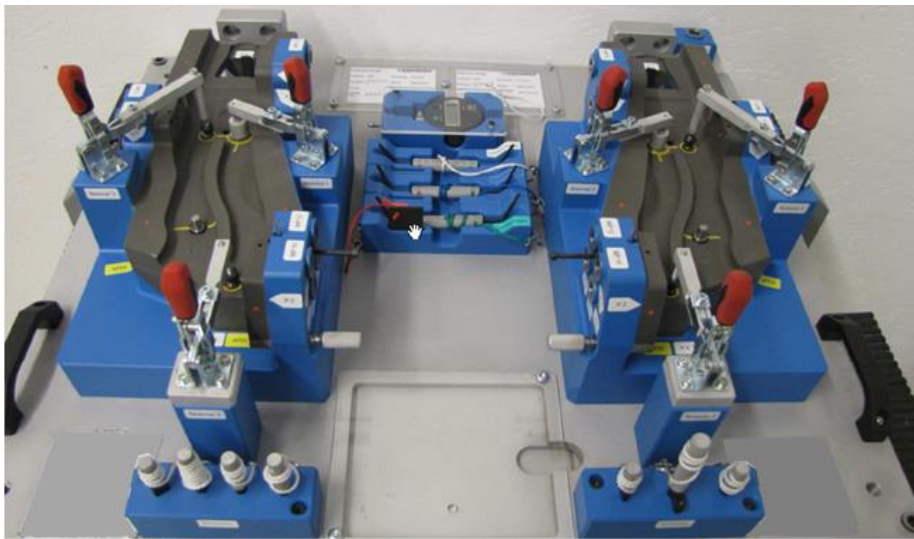


Design Specifications for Gauges and GOM Measuring Fixtures



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1 Objective

This design specification for gauges and GOM Fixtures is intended to facilitate the communication between quality planning specialist, procurement, supplier and user of the gauge by setting clear requirements.

The design specification for gauges and GOM Fixtures ordered by KIRCHHOFF Automotive considers requirements regarding materials, accuracy and function. These requirements are based upon generally accepted technical practices and operational needs.

Compliance to these requirements is mandatory for all involved parties. They are determined by the inquiry documents as well as by the present design specification.

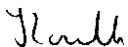
This means for the manufacturer that he is only allowed to fulfill the requirements in an alternative way in terms of a more economical production when deviations are agreed in advance with the quality planning specialist and the alternatives have been expressly approved.

Deviations from this design specification, which are required by KIRCHHOFF Automotive must be recorded in Gauge Method and ordered by Quality Planning.

The design specification with revision status 008 includes updated requirements mainly for GOM fixtures, gauge documentation, cords, pillars and dial gauges. It applies to all newly ordered gauges and GOM fixtures. For all gauges that are already finished or are under construction at the effective date the previous revision status 007 is applied.

In case modified legal requirements come into effect or possible gaps maybe in the regulations of this design specification, the degree admissible by law respectively the corresponding state of the art of the application will be substitution.

Attendorn, February 26th, 2024



Ralph Kowalke
Manager Quality Planning
Europe and Asia



Zeljko Jozic
Manager Quality Planning
North America

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2 Abbreviations

- BSK = Trim edge
- EM = Extended measurement surface
- LL = Clearance
- LH = Left-hand side
- LHD = Left-hand-drive
- RH = Right-hand side
- RHD = Right-hand-drive
- RPS = Reference point system
- ZB, ZSB = Assembly

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3 Design of Gauges

3.1 General

As a standard, the gauge has to be built in vehicle position. In exceptional cases, the inquiry documents may specify a gauge body position rotated by integer multiples of 90° from vehicle position.

All Gauges and GOM fixtures must be designed and produced according to the reference system (normally ASME Y14.5M-2018 or RPS) stated on the part drawing. After completion of the gauge design the CAD-data have to be forwarded to the quality planning specialist for design approval. Data must be provided as Catia 3D-Model, JT or STEP and additionally as 3D-PDF. All checking pin diameters must be specified in a catalogue or a 2D-drawing. Costs incurred for the manufacturing of gauges or fixtures where the design has not officially been approved by the quality planning specialist, are at the expense of the supplier.

The supplier has to assure that the part can be inserted into the gauge without any problems by doing a CAD simulation.

It has to be guaranteed, that all measuring points (e. g. surfaces, edges, holes) are measurable and accessible by the measuring machine. This has to be particularly considered with regard to the positions of clamps, displaceable bridges, templates or similar.

3.2 Reference to vehicle coordinate system

Reference to the vehicle coordinate system is made by flanged bushings with a minimum inner diameter of 12 mm respectively tooling balls for alignment. The bases which are incorporated into the base plate have to be wear-resistant and, if possible, impact-protected. For this purpose three appropriately secured flanged bushings (Figure 1) with grinded flanges must be used. As an alternative tooling balls are permissible.

The positions of the flanged bushings or tooling balls must be indicated in all three coordinate axis on the base plate with three decimal places (Figure 2).

The base plate has to be parallel to a plane of the vehicle coordinate system.

Additional net references on the gauge/fixture are allowed. However, it should be noted, that for measuring the gauge/fixture at KIRCHHOFF Automotive, the datum surfaces defined in the part drawing are used for alignment. The CAD-Data provided by KIRCHHOFF Automotive are always used as the basis for gauge/fixture design and measuring.

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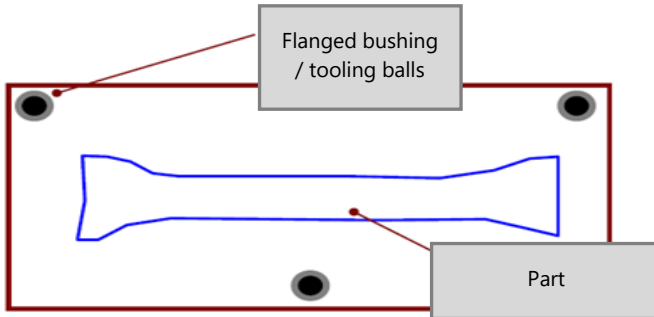


Figure 1



Figure 2

4 Baseplates

The standard materials which are used for baseplates are:

- rolled aluminum plate (aluminum block material)
- cast aluminum.

Base plates must have inherent stability, allowing to use them on provisional supports and not only on a plain measuring table. Therefore the minimum plate thicknesses and reinforcements have to be respected (Figure 3). They are just minimum requirements and are not releasing suppliers from the responsibility to provide stable baseplates.

Largest edge length [mm]	Min. plate thickness [mm]	Reinforcement Type	Min. dimension of reinforcement [mm]
≥ 600 and < 800	25		60 x 20 longitudinal sides
≥ 800 and < 1000	25		70 x 20 longitudinal sides
≥ 1000 and < 1200	30		140 x 25, framed, with notches for forklift truck
≥ 1200 and < 1400	30		140 x 25, framed, with notches for forklift truck
≥ 1400	30		140 x 25, framed, with notches for forklift truck

Notches for forklift truck:
width 227.5 mm, height 70 mm, 372.5 mm distance from midpoints of notches.

Reinforcements / frames to be fixed with screws min. M8 and dowels.

Figure 3

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In order to simplify the transport of the gauges/fixtures, the dimensions of the baseplate should allow a space-saving transport on euro-pallets (Figure 4) or lattice boxes (Figure 5). You must pay attention, that the accessibility during the removal of gauges, e. g. from a lattice box, is possible.

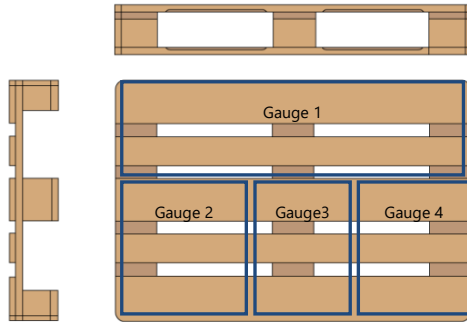


Figure 4

Figure 5

5 Pillars

Stability is as well essential for pillars. Figure 6 shows the minimum requirements depending on the height. For tall pillars reinforcement angles or stiffener bars must be used.

Solid material to be used for pillars. Multi-chamber profiles e. g. Bosch Rexroth are allowed for Europe only.

The dimensions are just a minimum requirement and are not releasing suppliers from the requirement to provide a gauge with stable pillars.

Height of pillars [mm]	Min. cross section [mm]	Reinforcement angles	Stiffener bars / plates between pillars in the upper half of the pillar
< 250	60 x 60		
>= 250 and < 500	70 x 70		
>= 500 and < 800	80 x 80	yes	yes
>= 800	100 x 100	yes	yes

Figure 6

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6 Gauge/fixture body

6.1 Basics

The gauge/fixture body has to be set up in aluminum (e. g. material AlMg4,5Mn) or plastic block material with a shore-D hardness of minimum 80 (e. g. Cibatool BM 5112 grey or Cibatool BM 5166 ivory) according to the project requirements.

All components must be mounted with a minimum of two screws M6 or ¼" and doweled to the baseplate of the gauge with minimum two dowels. No shims are allowed on gauges.

Neither a component of the gauge/fixture (e. g. clamp, slider, pin) nor the tested part itself may protrude the base plate due to its dimensions. All mounting parts, pins, templates etc., must be stored on the gauge.

When a gauge has heavy swing details or flip templates, an automatic locking feature, counter balance system or shock absorber must be incorporated to protect anyone operating the gauge.

All checking pins, bushings, datums and clamps have to be marked in ascending order, that means:

- Datums and clamps: A1, A2, ...
- Locating pins & bushings: Z1, Z2, ...
- Checking pins & bushings: P1, P2, ...
- Checking plate for trim: in terms of color - with assignment to the respective area.
- Checking pins for contour testing: in terms of color - with assignment to the respective area.

Locating pins and zero contact surfaces have to be additional marked with yellow color.

The allocation of the pins to different tolerance areas must be visible, even if the tested part is clamped to the gauge.

If generously tolerated holes or cut-outs have to be checked for existence only, this has to be done by pins fixed in the gauge/fixture body which protrude from the part by minimum 5 mm. That means if the hole or cut-out is missing, the part can't be checked. These pins have to be tight and exchangeable. In case this is not possible due to reasons of design or handling, an alternative has to be developed together with the quality planning specialist.

6.2 Alignment and clamping

To align a part, in general two locating pins are used. One of them has to be designed as a "tapered pin" (4 way locator), the other one as a "swordlike pin" (2 way locator). For details please refer to the method plan of the gauge.

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As a standard, these pins have to be carried out as removable pins. Depending on customer needs and requirements, these pins can be specified in the gauge method as spring-loaded, too. If so, a lock down feature is required for layout purposes.

The 4 way and 2 way locators must serve both purposes MMC (Maximum Material Condition, which means the smallest hole diameter) and RFS (Regardless of Feature Size, which means tapered pin). The tip of the locators should be MMC and continued tapered, for RFS function.

The swordlike pin has to be assured against rotation. The positional tolerance of the hole for the swordlike pin has to be incorporated into the narrow (not tapered) side of the swordlike pin.

Positions and sizes of datum surfaces are specified in the inquiry documents.

All contact surfaces, bushings and pins must be hardened and grinded to a hardness of min. 400 HV30.

The part has to be fixed with clamps in its position. Unless otherwise specified, for each datum surface a separate clamp has to be used. For that, preferably horizontal hold-down clamps should be used, otherwise vertical hold-down clamps. In case of ring-shaped contact surfaces (e. g. at hole positions) horseshoe clamps (Figure 7) must be used. It is not allowed to use sleeves for clamping.

Elongated clamps have to be avoided. If there is no other technical solution possible, the explicit approval of the quality planning specialist is needed to use elongated clamps.



Figure 7

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6.3 Datum surfaces



Figure 8



Figure 9

Datum surfaces must be realized as shown in Figure 8. Depending on the specification they can be designed circular as well. Herewith it is ensured, that the center-point of the datum surface can be measured, if this will be required in measuring plans of the customer. Mounting screws in the center point of the datum-surfaces, like shown in Figure 9, are not acceptable. The datum surfaces must have a hardness of minimum 400 HV30. Magnetic datum surfaces are not allowed.

In case of removable datum surfaces, both positions must have a locking feature. See Figure 10.

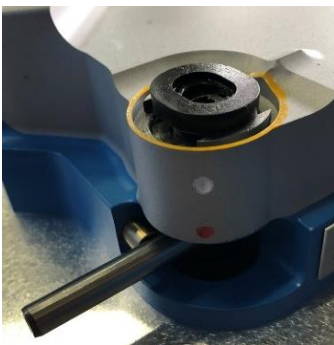


Figure 10

6.4 Dial gauges

If dial gauges are needed for measuring one or more criteria, the following requirements must be fulfilled:

- Digital dial gauge with wireless feature (Mahr MarCator 1086Ri for Europe)
- Clamping shank \varnothing 8 mm - h6
- Guide bushings
- The adapter ring for the dial gauge must be screwed with a stud
- Certificate of calibration either from manufacturer of dial gauge or from an ISO 17025 accredited laboratory

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Regarding the positioning of the dial gauge it has to be considered, that the metering of the measuring result is possible without any limitations.

A possibility for calibration (zero pad) must be in place for all measuring elements, which are in contact to the part. The tolerance for the zero pad is +/- 0.02 mm.

For each measuring position at a gauge the requirements mentioned in the AIAG manual "Measurement System Analysis" (MSA), fourth edition, June 2010, have to be fulfilled.

The Gauge/Measuring Fixture must be designed and manufactured having in mind passing MSA requirements, GR and GR&R in particular. Less than 10% is the target, up to 20% is acceptable, 30% needs improvement and over 30% will be rejected.

Generally, KIRCHHOFF Automotive will cross-check the measurement system capability of a gauge/fixture at the production plant, at the latest.

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7 Test Criteria

7.1 Contour

All contour checks are made with 3 mm or 5 mm clearance as specified in the inquiry documents. If during the design phase a different clearance dimension becomes necessary, the responsible quality planning specialist has to be informed. He will decide to which extent the deviation can be accepted, respectively will work out a suitable technical solution together with the gauge/fixture supplier.

For checking the part contour, a corresponding maximum/minimum bended checking pin with ball ends has to be prepared. The balls must be fastened with threads. Glued balls are not permissible.

The assignment of checking pins to different tolerance areas is done with colored dots on the checking pin and on the corresponding areas at the gauge. Even if the part rests on the gauge, the assignment must be visible. An example is shown in Figure 11.



Figure 11

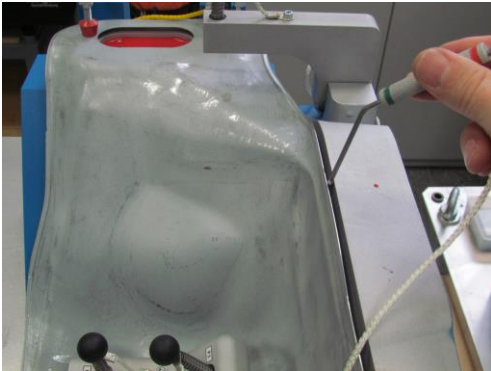
7.2 Trim edges

Trim edges have to be designed on nominal size. For checking, supplementary measuring surfaces (EM) of minimum 20 mm, 90° degrees to the part, are necessary. The inspection of the trim edge is done with test plates. The minimum resp. maximum tolerance of the trim edge is incorporated to these test plates (Figure 13 to Figure 14).

As an alternative, a cylindrical pin with the minimum resp. maximum tolerance of the trim edge incorporated is permissible, if specified in the inquiry documents.

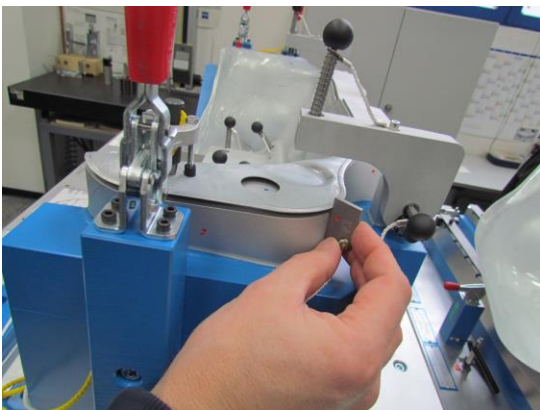
In exceptional cases trim edges at maximum size with minimum size indicated with a scribe line may be requested, if the trim tolerance zone is at least 1.5 mm.

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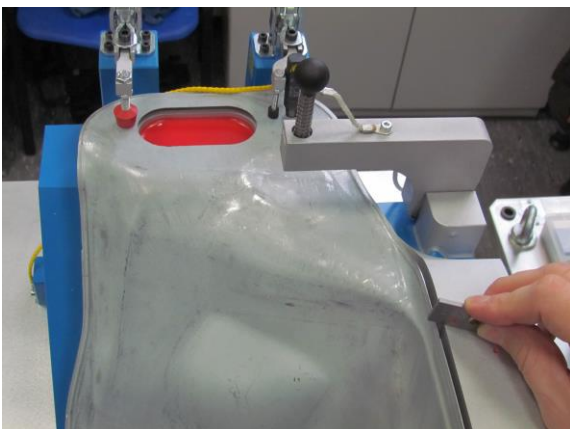
Inspection of contour

Figure 12



Inspection of trim edge

Figure 13



Inspection of trim edge

Figure 14

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7.3 Hole positions

Checking pins for hole positions have to be produced based on the principle: „minimum hole diameter minus positional tolerance“.

For checking of nuts, stepped pins with two diameters (first: checking of nuts, second: checking of holes) must be used. For the checking of nuts the following principle applies: „core diameter D1 of the nut minus positional tolerance“.

Screws have to be checked by corresponding sleeves; for the checking diameter of the sleeve the following applies: “Nominal diameter of the screw plus positional tolerance”.

All checking pins for formed holes as well as square and hexagon holes have to be designed not allowing any rotation of the pin.

Captive pins (spring-loaded) should be used for attribute checks where possible. Pins shall not extend past the gauge clearance surface when retracted.

When designing guide bushing and the related pin, each size of checking pins has to be combined with an individual diameter of the bushing. Thereby a mix-up of the checking pins and their positions is avoided.

All contact surfaces, bushings and pins must be hardened and grinded to a hardness of min. 400 HV30. Air vent holes are mandatory on any sliding fit pins.



Figure 15

A suitable deposition for pins has to be provided. A plastic or aluminum block with holes, preferably nearby the holes to be checked is mandatory. The deposition places have to be marked according to the corresponding pins. Checking pins and bushings: P1, P2, ... (see chapter 5.1). Please engrave the marking, don't use labels. Coiled cables have be used for fixing the checking pins at the base plate of the gauge (Figure 15).

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7.4 Hole diameters

For hole diameters with a tolerance range less than 0.3 mm limit plug gauges with lower limit / maximum limit dimensions have to be provided. Minimum and maximum dimensions as well as KA no. (without suffix) have to be engraved clearly into the limit plug gauges. For elongated holes, tolerances have to be checked separately with two pins for length and width. The width of the length check feature to be cut to at least 10% below the minimum width tolerance.

In case of several (elongated) holes with the same dimensions and tolerances on the part to be checked, only one limit plug gauge (set) has to be provided.

8 Tolerances

8.1 Datums

Contact surfaces and hole positions called out as DATUM have to be produced with a positional tolerance range of ± 0.05 mm.

8.2 Other surfaces and positions

- Hole positions have to be produced within a tolerance range of ± 0.05 mm.
- Pin diameters have to be produced within ± 0.02 mm.
- Areas with clearance have to be produced within a tolerance range of ± 0.10 mm.
- Extended measurement surfaces (EM) have to be produced within a range of ± 0.10 mm.
- Contour-templates have to be produced within a tolerance range of ± 0.10 mm.
- Zero-pads have to be produced within a tolerance range of ± 0.02 mm.

8.3 Surface finish

- Datum surfaces: Rz 10
- Grid reference surfaces: Rz 10
- Gauge body: Rz 25
- Generally: Rz 40

8.4 Fits

- Locating pin / Bushing: g6 / H7
- Checking pin / Bushing: g6 / H7
- Length of parallel: min. 10 mm

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9 Weight

For all gauges and fixtures transport handles must be attached to the gauge. If the weight of the gauge exceeds 15 kg, four threaded holes M12 must be added to enable screwing-in eyebolts for transport. At least four feet (depending on the gauge/fixture size) have to be fixed underneath. When attaching the transport handles and threaded holes please pay attention to position, accessibility, center of gravity and risk of injury.

If required the gauge or fixture has to be supplied including a transport cart. This cart will be enquired and ordered separately by the quality planning specialist.

For North America: If a gauge exceeds 45 kg, a transportation cart must be part of the quote.

10 Coloring

In order to have a uniform overall picture, the color scheme in the following table has to be used:

Area	Color	Remark
primary color on gauge body up to approx. 25 mm in front of BSK	RAL 5015 (sky blue, KIRCHHOFF blue, HEX #2271B3)	Different OEM requirements supersede.
Baseplate	Not painted, dull, not glossy, e. g. sandblasted	no reflections
areas not to be tested, clearance	black	surface
datums, locator pins, zero areas	yellow	clamps, bushings, bolts, billets, clamping areas
nominal area (outline)	Red	countersink or labels

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Area	Color	Remark
clearance (3/5mm – general tolerance)	green	countersink or labels
clearance (3/5mm – matching surfaces)	blue	
hidden surfaces without layout - on demand	white	surface
	grey	surface
EM – at least 20 mm locating pins and datums	red	countersink or labels
	yellow	

11 Gauge marking

11.1 Gauge label

The content of the gauge label has to be filled in according to the data in the order. All fields have to be filled by the gauge supplier. KIRCHHOFF Automotive completes the field "inspection status." If some information is missing, please contact the responsible quality planning specialist.

The gauge label has the following content:


INSPECTION GAUGE		
Customer:	Ownership:	
Part name:	CAD/CDB Doc. No.:	
Part No.:	Weight [kg]:	
Drawing-Date:	Dimension [mm]:	
CDB Equipm. No.:	Remark:	
KA-No.: XXXX.90.801.04		
<input type="checkbox"/> [new] <input type="checkbox"/> [change]	<input type="text" value="inspection status"/>	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> To be completed by KIRCHHOFF Automotive </div>
Date: dd.mm.yyyy		

Figure 16

In case of manufacturing a new gauge respectively in case of a gauge modification, the gauge label „INSPECTION GAUGE“ must be prepared anew by the gauge supplier. When the new respectively modified gauge is checked, the inspection status label will be attached by KIRCHHOFF Automotive.

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An MS-Excel-template for the gauge label is available at:

<https://www.kirchhoff-automotive.com/de/unternehmen/einkauf/download/global/>

The gauge/fixture labels are placed in a milled pocket in the base plate and covered with a plexiglass pane to protect them against contamination and damage. Afterwards the pane will be fixed at the base plate with Torx-screws. The labels must not be glued.

Furthermore, there must be an appropriate explanation on the gauge/fixture, wherein the used color codes and abbreviations are explained. Beyond that, a producer label is allowed, which does not contain any article-specific information.

11.2 Marking of the baseplate

At the narrow side and at the longitudinal side of the baseplate a label with KA-No. (without suffix) and customer name must be attached (Figure 17).

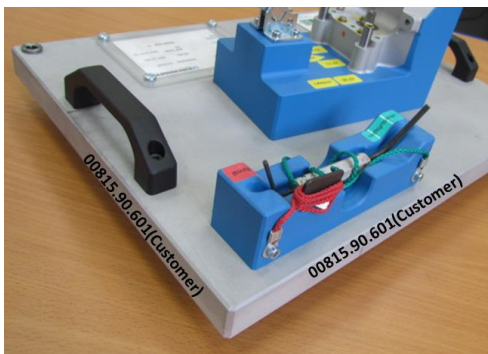


Figure 17

11.3 Marking of exchanges parts and loose parts

All exchangeable parts and loose parts must have the gauge number engraved. It is not allowed to use labels.

12 Operational safety

The gauge should be user-friendly and allow a safe handling:

- Sharp edges are not allowed.
- Avoid crushing hazards.

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13 Specifics for GOM Measuring Fixtures

13.1 Introduction

The GOM cell is an optical 3D measuring machine for an efficient quality control in the production process.

Whereas mechanical measuring machines capture data in a point-based manner, optical 3D-coordinate measuring systems provide full-field deviations of the 3D actual coordinates and the CAD data.

The cell consists of a housing, a standard robot equipped with the optical sensor and a rotary table. Before executing measuring programs, all robot movements are simulated in the virtual measuring room and checked for safety. Once the programs are created and tested the measurement can be done by the operators.

The new technology requires measuring fixtures with some special features. They are detailed in this chapter. All other features of GOM measuring fixtures have to be realized correspondingly in the same way as specified in the previous chapters.

Figure 18



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13.2 Basics

The GOM system uses white glued dots to support the orientation of the optical sensor. These dots are applied during the preparation of a measuring program and are not in the responsibility of the supplier of the measuring fixture.

Depending on size and geometry of the part, GOM measuring fixtures must be equipped with additional devices to allow a proper optical measurement.

To avoid attaching the white glued dots to the part to be measured, aluminum profiles 40 x 40 mm are placed in a horizontal distance of 50 mm to the trim line and about 50 mm below the trim line of the part. See Figure 19.

The aluminum profiles must be fixed with screws at suitable columns. Any movements of the aluminum profiles are not permitted. For safety reasons and visual aspects bars should be closed with special plastics endings.

Profiles and columns must keep a distance of minimum 50 mm from the edges of the baseplate.

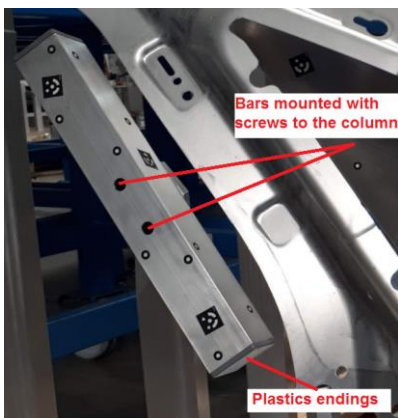


Figure 19

If the part has free area inside, it is possible to put a support element in the background for stickers. Such support elements should be made from a plate with rigid connection to the columns. Such support elements should not hinder the insertion of the part. See Figure 20.

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Figure 20

13.3 Datum surfaces

GOM measuring fixtures for hot-formed parts must be equipped with convex datum surfaces, if the datum surfaces are located on curved surfaces. In case of datum surfaces on flat surfaces the drawing requirements regarding position, size and shape of the datum surfaces must be followed. Figure 21 shows the preferred solution in case of datum surfaces on curved surfaces. Other solutions are possible, too.

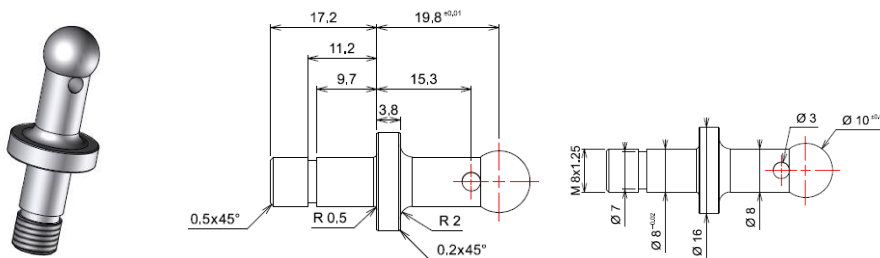


Figure 21

In case GOM-fixtures are ordered for cold-formed parts and assemblies, the datum surfaces must be exactly in line with the drawing regarding position, size and shape. A fixing screw in the middle of the datum surface will not be accepted.

13.4 Clamps

Only horizontal hold-down clamps equipped with a globe-joint (see Figure 22) should be used.

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Figure 22

13.5 Color

Baseplate and body in dull black color are no longer required. A matted aluminum surface is sufficient. A shiny surface is not allowed. For bushings and clamps no special surface treatment is needed.

13.6 General requirements

GOM measuring programs are prepared offline based on the CAD design of the measuring fixture and the part geometry. Therefore, it is very important that all attachments (as clamps, holders, pin trays etc.) are included in the 3D design and are arranged in the correct position. Otherwise, there is a risk of collision when executing the program.

In case the part has to be measured from the underneath, e. g. for mating surfaces or to measure material thinning, the part must be arranged 400-500 mm above the top of the baseplate. This has to be agreed with the responsible quality planning specialist.

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14 Pre-Acceptance

A pre-acceptance of gauges at supplier location is mandatory. As a standard the gauge suppliers completes the pre-acceptance checklist for gauges available at: <https://www.kirchhoff-automotive.com/de/unternehmen/einkauf/download/global/>

and provides it to the responsible quality planning specialist prior to the delivery of the gauge. After written approval of the quality planning specialist the supplier is entitled to ship the gauge to the place of delivery and to issue the invoice.

Failure to follow this procedure may result in delayed payment and/or negative supplier rating.

At the quality specialists disposition the pre-acceptance can be done by the quality planning specialist at supplier location.

15 North America specific requirements

Third party certification is required for gauges and measuring fixtures.

If a gauge exceeds 45 kg, a transportation cart must be part of the quote.

A loading and unloading instruction is required for larger fixtures and the instruction shall be adhered to the fixture base.

16 Further applicable documents

- KIRCHHOFF Automotive Quality Assurance Guideline for Suppliers
- OEM customer standards

17 Ordering process of gauges

- Supplier receives RFQ together with the gauge method plan.
- The purchase order is issued by purchasing. Without purchase order the supplier is responsible for all costs arisen.
- The supplier provides the gauge design to the quality planning specialist at the date specified in the purchase order.
- The gauge design is approved by the quality planning specialist. He issues the design approval to the supplier. For the approval process at KIRCHHOFF Automotive a time period of 10 days has to be considered.

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- Pre-acceptance of the gauge according to pre-acceptance checklist. Checklist completed by gauge supplier.
- Quality planning specialists approves the shipment of the gauge and books goods receipt.
- Supplier sends gauge to the place of delivery and sends a copy of the delivery note to the quality planning specialist (Europe) or to the buyer (North America).

18 Scope of delivery

The following documentation must be send to the relevant quality planning specialist by electronic data transfer at latest at the time of delivery of the gauge. A microSD card with these information is no longer permissible.

- Provided CAD-data from KIRCHHOFF Automotive (all transmitted variants in the original format)
- Gauge and Part design (identical to the gauge status), in Catia and/or Step
- Measurement report including comparison of target and actual values. Alignment done with bushings in baseplate and measuring of component datums. Alignment done with component datums and measurement of hole positions, surfaces and trim edges (EM). Movable datums, bushes for dial gauges and zero pads must be included in the report. Report numerically and graphically in PDF-format. The base of the measurement is the component-data set from KIRCHHOFF Automotive. A measurement against gauge design data is not acceptable.
- All other provided tools and documents in original format.
- If required: gauge and part drawings (identical to the gauge status) in Catia and/or Step.
- If required: Operating instructions in German and/or English in MS-Word and Acrobat PDF format.
- Calibration certificates for dial gauges.

An extra copy of the delivery note has to be send to the quality planning specialist by e-mail.

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19 Acknowledgement of receipt**For Europe and Asia:**

KIRCHHOFF Polska Sp.z o.o.
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PL-39-300 Mielec

arkadiusz.kardys@kirchhoff-automotive.com

For North America:

KIRCHHOFF Automotive Aurora
attn. Eugene Lavrov
200 Vandorf Sideroad

Aurora, ON L4G 0A2

CANADA

eugene.lavrov@kirchhoff-automotive.com

We confirm the receipt of the Design Specification for Gauges of KIRCHHOFF Automotive, revision status 008. It is taken as a basis for each newly ordered gauge by KIRCHHOFF Automotive from now on. This specification replaces all previous agreements and requirements.

Company stamp

Date

Authorized signature

Please return the signed acknowledgement within 14 days after receipt of the design specification by e-Mail to KIRCHHOFF Automotive.

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20 Changes to this version

Version	Date	Description
007	February 8 th , 2023	<ul style="list-style-type: none"> 1 – Objective modified 4 – Baseplates completely reworked 5 – Pillars – section added 6.2 – New requirements for locating pins and clamps 6.4 – Modified 19 – New contact for Europe and Asia 20 – Section added
008	February 26 th , 2023	<ul style="list-style-type: none"> 1 – Objective modified 3.1 – GD&T standard updated to ASME Y14.5M-2018 3.2 – Minimum inner diameter for bushings added 4 – Dimensions of notches for fork lift trucks modified 5 – Requirements for profiles used for pillars detailed 6.2. – Requirements modified: removable datum pins as a standard, no sleeves at clamps allowed 6.3 – New requirements: Magnetic datum surface not permissible. Requirements for auxiliary datum surfaces detailed 6.4 – Requirements for dial indicator modified 7.3 – Coiled cables to be used instead of cords. Key-backs deleted. 11.1 – MicroSD card no longer required 13 – Fixing holes for GOM fixtures deleted 13.2 – Completely reworked: aluminum profiles required, rulers deleted 13.5 – Requirement modified: Black painting deleted. Surface aluminum matted. 17 – Recipient for sending delivery note modified 18 – MicroSD card deleted. Requirements for measurement report modified 19 – Contact for Europe and Asia modified

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