**3.3-6** The tension member shown in Figure P3.3-6 is a C12 × 20.7 of A572 Grade 50 steel. Will it safely support a service dead load of 60 kips and a service live load of 125 kips? Use Equation 3.1 for $U$.

a. Use LRFD.

b. Use ASD.

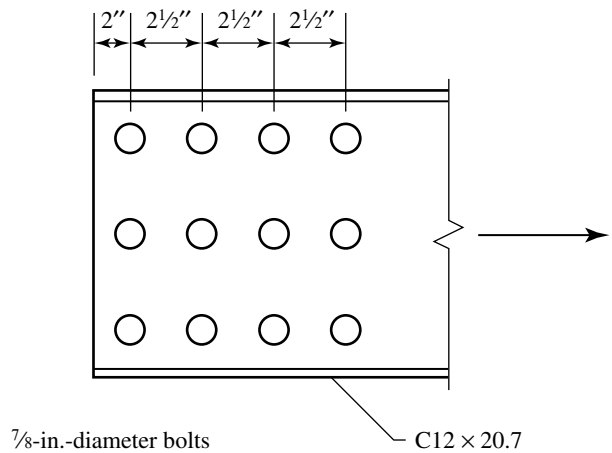


**FIGURE P3.3-6**

**3.3-7** A double-angle tension member, 2L4 × 3 × ¼ LLBB, is connected with welds as shown in Figure P3.3-7. A36 steel is used.

a. Compute the available strength for LRFD.

b. Compute the available strength for ASD.

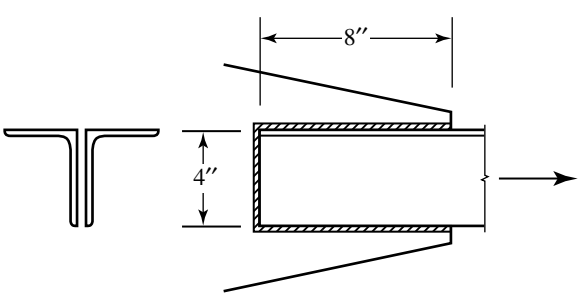


**FIGURE P3.3-7**

**3.3-8** An L5 × 5 × ½ tension member of A242 steel is connected to a gusset plate with six ¾-inch-diameter bolts as shown in Figure P3.3-8. If the member is subject to dead load and live load only, what is the maximum total service load that can be applied if the ratio of live load to dead load is 2.0? Use the alternative value of $U$ from AISC Table D3.1.

a. Use LRFD.

b. Use ASD.

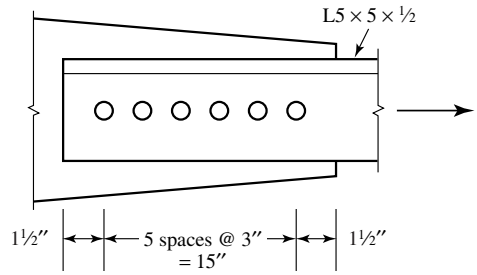


**FIGURE P3.3-8**

### Staggered Fasteners

**3.4-1** A36 steel is used for the tension member shown in Figure P3.4-1.

a. Determine the nominal strength based on the gross area.

b. Determine the nominal strength based on the net area.

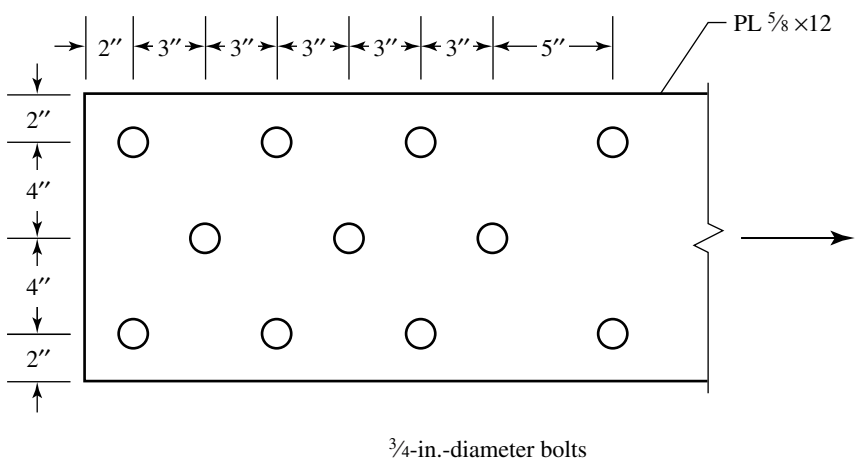


**FIGURE P3.4-1**

**3.4-2** The tension member shown in Figure 3.4-2 is a PL ⅝ × 10, and the steel is A36. The bolts are ⅞-inch in diameter.

a. Determine the design strength for LRFD.

b. Determine the allowable strength for ASD.