German Commission for Paint and Bodywork Repair

Annotations Regarding The Delivery Condition Of Bodywork To Paint

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The following document was translated by Allianz Center for Technology from the German original text „Erläuterungen zum Übergabezustand von Karosserie an Lack“ by the German Commission for Paint and Bodywork Repair, dated March 22, 2021 (please see https://azt-automotive.com/de/downloads → “Beschlüsse der Deutschen Kommission für Lack und Karosserieinstandsetzung”). The original text in German language is the only relevant version in case of any question that might occur.

1. Preliminary note

The basis for a proper and professional vehicle painting of repaired vehicle bodies and / or their add-on parts is the professionally produced delivery condition from the body shop to the painter. The delivery condition of bodywork to paint, as agreed and described in the German Commission for Paint and Bodywork Repair, among others with associations and vehicle manufacturers, clearly defines the work steps to be carried out by the participating crafts and the materials and tools to be used. This delivery condition is the basis for a paintable surface and at the same time the basis of the calculation aid for dent removal work[1] of the German Commission for Paint and Body Repair as well as part of the system description for the AZT Paint Calculation System[2] and thus the starting point for the paint calculation.

Even if a damage calculation system based on vehicle manufacturer values is used, the work and process steps to be carried out by the bodyrepair and paint departments involved must be defined accordingly to ensure that the repair work is carried out properly and professionally. As far as it is known, manufacturer calculation logics are also based on the defined delivery condition of the German Commission for Paint and Body Repair.

On the basis of feedback and experience from the repair market, it can be stated that in some cases the bodywork damage is not handed over to the paint specialist / paint store with the

[1] The German version of the calculation aid for dent removal work approved by the German Commission for Paint and Bodywork Repair can be accessed at no charges e.g. on https://azt-automotive.com/de/downloads → „Beschlüsse der Deutschen Kommission für Lack und Karosserieinstandsetzung“.

[2] AZT Paint Calculation – System Description, please see https://azt-automotive.com/en/downloads → „Paint“

necessary care. As a result, the actual condition of the body after completion of the body repair work to the paint specialist sometimes deviates significantly from the defined delivery condition. This leads to discussions and sometimes conflicts between car dealerships, body repair shops and paint shops, especially in constellations where bodywork and paint work is not carried out in the same house or company. In terms of costs, this problem can only be solved between the (body) repair shop / car dealership and the paint shop that was commissioned.

The aim of all parties involved in the repair process is the proper and professional repair of the existing bodywork damage, taking into account the specifications made by the respective vehicle manufacturer and the current state of the art, as well as the fair remuneration of working time and materials for the actually required work.

If the agreed handover condition (definition: see Chapter 3) is not achieved by the bodywork specialist, the painting specialist must invest additional effort (working time & material) to produce the defined delivery condition in order to obtain the paintable surface in the required and specified quality.

However, this additional work performed by the paint specialist is already included in the body repair or renewal time and is settled by the bodyworker or reimbursed to the bodywork department when the claim is settled, even though the work steps taken into account for this purpose were not performed or were performed only insufficiently in the required precision and quality. As a result, the paint specialist carrying out the work must produce the delivery condition at his own expense in order to exclude the risk of later warranty claims for his professional work. In such cases, it is therefore justified that the performing paint shop as contractor invoices the necessary expenditure (working time and materials) to the commissioning car dealership or body repair shop. In this case, the body shop / car dealership must offset the expense against its repair time – Double billing is not permitted.

This statement of the German Commission for Paint and Bodywork Repair is therefore intended as information and guideline for all parties involved in the repair process to emphasize and explain the importance of the handover condition for a proper and professional repair.

2. Products for creating a professional delivery condition

The application of body filling compound may be necessary to achieve the proper delivery condition. The body filler replaces the leaded solder filling tin that was in use until a few years ago. For this purpose, special materials based on 2-component epoxy resin are available to the bodywork specialist today.

In addition, for small to medium damages, so-called "metal fillers" (e.g. diamond fillers) based on 2-component polyester material with metallic powder for steel or aluminium substrates are also available as filling material.

The use of such state-of-the-art car body fillers or materials replacing the leaded tin in the course of car body repair ensures proper and professional repair, taking into account the respective processing instructions.

However, only materials based on 2-component epoxy resin are to be regarded as body fillers or leaded tin substitutes in the true sense of the word. Nevertheless, the processing and

treatment of both body filler materials available to the bodywork specialist, which can be used separately or in combination depending on the type of damage, are taken into account in the calculation aid for body dent removal work in order to achieve the defined delivery condition. An increase in working time estimates is therefore not necessarily required as a matter of principle.

If only or mainly the 2-component polyester filler materials commonly used in the paint shops are used to achieve the delivery condition, this can lead to serious quality problems following completion of the paint job and thus to complaints and expensive rework. The company carrying out the work is responsible for the quality of its work.

The following damage patterns and damage mechanisms can occur if work is not carried out professionally:

- Loss of gloss,
- Adhesion disturbances up to flaking,
- Edge zone markings in the paint surface,
- Infiltration of the painted surface by moisture with accompanying corrosion up to perforation corrosion of the repaired area with blistering.

This is often caused by increased application of 2-component polyester filler (up to several millimeters), whose hygroscopic property (absorption of air humidity) intensifies potential damage mechanisms.

The use of 2-component polyester filler material to achieve the delivery condition instead of the above-mentioned body filler / tin substituting filler materials therefore does not represent a proper and professional repair.

In any case, the specifications of trade associations and manufacturers of the body filler materials must be observed when handling 2-component materials with regard to occupational safety, fire protection and environmental protection.

3. Definition of the delivery condition of bodywork to paint

According to the calculation aid for dent removal (also known as dent formula) developed and approved by the German Commission for Paint and Body Repair, the delivery condition is defined as follows:

> The areas and parts processed by the bodywork specialist must be dented to match the contours and edges. If necessary, this can be done by additional professional application of current, state-of-the-art body filling compounds. Finally, the surfaces must be finished by the bodywork specialist using suitable tools (no angle grinder) in such a way that the painting specialist can continue with the first step (sanding with random orbital sander / orbital sander and e.g. abrasive grain P120).

In addition, the system description of the AZT Paint Calculation already contains further supplementary aspects in addition to the preceding definition:

> The starting point of the working times specified in the AZT Paint Calculation System is the paintable surface.

In the case of repair coatings, this is given when:

1. The areas and parts processed by the bodywork specialist have been dented or welded in to match the contours and edges. If necessary, this can be achieved by additional professional application of up-to-date, state-of-the-art body filling compounds. Finally, the surfaces must be finished by the body shop technician using suitable tools (no angle grinder) in such a way that the painting specialist can continue with the first step (sanding of the transitions with random orbital sander / orbital sander and e.g. abrasive grain P120).

2. The vehicle painter is able to finish the surfaces processed according to point 1 in a maximum of three steps, e.g.
   Polyester filler, fine filler, sanding filler
   or polyester putty, polyester spray putty, abrasive filler
   or polyester spray putty, abrasive filler.

In the event of a repair, the delivery condition from body to paint defined in this way means that the areas repaired by the bodywork specialist are prepared in such a way that the paint specialist can achieve the final surface structure and shape using the working processes mentioned in point 2.

4. Practical significance

In order to be able to achieve a sustainable surface in professional quality in the course of vehicle or component painting, the repair must be prepared on the bodywork side to such an extent that a load-bearing and solid substrate is created for the paint build-up. This means that the repaired surface must be thoroughly sanded (random orbital sander, orbital sander or linear sander) using appropriate abrasives by the bodyworker, enabling the paint specialist to proceed one's work with abrasive grain P120 (or finer). Transition areas to the existing paint structure as well as plastics and lightweight construction materials must be treated with a correspondingly finer finish. Only after these work steps have been carried out professionally the order can be handed over to the painting department or the paint shop.

The aim is an even and fine metallic final sanding by the bodyworker, while at the same time removing any surface defects at paint transitions to the adjacent area and deburring the substrate. This is particularly important for assessing the contour- and edge-true repair, as the reconstruction of the surface geometry provided by the vehicle manufacturer, including edges, reinforcing fins and other shapes, is an elementary part of the body repair. If there are limits to sheet metal processing, i.e. reverse forming, and if this is necessary, the bodywork specialist can achieve a surface with the correct contours and edges by applying additional professional body filler compounds in accordance with the current state-of-the-art and by subsequently processing them. The polyester (spray) filler (unsaturated / saturated, with / without short- / long-fiber / coarse- / finely ground) applied by the painting specialist performing the work, serves as a basis for the final coating by creating the appropriate surface structure in fine work. Modeling or creating a surface with the correct contours and edges using polyester filler does not constitute proper and professional repair.

If the bodywork specialist or, in general, the customer of the painting work lacks the necessary prerequisites for achieving a professional delivery condition from a professional and / or technical point of view or for other reasons, it is advisable for the purpose of professional damage repair (bodywork and paint) to have the delivery condition produced by the bodywork specialist / paint specialist as contractor. Since the necessary expenditure (working time and materials) is already allocated to the customer, a settlement to be agreed between customer and contractor is permissible and justified in these cases. In such cases, it must be ensured that the necessary and required effort is still compensated, but that the total effort (working time and material costs) does not increase because of the agreement.

5. Practical examples

5.1. Defined delivery condition achieved by bodywork

Example 1 – Right sill / dog leg of a Smart forfour (W453; built 2017)

Damaged area: 10 dm² Level of difficulty: III (factor 2.5)

Picture 1: Damaged area as given to the repair shop – example 1.

Picture 2: Sill / dog leg after sheet metal repair and before applying 2K epoxy resin body filler.

Picture 3: Sill / dog leg after application of 2K epoxy resin body filler.

Picture 4: Defined delivery condition achieved after sanding the 2K epoxy resin body filler.

Example 2 – Right side panel of a Kia Venga (built 2019)

Damaged area: 7 dm² Level of difficulty: III (Factor 2.5)

Picture 5: Damaged area as given to the repair shop – example 2.

Picture 6: Application of 2K epoxy resin body filler after sheet metal repair.

Picture 7: Defined delivery condition achieved after sanding the 2K epoxy resin body filler.

Example 3 – Right front door on an Audi Q5 (8R; built 2016)

Damaged area: 10 dm² Level of difficulty: III (Faktor 2.5)

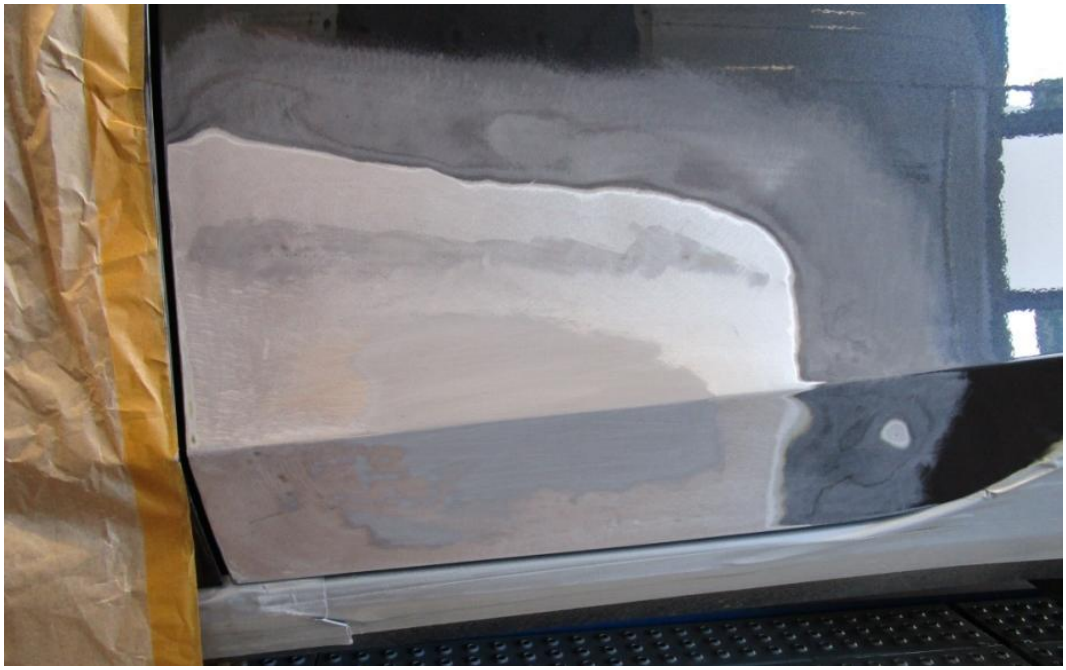
Picture 8: Damaged area as given to the repair shop – example 3.

Picture 9: Defined delivery condition achieved without application of 2K epoxy resin body filler.

Example 4 – Left rear door on an Audi A4 (B8; built 2013)

Damaged area: 11 dm² Level of difficulty: III (Faktor 2.5)

Picture 10: Damaged area as given to the repair shop – example 4.



Picture 11: Defined delivery condition achieved with application of 2K epoxy resin body filler.

Additional examples:

Picture 12: Skoda Octavia (5E; built 2015) with repaired left side panel – Delivery condition achieved without application of 2K epoxy resin body filler but with sheet metal repair only.

Picture 13: Volkswagen T5 (built 2013) with repaired right side panel – Delivery condition achieved with application of 2K epoxy resin body filler.

Picture 14: Ford S-Max (WA6; built 2012) with repaired left rear door (without body filler) and left side panel (including application of 2K epoxy resin body filler).

Picture 15: VW Passat (B8; built 2015) with repaired left side panel – Delivery condition achieved with application of 2K epoxy resin body filler.

Picture 16: Replaced right side panel (welded in part) on a VW Passat (B8; built 2015) – Delivery condition achieved with application of 2K epoxy resin body filler.

5.2. Defined delivery condition NOT achieved by bodywork

Picture 17: Delivery condition not achieved as repair work is comparatively coarse and imprecise with deep scratches in sheet metal and adjacent paint and a missing smooth transition area to the existing paint

Picture 18: Delivery condition not achieved due to non-welded holes in the sheet metal, lack of final sheet metal treatment or application of body filler, high roughness due to missing final grinding and missing smooth transition area to the existing paint.

Picture 19: Delivery condition not achieved due to high roughness and missing smooth transition area resulting from a missing final grinding.

Picture 20: Delivery condition not achieved, mainly caused by missing smooth transition areas from new part to existing body and missing final grinding.

Picture 21: Delivery condition not achieved due to unsmooth transition area and high surface roughness resulting from a missing final grinding.
Note: Based on the assumption that the painting specialist can start directly with the first work steps when the delivery condition is suitable, it should be stated here that further disassembly work, e.g. of door lock, clips and stopper, is required.

6. Concluding remark

This document is intended to support all parties involved in vehicle damage repair, on the one hand to ensure the required proper and professional repair with appropriate quality and on the other hand to raise awareness of the importance of the defined delivery condition of bodywork to paint.

The repair of body shell sheet metal parts is always individual and depends on the damage pattern of the respective component and its material as well as on the performing worker, his skills, experience and the tools available. In addition to the sheet metal work itself, it is also possible to use paste-like body filler / tin solder substitutes to achieve the delivery condition, depending on the extent of damage and the body repair methods used. It should be noted that the application and processing of 2-component epoxy resin-based body filler / tin substitutes is carried out in the body shop and this is also taken into account in the calculation aid for dent removal work.

The aim of any body repair should be to achieve the defined delivery condition, while maintaining a proper and professional working method, before the job is forwarded to the paint department.

Further processing with so-called 2-component polyester (spray) filler (unsaturated / saturated, coarse / finely ground / with / without short / long fiber), which is to be assigned to the paint materials, is carried out by the paint specialist carrying out the work. This provides a clear dividing line in terms of responsibilities for the respective work steps between bodywork and paint, which is clearly defined with the delivery condition. Furthermore, the plant equipment with regard to processing guidelines and the regulations on personal protective equipment (PPE) must also be taken into account when processing these materials.

In constellations in which bodywork and paint work is carried out in different workshops and the technical responsibility is therefore divided between at least two companies involved, it is advisable to record the delivery condition for each job in detail. If the workmanship does not correspond to the definition (see e.g. Chapter 3), appropriate procedures should be agreed in good time between the customer (usually a car dealership / body shop) and the contractor (paint store) in order to avoid delays in the repair process. The aim of an open and honest exchange of the respective motivations and challenges is to achieve a solution that is sustainable for all parties involved.

In principle, the person carrying out the work is to be granted the right to record the working time and materials required and to invoice the person commissioning the work (usually the car dealership / body shop). In this case, the ordering party must offset the effort against its repair time so that the total effort required and to be compensated does not increase.

All picture sources: AZT Automotive GmbH & Zentralverband Karosserie- und Fahrzeugtechnik e.V.

This document was decided unanimously on March 22, 2021 by the members of the German Commission for Paint and Bodywork Repair:

- Bundesverband der freiberuflichen und unabhängigen Sachverständigen für das Kraftfahrzeugwesen e.V. (BVSK)
- Bundesverband Farbe, Bundesfachgruppe Fahrzeuglackierer (BFL)
- Gesamtverband der Deutschen Versicherungswirtschaft e.V. (GDV) sowie:
  Allianz Versicherungs-AG, Generali Deutschland AG
- Verband der Deutschen Lack- und Druckfarbenindustrie e.V. (VdL) – Arbeitskreis Autoreparaturlacke
- Verband der Automobilindustrie e.V. (VDA), vertreten durch:
  Bayerische Motoren Werke AG (BMW), MAN Truck & Bus SE, Opel Automobile GmbH, Volkswagen AG
- Verband der Internationalen Kraftfahrzeughersteller e.V. (VDIK) sowie:
  Honda Motor Europe Ltd, Renault Deutschland AG
- Verband der Technischen Überwachungs-Vereine e.V. (VdTÜV), vertreten durch:
  TÜV Süd AG
- Zentralverband Deutsches Kraftfahrzeuggewerbe e. V. (ZDK)
- Zentralverband Karosserie- und Fahrzeugtechnik e.V. (ZKF)
- AZT Automotive GmbH
- Autovista Group International AG / Schwacke GmbH
- DEKRA SE
- Deutsche Automobil Treuhand GmbH (DAT)
- IRS Holding GmbH / Hagelschadenzentrum Douteil GmbH
- KTI Kraftfahrzeugtechnisches Institut und Karosseriewerkstätte GmbH & Co. KG
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