8.D4 We are asked in this problem to calculate the temperature at which the rupture lifetime is 200 h when an S-590 iron component is subjected to a stress of 55 MPa (8000 psi). From the curve shown in Figure 8.32, at 55 MPa, the value of the Larson-Miller parameter is 26.7 x 10^3 (K-h). Thus,

$$26.7 \times 10^3 \ (K\text{-}h) = T\left(20 \ + \ \log t_r\right)$$

$$= \ T\left[20 \ + \ \log(200 \ h)\right]$$

Or, solving for T yields $T = 1197$ K (924°C).