(a) When the flange consists of a single split flange or flange ring, it shall be designed as if it were a solid flange (without splits), using 200% of the total moment $M_o$ as defined in 12-4.

(b) When the flange consists of two split rings each ring shall be designed as if it were a solid flange (without splits), using 75% of the total moment $M_o$ as defined in 12-4. The pair of rings shall be assembled so that the splits in one ring shall be 90° from the splits in the other ring.

(c) The splits should preferably be midway between bolt holes.

(d) It is not a requirement that the flange rigidity rules of 2-14 be applied to split loose flanges.

### 2-10 NONCIRCULAR SHAPED FLANGES WITH CIRCULAR BORE

The outside diameter $A$ for a noncircular flange with a circular bore shall be taken as the diameter of the largest circle, concentric with the bore, inscribed entirely within the outside edges of the flange. Bolt loads and moments, as well as stresses, are then calculated as for circular flanges, using a bolt circle drawn through the centers of the outermost bolt holes.

### 2-11 FLANGES SUBJECT TO EXTERNAL PRESSURES

(a) The design of flanges for external pressure only [see UG-99(f)] shall be based on the equations given in 2-7 for internal pressure except that for operating conditions:

$$ M_o = H_D(h_D - h_{G}) + H_T(h_T - h_{G}) $$

For gasket seating,

$$ M_o = Wh_G $$

where

$$ W = \frac{A_m^2 + A_h}{2} $$

$$ H_D = 0.785B^2p_e $$

$$ H_T = H - H_D $$

$$ H = 0.785G^2p_e $$

$P_e$ = external design pressure

See 2-3 for definitions of other symbols. $S_o$ used in eq. (11a) shall be not less than that tabulated in the stress tables (see UG-23).
vessel, or pipe wall extends near to the flange face and may form the gasket contact face, the shearing stress carried by the welds shall not exceed 0.8 \( S_n \). The shearing stress shall be calculated on the basis of \( W_{m1} \) or \( W_{m2} \) as defined in 2-3, whichever is greater. Similar cases where flange parts are subjected to shearing stress shall be governed by the same requirements.

2-9 SPLIT LOOSE FLANGES

Loose flanges split across a diameter and designed under the rules given in this Appendix may be used under the following provisions.

(a) When the flange consists of a single split flange or flange ring, it shall be designed as if it were a solid flange (without splits), using 200% of the total moment \( M_o \) as defined in 2-6.

(b) When the flange consists of two split rings each ring shall be designed as if it were a solid flange (without splits), using 75% of the total moment \( M_o \) as defined in 2-6. The pair of rings shall be assembled so that the splits in one ring shall be 90 deg from the splits in the other ring.

(c) The splits should preferably be midway between bolt holes.

2-10 NONCIRCULAR SHAPED FLANGES WITH CIRCULAR BORE

The outside diameter \( A \) for a noncircular flange with a circular bore shall be taken as the diameter of the largest circle, concentric with the bore, inscribed entirely within the outside edges of the flange. Bolt loads and moments, as well as stresses, are then calculated as for circular flanges, using a bolt circle drawn through the centers of the outermost bolt holes.

2-11 FLANGES SUBJECT TO EXTERNAL PRESSURES

(a) The design of flanges for external pressure only [see UG-99(f)] shall be based on the equations given in 2-7 for internal pressure except that for operating conditions:

\[
M_o = H_D(h_D - h_G) + H_T(h_T - h_G)
\]

For gasket seating,

\[
M_o = Wh_G
\]