

PROPOSED ECU ANALYSIS PROTOCOL

ZF proposes the following protocol for the analysis of the ECU from the 2018 Toyota Corolla VIN [REDACTED] ("Subject ECU").

The subject ECU is currently in the possession of NHTSA Vehicle Research & Test Center ("VRTC"). It will remain in the sealed packaging until the date of the analysis, and VRTC will present the Subject ECU at the inspection.

- Before any ECU is powered, an exemplar will be connected to the ZF loadbox to demonstrate the setup is correct and fault free. The following analysis of the Subject ECU will be completed at ZF's facility located at 34605 W. Twelve Mile Road, Farmington Hills, Michigan 48331-3263, in the following order:
 1. External photographs will be taken.
 2. ZF will open the Subject ECU and photograph the PCB (normal and high magnification).
 3. ZF will measure Vcc, RESET, Vsat, Vdiag resistance between test point and ground.
 4. If the resistance measurements on the Subject ECU are not consistent with measurements of any of the same test points on an exemplar ECU:
 - i. If necessary, ZF will solder an EEPROM to the subject ECU.
 - ii. On subject ECU, as needed, ZF will lift pins on integrated circuits to isolate source of low resistance.
 - iii. ZF will remeasure resistance at test points to confirm low resistance is no longer present.
 - iv. No parts will be removed from the subject ECU.

*DS84 removed - placed in ESD container.
will be kept with subject ECU*

- The following download of the recipient ECU with the subject eeprom will be completed by ZF's facility at 34605 W. Twelve Mile Road, Farmington Hills, Michigan 48331-3263, in the following order:
 1. ZF will connect recipient ECU with subject eeprom to ZF loadbox.
 2. ZF will download eeprom contents.
 3. Using the ZF PTM software, ZF will download fault history screens, EDR screens, system flags screens, LLSE data screen, ARC monitor screen.
 4. Toyota will connect the Toyota Techstream tool to the ZF loadbox and download VCH data.
- The information ZF provides in the course of the investigation and analysis, and the tools and software used to provide that information, are confidential and proprietary to ZF and subject to protections from disclosure.
- All parties will confer regarding any changes to the protocol or other analysis that may be reasonable and appropriate beyond what is proposed above.
- Upon completion of this protocol, ZF will place the subject ECU in an electrostatic bag and return it to NHTSA VRTC.
- ZF will submit the data collected in this protocol with a request for confidential treatment pursuant to 49 CFR part 512.

ZF:

Manny Goodman

Print Name

9/20/18

Date

Toyota:

MATT BEGLET

Print Name

9/20/2018

Date

NHTSA:

B. M. Collins

Print Name

9/20/18

Date