Reference Manual

E83
LIFE CYCLE IMPULSE

Technical Training

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E83 Life Cycle Impulse (LCI)

Initial Print Date: 09/06 Revision Date:

E83 Life Cycle Impulse

Model: E83 X3 3.0si

Production: from August 2006

OBJECTIVES

After completion of this module you will be able to:

- Identify the changes made to the E83 X3 LCI

Introduction

The BMW X3 has been available on the market as of the 2004 model year and represents a premium product in the segment of compact luxury SUVs.

As of August 2006 production, the E83 will undergo a redesign in order to maintain its leading position in the market and to fend off the ever increasing number of competitors.

This model redesign, known as LCI (Life Cycle Impulse), includes a pronounced visual upgrade, the introduction of new engines as well as a whole series of improvements in details as well as in the range of interior trim and fittings.

As of September 2006, the E83 X3 3.0i with M54B30 (170 kW/231 bhp) will be replaced with the X3 3.0si with N52B30O1 (191 kW/260 bhp).

Body

Bodyshell

The only technical change is to the openings for the reversing lights in the inner panel of the rear hatch. Due to the higher positioning of these lights, it was also necessary to displace the clearance for their bulbs further upward.

The carrier, sheet metal components and assembly concept remain unchanged. Only the underbody paneling has been adapted to the new engines as part of the model redesign. Modifications to the bodyshell components are solely restricted to details such as the repositioning of threaded connections, pins or securing elements for the adapted wiring harnesses.

All parts of the bodyshell (hood/tailgate, side panels, doors, sills and weatherstrips) remain unchanged. The same also applies to the body connection points.

Front

The redesigned E83 can be immediately distinguished from its predecessor by the partly painted bumpers and the double kidney grill that extends further downward.

The newly designed front bumper which was previously two-piece is now three pieces. A top section painted in the car color and a bottom cover that is also painted are now clipped onto the black-structured, bolted carrier. These painted parts can be individually replaced as required by removing the complete bumper.

Front view - Left: E83 up to 8/06, Right: E83 LCI

The kidney grills now extend further downward is available only with light titanium bars.

The grill between the double kidney and bumper as well as the lower grill are black on all vehicles.

Rear
The rear bumper on the E83 LCI is also a new design. It is now made up of four main parts (previously one-piece). Two black side panels and one exhaust finisher also in black are fitted on a carrier painted in the car color.

In the same way as the front bumper, the rear bumper can also be dismantled for repairs and paint work (after disassembly).

Two separate reflectors are clipped on to the left and right of the exhaust finisher.

The PCD sensors of the rear bumper are located in the painted area and are therefore painted in the car color (unchanged black at the front).

The panel at the lower edge of the rear hatch is now also painted in the car color, thus making a decisive contribution to the overall higher grade impression of the X3's rear end.

Vehicle Exterior Lighting

Headlights
The front headlights retain their outer contour and connection points. However, vehicles with halogen headlights are now equipped with new open-design segments for high beam and low beam reflector. The tube body, cover frame and housing are new. In addition, vehicles with bi-xenon lights now have lights with four light coronas (previously two).

The previous headlight washer system with free-standing water jets has now been replaced by a system with retractable washer jets.

Fog Lights
The new fog lights for the X3 have been modified.

A new cornering light function has been added. This function is controlled by means of signals from the direction indicator and steering angle sensor. When turning, the respective fog light is switched on thus optimally illuminating the turn-off area.

Turn Indicators
The design of the front direction indicator lights has been slightly modified in the same way as the side repeater lights which are white. The vehicle is additionally equipped with side markers.

Taillights

The tail lights have also undergone a facelift. A new chamber arrangement (reversing lights now further up) as well as the use of active light guides for the tail light function (instead of the previous bulbs) give the rear end of the X3 a modern appearance.

The lights on the side panels retain their outer contour and connection points while the contour of the lights on the rear hatch have been modified.

Rear view - Left: E83 up to 8/06, Right: E83 LCI

Interior Design

Cockpit
The dashboard has been upgraded by numerous details. The instrument cluster shroud (previously attached) provides for a wider color separation groove and a more harmonious general impression. The dashboard, shroud, and airbag cover also have a new structure finish.

The cover of the glove compartment is positioned slightly lower.

The trim covers for the fresh air grills, the light switch cluster and the cup holder are now coated with soft paint (three different colors - depending on interior color).

Both the basic steering wheel as well as the sports steering wheel now feature a new steering wheel rim and a new cover.

In addition, the sports steering wheel features new spokes and a new backing. Both steering wheels have 3 spokes, the previous 4-spoke basic steering wheel is no longer available.

As in other model series, the interior rear-view mirror in the E83 is available with a digital compass.

Cockpit - Left: E83 up to 8/06, Right: E83 LCI

Door Panels

The door mirrors have also been distinctly upgraded by new surface structuring and geometry. The connection to the dashboard has been improved while the trim covers for the speakers are now larger due to the installation of new speakers.

Storage compartment shelves integrated in the door trim panel replace the previous netshell combination. The finishers for the power window switches are now smaller.

Door trim panel - Left: E83 up to 8/06, Right: E83 LCI

Rear Seat

Modifications to the foam material in the seat and the seat cover of the rear bench seat have raised the front edge by 30 mm thus improving the seating comfort in the rear. A seat heating system will be additionally offered for the rear seat.

Drivetrain

N52 Engine

The N52 engine first offered in the E90 will be reengineered for the September 2006 launch and will then be known as the N52K. The exact engine designation will N52B30O1.

Compared to the M54 6-cylinder engine previously fitted in the E83, the N52K is characterized by lower fuel consumption (12% reduction), reduced weight (10 kg less), 35 hp (30 kW) increase in power output and an increase of 11 lb ft torque.

The exhaust manifold has been slightly adapted to match the geometry of the E83.

The same also applies to the oil pan with modified underbody area and threaded connection to the front axle.

The shape of the engine support has been modified to accept the N52. The power steering oil reservoir is now mounted on the screw connection for the alternator instead of on the frame side member as previously.

Intake Air Duct
For the first time at BMW, the intake silencer is a fixed part in the engine. The unfiltered air duct is crash-optimized. An unfiltered air resonator and a time chamber filtered air resonator are used in order to satisfy acoustics requirements.

Digital Engine Electronics (DME)

The engine management MSV80 is used in connection with the N52K. This system is a further development of the MSV70 and has been adapted in terms of several details.

Exhaust System

For acoustics reasons, the exhaust system is now mounted at the level of the transfer case instead of at the engine support as previously.

Note: For detailed information on this engine please refer to the ST613 “2007 NG6 Engines” technical training manual.

Gearbox

6-speed Manual Transmission

The synchromesh of the gearshift mechanism has been newly developed to provide outstanding gearshift comfort both at low as well as elevated shift forces.

1st/2nd gearshift now takes place in double cone synchromesh and single-cone synchromesh for 3rd/4th and 5th/6th gear.

A central selector valve connects the gearshift with a shift gate on the inside for the first time. Another new feature is the passive shift lock that guarantees distinctly greater locking reliability in addition to further optimized smoothness of operation.

The pressure diecast aluminum transmission casing is of 2-piece design similar to that of the 5-speed manual transmission.

6-speed Automatic Transmission GM6 (6L45)

The new automatic transmission GM6 replaces the previous transmission GM5 in the E83. As indicated by its designation, the transmission has 6 forward drive ranges (GM5: 5).

The spread and gear ratio are virtually identical to the GM5.

The power transmission capacity of the transmission weighing 170lbs (76.9 kg), including oil, is 258 lb ft (350 Nm). Its main advantages include a 6 % reduction in fuel consumption and improved gearshift dynamics.

The lower fuel consumption results from the use of the so-called neutral idle control (NIC), low converter slip thanks to the use of a turbine-torsion damper as well as reduced drag losses in the clutches.

The structure of the transmission generally corresponds to that of the 6HP19. The main difference in the GM6 is a one-way clutch to ensure stable shift quality when shifting from 1st to 2nd. Thanks to their high drive percentage with the clutch engaged, converters with turbine-torsion dampers provide a direct connection to the engine.

The transmission control unit is accommodated together with the hydraulic control unit in the transmission (mechatronics concept). This arrangement provides advantages in terms of package space and, due to the smaller number of interfaces, it also ensures increased system reliability.

Running Gear

Rear Axle Differential (final drive)

A new final drive unit (L-axle drive) has been developed to improve the efficiency of the final drive for the X3. The final drive has adopted the new bearing concept from the BMW 3 Series together with the new double angular contact ball bearings. This results in a considerable reduction in the operating temperature of the final drive, having a positive effect on operation and service life.

At the same time, oil flow losses have been substantially reduced while adapting and optimizing the efficiency of the gearing in terms of the displacement characteristics.

The torque capacities of the final drive units HAG168L and HAG188L have been increased by 10 % making these final drive units heavier. For acoustics reasons, their casings are still made from spheroidal cast iron.

The table below identifies the differential usage and ratio by vehicle equipment options:

Model/equipment	Differential (ratio)
X3 3.0si manual	HAG188L (3.73 :1)
X3 3.0si automatic	HAG168L (4.44:1)

Two-stage Disc-type Vibration Absorber

For effective acoustic decoupling of the drive train, a two-stage disc-type vibration absorber is fitted between the propeller shaft and transfer case that becomes harder as the applied torque increases.

Chassis

Various modifications to the chassis of the E83 have been necessary to accommodate the higher performance N52K engine. Most of these modifications, however, are restricted to geometric adaptations (steering system and heat shields).

Mounts

The engine and transmission mounts are new.

DXC+

The driving dynamics system DXC+ in the E83 features additional functions.

In addition to the known features such as ABS, ASC, CBC, DSC and HDC, the following will be added:

- Dynamic Traction Control (DTC) for ensuring maximum traction irrespective of the driving surface
- Hill starting assistance (Hill-holder)
- Dry brakes in rain
- Brake standby/brake travel reduction
- Brake fading assistance

RDC
All E83 vehicles will be equipped with the tire pressure monitoring system RDC which was introduced in March 2006.

Power Steering Cooling

The DSC control unit has an additional program module for the power steering cooling. This function increases the fan speed to secure the required cooling capacity under high load conditions (e.g. uphill/downhill driving) at low speed. The signals relating to the driving speed, power output (via HFM) and steering angle lock are used as the control data for this purpose.

Electrical Systems

EWS 4.4

The E83 will be equipped with the EWS 4.4 already known from other model series. Thanks to improved logic of the vehicle immobilizer, this electronic control provides increased anti-theft protection, resulting in a more favorable insurance classification of the E83.

Lights Module 2

The lights module 2 replaces the previous light switch cluster in the E83 LCI; it combines its functionality with that of the AHL control unit.

Rear Seat Heating

Rear seat heating will be offered in all X3 models.

Oil Level Indicator

The oil level indicator is now integrated in the instrument cluster.

Radio, CD

The new radio platform of all E83 features a double tuner and station list expansion.

An AUX-In jack is provided on the center console for the connection of external audio sources.

The Random function in the CD changer now only refers to the selected CD and no longer to all (up to six) CDs in the magazine of the changer. This reduced number of selection options substantially shortens the pauses between the music tracks.

Navigation

The computer hardware is now lead-free and therefore recyclable.

Specifications

	X3 3.0si
Engine	N52B30O1
Type/cylinders/valves	In-line 6/4
Displacement (ccm)	2996
Stroke/bore (mm)	85
Power output (kW/bhp)	260
At engine speed (rpm)	6600
Torque (Nm)	305
At engine speed (rpm)	2500
Governed engine speed (rpm)	6800
Compression ratio	10.7 : 1
Engine electronics	MSV80
Engine weight (kg)	165
Emission stage	ULEV II
Rims	*
Tires	*
Battery (Ah)	70
Alternator (A/W)	150/2100
Payload (kg)	520
Performance: 0 - 60 mph	Auto 7.1 sec Man 6.9 sec

* Value not available when going to print