

35-420 Checking semi-trailing arms

Adjusting dimensions for checkup

Distance "a" from measuring table to rear axle shaft flange on upper edge for wheel fit	293.5 ± 0.5 mm
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Test values¹⁾

Distance "b" of inner bearing eyes	414 ± 2 mm
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Rear axle shaft flange lateral runout	0 to 0.12 mm
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Camber (+) or (-)	0° ± 20'
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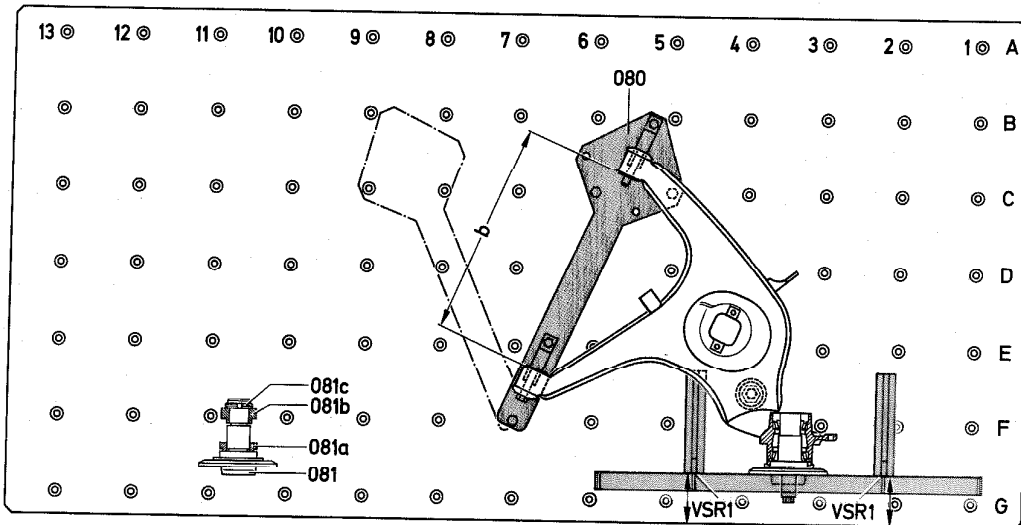
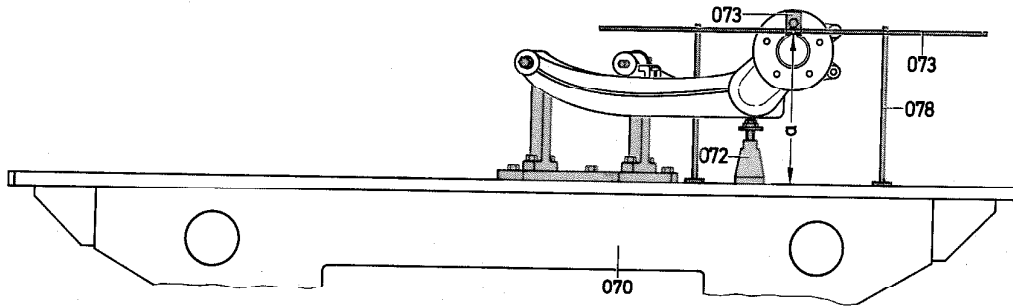
Toe-in (+) or toe-out (-) Measuring points for toe-in per wheel (VSR1) ²⁾	+ 1.0 mm ³⁾ 0 -0.5 mm
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1) The checkup for steel plate semi-trailing arms of the standard diagonal swing axle and for light alloy coupled semi-trailing arms of diagonal swing axle with starting torque compensation is the same.

2) Difference dimension front to rear, with reference to 14" rim dia (measuring points for toe-in per wheel (VSR1) at a distance of 185 mm from wheel center).

3) On both semi-trailing arms of one axle the entire misalignment (deviation) of toe-in (left-hand and right-hand semi-trailing arm together) in plus direction should not exceed 1.5 mm, in minus direction 1.0 mm. However, these maximum dimensions are permitted only if the tolerances for total toe-in (VSG1) on complete axle are not exceeded.

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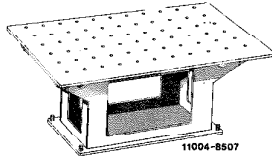
1350-6779/2

- a Height adjusting dimension for rear axle shaft flange at upper edge for wheel fit
 - b Distance of inner bearing eyes (reference dimension)
 - VSR1 Measuring points for toe-in per wheel (with reference to 14" rim dia at a distance of 185 mm from wheel center).
- | | |
|---------------------|------------------------|
| 070 Measuring table | 081 Measuring flange |
| 072 Jack | 081a Outer spacer ring |
| 073 Straightedge | 081b Inner spacer ring |
| 078 Try square | 081c Slot nut |
| 080 Control mount | |

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Required equipment

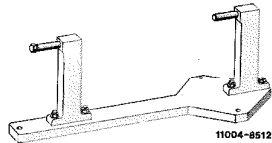
Measuring table with coordinate bore holes 13 mm dia F 7, spacing 150 mm



BE 03600 1522
E 0145

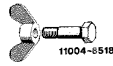
Special tools

Control mount for semi-trailing arms and coupled semi-trailing arms



116 589 15 23 00

Fitted screw with wing nut for locating control mount on measuring table (required 4 each)



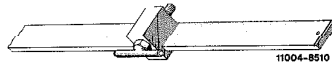
116 589 19 63 00

Jack, adjustable from 100 to 160 mm



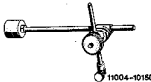
116 589 08 31 00

Straightedge (750 mm long) with holder



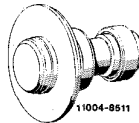
116 589 12 31 00

Magnetic holder for dial gauge



363 589 02 21 00

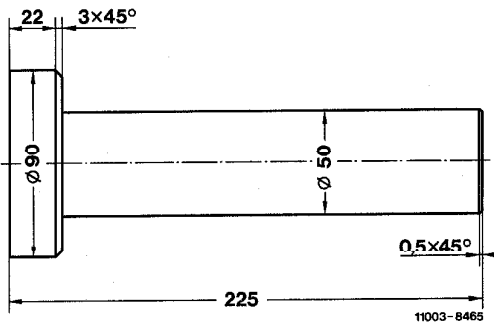
Measuring flange for semi-trailing arm and coupled semi-trailing arm without wheel bearing



116 589 31 21 00

Self-made tool

Measuring base for magnetic holder
Material: steel



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Conventional tools

Dial gauge A 1 DIN 878	e.g. made by Mahr D-7300 Esslingen Order no. 810
Extension 50 mm for dial gauge	e.g. made by Mahr D-7300 Esslingen Order no. 902
Try square 300 x 200 mm (required 2 each)	e.g. made by Stiefelmayer D-7300 Esslingen Order no. 151 AR
Height measurement and tracing tool size III	e.g. made by Stiefelmayer D-7300 Esslingen Order no. 5 V
Bell-type mount for angle measuring tool	e.g. made by Beissbarth D-8000 Munich Order no. P1/96
Angle measuring tool	e.g. made by Beissbarth D-8000 Munich Order no. P 10/05

Notes

Checking of semi-trailing arm as an individual component is in principle and in job sequence the same as for complete directional stability assembly. A semi-trailing arm with wheel bearing as well as a semi-trailing arm without wheel bearing can be checked in combination with a measuring flange instead of the rear axle shaft flange.

For measuring the directional stability system and its various components a measuring table of 2000 x 1000 mm will be required. The measuring table has coordinate bore holes of 13 mm dia F 7 spaced 150 mm apart for locating the control mounts. The coordinate bore holes are identified in longitudinal direction with the numbers 1 to 13 and in transverse direction with the letters A to G.

The measuring values before and following axle reconditioning must be recorded in "Data sheet for directional stability of rear axle" (35-410).

The control mount for steel plate semi-trailing arms as well as for light alloy coupled semi-trailing arms for left and right is mounted on measuring table in such a manner that the nominal values for camber and toe-in are each resulting in a 0 value. If applicable, the misalignment (deviations) of camber and toe-in are each measured in plus or minus direction.

Checkup of semi-trailing arm comprises:

- a) Checking rear axle shaft flange for lateral runout
- b) Rear axle camber
- c) Toe-in

Preparations for checkup

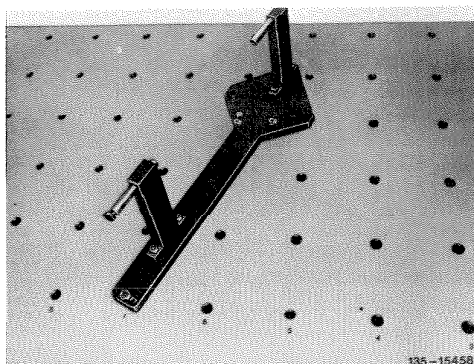
1 Remove brake caliper and brake disc from semi-trailing arm (42-228).

2 Attach control mount with fitted screws and wing nuts to measuring table.

Associated coordinate bore holes:

For left-hand semi-trailing arm F7 and C6,

for right-hand semi-trailing arm F7 and C8.

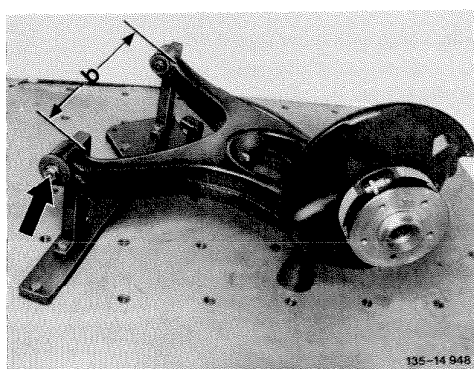


3 Place semi-trailing arm on both pins of control mount and attach with hex screw (arrow) to outer bearing. Support semi-trailing arm outside by means of jack.

Note: If the semi-trailing arm cannot be introduced easily into pins of control mount, measure distance "b" of inner edges of bearings in relation to each other by means of a precision measuring tape.

Reference dimension

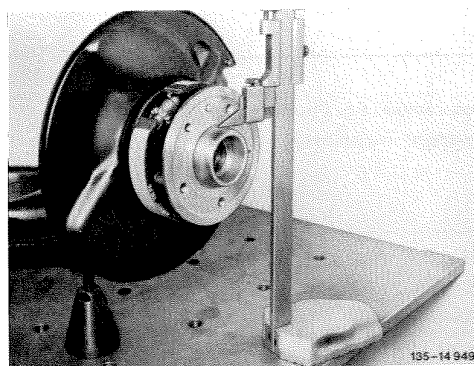
Steel plate and light alloy coupled semi-trailing arm	414 ± 2 mm
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4 Set distance "a" by means of a height measuring instrument from measuring table to rear axle shaft flange at upper edge for wheel fit. For this purpose, change height of jack accordingly.

Adjusting dimension

Model 107, 114, 115 116, 123, 126	293.5 ± 0.5 mm
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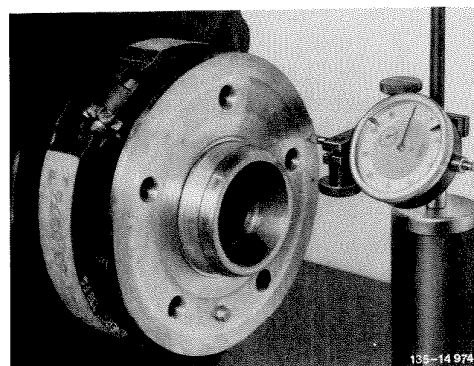


Checkup

5 Check rear axle shaft flange for lateral runout. For this purpose, use dial gauge with magnetic holder and self-made measuring base.

Check value

Model 107, 114, 115 116, 123, 126	0 to 0.12 mm
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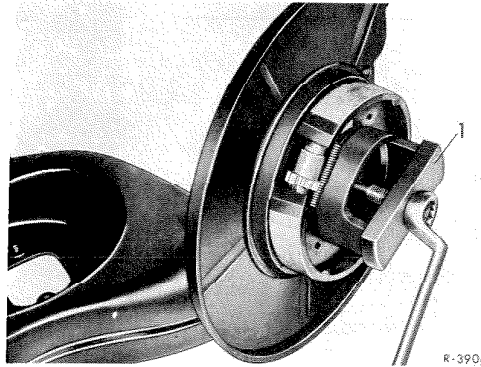
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Attention!

If the lateral runout of the rear axle shaft flange is beyond permissible tolerance range, insert measuring flange for additional checkups.

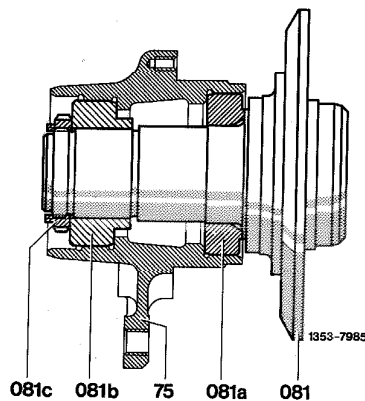
Mount measuring flange:

- a) Remove rear axle shaft flange (35-130).
- b) Knock-out outer race of inner tapered roller bearing by means of locking-out mandrel. Pull-off outer race of outer tapered roller bearing by means of respective tool.



- c) Introduce measuring flange with outer spacer ring. Mount inner spacer ring with small diameter facing flange end and slightly tighten slot nut.

- 75 Semi-trailing arm
- 081 Measuring flange
- 081a Outer spacing ring (pressed-on)
- 081b Inner spacing ring
- 081c Slot nut



Attention!

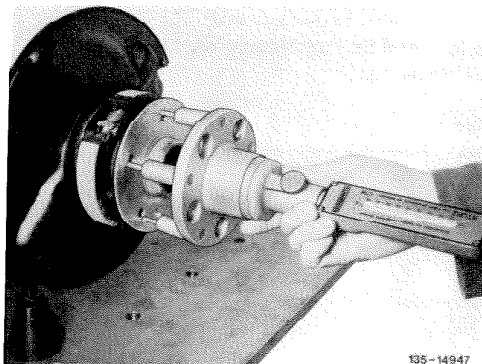
The measuring flange should be seated in wheel carrier of semi-trailing arm without play.

Rear wheel camber

- 6 Measure rear wheel camber. For this purpose, use angle measuring instrument and bell-type mount.

Check value

Model 107, 114, 115	$0^{\circ} \pm 15'$
116, 123, 126	



Note:

a) Steel plate semi-trailing arm

If the camber is higher than the permissible tolerance range, the fault may be a distortion of the semi-trailing arm itself or of the bearing brackets on rear axle carrier. However, experience has shown that on steel plate semi-trailing arms a distortion is mainly characterised by a misalignment (deviation) in direction of track.

b) Light alloy coupled semi-trailing arm

If the camber is higher than the permissible tolerance range, the fault may be a distortion of the separate wheel carrier.

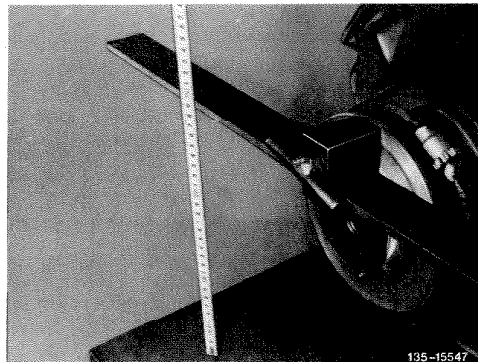
The cast light alloy coupled semi-trailing arm itself will not yield both in direction of camber and track. **If the wheel carrier is only slightly distorted in direction of camber, continued use of semi-trailing arm in combination with a new wheel carrier is permitted. In the event of major distortions of wheel carrier (camber misalignment more than 1°), the semi-trailing arm should be replaced for safety reasons to eliminate any risk of incipient cracks.**

Toe-in per wheel (VSR1)

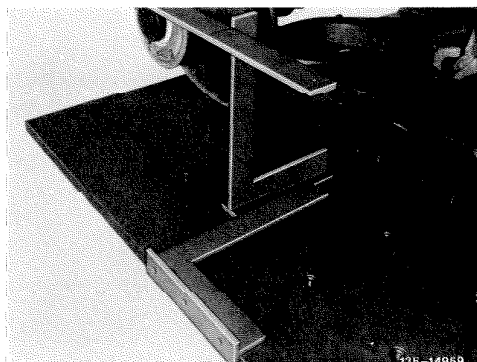
Note: A straightedge on rear axle shaft flange or measuring flange serves for measuring toe-in. Measuring points for toe-in per wheel (VSR1) are the inside marks applied 185 mm from wheel center with reference to 14" rim dia. The measuring values thereby correspond to values of chassis measurements at respective position of semi-trailing arms (also refer to comparison table for toe-in values in millimeters and degrees, section 35-410 "Complete checkup of rear axle directional stability").

The outer markings (measuring points VSR2) on straightedge at a distance of 370 mm from wheel center can be used for additional reference measurements, if in doubt. The resulting double toe-in values are then halved in relation to values with reference to 14" rim dia.

7 Attach straightedge with holder to rear axle shaft flange while paying attention to the two markings for wheel center. Set straightedge into horizontal position by measuring and compensating vertical distance of straightedge in relation to measuring table both at front and rear.

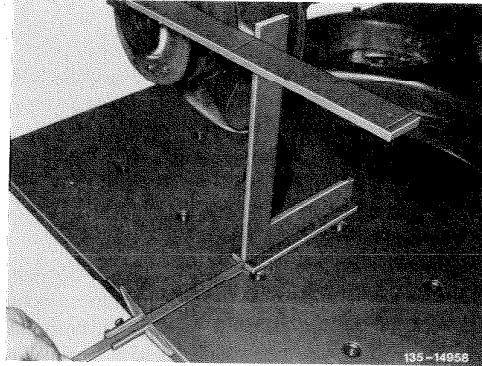


8 Position try square at front against inner mark of straightedge, using a second try square for this purpose.

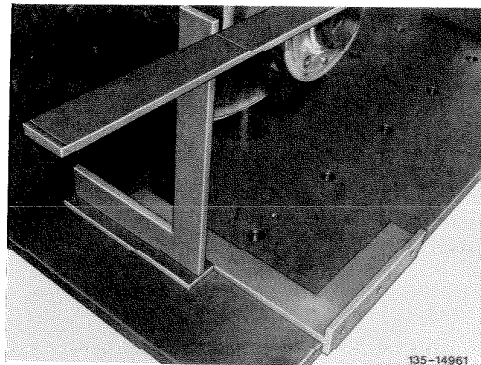


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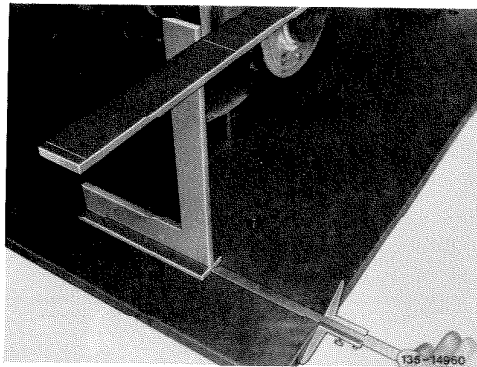
9 Measure front distance from edge of measuring table to try square or to straightedge by means of depth gauge and write down value.



10 Place try square at the rear against inner mark of straightedge using a second try square for this purpose.



11 Measure rear distance from edge of measuring table to try square or to straightedge with depth gauge and write down value.



12 To find toe-in per wheel (VSR1) determine difference between values measured at the front and rear and enter into data sheet.

Check value

Model 107, 114, 115	0 + 1.0
116, 123, 126	- 0.5 mm

**Example: Model 123
Toe-in per wheel (VSR1)**

Left-hand wheel:
 Front value = 62.5 mm
 Rear value = 62.3 mm
 results in difference
 toe-in = + 0.2 mm

Right-hand wheel:
 Front value = 64.4 mm
 Rear value = 61.9 mm
 results in difference
 toe-in = + 2.5 mm

Attention!

In the event of a deviation from nominal value check whether it is toe-in (+) or toe-out (-). On both semi-trailing arms of one axle the entire misalignment (deviation) of toe-in (left-hand and right-hand semi-trailing arm together) in plus direction should not exceed 1.5 mm, and 1.0 mm in minus direction. When checking complete directional stability assembly, the toe-in value should also be within permissible tolerance (35-410).

Note: The example (steel plate semi-trailing arm on model 123) shows on left-hand semi-trailing arm a toe-in which is in order, while the right-hand semi-trailing arm has a non-permissible toe-in misalignment (deviation) caused by distortion.

If the light alloy coupled semi-trailing arm shows a misalignment (deviation) of toe-in, it is an indication that the separate wheel carrier is distorted (also refer to section "Rear wheel camber").

The cast light alloy coupled semi-trailing arm itself is not yielding both in direction of camber and caster.

If the wheel carrier is distorted in direction of track, replace coupled semi-trailing arm for safety reasons due to risk of incipient cracks!