EV OVERVIEW

An electric vehicle is powered by a battery - Edrive and it does not need any type of fossil fuel. While conventional vehicles use an internal combustion engine and gasoline or diesel as fuel, electric vehicles use electrical energy that is stored inside the high voltage battery. As a result, electric vehicles run on electricity, they are eco-friendly - they do not require fuel and are zero emission vehicles.

Review and Characteristics

This is an electric vehicle. Some of the vehicle's systems operate differently and have different operating characteristics than vehicles equipped with an internal combustion engine. It is important to carefully read the entire Owner's Manual for this reason.

This Vehicle uses two types of battery systems- a high voltage system in which a high voltage battery powers the inverter and electric motor which in turn propel the vehicle and a low voltage system in which a 12-volt battery provides power to the vehicle systems and features such as the audio system, supplementary restraint systems, headlights and wind-shield wipers. The high voltage battery also charges the 12-volt battery.

The high voltage battery must be charged with electricity before the vehicle can be driven. As the vehicle operates, the battery gradually discharges and when completely discharged, the vehicle needs to be plugged in for charging. To increase the range of the EV, regenerative braking has been incorporated. Basically, while the vehicle is coasting or braking, the motor works as a generator and converts the vehicle motion (kinetic energy) to electrical energy to charge the HV battery.

This vehicle is considered to be an environmentally friendly vehicle because it does not emit exhaust gases, and thus is cleaner than the conventional vehicles in terms of air pollution.

Main Components

3 IN 1 Unit

- **On-Board Charger (OBC):** A device that charges the high voltage battery by converting AC power from a domestic supply into DC power and supplying it to the battery.
- **DC-DC Converter:** A device that converts HV DC power from the HV battery to LV DC power which is required to maintain LV battery charge, which in turn powers the LV systems like lights, wipers, infotainment, etc. in the vehicle.
- **Power Distribution Unit:** Distributes power from the high voltage battery to the HV components like inverter, DC-DC converter, E-compressor etc.
- **Bi-directional Convertor:** The bi-directional AC-DC/DC-AC converter regulates the active power transferred from the DC battery to the AC powered devices. Additionally, it maintains unity power factor while controlling active power transferred from the AC grid to the DC battery..

- **Electric Motor:** A device that converts electrical energy into rotational mechanical energy which is then transferred as rotational torque to the wheels through the gearbox.
- **High Voltage Battery (lithium ion polymer)** - An on board high voltage electrical energy storage device

General Warnings

- Your vehicle contains a sealed Li-ion high voltage battery. If the Li-ion battery is disposed of improperly, there is a risk of severe burns and electrical shock that may result in serious injury or death and there is also a risk of environmental damage.
- The EV system uses high voltage DC current. The system can be hot during and after starting and when the vehicle is shut off. Be careful of both the high voltage and the high temperature.
- Avoid being exposed to high-voltage components in the first place. Observe all high-voltage warning labels these indicate high-voltage components or areas. Observe all orange cables and other high voltage components, large and small these carry high voltage.
- Do not touch high-voltage components while the vehicle is in operation or cranked state.
- Do not disassemble, remove or replace high-voltage parts and cables as well as their connectors because they can cause severe burns or electric shock that may result in serious injury or death.
- The vehicle high voltage system has no user serviceable parts. It is recommended that you take your vehicle to a TATA MOTORS EV service centre for any necessary maintenance.
- Pay special attention to pedestrians. Because there is no motor noise, pedestrians may not know the vehicle is approaching, moving or about to move, and may step into the path of vehicle travel.
- When leaving the vehicle, be sure to turn off the EV system. The EV system uses high voltage current. Failure to follow the proper handling instructions may cause serious injury or death.

Safety Of The High-voltage System

- Do not perform any modifications or work on the vehicle, especially maintenance and repair work on the high-voltage system and the body and avoid retrofitting accessories.
- If work is not carried out properly, there is the risk of fire and fatal injury from electrocution due to the high-voltage system.
- TATA MOTORS recommends to have modifications and work on the vehicle only to be carried out by an authorized TATA MOTORS authorized EV service center or one that operates according to TATA MOTORS' specifications with personnel trained accordingly.
- Your vehicle's high-voltage system is a self-contained system. Safety is ensured as long as no unauthorized work is performed on high voltage electrical components or on the chassis.

High-voltage System: Contact With Water

The high-voltage system is typically safe even in the following example situations:

- Water in the foot well, for instance after a rainstorm when sunroof was kept open.
- Vehicle is in water but only up to 300 mm.
- Liquid escapes in the trunk.

In these cases there is no risk of injury from electrocution. Other damage to the vehicle is possible.

Common Terminologies And Abbreviations

EV – Electric Vehicle

HV battery – High Voltage battery

LV battery – Low Voltage (12V) battery

AC – Alternating Current

DC – Direct Current

OBC – On Board Charger

PDU – Power Distribution Unit

VCU – Vehicle Control Unit

BMS - Battery Management System

OBD - On Board Diagnostics

SoC – State of Charge

SRS – Supplementary Restraint System

CRS - Child Restraint System

DAB – Driver Airbag

PAB – Passenger Airbag

ABS - Anti-lock Braking System

EBD - Electronic Brake Force Distribution

ESC - Electronic Stability Control

PEPS - Passive Entry/Passive Start

ESCL – Electronic Column Steering Lock

EPAS – Electric Power Assisted Steering

LED – Light Emitting Diode

DRL – Daytime Running Lamp

ORVM - Outer Rear View Mirror

IRVM – Inside Rear View Mirror

EC-IRVM – Electric Chromic Inside Rear View Mirror

HVAC – Heating Ventilation and Air Conditioning

FATC – Fully Automatic Temperature Control

DIS – Driver Information System

DTE - Distance to Empty

IGN – Ignition

ACC – Accessory

APB – Automatic Parking Brake (APB)

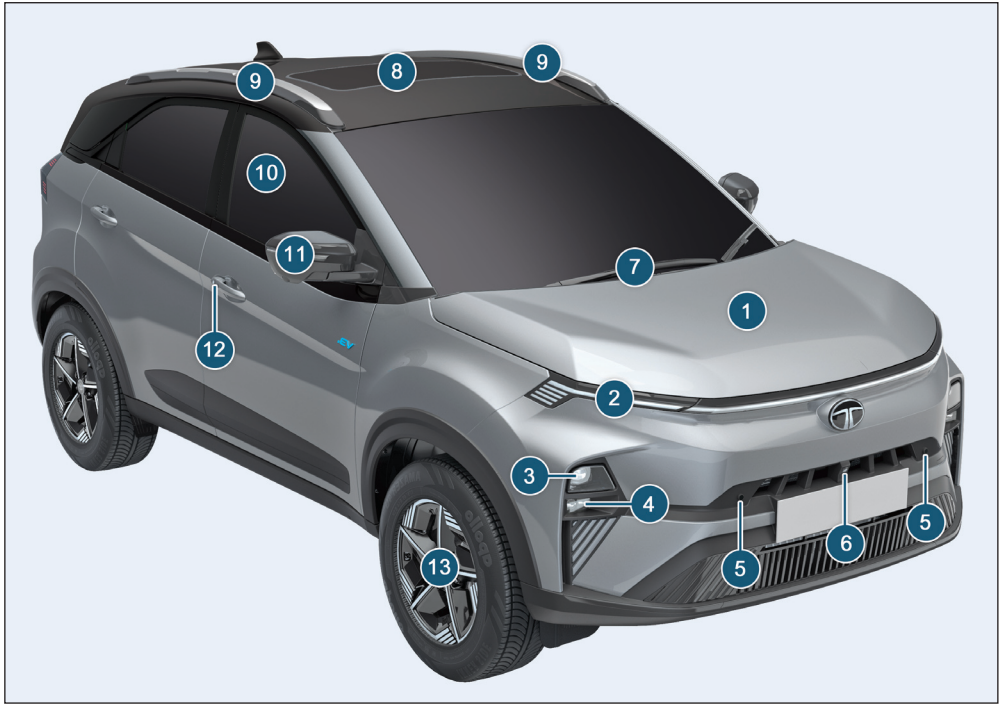
CPL – Centre Positioning Light

V2L – Vehicle to Load

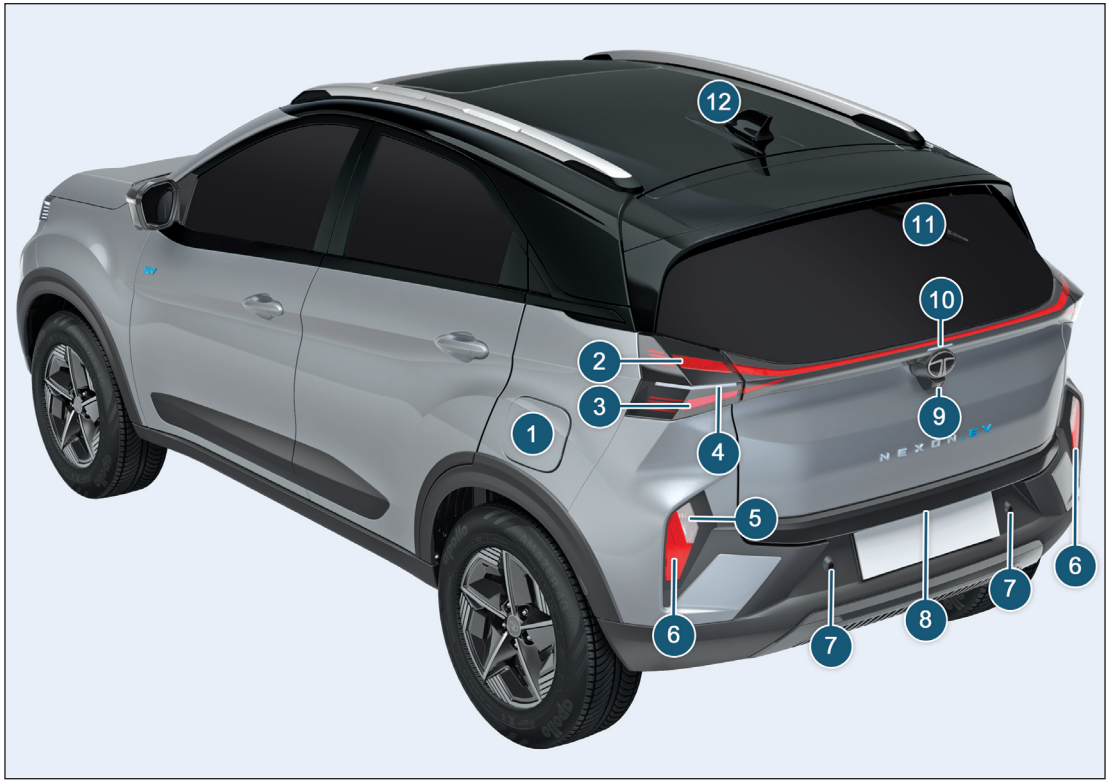
V2V – Vehicle to Vehicle

OVERVIEW

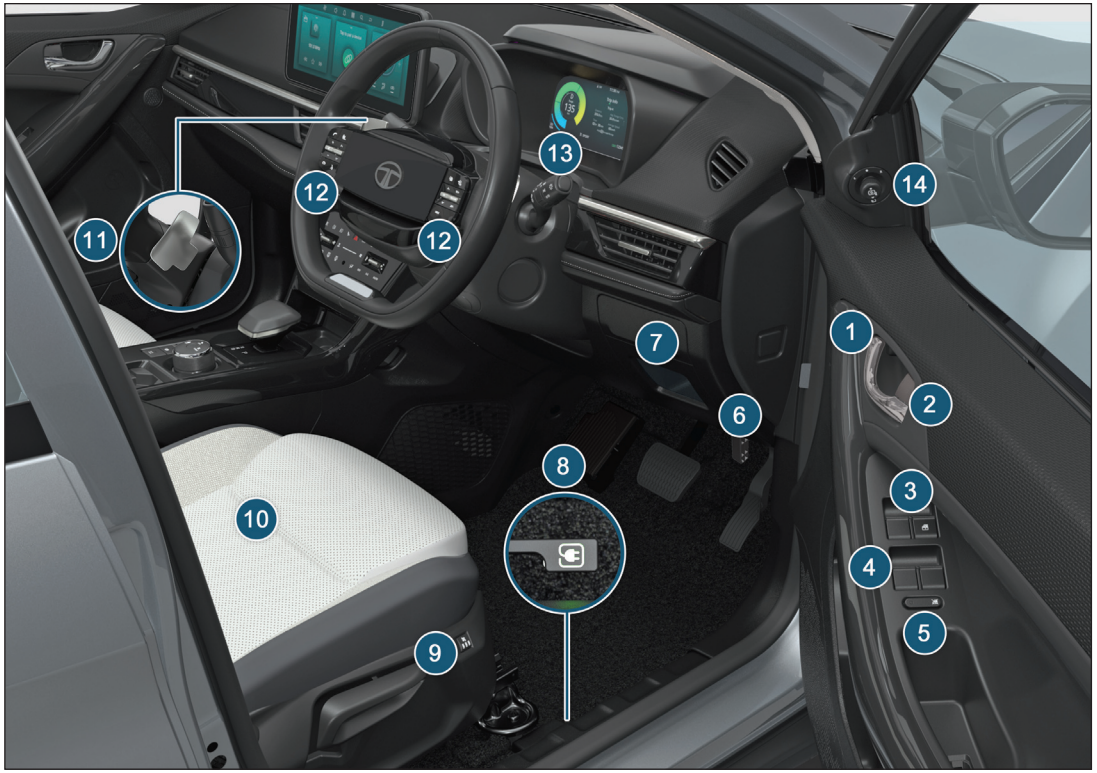
Know Your Vehicle



1. Bonnet
2. Turn Indicator/ DRL/ Position Lamp
3. Head Lamp
4. Fog Lamp
5. Front Parking Sensors
6. Front Camera
7. Front Windshield Wipers
8. Sunroof
9. Roof Rails
10. Windows
11. Rear View Mirror with Camera
12. Door Handle Switch (DHS)
13. Alloy Wheels



1. Charging flap
2. Position Lamp
3. Stop Lamp
4. Turn Indicator
5. Reverse Lamp
6. Reflex Reflector
7. Rear Parking Sensors
8. Tail Gate Open Switch
9. Rear Camera
10. High Mounted Stop Lamp
11. Rear Windshield Wiper
12. Shark Fin Antenna



1. Door Opening Lever
2. Door Opening Knob
3. Express Down
4. Power Window Switches
5. Inhibit Switch
6. Bonnet Opening Lever
7. Driver side Coin Box
8. Charging flap opening
9. Seat Ventilation
10. Seat
11. Regeneration Lever
12. Steering wheel switches
13. Combi Switch RHS / LHS
14. Outer Rear View Mirror Selector

1. Instrument Cluster
2. Horn
3. Driver Air Bag
4. Start/Stop Switch
5. Drive Modes
6. Gear Mode
7. Hazard Warning Switch
8. Infotainment Display
9. Passenger Airbag
10. Glove Box
11. Fascia Switches
12. Parking Brake
13. Power Socket & USB
14. Arm Rest
15. USB Charger for Rear Passenger

Important Messages

In this Owner's Manual, you will find the text under the heading "WARNING", "CAUTION" and "NOTE" which highlights important information. Pay particular attention to these highlighted messages. The Images / Illustrations in this owner's manual are only for reference. It may defer with actual vehicle.

ⓘ NOTE

Indicates additional information that will assist you in gaining the optimum benefit and care for your vehicle.

⚠ WARNING

Indicates procedures or information that must be followed precisely in order to avoid the possibility of severe personal injury and serious damage to the vehicle.

⚠ CAUTION

It indicates to be careful. You are capable of doing something that might result in damage to equipment.