Abstract

In a survey on the capacity of hydrostatic motors, the **Orbital Rotor** unit is found to have a very high magnitude of **torque-to-inertia** ratio. Such a unit may be termed more specifically as "the **epitrochoid** generated **RO**tary **PI**ston **MA**chine (**ROPIMA**) type **L**ow **S**peed **H**igh **T**orque (**LSHT**) **Hydrostatic** or **Hydraulic Motor**"

A closer attention reveals that such units have ancestral relationship with the famous **Wankel Engine** as well as **Cyclo-reducer.** The unique feature of the **floating axis** rotor and fixed axis stator set in such a unit is that they are subjected to three major activities simultaneously. These are, **(i) volume expansion-compression (ii) high ratio epicyclic gearing and (iii) bearing of the high radial loads.**

The main objective of this work is to evolve a set of design and analytical principle in a coherent and commonly usable form. It may also be regarded as an attempt to crystallize the formative discipline of the ROPIMA technology.

Geometric and kinematic features have been studied extensively in light of the basic cycloidal motions employed for the generation of rotor-stator profiles. Limits on modification of the profiles have been established.

Rotor-stator as well as valve kinematics have been studied rigorously. Investgation on the interrelation among different kinematic models is also a major work.

An attempt has been made to predict the losses theoretically.

Final expressions are presented in the dimensionless form and in more rational way. This has made the design and selection of such units much easier.

Experiments have been conducted on a specific motor to examine the validity of the theoretical works with specific reference to its very slow speed performance.

Computer calculations and techniques (including Graphics) have been used extensively in theoretical as well as experimental ventures.