

TOYOTA Diagnostic Software User Guide

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1. Usage Brief

1.1 About Software

TOYOTA Diagnostic Software diagnoses TOYOTA/LEXUS Car Model DTC, Data Stream, Actuation Test, Freeze Frame and Special Functions.

1.2 Application Range

This document is applicable for TOYOTA diagnostic software developing engineer, technical engineer and customer.

1.3 Attention

With the developing of TOYOTA software, this document may vary. If any problem found during the usage, please feedback to TOYOTA diagnostic software developing engineer.

2. Instructions

2.1 Menu Selection

2.1.1 Primary Menu

Primary Menu is for diagnostic socket selection, including 17PIN DLC, 17F/22PIN DLC and 16PIN DLC. Almost all TOYOTA/LEXUS after 2000 use 16PIN DLC. Those before 2000 mostly use non-16PIN DLC or both of them. Usually, there are two diagnostic sockets. One locates under instrument panel, the other locates in engine compartment. Some specially locates under seat.

2.1.2 Area Selection

Area Selection is separated into Japan Area and Other Area. Japan Area is only for Japanese market cars. Other Area is for cars outside Japanese market. If failed to test when using Other Area, please try with Japan Area. Especially 16PIN DLC before 2000 may require Japan Area to test.

2.1.3 Japan Area

There are 4 menus under Japan Area: Fast Test, Drive Chain, Chassis and Body. Fast Test detects all system fault codes and clears DTC. Other 3 menus further contain Automatically Search and Select System. As Automatically Search takes long time, it is suggested to select system to test when user is familiar with existing ECUs or when user has targeted system.

2.1.4 Other Area

Other Area diagnose for non-Japan markets. Firstly, identify the car. Different car takes different time in scanning. Generally, new models take short time. Other Area contains automatic test and manual test. Manual test requires selecting car mode, which is usually in the form of 3-digit letters. User can get the car mode from the nameplate in engine compartment or near car door. It is suggested to use automatic test in most cases unless automatic test has problem or cannot test. Automatic test will overleap mode menu to scan systems. Since different car model has different number of ECUs, the scanning time also differs.

2.1.5 Assistant Selection Menu of Other Area

- w/ Smart key
- w/o Smart key
- w/VSC
- w/o VSC
- unleaded
- leaded
- w/o TVSS
- w/TVSS
- w/o DPNR(Diesel Particulate-NOx Reduction system)
- w/DPNR(Diesel Particulate-NOx Reduction system)
- w/LASER CRUISE
- w/o LASER CRUISE
- w/LKA(Lane Keeping Assist) System
- w/o LKA(Lane Keeping Assist) System
- w/Intelligent Parking Assist
- w/o Intelligent Parking Assist
- LHD (Left Hand Drive)
- RHD (Right Hand Drive)
- TMT (Toyota Motor Thailand) Product
- TMCA (Toyota Motor Corporation Australia) Product
- TMC (Toyota Motor Corporation)
- TMUK (Toyota Motor Manufacturing UK) Product
- TMMF (Toyota Motor Manufacturing France) Product
- TMV (Toyota Motor Vietnam)
- TMMT(Toyota Motor Manufacturing Turkey) Product
- TSAM (Toyota South Africa Motors) Product
- GTMC (Guangzhou Toyota Motor Co., Ltd.) Product
- TFTM (Tianjin FAW Toyota Motor Co., Ltd.) Product
- SFTM (Sichuan Toyota Motor Co., Ltd.)
- TMMC (Toyota Motor Manufacturing Canada Inc.)

- TDV (TOYOTA DE VENEZUELA)
- TFTM (Taiwan Toyota Motor Co., Ltd.) Product
- TKM (Toyota Kirloskar Motor)
- TDB (Toyota do Brasil LTDA.)
- IMC (Indus Motor Co., Ltd.) Product

2.2 System Explanation

TOYOTA/LEXUS systems are separated into 3 parts: POWERTRAIN, CHASSIS and BODY. POWERTRAIN contains Engine, ECT, Cruise Control, HV Battery and Hybrid Control, etc. CHASSIS contains ABS/VSC/TRC, EMPS, Air suspension, AHC and Tire Pressure Monitor, etc. BODY contains SRS, Immobilizer, Entry & Start, AFS, Air Conditioner, Combination Meter and Main Body, etc. Below are Toyota/Lexus whole systems and system introduction:

- 1). 4WD_CAN: This ECU controls four wheel drive system.
- 2). ABS (Anti-lock Brake System)/VSC(Vehicle Stability Control)/TRC(Traction Control): This ECU controls Anti-lock Brake System, Vehicle Stability Control and Brake System of vehicle secure performance.
- 3). ABS (Anti-lock Brake System)_CAN: This ECU controls Anti-lock Brake System, Vehicle Stability Control and Brake System of vehicle secure performance.
- 4). Accessory Gateway: This ECU controls the communication between BUS and ACC.
- 5). LH Active Headrest: This ECU controls left hand headrest.
- 6). RH Active Headrest: This ECU controls right hand headrest.
- 7). Active Empennage: This ECU controls the active empennage according to the vehicle speed.
- 8). AFS (Adaptive Front Lighting System): This ECU controls front lighting illumination axis according to vehicle speed and steering angle.
- 9). AHC (Active Suspension Height Control): This ECU controls suspension and damper according to the wheel speed, steering wheel rotation and gravity.
- 10). Air Suspension: This ECU controls suspension and damper actuator according to the wheel speed, steering wheel rotation and gravity.

- 11). ASG (Automatic Sequential Gearbox): This ECU controls electric manual shift gearbox. ASG ultimate multifunctional 4 drive modes: Automatic, sport, normal and wetland.
- 12). Audio System: This ECU controls audio system.
- 13). Rear Door: This ECU controls rear door locking.
- 14). Tailgate Power Window: This ECU controls tailgate power window.
- 15). Blind Spot Monitoring Master Device: This ECU detects the sides of master device in blind spot of vehicle external rearview mirror through radar and sends alert to driver.
- 16). Blind Spot Monitoring Slave Device: This ECU detects the sides of slave device in blind spot of vehicle external rearview mirror through radar and sends alert to driver.
- 17). Body: This ECU controls wireless door locking and security system, as well as interior lighting of ceiling lights and door lights, power window and rearview mirror.
- 18). Body 2: This ECU controls interior lighting of ceiling lights, door lights, wiper system, lighting system and belt motor.
- 19). Body 3: This ECU controls interior lighting and front wiper.
- 20). Body 4: This ECU controls tail lights, trunk cover and oil filling cover, and monitors status of all switches.
- 21). Body 5: This ECU controls front lights.
- 22). Central Console Switch: This ECU controls operation switch of central console.
- 23). Charging Control: This ECU controls power supply and limit the supply to other systems.
- 24). Sonar: This ECU detects the distance between car and other objects and controls warning system.
- 25). Instrument Panel: This ECU controls instruments and warning lights.
- 26). Instrument Panel Switch: This ECU is a combination switch, integrating

switches with different functions. Usually, it integrates turning signal switch, dimmer switch, lamp control switch, front wiper switch and cleaner switch.

- 27). Cruise Control: This system sets up speed automatic control cruise and is carried out by engine ECU.
- 28). Driver Door Motor: This ECU controls driver side power window.
- 29). Driver Door: This ECU controls driver side door locking and power window.
- 30). Driver Seat: This ECU controls driver side seat position and seat position memory.
- 31). DRS (Drag Reduction System): This ECU detects car circular motion and controls rear wheel to prevent car shake.
- 32). Driver Seat Switch: This ECU controls switches around driver seat.
- 33). E-ACM (Engine-Active Control Mount): This ECU produces corresponding vibration to reduce engine vibration.
- 34). ECB (Electronic Control Brake) Gateway: Gateway exists in ECB ECU. It detects communication faults with connected ECU.
- 35). ECM (Engine Control Module) Gateway: This gateway exists in ECM ECU. It detects communication faults with connected ECU.
- 36). ECT (Electric Control Transmission): This ECU controls power from hydraulic pressure converter to automatic transmission of output shaft.
- 37). EHPS (Electro Hydraulic Power Steering): This ECU controls steering.
- 38). Electronic Parking Brake: This ECU controls parking brake.
- 39). Power Supply Control: This ECU controls power supply and limit the supply to other systems.
- 40). EMPS (Electric Motor Power Steering): This ECU controls steering.
- 41). EMS: This ECU controls suspension and damper according to the steering wheel speed, steering gear rotation and gravity.

- 42). Engine: This ECU controls fuel injection, ignition timing, knock control, idling engine speed, self test function and backup function for special case, etc.
- 43). Engine (LH Bank): This ECU controls for left hand bank the fuel injection, ignition timing, knock control, idling engine speed, self test function and backup function for special case, etc.
- 44). Engine (RH Bank): This ECU controls for right hand bank the fuel injection, ignition timing, knock control, idling engine speed, self test function and backup function for special case, etc.
- 45). Engine and Electronic Control Transmission: This ECU controls fuel injection, ignition timing, knock control, idling engine speed, self test function and backup function for special case, etc. Moreover, it controls automatic transmission.
- 46). Engine 2: This ECU controls for Engine Bank 2 the fuel injection, ignition timing, knock control, idling engine speed, self test function and backup function for special case, etc.
- 47). Entry & Startup: This ECU controls keyless entry and engine startup. It determines whether to stop engine startup through the comparison between ID code and vehicle pre-registered code.
- 48). Entry & Startup (CAN): This ECU controls keyless entry and engine startup. It determines whether to stop engine startup through the comparison between ID code and vehicle pre-registered code.
- 49). 4WD: This ECU controls four wheel drive system.
- 50). Free-Tronic: This ECU controls clutch actuator. Unlike traditional manual transmission, it does not require driver for clutch engagement / disengagement or half clutch. Thus, it makes the driving easier and more comfortable.
- 51). FL Door: This ECU controls front left seat position and seat position memory.
- 52). FL Seat A/C: This ECU controls climate around front left seat.
- 53). FR Door: This ECU controls front right seat position and seat position memory.
- 54). FR Seat A/C: This ECU controls climate around front right seat.

- 55). Front Stabilizer: This ECU self regulates the front stability according to the running condition.
- 56). Gateway: This ECU forwards signals from Techstream or other ECUs and detects the communication faults between them.
- 57). BEAN (Body Electric Area Net) Gateway: This Gateway forwards signals between BEAN BUS and CAN V, and detects the communication faults with connected ECU.
- 58). CAN Gateway: This Gateway forwards signals between 2 CAN BUS, and detects the communication faults with connected ECU.
- 59). V Gateway: This Gateway forwards signals between 2 CAN BUS, and detects the communication faults with connected ECU.
- 60). Air Intake Grille System: This ECU controls On/Off of Air Intake Grille System according to the vehicle side information (vehicle speed, engine coolant temperature, ambient temperature, A/C refrigerant pressure and A/C switch status) to improve the fuel economy.
- 61). Headlight Automatic Leveling: This ECU controls headlight illumination axis at vertical direction according to vehicle leaning.
- 62). HV (Hybrid Vehicle) Battery: This ECU controls blower motor control based on battery temperature. It also calculates charge status according to battery voltage, battery temperature and current sensor. Moreover, it sends charge status to HV ECU.
- 63). HV (Hybrid Vehicle) Gateway: This gateway exists in HV ECU. It detects communication faults with connected ECU.
- 64). Hybrid Power Control: This ECU calculates engine output, motor drive torque and generator drive torque to control the driving force of hybrid power vehicle based on throttle opening and shift position, etc.
- 65). Anti-theft System: This ECU determines whether to stop engine startup through the comparison between ID code and vehicle pre-registered code.
- 66). IPA (Intelligent Parking Assistant) / Parking Assistant Monitor: IPA ECU controls steering wheel automatically and makes parallel parking easier or reverses in parking lot through reverse pilot monitoring.

- 67). KDSS (Kinetic Dynamic Suspension System): This ECU controls suspension and damper according to the wheel speed, steering wheel rotation and gravity.
- 68). Lane Departure Alert: This ECU controls lane departure alert.
- 69). Lane Keeping Assistance System: This ECU controls lane departure alert and lane keeping assistance.
- 70). Laser Cruise: This system controls cruise with optimal speed and monitors the distance between car and other objects to prevent crash. It's carried out by Engine ECU.
- 71). Main Body: This ECU combines and controls body system and gateway system.
- 72). Main Switch: This ECU controls all door power windows.
- 73). Rearview Mirror: This ECU controls rearview mirror on both sides. Functions include: Vertical/horizontal position sensor and rearview mirror movement.
- 74). LH Rearview Mirror: This ECU controls rearview mirror on left side. Functions include: Vertical/horizontal position sensor, rearview mirror movement and footlight setting.
- 75). RH Rearview Mirror: This ECU controls rearview mirror on right side. Functions include: Vertical/horizontal position sensor, rearview mirror movement and footlight setting.
- 76). Multi-bus Gateway: This Gateway forwards signals among 3 CAN BUS.
- 77). Multi-bus Monitor 1: This system is in Multi-bus Gateway ECU. It detects the communication faults with connected ECU.
- 78). Multi-bus Monitor 2: This system is in Multi-bus Gateway ECU. It detects the communication faults with connected ECU.
- 79). Multi-mode M/T (Manual Transmission): This ECU controls Multi-mode M/T (Manual Transmission), a kind of electric manual shift transmission. There are two shift modes for this transmission. E-Mode: Automatic Shift. M-Mode: Manual Shift.
- 80). Navigation System: This ECU controls navigation system.

- 81). Night Vision System: This ECU controls frontal visual field assistant system.
- 82). Passenger Detection System: This ECU controls passenger detection sensor.
- 83). Passenger Main Switch: This ECU controls passenger door power window.
- 84). Passenger Door: This ECU controls passenger side door locking and power window.
- 85). Passenger Seat: This ECU controls passenger side seat position and seat position memory.
- 86). Passenger Door Motor: This ECU controls passenger side power window.
- 87). Plug-in Control: This ECU controls plug-in charging system (battery charger, battery able, etc.).
- 88). PM1 Gateway: This Gateway exists in PM1 ECU. It detects communication faults with connected ECU.
- 89). PM2 Gateway: This Gateway exists in PM2 ECU. It detects communication faults with connected ECU.
- 90). Power Supply Control: This ECU controls button starting system. For example, the relay of drive power supply transmits starting signal of hybrid power system to HV (Hybrid Vehicle) ECU. The drive key interlock magnetic valve receives different switch and communication signals.
- 91). PPS: This ECU controls steering operation.
- 92). Pre-Crash: This ECU controls driver and front passenger seatbelt actuator and brake system when radar sensor confirms whether it is an inevitable crash in advance.
- 93). Pre-Crash 2: This ECU controls driver and front passenger seatbelt actuator and brake system when radar sensor confirms whether it is an inevitable crash in advance.
- 94). Radar Cruise: This system controls cruise with optimal speed and monitors the distance between car and other objects to prevent crash. It's carried out by Engine ECU.

- 95). Rain Sensor: This ECU automatically controls front wiper when it rains or when there's any moisture on the windshield, and regulates the wiping interval according to the rainfall.
- 96). Rear Console Switch: This ECU controls operation switch of rear console.
- 97). RL Door: This ECU controls rear left side door locking and power window.
- 98). RL Seat: This ECU controls rear left side seat position and seat position memory.
- 99). RL Seat A/C: This ECU controls climate around rear left seat.
- 100). RR Door: This ECU controls rear right side door locking and power window.
- 101). RR Seat: This ECU controls rear right side seat position and seat position memory.
- 102). RR Seat A/C: This ECU controls climate around rear right seat.
- 103). Rear Seat Switch: This ECU controls operation switch of rear seat.
- 104). Rear Stabilizer: This ECU self regulates the rear stability according to the running condition.
- 105). Remote Engine Starter: This ECU controls engine startup from outside of the car.
- 106). Retractable Hardtop: This ECU controls On/Off of hardtop sunroof.
- 107). RL Door Motor: This ECU controls rear left side power window.
- 108). RR Door Motor: This ECU controls rear right side power window.
- 109). Sequential M/T (Manual Transmission): This ECU selects shift position according to shift lever switch signal and controls the actuator to ensure a smooth and steady shift.
- 110). Sliding Sunroof: This ECU controls On/Off of sliding sunroof.
- 111). SRS (Supplemental Restraint System) Airbag: This ECU controls the Airbag inflation igniter when crash sensor detects crash.

- 112). Stabilizer: This ECU self regulates the stability according to the running condition.
- 113). Startup Control: This ECU controls the engine startup.
- 114). Steering Lock: This ECU determines whether to stop engine startup through the comparison between ID code and vehicle pre-registered code.
- 115). Steering Pad Switch: This ECU controls switch on steering wheel, such as audio switch, instrument display switch and radar cruise switch, etc.
- 116). Start/Stop System: This ECU automatically controls idling stop and engine start when car stops and starts so as to save fuel.
- 117). Start/Stop: This ECU automatically controls idling stop and engine start when car stops and starts so as to save fuel.
- 118). Telematics (Remote Information Processing System): This ECU wirelessly controls the information sending/receiving.
Note: Telematics (Remote Information Processing System): It cannot communicate with diagnostic tool within 20 seconds after ignition switch on.
- 119). Anti-theft System: This ECU controls anti-theft system. Meanwhile, it controls intelligent key system to start door lock/unlock, steering lock release, engine startup and trunk open.
- 120). Tilt and Telescopic: This ECU controls electric tilt and telescopic of steering column.
- 121). Tire Pressure Monitor: This ECU controls tire pressure.
- 122). Transmission Control: This ECU controls P-position switch and shift lever, detects P-position shift position and transmits the shift position signal to ECU.
- 123). TVSS (Toyota Vehicle Safety System): This ECU controls anti-theft system.
- 124). Vehicle Control: This ECU controls Idling Stop, ES Start (Hill Start), Idling Rising at Start, Economical Running, Cruise and Preheating.

- 125). VGRS (Variable Gear Ratio Steering): This ECU sets up the optimal steering gear ratio for vehicle speed.
- 126). WIL (Whiplash Injury Lighten) Gateway: WIL BUS Gateway detects communication faults with PCS-WIL (Pre-Crash Safety) ECU.
- 127). Wiper: This ECU controls front wiper according to vehicle speed and rainfall.

2.3 Function

Toyota/Lexus Special Functions contain "Autoscan" and "Select All". "Autoscan" only lists special functions existing in this car and "Select All" lists special functions of all Toyota/Lexus cars. This is only for users who are familiar with special functions. For the detailed special functions, please refer to technical document on X431 website.

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