i-VTEC

INTELLIGENT - VARIABLE VALVE TIMING AND LIFT ELECTRONIC CONTROL
History & Importance

- **VTEC (Variable Valve Timing and Lift Electronic Control)** is a [valve train](#) system developed by Ikuo Kajitani at HONDA in the year 1983.

- It originated from **REV (Revolution-modulated valve control)** introduced on the [CBR400](#) in 1983 known as HYPER VT EC.

- It improves the [volumetric efficiency](#) of a four-stroke internal combustion engine.

- This system uses two [camshaft](#) profiles and electronically selects between the profiles.
CAM ???

- A **cam** is a rotating or sliding piece in a mechanical linkage used especially in transforming rotary motion into linear motion or vice versa.
- CAM is nothing but a Mechanical TIMER.
- A **camshaft** is a shaft to which a CAM is fastened or of which a cam forms an integral part.
PURPOSE!

- **Volumetric efficiency** in **internal combustion engine design** refers to the efficiency with which the engine can move the *charge* into and out of the *cylinders*.
- **Valvetrain** is an all-encompassing term used to describe the mechanisms and parts which control the operation of the valves.
Valve timing diagram
WHY VTEC

- As we have discussed, by implementing the VTEC mechanism we can have variable valve timing and hence optimised volumetric efficiency at all conditions. We can have economic and smooth performance at low speed and higher power output like that of a bigger engine at high RPMs.
ADVANTAGES

- Engine Becomes Versatile
- Torque Curve Is Flat
- Steady Output Of Torque Making Whole Rpm Usable
- Displacement Does Not Increase
DISADVANTAGES

• VTEC makes the engine costly.
• Again it works only in higher rpms. Therefore a VTEC car is just like a non VTEC car at low rpms. And when cars drive at low rpms VTEC system has nothing to do in this case.
What It Does | Effect
---|---
Intake & Exhaust Valves Change Profile | High Output & High RPM
Intake Valves Change Profile | Mild Gains For Practical Uses
One Intake Valve Closes @ Low RPM | Ultra Low Fuel Consumption

High Output & Ultra Low Fuel Consumption
CONCLUSION

• Many companies are trying to achieve infinitely variable valve timing. HONDA MOTORS implemented VTEC system successfully till now and it proves to be very useful for daily driving cars.

• At last we can say…

• ‘VTEC is nothing but a cam for all reasons.’
CONTEMPORARIES

1. **MIVEC** from **Mitsubishi**,  
2. **VVTL-i** from **Toyota**  
3. **VarioCam Plus** from **Porsche**  
4. **VVL** from **Nissan**  
5. **Valvetronic** from **BMW**