

ReAX ReFlash Procedure via ZF Testman

Software Flash Procedure
for ZF ReAX Column



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The English version is the original document.

I Symbols used in this document

 DANGER
 The signal word DANGER indicates a dangerous situation that, if not prevented, will lead to a severe injury or death.
 ⇒ Information as to how the danger can be prevented.

 WARNING
 The signal word WARNING indicates a dangerous situation that, if not prevented, can lead to a severe injury or death.
 ⇒ Information as to how the danger can be prevented.

 CAUTION
 The signal word CAUTION indicates a dangerous situation that, if not prevented, can lead to a slight or moderate injury.
 ⇒ Information as to how the danger can be prevented.

NOTICE
 The signal word NOTICE indicates a situation that, if not prevented, can lead to property damage.
 ⇒ Information as to how the property damage can be prevented.

 This symbol indicates information concerning special workflows, methods, application of aids, etc.

 Reference to information on the internet

Descriptive text

- Action step
 - Action step 1 (in ascending order)
 - Action step 2 (in ascending order)
 - ⇒ Consequence of an action
- Listing

II Information on the document

Document overview

The specifications listed in these documents must be observed, because they are a prerequisite for fault free operation of the product and for the warranty granted by ZF Friedrichshafen AG. Please get in touch with your contact if you need binding documents.

Purpose of this document

This document is intended to be used by workshops.

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The ZF/TRW Technical Support Center web page provides you with convenient access to the complete technical documentation. All documents are available in PDF format. Please contact your ZF partner for printed versions. Please note that the publications are not always available in all language versions.

*Language code XX: 01 = English, 02 = German, 03 = French, 04 = Spanish, 05 = Italian, 06 = Dutch, 07 = Swedish, 08 = Russian, 09 = Polish, 10 = Croatian, 11 = Romanian, 12 = Hungarian, 13 = Portuguese (Portugal), 14 = Turkish, 15 = Czech, 16 = Chinese, 17 = Korean, 18 = Japanese, 19 = Hebrew, 20 = Greek, 21 = Arabic, 24 = Danish, 25 = Lithuanian, 26 = Norwegian, 27 = Slovenian, 28 = Finnish, 29 = Estonian, 30 = Latvian, 31 = Bulgarian, 32 = Slovakian, 34 = Portuguese (Brazil), 35 = Macedonian, 36 = Albanian, 97 = German/English 98 = = multilingual, 99 = non-verbal

III Safety information**Observe all required provisions and instructions:**

- Read this publication carefully.
Adhere to all instructions, information and safety information to prevent injury to persons and damage to property.
ZF will only guarantee the safety, reliability and performance of their products and systems if all the information in this publication is adhered to.
- Always abide by the truck manufacturer's specifications and instructions.
- Observe all accident regulations of the respective company as well as regional and national regulations.

Make provisions for a safe work environment:

- Only trained and qualified technicians are to perform work on the truck.
- Use personal protective equipment if required (protective goggles, respiratory protection, ear protectors, etc.)

IV List of abbreviations

Abbrev.	Meaning
CAN	Controller Area Network; asynchronous serial bus system for networking control units in vehicles

V Scope of this document

This section provides a brief overview of the structure of this document:

Chapter 1 - Purpose

Description of overview of the software flash procedure for ZF ReAX Column.

Chapter 2 - Tools

In this chapter you can find a list of tools required to complete the replacement procedure.

Chapter 3 - First Steps

Description of the steps required to complete this procedure.

Chapter 4 - Procedure

This chapter provides the necessary steps to install and use the Testman tool.

Chapter 5 - Changing the Steering Wheel

Information to install a 16" steering wheel to replace 18" steering wheel as needed.

Chapter 6 - Set Straight-Ahead

Information regarding the calibration of the steering wheel.

Chapter 7 - ReAX Column software has now been updated

Description of removing Testman tool.

Chapter 8 - OEM and workshop hints

This chapter provides additional information for training and learning opportunities.

Chapter 9 - ZF contact

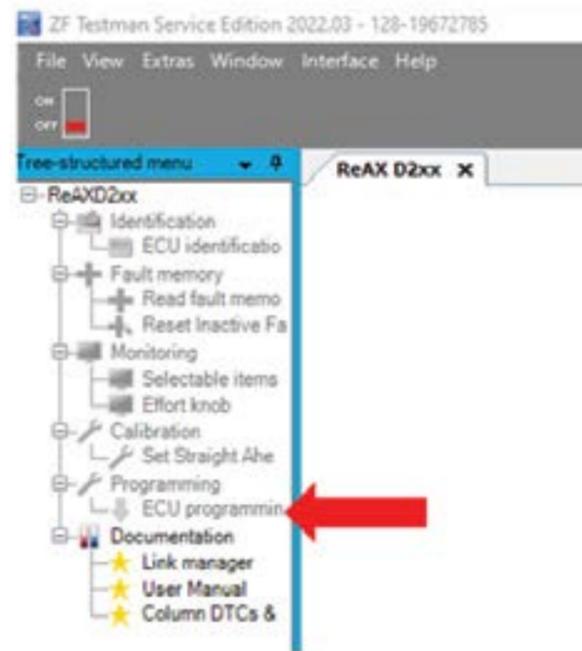
Information of regional offices distributed per country.

1 Purpose

The purpose of this procedure is to provide a general overview of the software flash procedure for ZF ReAX Column. It is intended to serve as a guide to upgrade current 14G level software to the most recent 14H level software.

1.1 Key Points

- This procedure will only work with specifically licensed ZF Testman diagnostics tool
- Make sure ZF Testman has been updated to most recent software version
 - Verify that “ECU Programming” is shown under “ReAXD2xx” in the Tree-structured menu



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- Only ZF-approved personnel are authorized to flash ReAX software
- Verify correct software has been installed when finished. This will be the final step in the flashing process

i The steering wheels on some buses have been changed from a 16-in to 18-in or 20-in steering wheel after powering ReAX column down. ReAX is designed to work with 16-in steering wheels only. Be sure to install only 16-in diameter steering wheels onto operating ReAX steering columns. If a 16-in steering wheel is not available, then ReAX must remain powered down until the wheel can be replaced.

2 Tools

This chapter provides an overview of the tools necessary to complete the replacement of the ReAX module.

Tools
Laptop with ZF Testman license installed and updated
DPA06 Interface (ZF PN 6008.208.201)
J1939 Diagnostic Adapter (ZF PN 6008.207.098)
DPA06 Adapter Harness (ZF PN 6008.207.149)
One of the Following:
USB Cable (ZF PN 6008.207.026)
Ethernet Cable (ZF PN 6008.207.151)
Bolt-style steering wheel puller kit
Torque wrench (capable of 50 ft-lbs)
1-1/4" socket for steering wheel nut
Breaker bar or large ratcheting wrench to remove steering wheel nut

3 First Steps

Before beginning ReAX Module replacement, ensure all required connections are complete and correctly installed.

3.1 Verifying with ZF Testman

The ZF Testman Diagnostic tool can be used to verify column function as a first check. Connect the ZF Testman tool to the J1939 diagnostic port and connect to the column. (Follow step 4 below for Testman connection procedure.) If connection to the column is established, then column power and column CAN connection is correct. If connection via Testman is not established, ensure that column Power and CAN connection are present by following the steps below.

3.2 Column Power

Ensure the column power harness is correctly installed and providing 12V of power while ignition is turned on. (An audible click can be heard from the ReAX Module once column receives 12V of power.)

Each column power harness features a 60A fuse that is located behind the side panel to the driver's left. Verify that the fuse is correctly installed and functioning properly.

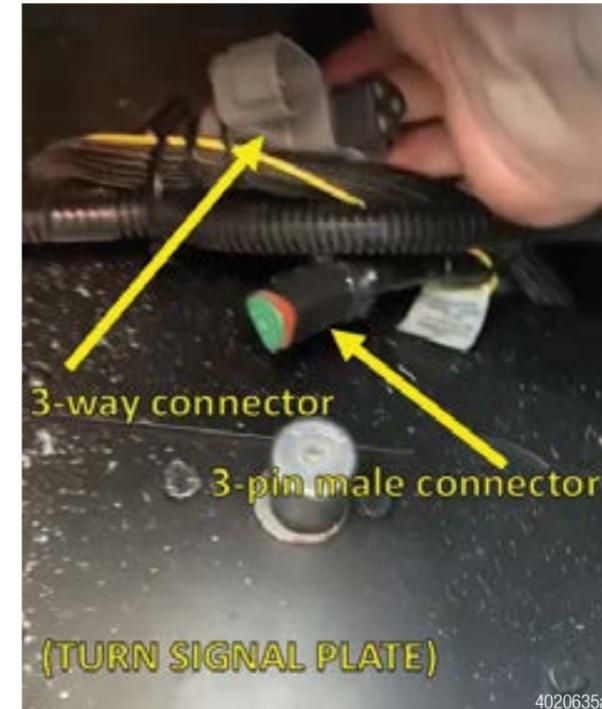


If column power harness does not provide 12V after verifying installation of 60A fuse, contact tech support for assistance.

3.3 CAN Connection

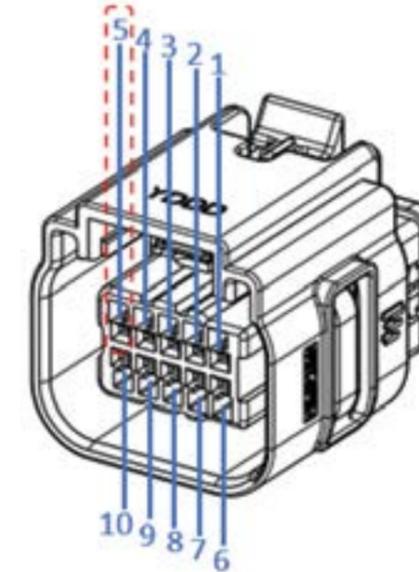
ZF ReAX Column electric torque overlay requires specific CAN signals from the vehicle CAN bus to function correctly. Some buses have had the CAN harness disconnected at the column and others have disconnected the CAN harness at a 3-way Deutsch connector located under the turn signal plate.

The turn signal plate is located to the left of the steering column on the floor and features button-style switches for operating the turn signals. The 3-way connector can often be found under the forward edge of the plate. Verify that the male 3-pin plug is connected to the 3-way connector.



The CAN harness also carries an ignition signal through pin 5 that is critical for ReAX to function. Verify that PIN 5 in on the CAN connector provides 12V when ignition is turned on.

**CAN HARNESS CONNECTOR
PIN 5 – IGNITION 12V**



After verifying the CAN harnesses is properly connected to the vehicle, be sure that the CAN harness is correctly connected to ReAX column.

3.4 Column Centering Process

An important part of this process is ensuring both road wheels and steering wheels are centered correctly without tire windup. It is a good practice to ensure vehicle wheels are centered by driving the vehicle forward with wheels straight before parking. Visual inspection of the road wheel position is typically insufficient.

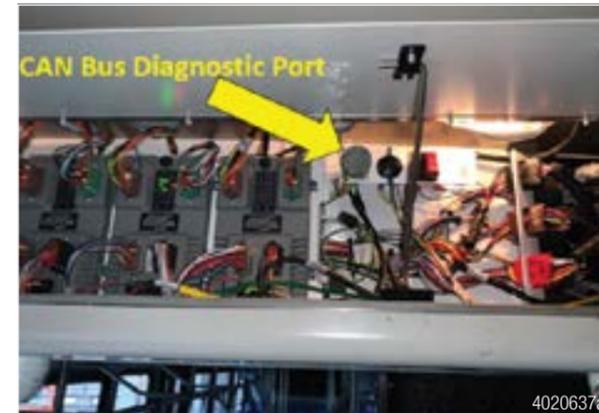
4 Procedure

i Be sure the vehicle is parked with the road wheels pointing straight ahead. This will assist if the steering wheel needs to be removed or changed.

1. Connect Testman DPA06 to the provided 9-pin J1939 connector.
2. Connect Testman DPA to the laptop using the provide Ethernet (blue) cable or USB cable.
3. Plug the DPA06 Adapter Harness (9-pin) into the vehicle's green J1939 diagnostic port.

i Internal combustion engine vehicles have two locations for the diagnostic port: under the left side of the dash (forward of the driver's left leg) or above in the overhead compartment.

i eBus models have only one location for diagnostic port, in the overhead compartment.



4. Turn on the vehicle's ignition.
5. Launch ZF Testman application on laptop.

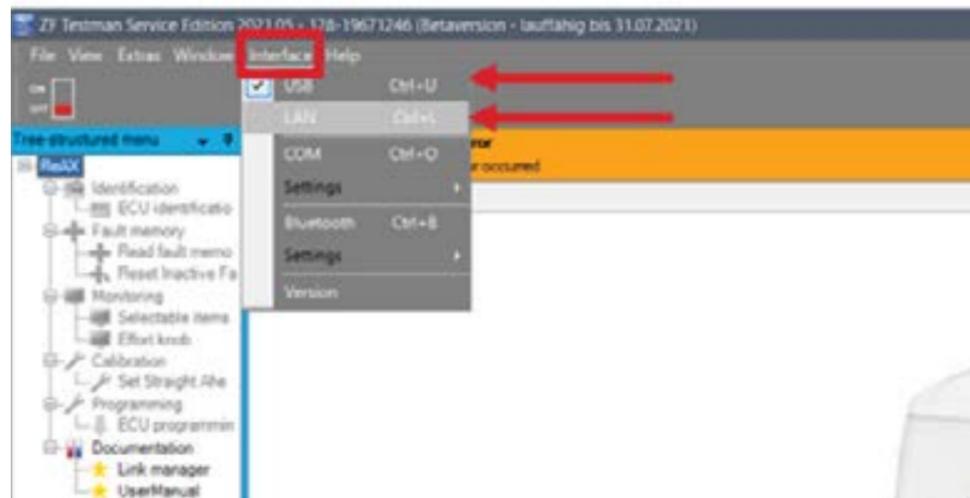
i If the engine is running, the engine speed must be less than 800 RPM to proceed with software flash. The vehicle's high idle setting may need to be turned off to reduce engine speed. The vehicle should be stationary during reflash procedure.

6. Select ReAX from the drop-down menu on the left side of the window.



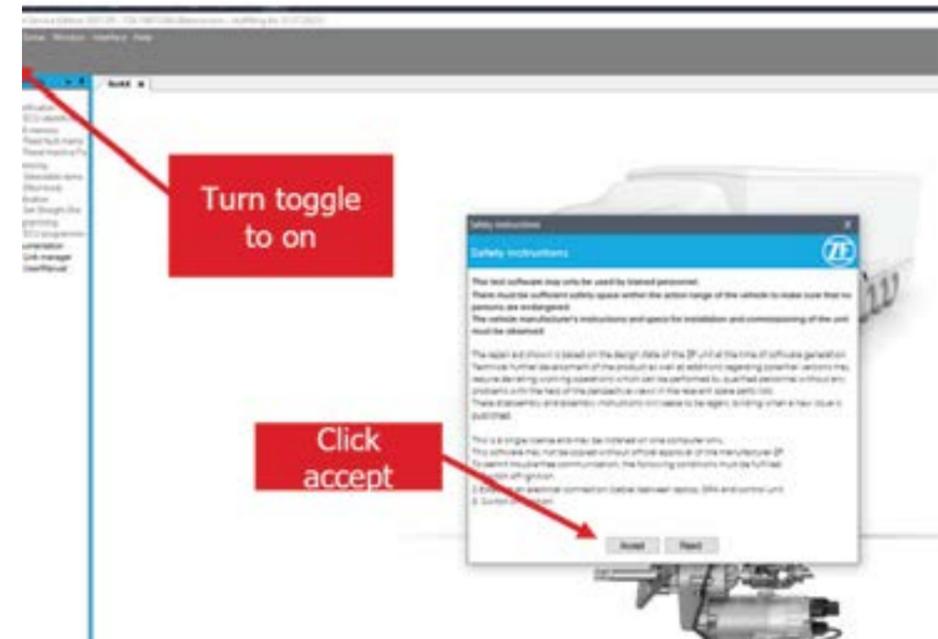
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7. Verify under the interface tab that the correct cable is selected. (Choose the cable interface that you are using to connect the DPA06 to the laptop.)



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8. Click the Toggle button to the ON position. When prompted, click Accept to establish connection.



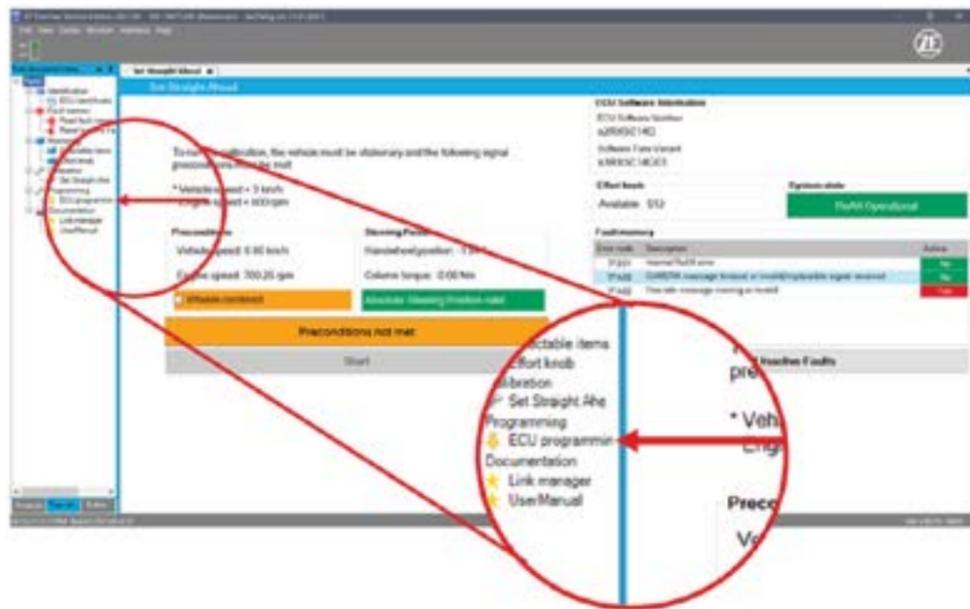
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9. Once communication is established, the CAN link will turn green and the Tree menu will become functional.



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10. The following screen is shown after connection to the ReAX column is established. Click ECU Programming.



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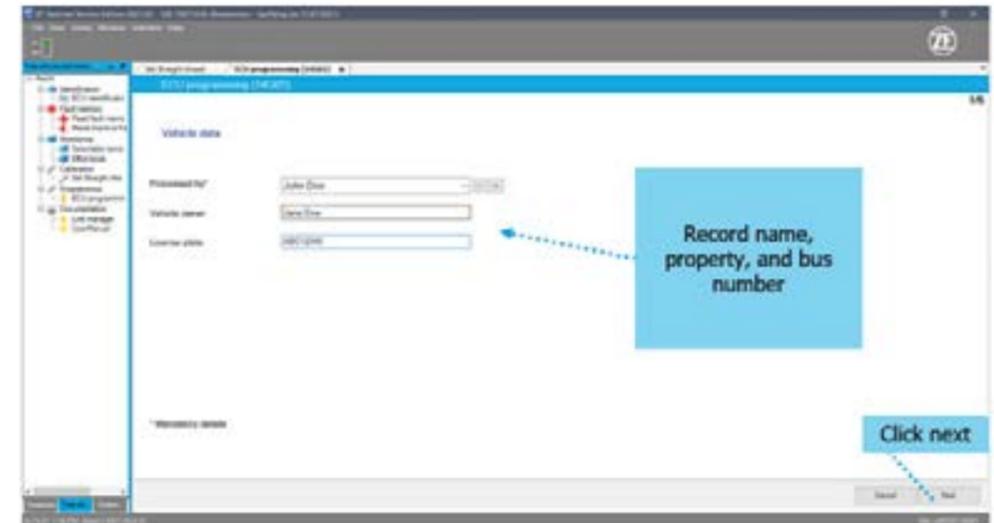
11. Select the correct software version for the vehicle's drivetrain from the Software Version drop-down menu.



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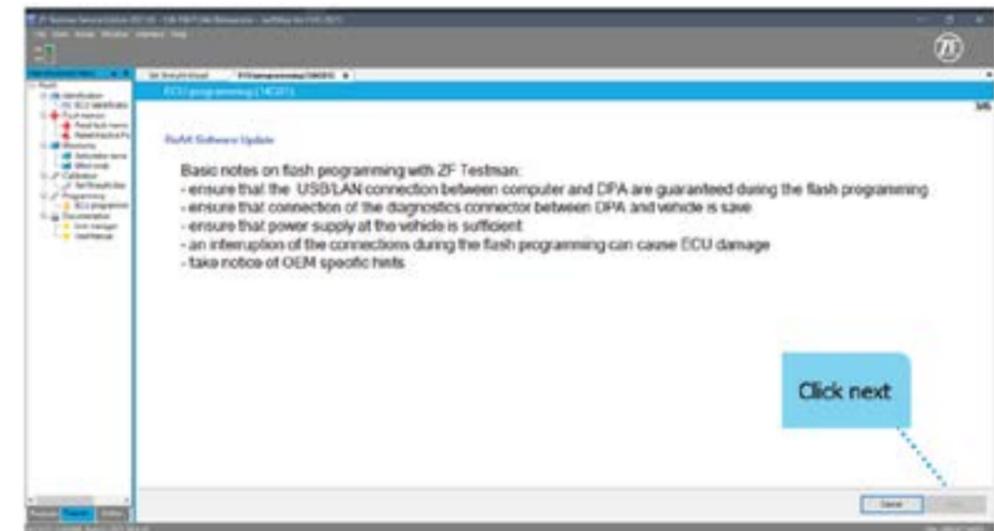
i For GILLIG hybrid buses, select "14H01 – IC Vehicles".

12. Fill in the required fields when prompted and click next.



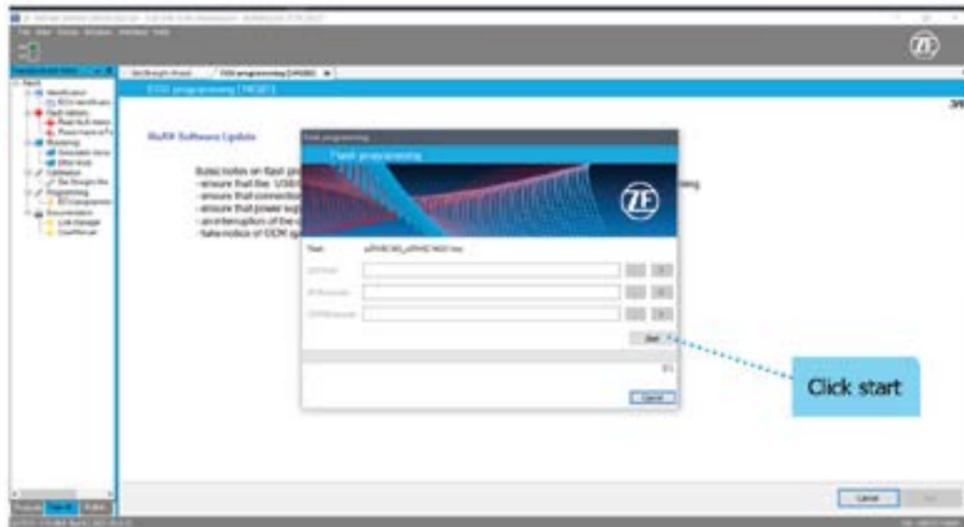
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13. Verify the following requirements are complete and click next.



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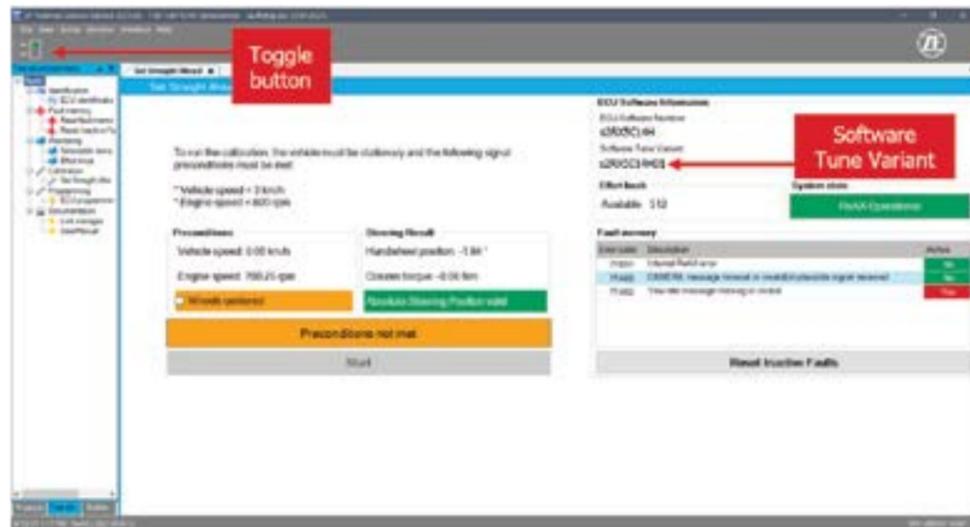
- Launch the download process by clicking Start and follow the prompts when asked for vehicle information.



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i If software download fails to complete, a reset is required. Turn the vehicle off and switch off the vehicle main power battery switch under driver’s window. Wait at least 30 seconds before switching main power on and return to step 3 above.

- Wait for ECU programming to reach 100%. The status bar will read “Finalizing flash job” and then prompt the user to specify the location of the PDF report file. Add any necessary comments in the Remarks field and then click Next.
- The reflash sequence is complete when Testman displays the PDF report.
- Toggle the on/off switch in the upper left hand of the window to off and then back to on. Verify the correct Software Tune Variant under the ECU Software Information section of the window.



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i Software Tune Variant should match with table below.

Vehicle Platform	Software Tune Variant
Internal Combustion Engines	s2RX5C14H01
Hybrid	s2RX5C14H01
Battery Electric Vehicle	s2RX5C14H02

i Only 16-in steering wheel is approved for use with proper functioning ReAX steering column.

5 Changing the Steering Wheel

If the vehicle is equipped with an 18" or larger steering wheel, a 16" steering wheel will need to be installed. The following steps apply for steering wheel replacement only.

-  Be sure that vehicle wheels are pointed straight ahead before proceeding.
-  Be sure that ZF ReAX column is centered (reading less than 4° in ZF Testman) before proceeding. To reset center position, follow the "Set Straight Ahead" steps below.

1. Remove the existing steering wheel by removing the horn cap and disconnect horn wire.
2. Remove the steering wheel nut with the 1-1/4" socket.
3. Remove the steering wheel using the steering wheel puller kit.
4. Install 16" steering wheel and ensure that it is centered. (Vehicle wheels and steering column will already be centered.)
5. Re-install steering wheel nut and torque to 50 ft-lbs.
6. Reconnect the steering wheel cap to the horn wire and install onto steering wheel.

6 Set Straight-Ahead

6.1 Overview



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6.2 Preconditions

To start the Set Straight-Ahead calibration, the following preconditions must apply:

Vehicle speed	< 3 km/h
Engine speed	< 800 rpm
Vehicle wheels	in centered position

Vehicle speed and engine speed are permanently read from the steering systems CAN as long there is an active diagnostic connection established.

The read values are shown in the Preconditions section:

Attention

The vehicles wheels need to be centered manually.

Please confirm this production step by ticking the checkbox "Wheels centered".



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6.3 Steering Result

Handwheel Position, Column Torque and Absolute Steering Position Valid are permanently read from the steering systems CAN as long there is an active diagnostic connection established.

After a successful calibration, Handwheel Position and Column Torque are set to 0.

Absolute Steering Position Valid should always be valid (=green).



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Attention

If Absolute Steering Position Valid is invalid, the vehicle needs to be checked separately. Contact ZF Technical Support.



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6.4 Start Button

Clicking the Start button starts the calibration. Status indication keeps blinking with status “Calibration running” while routine is running.

6.5 Status Indicator



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The status indicator gives feedback of the current calibration state as well as error messages.

Message	Description
Calibration not started	Calibration is not started yet.
Preconditions not met	One or more preconditions are not met to start the calibration.
Calibration running	Calibration is currently running.
Calibration finished	Calibration has been executed and finished successful.
Calibration canceled by user	Calibration has been cancelled by user.
Security Access failed	Security access as part of the calibration routine failed. See additional information for details.
Calibration failed	Calibration routine has failed. See additional information for details.
Calibration not started. CAN message PropB_F7 not received	Calibration is not possible as the required message PropB_F7 is not sent on the CAN.

i After following the recentring procedure, it may be necessary for a test drive to verify that the column has been centered correctly. Incorrect centering process may lead to the steering column applying torque to the steering wheel while driving straight ahead.

7 ReAX Column software has now been updated

- Be sure to turn ignition off
- Disconnect cables from Testman DPA06 and securely repackage in container
- Return Testman to:
ZF/TRW Commercial Steering
ATTN: Jim Arihood, H1 Lab
1450 N 9th St
Lafayette, IN 47904

i For technical support, please call ZF Technical Support.

ZF Commercial Vehicle Steering Technical Support

Phone: 1-800-879-0899

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