

AST Pro (Auto Start Toyota) v 5.1

Toyota / Lexus emergency engine start unit

➤ PURPOSE OF THE DEVICE

- Emergency engine start of Toyota / Lexus cars in case of the lost keys or certification system malfunction.
- Recovery of a car working when all keys lost. (Adaptation of SmartECU)
- Registration of new smart keys using the registered (valid) key. (Adding Key)



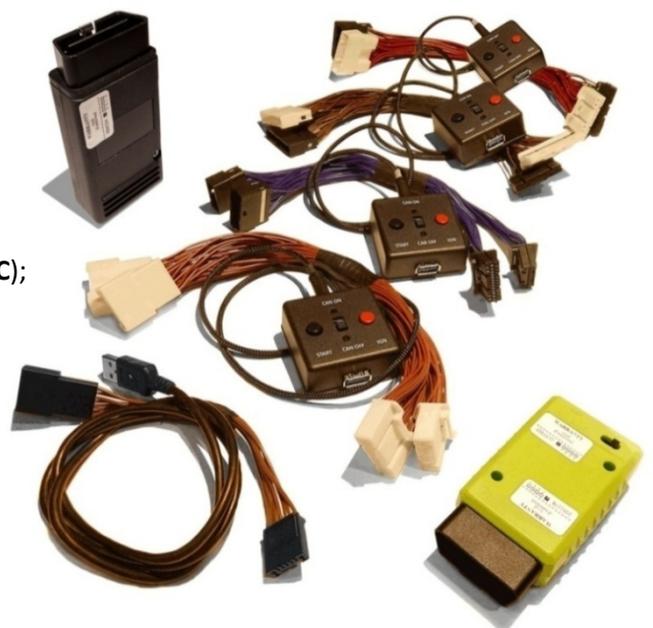
➤ SUPPORTED MODELS

Toyota / Lexus: AST Pro supports all-new models of **2015-2020** with Smart keys **AA, A8, A9,39, 88, 98**.

AST Pro v5.1 is not intended for permanent use, only for a temporary solution in an emergency!!!

➤ THE KIT

- AUTOSTART DEVICE (**black**) (Fig.3A);
- OBD PROGRAMMER (**green**) (Fig. 3B);
- Adapter to ESCL (**Electronic Steering Column Lock**) (Fig. 3C);
- Set of Smart ECU adapters with CONTROL CONSOLE (fig. 3D,3E);
- Cable with twin NEEDLES for connection to Body ECU (Fig.3F);
- USB Cable (***Only the USB 3.0 cable is used!**) (Fig. 3G);



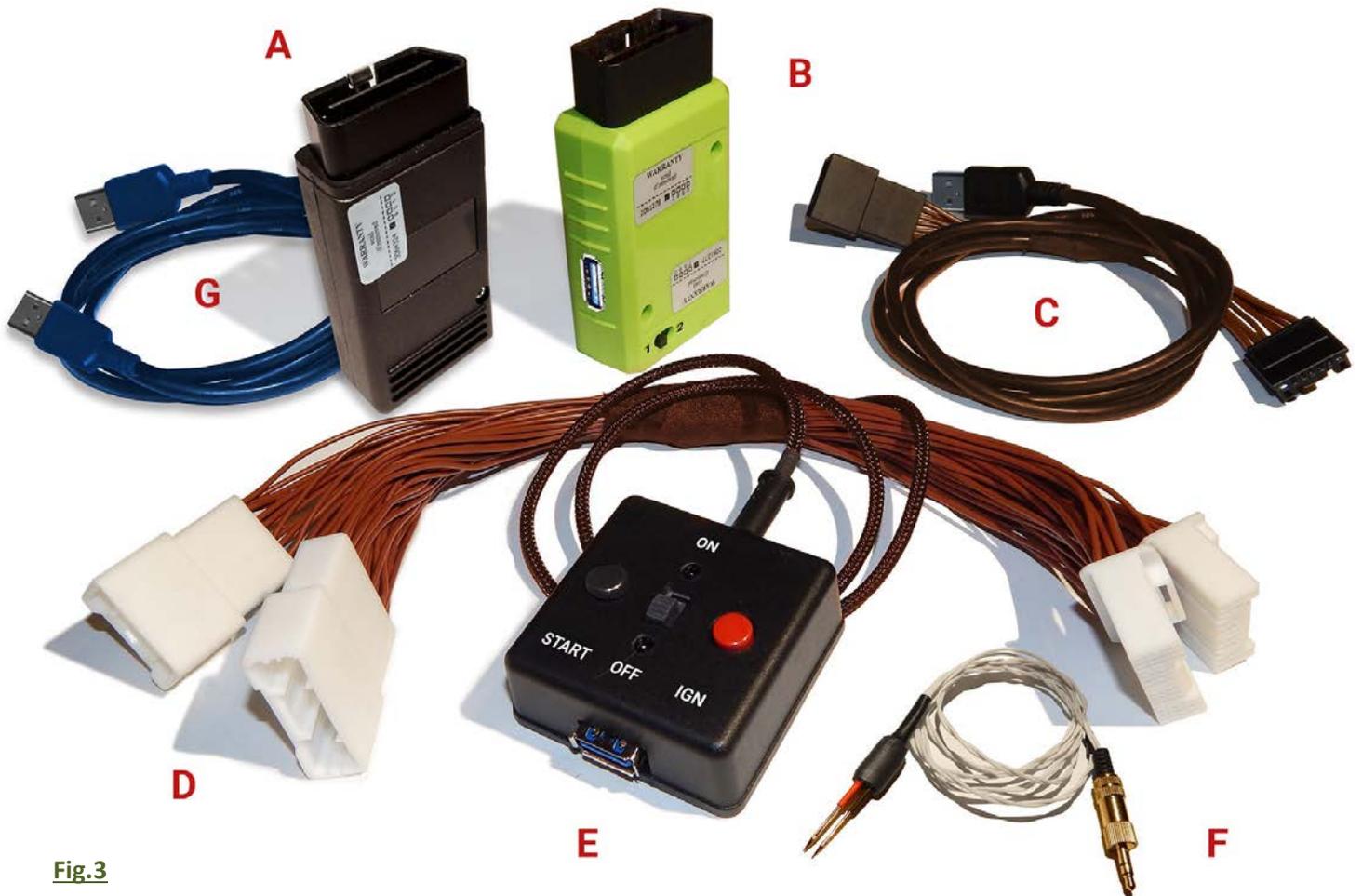


Fig.3

➤ **APPLICATION AND CONNECTION OPTIONS**

1. Emergency start:

- 1.1. Connection via Smart ECU;
- 1.2. Connection via ESCL (car alarm is off);
- 1.3. Connection via ESCL (car alarm is on);
- 1.4. Connection via ESCL (old type certification system with 98 key, car alarm is off);

2. Recovery of car working when all keys lost (Adaptation of Smart ECU):

- 2.1. Connection via Smart ECU;
- 2.2. Connection via ESCL;

3. Registration of new smart keys using the registered (valid) key (Adding Key):

- 3.1. Smart Keys Registration.

➤ **OPERATION SEQUENCE** (Step-by-step instruction)

SECTION 1. EMERGENCY START

1.1. EMERGENCY ENGINE START (Connection via Smart ECU)

- a. Disconnect **the upper** connector from Smart ECU (for hybrids, cars with start-stop system and AA, A8, A9 keys). For other car models with A8, A9 keys and vehicle with 39, 88 keys disconnect **the upper and lower** connectors.
- b. Connect the Smart ECU to the disconnected plugs through the appropriate adapter (Fig.3D). Select the adapter depending on the car model and key type (Fig. 8A-8D).
- c. Switch **CAN** mode on **CONTROL CONSOLE** to position **ON**. (Fig. 3E)
- d. Connect the **CONTROL CONSOLE** (Fig.3E) to **AUTOSTART DEVICE** (Fig.3A) using **USB cable** (Fig.3G). The LED on the device will flash **green**.
- e. If the autostart procedure is successful, the LED on the device will light **green** permanently.
- f. The steering column unlocks automatically, the ignition turns on and the engine starts automatically. All this actions occur **in automatic mode**.

Attention!!!

- ✓ *When in automatic mode the ignition does not turn on, the engine does not start, and the LED blinks green, starting is possible in manual mode. In this case, activate the system using the door jamb switch. (Fig.4) Then turn on the ignition with **IGN** button and start engine with **START button** on the CONTROL CONSOLE (Fig.3E).*
- ✓ *If you need to disconnect **AUTOSTART DEVICE** and leave the engine turned on, press **IGN** button on the **CONTROL CONSOLE** and disconnect the unit. The engine will continue to run until you turn off the ignition with the **IGN** button on the **CONTROL CONSOLE**.*
- ✓ *When the car alarm is armed the procedure of emergency engine start is performed as described above. During this procedure, the Panic mode will be activated!*

1.2. EMERGENCY ENGINE START (Connection via ESCL (Electronic Steering Column Lock), the car **alarm is OFF**).

- a. Unplug the connector from **ESCL**.
- b. Plug this connector to **ESCL** through the appropriate adapter (Fig.3C).
- c. Connect USB cable of the adapter (Fig.3C) to **AUTOSTART DEVICE** (Fig.3A). The LED on the device will flash **green**.
- d. Insert **AUTOSTART DEVICE** into OBD connector of the car.
- e. Activate the system with the **door jamb switch** (Fig.4).
- f. If the autostart procedure is successful, the led on the device will light **green** permanently.
- g. The steering column unlocks automatically, the ignition turns on and the engine starts automatically. All this actions occur **in automatic mode**.



Fig.4

1.3. EMERGENCY ENGINE START (Connection via ESCL (Electronic Steering Column Lock), the car **alarm is ON**).

- a. Unplug the connector from **ESCL**.
- b. Plug this connector to **ESCL** through the appropriate adapter (**Fig.3C**).
- c. Connect the cable jack (**Fig. 3F**) to **AUTOSTART DEVICE AUX** terminal (**Fig.3A**). Connect twin **NEEDLES** of the cable (CAN signal) to the appropriate pins of **BODY ECU** (**Fig.7A, 7B**).



Attention!!! *Wiring of CAN signal is twisted pair. If the procedure is performed for a car not specified in the instructions (Fig.7), find the twisted pair and connect the probes to these wires.*

- d. Connect **USB cable** of the adapter (**Fig.3C**) to **AUTOSTART DEVICE** (**Fig.3A**).
*** DO NOT insert AUTOSTART DEVICE in OBD connector of the car!!!**
- e. The LED on the device will flash **green**.
- f. If the autostart procedure is successful, the LED on the device will light **green** permanently. The steering column unlocks automatically, the ignition turns on and the engine starts automatically. All this actions occur **in automatic mode**.

Attention!!!

- ✓ *The procedure of emergency auto start does not deactivate the alarm when car alarm is armed. During execution of emergency auto start procedure, **Panic mode is activated**.*
- ✓ *If the **Gateway ECU** is not used in the car (Toyota RAV4, Camry, Corolla, etc.), the emergency engine start procedure does not require connecting additional needles to **BODY ECU**. The procedure is performed as described in **sections 1.1 and 1.2**.*

1.4. EMERGENCY ENGINE START for old type certification system with 98 key (Connection via ESCL (Electronic Steering Column Lock), the car **alarm is OFF**).

- a. Unplug the connector from **ESCL** (**Fig.5C, Fig.6**).
- b. Plug this connector to **ESCL** through the appropriate adapter (**Fig.3C**).
- c. Connect **USB cable** of the adapter (**Fig.3C**) to **AUTOSTART DEVICE** (**Fig.3A**).
- d. The LED on the device will flash **green**.
- e. Activate the system with the **door jamb switch** (**Fig.4**).
- f. If the autostart procedure is successful, the led on the device will light **green** permanently.
- g. To start the engine, press **Start/Stop Button** on dashboard of the car.

➤ SECTION 2. RECOVERY OF CAR WORKING WHEN ALL KEYS LOST (Adaptation of Smart ECU)

Attention!!! New Toyota / Lexus models with Smart keys use Smart ECUs storing data about this keys in processors which are protected from data interception. (See **SKU numbers of SmartECU**)
Adding and registering of the keys in these models is possible if at least one working key is available.

If all car keys are lost, you can restore car working **only** by Smart ECU replacing with New Smart ECU equipped with New key or Used Smart ECU with the key registered to this unit.

Attention!!!

For new cars with **AA smart key** (Toyota Corolla, RAV4 2019 etc.), key registration and adaptation of Smart ECU to certification system of the car is carried out by dealer equipment and **only online mode (via the Internet)**.

You can **restore car working by replacing** the Smart ECU that uses **AA key** with **New Smart ECU (A9)** equipped with **new key** or **Used Smart ECU (A9)** with **key registered to this block**.

After replacing the Smart ECU, adaptation of this unit to the certification system is carried out by AST Pro device or any other equipment and **does not require online mode**.

2.1. ADAPTATION OF SMART ECU TO CERTIFICATION SYSTEM (Connection via Smart ECU)

- a. Disconnect **the upper** connector from Smart ECU (for hybrids, cars with start-stop system and A8, A9 keys). For other car models with A8, A9 keys and vehicle with 39, 88 keys disconnect **the upper and lower** connectors.
- b. Connect the disconnected plugs to Smart ECU through appropriate adapter (Fig.3D). Select this adapter depending on the car model and key type (Fig. 8A-8D).
- c. Switch **CAN** mode on the **CONTROL CONSOLE** to position **OFF** (Fig. 3E).
- d. Connect **CONTROL CONSOLE** (Fig.3E) to **AUTOSTART DEVICE** (Fig.3A) using the USB cable (Fig.3G). The LED on the device will flash **green**.
- e. Activate the system with the **door jamb switch** (Fig.4).
- f. Set the switch of **OBD PROGRAMMER** (Fig.3B) to position **#1**.
- g. Insert **OBD PROGRAMMER** into OBD connector of the car.
- h. After connecting the sound beep **once**. The immobilizer lamp goes out and **AUTOSTART DEVICE** blinks **orange**.



Attention!!! If the immobilizer lamp continues to flash after connecting OBD PROGRAMMER, you need disconnect the programmer and connect it again to OBD connector. The immobilizer lamp should go out, and AUTOSTART DEVICE LED should blink **orange**.

- i. Touch surface of the engine START/STOP button with the appropriate smart key. (**for new block use new key, for used block use the key bound to this SmartECU**).
- j. The LED on **AUTOSTART DEVICE** will light **green** permanently, the immobilizer lamp starts blinking. **OBD PROGRAMMER** can be disconnected.
- k. SmartECU adaptation is complete. You can start the car.

2.2. ADAPTATION OF SMART ECU TO CERTIFICATION SYSTEM (Connection via ESCL (Electronic Steering Column Lock)).

- a. Unplug the connector from **ESCL**.
- b. Plug this connector to **ESCL** through the appropriate adapter (Fig.3C).



- c. Connect **USB cable** of the adapter (**Fig.3C**) to **AUTOSTART DEVICE (Fig.3A)**.
- d. The LED on the device will flash **green**.
- e. Activate the system with the **door jamb switch (Fig.4)**.
- f. Set the switch of **OBD PROGRAMMER (Fig.3B)** to position **#1** .
- g. Insert **OBD PROGRAMMER** to OBD connector of the car.
- h. After connecting the beep sounds **once**. The immobilizer lamp goes out, and **AUTOSTART DEVICE** blinks **orange**.

Attention!!! *If the immobilizer lamp continues to flash after connecting OBD PROGRAMMER, you need disconnect the programmer and connect it again to OBD connector. The immobilizer lamp should go out, and AUTOSTART DEVICE LED should blink orange.*

- i. Touch surface of engine Start/Stop button with the appropriate smart key.
(**for new block use new key, for used block use the key bound to this SmartECU**).
- j. The LED on **AUTOSTART DEVICE** will light **green** permanently, the immobilizer lamp starts blinking. **OBD PROGRAMMER** can be disconnected.
- k. SmartECU adaptation procedure is complete. You can start the car.

SECTION 3. REGISTRATION OF NEW KEYS USING THE REGISTERED (VALID) KEY.

3.1. SMART KEYS REGISTRATION (ADDING KEY)

- a. Turn off the car ignition.
- b. Set the switch of **OBD PROGRAMMER (Fig.3B)** to position **#2**.
- c. Connect the **OBD PROGRAMMER** to OBD connector of the car.
- d. After connecting, a beep sounds twice. The immobilizer lamp on the dashboard goes out.



Attention!!! *If the immobilizer lamp continues to flash after connecting the OBD PROGRAMMER, you must disconnect the programmer and connect it again to OBD connector. The immobilizer lamp should go out.*

- e. Within 30 seconds, touch surface of engine Start/Stop button with the **registered** smart key. One beep will sound and LED will light up.
- f. Remove the smart-key from vehicle.
- g. Within 30 seconds, touch surface of engine START button with the additional **new** smart key.
- h. After a single beep, remove the smart-key from START button.
- i. If the second single beep sounded, it means the additional key is registered successfully. After that, you need to remove the smart key from the vehicle.

*** If the second audio signal does not sound, this means the smart key is not registered.**

- j. To continue registering additional smart keys, you need to repeat **steps 7.6 - 7.8**.
- k. After you finish the registering of the last smart key, you need to wait **OBD programmer** emits three beeps. Disconnect this programmer from OBD connector.

- I. AddKey procedure is complete. After completion of the procedure the immobilizer lamp starts flashing on the dashboard.

The key cannot be registered for the following reasons:

- ✓ **Type of smart key does not match the type of key used in the vehicle. In this case, you must use the appropriate smart-key;**
- ✓ **Smart key is locked (the key is registered to another car). You need to unlock this key using a special programmer, or use a new smart key.**

➤ **LOCATION OF CONNECTORS AND ECU BLOCKS**

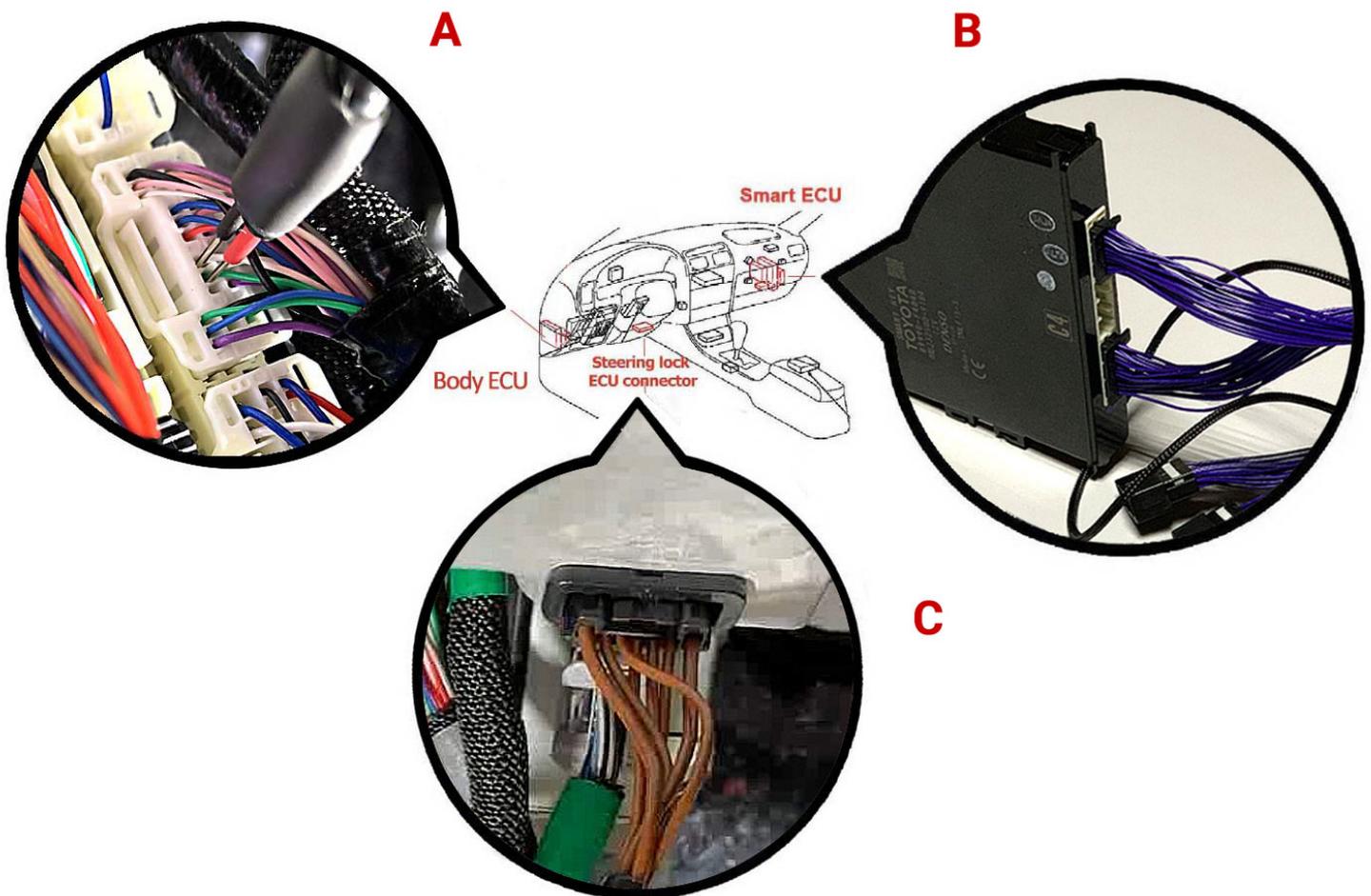


Fig.5

➤ **CONNECTION VIA ESCL** (*Electronic Steering Column Lock*)



Fig.6

➤ **CONNECTING ADDITIONAL CONTACTS (CAN SIGNAL) TO THE BODY ECU**

CH-R, GX, Highlander, LX, NX, RX - contacts 13-14 (Fig.7A)

Camry, Rav4 - contacts 5-6 (Fig. 7B)

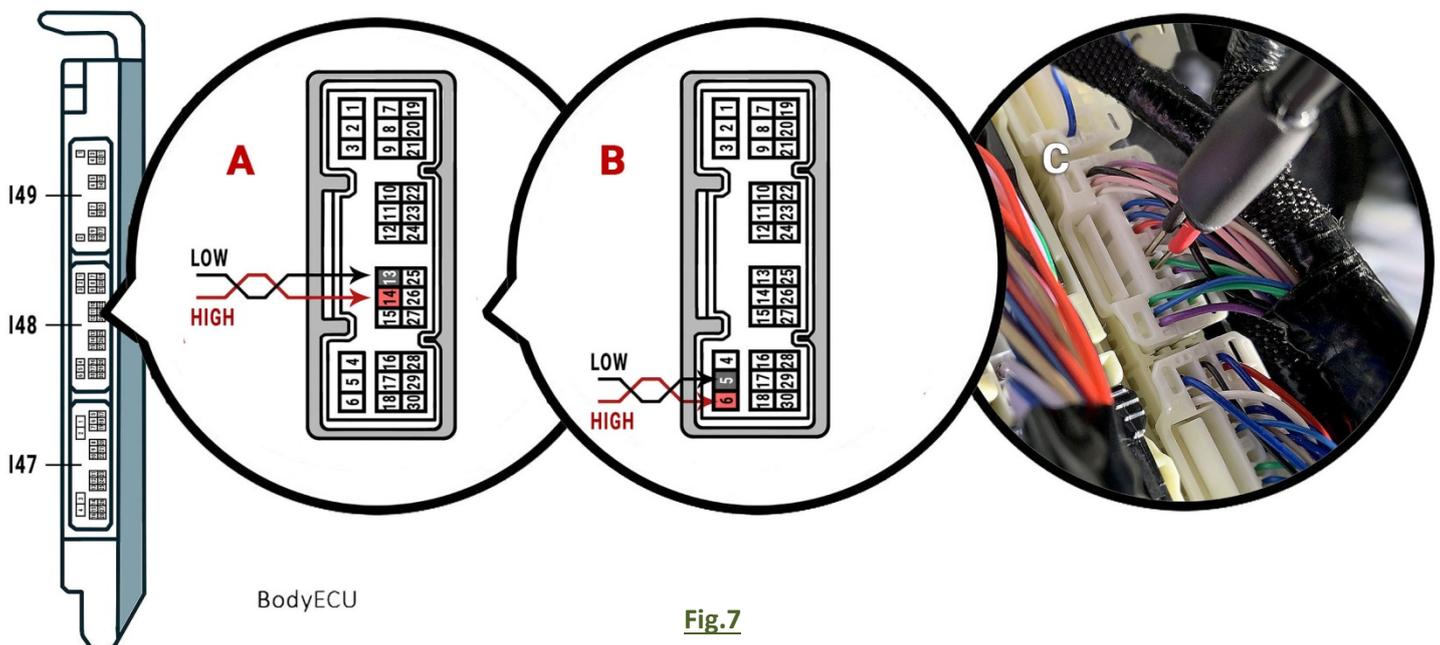


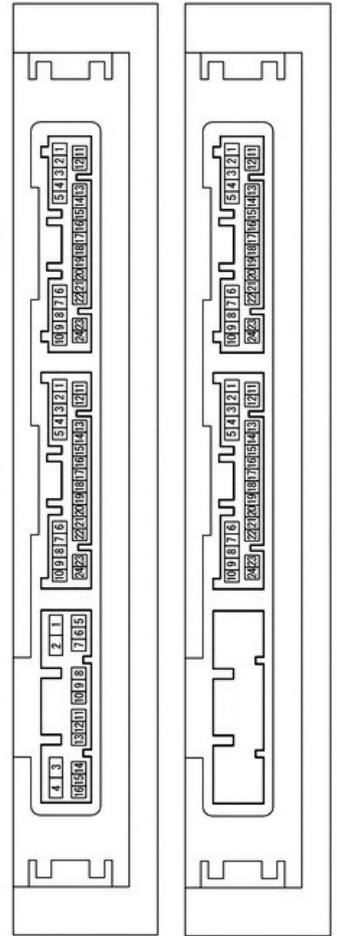
Fig.7

Connection for IS, LX, LS, NX, Alphard, Highlander, LC150, LC200, Prado

(Key A8)



Fig.8A

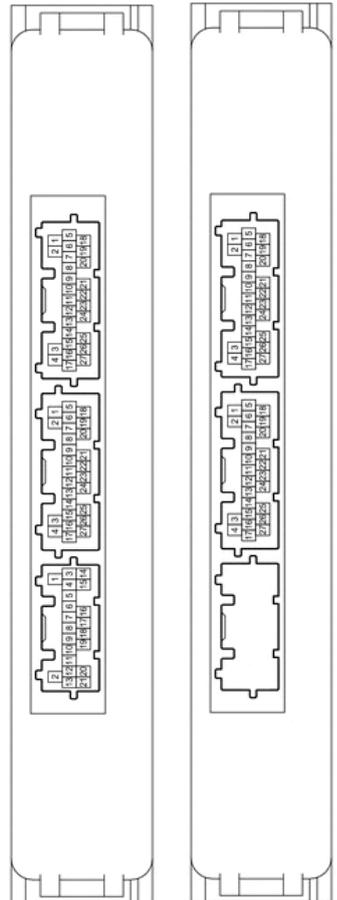


Connection for CH-R, ES, IS, LS, RX, UX and also RAV4 and, Camry (since 2018)

(Key A9, AA)



Fig.8B

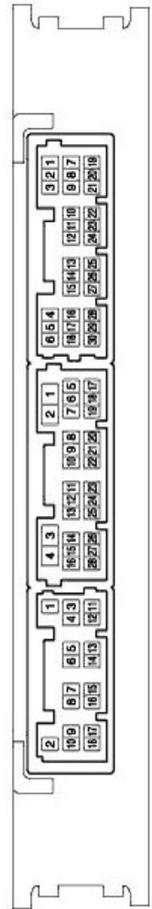


Connection for ES, GS, Rav4, Camry (till 2018)

(Key 88)



Fig.8C

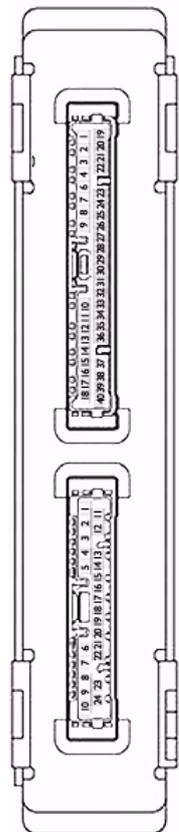


Connection for Fortuner, Hilux (from 2015 to 2018+)

(Key 39)



Fig.8D



➤ **THE TYPES OF ADAPTERS FOR SMART ECU UNITS**

Adapters for SmartECU differ in the type of key (AA, A8, A9, 39, 88)

- 🚗 **AA** - (IS, UX, ES, RAV4 (since 2018));
- 🚗 **A8** - (IS, LX, LS, NX, Alphard, Highlander, LC200, Prado);
- 🚗 **A9** - (RX, LS500, CH-R, Camry and RAV4 (since 2018));
- 🚗 **39** - (Fortuner, Hilux (since 2015 till 2019));
- 🚗 **88** - (ES, GS, Rav4, Camry (till 2018));

➤ **SKU NUMBERS:**

* SKU numbers of SmartECU new generation (2017-2018)				
Model	Petrol (Gasoline)	Diesel	Hybrid	Key
Lexus ES	89990-33412 (2018) 89990-33411 (2017)	-	-	88
Lexus GS	89990-30441	-	-	88
Lexus IS	89990-53381	-	-	A8
Lexus LS 500	899H0-50010	-	899H0-50020	A9
Lexus LX 570	89990-60291	(till 07/2017) 89990-60470 (since 08/2017) 89990-60471	-	A8
Lexus NX	89990-78080	-	89990-78100	A8
Lexus RX	(since 2015-18) 89990-48430 (since 2017-18) 89990-48431	-	(since 2015-18) 89990-48450 (since 2017-18) 89990-48451	A9
Lexus UX	-	-	89990-76190	-
Toyota Alphard	89990-58110, 89990-58210 89990-58240	-	-	A8
Toyota Camry	89990-33400, 89990-33690	-	89990-33480	A9
Toyota CH-R	89990-F4010	-	89990-F4050	A9
Toyota Hilux	89990-0K081, 89990-0e080	-	-	39
Toyota Highlander	89990-0E081	-	89990-0E150	A8
Toyota LC 200	89990-60471	89990-60280	-	A8
Toyota Prado	89990-60196, 89990-60430	89990-60205, 89990-60440	-	A8
Toyota RAV4	89990-42112	89990-42112	89990-42091	88

TO PURCHASE THE EQUIPMENT, AS WELL AS CONSULTING, MAINTENANCE,

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