Table of Contents

Vehicle Coding Information

Subject **Page**

Initial Print Date: 12/04 Revision Date:

Vehicle Coding Information

Model: All

Production: All

OBJECTIVES

After completion of this module you will be able to:

- Understand the purpose of the Central Coding Key (ZCS code)
- Locate/view the ZCS information and determine where it is stored
- Identify what modules in a vehicle are codable via ZCS
- Understand the purpose of a Vehicle Order (VO/FA)
- Access and explain the information contained within the vehicle order

Vehicle Coding Information

Introduction

As part of an ongoing process to reduce the need for country, model and option specific control modules, BMW began to utilize a multi digit vehicle coding structure referred to as a Central Coding Key (ZCS) and later changed to a structure referred to as a Vehicle Order (VO/FA).

GM	**16430000P**
SA	**0000422005009CC0U**
VN	**000001E116K**

The Central Coding Key (ZCS) is a unique 37 digit (originally a 48 digit) code that contains specific model, country variation and individual equipment/option information for a vehicle.

During the manufacturing process of a vehicle, the ZCS code is created to identify the specific vehicle being built and to properly code the control modules installed during the assembly process once the vehicle reaches the end of the line. To ensure that the ZCS code can be retrieved once the vehicle leaves the factory it is stored in one or two control modules, depending on the model.

ZCS is often referred to as a “key” since it is able to automatically “unlock” or ”activate” specific functions of a new control module or can be used to recode a used control module to be compatible with the specific vehicle it has been installed into. With the introduction of the E31 the ZCS information was used for the first time as a coding key for replacement vehicle control modules, this ensured that the replacement modules would be coded to the required specification of the vehicle.

As the number of options & accessories available for installation in a vehicle increased, an alternative to the ZCS code was introduced on 9/01 production E46 vehicles. The ZCS system was replaced with a system known as the Vehicle Order (VO/FA). The VO is a straight forward listing of vehicle specific information including a list of the option codes pertaining to the systems or equipment installed in the vehicle and is used in the same manner as the ZCS to properly code replacement or additional modules.

Regardless of which structure is utilized on a vehicle, codeable modules have no limit as to the number of times that they can be recoded.

ZCS Structure

The 37 digit structure of the ZCS is subdivided into three segments. The segments represent specific information about the vehicle.

Each segment ends with a checksum "digit". A checksum is utilized by the coding software to detect unacceptable/erroneous manually entered coding information.

GM	**16430000P**
SA	**0000422005009CC0U**
VN	**000001E116K**

The information/digits of the ZCS code reflects the options installed in the vehicle and should never be changed manually unless it is necessary for special recoding functions such as:

- Canadian market vehicle being moved to the US
- Retrofit installation of an accessory system (ie. CPT9000 phone system or BMW ULF system refer to ***SI B840103 & B84 08 04***)

If a modification needs to be made to the ZCS structure and there is no information available in a service bulletin then the BMW Technical Hotline should be contacted for assistance by submitting a PUMA case, requesting a modified ZCS code.

Each portion of the ZCS provides specific information regarding that vehicle:

GM (Grundmerkmale) - Identifies the "Basic Features" of the vehicle and contains 9 digits that are used to describe:

- Vehicle type (E36, E38, E39 ...)
- Specific body style of the vehicle (Sedan, Coupe ...)
- Country specific coding identification (US, UK, ECE ...)
- Unique equipment that affects the basics of the vehicle (with sunroof, without sunroof, wheel size ...)
- Basic language variant (English, Spanish, German ...)

SA (Sonderausstattungs) - Identifies the "Special Equipment" of the vehicle and contains 17 digits that describe what features/functions are installed in the vehicle, such as:

- Power Windows or Manual windows
- Power Door Locks or Manual Door Locks
- Power Sunroof or Manual Sunroof
- Power Convertible Top or Manual Convertible Top
- Phone Pre-wire

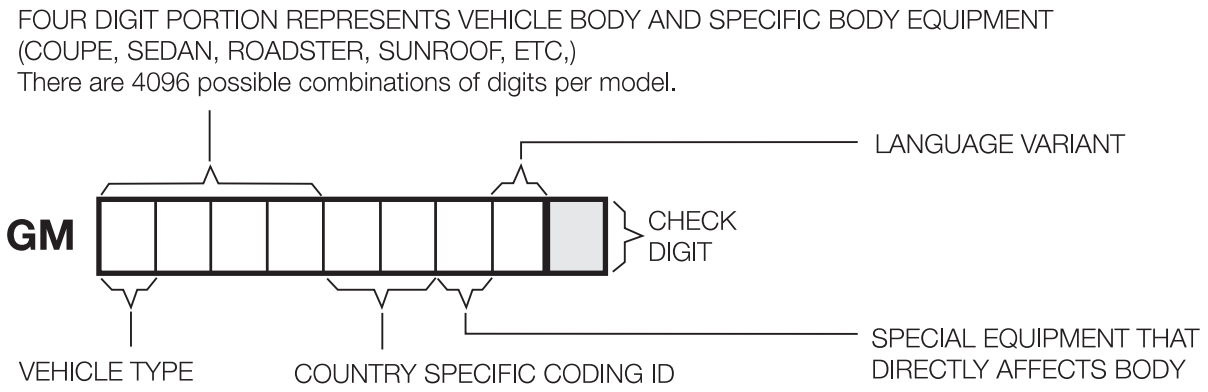
The SA segment is configured to provide a total of 64 possible number combinations (option groups) for all series vehicles worldwide. The information is modified whenever a new component/accessory is added to the vehicle via a retrofit coding procedure.

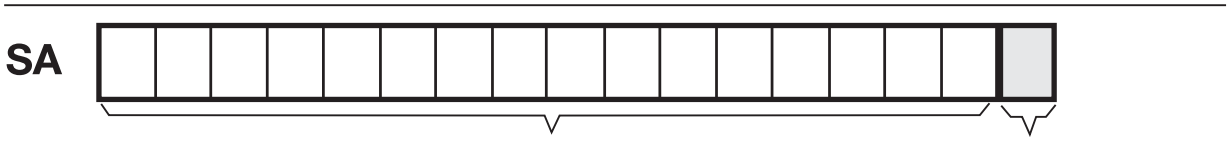
VN (Versionsnummer) - Identifies the "Version Number" of the vehicle and contains 11 digits that are used to describe:

- Series specific coding data that are not reflected in the GM or SA segments. This includes, model year dependent data, software and hardware versions of the control modules installed, coding instructions, etc.

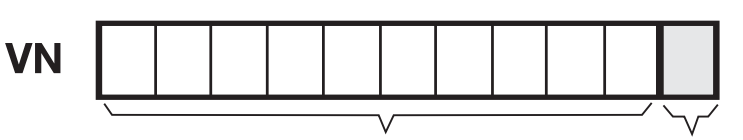
The VN is displayed as 40 possible combinations of digits. A deliberate change in the VN will result in erroneous coding data being used when recoding a module or coding a replacement module which will affect the proper operation of a control module(s) coded with an incorrect VN.

Note: In its original form the ZCS was displayed as a 48 digit code containing a fourth segment, the AM (Antriebsmanagement) which identified Powertrain management information specific to the vehicle, however this information was eliminated and was not needed for coding a control module.





The SA segment is configured to provide a total of 64 possible number combinations for all series vehicles worldwide. The number combinations are special equipment option packages.



The VN is displayed as 40 possible combinations of digits.

CHECK
DIGIT

ZCS Stored Location in Vehicle

The ZCS is stored in the vehicle to simplify the coding procedures when a module needs to be recoded or a replacement module needs to be coded. Depending on the vehicle, the ZCS information is stored in the following locations:

Vehicle	Model	Module	Vehicle	Model	Module
E31	All	EKM	E39	All	Instrument Cluster/EWS
E32	All	Instrument Cluster	E38	All	Instrument Cluster/EWS
E34	All	Instrument Cluster	E46*	All	Instrument Cluster/LSZ
E36	318i/is 325i/is M3	Instrument Cluster	E52	All	Instrument Cluster/LSZ
E36	318ti Z3	EWS II As of 9/98: Instrument Cluster/EWS	E53	All	Instrument Cluster/LSZ

* The E46 switched to a Vehicle Order (VO) data structure in 9/01.

The procedure to code control modules that utilize the ZCS information can be performed via the DISplus/GT1 or SSS using Progman with CIP 15.0 or higher and accessing the "Codierung ZCS/FA" function. Always reference service bulletins for information regarding the latest coding version and any possible software errors.

When coding a ZCS codable control module the coding program in CIP automatically searches the stored location, based on the VIN, and codes the selected module according to the information provided in the ZCS code.

On later production vehicles the ZCS information began to be stored in two locations, referred to as redundant data storages, this insures that the information is always available in the event the primary device storing the data fails.

Note: On early production vehicles without redundant data storage, if the module being coded or recoded is the module that stores the ZCS information, then the vehicles ZCS information must be obtained from the label located on the vehicle or electronically accessed from the module and printed out then entered manually via the input screen on DISplus/GT1 or SSS.

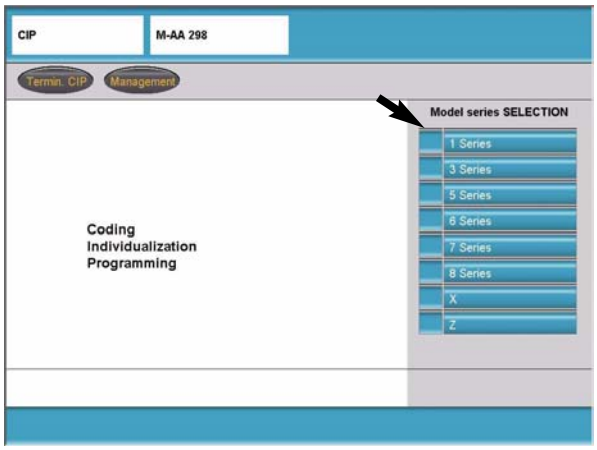
For vehicles with redundant data storage the coding of the module storing the data is performed automatically using the information stored in the "back up" module.

ZCS Identification / Display

The ZCS information for a specific vehicle can be obtained by:

- Accessing the control module(s) that electronically stores the information, using the DISplus/GT1 or SSS
- Locating the ZCS label affixed in the vehicle

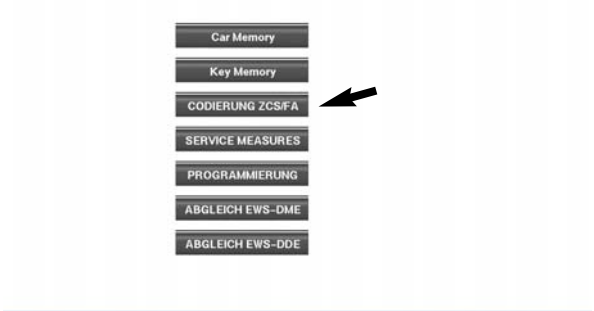
Accessing Stored ZCS Information



From Progman establish a connection to the interface connected to the vehicle and access CIP.

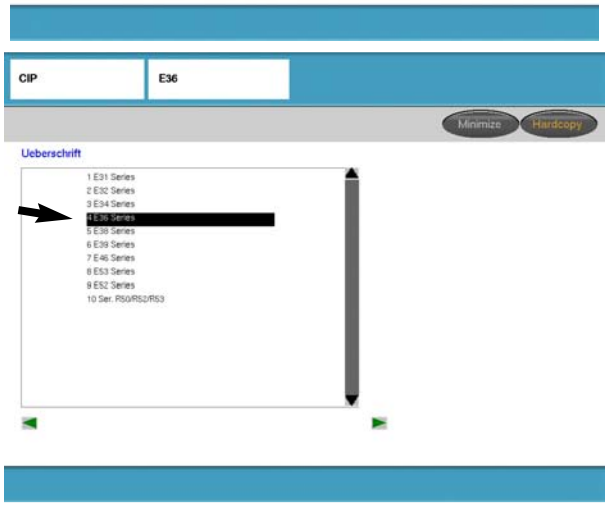
To perform the procedure from CIP the Model series must be selected **(3 series, 7 series ...)**.

Then select the body **(E32, E36 ...)**.



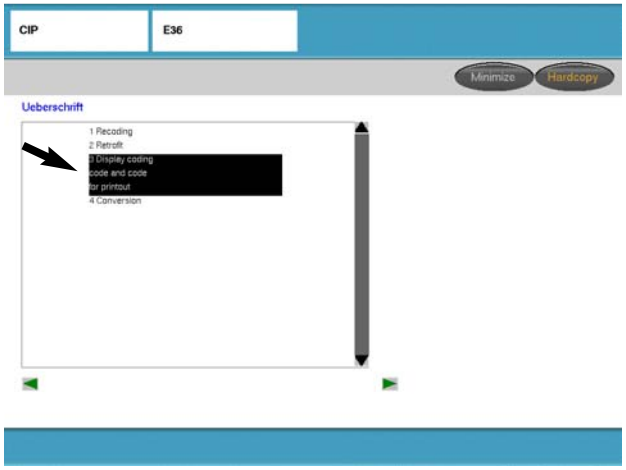
Select **"Codierung ZCS/FA"**.

Then advance screen to the right two times to enter the vehicle series selection screen.



Example:

*Select vehicle series (i.e **"E36 Series"**).*



Select **“Display coding code and code for printout”**.

ZCS Information for vehicle is displayed along with the stored location.

Accessing ZCS Information Label

On earlier production vehicles the ZCS label is affixed to the vehicle in a specific location depending on the model:

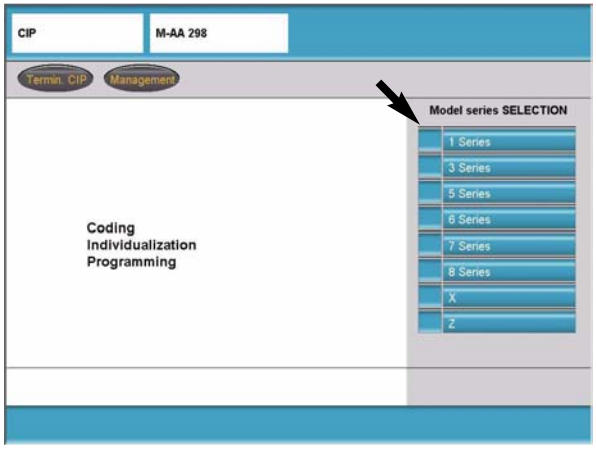
- E36 - Under rear seat; center area or next to left sending unit of fuel tank.
- Z3 Roadster - In Trunk; under carpet on floor, forward of tool kit.
- E31/32/34 - In fuse box cover
- E38 - In E-Box cover

Note: As of 9/98 production the ZCS label was eliminated from the vehicle. Some older vehicles will have identification labels containing an AM segment, this information is not needed for coding or recoding a control module on that vehicle.

ZCS Codable Control Modules

Control modules located in a vehicle that are ZCS codable are listed/identified by the "Codierung ZCS/FA" function contained in CIP.

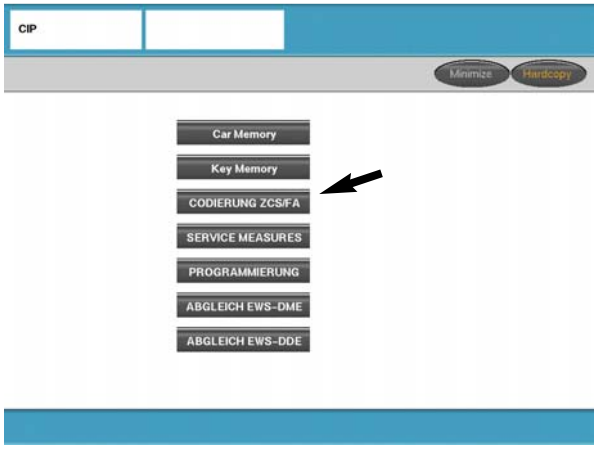
A list of the modules specific to the model can be accessed as follows:



From Progman establish a connection to the interface connected to the vehicle and access CIP.

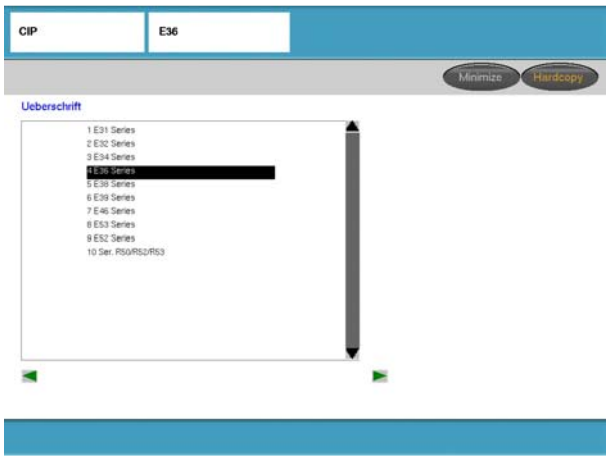
To perform the procedure from CIP the Model series must be selected **(3 series, 7 series ...)**.

Then select the body **(E32, E36 ...)**.



Select **"CodierungZCS/FA"**.

Then advance screen to the right two times to enter the vehicle series selection screen.



Example:

*Select vehicle series (i.e **"E36 Series")**.*

Select **“Recode”**.

Then advance screen to the right.

Displays control modules that are ZCS codable.

Workshop Exercise

Access the ZCS coding information on an E36, E39 , E46 or E53. and identify where the information is stored.

Determine which modules in an E36, E39, E46 or E53 are codable.

Vehicle Order

In 9/01 the ZCS vehicle data structure on the E46 was replaced with what is referred to as the Vehicle Order (VO) or Fahrzeugauftrag (FA). The vehicle order structure is utilized on all new models introduced/produced as of 9/01, such as E65/66, E60, E63/64, E83, E85 etc. Models such as E36, E39, E52, and E53 produced after 9/01 continued to be manufactured using the ZCS structure until production of the model is complete.

Vehicle Order for E46 as of 9/01 Production:

Vehicle identification number: KW17732 Vehicle order: Model series: E46 Type des. code: EV33 Time criterion: 0904 Paint code: 0A08 Upholstery code: N6SW Assbly. no.:	E-Wort: HO-Wort: 633L, SA: 1CA,205,210,240,249, 279,354,403,411,431, 438,441,459,465,473, 488,494,495,502,520,	521,522,534,550,639, 645,650,661,674,692, 818,823,832,845,853, 876,925,926,992,302, Vehicle order and vehicle identification number are stored in KOMBI .

Vehicle Order for New Models as of 9/01 Introduction:

Select measures plan.

Date / time:	10.11.2004 / 13:31
Model series:	E60
Vehicle ID number:	WBANA53584B848013
Vehicle order:	E60_#1203*NA53%0475&LCBA$1CA$205$248$2RA $302$319$354$403$415$416$430$431$438$441 $442$459$465$473$488$494$502$534$540$563 $605$609$620$639$645$676$694$697$785$818 $823$850$853$876$8SP$925$992-B110+K639+OI11 +OI12
Vehicle data status:	E060-04-09-504
Target data status:	E060-04-09-504

The vehicle order format contains information pertaining to the production of a specific vehicle such as:

Series Type - (E46, E65, E60, etc.)

Time Criterion - Identifies date the options/hardware equipment available for installation into the vehicle was standardized/"locked". This information does not refer to the production date of the vehicle. A problem with coding or programming may occur if a module or option based on a newer or older time criterion date is installed into the vehicle.

Model Code (Basic Type) - Base level from which the vehicle is "created/built".

Paint Code - Identifies the color of the vehicle at time of production.

Upholstery Code - Identifies the type of upholstery installed in the vehicle at time of production.

Assembly Number - Identifies the programmed part number for powertrain (Not used)

E-Wort - Identifies additions/options added to the vehicle that are not part of standard SA codes/options

HO-Wort - Identifies options installed at Center/Dealer using 3 digit option code (Currently not used.

Installed Option/SA Codes - Listing of accessories & equipment options installed in the vehicle.

The information contained in the vehicle order is used to identify the module(s)/system(s) that are/should be installed in the vehicle and also what if any control modules need to be updated if a new system/option is added or removed to/from the vehicle to ensure proper compatibility with the devices installed in the vehicle. The information contained in the vehicle order such as installed options, is modified whenever a new component (module/system) is installed and coded to the vehicle. If the new component is not properly coded to the vehicle the SA listing is not updated and problems can be encountered whenever a measures plan for the vehicle is created, vehicle needs to be recoded or VKM/Individualization functions are to be modified.

A listing of the components that need to be updated is provided whenever a measures plan is generated (refer to CIP module for additional information).

Example: *Information contained in the VO of an E60*

Select measures plan.

Date / time:	10.11.2004 / 13:31
Model series:	E60
Vehicle ID number:	WBANA53584B848013
Vehicle order:	E60_#1203*NA53%0475&LCBA$1CA$205$248$2RA $302$319$354$403$415$416$430$431$438$441 $442$459$465$473$488$494$502$534$540$563 $605$609$620$639$645$676$694$697$785$818 $823$850$853$876$8SP$925$992-B110+K639+OI11 +OI12
Vehicle data status:	E060-04-09-504
Target data status:	E060-04-09-504

Series Type: *E60*

Time Criterion: *Identified as 1203 indicates the date (month/year) that the list of available options/hardware available for installation into the vehicle was standardized/"locked". Although the vehicle referenced was produced in 6/04 the time criterion of 1203 is still valid and indicates that no changes were made to the available option packages/hardware available for installation into that specific model since 1203.*

Model Code: *Identified as NA53 indicates the vehicle and engine type plus provides information pertaining to the country the vehicle was built for (i.e. LH or RH drive). If an automatic transmission is installed it will be considered an NA63, however the model code contained in the VO will always reflect the base level which is a manual transmission vehicle.*

Paint Code: *Identified as 0475 indicates the color of the vehicle at time of production.*

Upholstery Code: *Identified as LCBA indicates the type of upholstery installed in the vehicle at time of production.*

Installed Option/ SA Codes: *Listing of accessories & equipment options installed in the vehicle*
1CA - Selection COP relevant vehicles
205 -Automatic transmission
248 - Steering Wheel Heating
2RA - LT/ALY wheels

Review Questions

1. *What is the purpose of a ZCS code in a vehicle?*

2. *Where is the ZCS code stored in a vehicle?*

3. *How can you determine what modules in the vehicle are codeable via the ZCS code?*

4. *What is the purpose of a Vehicle Order what information does it contain?*

5. *When was the VO structure introduced?*

6. *Which models utilize a VO structure?*

7. *How can the VO information of a vehicle be accessed?*