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M Model Updates

Model: E60 M5 & E63/E64 M6

Production: From 3/2007 Production

OBJECTIVES

After completion of this module you will be able to:

- Understand and be able to explain the automatic soft close function
- Identify and locate the components used in the soft close function
- Explain the benefits of using diplexers/crossovers in the audio system
- Identify and locate the components used in the BMW Enhanced Premium Sound System.

Automatic Soft Close Function

Introduction

The E60 M5 and E63/E64 M6 will be equipped with the automatic soft close function on the doors as option 323 and will be available from March 2007 production.

The automatic soft close function requires the installation of suitable door locks with drives for automatic soft close (SCA drives).

The particular feature of this automatic soft close function is that the door lock and the automatic soft close drive are no longer a single unit, as was previously the case. The automatic soft close function drive is separate and controls the door lock by way of a bowden cable.

This means that the lock and the drive can be fitted separately and the installation space available can be used to the best effect.

If the automatic soft close option is ordered, it is installed on all the doors on the vehicle.

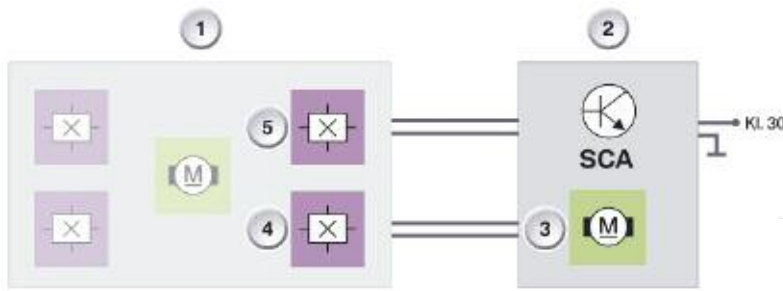
The benefit of the automatic soft close function is that the doors only have to be pushed or pulled lightly into the lock. This action starts the automatic soft close function which closes the doors fully.



Principles of Operation

The automatic soft close function is an independent (stand-alone) function. The only connection to the car's electrical system is terminal 30g and the earth connection. The automatic soft close function is ready for use from "terminal 30g ON".

Automatic Soft Close Function Circuit Diagram



Index	Explanation	Index	Explanation
1	Lock in the vehicle door	4	Locking pawl Hall sensor
2	Automatic soft close function drive	5	Rotary striker Hall sensor
3	Automatic soft close function drive motor		

The electronics for controlling and monitoring the function are located in the automatic soft close function drive.

The sensors for the automatic soft close function are Hall sensors and are found in the lock. The Hall sensors are built into the lock of each vehicle door. One Hall sensor is for the locking pawl, the other for the rotary striker.

The automatic soft close function analysis the status of the Hall sensors. The automatic soft close function drives are activated or moved back to their starting position, depending on their current status.

The automatic soft close function drive is connected to lock by way of a Bowden cable and a 4 wire cable.

Automatic Soft Close Function Drive Locations



Index	Explanation	Index	Explanation
1	Lock for driver's side rear door	3	Lock for driver's side door
2	Drive for automatic soft close function in driver's side rear door	4	Drive for automatic soft close function in driver's side door

Locking Procedure

(When door is pushed into the lock starting position)

Door open, the automatic soft close function is in the standby position.

When the door is closed normally, first the locking pawl (lock) Hall sensor changes its status. The electronics in the automatic soft close function drive start the door closing operation after a delay of 200 ms. This prevents the automatic soft close function drive starting before the lock bolt is located in the rotary striker.

The drive operates the rotary striker by way of the Bowden cable until the Hall sensor for the rotary striker changes its status. The locking pawl is then engaged and secured in the rotary striker. Control over the automatic soft close function drive is then withdrawn and the automatic soft close function drive moves to the parked position.

When the door is opened using the outside door handle (bow handle) or inside door handle, the system runs back to its original position. This is also known as the standby position.

Note: Only when the rotary striker sensor has changed its status is the rotary striker mechanically locked by the locking pawl. This is particularly important, as only then is it guaranteed that the door is truly closed.

■ Closing the Door by Slamming

Slamming the door would make closing with the automatic soft close function drive unnecessary. Since it must, however, be ensured that the door is truly locked, the automatic soft close function drive is nevertheless still operated for safety reasons.

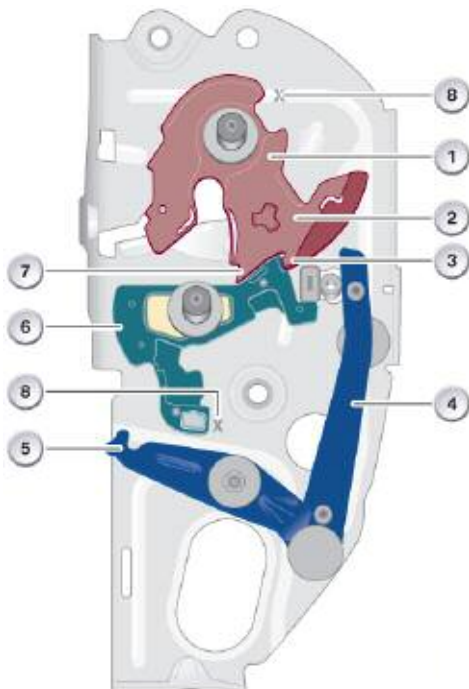
The electronics in the automatic soft close function drive detect the slamming of the door by the fact that the Hall sensors in the locking pawl and the rotary striker have changed their status within a brief period.

■ Anti-repeat Circuit

Every automatic soft close function drive has an anti-repeat circuit to prevent overheating of the automatic soft close function drive. It permits 15 operations (counter incremented up to 15 times) of the control for the automatic soft close function drive.

The automatic soft close function drive is then locked electrically for approximately 2 minutes.

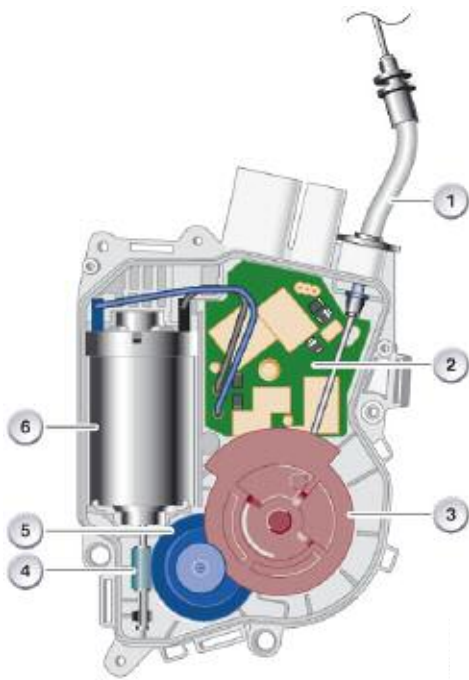
■ Design of the Lock and Drive



Index	Explanation
1	Rotary striker
2	Rotary striker pull pawl
3	Advance detent tooth for rotary striker
4	Drive pawl
5	Automatic soft close function drive actuating lever
6	Locking pawl
7	Rotary striker main detent tooth
8	Hall sensor installation locations

Light closing causes the advance detent tooth (3) of the rotary striker (1) to engage on the locking pawl (6). The automatic soft close function drive pulls on the actuating lever (5).

The actuating lever rotates the rotary striker by means of the pull latch (4) until it is rotated over the main detent tooth (7). The locking pawl can now engage in the main detent tooth of the rotary striker. The rotary striker is thus secured and the lock can no longer



Index	Explanation
1	Bowden cable
2	Control electronics
3	Bowden cable drive wheel
4	Drive worm
5	Idler gear
6	Drive motor

The automatic soft close function drive motor (6) has a two-start worm (4) on its shaft. This permits drive in the CLOSE direction for the automatic soft close function. The rotary motion of the drive worm is transferred to the driven wheel (3) by the idler gear (5). The drive gear transfers the rotary motion to the Bowden cable (1). This means that the actuating lever in the lock is pulled by the Bowden cable and thus the vehicle door is fully closed.

Service Information

The lock and the automatic soft close function drive are a closed unit (modular). This means that a faulty lock or automatic soft close function drive cannot be replaced individually.

Opening the drive, for instance, destroys it, and perfect operation is no longer guaranteed. The automatic soft close function drive is inseparably fastened to the lock. Only the lock and the automatic soft close function drive can only be ordered as a spare part together.

Note: There is no diagnostic function for the automatic soft close function drive in the diagnostics system. Retrofitting the automatic soft close function is only possible with great effort and is thus not foreseen.

BMW Enhanced Premium Sound System

The BMW Enhanced Premium Sound System (SA 752) positioned over the Top-HiFi system will be offered in the vehicles of the E60 M5, E63 M6 model series as from March 2007.

The sound system consists of 16 speakers (7x tweeter, 7x mid-range speaker, 2x central bass supplied by LPG) in connection with the high-end audio amplifier manufactured by Lear).

The 4 speakers in the rear window shelf will not be installed on the E64 M6 convertible. This model will receive only 12 speakers.

The systems differ in terms of the speakers and their installation locations. A special feature of the BMW Enhanced Premium Sound System (SA 752) is the frequency diplexers/crossovers (supplied by LPG) installed in the two front doors.

They separate the high and medium range much more accurately and with better sound results than when using an individual capacitor as in the Top-HiFi system; SA 677.



Due to space limitations, the frequency diplexers/crossovers are installed only in the front doors. A capacitor is used as the frequency diplexer for all other mid-range speakers and tweeters.



Frequency Diplexer/Crossover in the front door