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Abstract
In this thesis, two economic periodical replacement models for a two-unit system suject to failure rate interaction between units is presented.
In the model 1, whenever unit 1 fails, it causes a certain amount of damage to unit 2 by increasing the failure rate of unit 2 by some amount, while each unit 2 failure induces unit 1 into instantaneous failure. Without failure interaction between units, the failure rates of two units also increase with age by ageing process. The two-unit system is all replaced at age , or on total failure, whichever occurs first. The aim of this model is to derive the long-run expected cost per unit time by introducing relative costs as a criterion of optimality. The optimal period which minimizes that cost is discussed.
In model 2, the failure rate interaction is the same as model 1. But the replacement policy is according to the follows. The two-unit system is all replaced at the instant of unit 1 failure, or on total failure, whichever occurs first. The long-run expected cost per unit time is also derived by introducing relative costs. The optimal number of minimal repair, , is found.
Finally, two numerical examples are given to illustrate two replacement models, respectively.
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