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Service and Maintenance

Subject **Page**

Initial Print Date: 02/06 Revision Date: 05/10

Subject **Page**

Service and Maintenance

Model: All

Production: All

OBJECTIVES

After completion of this module you will be able to:

- Know the requirements of the Quality Certification.
- Understand the Battery Maintenance Requirements.
- Locate BMW Service Bulletins

Quality Certification I (QCI)

Every new vehicle which arrives at the BMW center requires that a Quality Certification (QCI) be performed. The QC I is performed in two parts.

- Display Vehicle Check
- Delivery Check

When performing a QC1, a checklist has to be competed. Refer to Centernet for latest forms (based on Model and Model Year).

The requirements for a vehicle's Quality Certification vary slightly by model. The checklist must be adhered to strictly.

Every item checked off signifies that it has been verified and in proper working condition. If an item is found defective an extra line has to be added on the repair order.

The QC1 checklist has two sections that should be checked off by a technician.

Page Size	Page Color	Operation
Half	blue	Display Vehicle Check performed by Technician. Perform when vehicle is being used for showroom display or demonstrator.
Full	White	Display Vehicle Check performed by technician.
		Delivery Check performed by Technician.
		Delivery Check performed by BMW Client Advisor.
		Perform when vehicle is being prepared for customer sale.

Display Vehicle Check- BMW Technician

The Display Vehicle Check is performed if the vehicle is to be stored on the centers lot or in the showroom. The vehicle is inspected for shipping damage and any defects that may not have been caught at the VPC (Vehicle Preparation Center).

- Complete the upper portion of the checklist and the box labeled 00 00 008 Display Vehicle Check-Technician.
- Remove the top copy of the checklist and attach it to the repair order.

The remaining portion of the checklist should be left in the vehicle or put into the vehicle sales file.

Note: The automobile inventory should be verified frequently, so there are no open recalls/campaigns. Recalls/campaigns should be performed prior to the TECHNICIAN DELIVERY CHECKLIST to avoid any delays during delivery, including spot deliveries.

Delivery Check- BMW Technician

The Delivery Check is performed no more than 24 hours prior to the customer taking delivery of the vehicle. The purpose of the Delivery check is to ensure that no damage or system problems have appeared since the vehicle was first checked at arrival to the center. The BMW center must deliver a vehicle to the customer free of any defects at time of delivery, this is difficult to ensure if the vehicle has not been inspected for several days or weeks.

Vehicles that are sold before arrival to the center or to be put into service as Loaner Cars may have both parts of the QC I performed together, this is referred to as a Spot Delivery. In this case the vehicle will not be sitting on the lot more than 24 hours before delivery.

Always refer to the latest Service Information for special instructions and warranty information that is necessary to properly perform a QC I.

Notes:

Sample Quality Certification I

Service Department Copy

QUALITY CERTIFICATION I

2006 325i/330i (E90), 525i/530i, 7 Series

DOT TIRE DATA

1)										
2)										
3)										
4)										
Spare										

Customer Name: _____

Stock No.: _____ Model: _____

Chassis #: _____ Year: _____

BMW Center Name: _____

BMW Center No.: _____ Delivery Date: _____

00 00 008 DISPLAY VEHICLE CHECK - TECHNICIAN	
Check for Transportation Damage	
Remove 6 Series Convertible Top Shipping Cover	
Check Car Cleaned - Interior & Exterior	
Check Cleanliness of Engine Compartment	
Remove Transportation Battery Disconnect Switch	
Maintain Exterior Paint Surfaces Against Airborne Pollutants	
Check for Appropriate Fuel Level	
Take out of Transport Mode using DISplus or GT1	
Initialize Steering Angle Sensor on Active Steering	
Check and Adjust Tire Pressures (incl. spare tire if equipped)	
Digital Clock (set to proper time of day/year)	
Digital Compass (set/calibrate)	
Program Radio and Check Operation	
Top Up Washer Fluid	
Install Service Windshield Wipers	
Jack & Lug Wrench (secured) and Spare Tire in Trunk (if equipped) (incl. tool kit complete)	
Maintain Battery Voltage (12.65V minimum)	
Initialize Windows and Sunroof (incl. toll function & child safety button)	
Connect Approved BMW Charger if displayed in Showroom	
Remove Shipping Spacers if equipped	

00 00 010 DELIVERY CHECK - TECHNICIAN (Prior to Customer Delivery)
Note: Items in the DISPLAY VEHICLE CHECK should also be included.

ROAD TEST (OPERATION/ADJUSTMENT):	
Check/Adjust Tire pressure (incl. spare tire if equipped)	
Check for Appropriate Fuel Level	
Program Vehicle/Key memory as per customer's preferences using form ZUS3077	
Enter BMW Assist Phone Numbers per completed Agreement	
Check for and correct Check Control Messages	
BMW Assist: perform test call	
Warning Lights	
Engine Operation	
Transmission (incl. auto P & L on 7 Series) Function Selector (incl. instrument panel display)	
Park Distance Control (PDC) Operation, if equipped	
Steering (wheel in center position)	
Foot/Parking Brakes (before and during roadtest)	
Initialize the Flat Tire Monitor System if equipped with Run-Flat Tires	
Check Handling and Wheel Balance	
Absence of Rattles, Squeaks and Wind Noise	
Cruise Control Operation	
Telephone (7 Series)	
Speaker and Fader Operation (incl. bass, treble & balance)	
On-Board Computer and Control Display (incl. service indicator and Check control)	
Check Operation of BMW Options and Accessories	
Windshield Wipe/Wash Systems	
Interior/Exterior Mirrors (incl. dim & memory functions)	
Seats/Headrests/Steering Wheel (incl. memory function)	

AFTER ROAD TEST:	
Read Out Diagnostic System - Correct Faults as Necessary	
Program State and/or Emissions Inspection (if required) into service display	
Install Front License Plate Bracket if needed	
Stamp the Service Booklet in the QC1 space	

CHECK AND ADJUST:	
Doors, Trunklid and Hood	

CHECK:	
Battery Voltage (12.65V minimum)	

REMINDER:
Please complete and mail the postage paid and pre-addressed VEHICLE CONDITION REPORT.

COPY DISTRIBUTION:

BLUE	WHITE	GREEN	GOLD
SALES	SERVICE	SALES	CUSTOMER

SD92-285 (03/05)

DELIVERY CHECK - SALESPERSON (Prior to and at Customer Delivery):	Prior Del.	At. Del.
Car Cleaned - Interior & Exterior		
Check Tire Pressure (incl. spare tire if equipped)		
Check Battery Voltage (12.65V minimum)		
Check for Appropriate Fuel Level		
Warning Lights & Check Control		
Install Navigation System Map DVD		
Sound System (incl. CD player & telephone)		
Record Vehicle/Key Memory Features as per Customer's Preferences using form ZUS3077		
Seats/Headrest/Steering wheel (incl. memory function)		
Oil Level and other Fluid Service Locations, top up if needed		
Jack & Lug Wrench (secured) and Spare Tire in Trunk Tool Kit Complete*		
Check Operation of BMW Options and Accessories		
New Owner Auto Program Video		
Provide cellular telephone body kit to customer (7 Series)		
Complete BMW Assist Agreement (before initialization by technician)		
Program phone numbers for BMW center and BMW Customer Relations into BMW Assist menu.		
Wallet Key Adapter in Tool Kit (7 Series)		
CBS Hand-Over Inspection		

ROAD TEST:		
Transmission (incl. Auto P & display)		
Park Distance Control (PDC) Operation, if equipped		

OWNER'S PORTFOLIO CONTENTS (stored in center console):		
Vehicle Owner's Manual		
Combined Service/Warranty/Roadside Assistance Booklet		
Telephone Owner's Manual (7 Series)		
Radio code cards		
Dealer Directory/Atlas		
Roadside Assistance Temporary ID Card		
Sales, Service and Parts Managers' Business Cards		
BMW Accessories Booklet		
Accident Guidelines and Checklists		
Driver's Reference Guide		
BMW Assist reference card		
Three Keys (incl. wallet key)		
Purchase Agreement		
Sales Document		
Key Memory Programming Checklist		
Note: Recommend to Customer to Review Vehicle Owner's Manual, New Owner Audio Program Video, Quick Reference Guide, and 7 Series Battery Switch		

*in driver's door pocket

Review Service Schedule/Warranty/Roadside Assistance		
Introduce to Service Department		

Comments: _____

_____

Technician: _____ Date: _____
(Display Vehicle Check)

Technician: _____ Date: _____
(Delivery Check)

Customer: _____ Date: _____

The BMW Experience

TECHNICIAN

TECHNICIAN

SALESPERSON

Transportation Mode

Transport Mode minimizes battery current draw while vehicles are in transit to BMW centers.

Transport Mode replaces the more traditional battery switch. Transport Mode has been phased in on all BMW models starting from the E39 (5 Series).

Transport Mode immobilizes vehicle convenience features. Actual features immobilized vary between vehicle models, but typically include radio operation, interior lights, etc.

Transport Mode must be deactivated at QC1.

Note: Once deactivated, Transport Mode cannot be reactivated

Deactivating Transport Mode

To deactivate Transport Mode, connect the vehicle to ISTA. Connect an approved BMW battery charger.

For E65 only , select "Diagnosis", then select "Function Selection / Service Functions / Maintenance / Transport Mode / Delete Transport Mode / Test Plan". Then follow the on-screen instructions to deactivate Transport Mode.

For all other BMW models , select "Diagnosis", then select "Function Selection / Service Functions / Body / Transport Mode / Delete Transport Mode / Test Plan". Then follow the on-screen instructions to deactivate Transport Mode.

Vehicle and Key Memory

This feature provides the flexibility of allowing the owner to customize certain functions of select vehicle systems and automatically identifies users of the vehicle by a key identification signal provided by the remote keyless entry system (FZV). VKM coding is done at the time of delivery during the QC I.

Vehicle & Key memory is marketed as a combined feature but is actually two separate functions of the select vehicle control systems.

Vehicle Memory

The owner is provided with a list of available system functions that can be customized to their liking. Prior to delivery, CIP is used to encode the owner's chosen selections into the appropriate control modules.

Key Memory

This feature provides the added convenience of identifying users of the vehicle whenever a lock or unlocked signal is generated via the individual FZV keys. A maximum of four FZV keys can be used with the Key Memory feature.

Each of the four keys generate a unique key identification signal (key number) that is transmitted simultaneously with the lock/unlock signals to the General Module. Key Memory does not respond to Lock/Unlock requests from the mechanical drivers door lock.

Most of the key memory functions require the vehicle be configured using the "KEY MEMORY" function of the ISTA/P. However, there are a few features that store settings automatically without configuration such as IHKA blower speed and temp setting.

There are features that function as both a Vehicle & Key Memory feature.

Example: The Automatic Seat Adjustment feature is encoded as a Vehicle Memory Function with the following possibilities:

- when unlocking,
- when opening a door after unlocking
- or not active at all.

If active, the seat positions are stored and reactivated by the Key Memory function for individual users of the car.

Service

Required Preconditions

Before configuring Vehicle or Key Memory Functions, connect a battery charger to the vehicle. This will ensure adequate battery voltage during the VKM configuration.

If battery voltage drops below 11.8 volts, the procedure will terminate.

Vehicle Memory Configuration Procedure

Please refer to Progman section located under the Workshop Applications tab of this book.

Vehicle/Key Memory Service Considerations

If a Vehicle/Key Memory capable control module becomes defective and needs replacement, the specific customized data will be transferred over to the new replacement unit during the encoding process.

If this is not possible due to extensive control module failure, the owner must be made aware of the situation and requested to provide the options they originally selected. For this reason, it is advantageous to print the selected features as mentioned in the Vehicle & Key Memory configuration procedures.

FZV Key Initialization Procedure

Also mentioned in the BMW Features section of this manual, If FZV keys need re-initializing, make sure they are initialized in the same order.

Technician Awareness

Vehicle Memory/Key Memory Configuration changes the functionality of the systems. It is recommended that the Vehicle/Key memory selections be reviewed for the vehicle you are working on. There may be an owner selected function activated that is not a common selection, causing misunderstanding of the system's function.

Service Maintenance Programs

There are two different types of service maintenance requirement used in BMW vehicles depending on the model and production date. The two maintenance programs are:

- Scheduled Maintenance
- Condition Based Service

Early BMW vehicles are dependent on a scheduled service maintenance program. This means that when a certain criteria is met, usually an oil change, the vehicle will have to undergo either an extensive oil service or a major inspection.

Starting with the E65 (7 Series) the BMW service program utilized is condition based. Condition Based Service (CBS) allows for the servicing of specific vehicle components only when it needs the actual service.

Scheduled Maintenance

A Service Maintenance Checklist has been developed for early BMW passenger cars that require scheduled maintenances. The checklist incorporates space to record values called for in specific checking operations.

These include disc brake pad thickness, tire pressures, and the freeze point temperatures of the engine coolant and of the windshield washer fluid.

Because the vehicle will be visiting the workshop less frequently it is very important that the maintenance and any time dependent services be carried out thoroughly and correctly. Follow the Service Maintenance Checklist for the necessary steps required to properly complete the service.

Engine Oil Service

Starting with the introduction of the 1999 3 Series (E46), BMW introduced an extended oil change interval of approximately 15,000 miles depending on engine operating conditions. The engine oil change interval of approximately 15,000 miles was carried over to all 2001 BMW models. (Before this the interval was approximately 7,500 calculated miles).

However, engine oil should be changed at least once a year. This revision (annual oil change) is retroactive to earlier model years and is included in the BMW Maintenance Plan. To coincide with the increased oil change interval, BMW also introduced "BMW High Performance Synthetic Oil" SAE 5W-30.

BMW recommends the use of BMW High Performance Synthetic Oil SAE 5W-30 or Castrol RS SAE 10W-60 Synthetic.

BMW Inspection I
The next scheduled maintenance procedure performed after an oil service is an Inspection I.

The advanced technologies used in engine management systems and improvements in low maintenance engine design have reduced the required maintenance in each inspection service significantly.

BMW Inspection II
The BMW Inspection II includes all of the procedures outlined in the Inspection I, but includes additional steps that are only necessary with higher accumulated miles.

Condition Based Service

Starting with the introduction of the E65, the CBS program does away with the scheduled maintenance program that requires the replacement of components that might not need immediate replacement.

Condition Based Service monitors wear and tear on important parts. Its sensors can determine when a component needs to be replaced or upgraded. Even if the degree of wear cannot be gauged directly, such as in the case of the air conditioning microfilter, the system uses algorithms to determine when a service check-up should be performed. 'Made-to-Measure Maintenance'

Several parameters provide the information for this system - mileage, temperature, driving style and more. Overall, Condition Based Service maximizes safety and keeps the vehicle on the road longer, as the car is serviced only when it is necessary. You get the most out of your automobile, and are always well informed.

Notes:

- **For the most recent list of approved motor oils and their engine application refer to bulletin SI B11 08 98.**
- **Intervals for services may vary slightly especially if it is a Motorsport model.**
- **Always complete the appropriate maintenance checklist when performing a scheduled maintenance.**

Sample 2005 BMW Service Maintenance Checklist

BMW of North America, LLC
2005 3 Series, Z4 (X3 and X5 - use 2004 checklist SD92-260)
Service Maintenance Checklist

Only operations that pertain to this vehicle will be performed.

NOTE: Any other requested repairs not listed or covered by the applicable BMW Limited Warranty will be charged to the owner and invoiced separately.

Customer's Name	
Chassis Number	Indicate # Lights illuminated in Service Interval Indicator G G G G G Y R
BMW center	Mileage (on Service Interval Ind.)
Repair Order No.	Mileage (on odometer)

State and federal statutes require a properly completed copy of this form to be retained in the BMW center's customer file.

TECHNICIAN'S SIGNATURE

Tire Pressure (psi): LF / RF / LR / RR / Spare

	Z4 2.5i, 3.0i Roadster	325i, 330i	M3	✔
	E85	E46		
BMW Oxygen Sensor Replacement, required at intervals of 120,000 mi. (325i SULEV: 150,000 mi. M3: 100,000 mi.)	●	●	●	
BMW Spark Plug Replacement, required at intervals of _____,000 mi.	100	100	60	
BMW Automatic Transmission Service; change ATF at intervals of 100,000 mi.	●	●		
1200 Mile Service				
Read out diagnostic system.			●	
Change oil and oil filter while engine is at operating temperature. Use only Castrol TWS Motorsport SAE 10W-60 Synthetic oil, or Castrol Formula RS 10W-60 Synthetic oil, BMW p/n 07 51 0 009 420			●	
Replace transmission fluid.			●	
Replace differential oil.			●	
Check all warning/indicator lights, check control.			●	
Road test with check of brakes, suspension, shock absorbers (external), steering, clutch/manual transmission.			●	
BMW Engine Oil Service				
Change oil and oil filter while engine is at operating temperature. We recommend BMW High Performance 5W-30 Synthetic oil, p/n 07 51 0 017 866	●	●		
Change oil and oil filter while engine is at operating temperature. Use only Castrol TWS Motorsport SAE 10W-60 Synthetic oil, or Castrol Formula RS 10W-60 Synthetic oil, BMW p/n 07 51 0 009 420			●	
Replace microfilters. **Note:** reduce replacement interval in dusty operating conditions.	●	●	●	
Check overall thickness of front and rear disc brake pads using special tool. Record results. If replacement is necessary*: Examine brake disc surfaces. Clean brake pad contact points in calipers. Grease wheel centering hubs. Check thickness of parking brake linings only when replacing rear pads. Record results.	●	●	●	
Check parking brake actuation. Adjust if necessary.	●	●	●	
Lubricate convertible top hinge covers.		●	●	
Reset Service Indicator. **Note:** Do not reset Service Indicator when additional oil changes (between the normal intervals) are requested by the customer.	●	●	●	
BMW Inspection I: Undercarriage				
Change oil and oil filter while engine is at operating temperature. We recommend BMW High Performance 5W-30 Synthetic oil, p/n 07 51 0 017 866	●	●		
Change oil and oil filter while engine is at operating temperature. Use Castrol TWS Motorsport SAE 10W-60 Synthetic oil, or Castrol Formula RS 10W-60 Synthetic oil, BMW p/n 07 51 0 009 420			●	
Check transmission for leaks.	●	●	●	
Check rear axle for leaks.	●	●	●	
Half shafts: Check for leaks at flexible boots.	●	●	●	
Visually check fuel tank, lines and connections for leaks.	●	●	●	
Check condition, position, and mounting of exhaust system. Examine for leaks.	●	●	●	
Check power steering system for leaks. Check p/s fluid level; add fluid if necessary.		●	●	
Check overall thickness of front and rear disc brake pads using special tool. Record results. If replacement is necessary*: Examine brake disc surfaces. Clean brake pad contact points in calipers. Grease wheel centering hubs. Check thickness of parking brake linings only when replacing rear pads. Record results.	●	●	●	
Check brake (and clutch) system connections and lines for leaks, damage, and incorrect positioning.	●	●	●	
Check steering for absence of play, condition of suspension track rods, front axle joints, steering linkage and joint disc.	●	●	●	
Check parking brake actuation. Adjust if necessary.	●	●	●	
Check all tire pressures (including spare). Correct if necessary. Record results. Check condition of tires (outer surfaces [left/right]), tread wear and pattern; in case of uneven tread wear readjust wheels alightment if requested.* Note: If requested, rotate all four roads wheels as instructed and rebalance.*	●	●	●	
Replace M-Mobility System sealant cartridge every 4 years.			●	

BMW NA SD92-283 8/04

*Invoice separately

Sample 2005 BMW Service Maintenance Checklist (cont.)

BMW of North America, LLC
2005 3 Series, Z4 (X3 and X5 - use 2004 checklist SD92-260)
Service Maintenance Checklist

Only operations that pertain to this vehicle will be performed.

NOTE: Any other requested repairs not listed or covered by the applicable BMW Limited Warranty will be charged to the owner and invoiced separately.

Customer's Name	
Chassis Number	Indicate # Lights illuminated in Service Interval Indicator G G G G G Y R
BMW center	Mileage (on Service Interval Ind.)
Repair Order No.	Mileage (on odometer)

State and federal statutes require a properly completed copy of this form to be retained in the BMW center's customer file.

TECHNICIAN'S SIGNATURE

Tire Pressure (psi): LF RF LR RR Spare

	Z4 2.5i, 3.0i roadster	325i, 330i	M3	✔
	E85	E46		
BMW Oxygen Sensor Replacement, required at intervals of 120,000 mi. (325i SULEV: 150,000 mi. M3: 100,000 mi.)	●	●	●	
BMW Spark Plug Replacement, required at intervals of _____,000 mi.	100	100	60	
BMW Automatic Transmission Service; change ATF at intervals of 100,000 mi.	●	●		
1200 Mile Service				
Read out diagnostic system.			●	
Change oil and oil filter while engine is at operating temperature. Use only Castrol TWS Motorsport SAE 10W-60 Synthetic oil, or Castrol Formula RS 10W-60 Synthetic oil, BMW p/n 07 51 0 009 420			●	
Replace transmission fluid.			●	
Replace differential oil.			●	
Check all warning/indicator lights, check control.			●	
Road test with check of brakes, suspension, shock absorbers (external), steering, clutch/manual transmission.			●	
BMW Engine Oil Service				
Change oil and oil filter while engine is at operating temperature. We recommend BMW High Performance 5W-30 Synthetic oil, p/n 07 51 0 017 866	●	●		
Change oil and oil filter while engine is at operating temperature. Use only Castrol TWS Motorsport SAE 10W-60 Synthetic oil, or Castrol Formula RS 10W-60 Synthetic oil, BMW p/n 07 51 0 009 420			●	
Replace microfilters. **Note:** reduce replacement interval in dusty operating conditions.	●	●	●	
Check overall thickness of front and rear disc brake pads using special tool. Record results. If replacement is necessary*: Examine brake disc surfaces. Clean brake pad contact points in calipers. Grease wheel centering hubs. Check thickness of parking brake linings only when replacing rear pads. Record results.	●	●	●	
Check parking brake actuation. Adjust if necessary.	●	●	●	
Lubricate convertible top hinge covers.		●	●	
Reset Service Indicator. **Note:** Do not reset Service Indicator when additional oil changes (between the normal intervals) are requested by the customer.	●	●	●	
BMW Inspection I: Undercarriage				
Change oil and oil filter while engine is at operating temperature. We recommend BMW High Performance 5W-30 Synthetic oil, p/n 07 51 0 017 866	●	●		
Change oil and oil filter while engine is at operating temperature. Use Castrol TWS Motorsport SAE 10W-60 Synthetic oil, or Castrol Formula RS 10W-60 Synthetic oil, BMW p/n 07 51 0 009 420			●	
Check transmission for leaks.	●	●	●	
Check rear axle for leaks.	●	●	●	
Half shafts: Check for leaks at flexible boots.	●	●	●	
Visually check fuel tank, lines and connections for leaks.	●	●	●	
Check condition, position, and mounting of exhaust system. Examine for leaks.	●	●	●	
Check power steering system for leaks. Check p/s fluid level; add fluid if necessary.		●	●	
Check overall thickness of front and rear disc brake pads using special tool. Record results. If replacement is necessary*: Examine brake disc surfaces. Clean brake pad contact points in calipers. Grease wheel centering hubs. Check thickness of parking brake linings only when replacing rear pads. Record results.	●	●	●	
Check brake (and clutch) system connections and lines for leaks, damage, and incorrect positioning.	●	●	●	
Check steering for absence of play, condition of suspension track rods, front axle joints, steering linkage and joint disc.	●	●	●	
Check parking brake actuation. Adjust if necessary.	●	●	●	
Check all tire pressures (including spare). Correct if necessary. Record results. Check condition of tires (outer surfaces [left/right]), tread wear and pattern; in case of uneven tread wear readjust wheels alightment if requested.* Note: If requested, rotate all four roads wheels as instructed and rebalance.*	●	●	●	
Replace M-Mobility System sealant cartridge every 4 years.			●	

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*Invoice separately

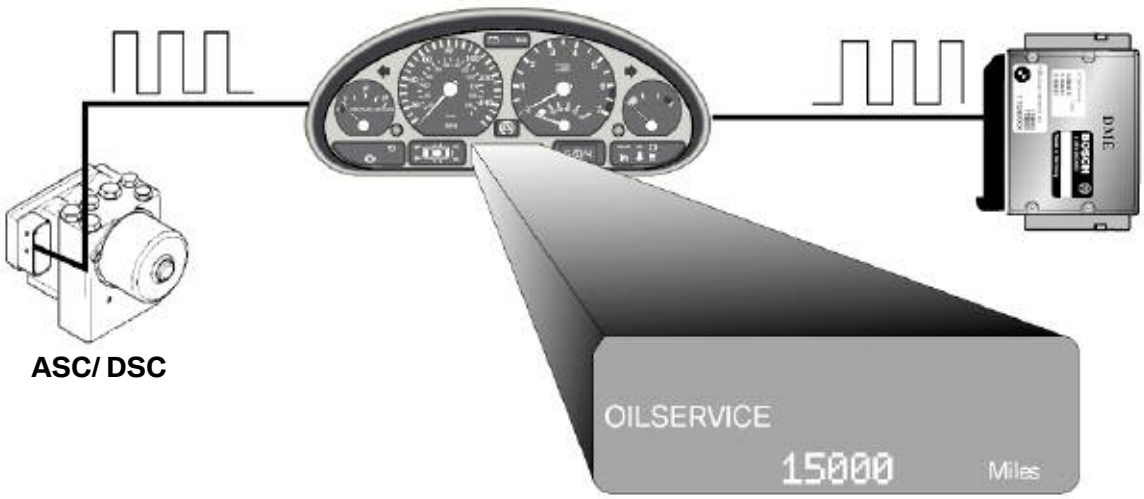
SIA IV

Models: E46 and E52

Production: From start of production

SIA IV Components

- Instrument Cluster with LED display
- DME
- Vehicle Speed Signal



E46 Service Interval Display

Instrument Cluster (IKE, KOMBI) with LED Display

The Instrument cluster calculates the Service Interval. The cluster is also responsible for displaying the mileage reading for the next service.

DME

The DME provides the Fuel Consumption (ti) signal.

ASC/DSC Control Module

The vehicle speed signal is provided by the ASC or DSC control module.

Principle of Operation

Starting with the E46 a new method for displaying the Service Interval is used. Colored LEDs are no longer used to display the amount of time until the next service or inspection is due.

With the SIA IV system, the actual mileage remaining until the next service will be displayed for five seconds when the ignition is first switched on.

The text “OIL SERVICE” or “INSPECTION” will also illuminate to show which service is due. A minus symbol(-) before the mileage display indicates that a service is past due.

The calculation process for determining the service interval is similar to SIA III. A set volume is stored in the Cluster. The processor receives the ti signal from DME as the vehicle is driven. The Cluster also receives the vehicle speed signal from the ASC/DSC control module.

Based on the amount of fuel consumed and the distance traveled, the processor calculates the distance remaining to the next service.

Service

Reset of the SIA can be done using special tool 62 1 110 if the vehicle is equipped with the 20 pin under-hood diagnosis connector.

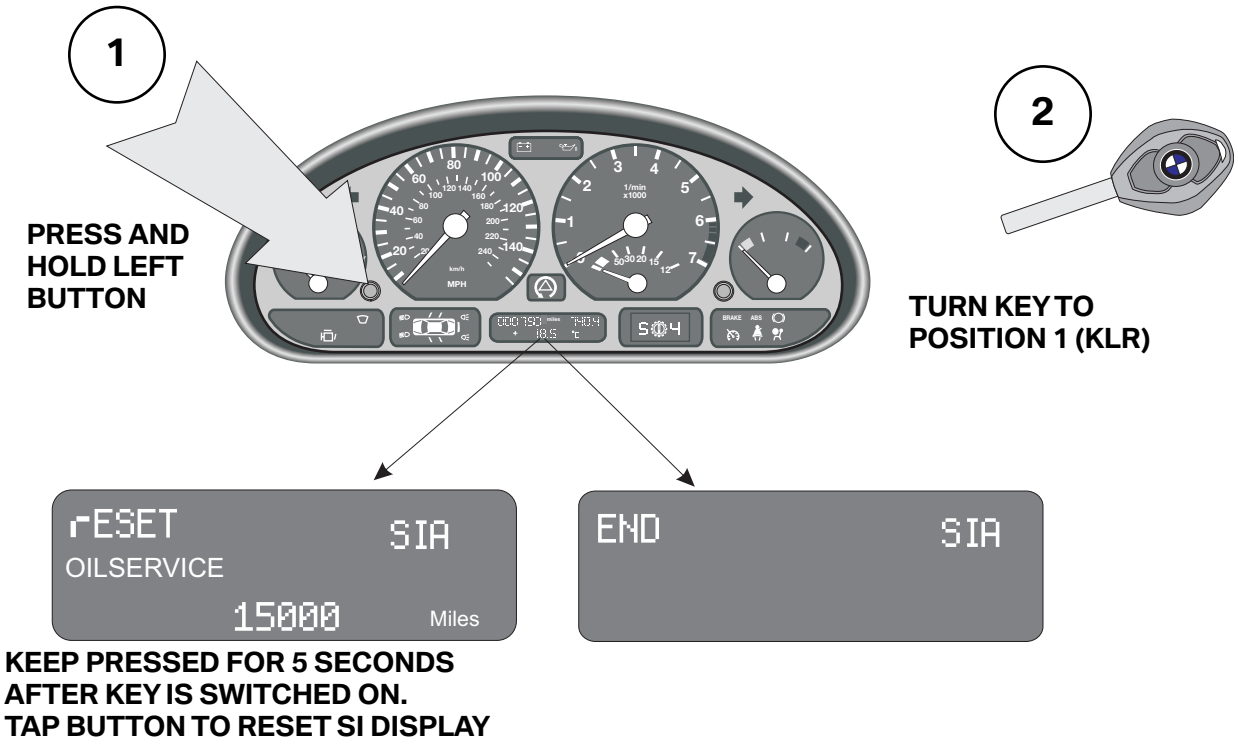
On 2001 MY vehicles onward without the diagnostic connector in the engine compartment, the use of the S.I reset tool is not possible. The Service Indicator may be reset using the Reset Mode in the Instrument Cluster or with Diagnosis.

Reset Procedure using the Reset Mode

(possible from 9/99 onward for E46, MY2001 E52)

- Ignition key must be “off”.
- Press and hold the trip odometer button in the instrument cluster (left button), and turn the ignition key to the first position (KLR).
- Keep the button pressed for approximately 5 seconds until one of the following words appear in the display: “OIL SERVICE, or “INSPECTION”, with “reset”.
- Release the reset button and press and hold it again until “reset” begins to flash.
- While the display is flashing, press the left button briefly to reset the service interval. After the display has shown the new interval, the following will appear: “END SIA”.

The system can only be reset again after 10 liters (2.5gal) of fuel have been consumed.



E46 Service Interval Reset

Reset Procedure using Diagnosis Program

- Connect the Diagnosis head to the diagnostic connector of the vehicle.
- Identify the vehicle and perform the Short Test.
- Select Function Selection and then Service Functions.
- Highlight Reset Service Interval Indicator.
- Select with tester.
- Follow the directions from the help information in the test module (upper right corer).
- Select which service is to be reset and press the continue key.
- An acknowledgement is displayed on the screen that the reset has been carried out.

Connected Service

The term "Connected Service" refers to "Networked service." Modern vehicles are already heavily networked internally by the single bus systems. Communication of vehicle occupants with the vehicle occurs via several control and display systems like the instrument cluster, on-board monitor with navigation system and on the E65 with the central Control Display.

This networking in constant progress is also revolutionizing the service process. It is called "Connected Service" and allows increasing communication and networking between the vehicle and the Retail Service Departments.

Customers can expect the following from the BMW Service in the future:

- Exactly planned appointments, no loss of information, early problem detection and flexible service.
- Fast handling of the service process without long waiting times for the service advisor, spare parts or vehicle.
- Departure from fixed items of inspection/repair, same high service quality, personal and individual advice.

Connected Service offers new possibilities. Vehicle specific service requirements are automatically assessed. Fixed inspection/maintenance schedules will be replaced by more flexible maintenance services.

The existing process will be further optimized, the appointment process will be faster and more effective and service advisors will have more time for individual consultation.

Connected Service is made up of several modules some of which are already available or are introduced starting with the E65.

The modules are:

- Condition Based Service (CBS)
- Coded Keys
- Key Reader
- Service Acceptance Module Software (SAM)

Condition Based Service (CBS)
BS defines vehicle specific maintenance requirements by sensor based monitoring of engine oil, air conditioning micro-filters and the front and rear brake linings. In addition, time dependent monitoring of the engine oil, brake fluid and coolant.

CBS also provides distance dependent monitoring of spark plugs as well as visual and functional checks. The service need display (SBA) is located in the instrument cluster and the details are displayed in the Control Display.

Coded Keys
The BMW keys have already been storing information for approximately 3 years. Since 1998 the chassis number and since 1999 the chassis number, mileage and status of the Service Interval Display (SIA) is stored.

The E65 keys (FBD keys or remote control service keys) store more information, such as check control messages and all CBS relevant data like: mileage, oil condition, brake pad wear and microfilter condition. The key is the “business card” of the vehicle.

Key Reader
The Key Reader allows readout of the data stored in the key when the vehicle is checked in for service. The required basic data of the vehicle and the data concerning all service requirements are automatically available.

Service Acceptance Module Software (SAM)
SAM is the software running at the service advisor’s work station. The software interprets and displays (processes) the vehicle data stored in the key.

SAM includes two future extension levels:

- **SAM 2** (Extension of SAM 1 - Future) Associated with TeleService 1, it allows the remote transmission of vehicle data stored in the keys and access to the central service databases (central repair history).
- **SAM 3** (Extension of SAM 2 - Future) Associated with TeleService 2, it allows the dealer to communicate with the vehicle for troubleshooting complex electronic problems.

TeleService
TeleService will be offered at two levels:

TeleService 1: allows automatic or manual data transfer by cellular phone from the vehicle to a TeleService center. The Service Call transmits wear and fault information. Emergency service calls may be placed to an assistance service center. The transmission of information via SMS (Short Message Service) will allow collection of data from customers.

TeleService 2: will allow remote diagnosis of the vehicle electronics. Finally, Telediagnosis/programming will allow the removal of faults, encoding and flash programming select control modules via the telephone interface.

Transfer and Analysis of Vehicle Operation and Service Data (FASTA)
FASTA increases product quality, gives input to Research and Development and is the basis for developing more accurate diagnostic tools and optimizing processes aimed at solving problems. In the workshop, the vehicle data is read with the diagnostic equipment and transferred via network to the central FASTA vehicle related database at BMW.

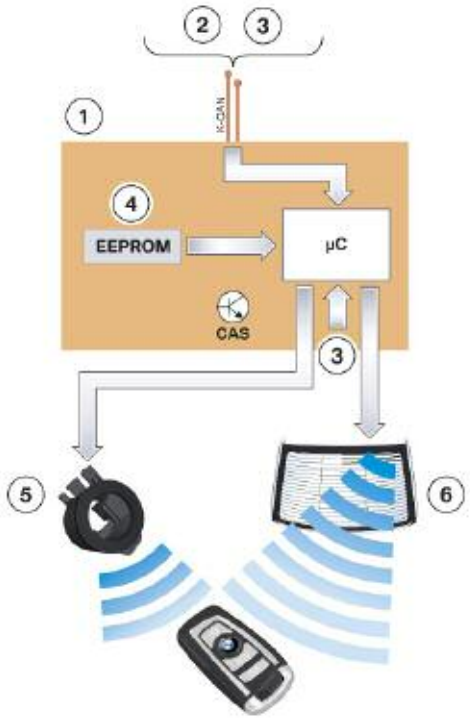
Starting with the E46, FASTA was implemented for the first time for a select number of dealers in Europe and in the USA. This pilot phase now is over and FASTA is now being used for the launch of all new models and as an integral part of quality control. For more information refer to bulletin SI B07 08 01 and 07 07 01.

NOTES

Updating Service Data

The service data records and fault memory entries are collected in a temporary memory by the Car Access System. The service data is thus available from a central point.

If one of the conditions set out below results in transfer of the service key data, the service key data on the ID transmitter is updated.



Index	Explanation
1	Car Access System
2	Current data on electrical system that Car Access System receives via K-CAN2
3	Diagnosis data via K-CAN2 or direct from Car Access System
4	Permanently stored data provided by Car Access System
5	Manual data transfer (emergency start coil, low frequency)
6	Automatic updating of data (transmission frequency of ID transmitter, high frequency)
µC	Accumulated data in Car Access System's temporary memory

Note: Updating can be performed both by way of the emergency start coil's low frequency signal (5) and by means of the transmission frequency used by the ID transmitter (6).

Updating Service Key Data

The service key data is stored in the Car Access System and transferred to the ID transmitter. Transfer is initiated automatically by specific conditions or manually. The data can be read out using the BMW Key Reader when the vehicle is serviced.

Automatic Updating

The service key data is updated every time the vehicle is driven. That data comprises:

- Conditioned Based Service data
- Check Control messages
- Fault memory entries.

The conditions for updating are:

- "Terminal 15 ON", speed above 40 kph followed by speed below 40 mph.
- The data is updated once a distance of 10 km has been covered and the speed is below 40 mph.
- The remote control receiver transfers the data to the ID transmitter when the engine is switched off. Data continues to be written to the ID transmitter even after it is taken out of the vehicle.
- A data read-out can then be obtained from the ID transmitter.

Manual Updating

The procedure for transferring current service key data to the ID transmitter in the course of servicing is as follows:

- Press and hold the Center-Lock button and use the START-STOP button to select "Terminal 15 ON", then release both buttons.
- Within 10 s, hold the ID transmitter against the right-hand side of the steering column trim in the position marked by the key symbol.

Note: The key symbol is printed on the steering column trim.

Wait until the Check Control message appears on the instrument cluster. The instrument cluster display shows the message "Updating service data".

- As soon as the updating process is complete, the Check Control message disappears and a gong sounds.
- A data read-out can then be obtained from the ID transmitter.

Note: The manual updating process transfers Conditioned Based Service data, Check Control messages and fault memory entries.

Display of "Updating service data" message on F01/F02

Index	Explanation
1	Key symbol
2	Updating service data
3	"Caution Symbol"

Condition Based Service (CBS)

Service Interval Indicator systems (SIA3 and SIA4) determine maintenance intervals based on fuel consumption, which is done to assess the need to change the engine oil. The main determining factor for the maintenance interval currently is the condition of the engine oil. Other maintenance needs, including the replacement of wear and tear items, are arranged to coincide with due engine oil changes.

BMW is now measuring the need for maintenance of several critical components besides the engine oil, and independently of the engine oil. This affords us the ability to bring a vehicle in for service whenever one of the measured components requires maintenance or replacement.

Condition Based Service (CBS - further development of SIA) will strike a compromise between too frequent maintenance and too rigid intervals which call for the replacement of maintenance items that may still have substantial useful life left. The objective is to furnish economical maintenance by providing the ideal service for individual vehicles.

Principle of Operation

Sensor Based (CBS) Schedules

The trend in the vehicle service business is to lengthen service intervals and reduce replacement of maintenance items. Additional measures have been taken to keep the vehicles in a roadworthy and comfortable condition.

Usage dependent maintenance of select wear and tear items is detected by physical and virtual sensors. This means that, in cases where the wear is not measured directly, the service due date will be determined by using auxiliary variables such as mileage, vehicle performance, temperature, etc.

Sensors built into certain components and control module algorithms take even more detailed account of the various conditions of vehicle use. The remaining times for selected maintenance tasks as well as any dates for State and/or Emissions Inspections (determined by the state in which the vehicle is registered) are individually displayed.

CBS determines the current and future maintenance requirements. The current status of Service items determined by CBS are shown in the Control Display. This data can also be read from the vehicle key by using the Key Reader, as the vehicle's current service status is automatically saved in the ignition key every time the key is used.

Three sensors detect the following wear conditions:

- Engine oil (sensor)
- Microfilter (virtual sensor)
- Front and rear brake linings (sensor as reference point)

The instrument cluster collects the values from the wear detection control modules and manages the internally defined service repair schedule. Data exchange is carried out on the bus systems.

Engine Oil Condition

The condition of the engine oil is detected by the oil condition sensor. Simultaneously, it also detects the engine oil level and the oil temperature.

The engine oil condition sensor is monitored by the ECM and is mounted in the oil pan.

The ECM contains an algorithm for evaluating the service due date. The following parameters are considered in the calculation:

- The correct oil grade is installed
- Oil level
- Oil temperature
- Engine load
- Fuel consumption (ti signal)
- Mileage
- Date (time elapsed since last oil change)

The remaining life to the next service is forwarded from the ECM to the instrument cluster by a bus message when the ignition is switched "ON." When the "engine oil" service is due, it is shown in the instrument cluster or the Control Display.

Microfilter State of Wear

The air intake section of the air conditioning system includes a microfilter on the right and on the left. The Microfilter includes an additional active carbon filter.

The condition of the microfilter is detected by the IHKA control module. It does not include a physical sensor to measure the level of contamination in the microfilter.

The IHKA uses an algorithm to calculate this from the following parameters:

- Ambient air temperature
- Rain sensor signal
- Heating use
- Air recirculation settings
- Driving speed
- Fan speed
- Mileage
- Date (time elapsed since the last oil change)

The remaining life to the next service is forwarded by the IHKA control module to the instrument cluster by a bus message when the ignition is switched "ON." When the "microfilter" service due date occurs, it is shown in the instrument cluster or the Control Display.

Front and Rear Brake Linings State of Wear

The brake lining state of wear on the front and rear axle is confirmed and detected by 2-stage brake lining wear sensors. These are located on the left front and right rear brake pads. The first stage (reference point for the calculation) of the wear indicator is activated when the thickness of the lining is 6 mm, and the second when it is down to 4 mm.

The brake lining wear sensors voltage signals are monitored by the DSC control module. The brake lining wear sensor operates in the first stage as on current models and a resistor was added for the second stage.

The algorithm is controlled by these two different voltages in the control module and determines the residual thickness of the brake lining. The residual wear of the brake lining is calculated from the following input parameters:

- Wheel speed
- Brake pressure
- Braking frequency
- Brake disc temperature
- Braking time
- Mileage (travel distance)

The residual wear of the brake lining on the front and rear axles is stored in the DSC control module when the ignition is switched “OFF” and is used as the starting value the next time the vehicle is started.

The residual distance to the next service is forwarded by the DSC control module to the instrument cluster by a bus message when the ignition is switched "ON." The "Front or Rear brake linings" service due date is displayed in the instrument cluster or the Control Display.

Note: Simultaneous replacement of the instrument cluster and ECM must be avoided whenever possible , otherwise all current oil maintenance schedule data will be lost. The values will then have to be inserted manually in each control module.

Internal Calculation of CBS Service Items

For certain wear and tear items, sensors are not needed by the Condition Based Service. The wear items that are calculated and managed internally by the instrument cluster are:

- Brake fluid
- Visual and functional checks (vehicle check)
- Coolant
- Official State Safety and/or Emissions Inspections
- Spark plugs

The maintenance of these items is performed at fixed intervals. The residual wear or the remaining time to next service is calculated by the instrument cluster using the travel/time parameters of: mileage, current date and internal distance counter. When a service item is due, it is shown in the instrument cluster or the Control Display.

Battery down times (battery cut off by the distribution switch) also stop the trip distance counter which leads to longer time based service intervals. This will disrupt the CBS volumes for engine oil, microfilter, brake fluid and coolant.

To correct this, the internal counter status must be reset by ISTA. The wear dependent items internally calculated by the instrument cluster are stored in the instrument cluster and in the CAS control module (redundancy).

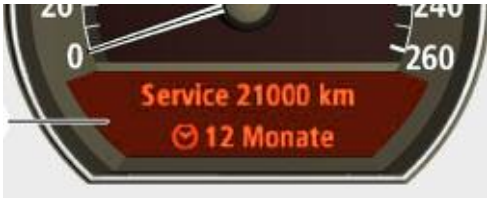
Note: The internal distance counter plays a particular role. Unlike the Time/Date, this counter cannot be set by the driver.

Service Indications

Regarding CBS, there are different service indicators:

- Service need display (SBA) in the cluster (base of speedometer) E65 only
- Check Control display in the instrument cluster
- CBS indicator in the Control Display

Service Need Display (SBA)



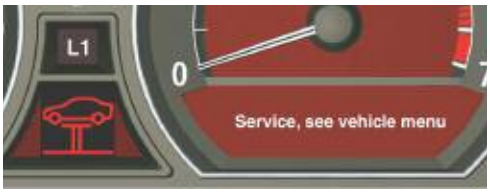
The Service Need Display is the evolution of the SIA4 Service Interval display. When KL15 is "ON," the Service Need Display appears under the speedometer in the instrument cluster for 10 seconds in the place where the fuel tank level is normally displayed.

The first line corresponds to the mileage dependent service items. It specifies the mileage when the next service is due. If the mileage is exceeded (service overdue), it appears with a minus sign.

The second line corresponds to the time dependent service items and is displayed by a clock symbol. It specifies the weeks/months/years when the next service is due. If the service is overdue, it appears with a minus sign.

The actual service item (with additional information) can be viewed in the Control Display.

Check Control Message



The CBS produces a Check Control message that indicates a service is needed.

The icon in the picture to the left is taken from an E65 instrument cluster that has a brake lining wear at the front or rear axle.

A brief Check Control message appears: "Service, see Vehicle menu." For more detailed information, the user can access the Control Display.

Note: For vehicles without a Central Information Display (such as an E90 without NAV) the customer only receives an icon as a warning that a particular service is due. The owner's manual should be referenced to look up the icon.

CBS Indicator in the Control Display

The Control Display provides additional information on service and maintenance procedures by selecting:

- “OB data” menu. for E65
- “Settings menu => Service menu” for others models

The CBS menu appears with the service items.

The Control Display shows a list of selected service and maintenance procedures, as well as legally-mandated official inspections.

The service and maintenance procedures are displayed in different colors:

- Green: No service is currently required
- Yellow: Service deadline is approaching
- Red: Service deadline has already passed

The service items highlighted in red with the highest priority appear in the bottom part of the display.

You can scroll through the list of service and maintenance procedures from top to bottom by turning the Controller from right to left. You can leave the list of service items by pressing the button with the Up arrow symbol.

The service and maintenance items are:

- Engine oil
- Microfilter
- Spark plugs
- Emissions Inspection
- Front brake pads
- Brake fluid
- Vehicle check
- Rear brake pads
- Coolant
- State Inspection

To display the service and maintenance item information in the Control Display, turn the Controller to select the item and confirm your selection by pressing the Controller.

CBS Reset

The CBS Reset procedure provides resetting of the individual Condition Based Service items. The items that require a reset depend on the individual vehicle usage. When one or more service and maintenance items has been performed, these items must be reset. The reset procedure can be carried out via the instrument cluster or ISTA.

Instrument Cluster

Resetting the maintenance item using the instrument cluster is different depending on the model of the vehicle.

E65

To reset a service item using the instrument cluster, press the reset button on the top left side of the instrument cluster for greater that 10 seconds.

A 4-line menu appears in the speedometer. At the top is the Back function, then the first three service and maintenance items sorted by priority. In addition, the residual wear or the remaining time are specified (possibly with a minus sign).

The "!" symbol means that you can reset this service and maintenance item, while a "0" indicates it is not able to be reset (the first 20% of the service interval is protected against premature/accidental reset).

1. Service items (in the speedometer)
2. Resetable service item (in the tachometer)

a. Back
b. Vehicle Check
c. Microfilter
d. Brake fluid
e. Back
f. RESET Vehicle Check

You can scroll through the service and maintenance items by pressing the reset button or the lower axial (FAS) button on the turn signal/high beam switch. When you have selected a service item, press the reset button for a few seconds to display a 2-line menu in the tachometer.

The Back function is at the top and the Resetable service and maintenance item is below it. Now select the service and maintenance item with the reset button (or the axial button) and press the reset button again for a few seconds.

In a third menu line, the system confirms that the reset was successful. The whole interval for the service operation is highlighted in the Service Need Display.

E60/61/63/64

When one or more operations have been carried out, e.g. front pads have been changed, these operations must be reset to their full service interval.

There are two options for resetting the service operations:

- Legally required service operations Legally required service operations such as the Statutory vehicle inspection (HU) and the Statutory exhaust test (AU), can only be reset in the "Service" menu.
- Maintenance service operations All service operations for the purpose of maintenance are reset by means of the reset button of the trip distance counter in the instrument cluster. If the reset button is pressed for longer than ten seconds, the reset mode opens automatically. "Reset?" is displayed in the lower display window.

In the upper display window, the CBS symbol , e.g. for "engine oil service overdue" will displayed. Press the reset button until the time/distance-dependent displays in the lower display window are replaced with dashes. Reset is no longer possible once more than percent of the interval has expired. A reset lock will be shown in the display with "OK".

1. Reset button for trip counter
2. Upper Display Window
   - CBS Symbol
3. Lower Display Window
   - Gear Indicator
   - Reset Mode

E90/91

To reset the service information data using the cluster:

- KL-15 on and all Variable displays in cluster off (clock should be displayed)
- Press and hold odometer reset button until CBS pictures display in cluster for about 5 seconds then release
- Use the BC button to scroll through till desired resetable picture is displayed.
- “Reset?” is displayed, Press and hold BC button a picture of a small analog clock runs through its display. When complete, the CBS reset that you chose is reset.
- If you want to insure that the reset was done, you can press the BC button while still looking at the CBS reset pictogram and the acknowledgment of reset will be shown with a check mark in a box.

CBS Data Correction

The CBS correction vehicle data allows “quick access” to create or change the CBS data stored in the vehicle. Sometimes the vehicle’s maintenance data will not be plausible (usually due to coding/programming issues). The correction includes decreasing the use percentage and number of resets when a reset was mistakenly performed. When the CBS reset is carried out, the changed data in the tester is automatically transferred to the vehicle.

Example: *A vehicle with only 3,000 miles on the odometer enters the service drive with the oil service light illuminated. The vehicle obviously does not need an oil service until* ***roughly*** *15,000 miles.*

The oil service should not be performed and the service maintenance light should not be reset either. This would make the vehicle undergo a ***roughly*** *18,000 mile service interval. Instead, the CBS data has to be manipulated or corrected to compensate for the miles already driven.*

CBS Handover Inspection

The CBS handover inspection is for the deletion of past data in the vehicle and reconfiguring the vehicle for latest data (updating after a service).

To perform a handover inspection select option three from the CBS correction, vehicle data page.

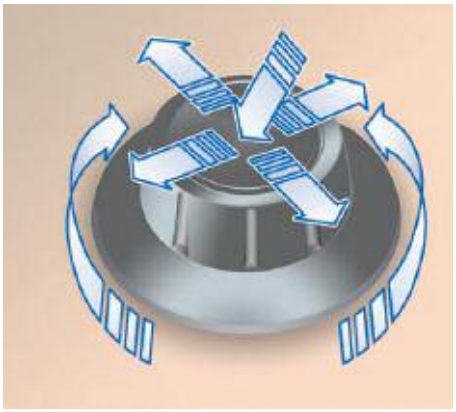
Option 3 includes:

1. Check status, telephone numbers
2. Enter date of first registration
3. Drover Adaptation reset
4. Back to selection CBS items

It is important that the correct telephone numbers are entered. These numbers are used by the TCU to make service calls for teleservice and for the customer to speak to a customer service representative.

Note: A list of the telephone numbers that should be entered can be found in SI B84 14 01.

Central Information Display (CID)



Service Mode

The controller can be used to activate the Service mode functions.

The Service mode is a special facility which provides information about the status of the display and user control system.

Note: This function was created to aid in diagnosis and is not intended for the customer.

The Service mode can be used, for example, to read out hardware/software versions for the Central Information Display or control units in the CIC system network.

As an addition to the comprehensive facilities of the diagnosis system, the Service mode serves as a simple means of quickly accessing diagnostic data without a BMW diagnosis system.

Activating the Service Mode

In the main menu, push the controller forwards and hold there for longer than 10 seconds.

Tactile feedback will then be generated.

Then proceed as follows:

- Turn the controller 3 stops clockwise
- Turn controller 3 stops anticlockwise
- Turn controller 1 stops clockwise
- Turn controller 1 stops anticlockwise
- Turn controller 1 stops clockwise
- Press the controller; the Service mode is added as the last menu item in the "Settings" menu.

The first menu level contains the following submenus:

- Navigation Service
- Telephone
- Gracenote.

Note: Push the controller in any direction to return to the main menu.

Instrument Cluster

Test Functions

The test functions are shown in the LC display of the instrument cluster. The test functions are used by the BMW service mechanics to check the coding. They also provide help in troubleshooting without the diagnostic tester.

To start function test

- Terminal R ON or terminal 15 ON
- Press and hold the reset button in the instrument cluster for 10 seconds (set/ reset)

Note: The test functions can also be called up by holding down the setting button in the instrument cluster and simultaneously switching on terminal R.

Display of test functions

The test functions are shown only in the upper LC display.

Locking and unlocking the test functions (test function 19)

Only the first two test functions are freely accessible.

As from the third, all further test functions are locked. The functions can be unlocked only via test function 19.

The test functions are unlocked by entering the sum of the digits in the vehicle identification number.

To end test function

- Ignition key at terminal R or terminal 15 ON
- Press and hold the setting button for longer than 5 seconds or
- Calling up test function 21 (RESET).

Note: To protect against unauthorized access, all test functions (with the exception of test 1 and test 2), are locked again after a RESET and "sleep cycle".

CBS displays in the instrument cluster

The CBS display always comprises the following two separate displays:

- A colored symbol in the upper display
  - Orange for normal
  - Yellow for service due
  - Red for service overdue
- and information on remaining distance and/or due date in the lower display.

You will find further information on the CBS displays in the BMW Owner's Handbook under Servicing Systems.

CBS Symbols

Visual system test

In the visual system test, all the indicator lamps and lights are lit briefly.

The needle instruments are moved from the lower to upper stop and back again.

Overview of test functions

Only the main test functions are listed in the following table. In addition to the majority of test functions there are further equivalent functions for which a similar display appears in the instrument cluster.

Test Function	Description	Display (e.g.)
01	Instrument cluster identification- - Vehicle Identification Number.	01.00 FGSTNR AB12345
02	System test	02.00 KI TEST
03	Not used	03.00 Not used
04	Electric load values	04.00 VERB-MOM 12,6 l/100 km
05	Range consumption	05.00 RW-VERBR
06	Fuel level	06.00 TANK L R S 24.5 26.7 50
07	Current display values	07.00 KTMP-MOM 104°C
08	Road speed	08.00 V-EFF 123 km/h
09	System voltage	09.00 Ub 13.3 V
10	Not used	10.00 Not used

Test Function	Description	Display (e.g.)
11	Units	11.00 ZEIT-EINH 24h
12	Calculated time of arrival	12.00 V-ANKUNFT 67,8 km/h
13	Audible signals	13.00 AUDIO LICHT-WARN BLINKER ZS-WARN
14	Self-diagnostics	14.00 FSP-Einträge 10
15	I/O ports processor	15.00 PORT 00 01010111
16	Dimming	16.00 DIMMRAD-CAN 46h
17	Contrast	17.00 DISP-HEIZ Ein io
18	Not used	18.00 Not used
19	Locking	19.00 LOCK LOCK: ON LOCK. 25
20	Fuel consumption correction	20.00 KORR-VERBR 1000 1er KORR 10er KORR 100er KORR
21	Reset (software reset)	21.00 Reset?

Breaking-in period

Moving parts need to be broken in to adjust to each other. The following instructions will help achieve a long vehicle life and good fuel economy.

Engine and differential

Always obey the official speed limit.

- **Up to approx. 1,200 miles/2,000 km**

Drive at varying engine and road speeds but do not exceed in gasoline engines, 4,500 rpm or a road speed of 100 mph.

Avoid full-throttle operation and use of the transmission's kickdown mode for the initial miles.

- **From 1,200 miles/2,000 km**

The engine and vehicle speed can gradually be increased.

Tires

Due to technical factors associated with their manufacture, tires do not achieve their full traction potential until after an initial breaking-in period. Drive conservatively for the first 200 miles.

Brake system

Brakes require an initial break-in period of approx. 300 miles to achieve optimized contact and wear patterns between brake pads and rotors. Drive conservatively during this breaking-in period.

Clutch

The function of the clutch reaches its optimal level only after a distance driven of approx. 300miles. During this break-in period, engage the clutch gently.

Following part replacement

The same breaking in procedures should be observed if any of the components mentioned above have to be renewed in the course of the vehicle's operating life.

For BMW M vehicles

Additionally, for Motorsport vehicles follow the next breaking-in periods.

- Up to 1,200miles

Drive at varying engine and road speeds, but do not exceed an engine speed of 5,500rpm and a road speed of 105mph. Do not depress the accelerator all the way down.

- From1,200 miles to 3,000miles

Engine and road speeds can be increased gradually up to a traveling speed of 135mph. Use the maximum speed only for brief intervals, e.g. when passing.

- Transmission

The transmission begins functioning at an optimal level only after a distance of approx. 300miles. Do not exceed engine speeds of 5,500rpm during this period.

Key Reader

Starting with the E65, BMW opened a new dimension in customer service. Using the Key Reader, Service Reception uses the data stored in the vehicle key to provide the following benefits:

- Accelerate and facilitate service consultation.
- Routine tasks, such as collecting vehicle data, will be minimized.
- After accessing the data stored in the vehicle's key, service and maintenance requirements are determined for the individual vehicle (CBS).
- A customized service maintenance list will be printed out for specific operations (E6x and E9x vehicles no longer utilize a conventional Service Maintenance Checklist).

The Key Reader facilitates and accelerates service reception. As soon as the key is inserted, the vehicle's maintenance data, VIN, and mileage are displayed at the client advisor's desk. It obtains this information by reading the vehicle data from the vehicle keys.

The Service Acceptance Module (SAM) software displays and prints this vehicle data via a Personal Computer with installed Key Reader. The reader accesses the stored vehicle data and the information is displayed on screen depending on the vehicle and model.

Key - Vehicle Data Holder and Business Card

The Key Reader automatically collects service relevant data from the vehicle key. The data is transmitted from the CAS module to the key or from the EWS module to the key (if not equipped with a CAS).

The key reader works with all current E38, E39, E46, E52, E53, and E85 vehicles with a vehicle key that has a colored BMW logo in the center and all E6x and E9x vehicles.

On early vehicles, the software only provides current vehicle mileage and VIN to the Service Advisor. On newer vehicles, E6x & E9x onward, the software supplies through detailed condition based service information and produces a "Vehicle Inspection Check List" customized to the specific needs of each vehicle.

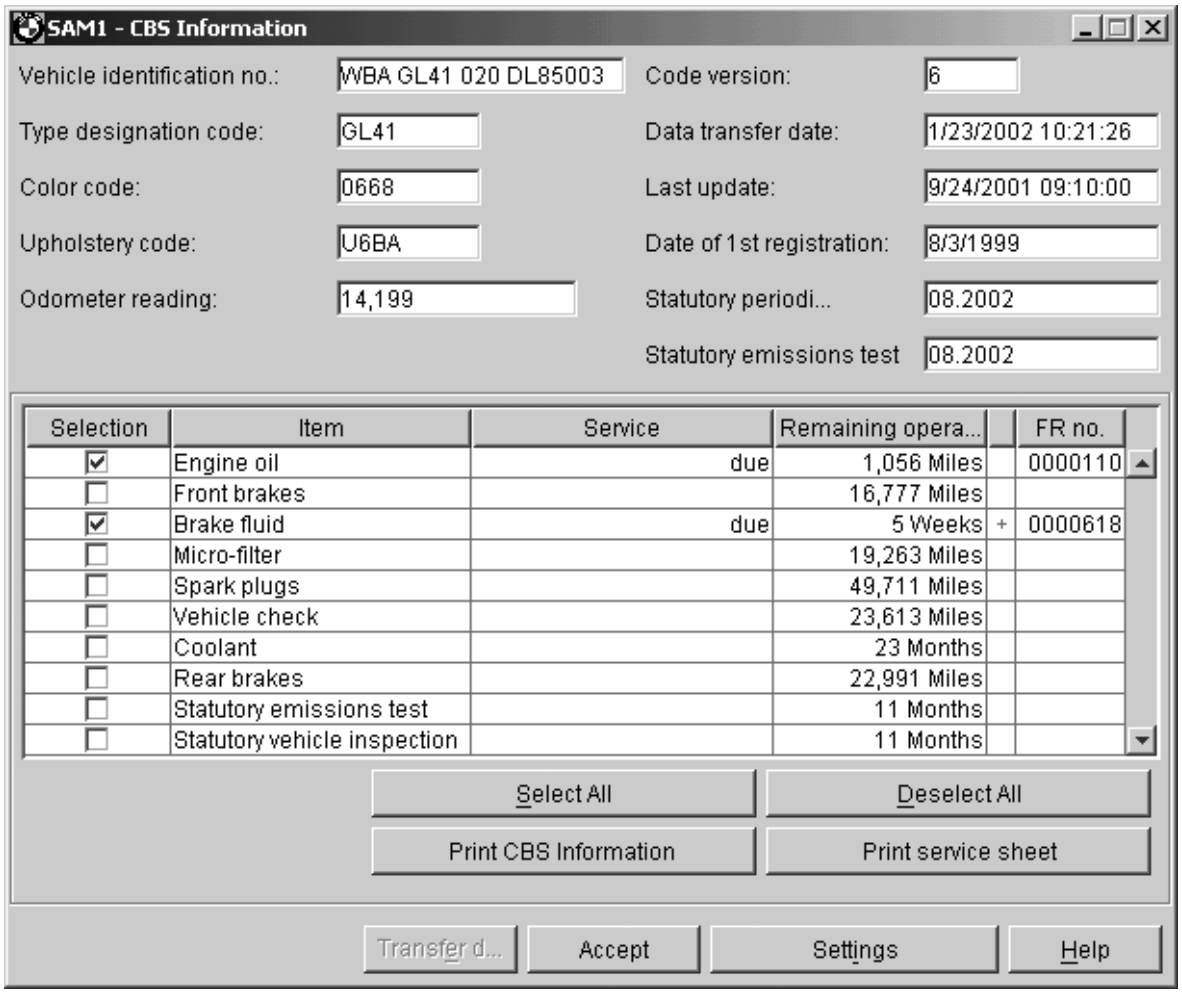
There are circumstances under which the current vehicle data is not stored in the key, for example: the customer has provided the spare key, which has not been used recently.

For this reason, a service function is provided to store data in the key:

- With the driver's door closed, push/hold the central lock switch in the unlock position and push/hold the start/stop button for approximately 5 seconds (without pressing the brake pedal) = Vehicle data is transferred to the spare key.

Service Acceptance Module Software (SAM)

SAM is the software running at the service advisor's work station. As soon as the key is inserted into the Key Reader, the software interprets the vehicle data stored in the key and the service and maintenance requirements determined for the individual vehicle (CBS) are displayed on screen (E65 example shown below).



This on screen information provides the service advisor more specific information about the individual vehicle requirements when consulting with the customer. As shown above, the on screen information indicates that the engine oil and brake fluid is due to be changed. In addition, future service and maintenance requirements (based on mileage or time) can be planned.

After accessing the data stored in the vehicle's key, a customized service maintenance list can be printed out for specific operations (as shown on the next page). The E65 and E66 no longer utilize a conventional Service Maintenance Checklist.

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