

The present disclosure relates to an engine having two modes of operation - air breathing and rocket - that may be used in aerospace applications such as in an aircraft, flying machine, or aerospace vehicle. The engine's efficiency can be maximized by using a precooler arrangement to cool intake air in air breathing mode using cold fuel used for the rocket mode. By introducing the precooler and certain other engine cycle components, and arranging and operating them as described, problems such as those associated with higher fuel and weight requirements and frost formation can be alleviated.