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**CE 20**

- The specifications of the engine as listed on the:
- Operating Cycle - Gas Generator
- Propellant Combination - LOX / LH<sub>2</sub>
- Thrust Nominal (Vacuum) - 200 KN
- Operating Thrust Range - 180 KN to 220 KN (To be set at any fix values)
- Chamber Pressure (Nom) - 6 Mpa
- Engine Mixture ratio (Oxidizer/Fuel by weight) - 5.05
- Engine Specific Impulse - 443 ± 3 seconds ( $4344 \pm 0.029 \text{ km/s}$ )
- Engine Burn Duration (Nom) - 595 seconds
- Total Flow rate - 462 kg/s
- Nozzle Area ratio - 100
- Mass - 588 kg



## The next generation of the Rocket Engines

- All rocket engines burn their fuel to generate thrust . If any other engine can generate enough thrust, that can also be used as a rocket engine
- There are a lot of plans for new engines that the NASA scientists are still working with. One of them is the "Xenon ion Engine". This engine accelerates ions or atomic particles to extremely high speeds to create thrust more efficiently. NASA's Deep Space-1 spacecraft will be the first to use ion engines for propulsion.
- There are some alternative solutions like Nuclear thermal rocket engines, Solar thermal rockets, the electric rocket etc.
- We are looking forward that in the near future there will be some good technology to take us into space



VULCAIN ENGINE

## JAPAN

**LE-7**

- First flight- 1977
- H-2 satellite launch vehicle
- Thrust - 1078 KN
- I<sub>sp</sub>- 446 seconds

**LE-5**

- Thrust -102.9 KN
- I<sub>sp</sub>-450seconds



YF-73

- First flight- 1984
- Long march
- Thrust- 44.15 KN
- $I_{sp}$ - 432 sec



YF-75

- First flight- 1994
- Thrust-78.45 KN
- $I_{sp}$ - 437 sec

Cryogenic fuel used in rockets.

Furthermore, the electronically controlled throttle regulated idle speed, traction control, stability control and cruise control functions. The rotor vane, which was coupled with the camshaft, would then rotate in the advance/retard direction against the rotation of the camshaft timing gear assembly which was driven by the timing chain. The pump, the detent oil passage would become blocked so that it did not operate. When the engine was stopped, the spool valve was put into an intermediate locking position on the intake side by spring power, and maximum advance state on the exhaust side, to prepare for the next activation. You're Reading a Free Preview Pages 124 to 136 are not shown in this preview. To reduce emissions, the FA20D engine had a returnless fuel system with evaporative emissions control that prevented fuel vapours created in the fuel tank from being released into the atmosphere by catching them in an activated charcoal canister. You're Reading a Free Preview Pages 915 to 944 are not shown in this preview. You're Reading a Free Preview Pages 358 to 359 are not shown in this preview. Send another report Close feedback form You're Reading a Free Preview Pages 48 to 102 are not shown in this preview. You're Reading a Free Preview Pages 628 to 630 are not shown in this preview. You're Reading a Free Preview Pages 190 to 229 are not shown in this preview. According to Toyota, port and direct injection increased performance across the revolution range compared with a port-only injection engine, increasing power by up to 10 kW and torque by up to 20 Nm. As per the Below, the injection system had the following operating conditions: cold start: port injectors provided a homogeneous air: fuel mixture in the combustion chamber, although the mixing around the ignition candles were stratified by the compression trace injection of the direct injectors. You are reading a free -visualization page 1150 to 1193 did not show in this visualization. You are reading a free viewing page 467 to 469 is not shown in this visualization. Based on sensor inputs, ECM controlled the injection volume and time of each type of fuel injector, according to motor load and motor speed, to optimize fuel: air mixture for the Condi Engine. The FA20D motor used a hot wire airflow meter, slot-in to measure the admission mass. "This meter allowed a part of the air of intake flowing through the detection reaction so that the air mass and the flow rate could be measured directly. You are reading a free -visualization page 689 to 728 will not be shown in this study, you are reading a free -visualization page 1204 to 1212 have not shown in this study. You can follow the progress of your request in: You have other dwellings or commentaries, you can add them to this request at any time. You are reading a free -visualization page 482 to 492 do not sound shown in this visualization. The timing gears set of cams tree contained advance and delay oil passages as well as a detention oil passage to make intermediate blocking as possible river. In addition, the ignition timing It was retarded to increase exhaust gas temperatures so that the catalytic converter could reach the operating temperature faster; Low motor speeds: Injection port and direct injection to a homogeneous air: e e rotom ed sedadicolev satih .e .otnemagerrac ed aicn<sup>9</sup>Aicife a e oAssimda ed ra ed emulov o ratnemua arap oAtsubmoc ed aramcAc an uortue euq adidem. 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