RLink Lite Case Study

TOPDON®

BMW Headlight Fault Detection Case

How to Use TOPDON RLink Lite and ISTA-D to Perform BMW 3 series Diagnostics

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Vehicle Fault Problems

01

Vehicle Fault Problems

Vehicle Information: BMW F30, manufactured in 2016, equipped with B48 engine and a driving mileage of 68823 km.
Customer Feedback: The vehicle's headlights reported malfunction. Both headlights cannot light up. The vehicle has been flooded before.

Preliminary determine the possible cause of the failure

1. Start the vehicle and check that both headlights cannot light up.

2. The instrument shows headlights failure.

3. The headlights failure will seriously affect driving safety. Let's see how to check this fault.

Devices Required for Diagnostics

02

Devices Required for Diagnostics

Computer with BMW OEM Software

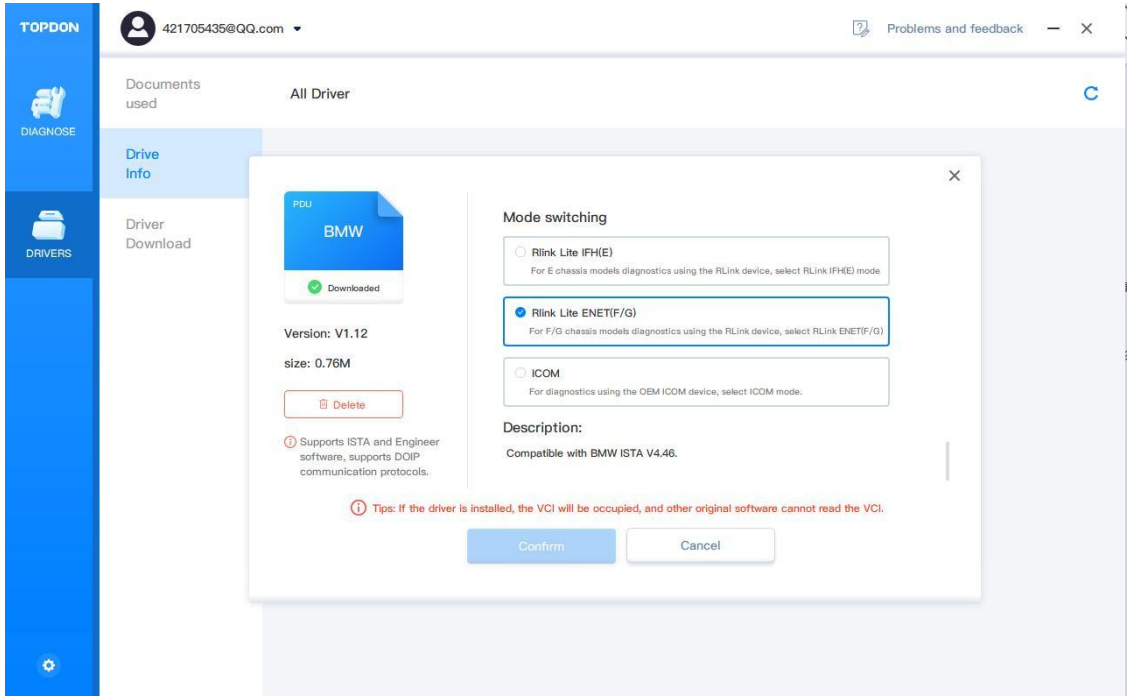
RLink Lite

Operations for Diagnostics

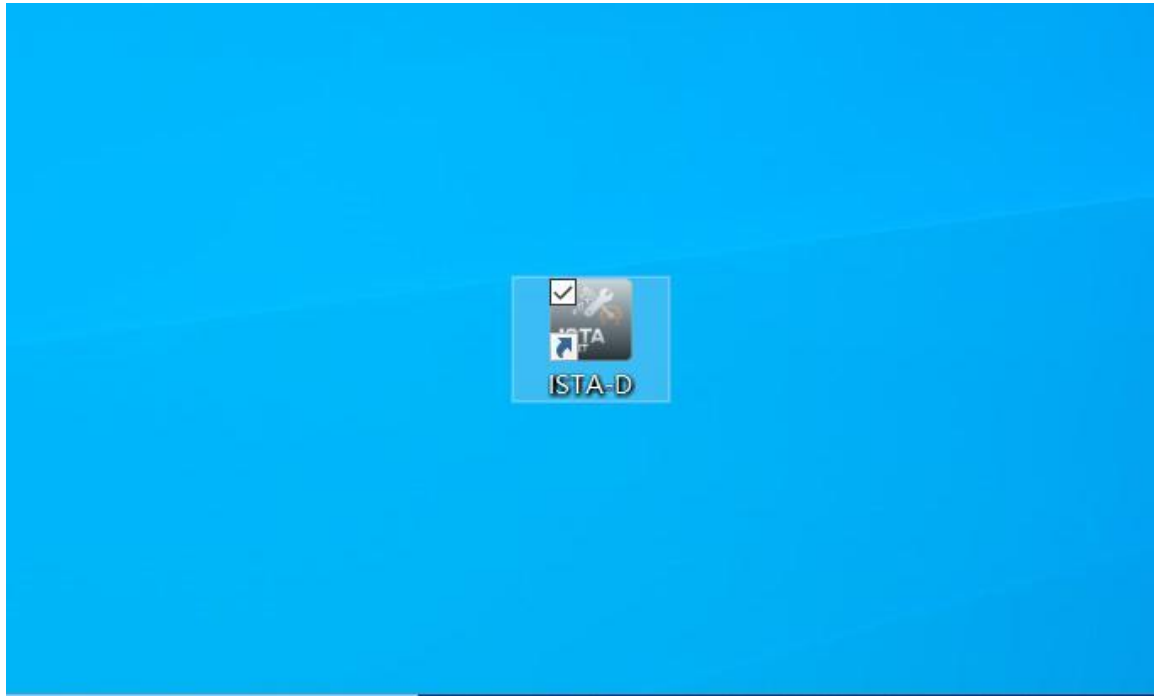
03

Operations for Diagnostics

1. Open RLink Platform to download the BMW driver. According to the vehicle model, choose the RLink Lite ENET (F/G) mode.

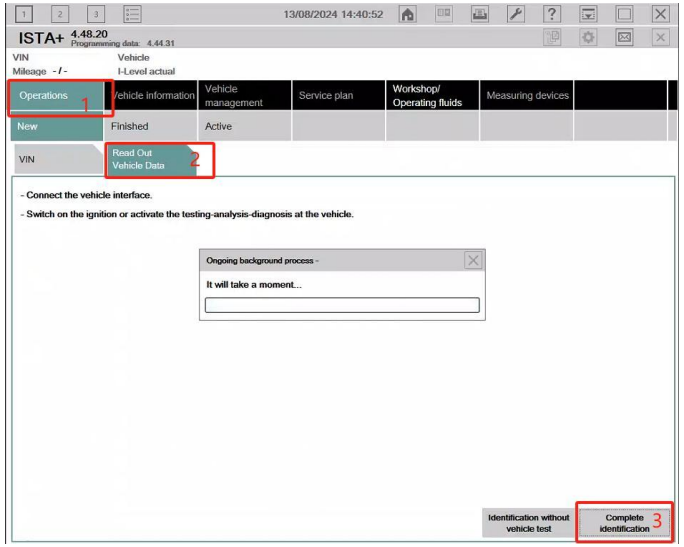


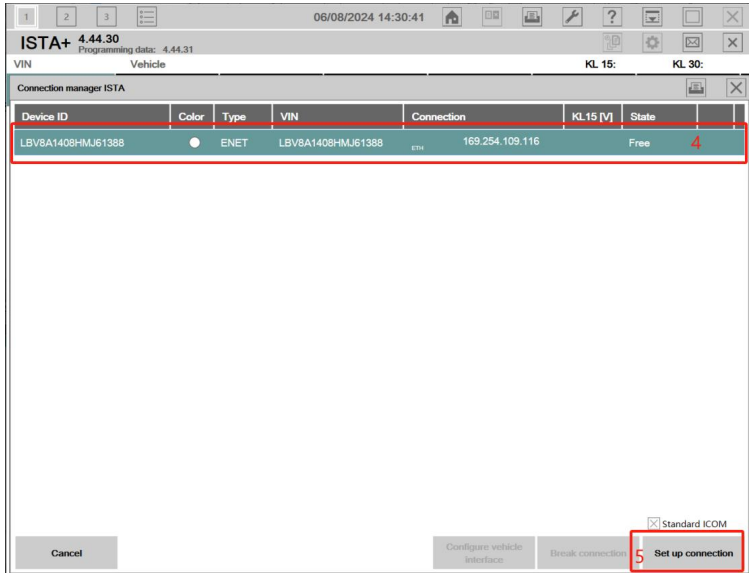
2. Double-click to open the BMW ITSA-D diagnostic software shown in the figure below.

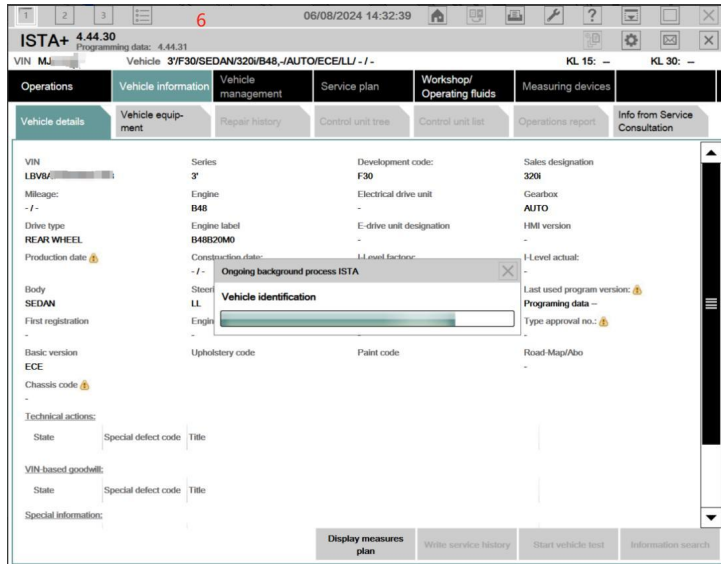


(Tips: The BMW driver is a tool to enable ISTA-D to work properly with RLink Lite for diagnostics.)

3. Open the ISTA-D. Connect the vehicle according to the order shown below. Enter the vehicle diagnostic interface.







Fault Cause Analysis

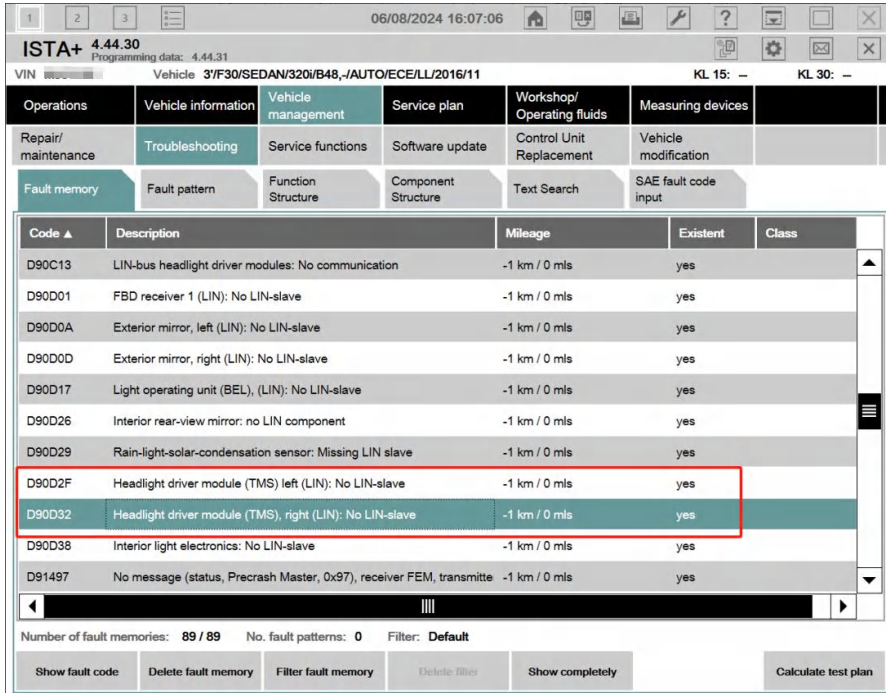
04

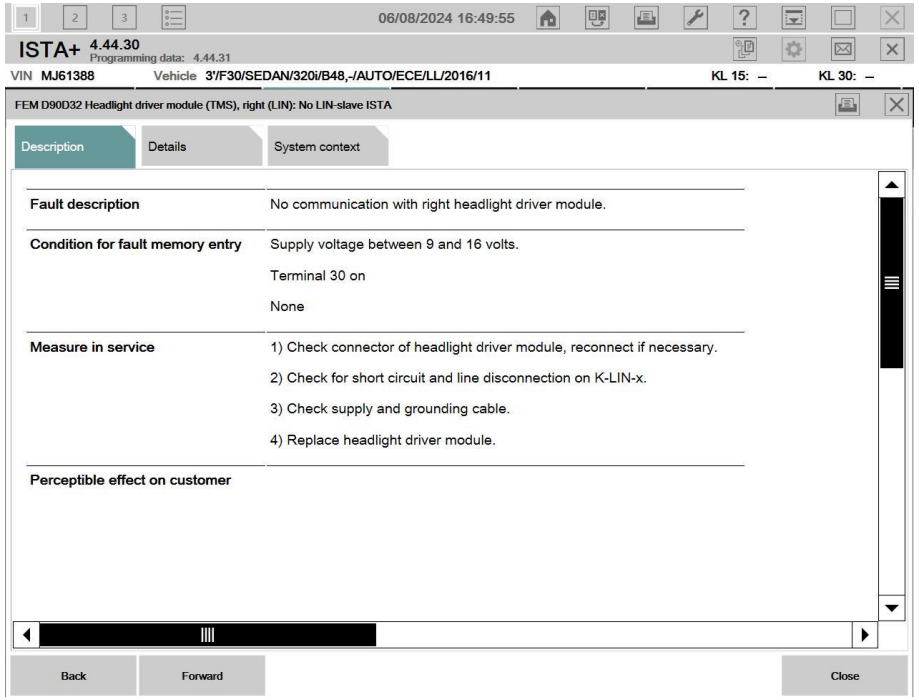
Fault Cause Analysis

After connecting the vehicle, enter the vehicle fault code interface, and the vehicle fault description will be displayed. This information allows you to further analyze the fault.

Vehicle malfunctions are currently expected to have three reasons:

1. Wiring reasons. Something is wrong with some of the wiring causing these faults.
2. Internal damage to the ECU causing chain failures.
3. Insufficient voltage causing all sensors and ECUs to report faults.





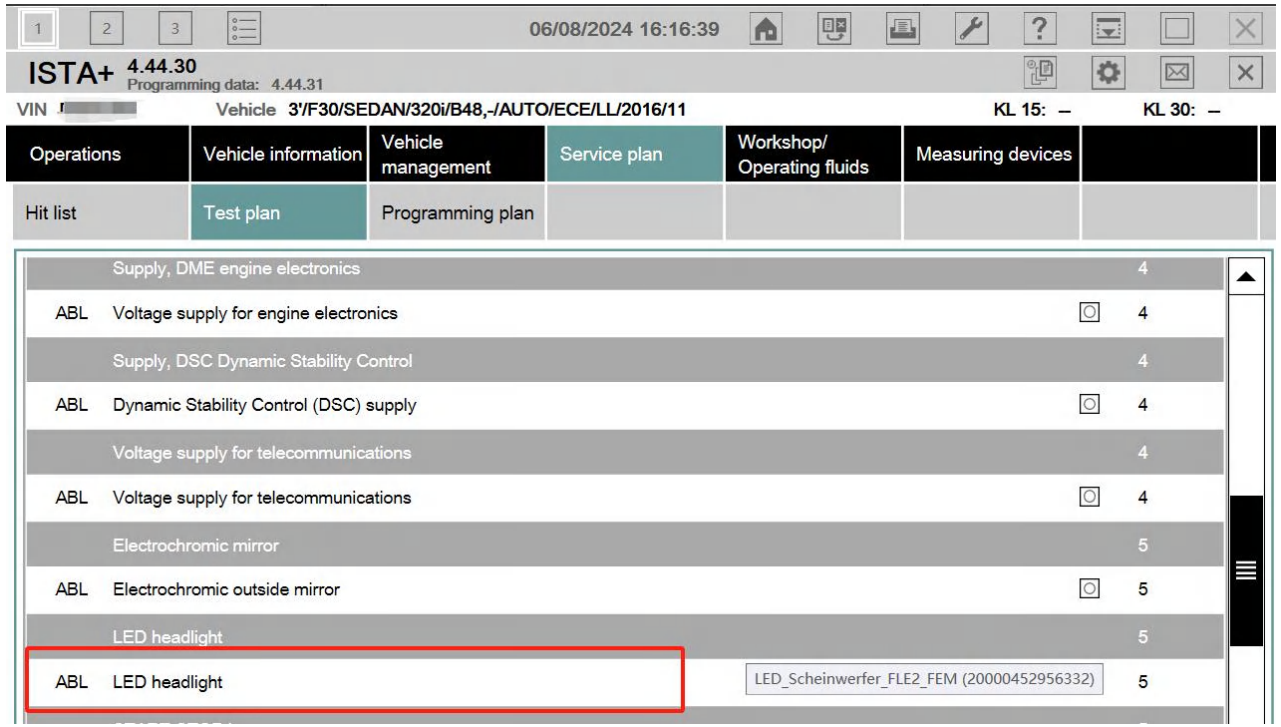
Tips: Double-click the fault code (as shown in the red box on the left) to check the detailed fault description (as shown on the right).

Troubleshooting

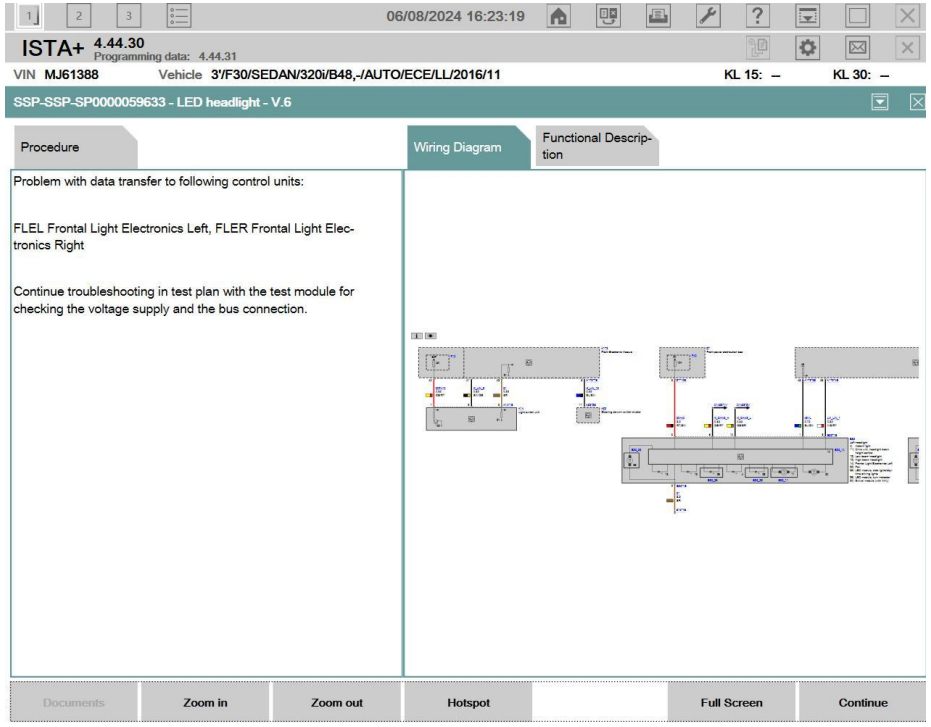
05

Troubleshooting

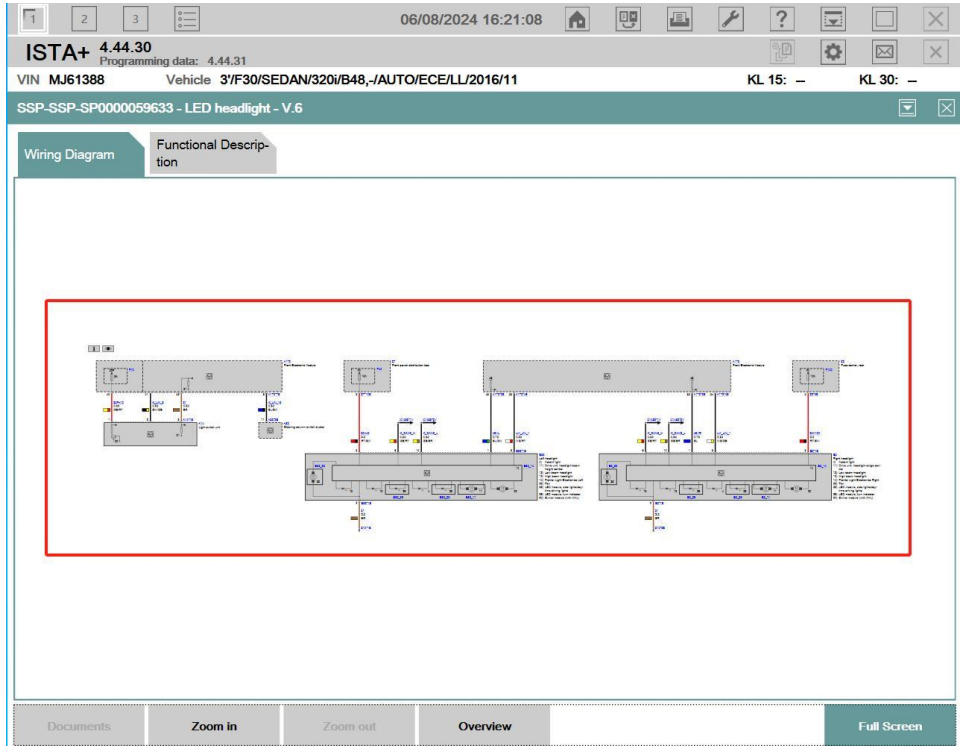
I. Select LED headlight (red box in the figure below) and double-click to enter the service plan.



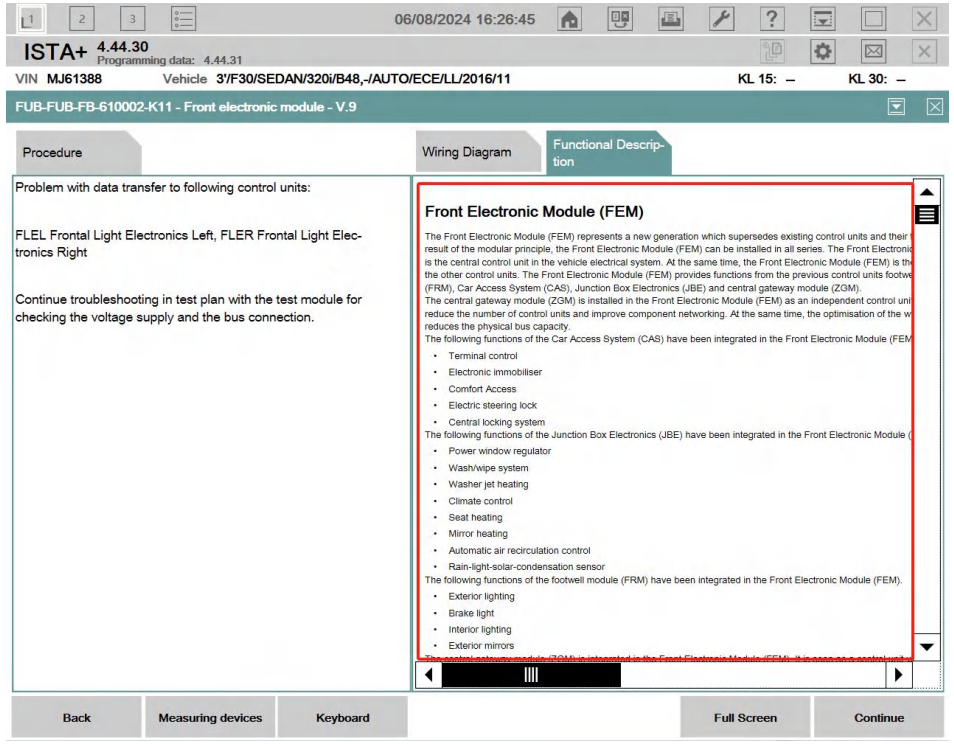
II. Follow the service plan on the figure below to perform the test.



III. Detailed description in the service plan

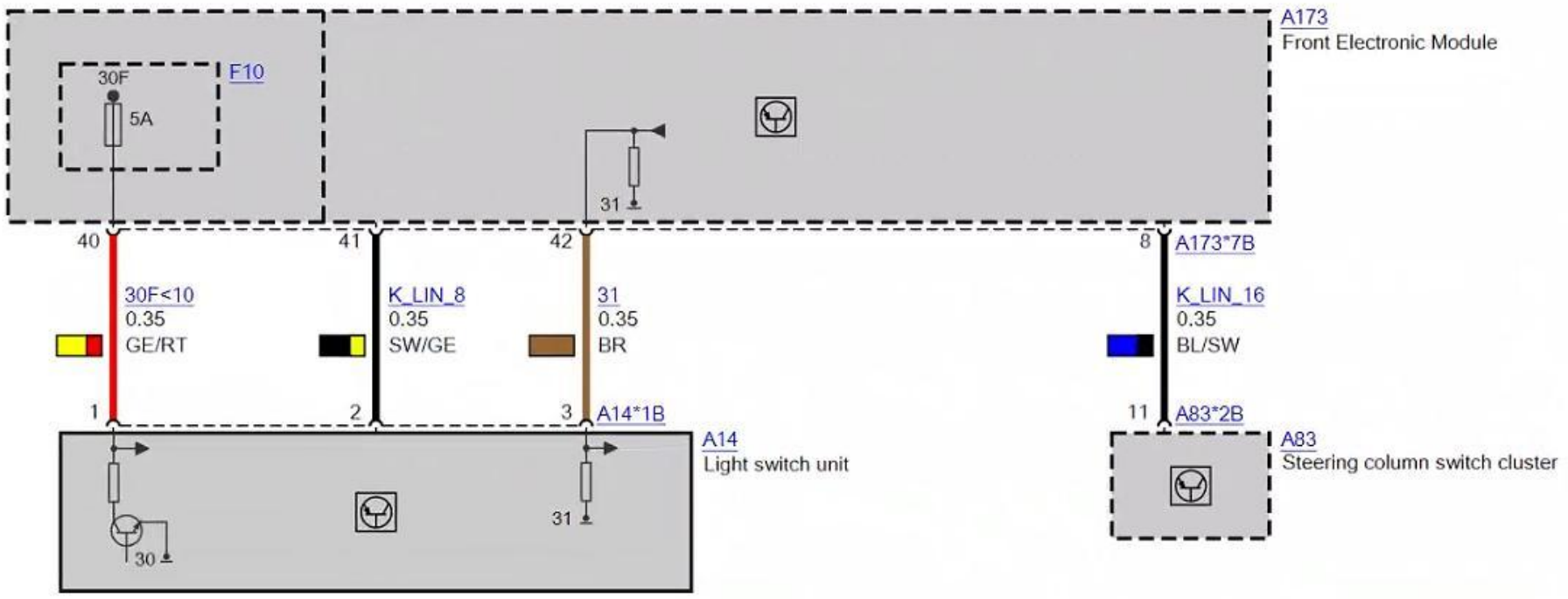


1. In the service plan, you can check the wiring diagram of the headlights. According to the wiring diagram, confirm the wiring of the headlights, the positions of the headlights and related modules.

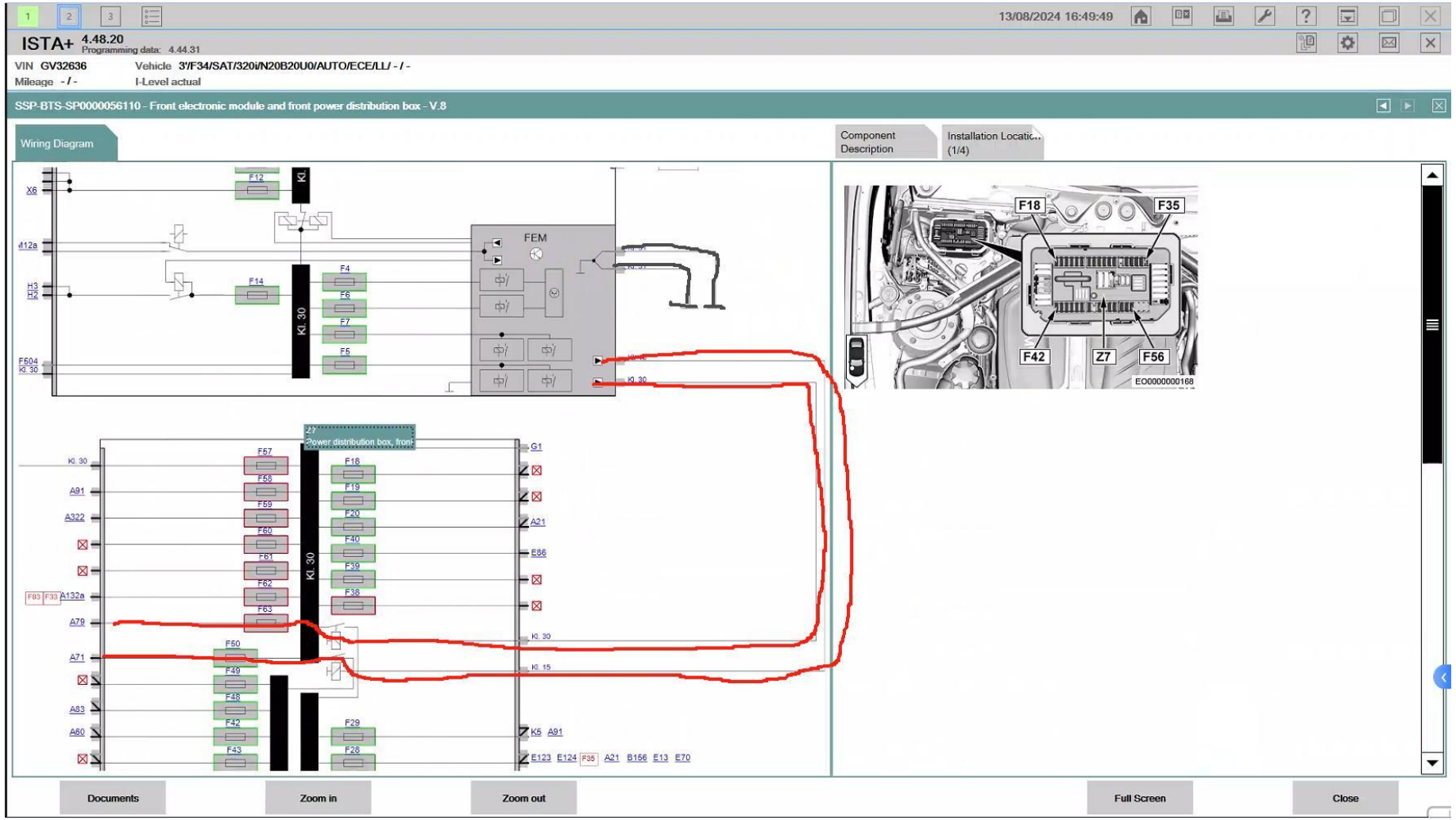


2. You can check the functional description of headlights and other related modules to analyze the working principle of headlights. According to the working principle of headlights, analyze the fault of headlights in stages, eliminate the parts that work normally step by step, and finally confirm the cause of the fault.

3. Headlight switch test: Check that the headlight switch fuse, the bond strap of power supply, and the test switch signal are normal. (As shown in the figure above, F10 indicates fuse, red wire indicates positive, gray wire indicates negative, black wire indicates signal wire.)

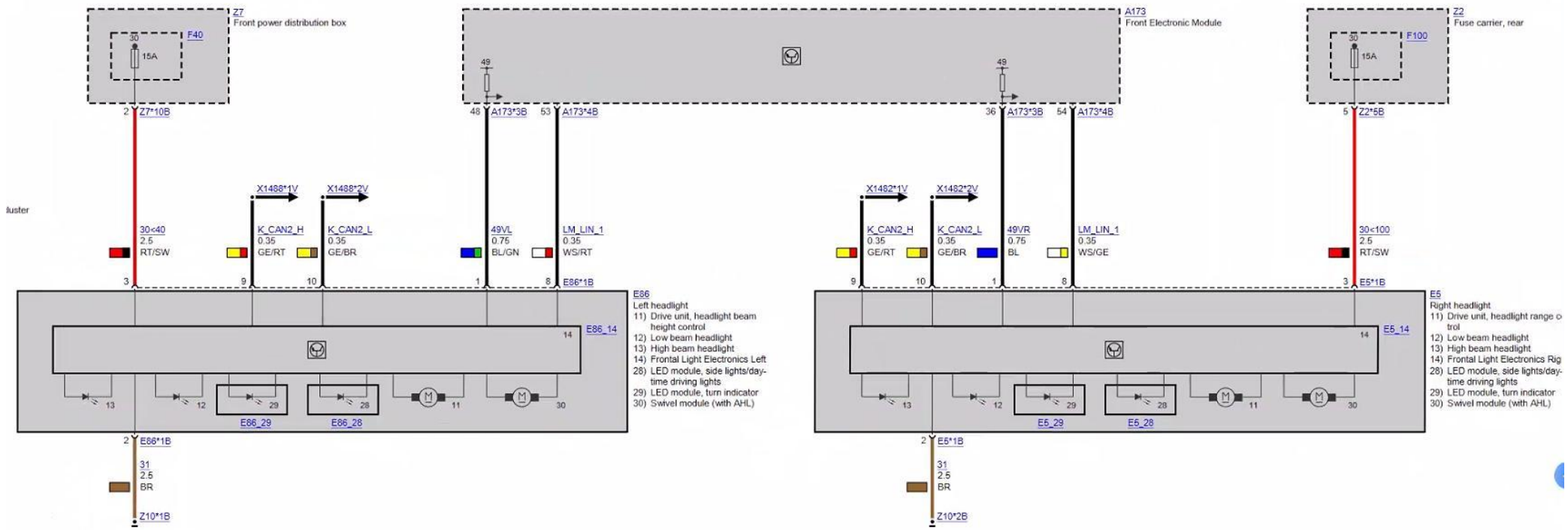


4. Check that the fuse, power supply, and the bond strap of the FEM module are normal. (Red wire indicates FEM power supply wire, black wire indicates bond strap, F50 and F63 indicates fuses, and the upper right is fuse box.)



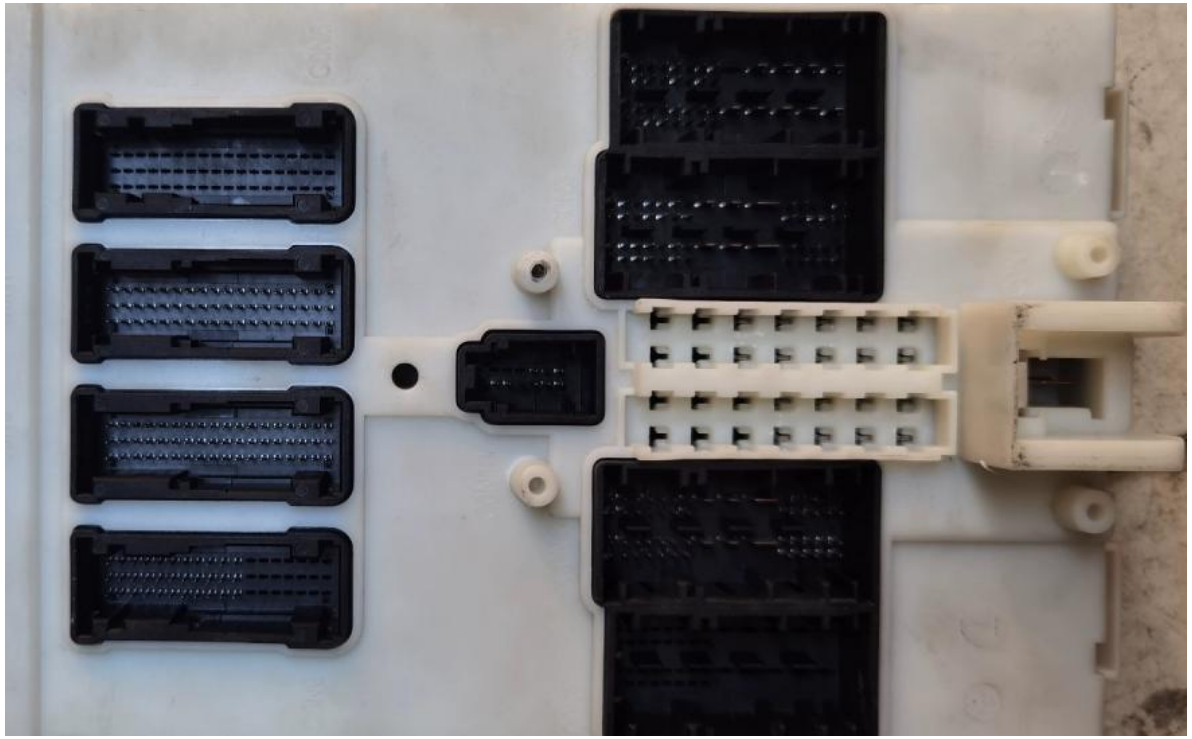
5. Check that the power supply and fuse of the headlights are normal. Turn on the headlights for testing. The signal from FEM to the headlights is abnormal and no voltage passes. (As shown in the figure above, the two red wires are the positive poles of the left and right headlights, the two gray wires are the negative poles of the left and right headlights, and the others are signal wires.)

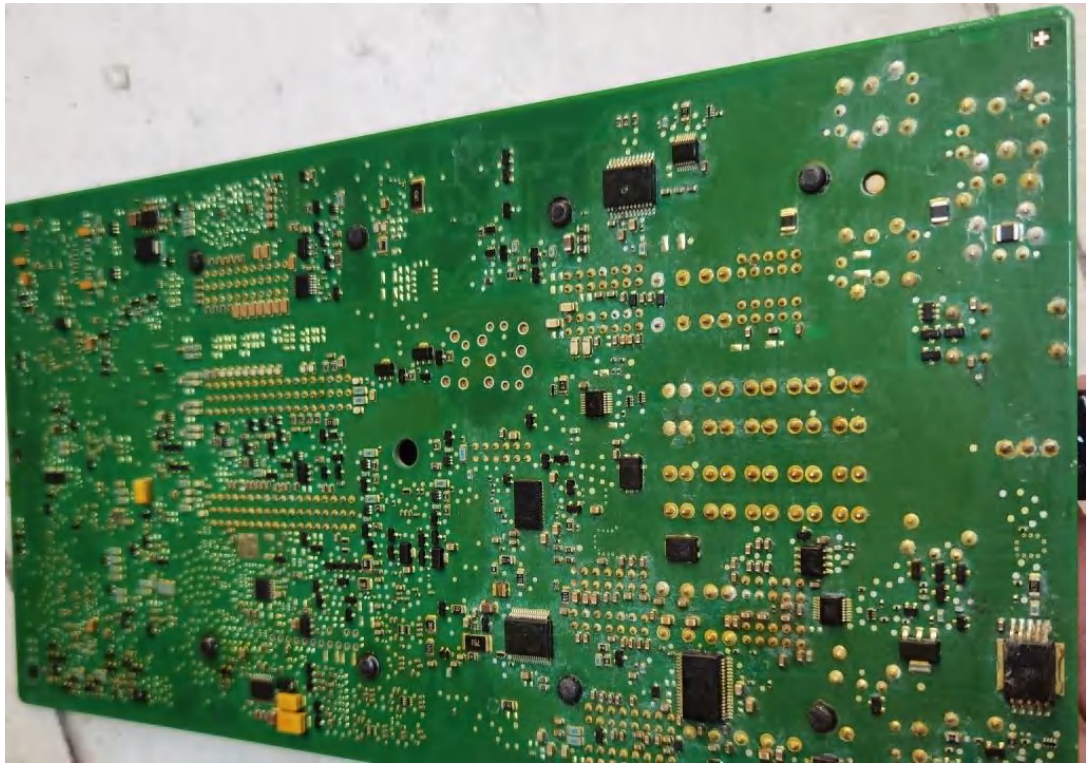
6. Check the power status of the FEM to the left headlight signal wire. Pin 1 and Pin 48, Pin 8 and Pin 53 are normal. Check the power status of the FEM and the right headlight signal wire. Pin 1 and Pin 36, Pin 8 and Pin 54 are normal. Suspect that the FEM is faulty.



7. Remove the FEM and find traces of water immersion. Disassemble the FEM and find serious corrosion inside the FEM. Confirm that the FEM is damaged.

8. Replace the FEM and the fault is solved.





Tips: Replacing the FEM requires programming. If you use engineer programming, you need to copy the old FEM data first and then write to the new FEM.

THANKS