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Abstract
In this paper, a periodical replacement policy incorporating with cumulative repair-cost- limit for a single-unit system under different failure models is discussed. The concept of cumulative repair-cost limit means that if the accumulated repair cost is larger than a pre-determined limit L, then the system is replaced preventively, otherwise, the system is minimally repaired. The system is also replaced at age or at a major failure of the system.
In the model 1, a single-unit system without external shocks, the failure rate of system is increasing by the aging process or the mechanical nature cause.
In the model 2, a single-unit system under increasing failure rate shock model, external shocks cause an amount of damages to the system and their damage to the system is on behalf of increasing the failure rate of the system some amount. But, if there are no external shocks, the failure rate is still increasing by the age.
Our problem is to determine an optimal replacement period such that the expected cost rate per unit time is minimized. Under a fixed L, the optimal period will be verified to be finite and unique under some specific conditions.
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