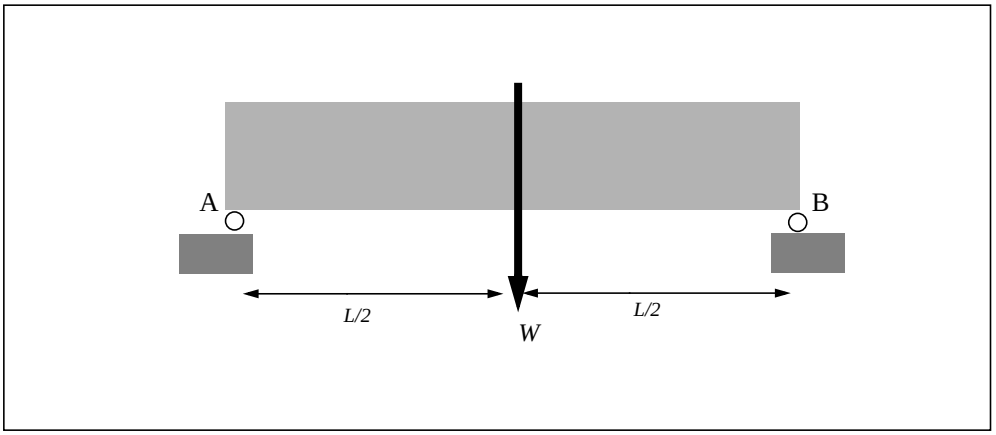
Design Exercise 2
1.050 Solid Mechanics
Fall 2004

A truss structure is needed to support a hoist in a garage which services ordinary passen-



ger vehicles. The hoist's major load is the engine block. The truss must span the twenty feet overhead, from wall to wall. All diagonal members are to have the same cross-sectional area. Horizontal members at the top and bottom are to have the same cross-sectional area, but may be different from that of the diagonals.

Develop a layout of a (statically determinant) truss structure which will support the load with a factor of safety of 2. (This material fails in tension if the member stress equals the yield stress of 50,000 psi).

Consider several alternative designs, exploring how their cost varies one to another taking, as a first approximation, the cost as proportional to the total volume of the material. You do not have time to optimize. Rather, limit your concern to identifying the parameters that will determine the cost and how their variation will effect the same.

Due at the start of class on Monday, 4 October