

Carsoft USA Technical Bulletin ABM: 310803

COMMON PROBLEMS AND SOLUTIONS FOR CARSOFT BMW

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Carsoft's technical training materials are current as of the date noted on the materials, and may be revised or updated without notice. Always check for revised or updated information. To help avoid personal injury to you or others, and to avoid damage to the vehicle on which you are working, you must always refer to the latest BMW Technical Publication and follow all pertinent instructions when testing, diagnosing or making repair. Illustrations and descriptions in this training reference are based on preliminary information and may not correspond to the final US version vehicles. Refer to the OEM's official introduction manual and/or the BMW-TIS for important information when available. Carsoft's technical information is for reference only; please refer to official service information for the most up-to-date information.

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Any list of vehicle coverage is for informational purposes and reference only and a specification does not guarantee specific coverage for a specific vehicle. Operating and environmental conditions exist that are beyond our control, so no guarantee of service or performance warranty is implied or expressed. If a system or vehicle is not listed it is not covered.

Modified vehicles may not be supported due to modifications which may render vehicle out of standard specification.

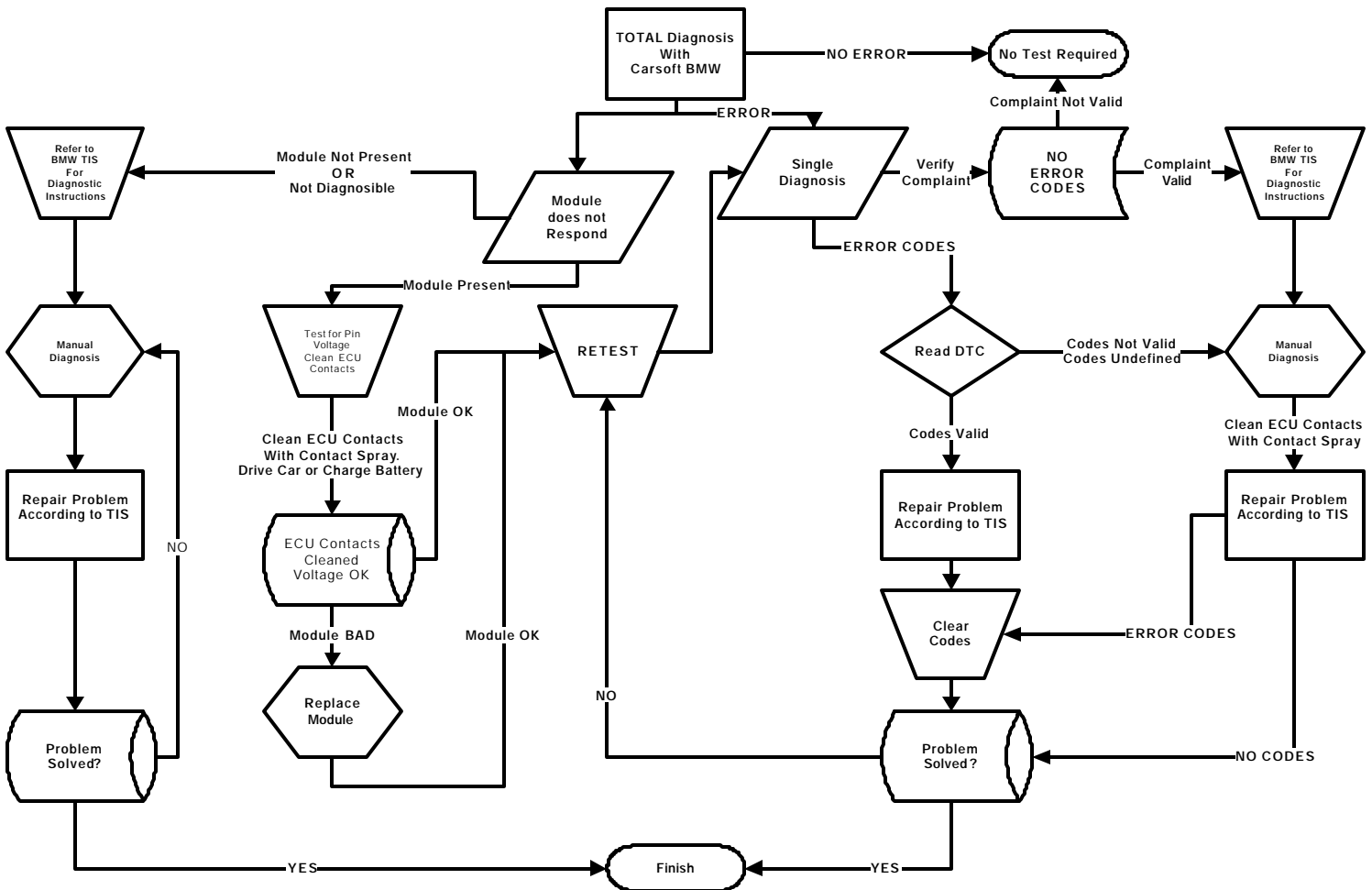
Due to current technology, errors and "bugs" cannot be avoided in software manufacturing. Replacement or repair by Carsoft is your sole remedy in this case; we do not accept returns of used or activated software for any reason. See our software license for warranty details.

⚠ WARNING: ALWAYS WEAR PROPER SAFETY EQUIPMENT AND OBEY SHOP SAFETY GUIDELINES AND PROCEDURES

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CARSOFT BMW Diagnostic Flow Chart:



This flow chart outlines the required steps of normal diagnosis. To verify codes on new cars, LIVE DATA functions may be utilized. On older cars, manual diagnostics is required.

Always retest cars after all repairs are made and print the diagnostic report. A “clean bill of health” will help minimize the cost of come-backs. If a customer returns in a short time with another problem, that triggers the same warning light, a diagnostic report can help avoid free repairs and unhappy customers.

Use Carsoft to diagnose every car that comes into the shop, no matter what service is provided. This will help you to diagnose and prevent future problems for customers and will offer that extra edge in service!

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IF MODULE COMMUNICATION CANNOT BE ESTABLISHED TRY THIS FIRST:

BMW cars are very well engineered, well designed products that have few major flaws. Due to technological capabilities at the time of construction, and as a means to keep costs under control, BMWs suffer from problems in the electrical system due to terminal design and materials. ECU connectors are on the bottom of control units, and as such, may come loose due to loss of contact by the retaining clips and gravity. Always verify that the connector has not fallen off the ECU or lost contact. Loose connections will ALWAYS cause communication problems with modules. In 1998, this design was improved, so newer cars do not seem to suffer from the same volume of problems.

From 1988-1998, BMW used Tin connectors for all ECUs. In 1998, and with the E38/E39/E46 chassis, better connectors were phased in to production. Tin is very soft and *HIGHLY* susceptible to corrosion, breakage, and loss of contact pressure. Because the Tin connector is silver-white, corrosion cannot usually be seen without magnification. Because of this, many strange codes come up, modules do not respond, intermittent problems are created, and difficulty in diagnosis is the result. This problem is most common in E32/E34/E36 (early) chassis.

⇒ **Diagnostic TIP for Pre-1998 Cars:** An overwhelming amount of technical service calls are due to this problem in ageing BMWs, and the majority of these problems HAVE BEEN SOLVED using the following procedure:

☒ NOTE: All stored faults will be erased when the battery is disconnected and ECU is removed. It is required to drive the car after this procedure to re-log any faults.

1. Turn off ignition switch and remove key
2. Disconnect vehicle battery
3. Wait at least 10 minutes
4. Remove control unit, following every precaution and appropriate instructions in the TIS.
5. Soak control unit contacts and vehicle contacts with contact spray. Carsoft recommends 3M™ Contact Cleaner or Würth Kontakt OS® or Kontakt OL®, as these have both been approved by BMW.

⚠ WARNING: RISK OF FIRE, EXPLOSION, AND BURNS. WEAR SAFETY GLASSES AND GLOVES. DO NOT USE Brake Cleaner, Carburetor Cleaner, Gasoline, Kerosene, or any other non-electronics safe solvent!

6. Let parts soak for at least 10 minutes.
7. Reinstall ECU, drive for time/distance required to re-log errors (usually approx. 20 minutes), and retest.

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IF MODULE COMMUNICATION STILL CANNOT BE ESTABLISHED:

VERIFY THAT:

1. The Carsoft BMW Cable is correctly connected to both the 20-Pin Diagnostic Socket and the serial port (COM1) on the computer. **DO NOT USE A USB TO SERIAL CONNECTOR. USB TO SERIAL CONNECTORS WILL NOT SUPPORT COMMUNICATIONS WITH CARSOFT.** Make sure that your laptop batteries are charged.
2. If ECU has been modified by an aftermarket chip, contact chip manufacturer before testing with Carsoft. Follow manufacturer's instructions for testing with MODIC III/GT1. Chips or programming may have changed codes or blocked diagnostic ability in Carsoft. The chip manufacturer may have proprietary test tools and procedures. Contact manufacturer for details, Carsoft Customer Service cannot help with problems related to aftermarket chips.
3. Verify voltage at Pin 14 (Constant Power Terminal 30) and Pin 16 (Ignition Power Terminal 15S). If voltage is lower than 11.75V, drive and retest, or charge battery with a battery charger. (MAX 30AMPS). Or exchange vehicle battery for new fully charged battery.

⚠ DANGER: Risk of injury! Risk of cable damage that is not covered under cable warranty! DO NOT SET CHARGER TO "START" or HIGH settings while the Carsoft cable is connected to the car!

4. Verify contact pins in diagnostic connector are free from corrosion. If necessary, spray contact cleaner designed for electronics, such as 3M™ Contact Cleaner or Würth Kontakt OS® or Kontakt OL®. Do not use brake cleaner, oils or lubricants or abrasive tools.

⇒ TIP: Remove control unit and soak terminals with Contact Cleaner for 10 Minutes. Reinstall and Retest.

5. On vehicles which utilize a CAN for communication between modules, a bad module may cause others to not respond or to be unable to establish communication. If this is the case, extensive testing of all modules may be required to rectify a CAN problem. Follow the procedures for testing the CAN for the model and year of the vehicle or disconnect modules one by one until communication can be established.
6. If ECU is producing unintelligible "ghost" codes, manually reset ECU, drive and retest. SEE ALSO #4.
7. If a problem with Carsoft is suspected, test a similar car and compare results. If a system can be diagnosed on a similar car the problem is with the module, not Carsoft. Test the vehicle electrical system for faults.

If you need technical support for Carsoft Products: Call (760) 438-5870 M-F 8:30AM-5:00PM Pacific Time Zone, or Email support@carsoftusa.com.

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Diagram of BMW 20-Pin Diagnostic Socket:



Pin	Signal	Minimum Voltage	Wire color (ETM)
1	TD	-	SW (Black)
2	CAN High	-	SW (Black)
3	CAN Low	-	GE (Yellow)
4	Screen	0.0V	
5	-	-	
6	Speed A	-	SW/WS (Black/White)
7	Service Interval	-	WS/GN (White/Green)
8	-	-	SW/GR (Black/Gray)
9	-	-	SW/BL (Black/Blue)
10	-	-	SW/RT (Black/Red)
11	-	-	
12	61 (D+)	-	BL (Blue)
13	-	-	
14	30 (B+)	11.75V	RT (Red)
15	RXD	11.0V	WS/GE (White/Yellow)
16	15S	11.75V	GN/WS (Green/White)
17	TXD II	2.0V	WS/VI (White/Purple)
18	PGSP	-	WS/GN (White/Green or GN/BL 6Cyl (Green/Blue)
19	31	0.0V	BR (Brown) or BR/OR 6Cyl. (Brown/Orange)
20	TXD	2.0V	WS/VI (White/Purple)

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IF THERE IS COMMUNICATION BUT THE MODULE DOES NOT RESPOND:

1. Verify that system tested is on the car. Many ECUS have multiple vehicle coverage, so they have communications protocols built-in for different types of modules and vehicles. It is common to have “module does not respond” if the protocols exist for communications but the function of the module is not present or active on the vehicle.
2. Is the Diagnostic Cable plugged into the Diagnostic Connector (20-Pin) correctly? It should be firmly connected, but do not force it!
3. On the ECU and the Diagnostic Socket: Is there any corrosion, broken pins, loose connections, pins pushed through the bottom, or any damaged or broken wires?
4. Is the key on? The ignition must be on and in position 2. Is ignition switch faulty? If it is on, but still no response, test vehicle with the engine running.
5. Is the control unit installed correctly, and is it correct for the vehicle?
6. Did someone replace a module and not code it properly?
7. Is there a fault with the CAN? Many CAN faults from other control units block diagnostic capabilities. Disconnect fuses for ECU that is suspected of producing a CAN error and retest.
8. Is there correct voltage at the diagnostic connector pins? Test the pins for correct voltage with your DMM. Do not use a test light it is inaccurate and will not give actual voltage. If not, test the circuits for faults (see BMW-ETM for appropriate diagrams and procedures). Chart below corresponds to the 20-PIN Diagnostic Socket:

Pin Number	Terminal ID	Minimum Voltage
14	Battery voltage	11.75 V
15	Data link terminal	11.0 V
16	Voltage supply (via key-on)	11.75 V
17	Data link terminal	2.0 V
19	Ground	Must be 0.0V
20	Data link terminal	2.0 V

If no other faults are present, but the module still does not communicate, it may be helpful to reinitialize it. To reinitialize modules, follow the specific repair and testing procedures in the TIS or most current Service Bulletin.

Otherwise:

1. Disconnect vehicle battery
2. Remove module
3. Wait a minimum of 10-15 minutes
4. Reinstall module
5. Reconnect battery
6. Start engine and run for 5 minutes
7. Retest with Carsoft BMW.

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EVERYTHING HAS BEEN TRIED, BUT THE MODULE DOES NOT RESPOND:

The ECU may have sustained some damage or other problem that renders it non-diagnosable. This can be caused by any one of a number of factors, but a replacement control unit is probably the most economical solution.

Common Causes for Non-Diagnosable ECUs:

1. Accident, Fire, or Water Damage.
2. Damage to EPROM from power surge due to faulty voltage regulator.
3. Damage from reversed battery polarity
4. Jump-Start with 24V, reversed polarity, or surge from Battery Charger
5. Accident damage repair by electric welding, without insulating battery cables.
6. Static electrical discharge to control unit or EPROM during installation or removal.
7. Aftermarket stereo or alarm installation errors or sub-standard workmanship.
8. Incorrect installation of aftermarket tuning equipment or chips.
9. Damage resulting from incorrect repair procedures to DME.
10. Use of incompatible parts for repairs, or installation of non-conforming accessories.
11. Accidents, mistakes, damage due to repair attempts by untrained technicians.
12. Lightning Strike
13. Car owner/Do-it-yourselfer tampering or failure to observe proper repair techniques.
14. Loss of data due to short circuit in diagnostic connector or EPROM in ECU.
15. ECU printed circuit boards solder faults due to vibration or manufacturing defects.
16. CAN Failure or CAN error in another ECU.

IMPORTANT:

Refer to BMW SI for most current service and testing information.

If an ECU can be tested on one car, but not another, there is nothing wrong with Carsoft. The problem lies in the ECU itself or the car's electrical system. If the same ECU cannot be diagnosed on any car, then a database file may have been corrupted within Carsoft. Call Customer Service and a patch file can be sent to you by email for repair.

NO COMMUNICATION DUE TO CABLE FAULT ERRORS:

Carsoft will produce "CABLE FAULTY" Errors if communication is interrupted or there is a problem with the cable. All CARSOFT Cables are tested by Quality Control to be sure that they are in perfect working order before they are shipped. CARSOFT CABLES are covered by a One Year Warranty against MANUFACTURERS DEFECTS AND MATERIAL FAULTS ONLY. **ABUSE, MODIFICATION, OR NEGLIGENCE TO FOLLOW SAFE PROCEDURES MAY RESULT IN DAMAGE THAT WILL VOID THE WARRANTY ON CARSOFT CABLES.**

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Common Causes for Cable Errors:

If you receive “CABLE FAULTY” Errors, check the following before you call Carsoft USA Customer Service.

- 1. COM Settings:** Make sure that the serial cable is connected to COM1 and that the BAUD rate (Bits per Second) is set at **9600** (WINDOWS Device Manager). Also make sure that there are no conflicts with other hardware using COM1 resources. Make sure CARSOFT BMW is also set on COM1 for preferences. If you are using a switch for multiple serial cables, make sure that the CARSOFT system cable is selected. If a modem or other device is present and sharing or using COM 1 or COM 3, disable it in BIOS and/or WINDOWS.
- 2. Cable is not Connected:** Make sure that cable is connected to both the serial port and the diagnostic socket on the car. **DO NOT OVERTIGHTEN CONNECTIONS!**
- 3. Extension Cables too long:** If you are using a serial extension cable, make sure that it is compatible with data transmission and not an old “null modem” cable. Make sure that it is also less than 15 feet (4m) due to Windows data management issues. Do not try to adapt a serial cable to PS/2, USB, or Parallel connectors. These types of connections are NOT SUPPORTED by CARSOFT Software. If you are using a Lap Top computer that does not have a serial port, make sure that your PCMCIA adaptor card is configured correctly, contact the PCMCIA card manufacturer for support.
- 4. Cable Connector or Serial Port Damaged:** Please be careful not to try to support the weight of the lap top on the serial cable, damage may occur. Please be careful not to let the cable drop onto hot engine components, damage may occur. Please do not close cable in doors or hood of cars, damage may occur. Do not attempt to modify the CARSOFT Cable or the serial connector, damage may occur. If your Lap Top has been dropped or damaged, internal damage may have rendered the Serial Port inoperable, have it examined by a qualified PC technician.

IF A CABLE IS SUSPECTED OF BEING FAULTY OR HAS BEEN BROKEN OR DAMAGED, CALL CARSOFT USA TECHNICAL SUPPORT AND ASK FOR A CABLE EXCHANGE FORM TO BE FAXED TO YOU. (760) 438-5870 M-F 8:30-5:00 PACIFIC TIMEZONE

NOTE: WE DO NOT, UNDER ANY CIRCUMSTANCES, SELL EXTRA CABLES. CABLE REPAIRS ARE ONLY FOR REGISTERED USERS OF CARSOFT. IF THERE IS NO RECORD OF YOUR PRODUCT REGISTRATION WE CANNOT PROVIDE ANY SERVICE FOR CABLES.

IF A CABLE HAS BEEN DAMAGED, IT MUST BE RETURNED FOR EXCHANGE. CARSOFT USA HAS BOTH STANDARD AND EXPRESS SERVICE FOR CABLE EXCHANGE. CONTACT CARSOFT USA CUSTOMER SERVICE. UNDER NO CIRCUMSTANCES WILL ANY CORE CHARGE BE REFUNDED IF A CABLE IS NOT RETURNED. IF A CABLE HAS BEEN MODIFIED OR OPENED, CABLE CORE FEE WILL NOT BE RETURNED.