Dear [Candidate's Name],

We are pleased to offer you the opportunity for an VTU Recognized internship in Toyota Center of Excellence in our organization. This will be a 3 months internship without the stipend.

This internship will give you the chance to:

- Gain knowledge about functioning and working automobile and its subsystems systems like Engine, Gear Box, Transmission . Cooling & Emissions etc (Brochure attached with this letter)
- Gain hands-on experience on Various Manufacturing process used automobile systems manufacturing.
- Exposer to EV Technology
- Industrial visits & expert talks from Toyota Engineers & Managers

Internship Type: **Un paid stipend**	Internship Mode: **Onsite**	Fees / Month : **₹ 3,000**
Duration: **3 Months**	Start date : **15th January 2025** End date : **14th April 2025**	Accommodation fees with food / Month (If Required) **: Rs. 10,000/-**
Internship Location:	**Amruta Institute of Engineering and Management Sciences(AIEMS)** **Bidadi Industrial Town, Ramanagaram, Near Toyota Kirloskar Motors Road, Bengaluru, Karnataka-562109**	

At the time of joining, please bring below mentioned documents with you.

- Two copies of your latest Passport size.
- Study & Permission letter from the college where student studying to attend internship
- Residence & Identity proof required (College ID Card & Adhar)

Rules & regulations of the internship :

- Attendance is mandatory and record of daily internship activities to be maintained in VTU Internship dairies .
- Institute (AIEMS) rules and regulations to be followed
- Hostel rules and regulations to be followed if they stay in Hostel.
- Internship examinations to be conducted as per VTU regulations
- College working hours 9:00 AM to 4:20 PM from Monday to Saturday (only 3rd Saturday is holiday)

Kindly confirm your acceptance of this offer by 30/11/2025.

Sincerely,

(Rajeshwar.S.Kadadevaramath)

Dr. Rajeshwar S Kadadevaramath
Dean Academics & Head Mechanical Engg
(Former Editor IJBSR & Ed-Member IJRM (Scopus) Inderscience Pub , Switzerland)

(former Head IEM ,SIT,Tumkur)
Amruta Institute of Engg & Mgt Sciences,(AIEMS), Bidadi
Karnataka, India

Brochure

Welcome to TOYOTA Centre of Excellence

Cut Section of a Vehicle facilitates a thorough understanding of the working of a vehicle. These are manufactured from a new/used automobile. Detailed construction and working is clearly explained. Different working systems are coloured differently to make learning easier. All systems are operational, thereby ensuring that their working can be demonstrated effectively

Fig: Toyota Crysta Cut Section


MPFI ENGINE
EXHAUST MANIFOLD
OIL PUMP
VALVES AND CYLINDER HEAD
HIGH PRESSURE PUMP
HIGH PRESSURE PUMP
IGNITION SYSTEM

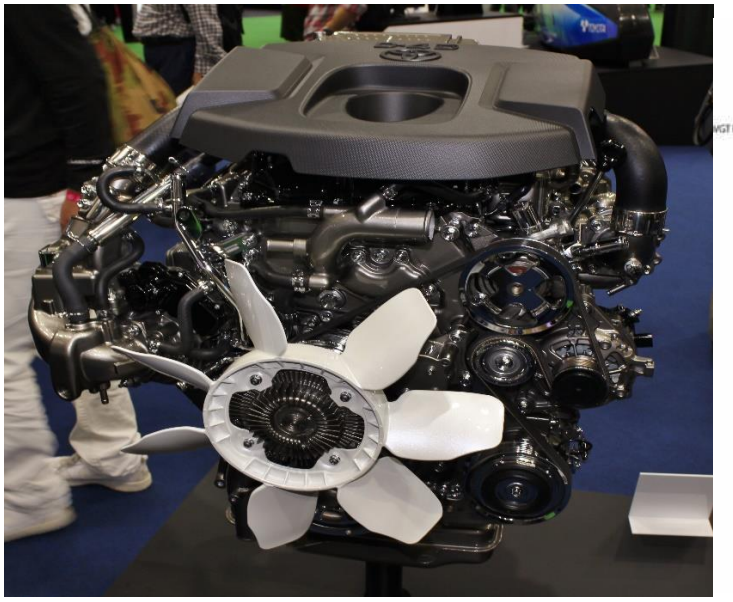
TOYOTA INNOVA CRYSTA — WORKING OF ALL MAJOR SYSTEMS

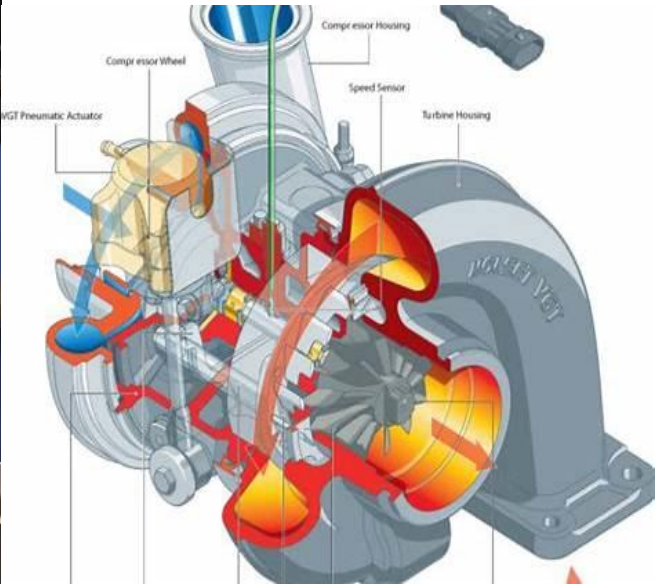
Below is a **clear, complete, easy-to-understand explanation of how all major systems of the Toyota Innova Crysta work.**
we have grouped them by category and added visual references where helpful.

1. ENGINE SYSTEM

The Innova Crysta comes with **diesel and petrol engines** depending on the model year and variant.

A. Diesel Engine (2.4L GD & 2.8L GD – Turbo Diesel)





How it works

- **Air Intake:** Fresh air enters the turbocharger.
- **Turbocharger:** Exhaust gases spin the turbine, compressing more air for the engine → increases power.
- **Fuel Injection:** High-pressure common-rail injectors spray atomized diesel.
- **Compression & Combustion:** Diesel ignites due to high compression (no spark plug).
- **Exhaust Treatment:** Includes catalytic converter + DPF (in BS6 models).

Key Features

- High low-end torque (useful for load carrying & city driving)
- Better fuel efficiency
- Smooth & durable GD-series engines

B. Petrol Engine (2.7L 2TR-FE)

How it works

- Uses **Dual VVT-i** → adjusts intake & exhaust valve timing for smooth operation.
- Spark plug ignites air–fuel mixture.
- More refinement, slightly lower torque vs diesel.

---

2. TRANSMISSION SYSTEM

The Crysta comes with:

✓ 5-speed Manual

✓ 6-speed Automatic (Torque Converter)

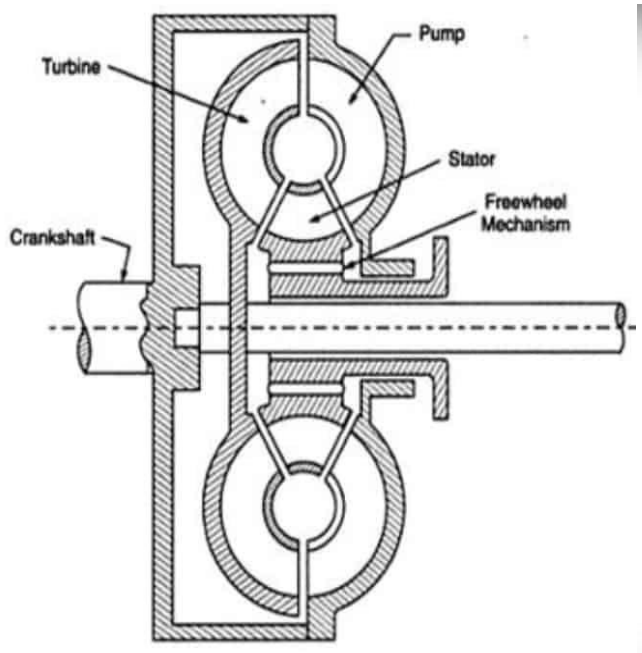
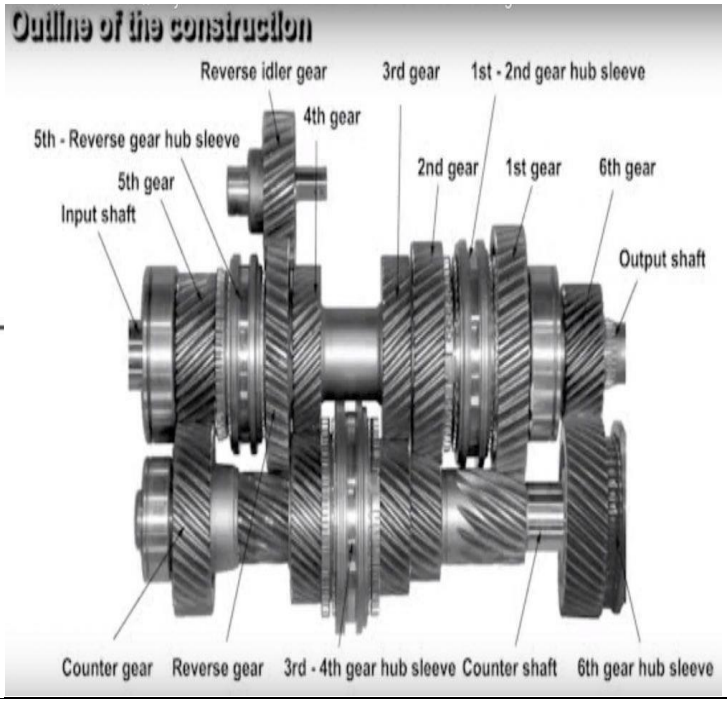


Fig: Torque converter



Automatic Transmission Working

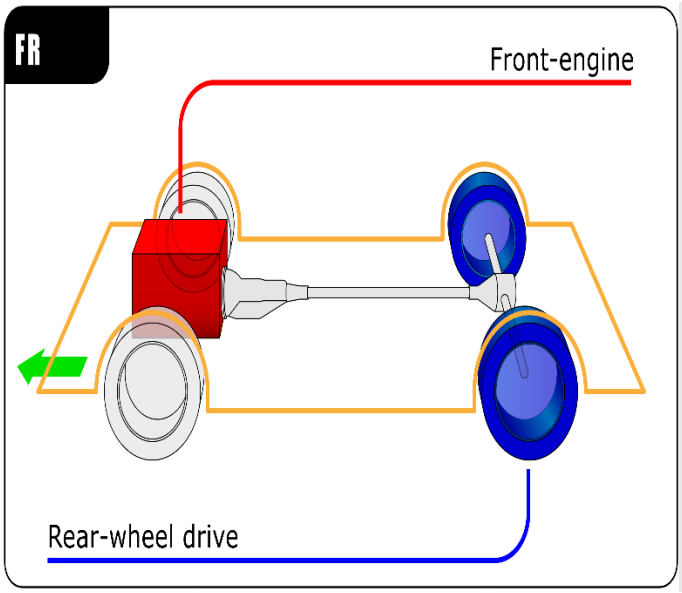
- **Torque Converter** replaces the clutch → uses fluid coupling.
- **Planetary Gear Sets** provide different gear ratios.
- **TCU (Transmission Control Unit)** selects gears based on:
  - speed
  - throttle input
  - engine load

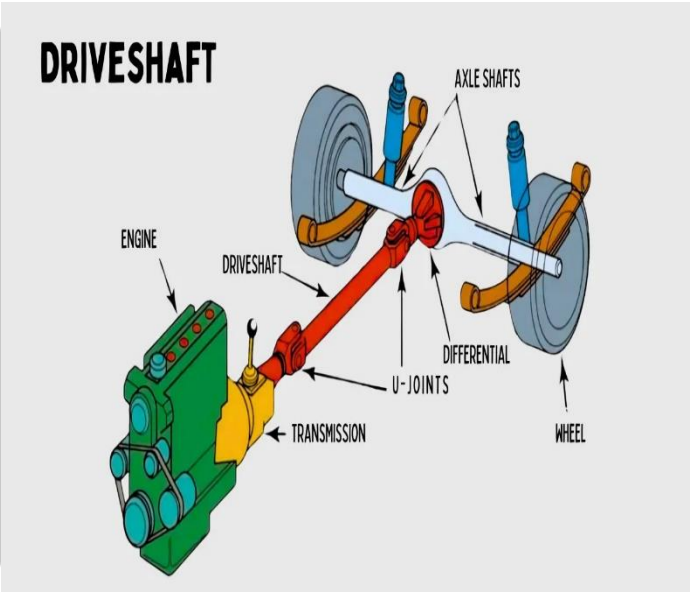
Manual Transmission Working

- Clutch pedal disengages engine power.
- Gear lever mechanically selects gear ratios.

---

3. DRIVETRAIN (RWD — Rear-Wheel Drive)



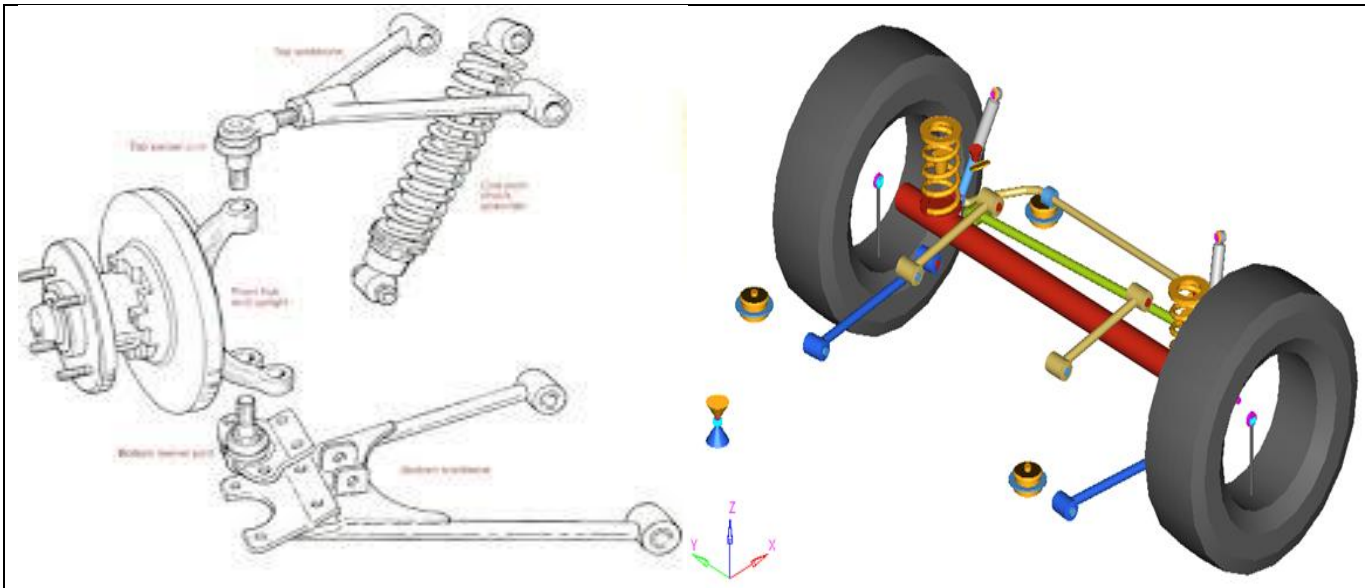


How it works

- Engine → transmission → **propeller shaft** → **rear differential** → rear wheels.
- Differential allows rear wheels to rotate at different speeds while turning.
- RWD gives:
  - Better stability with full load
  - Stronger pulling power
  - Balanced handling

---

4. SUSPENSION SYSTEM



Front Suspension: Double Wishbone

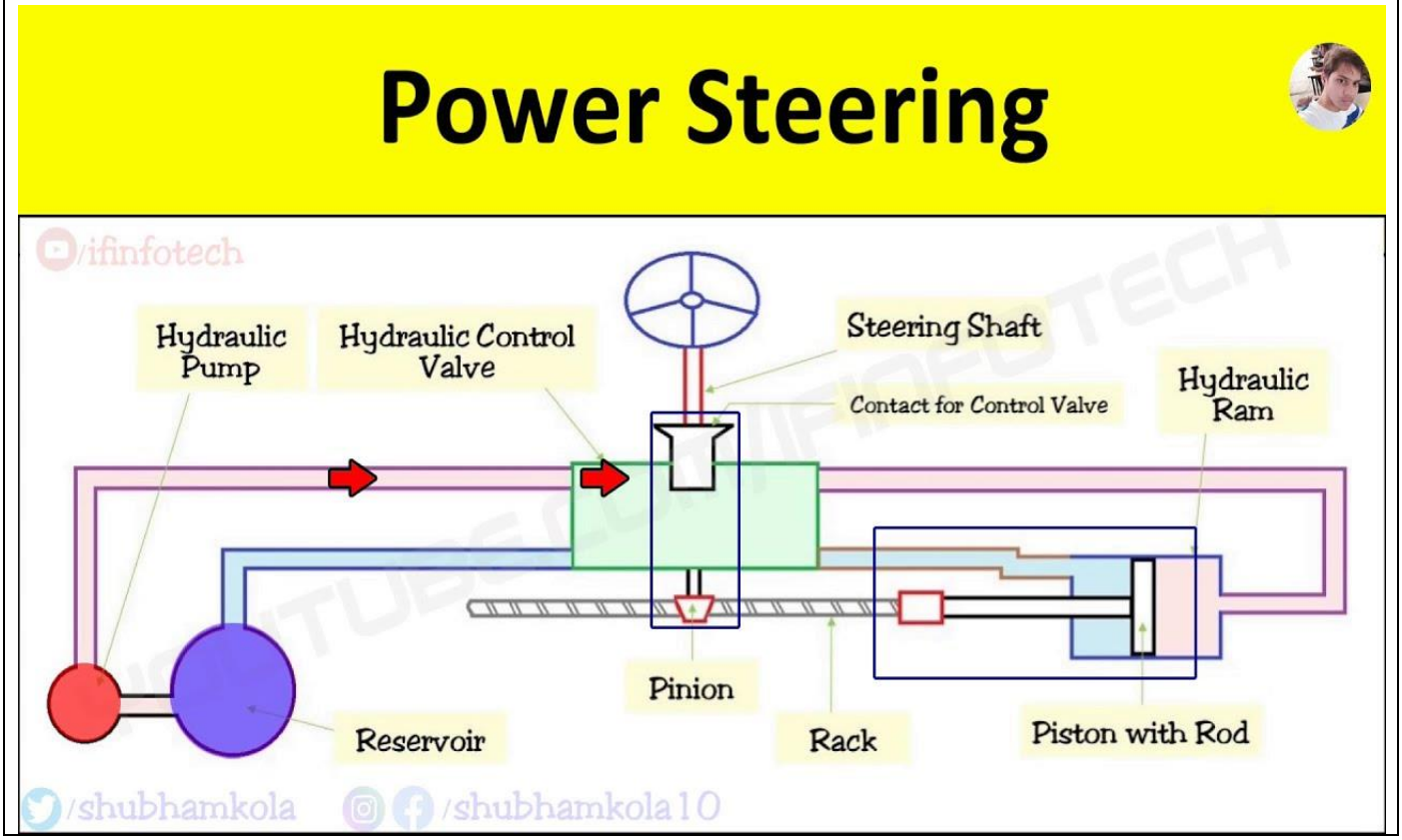
- Upper & lower arms keep wheel stable.
- Provides better ride comfort and handling.

Rear Suspension: 4-Link with Coil Springs

- Strong for heavy loads.
- Coil springs improve comfort vs leaf springs (older Innova).

---

5. STEERING SYSTEM

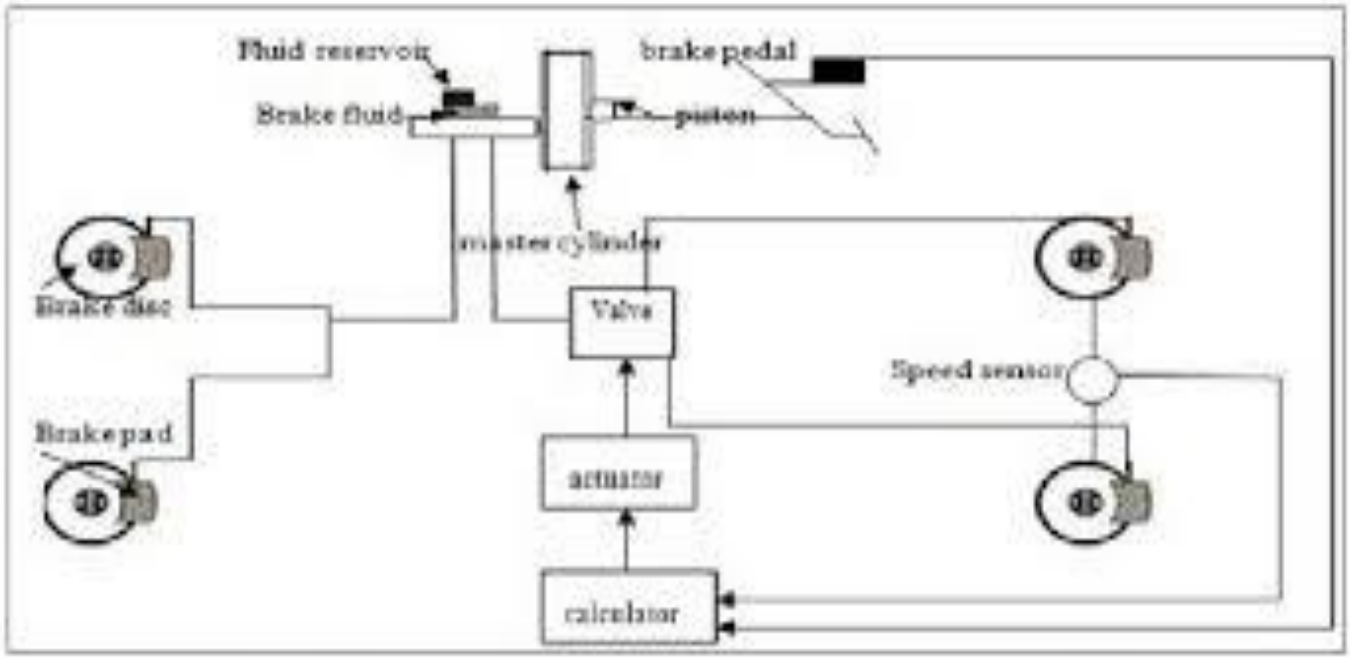


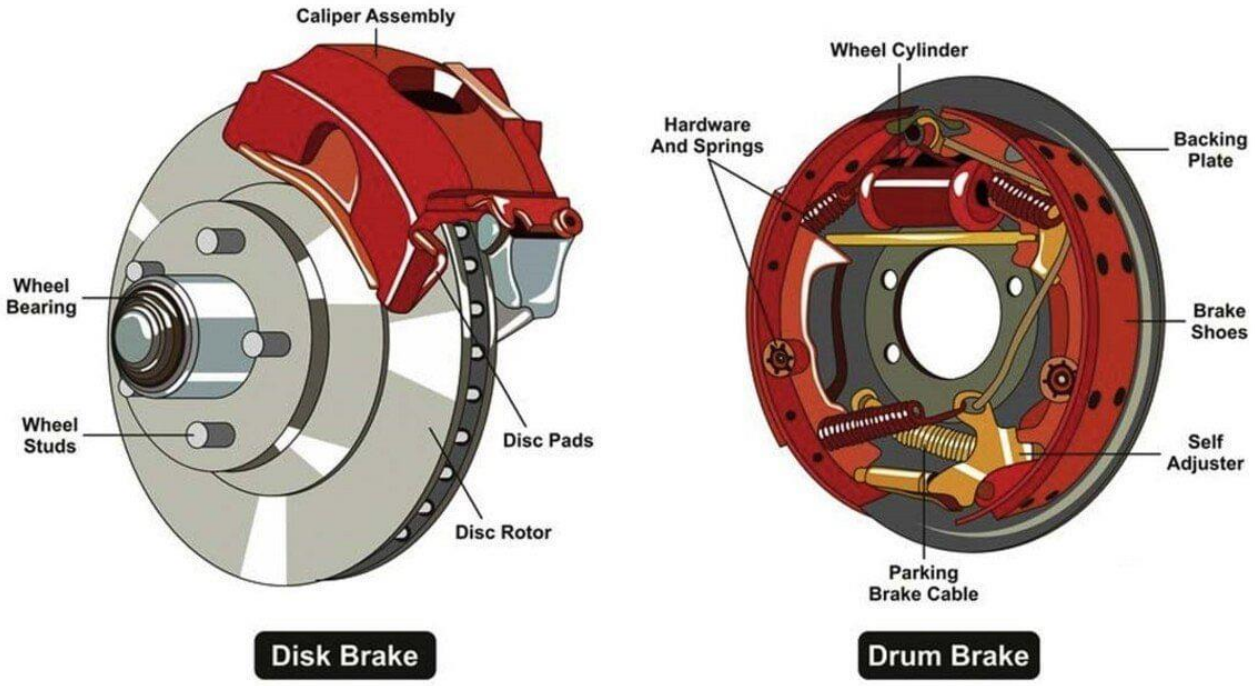
Hydraulic Power Steering

- Engine-driven pump pressurizes fluid.
- Hydraulic pressure reduces steering effort.
- Rack & Pinion converts steering wheel rotation into side-to-side wheel movement.

---

6. BRAKE SYSTEM





Components

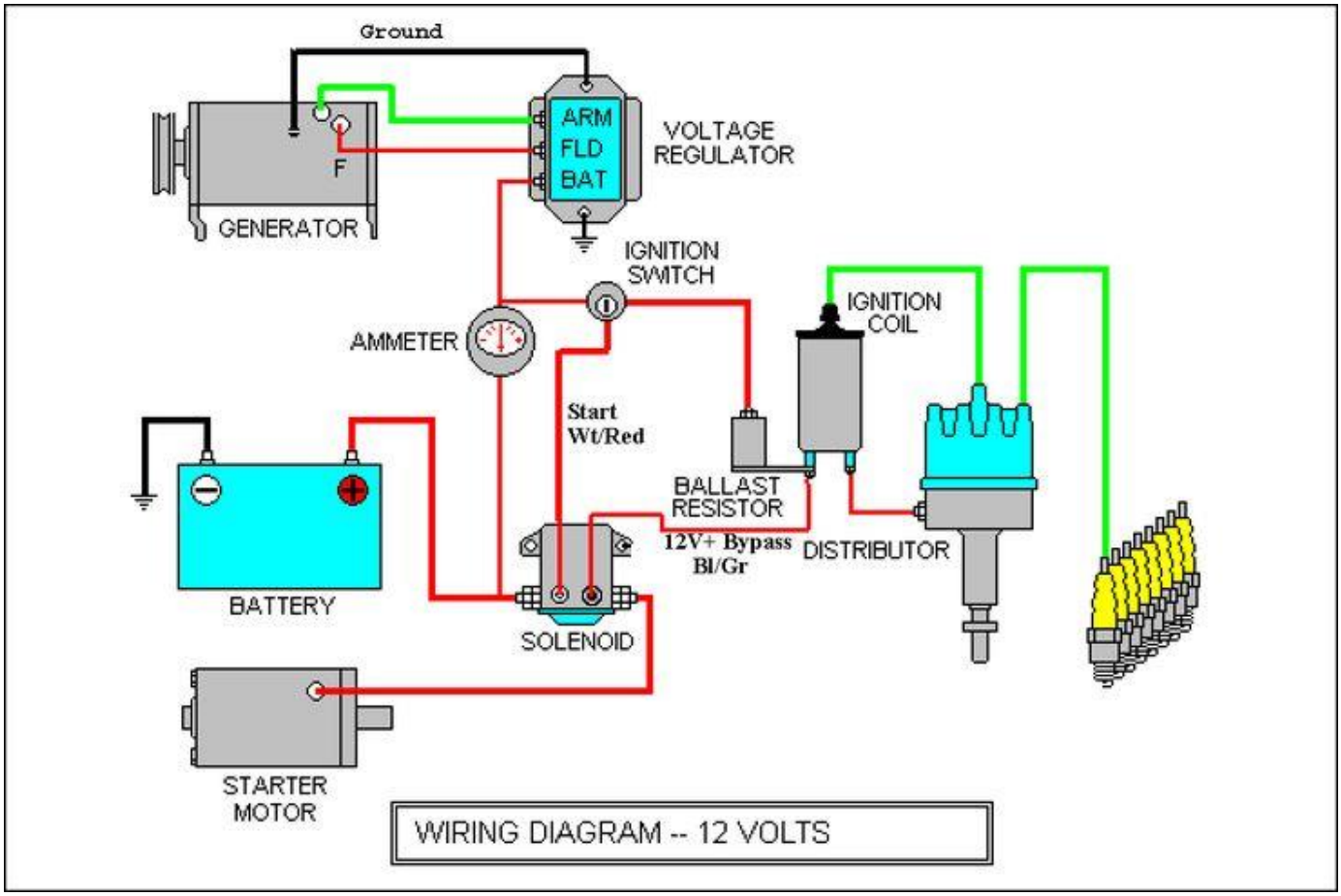
- **Front:** Ventilated disc brakes
- **Rear:** Drum brakes
- **ABS (Anti-lock Braking System)**
- **EBD (Electronic Brakeforce Distribution)**
- **BA (Brake Assist)**

How ABS Works

- Prevents wheel lock-up.
- Wheel-speed sensors monitor wheel rotation.
- ABS modulates brake pressure rapidly → improves control.

---

7. ELECTRICAL SYSTEM



Key Parts

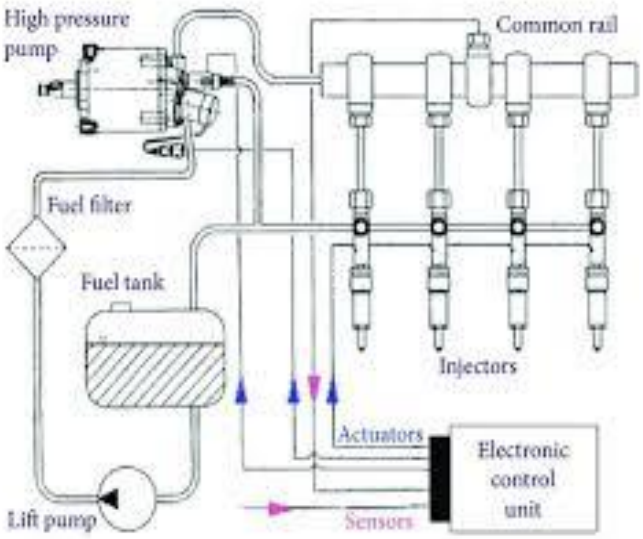
- Battery
- Alternator
- ECU (Engine Control Unit)
- TCU (Transmission Control Unit)
- Sensors (MAF, O2, Knock, Temperature, etc.)
- Lighting and infotainment

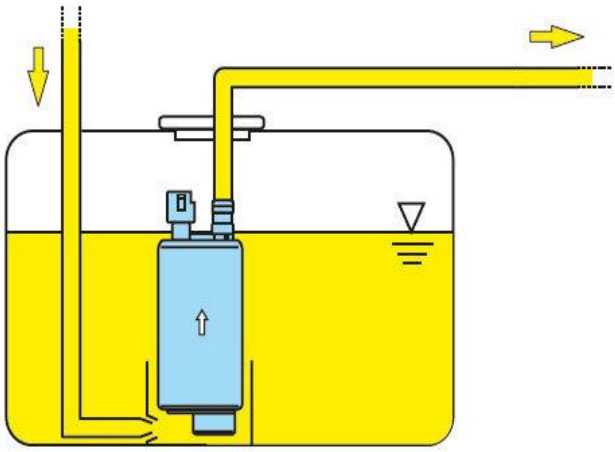
Function

- Alternator charges battery & powers electronics.
- ECU controls engine timing, injection, emissions.
- CAN Bus network connects all modules.

---

8. FUEL SYSTEM





Diesel Models

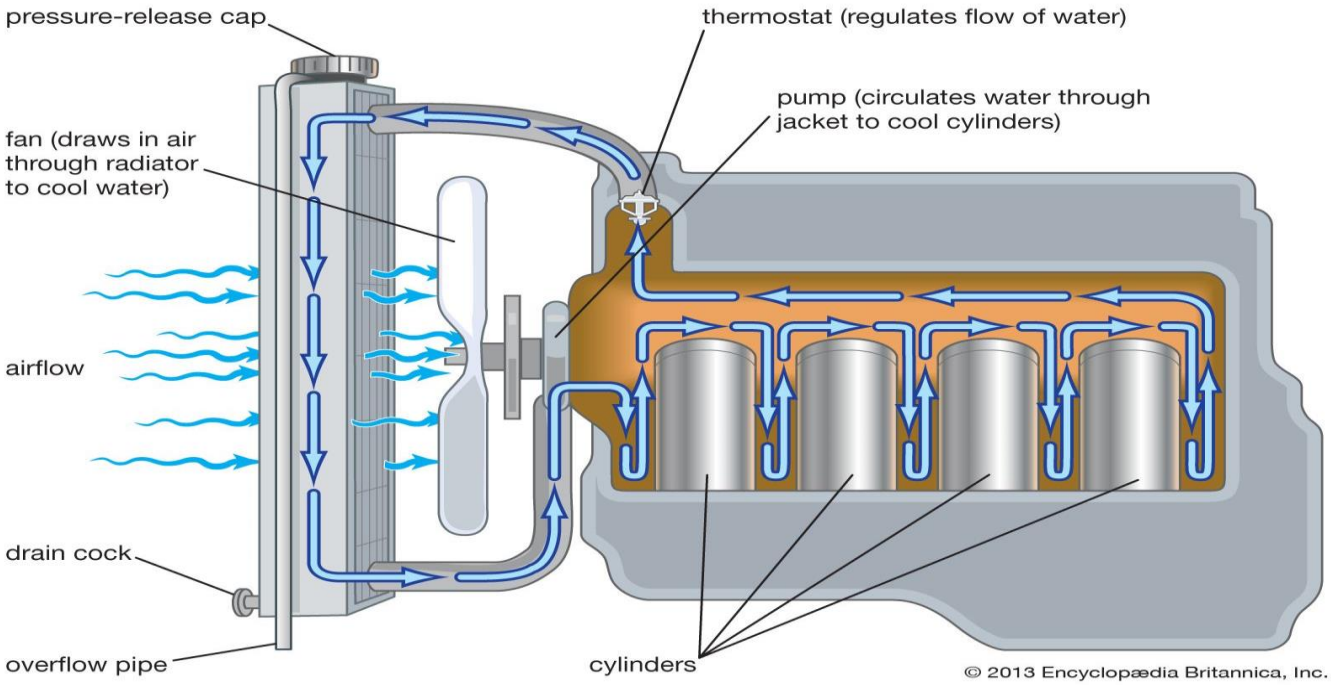
- Fuel tank → Lift pump → High-pressure pump → Common rail → Injectors.

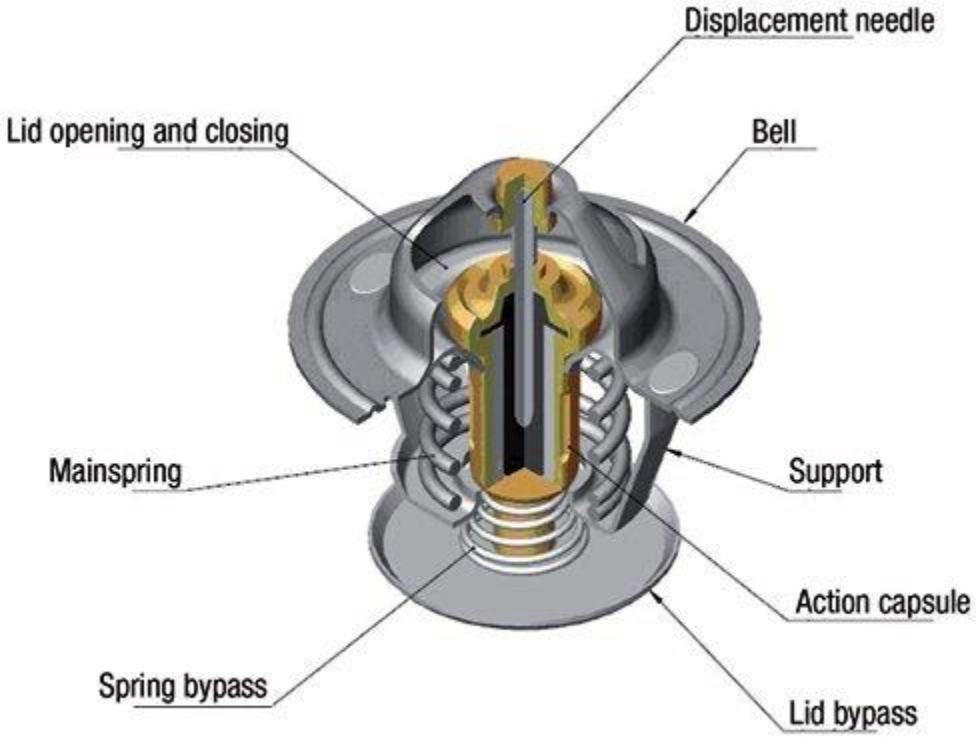
Petrol Models

- In-tank electric pump → Fuel line → Injectors.

---

9. COOLING SYSTEM



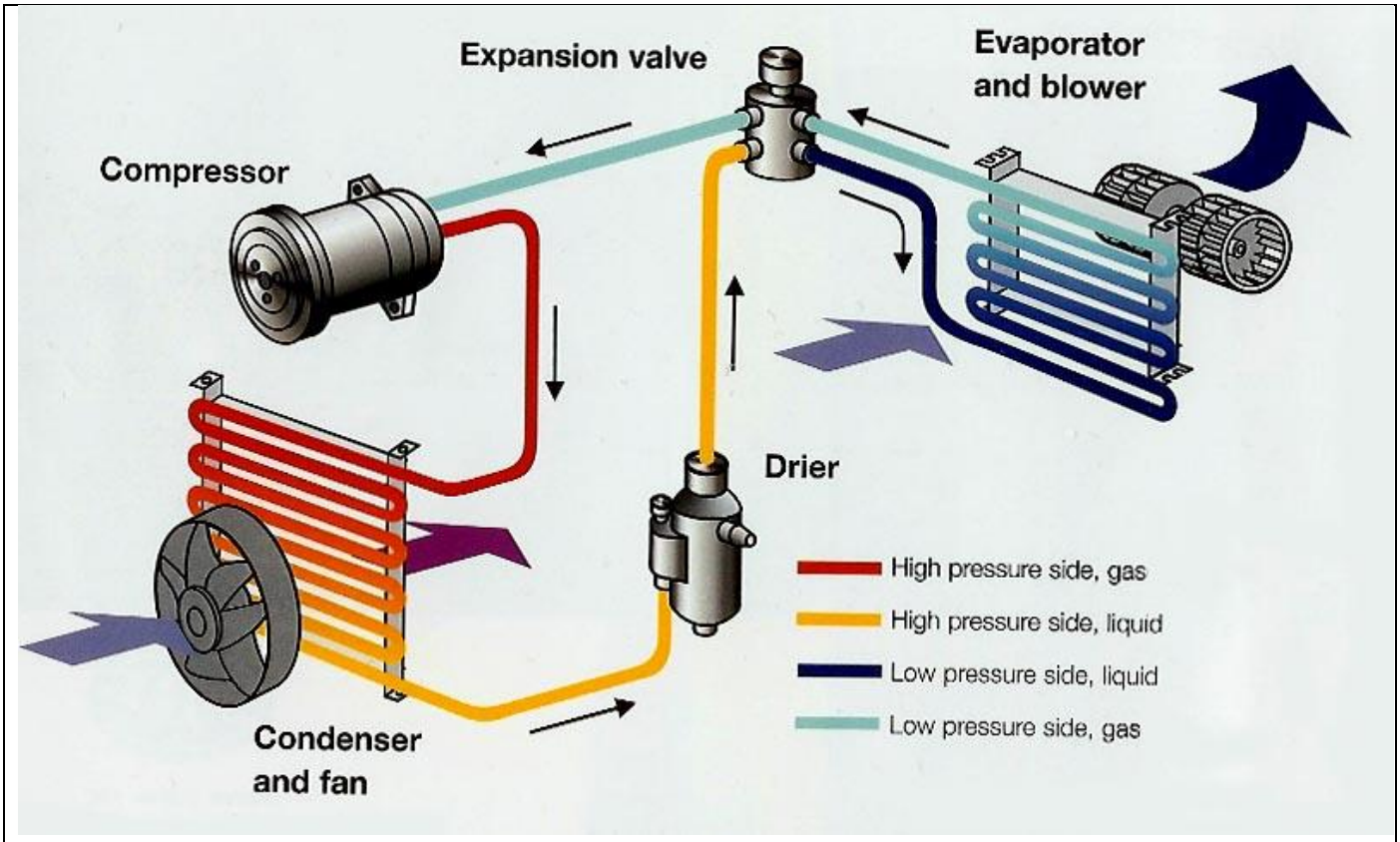


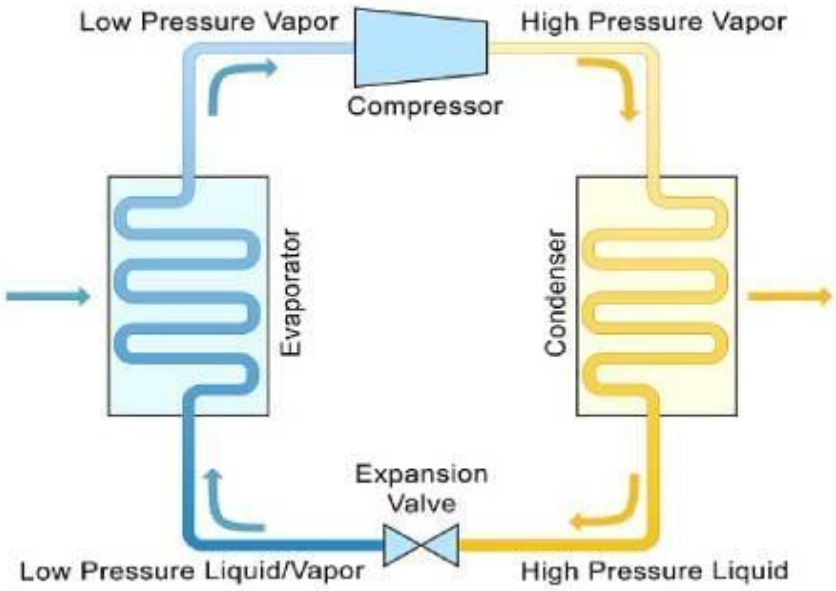
How it works

- Coolant circulates around engine block.
- Heat transferred to radiator → cooled by fan & airflow.
- Thermostat maintains optimal temperature.
- Expansion tank manages coolant pressure.

---

10. HVAC (Air Conditioning) System

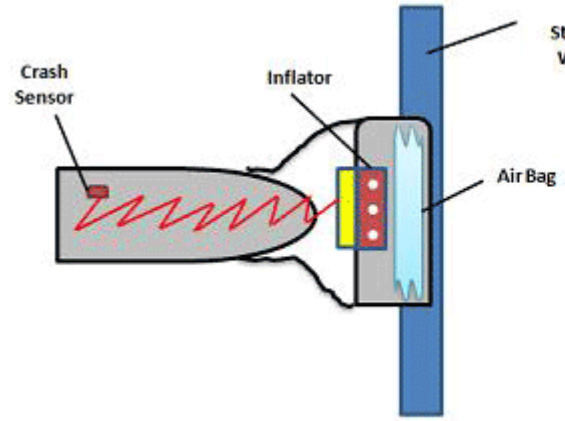


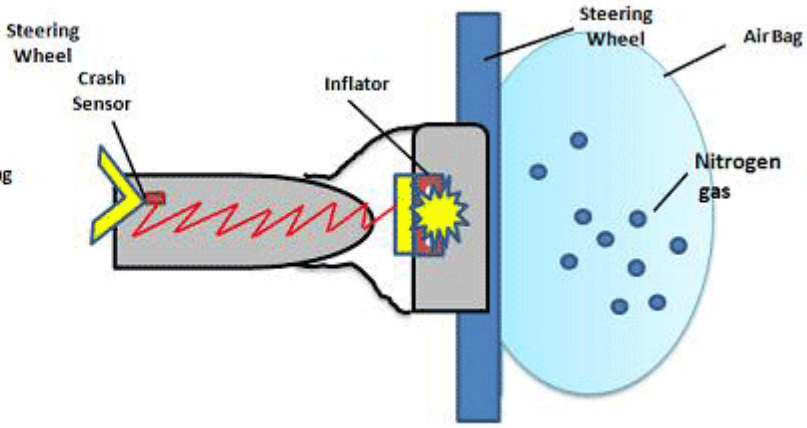


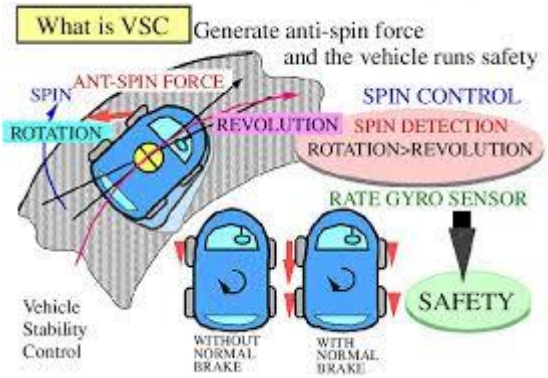
How AC works

- Compressor pressurizes refrigerant.
- Condenser cools it into liquid.
- Expansion valve reduces pressure.
- Evaporator cools cabin air using cold refrigerant.

11. SAFETY SYSTEMS







Includes

- **Airbags (Driver, Passenger, Side, Curtain — depending on variant)**
- **VSC (Vehicle Stability Control)**
- **TRC (Traction Control)**
- **Hill Start Assist**

How VSC Works

- Detects skidding.
- Applies brakes to individual wheels + reduces engine power to stabilize the vehicle.

---

12. INFOTAINMENT & CONNECTIVITY SYSTEM

Features

- Touchscreen display
- Bluetooth, USB, Aux
- Navigation (in some variants)
- Steering-mounted controls

✓ SUMMARY TABLE

System	Type/Technology
Engine	2.4/2.8L Diesel, 2.7L Petrol
Drivetrain	RWD

Transmission	5MT / 6AT
Suspension	Double Wishbone (F), 4-link Coil (R)
Steering	Hydraulic Power Steering
Brakes	Disc + Drum, ABS, EBD, BA
Safety	Airbags, VSC, TRC, HSA
Electrical	ECU, CAN bus
HVAC	Automatic Climate Control