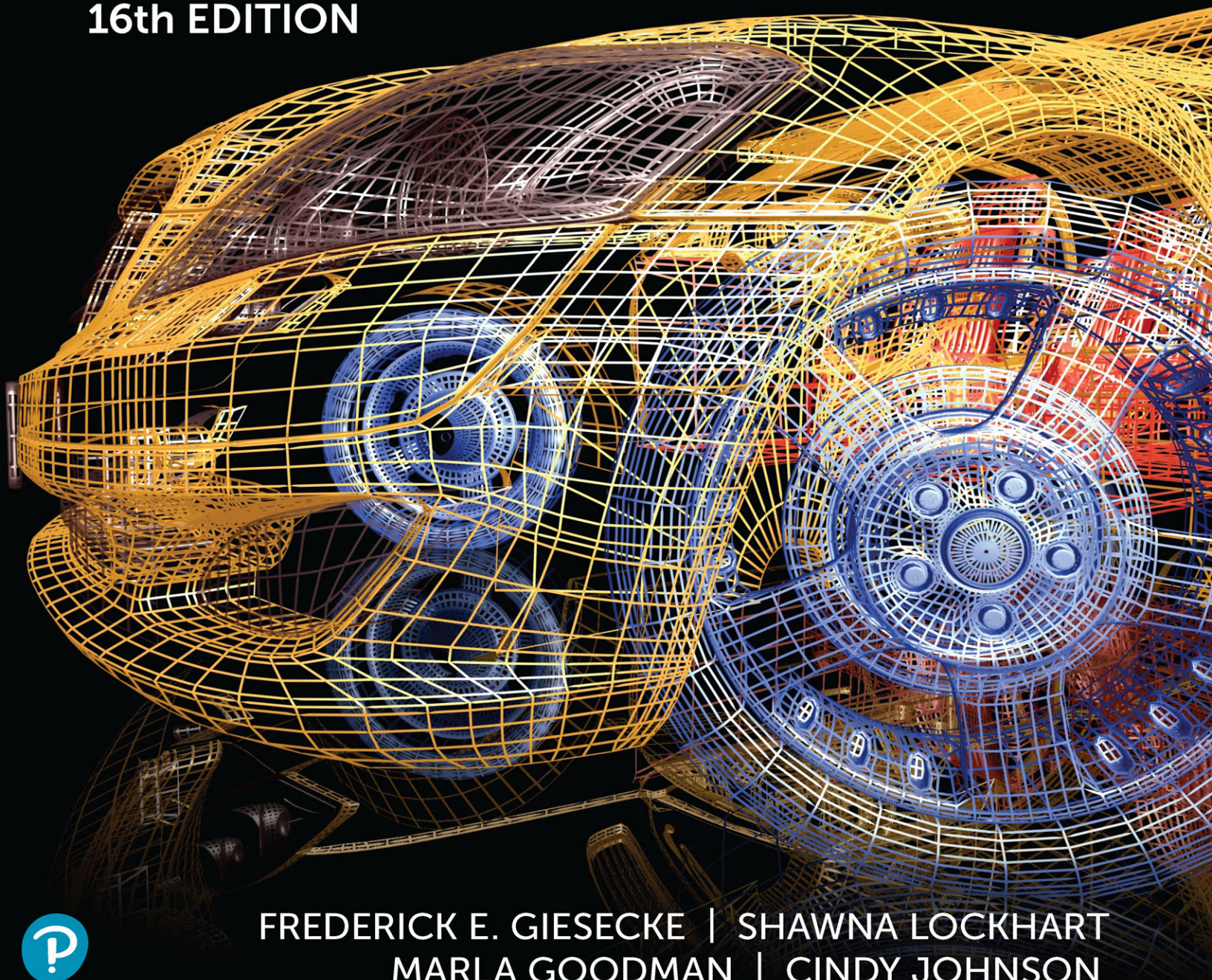
TECHNICAL DRAWING WITH ENGINEERING GRAPHICS

16th EDITION



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MARLA GOODMAN | CINDY JOHNSON

SIXTEENTH EDITION

TECHNICAL DRAWING WITH ENGINEERING GRAPHICS

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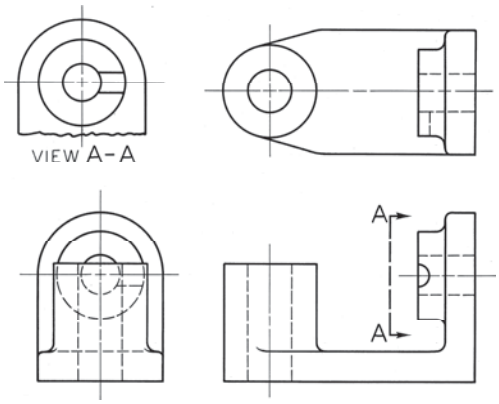
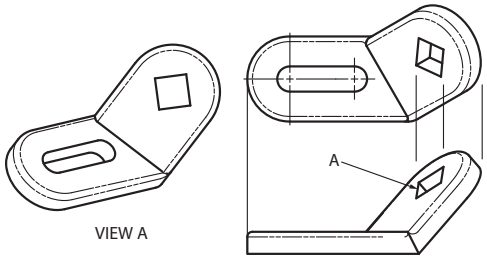


7.29 Removed View Using Viewing-Plane Line



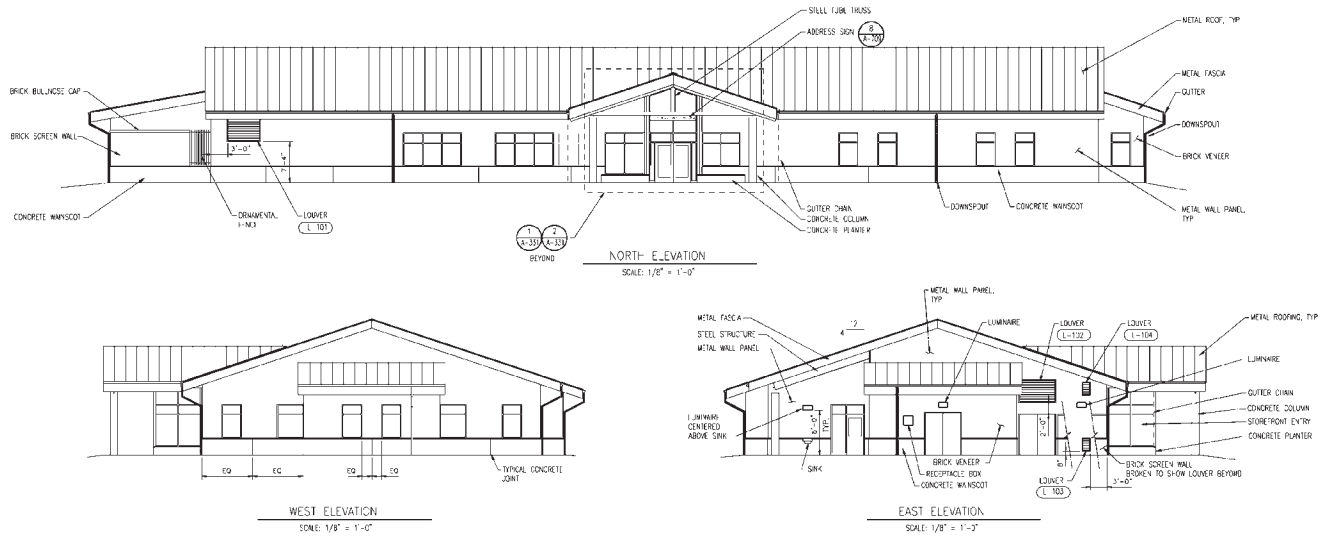
7.30 Removed View Using View Indicator Arrow

7.11 REMOVED VIEWS

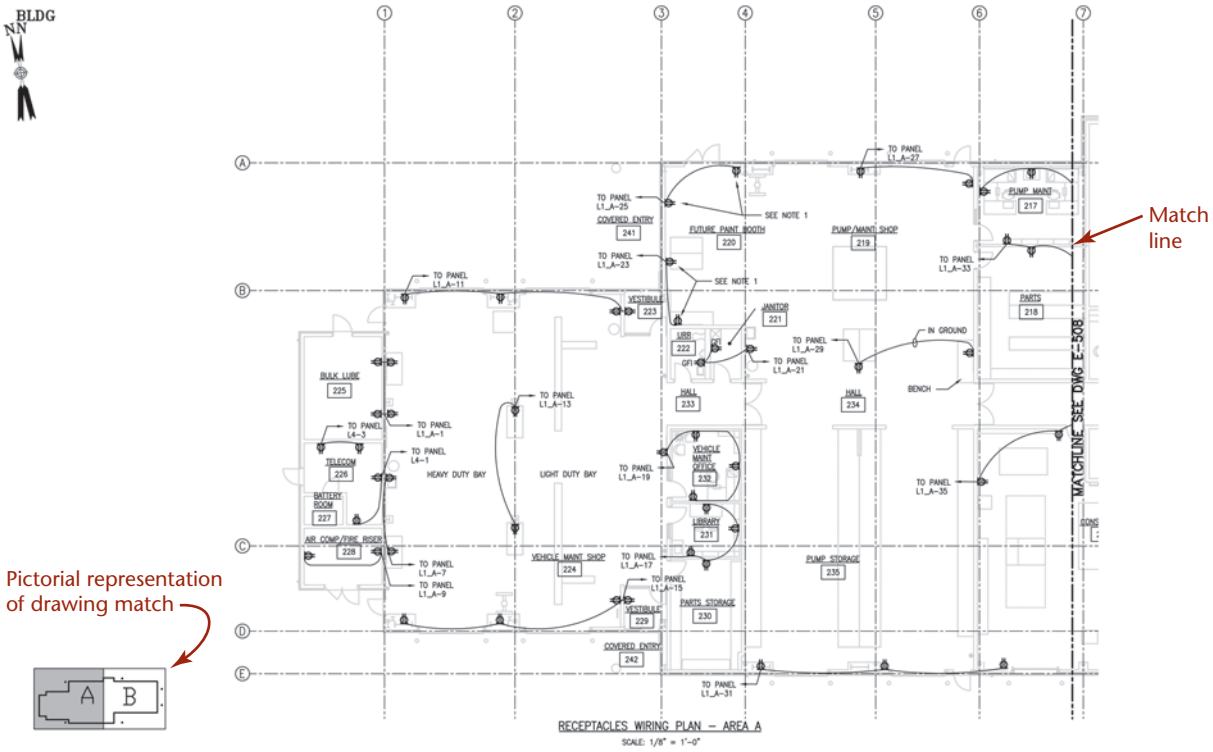
A ***removed view*** is a complete or partial view removed to another place on the sheet so that it is no longer in direct projection with any other view, as shown in the upper left corner of Figure 7.29. A removed view may be used to show a feature of the object more clearly, possibly to a larger scale, or to save drawing a complete regular view. A viewing-plane line is used to indicate the part being viewed. The arrows at the corners show the direction of sight. The removed views should be labeled View A–A or View B–B and so on; the letters refer to those placed at the corners of the viewing-plane line. A view indicator arrow can also be used to show the viewing direction for the removed view, as shown in Figure 7.30. Be sure to label the removed view clearly and provide its scale if it is different from the overall drawing scale.

Architectural drawings often cannot fit even two standard views on the sheet. The sheets are typically labeled to indicate the standard views, as in Figure 7.31. Views are labeled, for example, "Plan" for the top view, "East Elevation" for the side view seen from the east compass direction, and so forth. Additional views use a viewing-plane line or arrow to indicate the direction of sight.

In large civil drawings and other complex drawings such as the electrical drawing in Figure 7.32, one entire view may not be able to be shown clearly on a single sheet. For projects that extend sheet to sheet, match lines are often drawn showing how one sheet matches to the previous one.



7.31 Architectural Drawing with Views Labeled *(Courtesy of CH2M HILL.)*



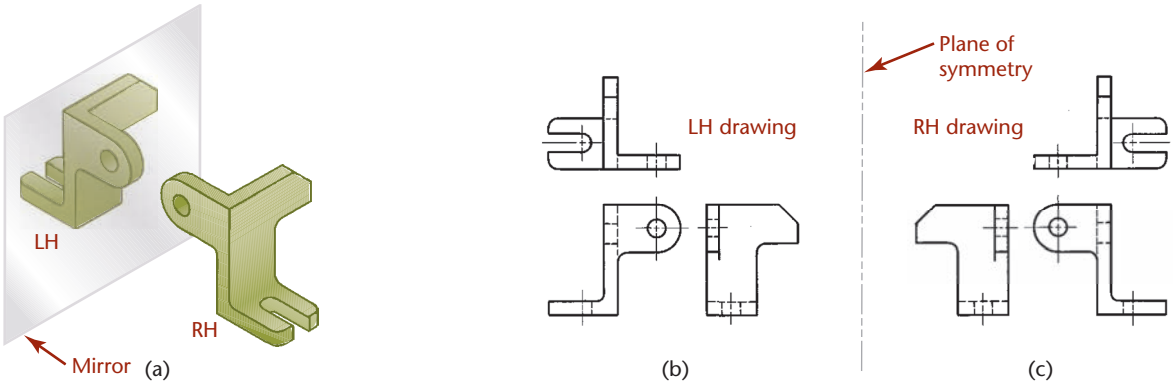
7.32 A Portion of a Building System Electrical Drawing Using Match Lines *(Courtesy of CH2M HILL.)*

7.12 RIGHT-HAND AND LEFT-HAND PARTS

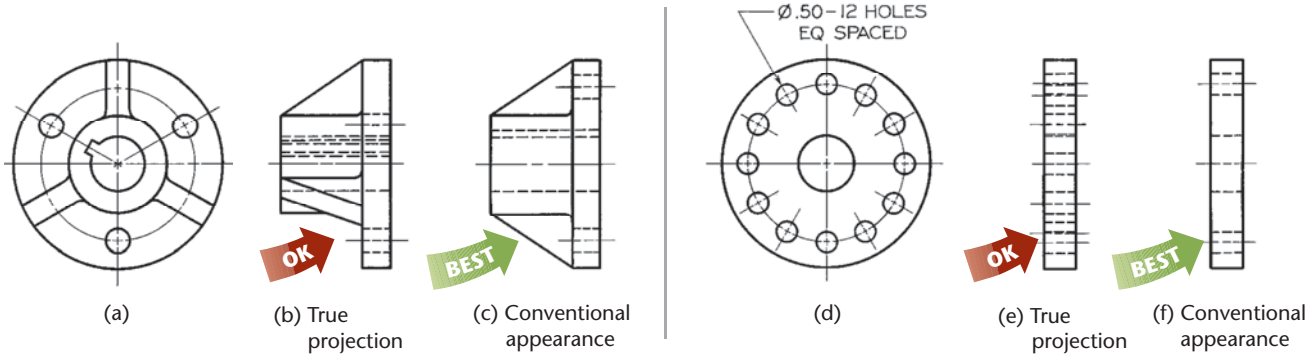
Often, parts function in pairs of similar opposite parts, but opposite parts can rarely be exactly alike. For example, the right-front fender of an automobile cannot be the same shape as the left-front fender. A ***left-hand part*** is not simply a right-hand part turned around; the two parts are mirror images and are not interchangeable.

On sketches and drawings a left-hand part is noted as LH, and a ***right-hand part*** as RH. In Figure 7.33a, the part in front of the mirror is a right-hand part, and the image shows the left-hand part. No matter how the object is turned, the mirror image will show the left-hand part. Figures 7.33b and c show left-hand and right-hand drawings of the same object.

Ordinarily you draw only one of two opposite parts and label the one that is drawn with a note, such as LH PART SHOWN, RH OPPOSITE. If the opposite-hand shape is not clear, you should make a separate sketch or drawing to show it clearly and completely.



7.33 Right-Hand and Left-Hand Parts



7.34 Revolution Conventions

7.13 REVOLUTION CONVENTIONS

Regular multiview projections are sometimes awkward, confusing, or actually misleading. For example, Figure 7.34a shows an object that has three triangular ribs, three holes equally spaced in the base, and a keyway. The right-side view is a regular projection, but is not recommended—the lower ribs appear in a foreshortened position, the holes do not appear in their true relation to the rim of the base, and the keyway is projected as a confusion of hidden lines.

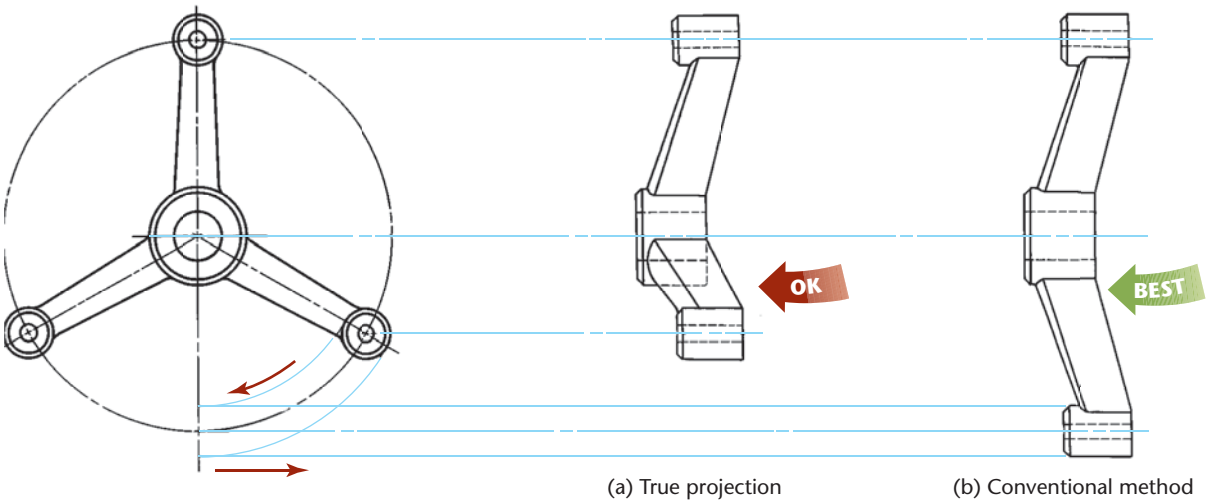
The method shown in Figure 7.34c is preferred because it is simpler to read and requires less time to sketch. Each of the features mentioned has been revolved in the front view to lie along the vertical centerline, from which it is projected to the correct side view.

Figures 7.34d and 7.34e show regular views of a flange with several small holes. The hidden holes are confusing and take unnecessary time to show. Figure 7.34f shows the holes revolved for clarity.

Figure 7.35 shows a regular projection with a confusing foreshortening of its inclined arm. In Figure 7.35b, the lower arm is revolved to line up vertically in the front view so that it projects the true length in the side view and makes the object's symmetry clear.

Revolutions like these are frequently used in connection with sectioning. Revolved sectional views are called *aligned sections.*

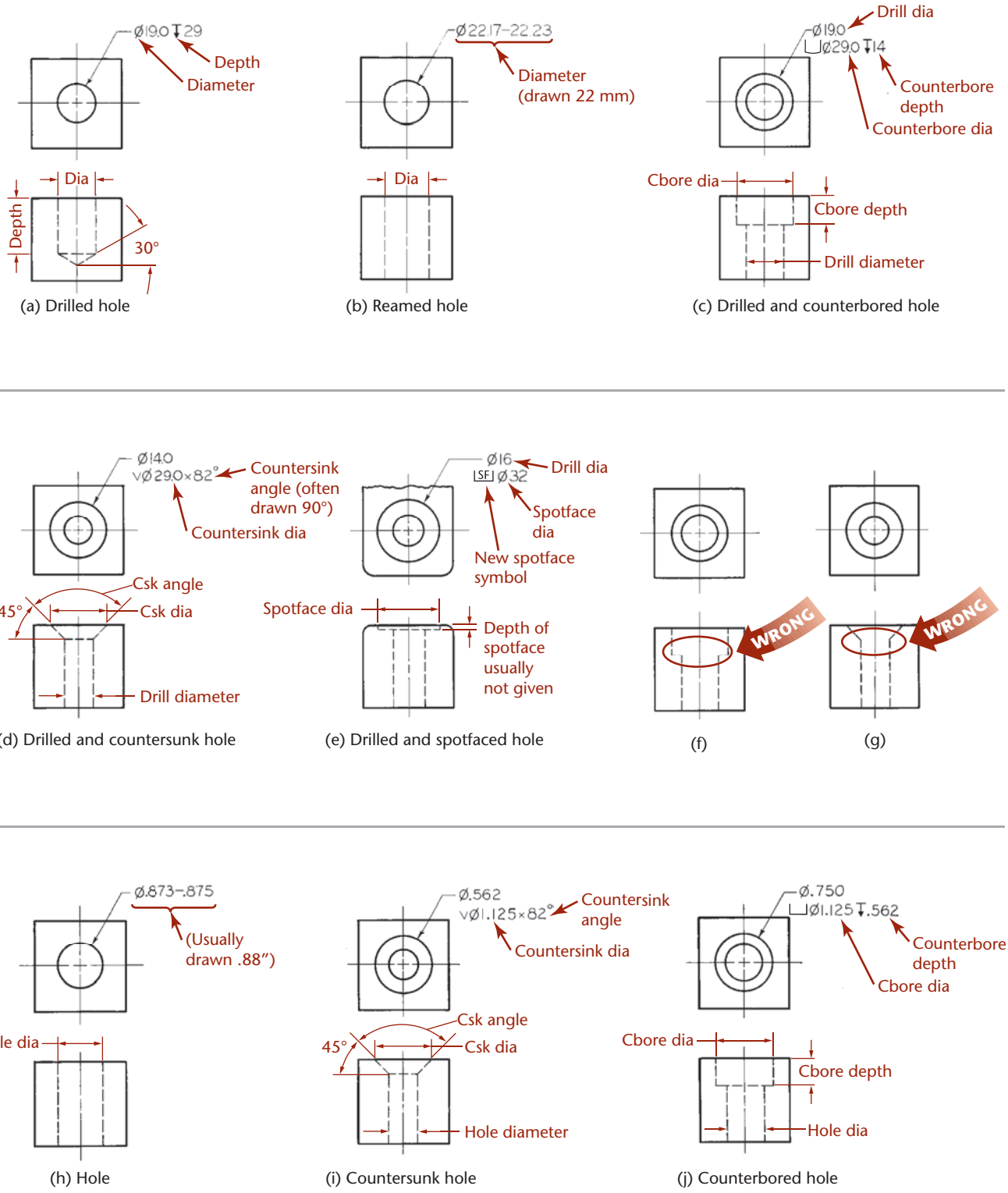
In views generated from 3D CAD models, revolving the features to show their true size is not required, but it is preferred, especially in hand-drawn and 2D CAD drawings.



7.35 Revolution Conventions

Common Hole Features Shown in Orthographic Views

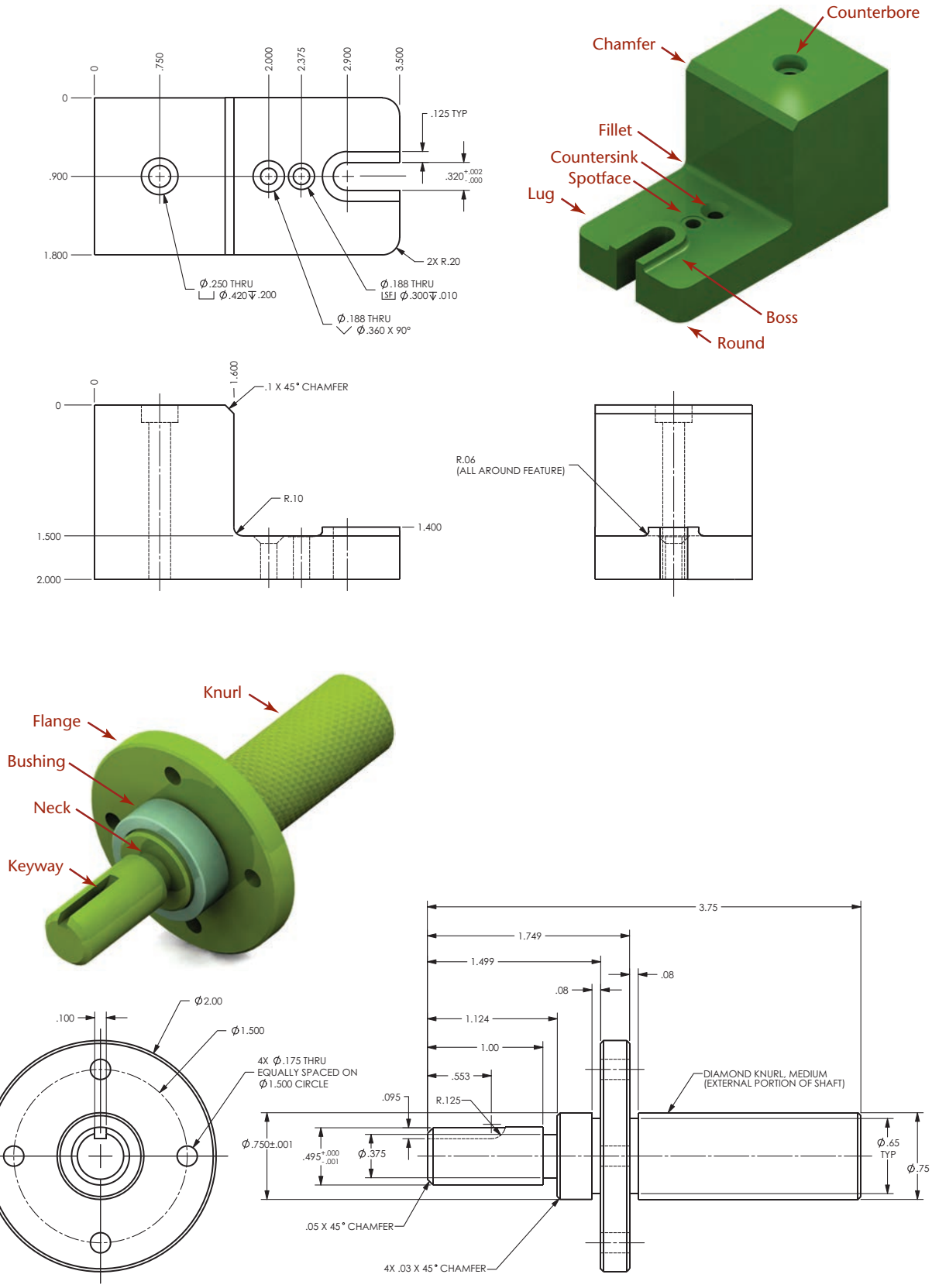
Orthographic views of common hole features are shown in Figure 7.36. See Table 7.1 on page 286 for descriptions of these common hole features.



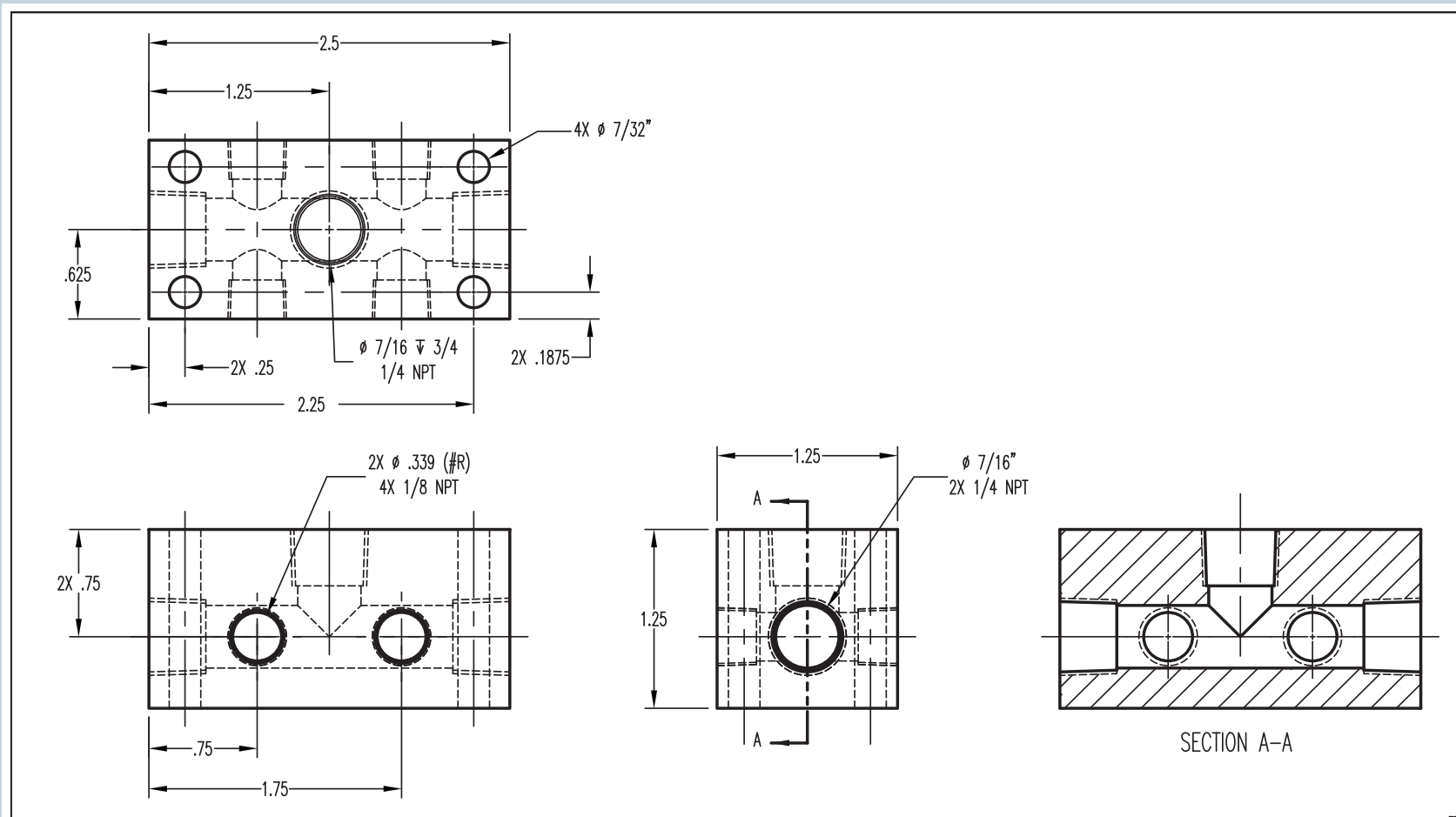
7.36 Representing Holes in Orthographic Views; Dimensions for (a)–(e) in Metric, (h)-(j) in Inches

Common Features Shown in Orthographic Views

Orthographic views of common features are shown in Figure 7.37. See Table 7.1 on page 286 for descriptions of common features.



7.37 Representing Common Features in Orthographic Views



Orthographic Views of a Solenoid Valve Manifold. *This drawing is for a part that has many intersecting holes.* *(Courtesy of Wood's Power-Grip Co., Inc.)*