



Passenger Car Seats

Design • Function • Care • Complaints

Service Technology Guide



Mercedes-Benz

Passenger Car Seats

Design • Function • Care • Complaints

Service Technology Guide

Ordering Workshop Information

All printed workshop information from GSP/TI, such as Introduction into Service Manuals, System Descriptions, Function Descriptions, Technology Guides, Technical Data Manuals and adhesive labels, can be ordered as follows:

In Germany

Through our GSP/TI Shop on the Internet

Link: <http://gsp-ti-shop.daimler.com>

or alternatively

Email: customer.support@daimler.com

Phone: +49-(0)18 05/0 10-79 79

Fax: +49-(0)18 05/0 10-79 78

Outside Germany

Please get in touch with the contact person responsible for your market.

Product Portfolio

Comprehensive information about our full Product Portfolio can also be found at our Internet Portal.

Link: <http://open-after-sales.daimler.com>

Questions and Suggestions

If you have any questions or suggestions concerning this product, please write to us.

Email: customer.support@daimler.com

Fax: +49-(0)18 05/0 10-79 78

or alternatively

Address: Daimler AG

GSP/TIS

HPC R822, W002

D-70546 Stuttgart

© 2007 by Daimler AG

This document, including all its parts, is protected by copyright. Any further processing or use requires the previous written consent of Daimler AG, Department GSP/TIS, HPC R822, W002, D-70546 Stuttgart. This applies in particular to reproduction, distribution, alteration, translation, microfilming and storage and/or processing in electronic systems, including databases and online services.

Image no. of title image: P00.01-3508-00

Order no. of this publication: 6516 1354 02

Preface	5
---------	---

Introduction

Knowledge base	6
----------------	---

General seat information

Seat bolster design	7
Seat cover types	8
Leather covers	11

Upholstery

General	14
Group 1	16
Group 2	18
Group 3	20

Care and cleaning

Seat covers	22
Cleaning agents	24
Equipment matrix	26

Overview of functions

Comfort systems	34
-----------------	----

Seat fault profiles

Noises, general	38
Noise kit	39
Combined Fixed-First-Visit measures	40
Noises	47
Creases	54
Malfunctions	56
Air pressure	61
Seat cover	63

Special tools

Seat covers	65
Seat frame/seat inflators	66

Abbreviations	67
---------------	----

Index	68
-------	----



Dear Reader,

In recent years, the variety of seats in Mercedes-Benz passenger cars has increased continuously. Furthermore, due to the high level of networking between mechanical, electrical and pneumatic components, the effect of external influences and the effect of subjective customer sensations, vehicle seats represent a complex vehicle system.

From feedback received from our service operations we have discovered that the existing media, such as the Introduction into Service manuals, Star Diagnosis, WIS and TIPS, are not sufficient to practically equip you, the **service adviser** or **mechanic** to meet this challenge.

For this reason, we have compiled a guide containing the most important aids for your work as a service adviser or mechanic with the assistance of specialists from service (product support and diagnosis) and development and with support from experienced mechanics from various service operations. This guide is not intended to replace the existing media; it merely links and supplements the existing information at important points. The Workshop Information System (WIS) and TIPS documents are available as usual as a source of basic documentation.

The guide is intended to be a practical medium providing you with all the essentials necessary for quick and effective diagnosis during reception and in the workshop, and for successful repairs.

We hope that this publication will be actively employed and will be able to contribute significantly to the success of your work.

Yours, Bernd-Rüdiger Heinisch

Daimler AG
After-Sales-Technik Interieur (GSP/TPI)

Note

All information was correct as of the copy deadline in August 2007 and may therefore vary from more up-to-date sources.

Knowledge base

Seat components

The picture below provides an overview of the many components incorporated in a modern seat from Mercedes-Benz (example shows a dynamic seat from model 221).



Design of dynamic seat (driver seat, model 221)

P91.10-3209-00

- | | |
|--|---|
| 1 Seat frame | 13 Seat cushion padding |
| 2 Backrest frame | 14 Backrest padding |
| 3 Electric wiring harness | 15 MCS/DS inserts/seat cushion module carrier |
| 4 Dynamic seat control unit | 16 MCS/DS inserts/backrest module carrier |
| 5 Seat control unit bracket | 17 Seat cushion cover |
| 6 Head restraint drive | 18 Backrest cover |
| 7 Seat belt buckle with pyrotechnical emergency tensioning retractor | 19 Rear seat-back lining (backrest) |
| 8 Sidebag unit | 20 Head restraint with guides |
| 9 Seat cushion ventilation motor group | 21 Rear entertainment |
| 10 Backrest ventilation motor group | 22 Stowage compartment with fire extinguisher |
| 11 Blower regulator | 23 Seat trim |
| 12 Backrest frame sides | |

Components

The picture below shows the composition of the upholstery structure using the dynamic seat of model 221 as an example.

The seat upholstery is made up of layers and materials which perform the following tasks:

- The backrest padding and seat cushion padding serve to pad and shape the seat and also act as an intermediate seat layer to improve seat comfort. The spacer fabric ensures that the air circulates properly on vehicles with active ventilation.
- The cut foam primarily serves to improve both the break-in characteristics and surface softness of the seat.
- The PES non-woven cloth also provides added softness and break-in comfort.
- The cushion cover is the final layer of the upholstery structure and serves as a design element.



Dynamic seat (model 221)

P91.10-3210-00

- 1 Backrest padding
- 2 Cushion padding
- 3 Spacer fabric

- 4 Cut foam
- 5 PES non-woven cloth with or without seat heater
- 6 Cushion cover

Seat cover types

Basic variants

The seat cover types are subdivided into the following four basic variants:

- Fabric covers
- Alcantara covers (textile fabric)
- Imitation leather covers
- Genuine leather covers

The seat covers can be ordered in various color combinations and material variants e.g. fabric combined with genuine leather or imitation leather combined with Alcantara (with both materials in different colors).

The availability of the different cover and color variants depends on the vehicle model and equipment/line.

Examples of the different surfaces and leather grains are shown in enlarged format on the following page to illustrate the differences between the seat cover materials.

i Note

See the equipment matrix in the "Care and cleaning" chapter for information about the various seat cover equipment variants in the different vehicle models and for care and cleaning tips.



P91.00-2225-00

Fabric



P91.00-2226-00

Imitation leather



P91.00-2227-00

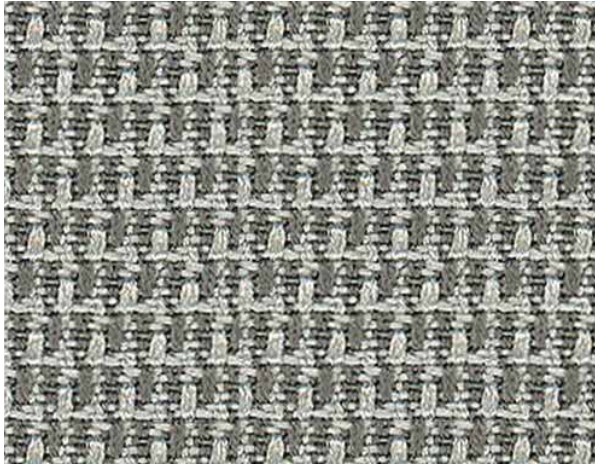
Alcantara (textile fabric)



P91.00-2228-00

Genuine leather

Surfaces and grain types



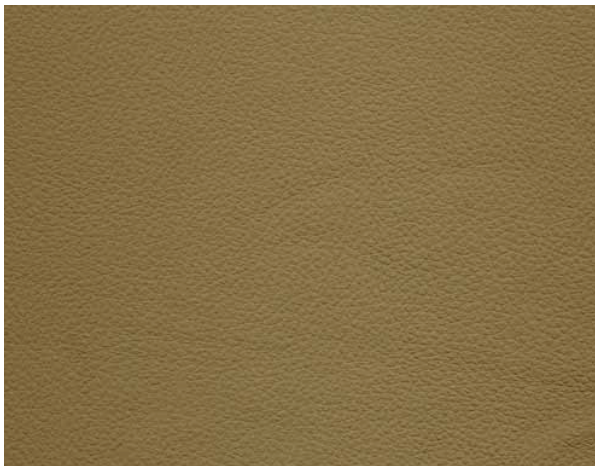
P91.00-2229-00

Cube fabric



P91.00-2230-00

Alcantara (textile fabric)



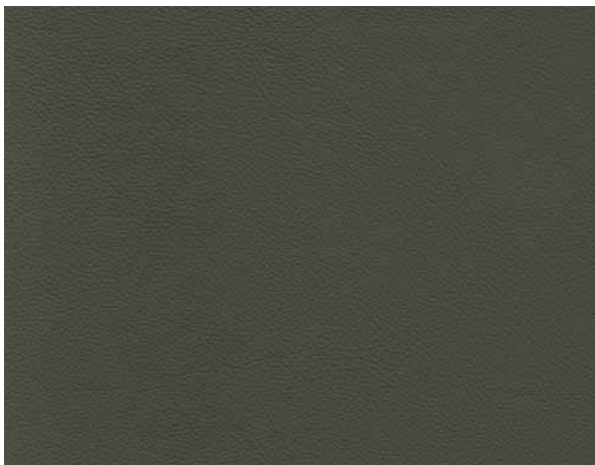
P91.00-2231-00

Artico leather (imitation leather)



P91.00-2232-00

Catania leather (genuine leather)



P91.00-2233-00

Nappa Exclusive leather (genuine leather)



P91.00-2234-00

Lugano leather (genuine leather)

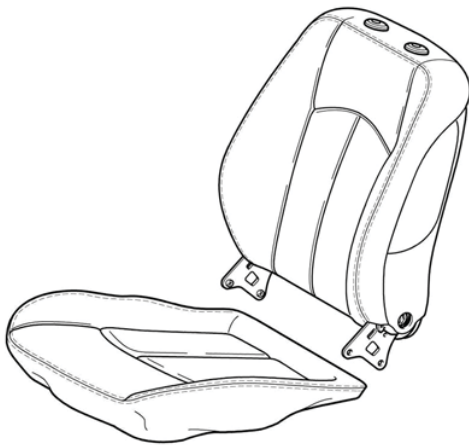
Seat cover types

Seams and attachment patterns

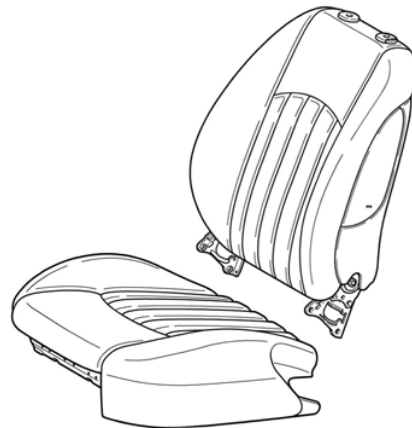
The following pictures show a small selection of the range of upholstery seam variants installed throughout the different Mercedes-Benz model series.

Seat covers are generally differentiated based on whether they primarily feature vertical upholstery seams or horizontal upholstery seams.

The range of different variants is supplemented by additional decorative seams which are through-sewn into the seat cover in a fluted style e.g. on model 219 (top right picture).



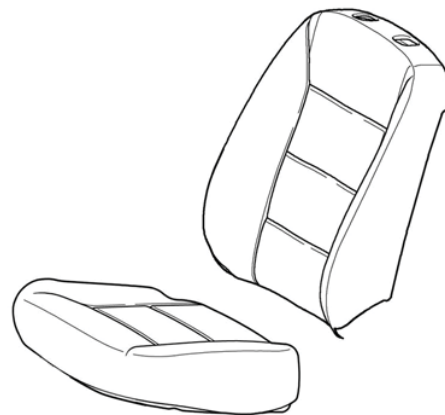
Example of vertical attachment



P91.00-2235-00



Example of horizontal attachment



P91.00-2236-00

Leather processing

By choosing a vehicle with leather-covered seats, the customer has opted for a high quality, exclusive product. Leather is a natural product. Every leather covering is unique:

- Leather is a hard-wearing and durable natural product.
- It has unmistakable, distinctive characteristics.
- It is soft to the touch, warm and protective.
- It is breathable, hygienic and ecologically sound.

In order to meet present market requirements, automotive leather is also adapted to current trends. Along with dark and subtle colors, brighter colors are also currently popular.

By combining traditional leather production methods with the latest technology, it is today possible to achieve exceptional quality and environmental compatibility throughout the value chain. The choice of cattle hides is influenced by important factors. These include the breed, climate, species, age and whether the cattle are kept on pasture or in barns.

The process of creating a finished leather cover from a cattle hide takes several days. The hides are first graded after the tanning process. Tanning is the process whereby a raw hide is made into leather. The hide structure is stabilized and made resistant by adding tanning agents. It is especially important for automotive leather to be highly resilient because it is must be able to withstand extreme temperature fluctuations and usage.

The classification process after tanning determines at an early stage how the leather will be used e.g. whether it will be processed into natural leather or corrected-grain leather.

To ensure that the high Mercedes-Benz quality standards are met, all cattle hides are subjected to an intensive quality check after each step of the leather production process. In addition, all Mercedes-Benz leather covers are dyed through.

Leather covers

Leather – quality zones

The finished leather is then sent to the cutting plant for the individual pre-cut parts to be produced. Strict requirements apply to the finished product during the cutting process. The natural characteristics of the hide (e.g. grain, growth marks, insect bites) are used to classify the leather into different zones based on a catalog of leather characteristics. This classification and the seat cover zones defined by the operating departments form the basis of the cutting process. The seat is divided into areas based on their visibility on a scale ranging from directly visible to not directly visible.

Quality zone A

These are the directly visible areas. The different natural characteristics must not be conspicuous at a distance of 50 cm.

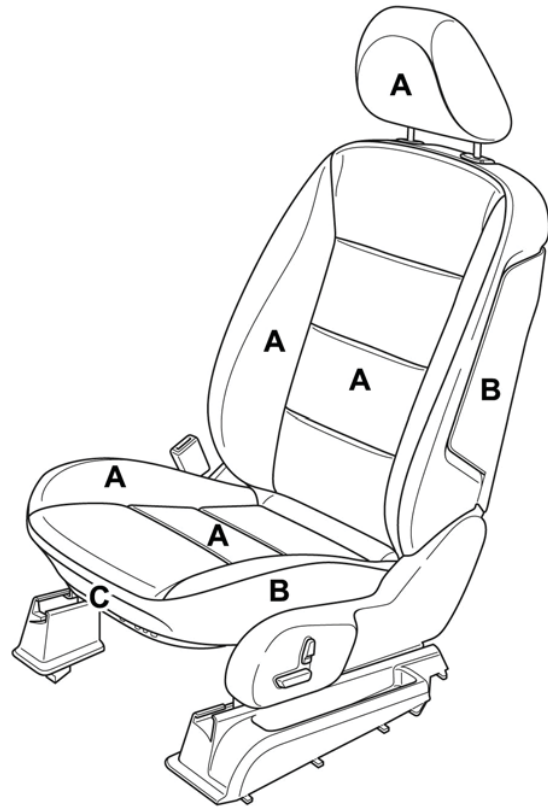
Quality zone B

These are the areas which are only visible to a limited extent and the visible areas where the leather parts are perforated. The natural characteristics must not be conspicuous during normal vehicle usage.

Quality zone C

These are the areas which are not directly visible.

The pre-cut leather parts are manually processed into covers in the sewing works and then upholstered into complete seats.



Seat quality zones

P91.10-3232-00

Leather seats in use – Complaints

There are differences in seat design within model series. For example, the seats will have a different appearance depending on the seat shape, attachment patterns and vehicle mileage. It is therefore important to consider every customer complaint individually.

Usage

The appearance of a seat is significantly influenced by how the individual seat is used by the customer. This means that there can be obvious visual differences between areas subject to heavy usage (e.g. entrance area) and areas subject to lighter usage (e.g. rear seats).

Soiling

The manner in which seat covers become soiled is dependent on a range of factors e.g. clothing, usage, seat shape, color. For example, light-colored covers are more difficult to look after. The original seat appearance can be retained in the long-term by regular cleaning and maintenance. See the "Care and cleaning" chapter for more detailed information and tips.

Abrasion

Abrasion of the leather surface can be caused in different ways:

- High mechanical load
- Sharp objects
- Usage of cleaning agents **not** approved by Mercedes-Benz and incorrect cleaning methods.

(See "Care and cleaning" chapter.)

Creases

Ambient conditions such as air humidity and temperature can have an effect on the appearance of the leather. Furthermore, the naturalness and exclusivity of the leather in the seat cover is emphasized on various models by means of a loose-fitting visual appearance combined with added fullness. This means that complaints about creases might be received due to the subjective perception of the customer.

Remedial actions for specific model series are described in the corresponding TIPS documents.

Please observe the notes in the "Upholstery" chapter to prevent creases due to faulty upholstery in the event of repair.

General

Upholstery process for seat covers

For the following description of the process for fitting and removing seat covers, the various vehicle models have been divided into groups according to the seat design and the attachment process used.

i Note

When performing repairs, the relevant work instructions from WIS which apply to all model series must be observed.

Mercedes-Benz seat cover groups		
Group 1	Group 2	Group 3
Seats with cut foam	Seats without cut foam	Seats without cut foam
Seat design with upholstery clips	Seat design with upholstery clips or upholstery wires	Seat design with upholstery rails
Model 216, 221, 230	Model 164, 171, 203, 204, 209, 211, 219, 251	Model 169, 245

Cut foam

The cut foam is a layer of padding of approx. 1 to 2 cm thickness which is additionally placed on the backrest or seat cushion padding.



P91.00-2237-00

Cut foam



Upholstery wires and upholstery clips

The seat bolsters and seat cover are attached/connected to each other at defined points during the upholstery process.

This attachment process prevents the seat cover from slipping out of place on the padding and causing unsightly creases.

Usually, upholstery wires are clipped into the relevant upholstery clips to attach the cover in place.

There are two variants of this system:

The first variant involves clips or upholstery wires that are embedded into the foam padding.

The other variant involves upholstery wires or clips that are attached to the seat cover.

Upholstery rails

On model 169 and 245, upholstery rails on the seat cushion cover are used instead of upholstery wires to attach the seat cushion.

Notes

Clips and upholstery wires

If clips or upholstery wires remain undamaged when a seat cover is removed, these must be reused.

Bent upholstery wires

The upholstery wires must be bent back to their original shape based on the attachment pattern.

Wire pockets and wire pocket selection

Wire pockets are used to guide the upholstery wires precisely. If the seat cover is too loose, the upholstery wires must be guided through the thin wire pockets and not through the wide wire pockets.

Stitched flag

The stitched flags must be laid out so that every single stitched flag points in the same direction, inwards or outwards.

Group 1

Work description for Mercedes-Benz group 1

Fitting a seat cover on a driver seat




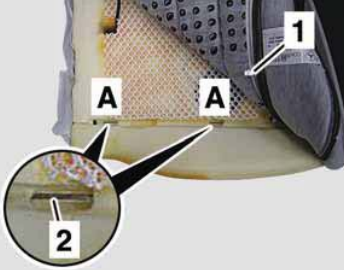
Procedure	Picture	Remarks
Insert upholstery wires in wire pockets and attach at marked crosses.		Picture shows reverse of seat cover.
When attaching the seat cover to the cut foam, ensure that the cut foam does not overlap.		OK! Cut foam does not overlap.
		⚠ Not OK! Cut foam overlaps.
Special case, model 216 The upper upholstery wire must be attached very precisely. Otherwise, the seat cover cannot be put on accurately and will become creased.		
Special case, model 216 At the top area of the backrest, a piece of Paratex non-woven cloth must be placed on the rubberized hair mat. Otherwise, the seat cover cannot be pulled over the top of the backrest.		




Procedure	Picture	Remarks
<p>Special case, model 216, 230</p> <p>In the area of the belt outlet, the cut foam must sit cleanly under the seat cover.</p>		<p>OK!</p> <p>Cut foam sits cleanly under seat cover.</p>
		<p>⚠ Not OK!</p> <p>Cut foam does not sit cleanly under seat cover.</p>
<p>Special case, model 216, 230</p> <p>The seat cover is carefully pressed between the two metal plates using a finishing tool.</p>		
<p>The procedure for attaching the seat cushion cover is the same as for the backrest.</p>		<p>OK!</p> <p>Cut foam does not overlap.</p>
		<p>⚠ Not OK!</p> <p>Cut foam overlaps.</p>

Group 2

Work description for Mercedes-Benz group 2

Fitting a seat cover on a driver seat

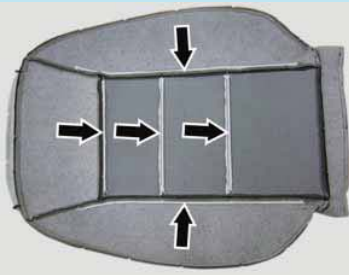


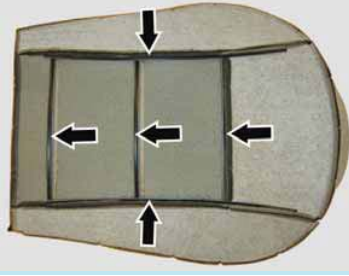

Procedure	Picture	Remarks
<p>The upholstery wires must be inserted into the wire pockets.</p>		
<p>Special case, model 204, 209</p> <p>If there is a retaining flap at the end of the wire pocket, the upholstery wire must also be routed through this.</p>		<p>i Note</p> <p>The retaining flap keeps the respective corner of the seat cover in the specified position.</p>
<p>The seat cover is attached to the clips embedded in the padding.</p>		
<p>Special case, model 209, 219</p> <p>On these model series, the upholstery wires are embedded in the backrest foam and the upholstery clips are attached to the seat cover. The seat cover must be attached at the points where the wire in the padding is visible.</p>		<p><i>A Attachment point</i></p> <p><i>1 Clip</i></p> <p><i>2 Upholstery wire</i></p>

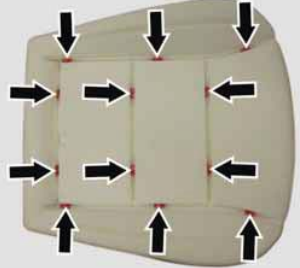

Procedure	Picture	Remarks
<p>Special case, model 171</p> <p>In the top area of the backrest, all seat cover retaining flaps must be guided through the opening to the rear. All retaining flaps must be hooked into the respective brackets.</p>		
<p>The smaller flap is hooked into the corresponding hook at the top of the backrest directly from the front.</p>		<p>There is a dual retaining flap on the seat cover on both the left and right sides of the opening. These flaps must be attached in the correct order.</p>
<p>The larger flap is hooked through the opening into the same hook from behind.</p>		<p>The larger flaps pulls the cover tight in the top area of the backrest and also prevents the smaller flap from slipping out.</p>

Group 3

Work description for Mercedes-Benz group 3

Fitting a seat cover on a driver seat

Procedure	Picture	Remarks
Guide the upholstery wires into the wire pockets of the seat cover for the backrest.		Picture shows reverse of seat cover. Upholstery wires (arrows)
Special case, model 169/245 The clips are embedded into the backrest on both of these vehicle models.		
Embedded clip		
Plastic rails are incorporated into the seat cushion cover for attachment purposes.		Upholstery rails (arrows)
Plastic rails for attachment		

Procedure	Picture	Remarks
Cushion foam with embedded clips		Embedded clips (arrows)
Embedded cushion clip		

Seat covers

The most frequent complaints about seat cover soiling are caused by the following:

- Stains from foodstuffs
- Abrasion of covers due to incorrect care and cleaning agents
- No or irregular care of seat covers
- Clothing dyes rubbing off on to the seat
- Wear due to high mileage

Remedy in case of soiling

Seat covers that have been soiled by external sources must not be replaced because this type of soiling can be prevented by regular and correct care and cleaning.

When using care products, it is important to ensure that the seat is not soaked in the product. The quantity of care product used must be such that only the seat surface comes into contact with the product. If not, stains, discoloration and even mold may occur.

Care and cleaning in summer

Particularly in the summer months, seat covers are subjected high stress due to solar radiation and heat. We therefore recommend particularly intensive cleaning and maintenance of seat covers before and after summer.

General information

Workshop staff and especially the customer can help to maintain the leather in its original condition for as long as possible by following a range of preventive measures.

In general, it is essential for the seats to be professionally cleaned on a regular basis. The type of cleaning always depends on the type of covers and the customer usage behavior.

Furthermore, external influences such as clothing dyes rubbing off onto the seats determine the level of care needed. Intensive and regular cleaning is particularly important on vehicles with light-colored seat covers.

Vehicle occupants should avoid wearing dark jeans which are not dyed through to help maintain the seat appearance in the long term. Wet items of clothing or towels should not be placed on seat covers.

When applying creams or lotions to parts of the body which could come into contact with the seat covers, allow these to work into the skin first before entering the vehicle.

Avoid eating in the vehicle where possible to reduce the risk of staining the seat covers.

Sharp or unwieldy objects such as belts or purses/wallets should not come into contact with seat covers.

Generally, loose dirt must always be removed from seat covers before they are cleaned. This means that dust particles should be removed with a duster or vacuum cleaner because the surface of the cover could otherwise be damaged by the cleaning process and when the cleaning agent is rubbed into the cover.

Exact cleaning intervals are not specified because the intervals depend on individual customer usage.

i Note

Always prevent stains from drying out by cleaning them up immediately.

If a stain dries out, it may no longer be possible to remove it with the cleaning methods listed here.

Cleaning agents

Recommended by Mercedes-Benz

Mercedes-Benz recommends the following two cleaning agents for cleaning and maintaining the seat covers on all of its passenger car model series:

- Textile upholstery cleaner
- Leather care foam

i Note

It is best to clean textile upholstery with a mild solution of water/dishwashing detergent or, alternatively, with textile upholstery cleaner.



P91.00-2238-00

Textile upholstery cleaner

Each of the cleaning and care products can only be used on particular materials. See the "Equipment matrix" in this chapter to find out which product is suitable for which material.

i Note

See the Electronic Parts Catalog (EPC) for the current replacement part numbers of both cleaning products. They can be ordered via the Global Logistics Center (GLC).



P91.00-2239-00

Leather care foam