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Rocket Propulsion

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Abstract:- The choice of propulsion for an aerospace vehicle is either the Jet or rocket Engine as these offer the required performance for high speed flight. The paper introduces rocket Propulsions and Combustions.

Keywords*: rocket propulsion, Combustions, turbine, thrusts.*

1. Introduction

Rocket Propulsion is the processes that uses force to move a rocket off the ground and into the atmosphere.

An excellent revision of the well known Rolls-Royce manual (Rolls-Royce,1986) provides a not to technical introduction to the operating principles of the aero gas turbine.

The early classic on Jet propulsion pennor (1957) is still widely quoted as a reference.

In a translation from the Russian zuyev and skubachevskii (1969) is devoted entirely to Cumbustion chamber design and include ram-jet engines and reheat systems.

Most of the information on rocket Propulsion appears as papers or reports. However a new edition of the standard introduction by Sutton (1986) presents the basic of chemical rockets.

More specifically a NASA report by Huzel and Huang (1971) covers the design of liquid propellant engines.

2. Jet and Rocket Propulsions

Rocket Propulsion the force that is used by the rocket to take off from the ground and into the atmosphere.

In rocket engine fuel and a source of oxygen called an oxidizer are mixed and exploded in a combustion chamber.

The combustion produces hot exhaust which pass through a nozzle to accelerate the flow and produce the thrust.

Turbine engines and propellers used air from the atmosphere as the working fluid but rocket uses the combustion exhaust gases.

In outerspace there is no atmosphere so turbine and propellers can not work there.

This explains why a rocket works in space but a turbine engine or a propeller does not work.

The propellant are loaded into the rocket just before launch.

Liquid fuel rocket: A liquid rocket fuel such as liquid oxygen liquid nitrogen

An oxidizer pumps to carry the fuel in a combustion chamber where the two liquid mix and burn.

A hot exhaust choke exit from where the exhaust is removed. Rocket propulsion is the method by which a rocket is lifted of the ground and propelled through the air.

Generally this is achieved through through a combustion of a propellant and the blasting of the exhaust downward which thereby pushes the rocket upward.

Rocket Propulsion is the system that powers a rocket to lift it of the ground and propels it through the air.

Unlike jets rocket carry there own propellants.

Solid or liquid propellant are used to blast rockets to immense height.

Rockets work by igniting a propellants as the propellant is cumbusted it to converted from a solid or liquid form into a gas.

The gases produced have such a high volume and are under such intense pressure from the heat of cumbustion that they are pushed downward through the nozzle and out of the open end of the rocket at high velocities.

Solid fuel rockets: A solid fuel oxidizer mixture with a cylindrical hole in the middle ammonium nitrate, ammonium dinitramide an igniter to cumbustion the propellant surface.

The hole in the middle of the propellant act as a cumbustion chamber the hot exhaust is choked at the throat exit from where the exhaust is removed.

The word thrust is simly a scientific way of describing a push. The thrust of rocket engines depends on two main variables the mass of the exhaust gases and the velocity of these gases.

Thrust is the force which moves any aircraft through the air.

Thrust is generated by propulsion system of the aircraft.

Different propulsion system develop thrust in different ways.

In any propulsion system a working fluid is accelerated by the system and the reaction of this acceleration produce a force on the system.

A general derivation of the thrust equation shows that amount of thrust generated depends on the mass flow through the engine and the exit velocity of the gases.

Types of rocket Propulsion

Different types of rocket Propulsions are

Liquid fuel chemical propulsion

Solid fuel chemical propulsion

Cold gas chemical propulsion ion.

Combustion

Combustion is simply defined as the processes of burning which usually involves a chemical reaction between fuel and oxygen and usually produce heat and light.

In rocket this processes is harnessed more aggressively with the goal of producing high speeds exhaust gases that can lift a rocket off the ground.

Because of the massive weight rockets have to rely on powerful propulsion system.

3. Conclusion

The paper introduces rocket and Jet Propulsions and their types and Cumbustions.

References

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