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### 2001 MODEL YEAR CHANGES

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## 20 PIN DIAGNOSTIC SOCKET DELETION

**Model: E39,E46,E52,E53**

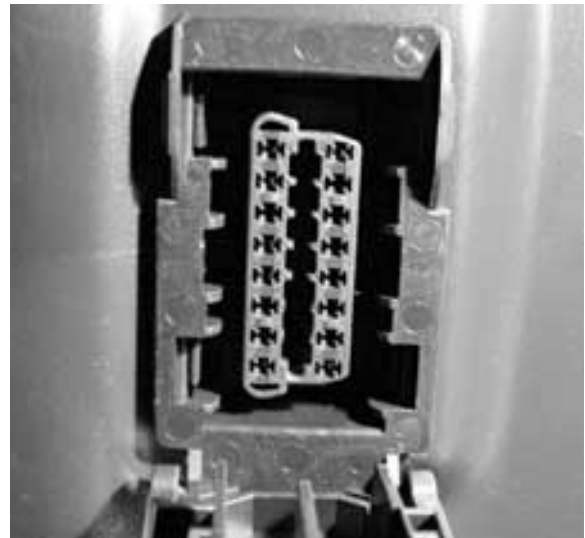
**Production Date: E46 from 6/00  
E39,E52,E53 from 9/00**

For model year 2001 the E39, E46 and E53 will eliminate the 20 pin diagnostic connector from the engine compartment. The 16 pin OBD II connector located inside the vehicle will be the only diagnosis port.

The E38 and Z3 will continue to use the 20 pin connector.

The 16 pin OBD II connector has been in all BMWs since 1996 to comply with OBD II regulations requiring a standardized diagnostic port.

Previously before 2001, only emissions relevant data could be extracted from the OBD II connector because it did not provide access to TXD (D-bus). The TXD line is connected to pin 8 of the OBD II connector on vehicles without the 20 pin diagnostic connector.

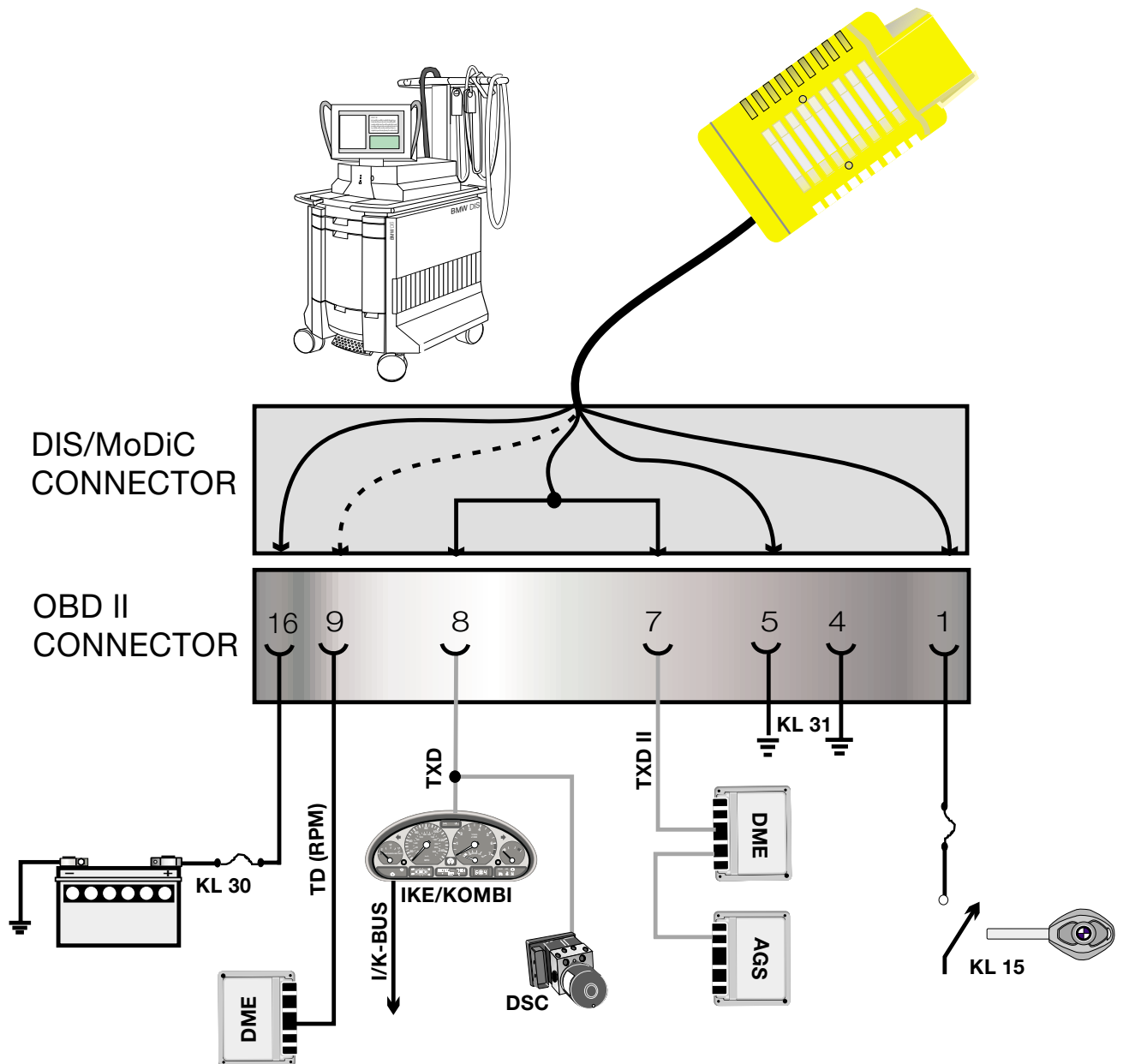


The cap to the OBD II connector contains a bridge that links KL 30 to TXD and TXD II. This is to protect the diagnostic circuit integrity and prevent erroneous faults.

The OBD II connector is located in the drivers footwell to the left of the steering column of E39, E46 and E53 vehicles.

Special tool 61 4 300 is used to connect to the 20 pin diagnostic lead of the DIS until the introduction of the DISplus.

## Diagnostics via the OBD II Connector

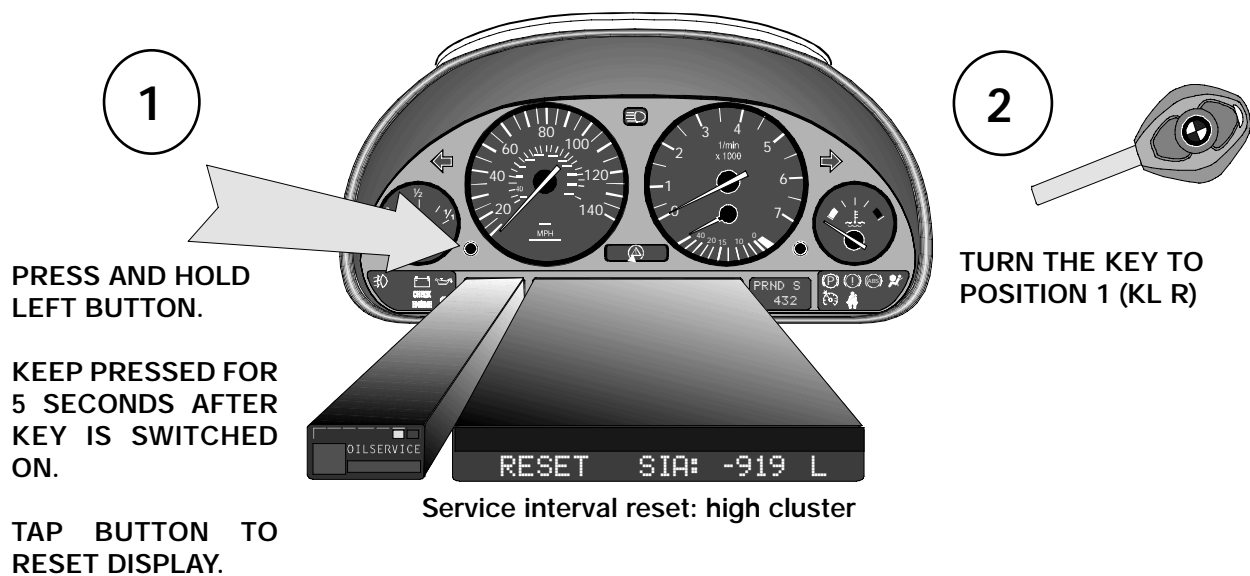


## INSTRUMENT CLUSTER SIA RESET

**Model: E38,E39,E46,E52,E53**

**Production Date: E46 from 9/99  
E38,E39,E53 from 9/00**

On 2001 vehicles without the diagnostic connector in the engine compartment, the use of the SIA reset tool is not possible. The service indicator may be reset using the reset mode in the instrument cluster.



### **Reset procedure for high and low clusters with SIA III using the Reset Mode:**

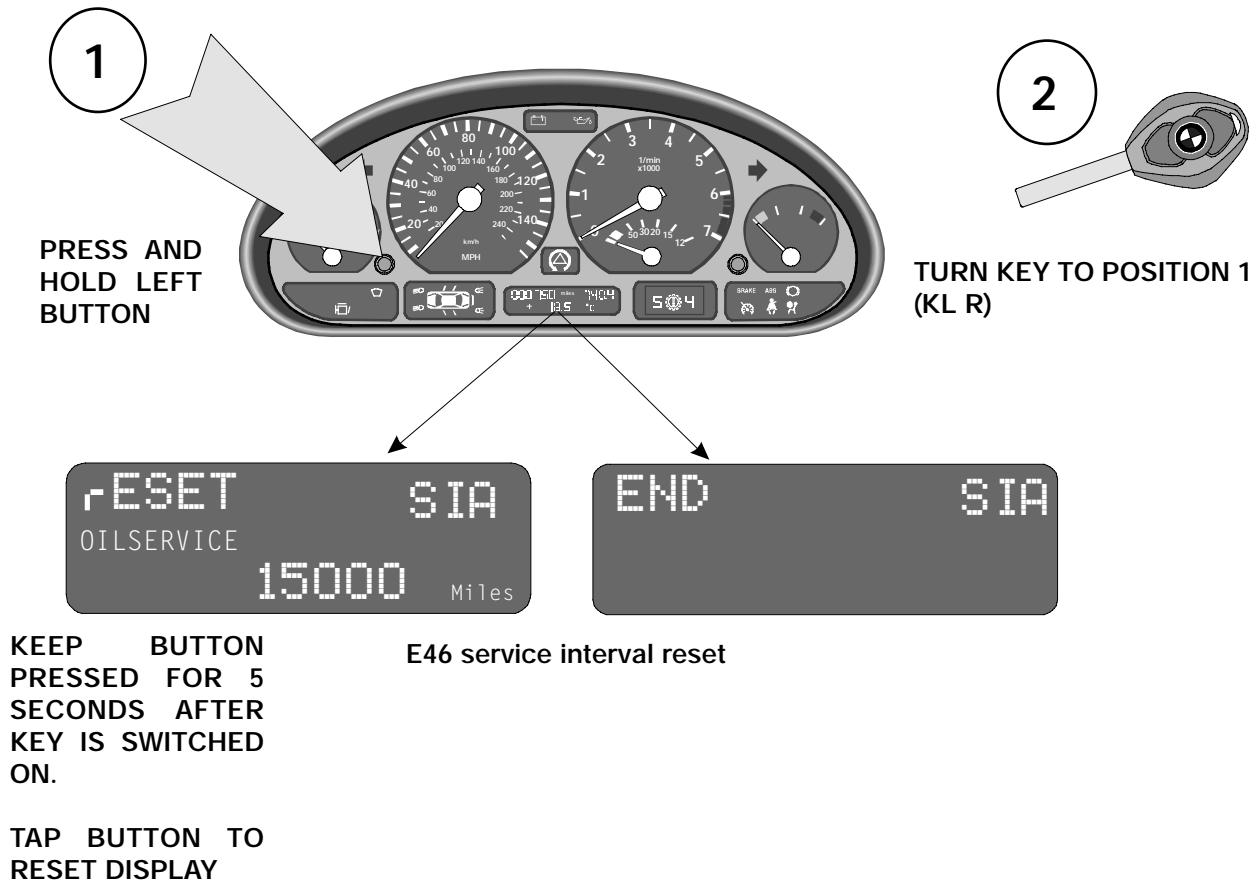
- Ignition key must be "off"
- Press and hold the trip odometer reset button in the instrument cluster (left button), and turn the ignition key to the first position.
- Keep the button pressed for approximately 5 seconds until one of the following words appear in the display: "OIL SERVICE, or "INSPECTION", with "RESET".

The service due is shown with "reset" if the coded minimum consumption limit has been reached and resetting is possible. If "reset" is not shown, the minimum limit has not been reached and resetting is not possible.

- Press and hold the reset button again until the word "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.



**Reset procedure for clusters with SIA IV using the Reset Mode. (possible from 9/99 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.
- 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 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.

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## 2001 E39 UPDATE

**Model:** E39 (525i/iT, 530i, 540i/iT, M5)

**Production Date:** From 9/00

For Model Year 2001 the E39 will receive it's first cosmetic facelift since series launch in 1997. In addition to the visual changes, several systems have been enhanced and updated. A new model has also been added, the 525i/iT, making 6 variants of the E39 possible.



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## Engines

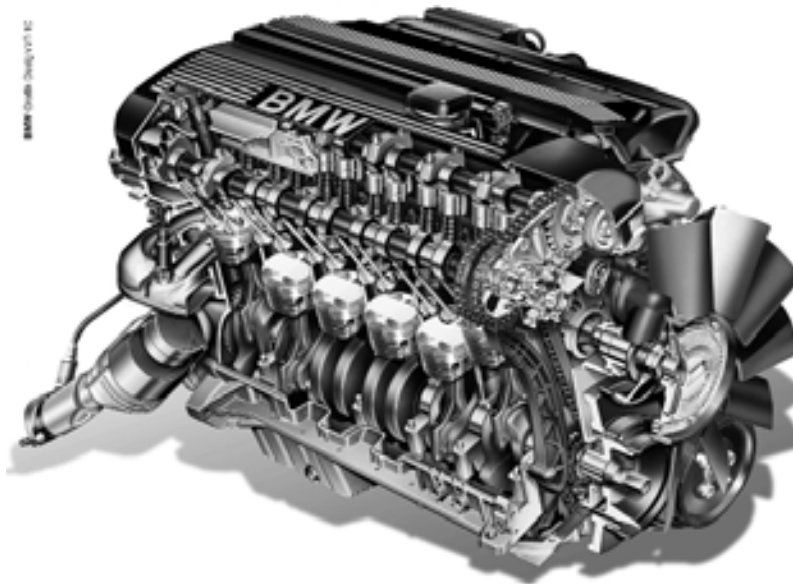
Two M54 engine variants will be added to the E39 for the 2001 M.Y. starting production 9/00. The M54 B30 and M54 B25. The M54 B30 engine will replace the M52 B28TU of the 528i and become the 530i. The M54 B25 engine equipped 5 Series will create a new model, the 525i, it will become the entry level 5 series.

The design objectives for the M54 engine were:

- Lower emissions
- Maintain fuel economy
- Increase power and performance.

The 540i/it will use the A5S 440Z automatic transmission with Steptronic as standard equipment and continues to have the optional 6 speed manual. The 525i and 530i models will use the A5S 390R (GM 5) with Steptronic as optional equipment until March of 2001 at which time the GM5 will be replaced by the A5S 325Z (5HP 19).

**Please refer to the 2000 Systems Diagnosis course material ST 039 for information concerning the M54 engine family.**



	<b>M54 B25</b>	<b>M54 B30</b>
<b>HORSEPOWER</b>	192@5900 rpm	225@6000rpm
<b>TORQUE</b>	245Nm@3500rpm	300Nm@3500rpm

## Body Work

The sheet metal remains unchanged, however several touches have been made to freshen the appearance of the 5 Series.

The front, rear and side impact strips have been painted body color. The 540i/it has a chrome insert along the upper edge of the impact strips.



The kidney grille inserts on all models have been widened to give the car's "face" a more aggressive appearance.





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## Fog lights

New circular fog lights with convex plastic lenses are tucked neatly into the corners of the new front air dam. The new lights use an H8 12V 35 W halogen bulb.



## Park Distance Control

The 2001 E39 will have Front and Rear PDC available as an option. The system operates just as the E38 and E53 with the same system. The vehicle is fitted with a PDC switch located on the SZM. Activation is automatic with reverse gear engagement, but may be deactivated with the switch. The switch may also be used to activate the system. Criteria for operation remain unchanged from previous systems.



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## Head and Tail Lights

The head and tail lights of the 2001 E39 have received a new look, utilizing optical wave guide technology. The wave guides are an innovation that are not only aesthetically pleasing, but also enhance safety.

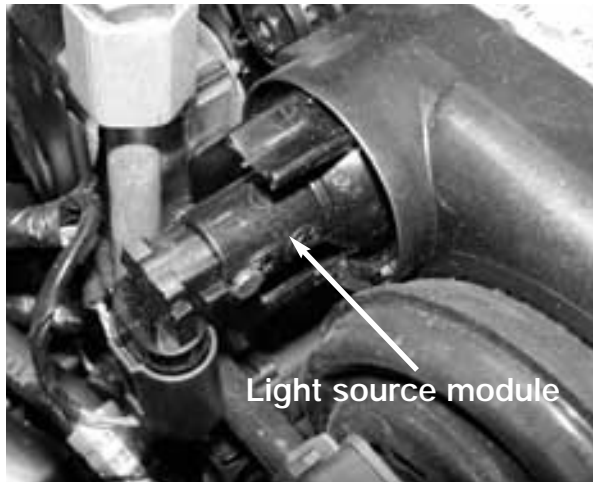


### Head Lights

The front headlights have been completely redesigned, however they fit into the existing body without any sheet metal changes. The high and low beam headlights are free-form reflectors and no longer use the glass lenses. The turn signal has been given its own circular lens next to the low beam.

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The parking light and side marker use the optical wave guide technology. Clear rings surround the high and low beam reflectors. The rings are illuminated by a light source module similar to the ones used in the Visual Entry Aid system. Output voltage for the light source module comes from the parking lamp final stage of the LCM III. There is one light source module located at the back of the head light housing between the high and low beam headlights. The side marker for US models also has an additional wave guide conductor for illumination.



**US version side marker reflector with wave guide illumination.**

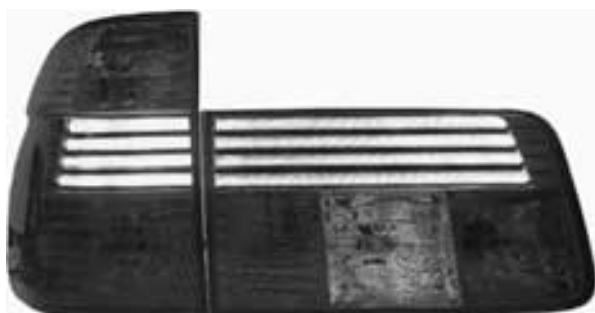
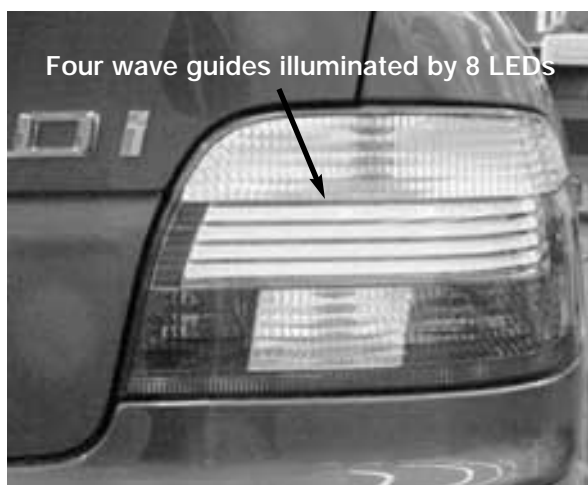
Third generation Xenon headlights manufactured by Hella are standard equipment on V-8 powered cars and available as an option on the 6 cylinder models. All xenon equipped vehicles also use LWR automatic headlight adjustment to maintain the vertical adjustment of the headlights at any vehicle load. **(Refer to the 1999 Model Update training for details of system operation)**

## Tail lights

The rear light housings have also been modified for 2001. No body changes were necessary.

The LED illuminated tail lights provide an exciting fresh look to the part of a 5 Series most drivers on the road are familiar with.

Each tail light housing contains 4 wave guide assemblies. At either end of the wave guides is a printed circuit board with 4 LEDs. The LEDs provide the illumination for the tail light only. US models use an additional 4 LEDs in the corner of the housing as a side marker.

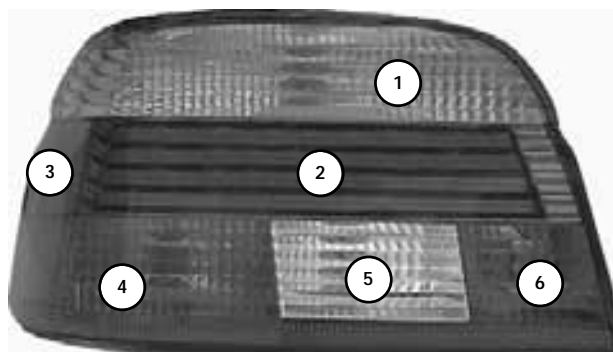


On Sport Wagon models, the tail light assembly is two pieces. In this case there continue to be only two sets of LEDs; one supplying light for each half of the housing. US models also have two LEDs for the side marker.

The advantage to using LEDs is the longer life span as well as lower power consumption.

The function of the LCM III remains unchanged from the previous year with the exception that because of the LED illuminated tail lights, there is no tail light monitoring function. The LCM III module has been updated for the new lighting features of the 2001 E39. All replacement LCM modules will supersede to this version in the parts system and it can be used on earlier vehicles.

1. Turn Signal
2. Wave Guide Tail light
3. Side Marker
4. Brake light
5. Reversing Light
6. Rear Fog light (Not used for US)



Sedan left tail light housing

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## E39 IHKR

The 525i/it will be fitted with IHKR as standard equipment. IHKA will be available as an option on those vehicles by ordering the Convenience package: SA 466.

IHKR is a semi-automatically regulated heating and air-conditioning system. The components are similar to the IHKR system used in the X5 3.0i.



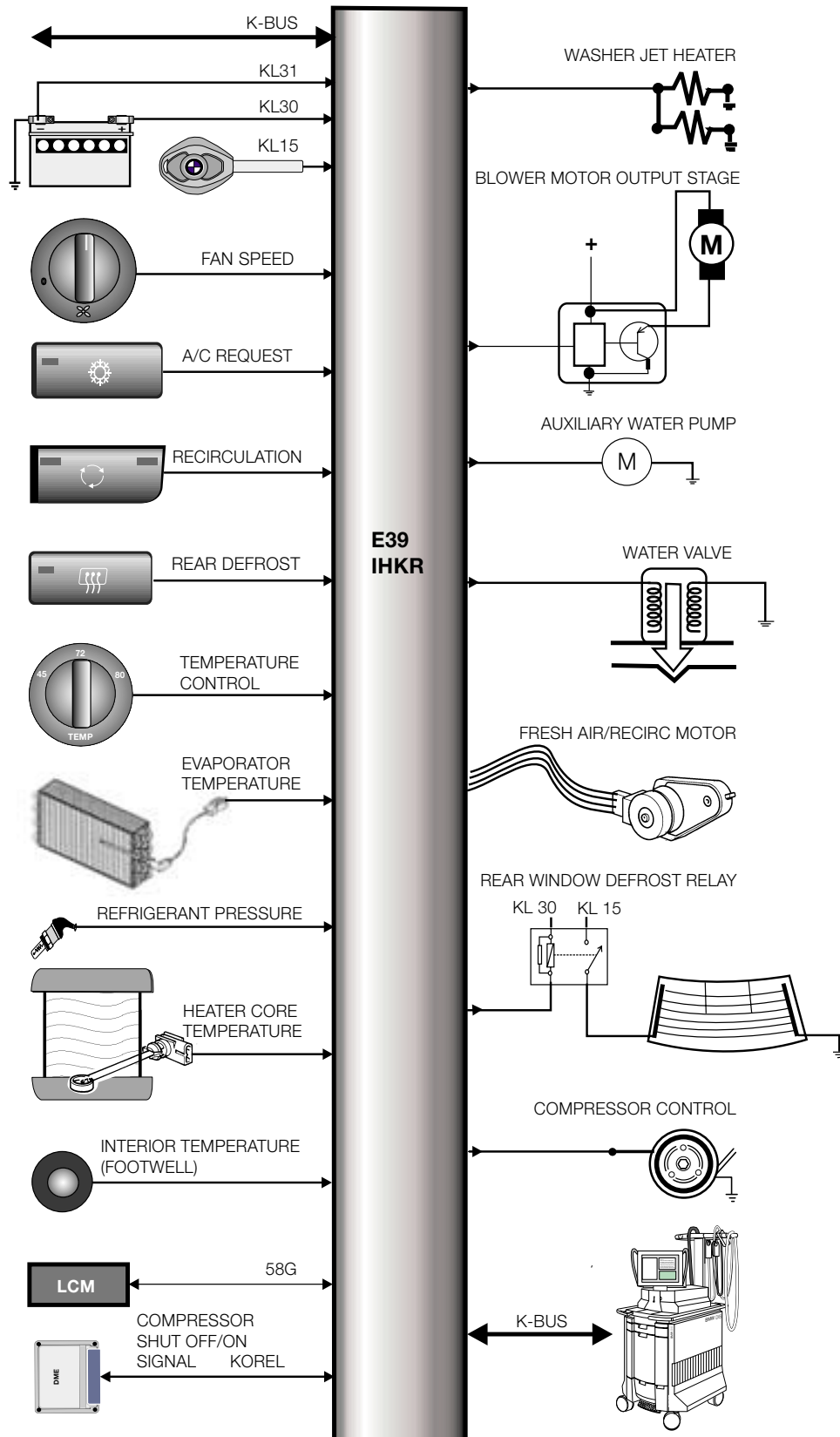
The E39 IHKR is a single zone system that regulates the temperature of the cabin based on the occupants desired temperature, selected by a temperature setting dial. Blower control, air distribution settings and stratification flap are manual.

### System Components

The E39 IHKR consists of the following components:

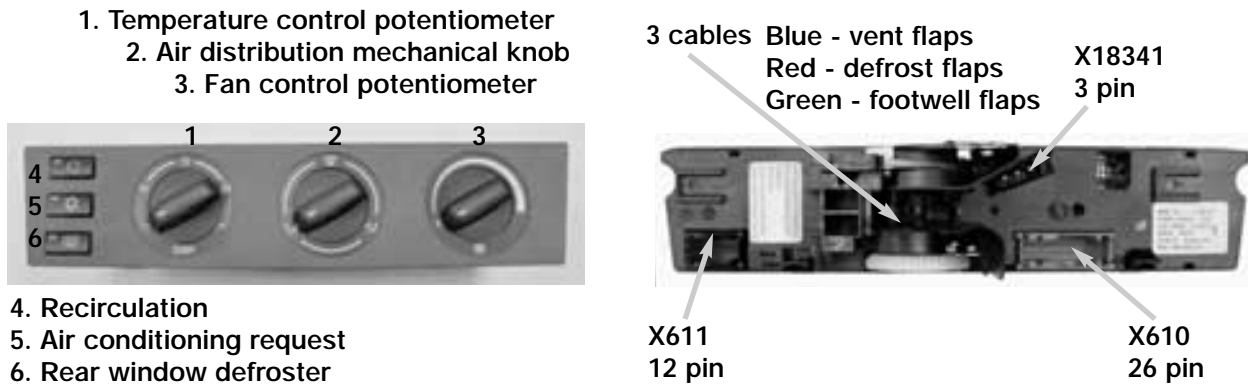
- IHKR control unit with operating controls
- IHKR integrated heater and air conditioning case
- 1 Heater core temperature sensor
- Evaporator temperature sensor
- Interior temperature sensor (located in drivers footwell)
- Double cage blower motor and final stage
- 1 Water valve (duty cycle controlled)
- Auxiliary water pump
- 1 Fresh air/re-circ stepper motor
- Auxiliary fan (DME controlled)
- Refrigerant Pressure Sensor
- Left and right fresh air micro-filters

## E39 IHKR I.P.O.



## IHKR control unit with operating controls

The IHKR control unit is incorporated into the control panel. The control panel consists of three buttons and three rotary dials.



## Functional Description:

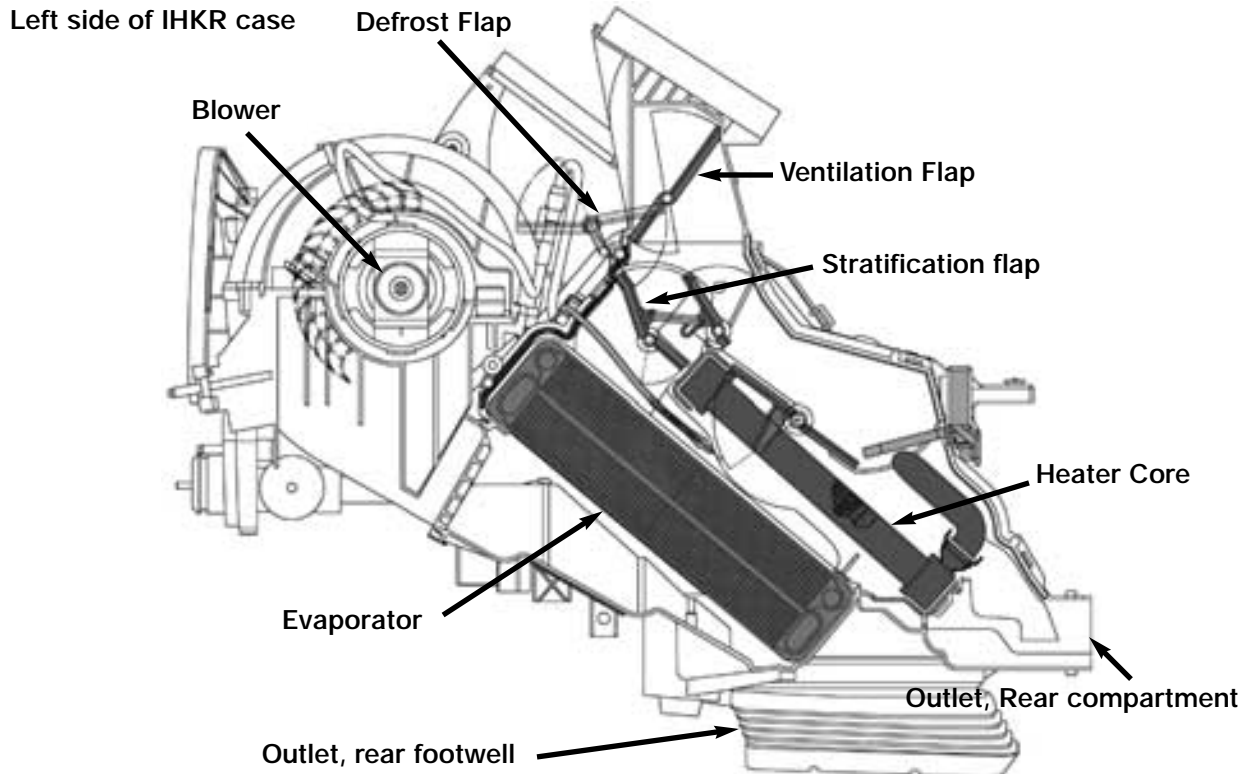
- **Air distribution:** is carried out using the mechanical rotary dial acting on three bowden cables.
- **Blower adjustment:** is carried out using the rotary dial potentiometer (22 steps). The control unit signals the final stage via a variable voltage signal.
- **Temperature control:** The desired interior temperature is set with the rotary dial potentiometer on the control panel. Temperature regulation is based on the Y-factor. The inputs used to determine the Y-factor are:
  - Position of the temperature control potentiometer dial
  - Heater core temperature
  - Coolant temperature
  - Exterior Temperature
  - Interior Temperature

Control of the interior temperature is carried out by the control unit cycling the water valve to regulate the temperature of the heater core. During heater operation the auxiliary water pump will be switched on to increase coolant circulation through the heater core. The service station feature is carried over to the E39 IHKR.

- **Fresh air/recirculation:** Recirculation is requested by an input to the control panel button or the MFL. The control unit actuates the fresh air/re-circ stepper motor for control of the flap position. Ram effect air is compensated for.
- **Air conditioning:** The request for air conditioning is made by means of a push button.

The IHKR control module communicates with the DME via the K-Bus/KOMBI/CAN Bus link to request permission for compressor activation. The control of the compressor clutch is directly by the IHKA module via a final stage.

- **Rear Window Defroster:** The rear window defroster is controlled via a request from the button on the panel. After switching on for the first time, the rear window is heated for 10 minutes. Output voltage to the window is provided by the K13 rear defogger relay. After automatic switch off, if the button is pressed once again the control unit will provide a clocked operation alternating at 40 seconds on and 80 seconds off. If the vehicle voltage drops below 11.4V during this second heating operation the function is stopped, however the LED on the button will not be extinguished. If voltage increases past 12.2V for at least one second, clocked operation will resume. Clocked operation continues until the button is pressed again or the ignition is cycled.
- **Washer Jet Heating:** The IHKR provides operating current to the washer jet heaters based on outside temperature. The washer jets are heated below an outside temperature of 37° F.
- **K-Bus Communication:** The IHKR control unit is on the vehicle K-bus and receives and sends information concerning:
  - Engine temperature, RPM, KL61, KL50, compressor request, auxiliary fan request, compressor load (DME)
  - Outside temperature KL15 and road speed (KOMBI)
  - Diagnosis and coding (DIS/MoDiC)



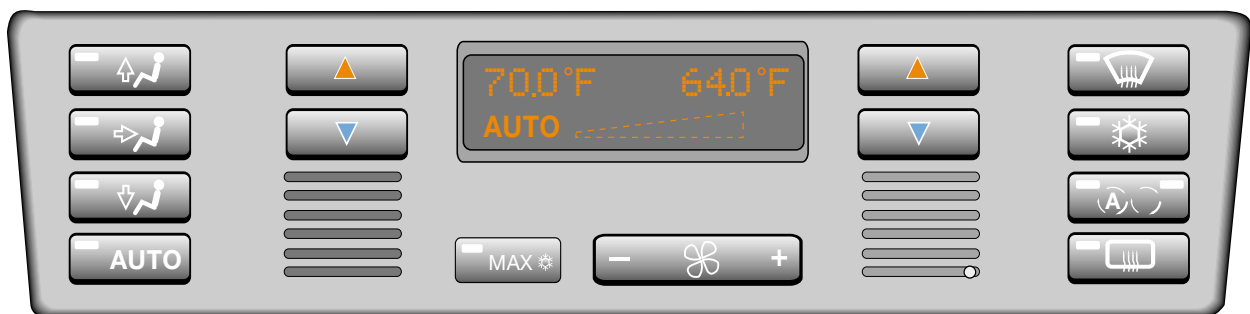


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## IHKA IV

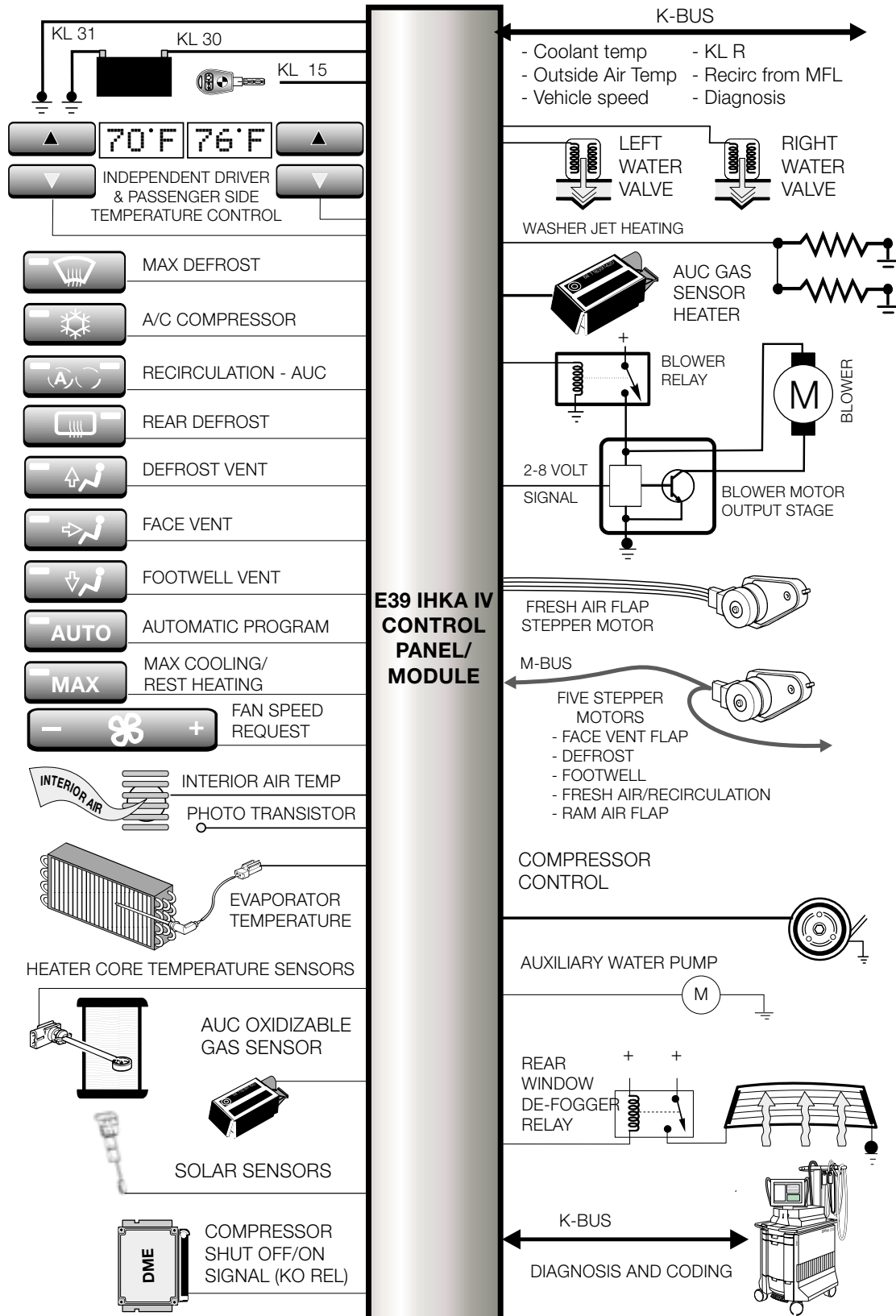
The IHKA system is standard equipment on 530i, 540i/it and M5 models. It is available as an option for the 525i/it. IHKA has been redesigned for the 2001 E39, it is identified as IHKA IV. The carry over features from the previous version are:

- Integrated control panel/module.
- Separate temperature control for driver and passenger.
- Air distribution control through the use of 5 “smart” stepper motors and one fast acting hard wired stepper motor.
- Automatic recirculation control (AUC).
- Recirculation control via MFL.
- “Rest” function for residual heat when engine is not running.
- Service station feature that closes the water valves when stopped to prevent hot coolant flooding the heater core.
- A/C compressor clutch activation via a final stage control.
- Stratification flap control via a bowden cable.



Please refer to the Climate Control course material ST 054 for a complete functional description of E39 IHKA

## E39 IHKA IV I.P.O.



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## Changes made to the E39 IHKA

- New Control Unit (since 9/00).
- Addition of solar sensor (since 9/00).
- New IHKA integrated heater and air conditioning case (since 3/00).

### IHKA IV Control Unit

The "REST" button on the control unit has been replaced with a "MAX" button. Two different functions are carried out by pushing the MAX button:

- Maximum cooling function
- Residual heat function

Determination of which function will be enabled is based on switching criteria.



### A/C MAX function

**(This feature was introduced in the E38 since 9/99)**

Maximum cooling performance is automatically activated by pressing the MAX button. An LED on the button illuminates to indicate that the function is active.

Criteria for operation:

Terminal 15 "on" , MAX button pressed and outside temperature above 60° F.

The following settings are adjusted or activated:

- Temperature control is canceled and the temperature display indicates 60° F.
- Both water valves are closed.
- The left and right Y-factors are set to -27.5%.
- The compressor is switched on (LED turns on in the A/C switch).
- The blower setting is set to maximum.
- Recirculation is activated (LED turns on in the re-circ switch).
- Air distribution is set to center vents only.

Operation of the max defrost is overridden by selecting MAX. The operation of the rear window defogger is not affected.

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## REST Function

The REST function continues to operate as usual except that the MAX button has taken the place of the REST button. Activation criteria continues to be:

- Ignition "OFF" or in KL R.
- "MAX" button pressed.
- Outside temperature below 60° F.
- Coolant temperature above 80° C.
- Battery voltage above 11.4V.

The REST feature operates as previously.

## Diagnostics

The IHKA IV diagnosis has been upgraded to the E46 style diagnostic program.

## Solar Sensor

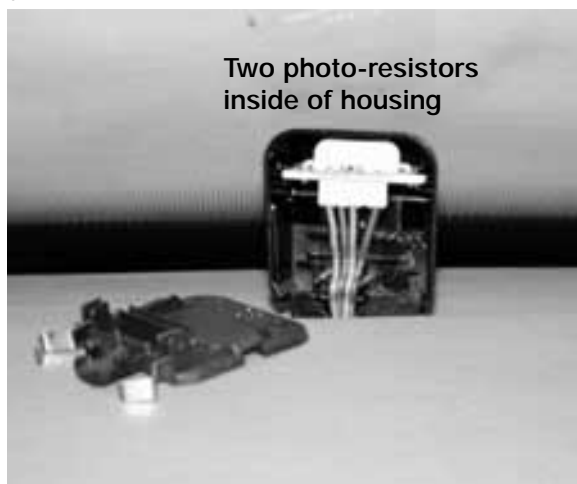
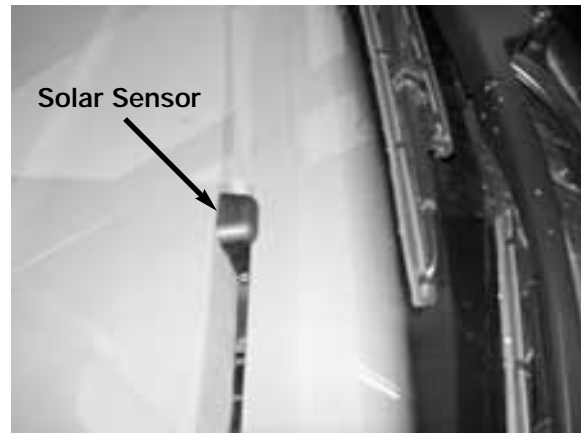
The IHKA IV integrates the solar sensor into the calculation used to automatically regulate the interior vehicle temperature. The sensor is located in the right side defrost outlet.

In the case of a very sunny day, the interior warms faster than the control unit can compensate for. Similar is true if the weather suddenly becomes overcast.

The input of the solar sensor in the E39 can affect the operation of:

- Blower setting
- Air distribution to center vent

Because the E39 IHKA IV is a dual zone system, the solar sensor housing contains two photo-resistors that measure solar radiation on the left and right halves of the interior.



(Please refer to the Solar Sensor module in the 2000 Systems Diagnosis training course ST 039 for a complete description of the solar sensor operation and diagnosis)

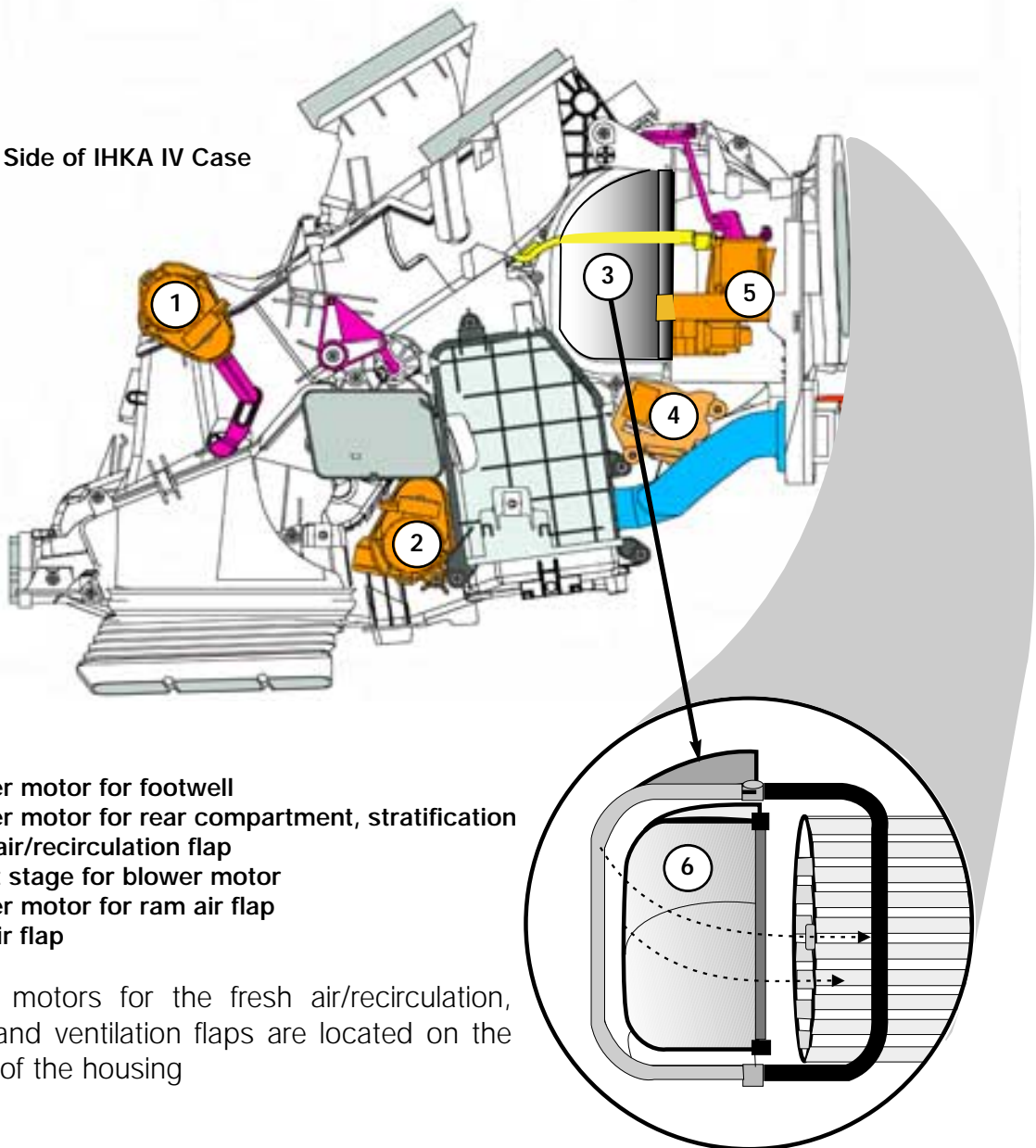
## IHKA integrated heater and air conditioning case

The E39 IHKA case has been redesigned since 3/00. The E39 and E53 both share the same case design.

The difference from the previous case is that a single flap (left and right), controls both the fresh air and recirculation inlets. Ram air is controlled by a separate flap. What makes it possible to use a single flap for fresh air/re-circ is the semi-circular door; as one inlet is covered another is opened.

Please refer to the Climate Control course material ST 054 for a complete functional description of ram air pressure compensation.

Right Side of IHKA IV Case



Stepper motors for the fresh air/recirculation, defrost and ventilation flaps are located on the left side of the housing

Ram air and fresh air/re-circ flaps as seen from the engine side of the bulkhead

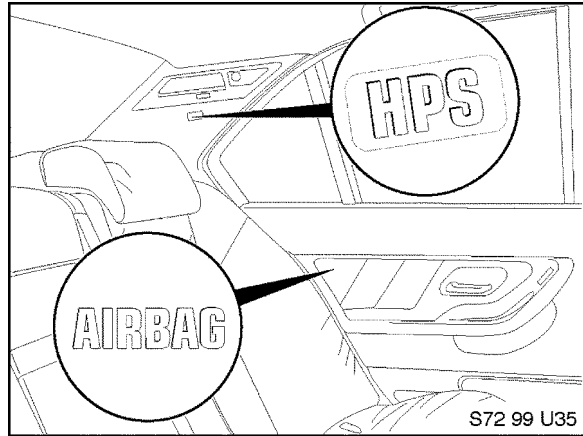
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## E39 Rear Head Protection System (HPS)

For 2001, rear head protection airbags (HPS) will be available for sedans ordered with rear side airbags.

The airbags are a cushion (not an ITS) that is deployed from the C-pillar. The HPS will **not** be de-activated along with the side airbags from the factory since there is no danger to small children sitting out of position.

A vehicle with rear HPS can be identified by observing "HPS" embossed in the C-pillar cover.



Rear airbags with HPS will be standard equipment on the 2001 E39 M5.

## Review Questions

1. What addition was made to the 16 pin OBD connector that made diagnosis possible with the DIS/MoDiC? \_\_\_\_\_

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2. Describe the procedure to reset the Service Interval Indicator from the instrument cluster. \_\_\_\_\_

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3. How does the E39 IHKR system maintain the desired cabin temperature? \_\_\_\_\_

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4. Was the "REST" feature deleted from the IHKA IV system? \_\_\_\_\_

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5. What was the addition made to the rear airbag system of the 2001 E39? \_\_\_\_\_

\_\_\_\_\_