



### Variable Valve Timing (VVT) System IITM Technology Available for Licensing

#### PROBLEM STATEMENT

- In conventional combustion systems, major limitations are **higher oxides of nitrogen (NO<sub>x</sub>) and particulate matter emissions**.
- Further, various low temperature combustion (LTC) strategies face **several challenges** including lack of **combustion timing control, narrow engine operating load range and higher unburned emissions**.
- Hence, there is a need to address the above issues in efficient manner.

#### INTELLECTUAL PROPERTY

IITM IDF Ref. 1769; IN Patent No:387807

#### TECHNOLOGY CATEGORY/MARKET

**Technology:** Variable Valve Timing (VVT) System;

**Industry/Applications:** Automotive, Engine, Fuel, Transport Industry;

**Market:** The global VVT system market is projected to grow at a **CAGR of 5.5%** during **2024-2029**.

#### TECHNOLOGY

- The present invention describes a **variable valve timing (VVT) system** (Refer Fig.1)
- Said system comprising a **cam block** mounted in a **splined camshaft** with a **cam moving mechanism**.
- The **cam moving mechanism** linearly moves the cam block in **an axial direction** of the splined camshaft for **varying contact** of a cam follower with **one or more cam profiles** in the cam block.
- The **variation in the contact** of the **one or more cam profiles** with the cam follower varies at least one valve actuation timing for improving ignition timing control.

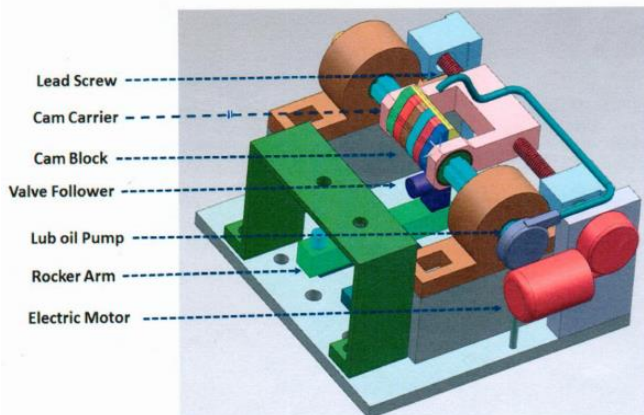


Fig.1 Illustrates a 3D model of variable valve timing (VVT) system

#### KEY FEATURES / VALUE PROPOSITION

##### ❖ *Technical Perspective:*

- Provides variation of one or more cam profiles in a cam block in contact with a cam follower of the VVT system.
- Provides a movement of cam block in an axial direction on a splined camshaft.
- Achieving **linear sliding motion** apart from the rotary motion.
- Variable cam profiles on the cam block **helps in generating** a required **valve actuation timing** through a follower and rocker mechanism.

##### ❖ *Industrial Perspective:*

- Provides **flexible and cost-effective VVT** system for improved combustion.
- Applicable in industrial combustion system which includes a lube oil pump for lubricating one or more components in the VVT system.

#### TRL (TECHNOLOGY READINESS LEVEL)

TRL-2/3, Proof of Concept ready

#### RESEARCH LAB

**Prof. Anand K,**  
Department of Mechanical Engineering

#### CONTACT US

**Dr. Dara Ajay, Head**  
Technology Transfer Office,  
IPM Cell- IC&SR, IIT Madras

**IITM TTO Website:**  
<https://ipm.icsr.in/ipm/>

Email: [smipm-icsr@icsrpis.iitm.ac.in](mailto:smipm-icsr@icsrpis.iitm.ac.in)  
[sm-marketing@imail.iitm.ac.in](mailto:sm-marketing@imail.iitm.ac.in)  
Phone: +91-44-2257 9756/ 9719