

BEV : GAC Toyota Motor (GAC Toyota) bZ3X Unit Teardown Report (Part 1)



铂智3X (bZ3X)



eAxle



ADAS ECU

Back ground

The bZ3X (Bozhi 3X), a sport utility vehicle jointly developed by Toyota Motor Corporation, Guangzhou Automobile Group, GAC Toyota, and the Toyota Intelligent & Electrified Vehicle R&D Center (China), was announced in March 2025.

By adopting components from Chinese manufacturers, the vehicle is priced from RMB110,000, keeping costs low.

Given Toyota's strong focus on reliability, LTEC has release several reports analyzing what types of components have been adopted.

This first report provides connection diagrams, as well as teardown and key component identification of the installed units.

Released reports

1. High-Voltage Electrical Components Teardown Report (15pages) 25R-0217-1

Connection diagrams of high-voltage electrical components (eAxle & battery), installation locations of related units, teardown, and major component analysis report.

2. Low-Voltage Electrical Components Teardown Report (15pages) 25R-0217-2

Connection diagrams of low-voltage electrical components (steering, HMI, ADAS, etc.), installation locations of related units, teardown, and major component analysis report.

3. Thermal Management Teardown Report (21pages) 25R-0217-5

Thermal paths for thermal management systems (cooling, heater, etc.), installation locations of related units, teardown, and major component analysis report.

4. ADAS related units Teardown Report 25R-0217-6

Connection diagrams of ADAS ECU (cooling, heater, etc.), teardown, and major component analysis report.

5. 7 in 1 eAxel Teardown report 25R-0217-3

Teardown, Component list including passive components, each 7 units connections, and connection of each PCBs inside of units

Delivered one week after order placement. Please contact us for report pricing.

Table of Contents

Summary

Table 1: Product Information	3
------------------------------	---

Main Powertrain Unit Overview

Figure 1: External View of bZ3X Main Powertrain Unit	4
--	---

7-in-1 eAxle

Figure 2: Integrated View of (1) Onboard Charger (OBC), (2) DC-DC Converter, and (3) Power Distribution Unit (PDU)	5
--	---

Figure 3: PCB View of (1) OBC and (2) DC-DC Converter	6
---	---

Figure 4: Photo of (3) PDU (eAxle)	7
------------------------------------	---

Figure 5: Photo of (4) Inverter Unit	8
--------------------------------------	---

Figure 6: Photo of (5) PTC Heater	9
-----------------------------------	---

Compressor

Figure 7: Photo of Compressor Unit	10
------------------------------------	----

LFP Battery

Figure 8: External View of LFP Battery with Battery Management Controller (BMC), Cell Monitoring Controller (CMC), and PDU (LFP)	11
--	----

Figure 9: Internal Circuit of LFP Battery and Power Distributor	12
---	----

Main Powertrain Unit Wiring

Figure 10: Physical Wiring Diagram of bZ3X Main Powertrain Unit	13
---	----

Figure 11: Interconnection Diagram between bZ3X Main Powertrain Units	14
---	----

Table of Contents (I)

Unit Connection Diagram

Figure 1: Inter-Unit Connection Overview

Unit Installation Layout

Figure 2: Unit Mounting Locations

Unit-Specific External Views and Key Component Survey

Figure 3-1: Auxiliary Battery (Li-ion)

Figure 3-2: ABS Unit

Figure 3-3: Master Cylinder Assembly

Figure 3-4: Steering System

Figure 3-5: Electric Power Steering (EPS)

Figure 3-6: Body ECU

Figure 3-7: Airbag ECU

Figure 3-8: Integrated Inertial Navigation Module

Figure 3-9: Body ECU (Integrated Type)

Figure 3-10: Gateway ECU

Figure 3-11: EPB (Electric Parking Brake) ECU

Figure 3-12: Rear Power Gate ECU

Figure 3-13: Door ECU

Figure 3-14: Center Console

Figure 3-15: Instrument Cluster

Figure 3-16: Display Unit

Figure 3-17: Onboard Computer

Figure 3-18: LiDAR Sensor

Figure 3-19: Millimeter-Wave Radar Sensor

Continue to next page

Table of Contents (II)

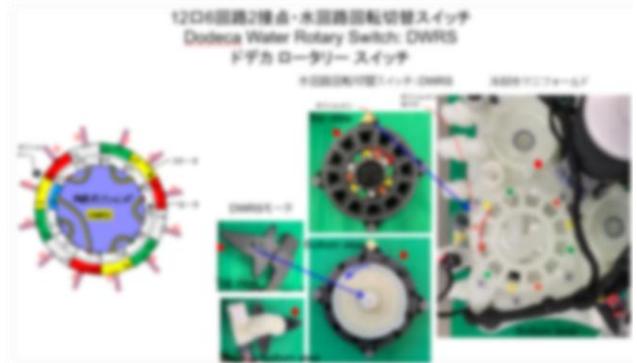
- Figure 3-20: Millimeter-Wave Radar Sensor
- Figure 3-21: Stereo Cameras (x2)
- Figure 3-22: Front Camera
- Figure 3-23: Door Mirror Cameras (x2)
- Figure 3-24: Door Mirror Cameras (x2)
- Figure 3-25: Rear Camera (Upper)
- Figure 3-26: Rear Camera (Lower)
- Figure 3-27: Rear-View Monitoring Camera
- Figure 3-28: Ultrasonic Sensor
- Figure 3-29: 4G Antenna
- Figure 3-30: Telematics Control Unit (TCU)
- Figure 3-31: GNSS Module
- Figure 3-32: Bluetooth Module
- Figure 3-33: Communication Module
- Figure 3-34: Headlamp (Right)
- Figure 3-35: Floor Light & SOS Switch Assembly
- Figure 3-36: Tail Lamp
- Figure 3-37: Tail Lamp (Right)
- Figure 3-38: AV Network Assembly
- Figure 3-39: Rain Sensor (Estimated)
- Figure 3-40: LF Antenna
- Figure 3-41: Rear Seat Occupancy Sensor
- Figure 3-42: Wheel Speed Sensor
- Figure 3-43: Driver Face Recognition Camera
- Figure 3-44: Shock Sensor (Estimated)
- Figure 3-45: Interior Antenna
- Figure 3-46: Temperature Sensor (Estimated)
- Figure 3-47: Position Sensor
- Figure 3-48: Position Sensor
- Figure 3-49: Door Pocket Light

(3) Thermal Management Teardown Report

In the electric vehicle bZ3X, the Thermal Management System (TMS) integrates multiple high-power, high-density subsystems—including the traction battery, motor/inverter, power electronics, and cabin HVAC unit. To manage thermal flow across these components, the vehicle employs a Water Rotary Switch (WRS) architecture. This system features twelve coolant inlet/outlet ports, dynamically configured into eleven distinct flow patterns to regulate heat distribution. Through this mechanism, the vehicle maintains optimal performance, reliability, and cabin comfort.

This report is intended to support the understanding of thermal control design in electric vehicle development, provide comparative insights across models, and serve as a reference for future design optimization.

TMS units



TMS Connection diagram



(3) Thermal Management Teardown Report

Table of Contents

Summary

Table 1	Product Information	3
---------	---------------------	---

Thermal Management Overview

Fig. 1	Thermal Management Unit Configuration	4
Fig. 2	Thermal Management Unit	5
Fig. 3	Heating/Cooling Control Targets	6

Refrigerant Circuit Analysis

Fig. 4	Refrigerant Circuit Overview	7
Fig. 5	Refrigeration Cycle – Terminology Definition (p-h Diagram)	8
Fig. 6	Refrigerant Circuit Diagram (COE0 Mode)	9
Fig. 7	Refrigerant Circuit Diagram (COE1 Mode)	10
Fig. 8	Refrigerant Circuit Diagram (C1E0 Mode)	11
Fig. 9	Refrigerant Circuit Diagram (C1E1 Mode)	12
Fig. 10	Refrigerant Circuit Diagram (COE2 Mode)	13
Fig. 11	Refrigerant Circuit Diagram (C1E2 Mode)	14

Cooling Water Circuit Diagram

Fig. 12	12-Port, 6-Circuit, 2-Contact Cooling Water Rotary Switch	15
Fig. 13	Water Circuit Switching Angle – Position 0°	16
Fig. 14	Water Circuit Switching Angle – Position 30°	17
Fig. 15	Water Circuit Switching Angle – Position 60°	18
Fig. 16	Water Circuit Switching Angle – Position 90°	19
Fig. 17	Water Circuit Switching Angle – Position 120°	20
Fig. 18	Water Circuit Switching Angle – Position 150°	21
Fig. 19	Water Circuit Switching Angle – Position 180°	22
Fig. 20	Water Circuit Switching Angle – Position 210°	23
Fig. 21	Water Circuit Switching Angle – Position 240°	24
Fig. 22	Water Circuit Switching Angle – Position 270°	25
Fig. 23	Water Circuit Switching Angle – Position 300°	26

Cooling Water Circuit Analysis

Fig. 24	DWRS Angle – Connection Configuration by Position	27
Fig. 25	Water Circuit Switching Angle – Position 0°	28
Fig. 26	Water Circuit Switching Angle – Position 30°	29
Fig. 27	Water Circuit Switching Angle – Position 60°	30
Fig. 28	Water Circuit Switching Angle – Position 90°	31
Fig. 29	Water Circuit Switching Angle – Position 120°	32
Fig. 30	Water Circuit Switching Angle – Position 150°	33
Fig. 31	Water Circuit Switching Angle – Position 180°	34
Fig. 32	Water Circuit Switching Angle – Position 210°	35
Fig. 33	Water Circuit Switching Angle – Position 240°	36
Fig. 34	Water Circuit Switching Angle – Position 270°	27
Fig. 35	Water Circuit Switching Angle – Position 300°	28

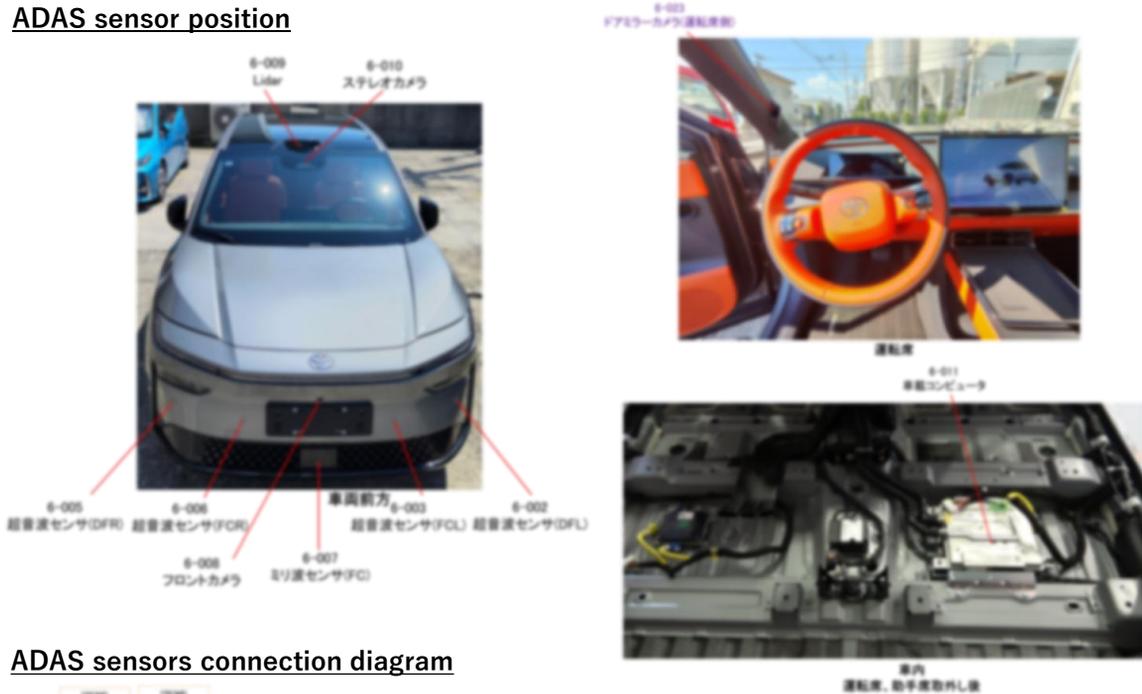
(4) ADAS related units Teardown Report

This vehicle incorporates autonomous driving technologies developed by the Chinese startup Momenta. Key features include Navigation-on-Pilot (NOA), hands-free driving, remote parking, traffic sign recognition, automated parking, and Over-the-Air (OTA) updates—collectively enabling advanced driver assistance capabilities.

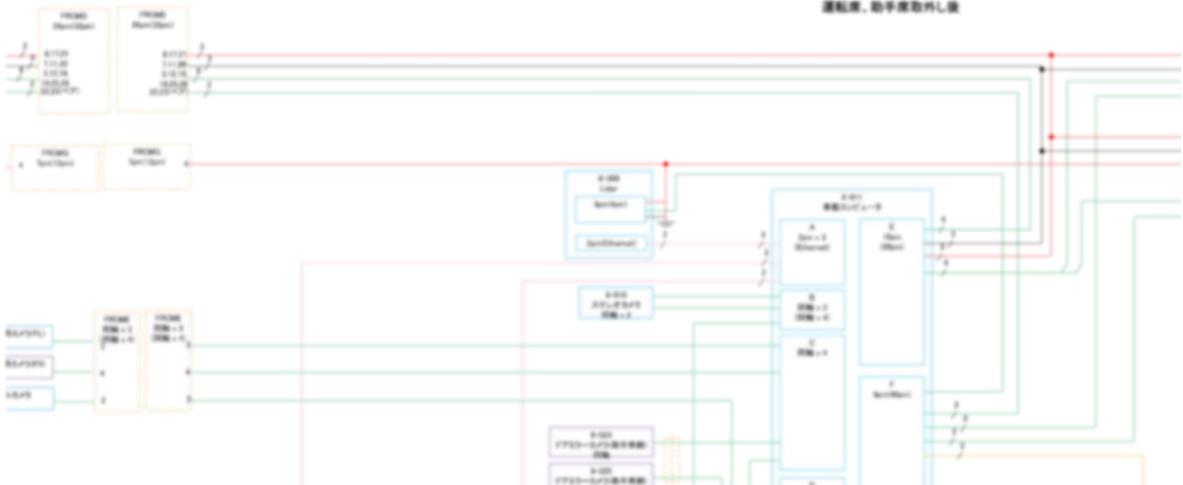
This report provides a detailed overview of the installation layout, interconnections, and component-level configuration of the associated electronic control units (ECUs) and sensor modules.



ADAS sensor position



ADAS sensors connection diagram



(4) ADAS related units Teardown Report

Table of Contents

being prepared

(5) 7 in 1 eAxel Teardown report



Inverter

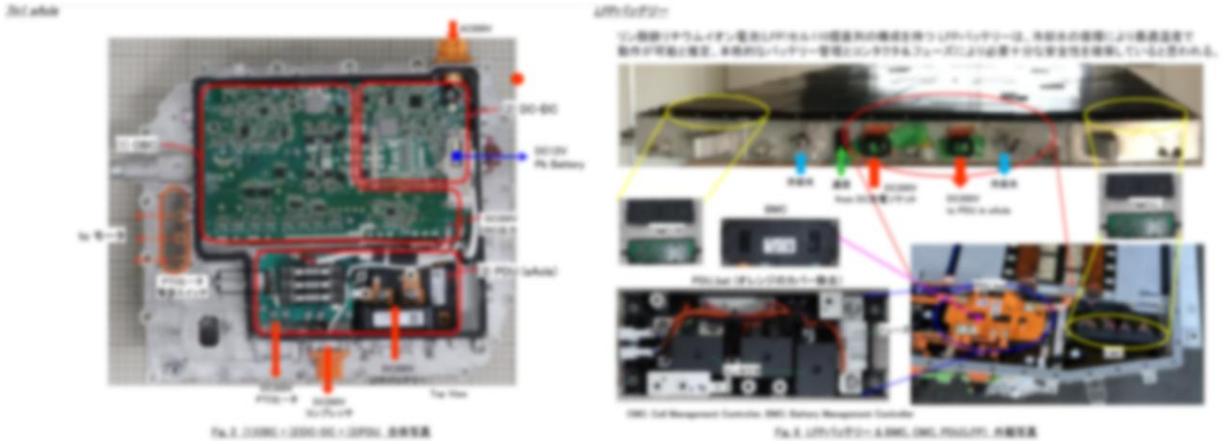


Battery unit



Compressor

Teardown



Connection diagram

