1 Chapter 3 - Stress and Strain

Sections covered: 3.14 - 3.16

Topics covered: The following topics are included:

1. Concepts and assumptions of Hertzian contact
2. Point contact for spheres
3. Line contact for cylinders
4. General point contact

2 Wear

Sections covered: Not in book

Topics covered: The following topics are included:

1. Surface fatigue wear (rolling surfaces)
2. Surface fatigue strength \((S_c)\), ultimate strength \((S_u)\) and Brinnel hardness \((H_b)\) relationships
3. Load-stress factor of safety relationships (spheres/cylinders)
4. Adhesive wear (sliding surfaces)

3 Chapter 15 - Power screws, Fasteners and Connections

Sections covered: 15.1 - 15.12

Topics covered: The following topics are included:

1. Difference between fasteners (UNS and ISO) and power screws (Acme, square thread)
2. Geometrical properties of power screws and fasteners
3. UNS Specification
4. Power screw mechanics (torque, efficiency, collar friction)
5. Fastener strength (proof strength, proof load)
6. Stress in fasteners and power screws
   (a) axial (buckling)
   (b) torsional shear
   (c) bearing
(d) direct shear (stripping)

7. Pre-load of fasteners
8. Torque to tighten fastener to given pre-load
9. Force in the fastener (bolt) and parts in a tension joint
10. Stiffness of bolt and parts
11. Length of threads and shank
12. Load and separation factors of safety
13. Gasketed joints
14. Fatigue of tension joints (focus on bolt)