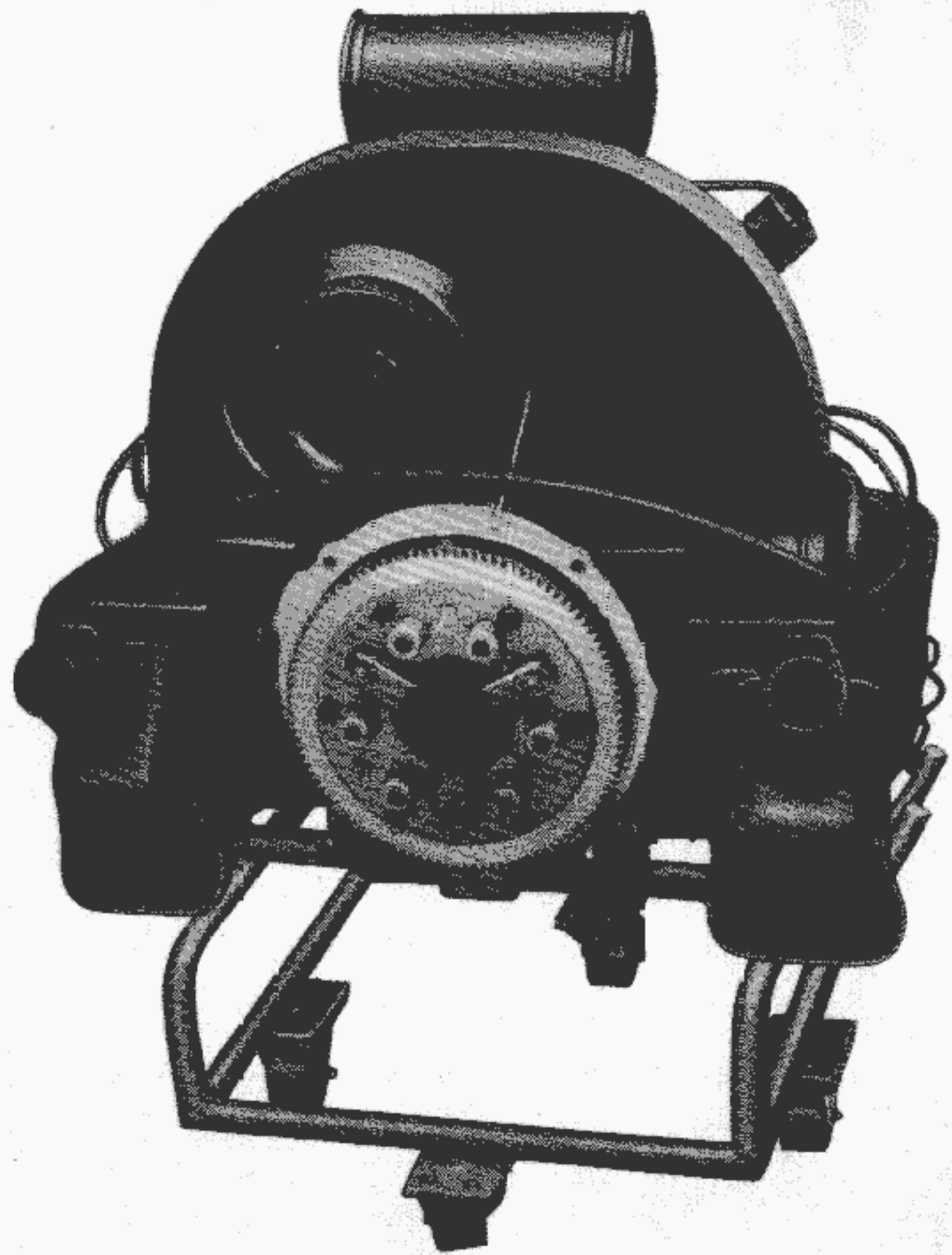


**Engine Trolley**

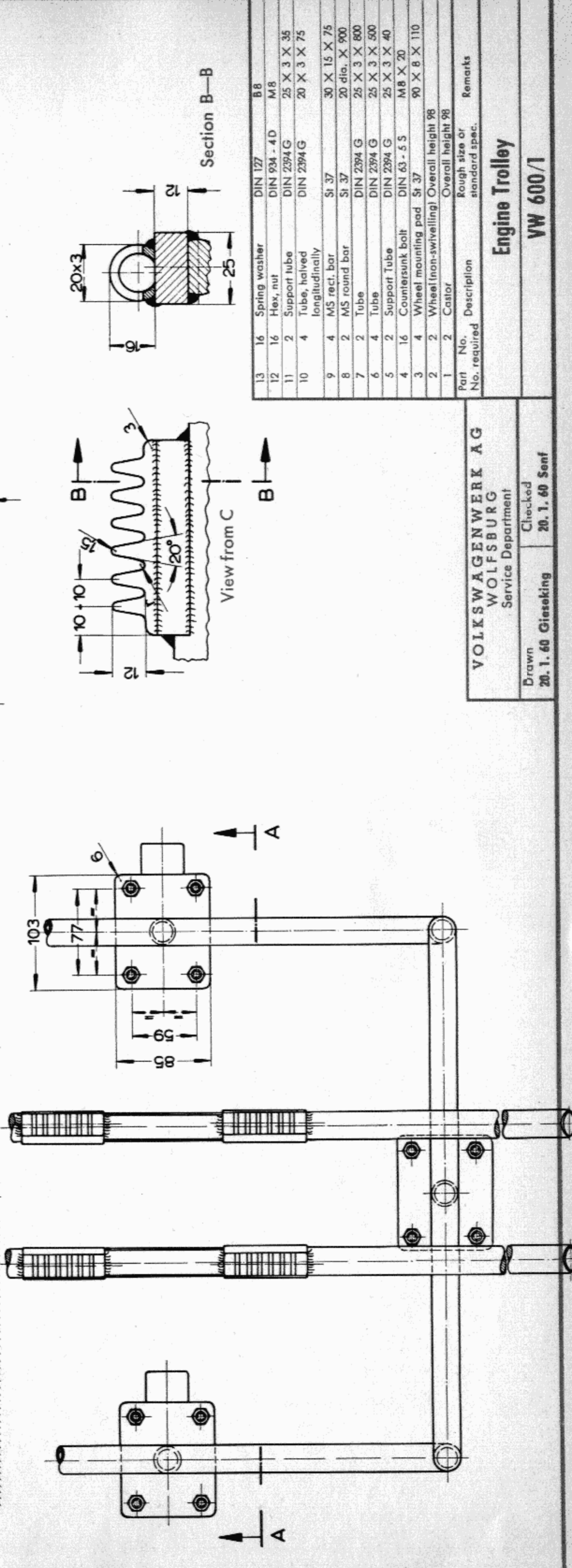
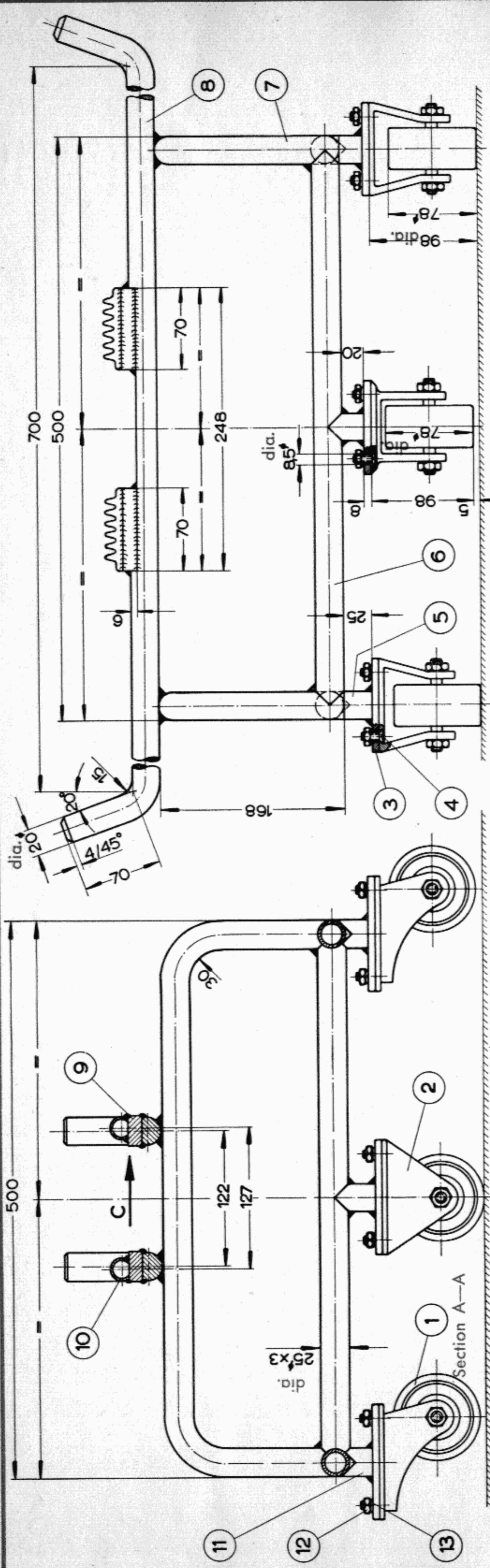
The engine trolley provides a safe support for the engine with the car on a hoist, or supported by a gantry crane. It also enables the engine to be moved about easily. The trolley runs on two non-swivelling wheels and two castors and is therefore highly manoeuvrable, whilst the welded-on cradle pads match the shape of the crankcase and thus entirely eliminate any possibility of damaging the engine when lowering on to the trolley.

Other examples of uses to which the engine trolley can be put are given in "Local Manufacture of Workshop Equipment" under Nos. VW 605, VW 606 and VW 633 as well as in the VW Workshop Manual.



### Construction Details for VW 600/1

- 1 — Cut all tubes, strip and round bar to dimensions given in list of parts.
- 2 — Bend round bar (8) as shown on drawing, cut off accurately to length and work the flats as indicated (depth 6 mm =  $\frac{15}{64}$  in.).
- 3 — Bend tube (7) as shown on drawing.
- 4 — Weld up tubular components (5), (6) and (7) and round bar (8) as shown on drawing.
- 5 — Weld longitudinally halved tubes (10) and square bars (9) to round bar members (8) adjacent to the flats, as shown on the drawing.
- 6 — Mark off positions of tapped holes for castors and non-swivelling wheels (1) and (2) on mounting pads (3); drill four 6.5 mm (0.256 in.) holes in each pad and countersink.
- 7 — Weld mounting pads (3) to tube ends (5).
- 8 — Screw castors and wheels to pads, using countersunk screws (4).
- 9 — Paint trolley.
- 10 — Grease all bearings.



Part No.	Description	No. required	Remarks
1	Castor	Overall height 98	
2	Wheel (non-swivelling)	Rough size or standard spec.	
3	Wheel mounting pad	M8 X 20	
4	Countersunk bolt	DIN 63 - 5 5	
5	Support Tube	DIN 2394 G	25 X 3 X 40
6	Tube	DIN 2394 G	25 X 3 X 500
7	Tube	DIN 2394 G	25 X 3 X 800
8	MS round bar	St 37	20 dia. X 900
9	MS rect. bar	St 37	30 X 15 X 75
10	Tube, halved longitudinally	DIN 2394 G	25 X 3 X 75
11	Support tube	DIN 2394 G	25 X 3 X 35
12	Hex, nut	DIN 934 - 4 D	M 8
13	Spring washer	DIN 127	B 8

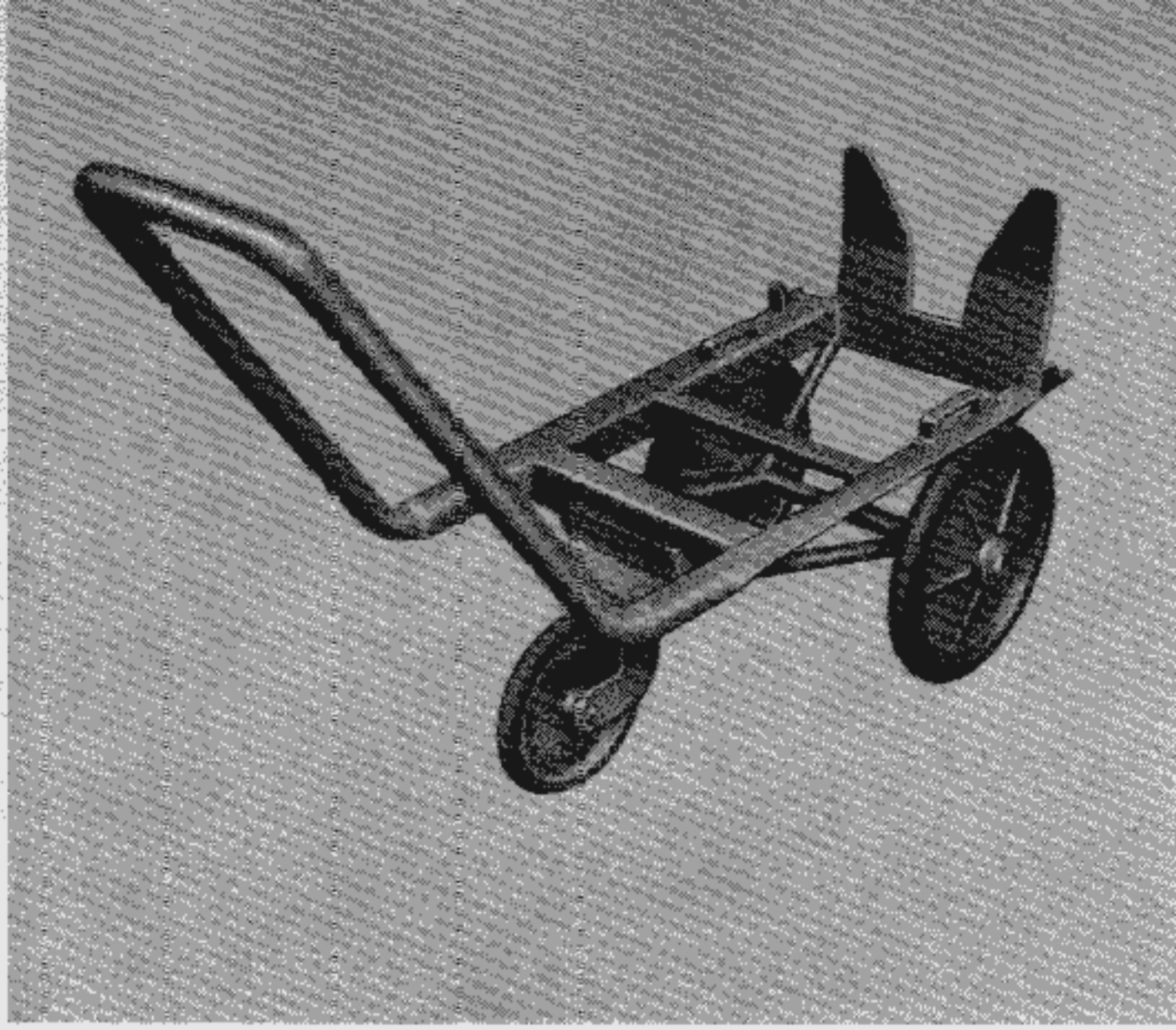
VOLKSWAGENWERK AG  
WOLFSBURG  
Service Department

Drawn  
20. 1. 60 Gieseke

Checked  
20. 1. 60 Sent

Engine Trolley

VW 600/1

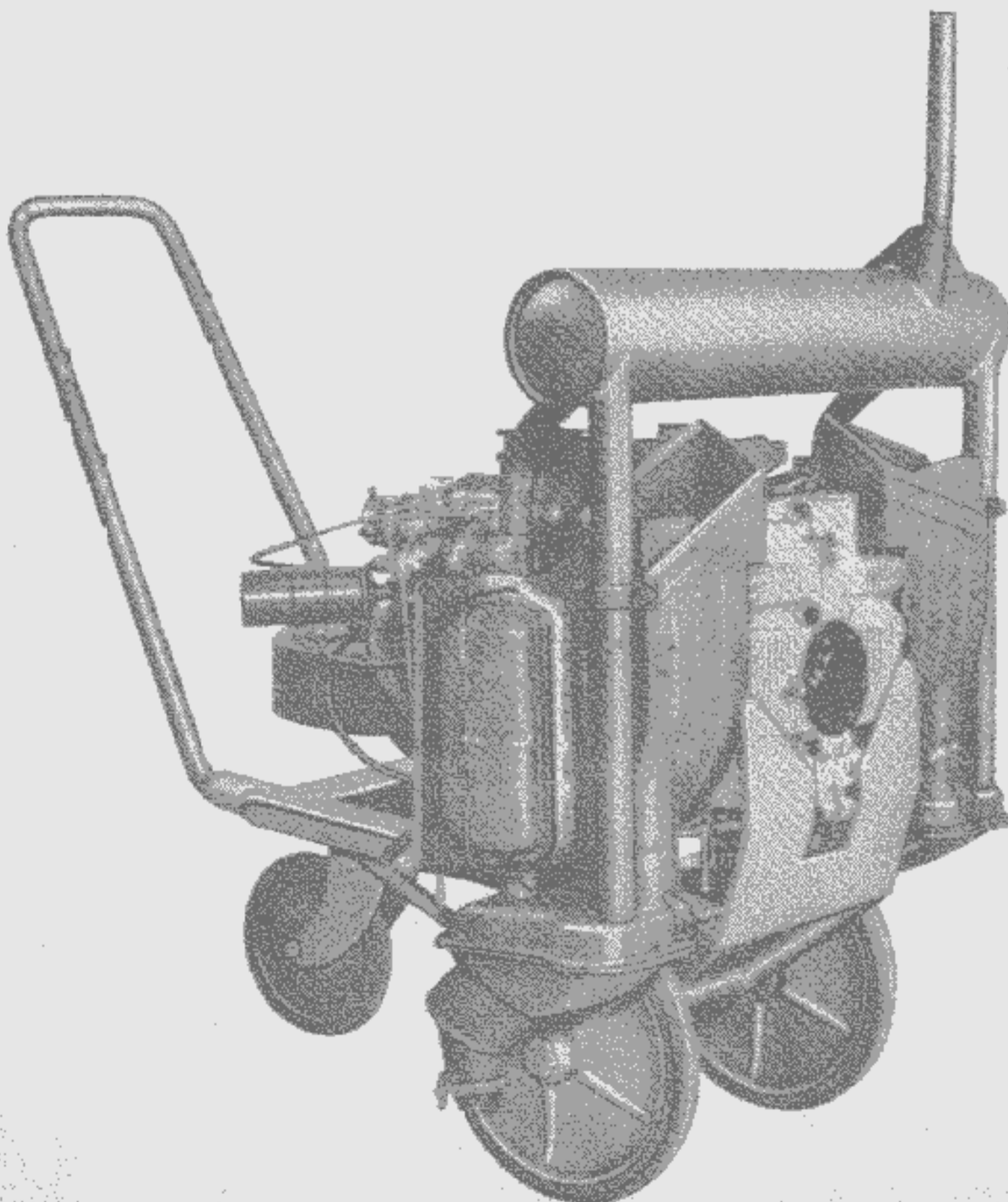
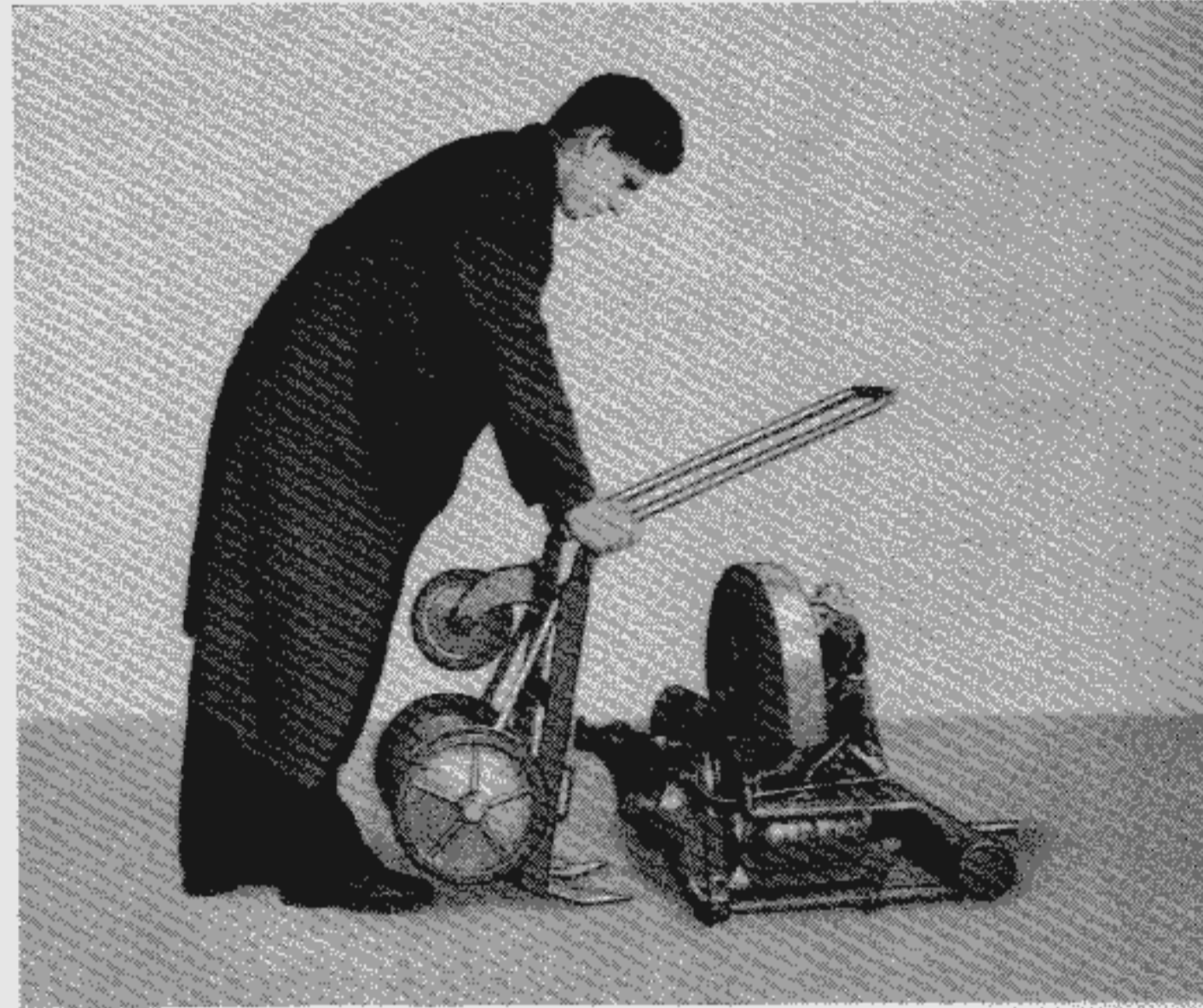


## Trolley for Assemblies and Units

This trolley is designed for moving the rear axle plus transmission assembly, engine or front axle from point to point within the repair shop.

Three large rubber-tired wheels ensure that the trolley runs easily and quietly — even when the floor surface is uneven.

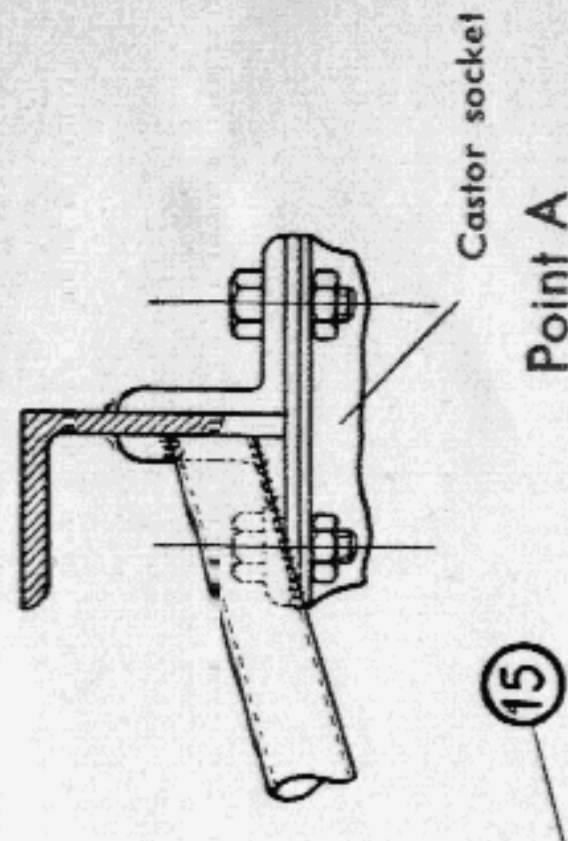
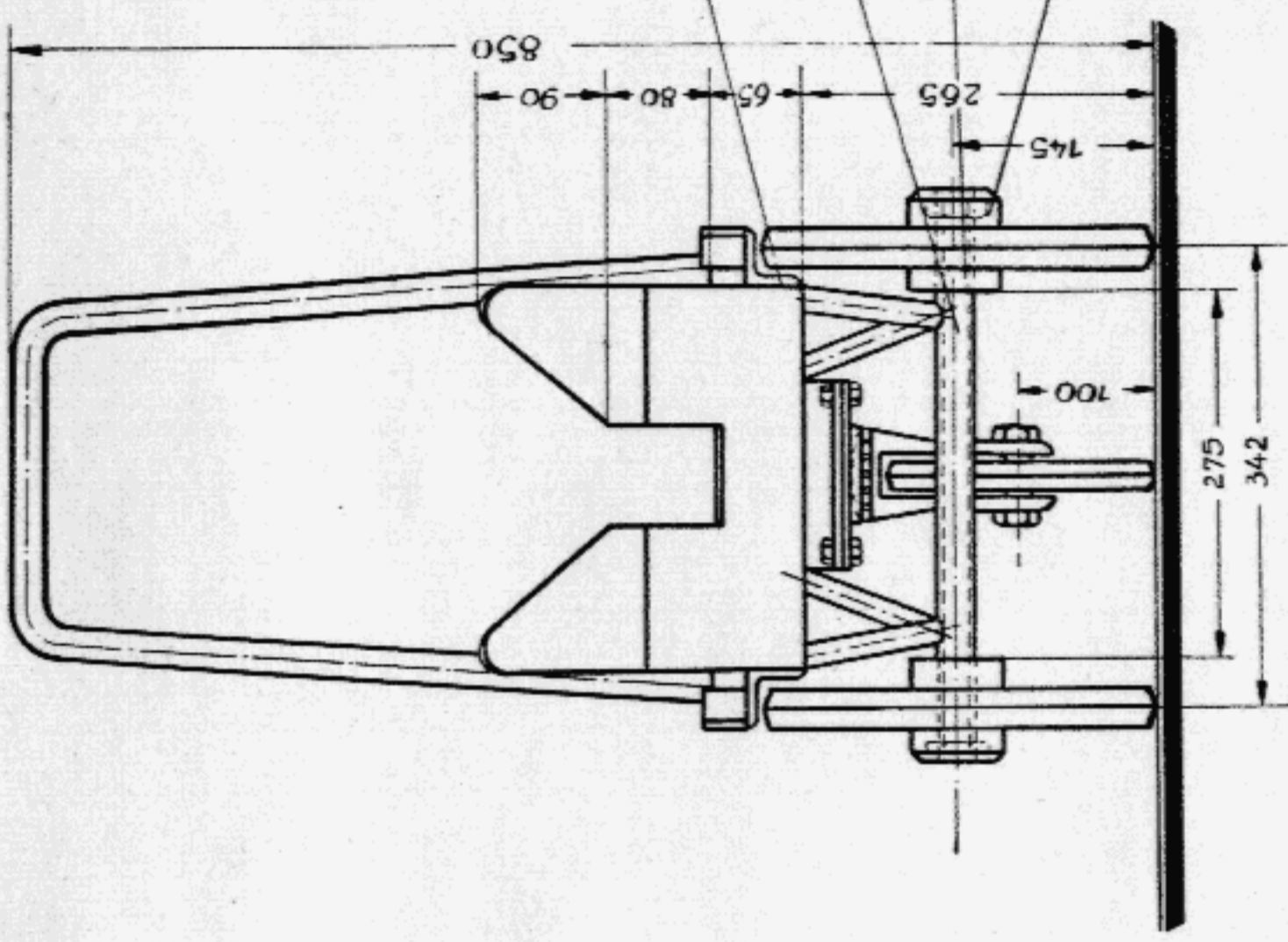
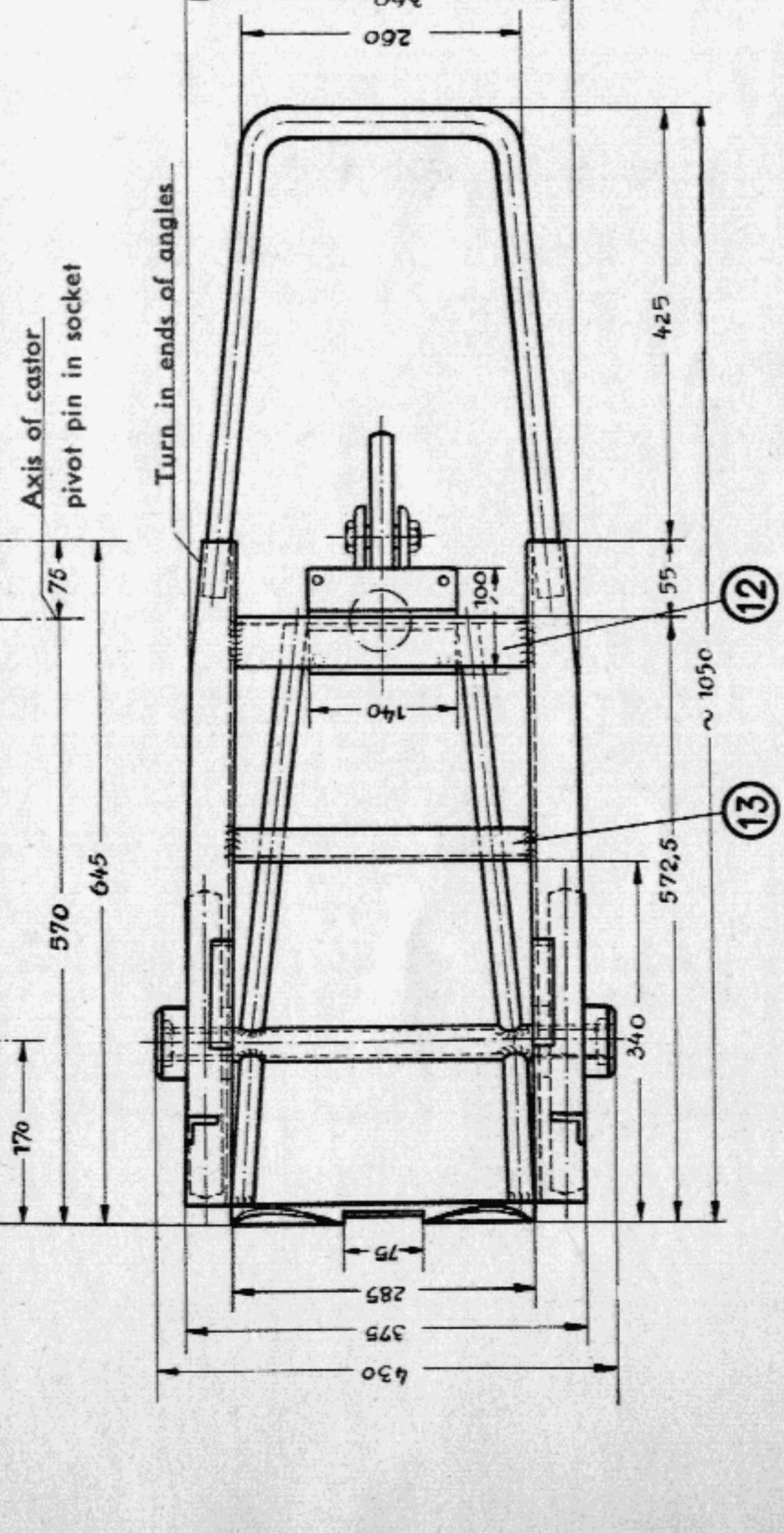
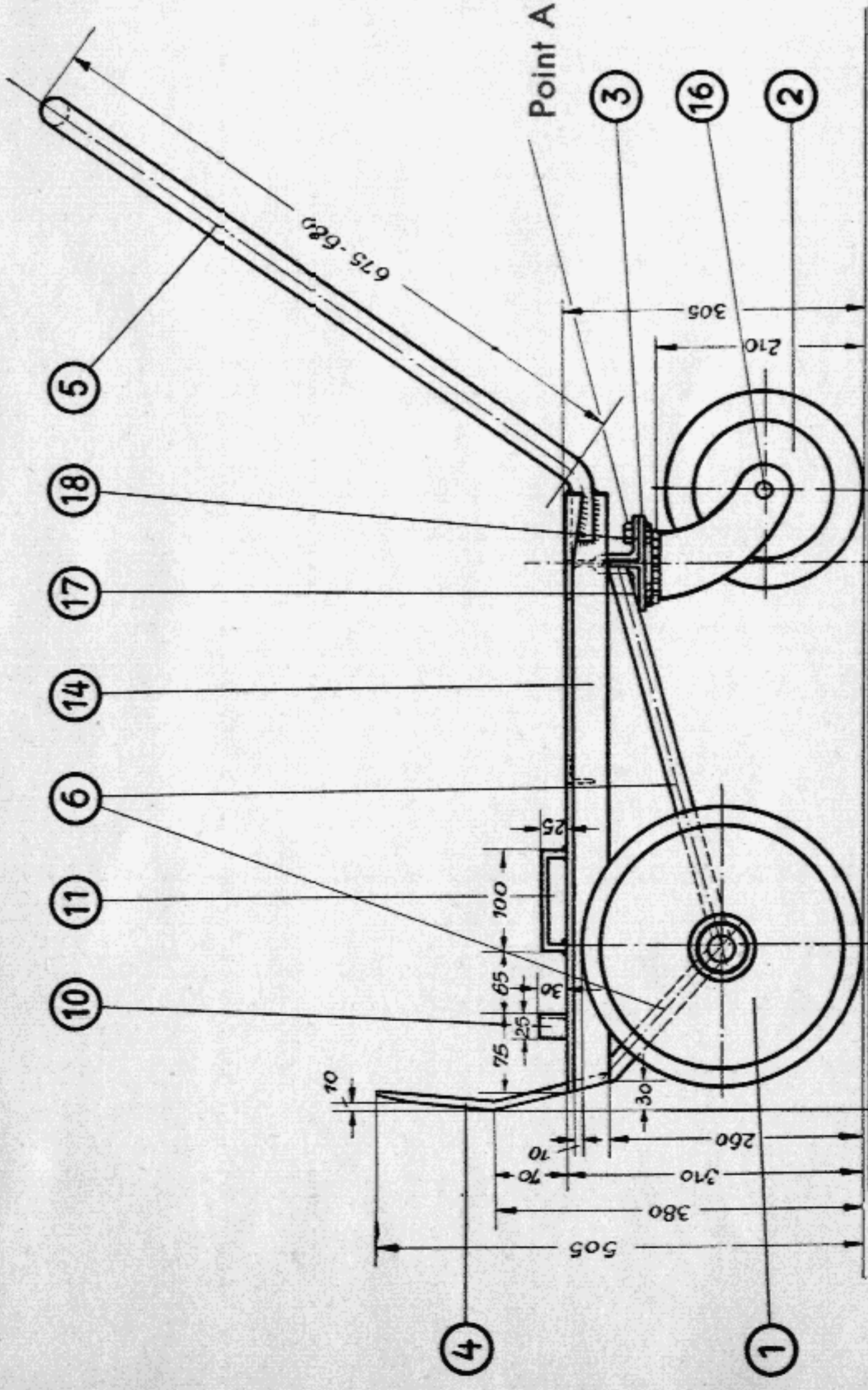
The rear castor gives exceptionally good manoeuvrability. A further asset is the fact that, by tilting the trolley forward, the user is able single-handed to pick up and load units directly from the floor.



Further examples of ways in which these trolleys can be used in conjunction with other Local Construction Service Equipment are given under Nos. VW 605, VW 606 and VW 633 as well as in the VW Workshop Manual.

### Construction Details for VW 601

- 1 - Cut off all tube, angles, strip and round bar for axle (8) to dimensions given in list of parts. Cut up tube (6), length 1200 mm (47 in.), into two lengths of 200 mm (7<sup>7</sup>/<sub>8</sub> in.) each, and two lengths of 400 mm (15<sup>3</sup>/<sub>4</sub> in.) each.
- 2 - Bend tube (5) as shown in drawing.
- 3 - Cut a M 18 × 1.5 thread for a distance of approximately 20 mm (3/<sub>4</sub> in.) on each end of the axle (8).
- 4 - Prepare steel plate (4).
- 5 - Weld up tubes (6) and (7) and angles (12), (13), (14) and (15) as shown in the drawing.
- 6 - Weld plate (4) to front end.
- 7 - Bend up brackets (10) and (11) as shown in drawing and weld to frame.
- 8 - Roll over rear ends of angles (14) to give a good wrap round ends of tubular handle (5). Weld tube to angles.
- 9 - Insert axle (8) into axle tube (7). Fit rubber-tired wheels (1) and secure by axle nuts (9); mount wheel caps on axle threads.
- 10 - Drill four 10.5 mm (0.413 in.) holes in the welded angles (15) in positions corresponding to the holes in the castor plate and attach the latter with four machine screws (17) and lock washers (18).
- 11 - Insert rubber-tired wheel (2) into the castor fork and secure by steel bolt (16).
- 12 - Paint trolley in the prevailing colour of the equipment and machines in the shop.
- 13 - Grease all bearings.



Chamfer all sharp edges

18	4	Lock washer	10ø inside	
17	4	Machine screw	M 10 x 20	+ nut M 10
16	1	Steel bolt	M 12 x 70	
15	2	Angle	45 x 45 x 5	Length 140
14	2	Angle	45 x 45 x 5	Length 630
13	1	Angle	30 x 30 x 4	Length 275
12	1	Angle	45 x 45 x 5	Length 270
11	2	Bracket	20 x 5	Length 150
10	2	Bracket	30 x 5 L 90°	Length 60
9	2	Axle nut	M 18 spanner 27 across flats	Thickness 10
8	1	Axle shaft	18ø x 420 ends threaded M 18	Length 20
7	1	Casing tube	24ø outside	Wall thickness 2.5. Overall length 280
6	1	Tube	1/2", 21,25ø outside 15,75ø inside	Overall length ~1200
5	1	Tube	3/4", 26,75ø outside 21,25ø inside	Overall length ~1800
4	1	Steel plate	6 x 285 x 245	Made in one piece or joined
3	1	Castor socket		
2	1	Rubber-tyred wheel	485/8 D200	Order without closed hub cap
1	2	Rubber-tyred wheel	485/8 D300	

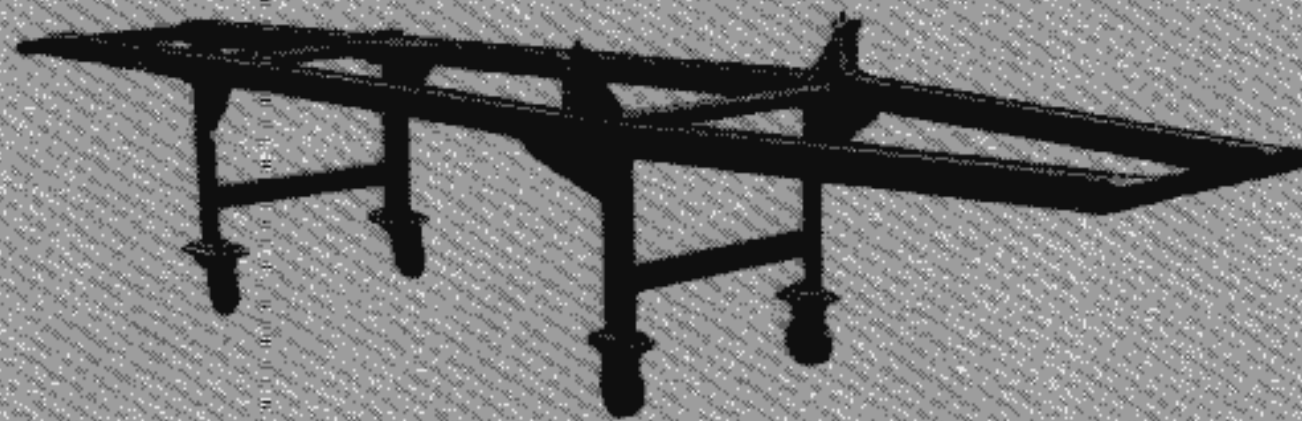
Part No. Required	Description	Rough Size or Standard Spec.	Remarks
18	Lock washer	10ø inside	
17	Machine screw	M 10 x 20	+ nut M 10
16	Steel bolt	M 12 x 70	
15	Angle	45 x 45 x 5	Length 140
14	Angle	45 x 45 x 5	Length 630
13	Angle	30 x 30 x 4	Length 275
12	Angle	45 x 45 x 5	Length 270
11	Bracket	20 x 5	Length 150
10	Bracket	30 x 5 L 90°	Length 60
9	Axle nut	M 18 spanner 27 across flats	Thickness 10
8	Axle shaft	18ø x 420 ends threaded M 18	Length 20
7	Casing tube	24ø outside	Wall thickness 2.5. Overall length 280
6	Tube	1/2", 21,25ø outside 15,75ø inside	Overall length ~1200
5	Tube	3/4", 26,75ø outside 21,25ø inside	Overall length ~1800
4	Steel plate	6 x 285 x 245	Made in one piece or joined
3	Castor socket		
2	Rubber-tyred wheel	485/8 D200	Order without closed hub cap
1	Rubber-tyred wheel	485/8 D300	

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WOLFSBURG  
Service Department

Drawn: 3 Aug., 50 Kohl  
Checked: Senf

Trolley for Assemblies and Units

VW 601

**Body Trolley**

The body trolley carries the body after it has been lifted off the chassis and is an indispensable aid to panel beating and paint shops because it allows safe and convenient handling of the body. Two non-swivelling wheels and two castors give ample manoeuvring facilities.

Among other appliances, the gantry crane No. VW 605 is adapted for lifting off the body of the VW Car and placing it on the body trolley.



### Construction Details for VW 602

- 1 - Cut off tubes, round bar, strip and sectional material to dimensions given in list of parts, place complete castor and wheel assemblies ready to hand.
- 2 - Cut a vinto each of the C-section bearers (1), forming the frame side members (length 4210 mm = 165<sup>3</sup>/<sub>4</sub> in.), and bend their ends through 15° as shown in the drawing.
- 3 - Fit end plates (2) to the ends of side members (1) and weld on.
- 4 - Fit tubes (3) and (4) to the frame and weld on as shown in the drawing.
- 5 - Fit stiffeners (20) to frame and cross rail (4) and weld.
- 6 - Place plates (10) in correct position on castor and wheel assemblies, mark off fixing holes and drill.
- 7 - Weld plates (11) and (10) and cross rails (12) to angles (5) and (6).
- 8 - Weld stiffeners (7) and supporting plates (13) to angles (5).
- 9 - Weld front and rear leg assemblies to frame as shown in drawing.
- 10 - Bolt wheels and castors to plates (10).
- 11 - Prepare dowels (19).
- 12 - Drill plates (18) as shown in drawing, weld to frame and press in dowels (19).
- 13 - Drill plates (16) and press in pins (17).
- 14 - Weld plates (14) and (16) to tubes (15).
- 15 - Weld plates (14) to frame as shown in drawing.
- 16 - Paint trolley in the prevailing colour of equipment and machines in the shop.
- 17 - Apply grease liberally to wheel and castor bearings.

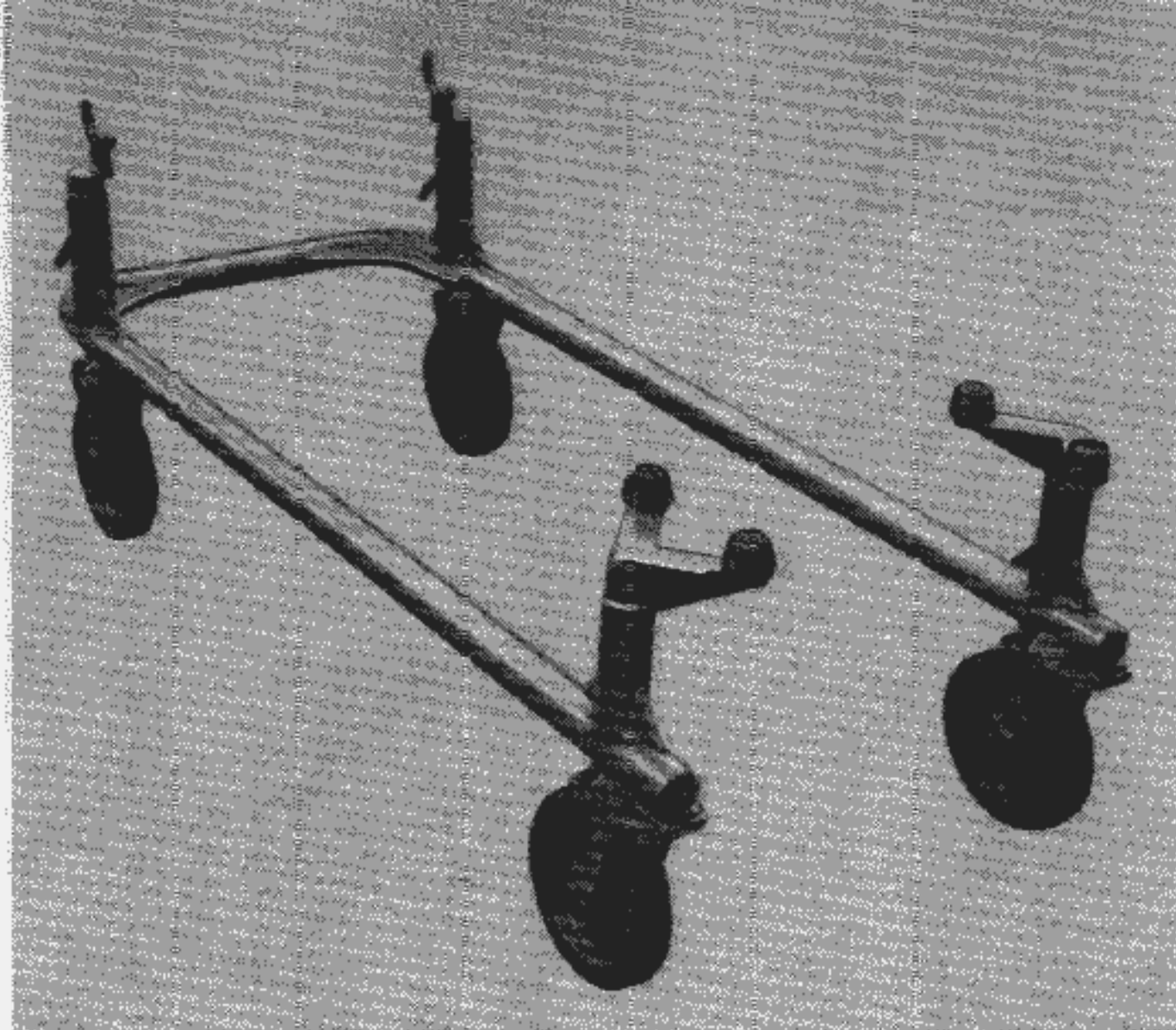
#### Note

As an alternative the frame can be made of 2<sup>1</sup>/<sub>2</sub>" steel tube, and legs (5) and (6) of 2" steel tube.





# LOCAL MANUFACTURE OF WORKSHOP EQUIPMENT

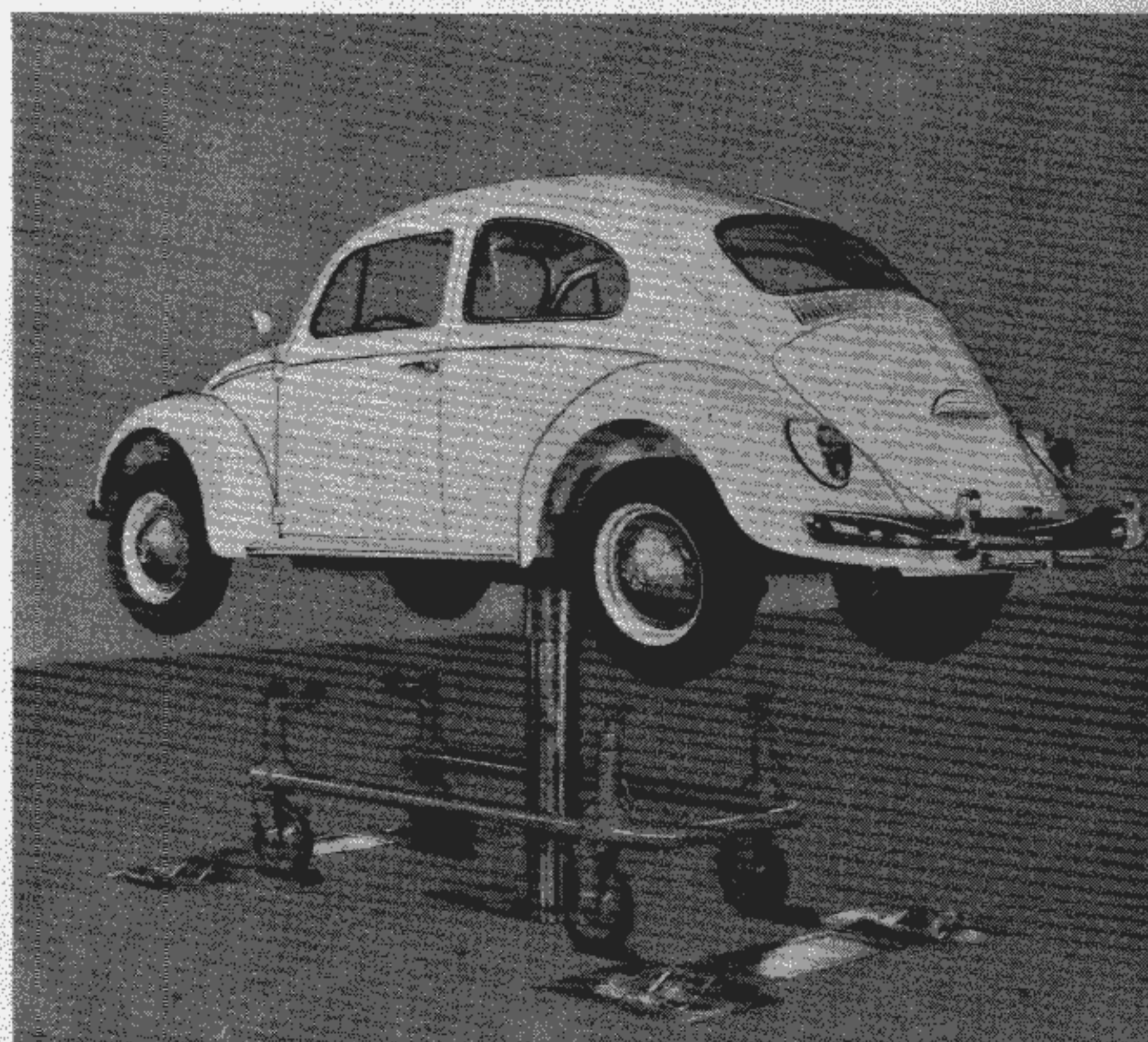
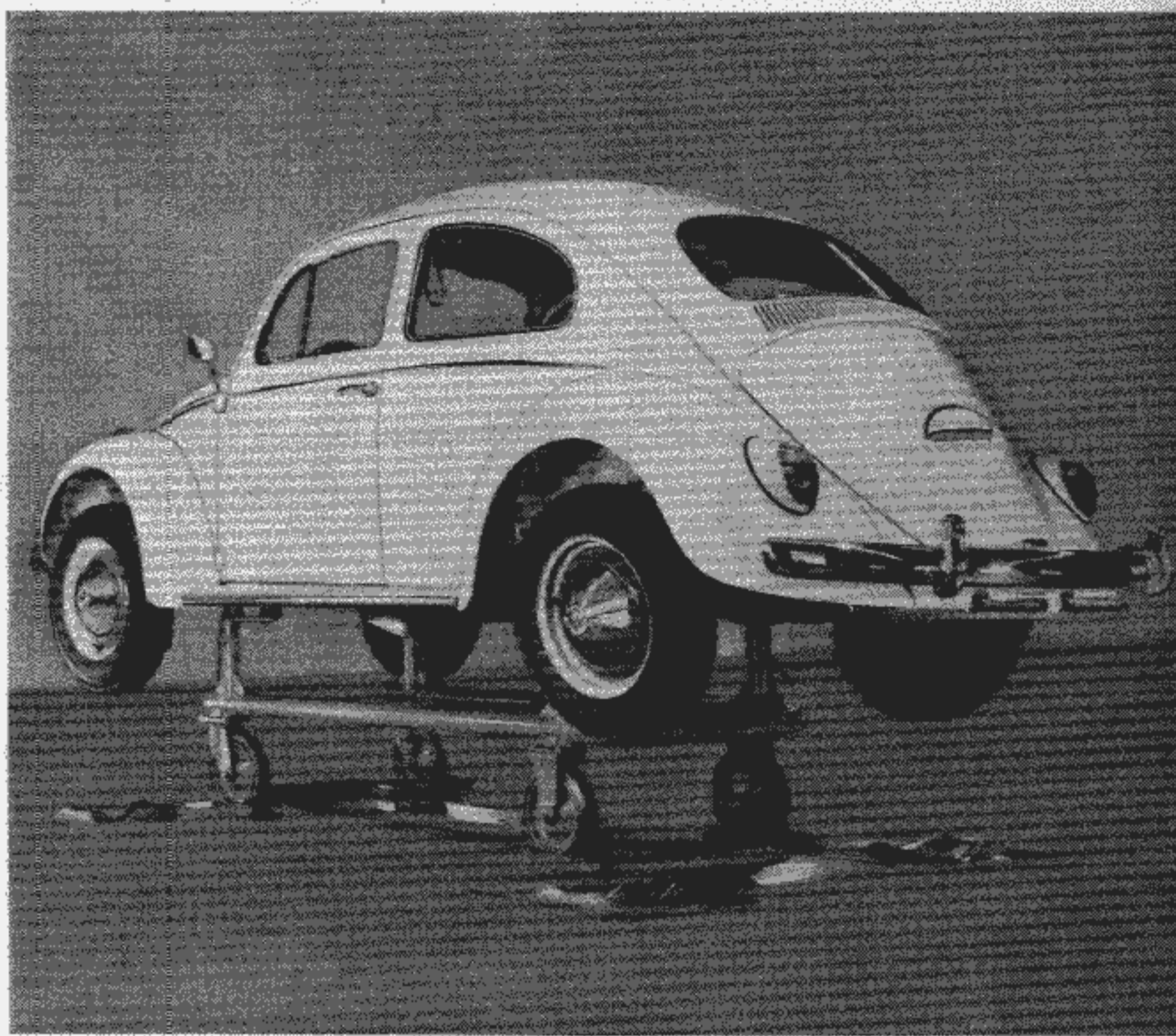


Vehicle Trolley for VW Automobiles

This vehicle trolley has been designed to suit the dimensions of the VW automobile special hoist, and can be used for types 1, 2 and 3.

Two non swivelling wheels and two castors fitted with solid rubber tires give the trolley maximum maneuverability thereby making it possible to move unloaded and loaded vehicles inside the Workshop and park them — even when space is restricted.

Due to the favourable height of the vehicle when on the trolley practically all repair work can be carried out in comfort.



### **Construction Details for VW 603/3 — sheet 1**

- 1 — Cut all parts as detailed in list of parts, and have standard parts ready to hand.
- 2 — Work parts (1) and (2) to length.
- 3 — Bend part (2) and weld together with part (1).
- 4 — Weld parts (14) to frame tube ends.
- 5 — Work the length and breadth of parts (8) and (9) wheel and castor mounting plates to correct fit.
- 6 — Mark out and drill 10.5 mm holes in parts (8) and (9).
- 7 — Weld parts (6) and (7) to wheel and castor mounting plates.
- 8 — Weld parts (6) and (7) together with wheel and castor mounting plates to the frame tube.
- 9 — Finish off part 5 and weld in position.
- 10 — Screw on wheels and castors.
- 11 — Finish parts (10) (12) and (18).
- 12 — Weld parts (10) and (4) to frame tube.
- 13 — Weld parts (12) (3) and (18) onto support.
- 14 — Insert part (17).
- 15 — Finish part (11) as shown in drawing.
- 16 — Weld parts (11) and (4) onto the frame tube.
- 17 — Finish parts (22) and (23).
- 18 — Paint trolley.

### **Construction Details for VW 603/3 — sheet 2**

- 1 — Cut all parts as detailed in list of parts.
- 2 — Finish off part 1.
- 3 — Finish part 2 to length and breadth dimensions given.
- 4 — Mark of part 3 and finish off.
- 5 — Finish off parts 4 and 5.
- 6 — Carry out all welding work.
- 7 — Smooth welded seams.
- 8 — Paint the whole bracket except the spigot.

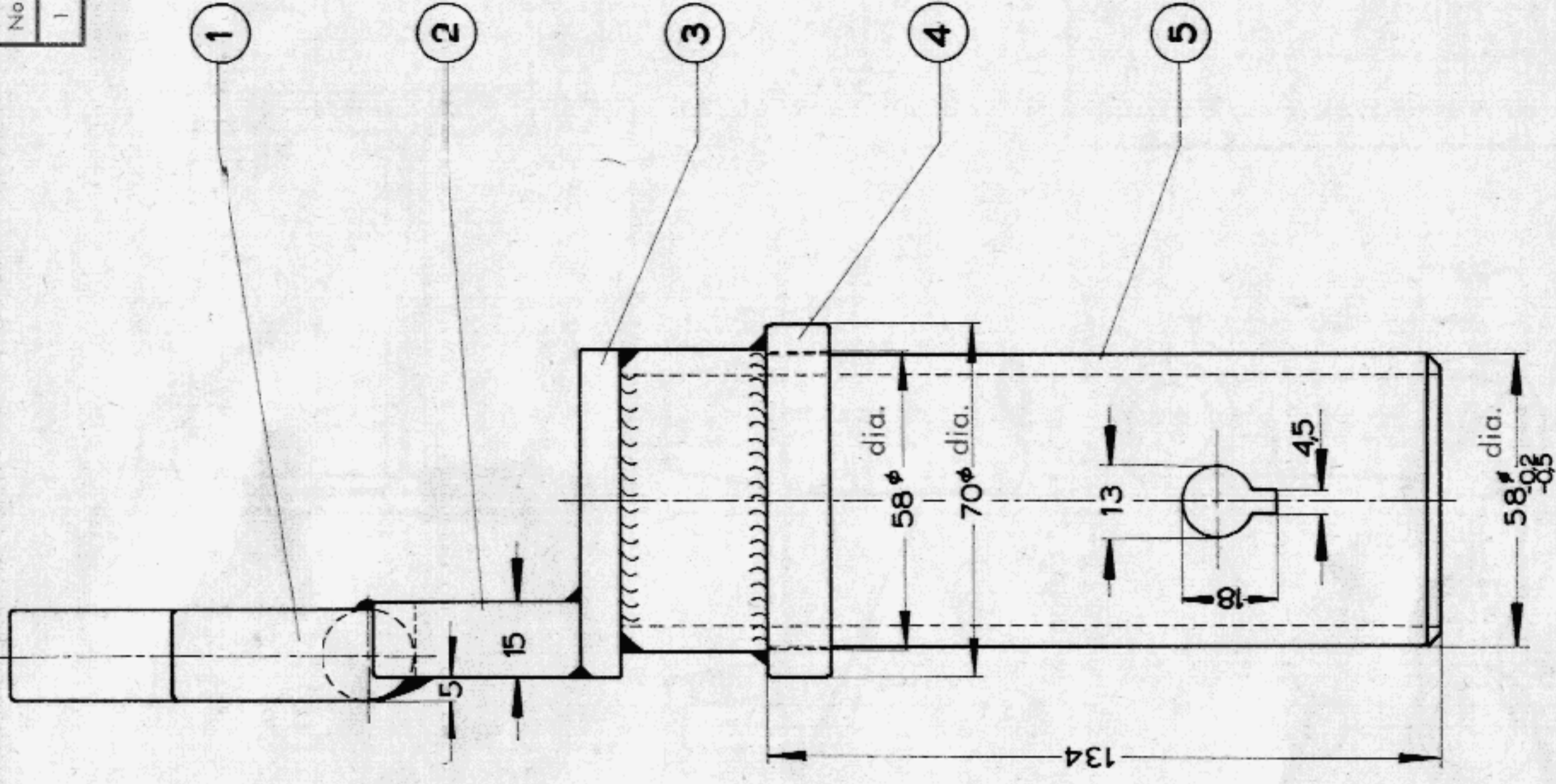


**Technical Data for non swivelling wheels and castors**

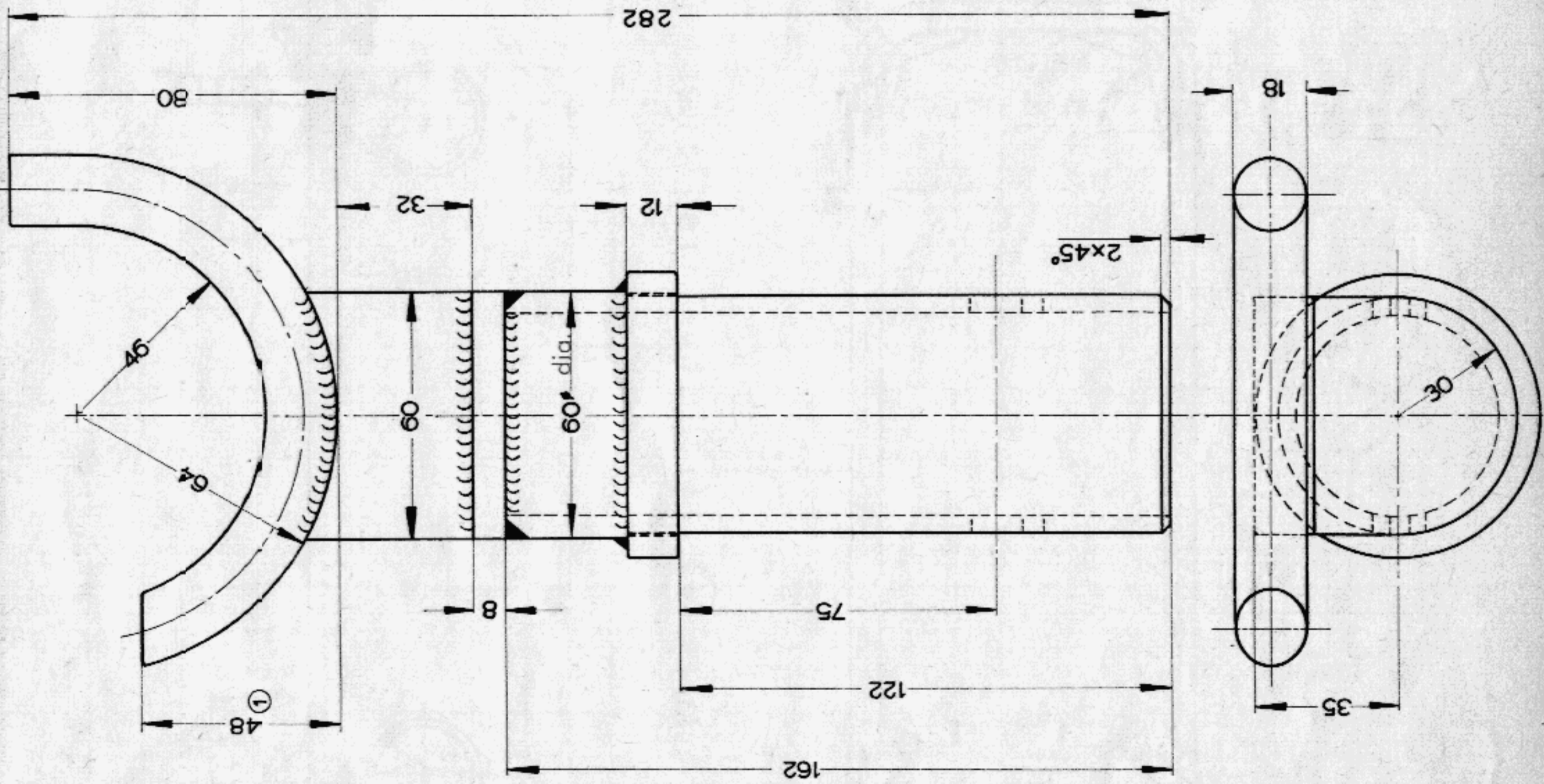
Wheel diameter 285 mm  
Carrying capacity approx. 500 kg (3)  
Length of mounting plate, non swivelling wheels 135 mm  
Length of mounting plate, castor 160 mm  
Width of mounting plate, non swivelling wheels 90 mm  
Width of mounting plate, castor 105 mm  
Castor angle of castor wheel 70 mm  
Rim Two halves bolted together  
Bearing Rollers in cage, lubricated by grease nipple  
Tires Replaceable, trapeziform rubber

No.	Date	Description of alteration
1	26. 9. 61	was 263
2	26. 9. 61	was without pin
3	3. 11. 61	was 240 kg
1	10. 10. 63	was 225
4	1	was 240
5	1	Part 17 and 18 modified
6	1	Part 5 measurement given
7	10. 10. 63	Part 19 added

No.	Date	Description of Alteration
1	19. 6. 62	was 31.



Shown for left hand side —  
right hand side is mirror image



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WOLFSBURG  
Service Department

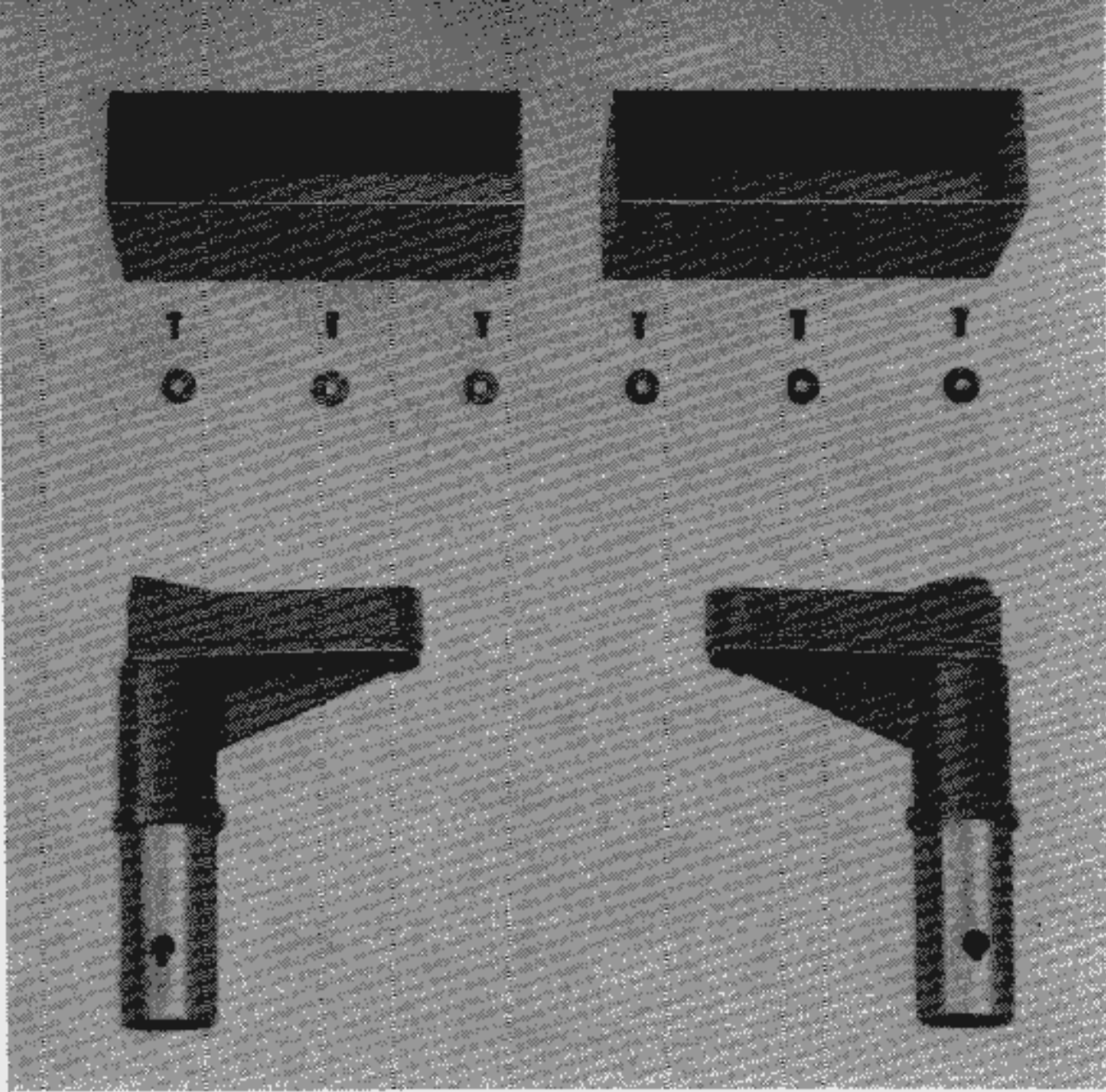
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Checked: 24. 8. 61 Ratte

Part No.	Description	Material	Part No. or standard spec.
5	2 Spigot	60 X 4 X 165	St 35 DIN 2385
4	2 Spacer ring	70 X 6 X 15	St 35 DIN 2385
3	2 Plate	70 X 8 X 65	C 15
2	2 Vertical plate	45 X 15 X 65	C 15
1	2 Bracket	18 φ X 180	C 15

**Rear Bracket for Vehicle Trolley**

Sheet No. 2  
No. of Sheets 2

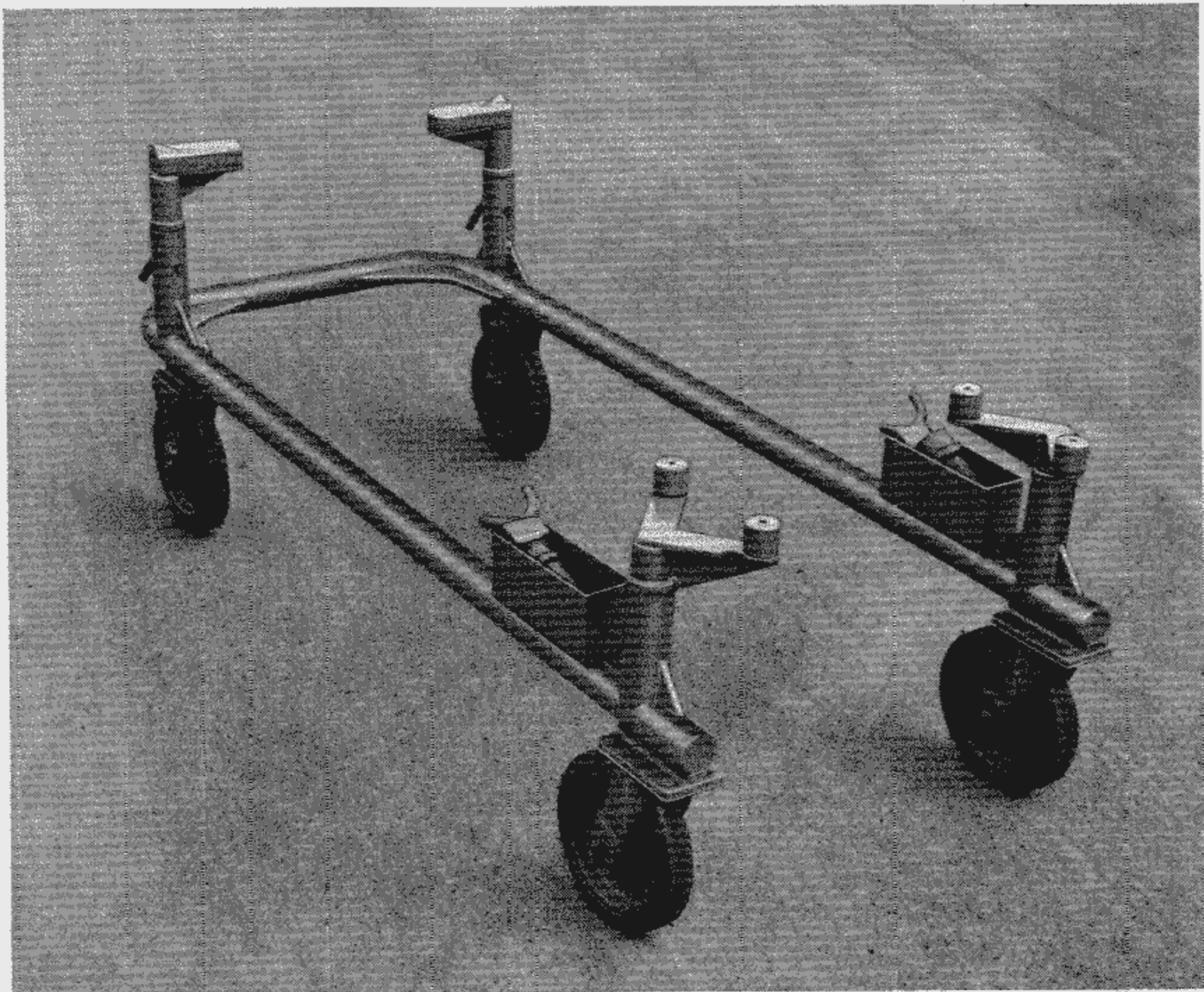
**VW 603/3**



**Additional Adaptor  
for Vehicle Trolley**

It is possible to lower and move type 3 vehicles with safety when these adaptors are used in conjunction with vehicle trolley VW 603/3, but this type of adaptor must only be used when removing or installing the sub frame.

Two cases are screwed onto the vehicle trolley for the storage of the additional adaptors.



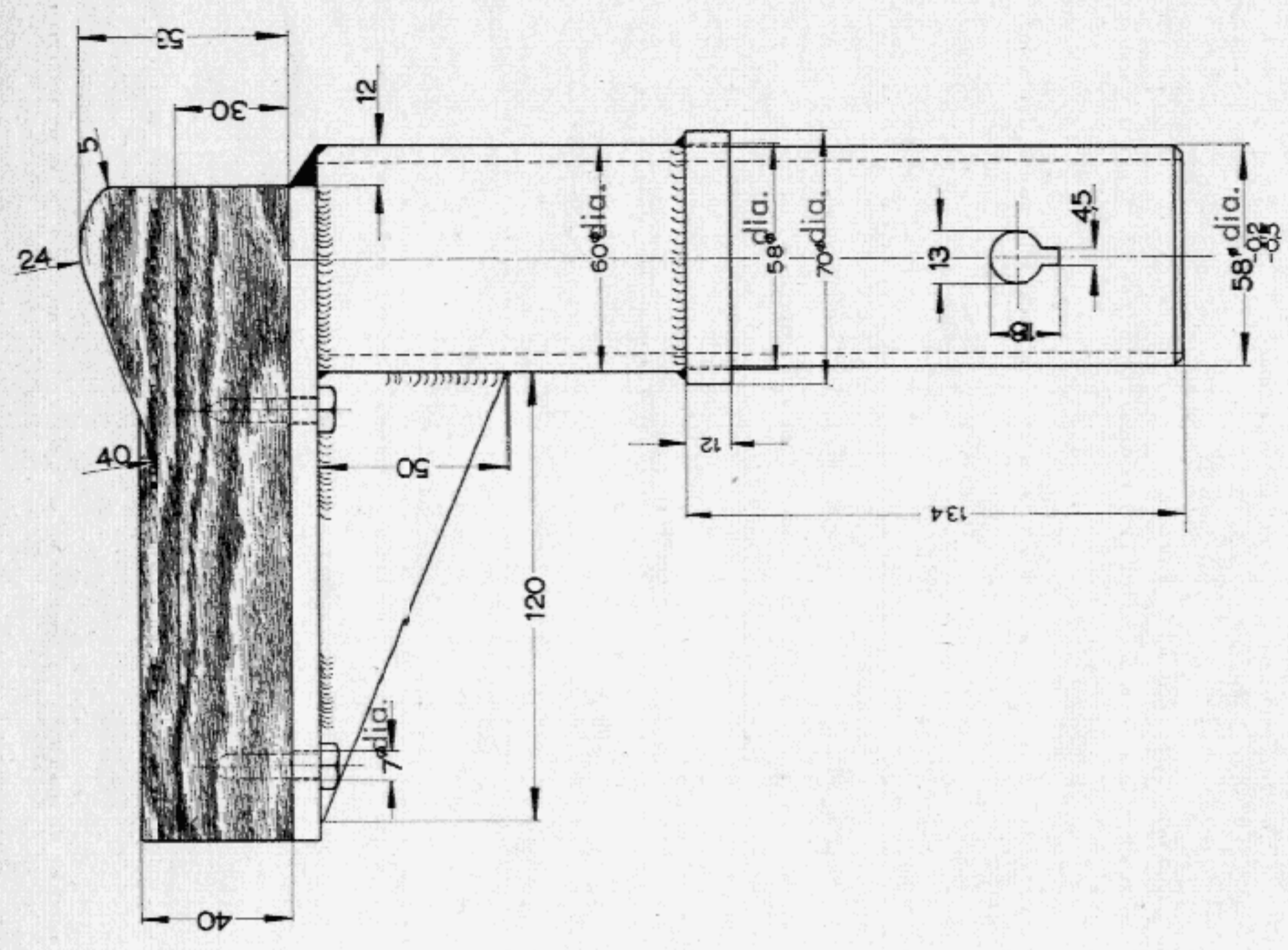
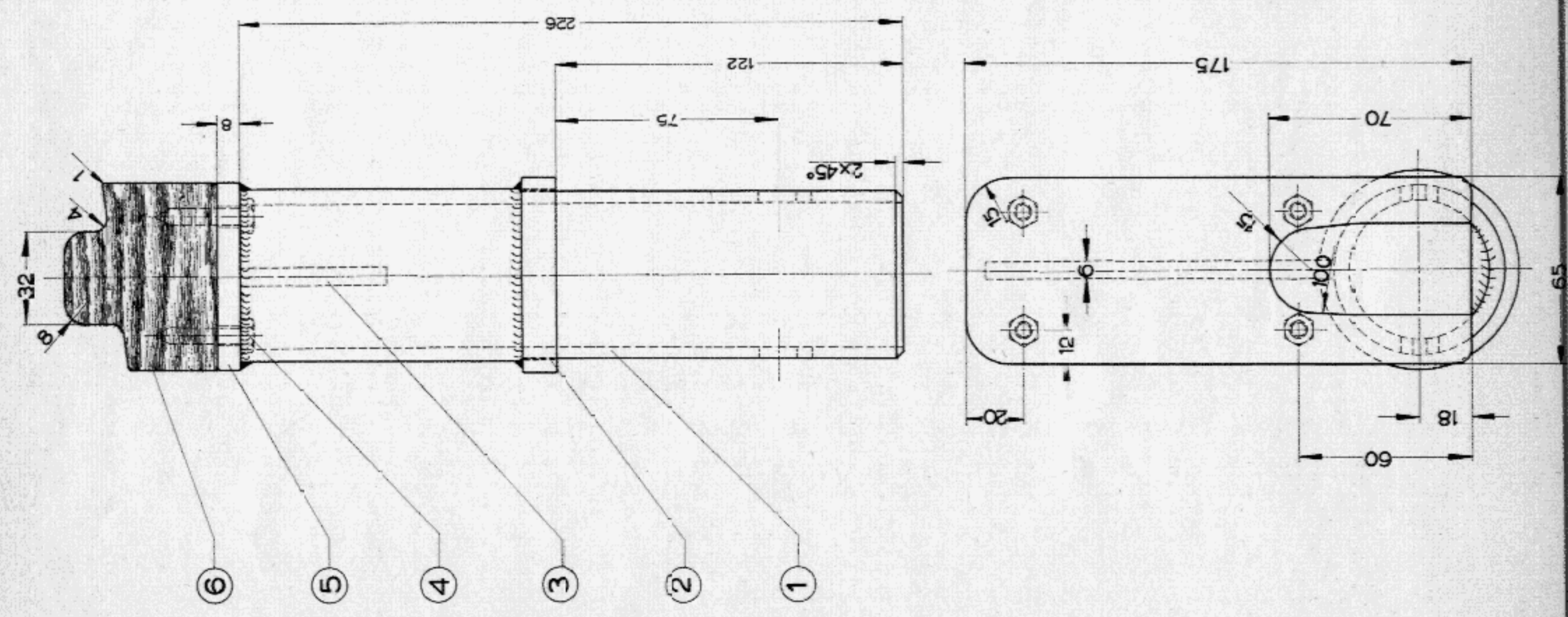
#### **Construction Details for VW 603/4 — sheet 1**

- 1 — Cut all parts as detailed in list of parts, have standard parts ready to hand.
- 2 — Turn part 1 down to measurement shown in drawing.
- 3 — Mark out peg hole in spigot and machine.
- 4 — Turn down part 2 as shown in drawing.
- 5 — Mark out part 3 and finish to shape as shown.
- 6 — Mark out bearer plate and finish to correct length and width.
- 7 — Mark out and drill 7 mm holes.
- 8 — Mark out part 6 as shown and finish to shape.
- 9 — Mark off and drill holes for wood screws in part 6.
- 10 — Carry out all welding as shown in drawing.
- 11 — Smooth down welded seams.
- 12 — Screw on part 6.
- 13 — Paint whole adaptor except spigot.

#### **Construction Details for VW 603/4 — sheet 2**

- 1 — Cut part 3 as detailed in list of parts and have standard parts ready to hand.
- 2 — Mark out the metal sheet and cut out the corner pieces.
- 3 — Bend the side and end pieces upwards and weld up corner joints.
- 4 — Smooth welded seams and round off corners.
- 5 — Mark out and drill all holes as shown on drawing.
- 6 — Drill 4.7 mm holes in frame tube of Vehicle Trolley (VW 603/3) as shown in drawing, cut M 6 internal thread in each hole.
- 7 — Paint case and screw in position.





Shown for left hand side  
Right hand side mirror image

6	2	Adaptor Block	60 X 70 X 180	Beechwood
5	2	Bearer	70 X 8 X 180	C 15
4	8	Hex Head Wood Screw	6 X 30	DIN 571
3	2	Support Bracket	125 X 6 X 55	C 15
2	2	Spacer Ring	70 X 6 X 15	SI 35 DIN 2385
1	2	Spigot	60 X 5 X 230	SI 25 DIN 2385
Part No. or No. required	Description	Material	Part No. or standard spec.	

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WOLFSBURG  
Service Department

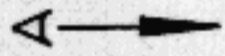
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Checked  
24. 8. 61 Ratta

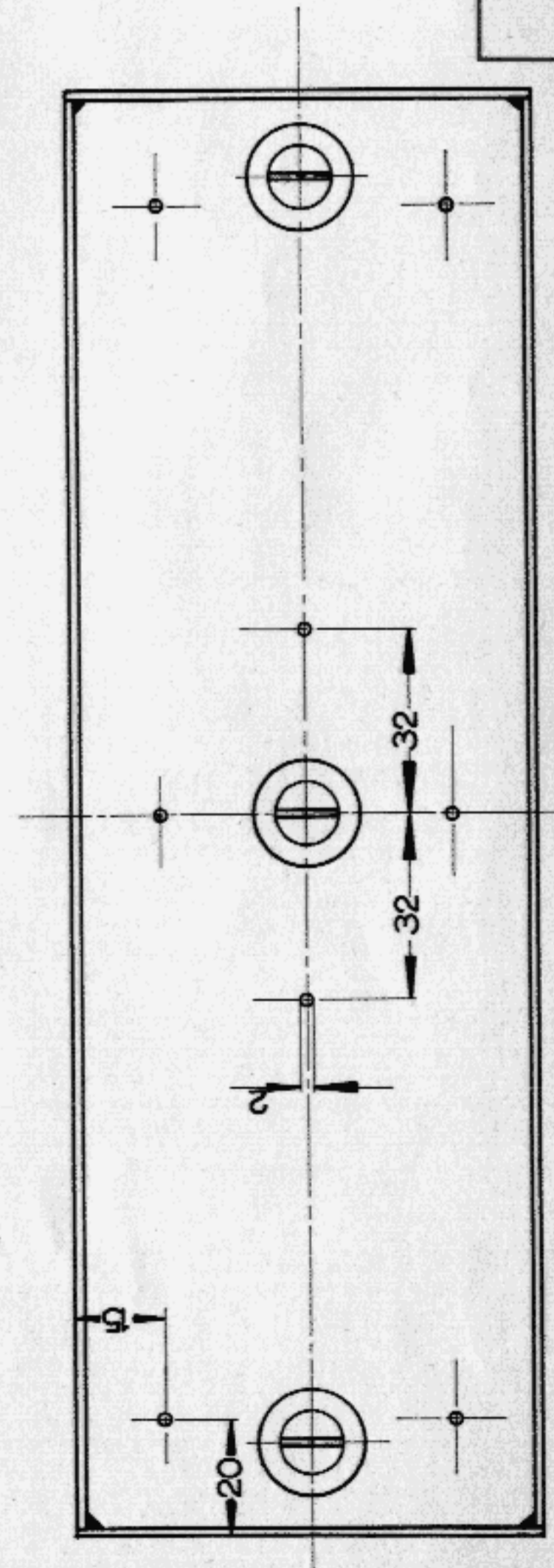
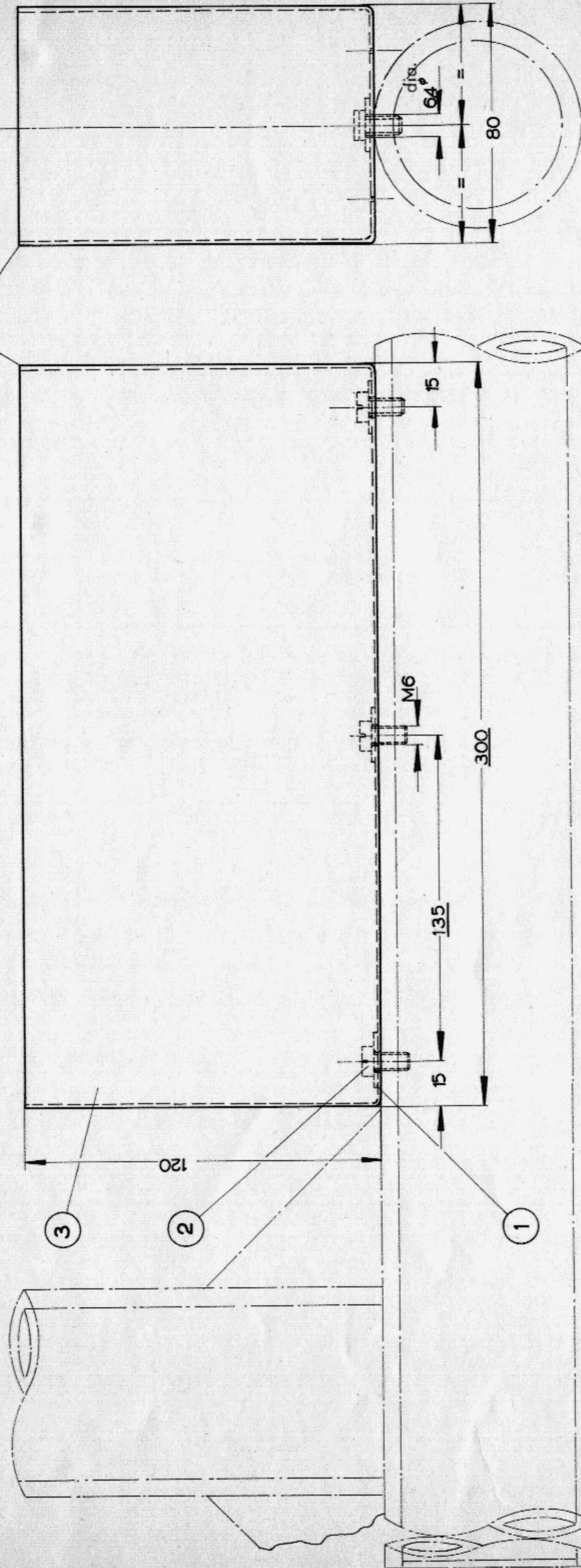
Additional Adaptor for Vehicle Trolley (VW 603/3)

VW 603/4

Sheet No. 1  
No. of sheets 2



Round off corners



View A

3	2	Case	325 X 1.5 X 545	St IX' 23
2	6	Cheese head screw	M 6 X 12	DIN 94-55
1	6	Washers	A 6-4	DIN 9021 St
Part No. required		Description	Material	Part No. or standard spec

**Adaptor Storage Case for Vehicle Trolley (VW 603/3)**

**VOLKSWAGENWERK AG**  
WOLFSBURG  
Service Department

Drawn  
5.7.61 Raebel

Checked  
5.7.61 Giesekeing

**VW 603/4**

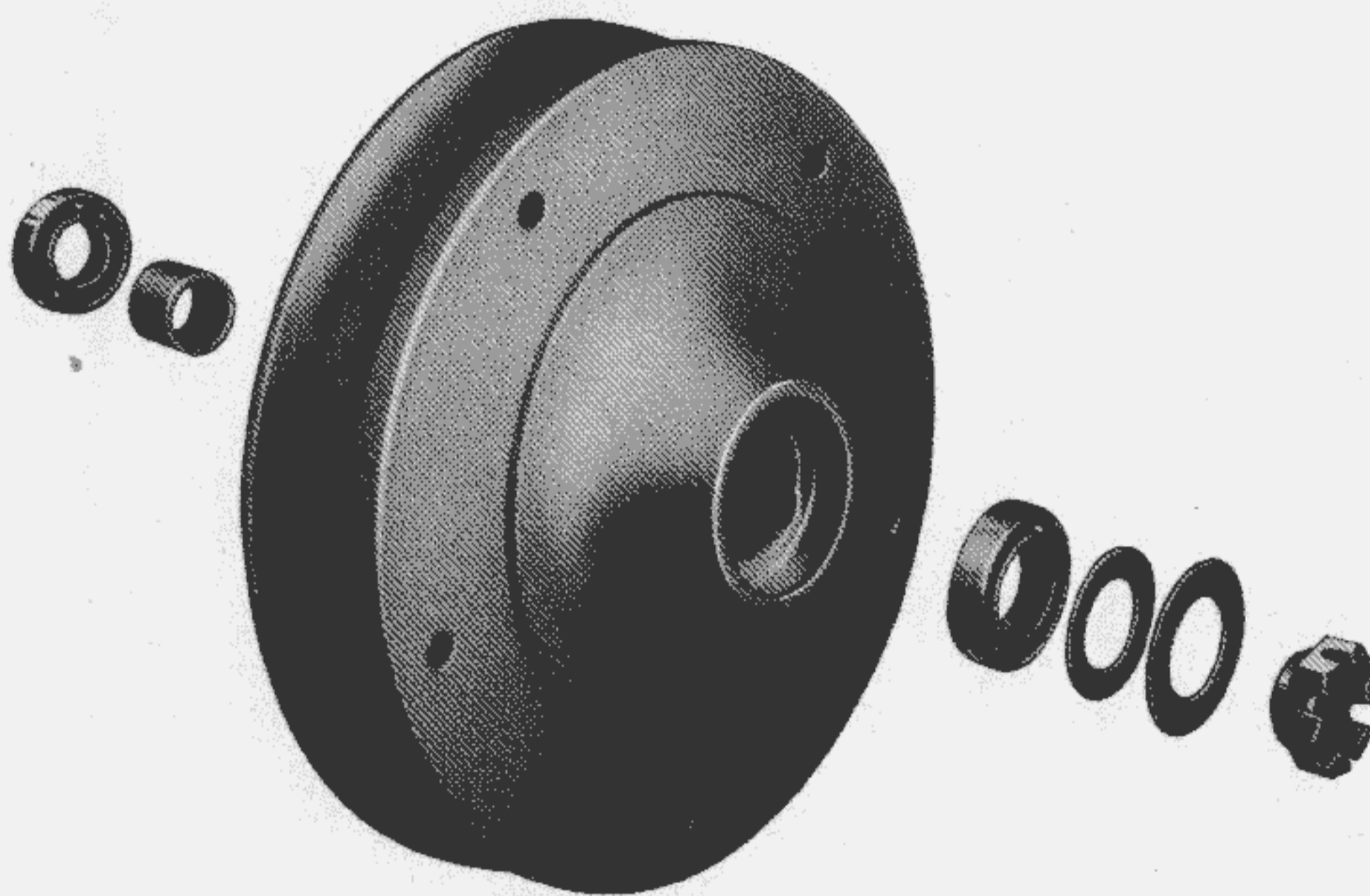
Sheet No. 2  
No. of sheets 2

## Free-wheeling Device for Towing with Locked Rear Axle

LOCAL MANUFACTURE OF WORKSHOP EQUIPMENT

This attachment can be used whenever it is necessary to tow a VW Car after it has undergone transmission damage which has had the effect of locking the rear wheels.

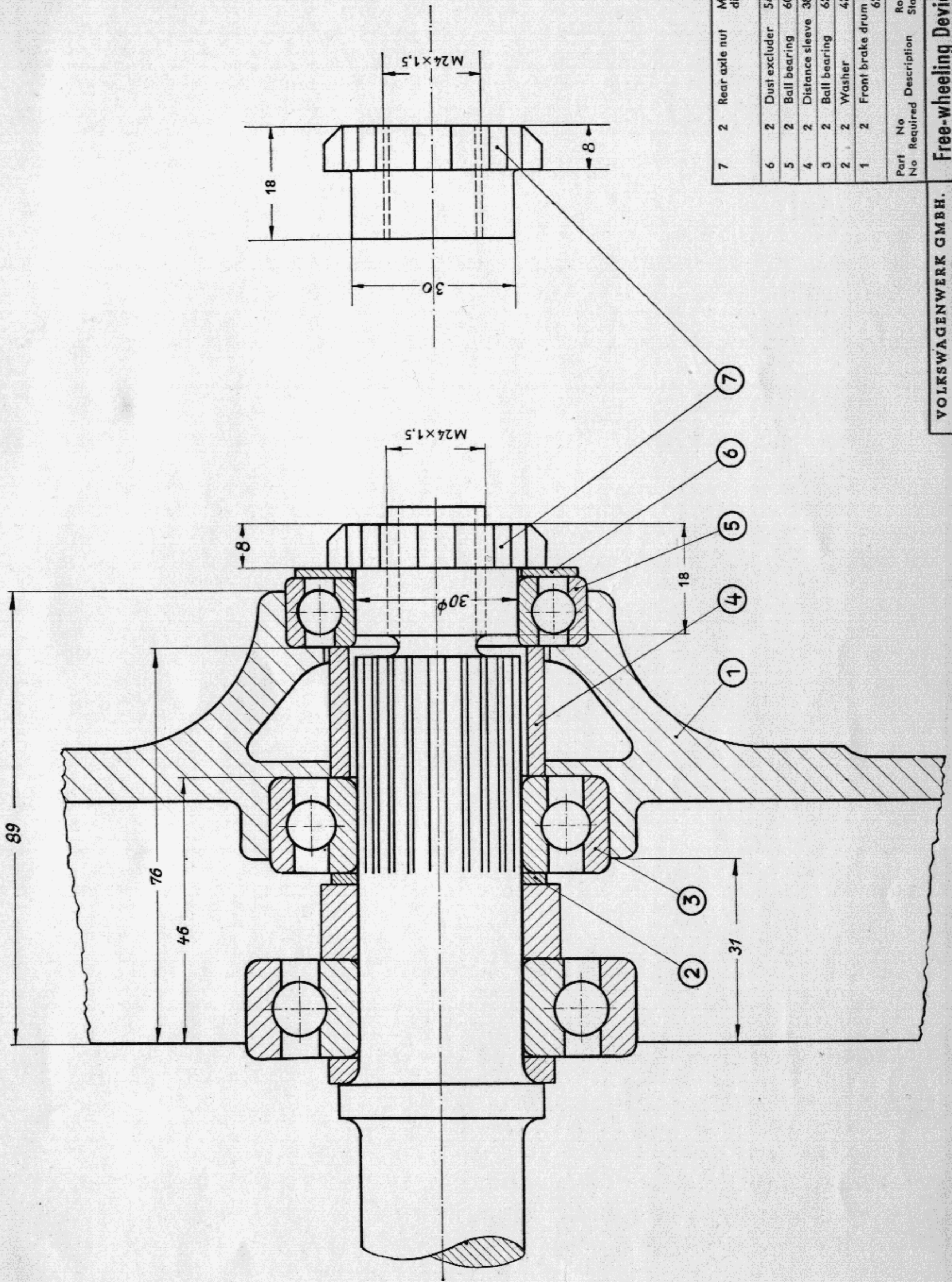
The rear wheels and brake drums of the vehicle to be towed are removed and the brake drums of the towing attachment, which are carried on ball bearings, are mounted instead. The rear wheels are then refitted. In this condition the vehicle can be towed over considerable distances to a repair shop.



A towing method which can be used in conjunction with this attachment is illustrated on the leaf relating to Local Construction Drawing No. VW 608.

#### **Construction Details for VW 607**

- 1 – Prepare parts as detailed in list.
- 2 – Turn inside and outside of brake drum hubs as shown in drawing.
- 3 – Press ball bearings (3) and (5), separated by distance sleeve (4), into brake drum.
- 4 – Make up washers (2) and (6).
- 5 – Turn rear axle nuts (7) to dimensions in drawing.
- 6 – Pack ball bearings with grease and lightly grease thread in nut.



7	2	Rear axle nut	M 24 x 18 x 30	Part No 501145 modified as per drawing
6	2	Dust excluder	54/32 dia. x 1 thick	
5	2	Ball bearing	6006	
4	2	Distance sleeve	38/32 dia. x 32 long	
3	2	Ball bearing	6206	
2	2	Washer	42/30 dia. x 2 thick	
1	2	Front brake drum (inner bearing 62 dia.)		

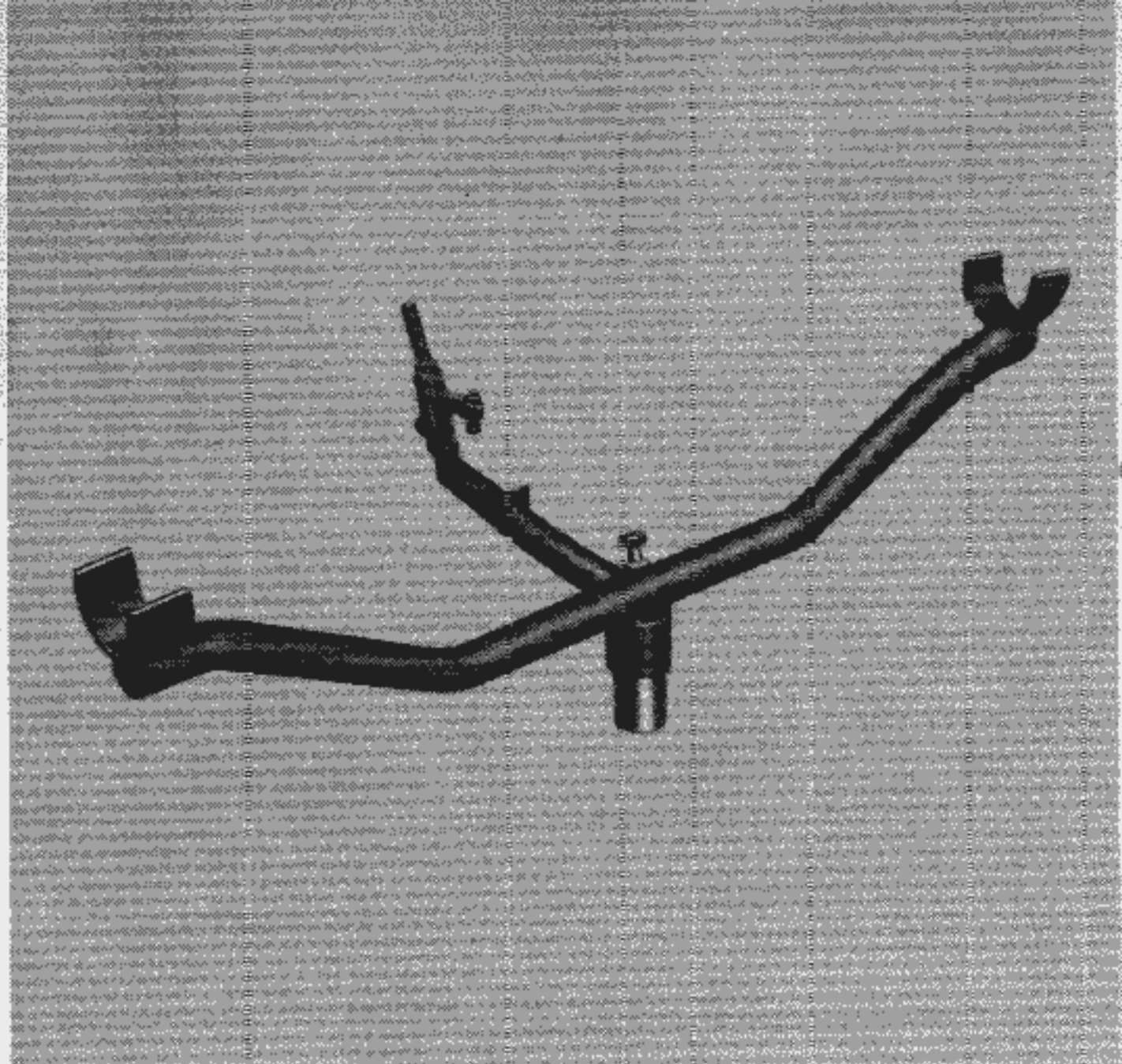
Part No	Description	Rough Size or Standard Spec.	Remarks

**Free-wheeling Device for Towing with Locked Rear Axle**

**VOLKSWAGENWERK GMBH.**  
**WOLFSBURG**  
 Service Department

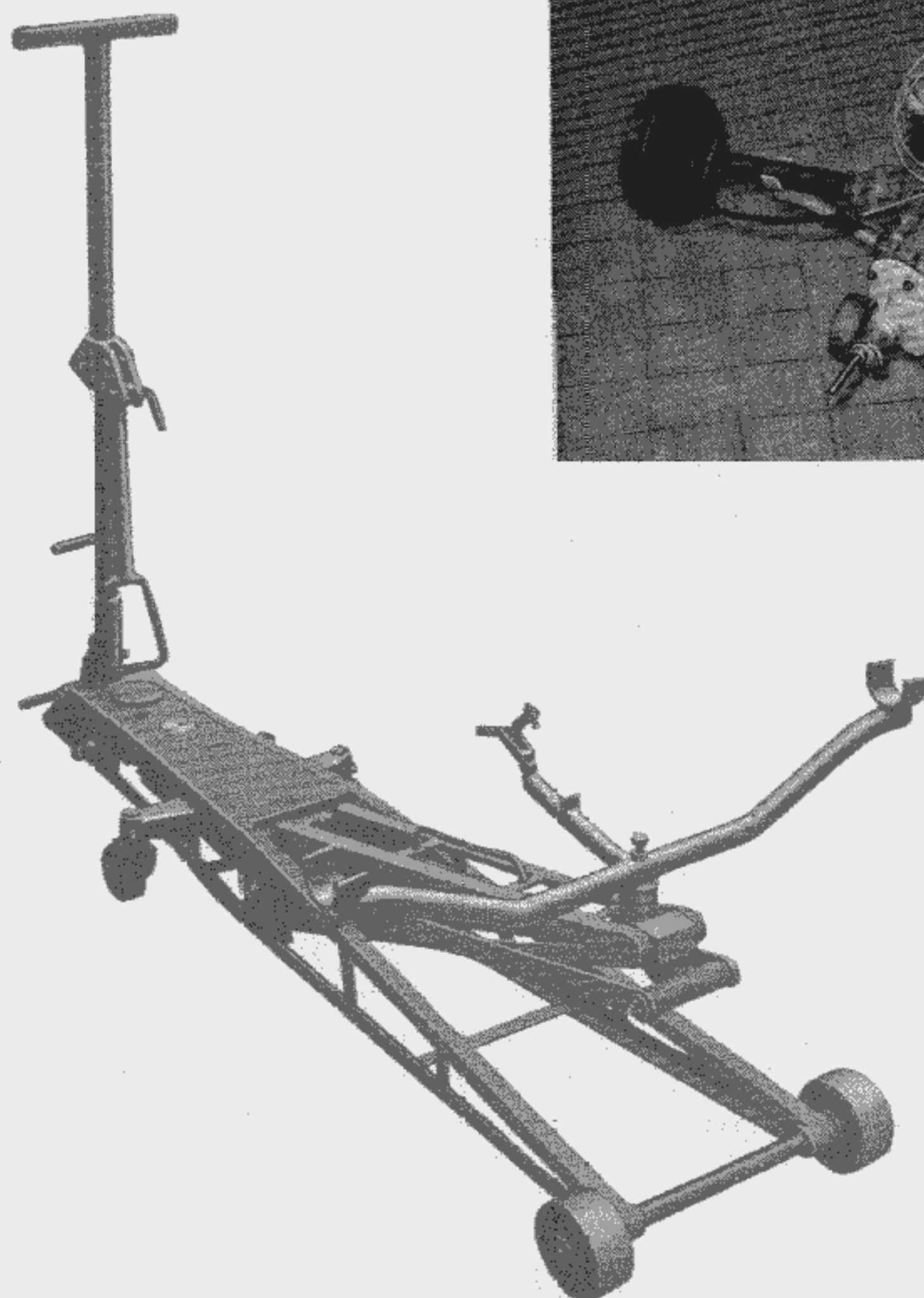
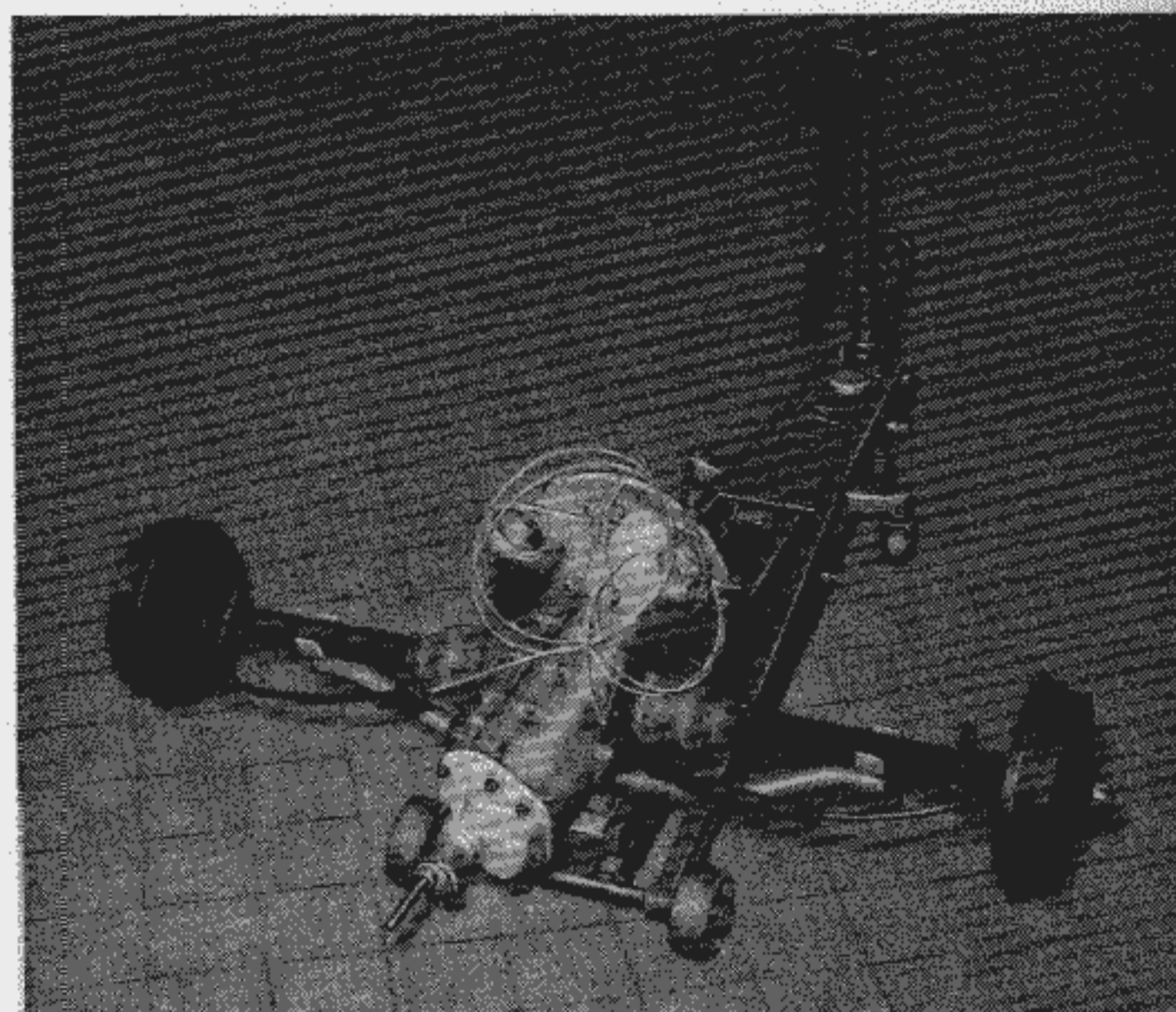
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 Checked: 9.1.59 Senf

**VW 607**



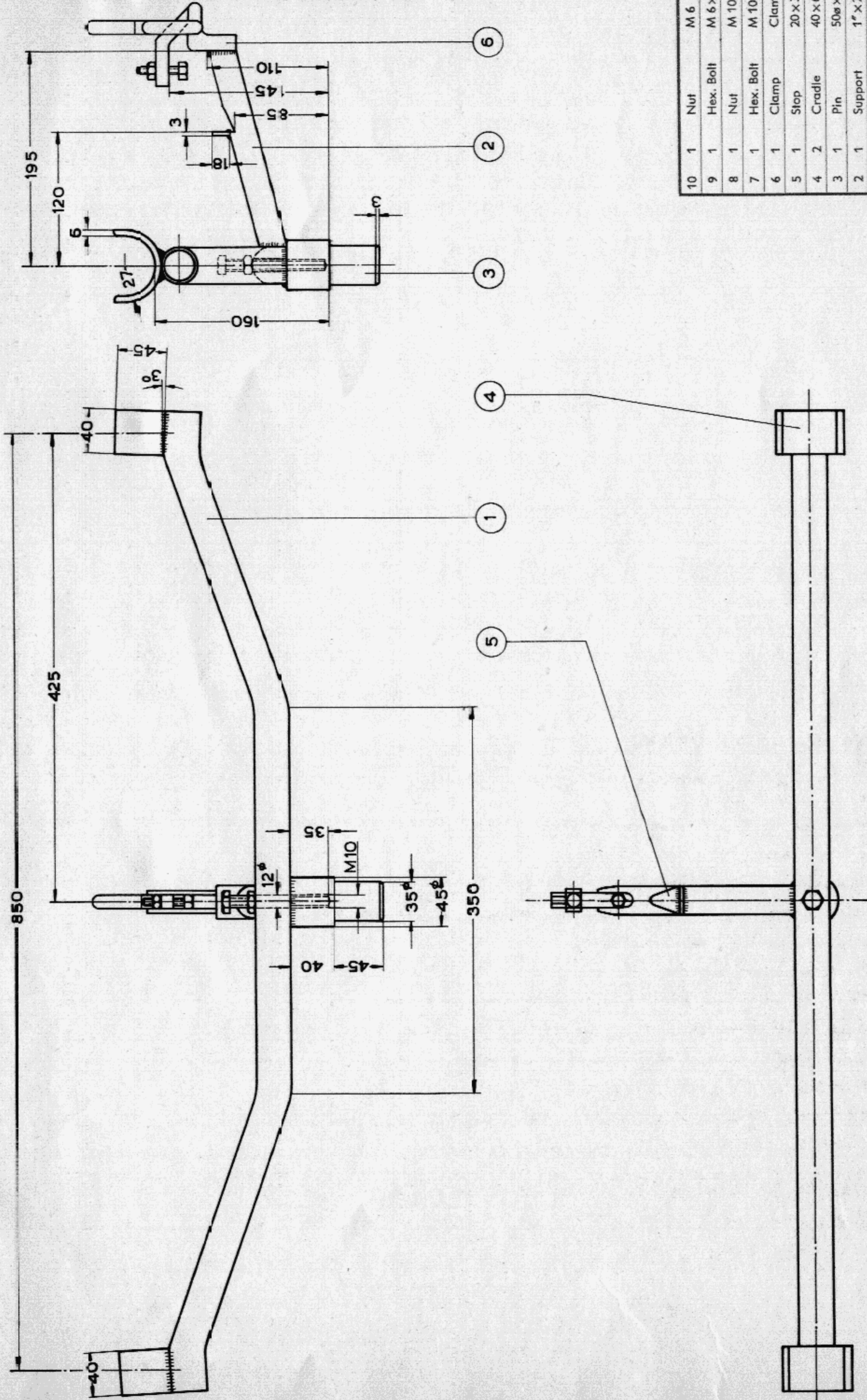
## Rear Axle Cradle for Garage Trolley Jack

This rear axle cradle greatly assists the process of removing and refitting the rear axle unit. A clamping device is provided for holding the transmission case, thereby preventing the unit from tilting.



### **Construction Details for VW 609**

- 1 - Cut all necessary parts from tubing, rod and strip to sizes given in list of parts. Have all items ready to hand.
- 2 - Bend frame tube (1) as shown in drawing.
- 3 - Bend cradles (4) as shown in drawing.
- 4 - Make up pin (3) as shown in drawing.
- 5 - Make up support (2) as shown in drawing, and shape to fit frame tube (1).
- 6 - Make up stop (5) as shown in drawing.
- 7 - Weld frame tube (1) centrally to pin (3).
- 8 - Weld cradles (4) to ends of frame tube (1) as shown in drawing.
- 9 - Weld previously shaped portion of support (2) to frame tube (1) as shown in drawing.
- 10 - Weld clamp (6) to support (2) as shown in drawing.
- 11 - Weld stop (5) to support (2) as shown in drawing.
- 12 - Drill 12 mm (0.472 in.) hole centrally in frame tube (1) as far as start of pin.
- 13 - Drill 8 mm (0.315 in.) hole in pin (3) as shown in drawing and tap metric 10.
- 14 - Screw bolt (7) with nut (8) into hole tapped metric 10 as above. The nut is for locking the bolt after the latter has been adjusted for height above the frame tube (1).
- 15 - Paint cradle assembly in prevailing colour of equipment and machines in the shop.
- 16 - Lightly grease bolt and clamp.



Manufacturer:  
 Sudburg Werke GmbH,  
 Sudenburg / Kr. Uelzen  
 Order No. 15 VW 5.16.8  
 and  
 Walter Klein  
 Wuppertal-Hahnerberg  
 Order No. 15 VW 542-06

Port No.	No. Required	Description	Rough Size or Standard Spec.	Remarks
10	1	Nut	M 6	DIN 934
9	1	Hex. Bolt	M 6 x 30	DIN 933
8	1	Nut	M 10	DIN 934
7	1	Hex. Bolt	M 10 x 70	DIN 933
6	1	Clamp	Clamp 15 VW	
5	1	Stop	20 x 3 x 28	St. 37.12
4	2	Cradle	40 x 6 x 130	St. 42.12
3	1	Pin	50 x 90	St. 50.11
2	1	Support	1" x 200	Gas barrel
1	1	Frame Tube	1 1/4" x 960	Gas barrel

**VOLKSWAGENWERK GMBH.**  
 WOLFSBURG  
 Service Department

Checked: Senf,  
 Hendriok  
 21 Nov., 55

Drawn: Sa.  
 29 Oct., 55

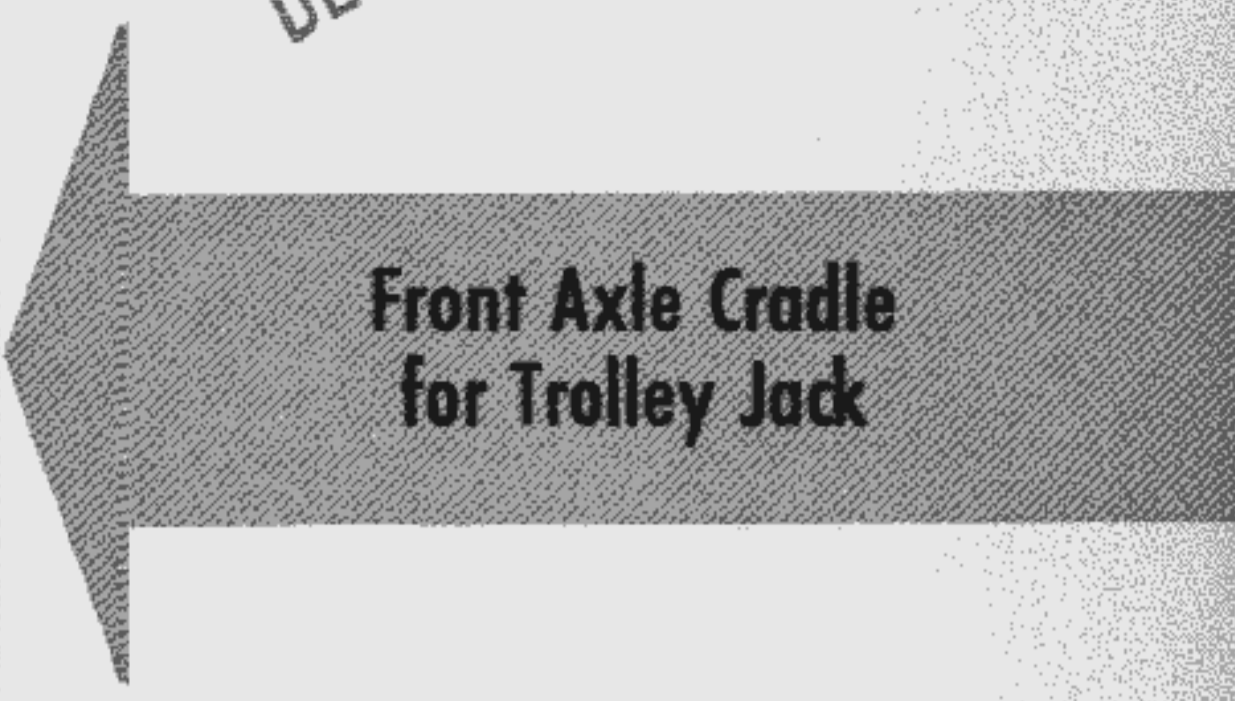
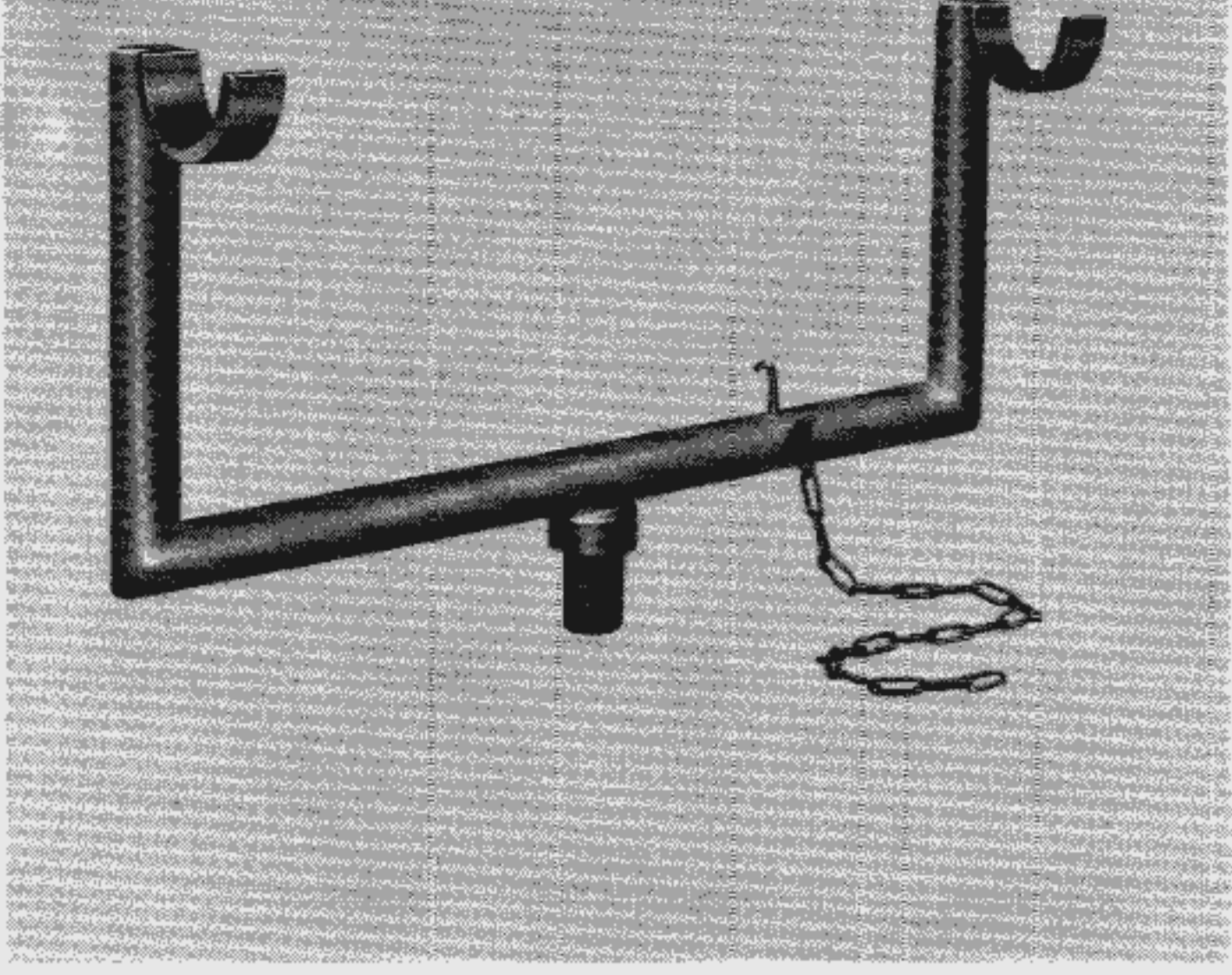
**Rear Axle Cradle  
 for Garage Trolley Jack**

**VW 609**



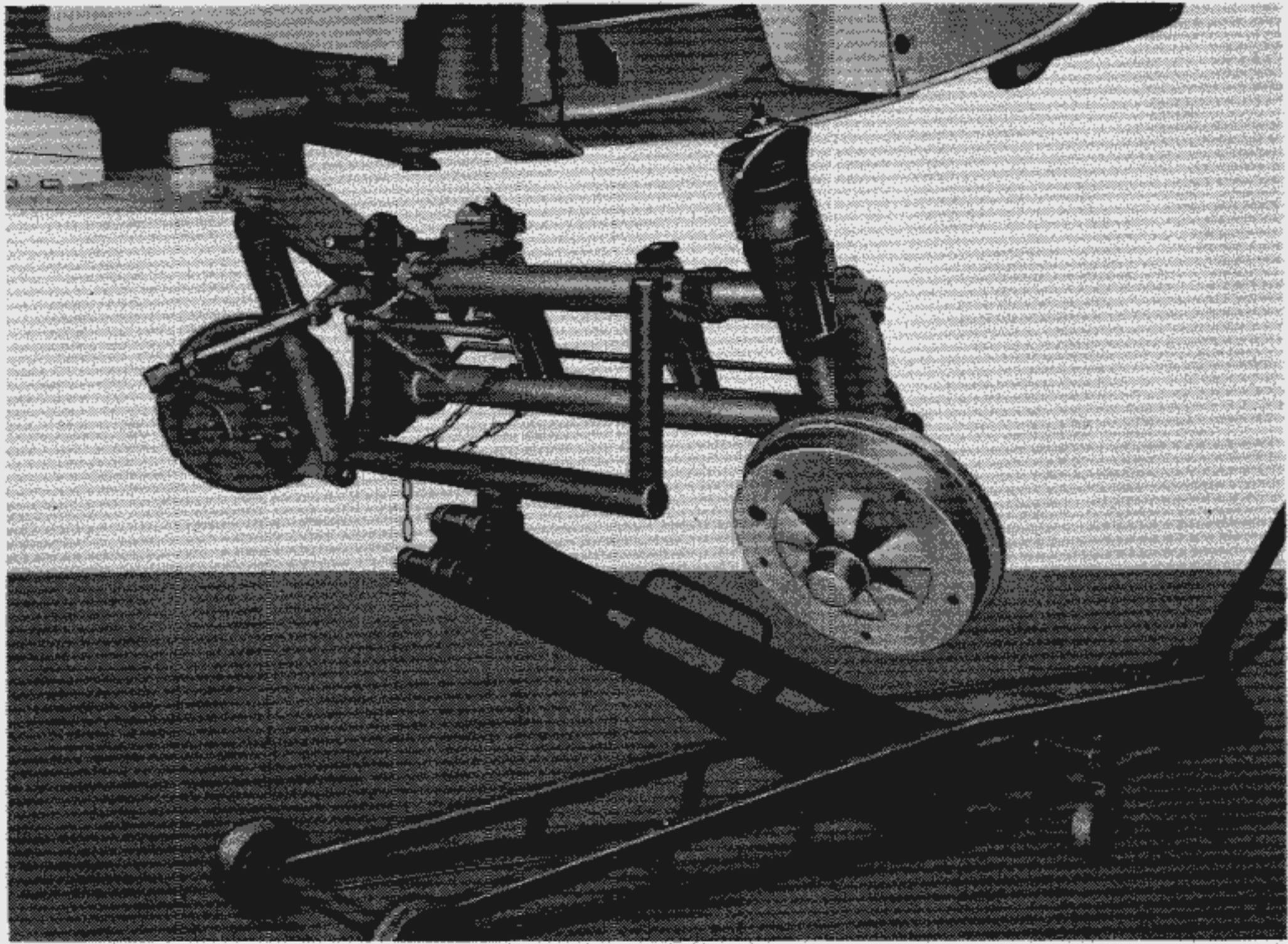
DEC 10 1965

VW 610



Front Axle Cradle for Trolley Jack

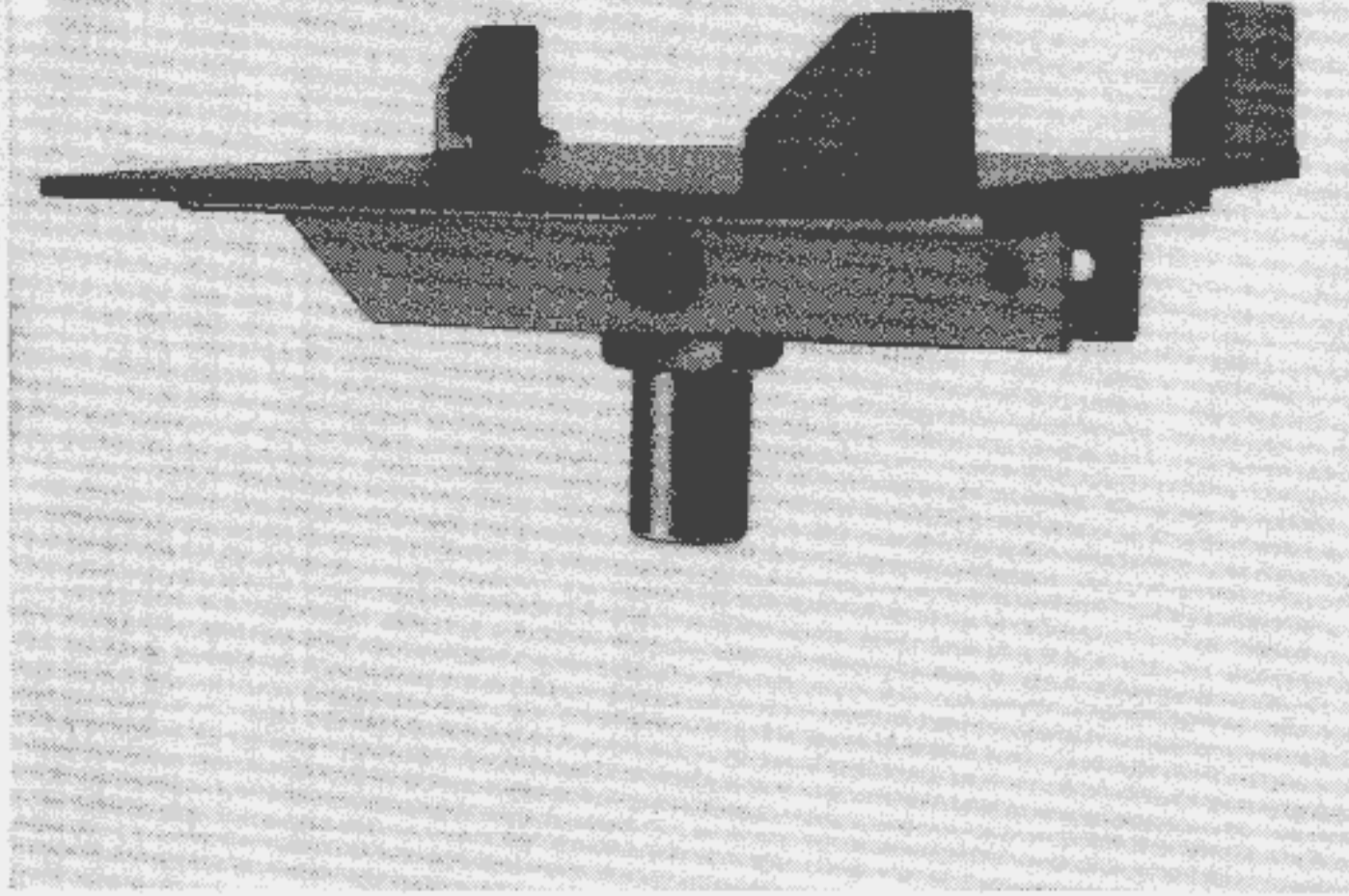
The front axle cradle is used in conjunction with a trolley jack. It carries the complete front axle whilst it is being removed or installed. This enables the work to be carried out by one fitter only. The front axle is suspended, whilst the assembly work is being carried out, by the upper tube which rests in both hooks. The chain is placed around the lower axle tube thus holding the axle in the most favourable fitting position.



**Construction Details for VW 610**

- 1 — Cut all parts and have chain ready to hand
- 2 — Mark out parts 2 and 6 and work
- 3 — Bend and rework part 7
- 4 — Bend part 5
- 5 — Turn down parts 1 and 3
- 6 — Carry out welding work
- 7 — Paint the whole appliance (except spigot of part 3) dark green (RAL 6011)  
paint the chain link shown in orange.

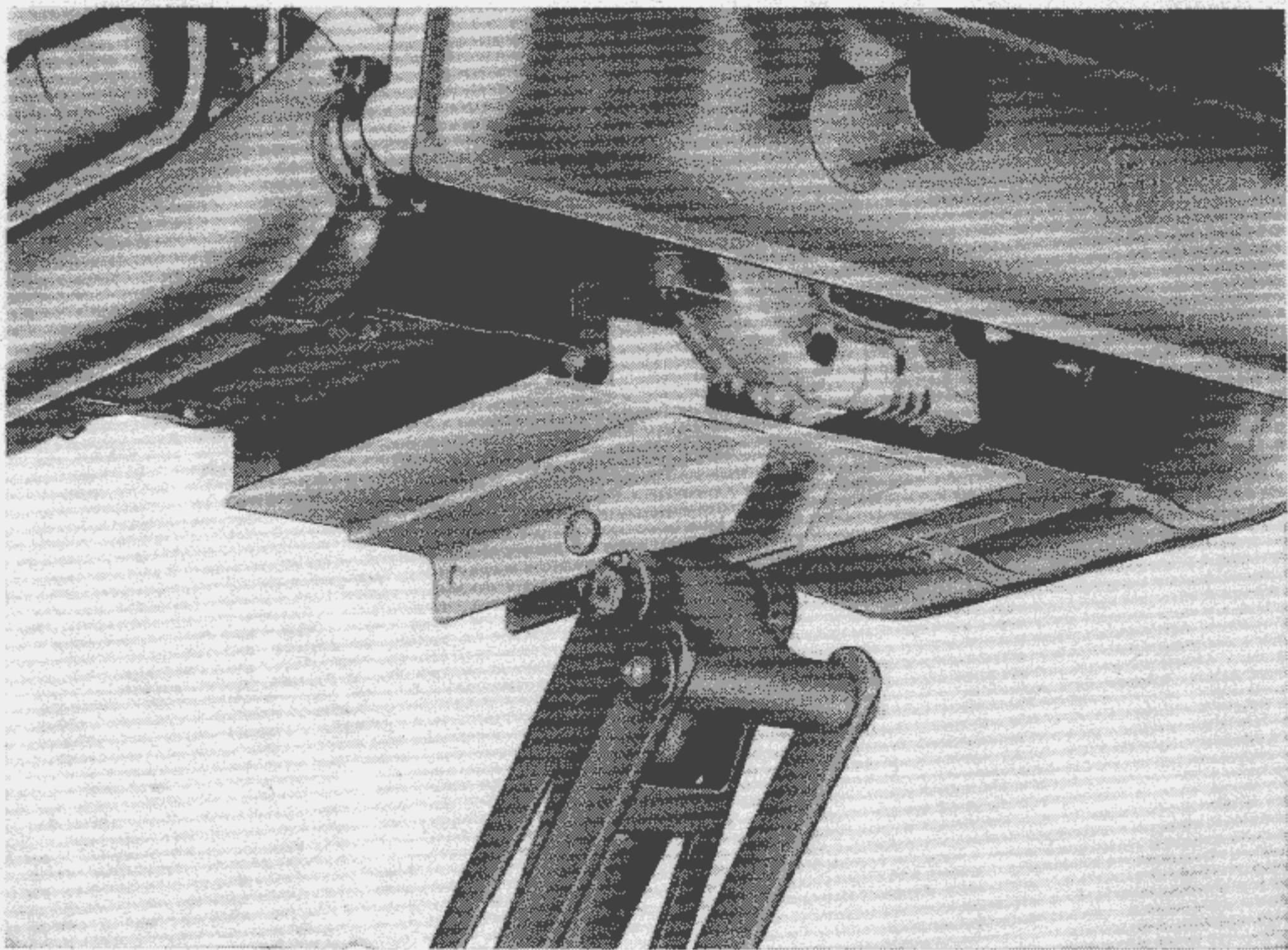


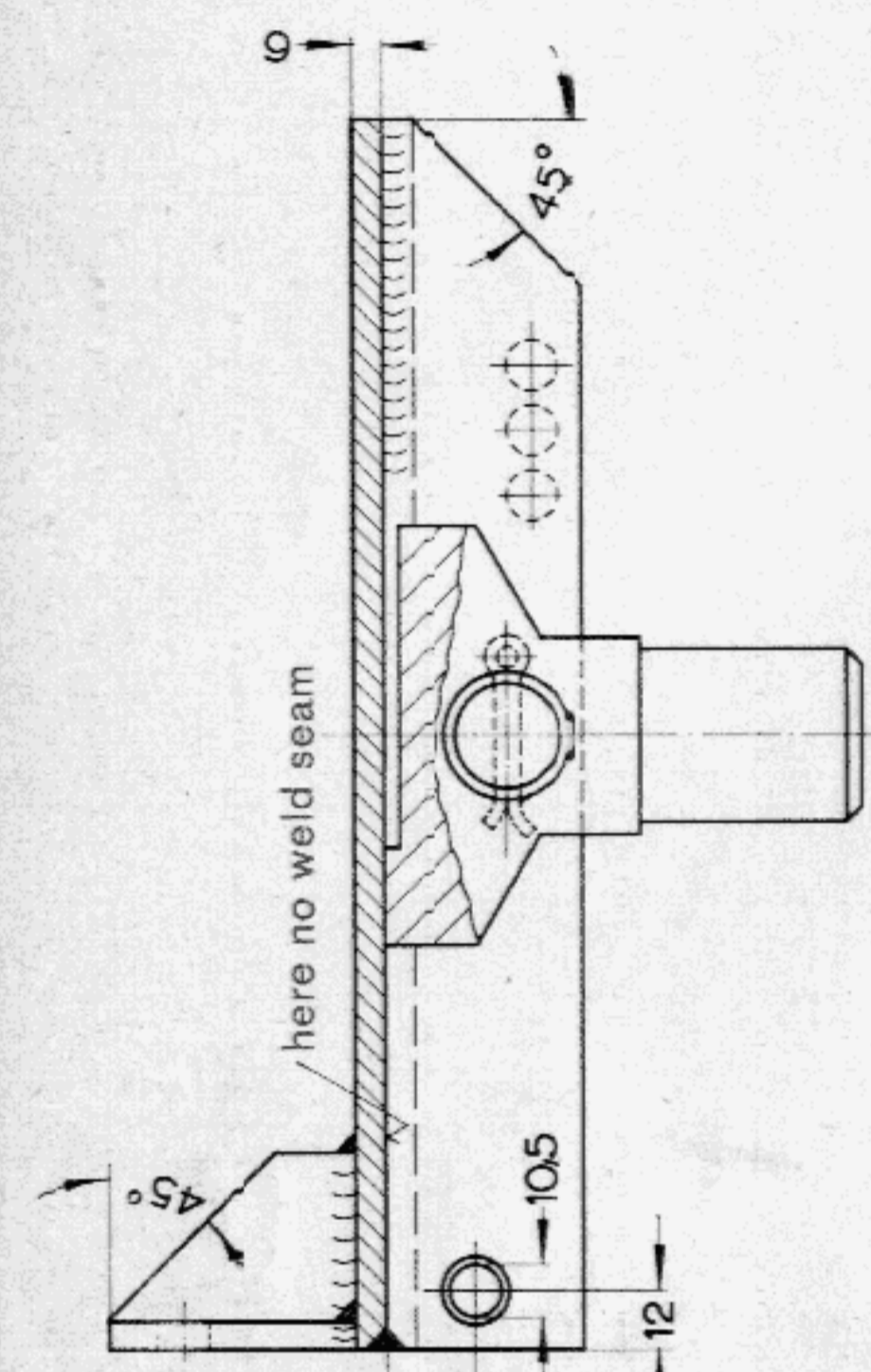


**Engine Support Plate  
for Trolley Jack  
Type 1, 2, 3, 122, 124, 126**

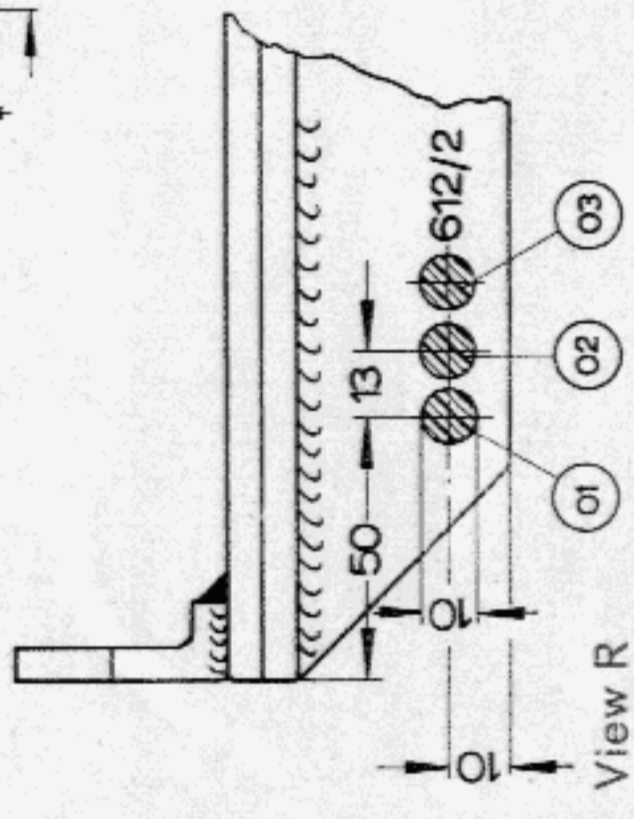
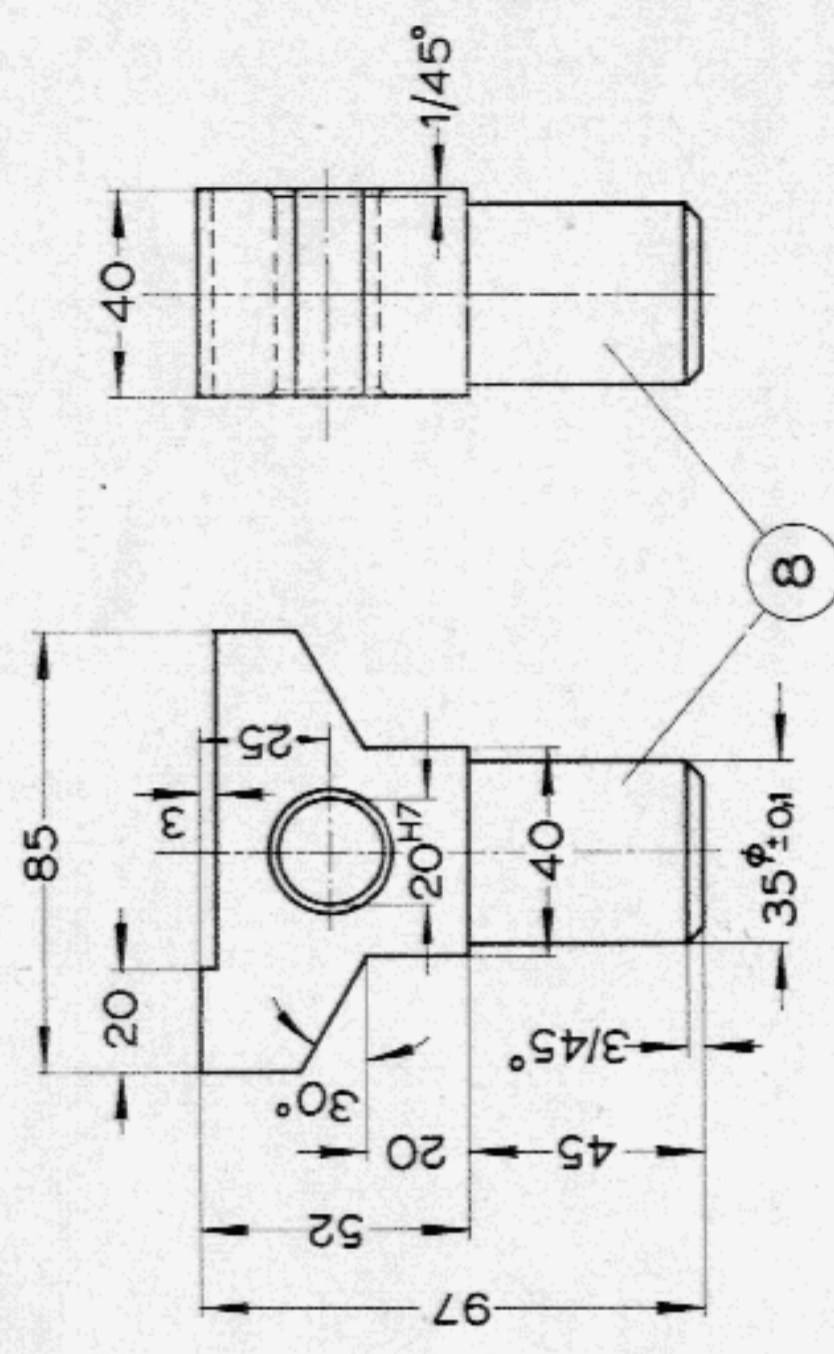
The engine support plate is used in conjunction with a trolley jack.

The support plate holds the engine whilst it is being removed and reinstalled. This enables the work to be carried out by one fitter only.





Section A-A



Chamfer edges

Qty.	Designation	Part	Material	Part No. or Standard spec.	Remarks
1	FI 100x40x90	8	C 15		
1	Bolt	7	DIN 1434-St 50		
1	Pin	6	DIN 94-St 34		
2	L 60x40x6x55	5	St 37-2		Left and right
1	L 60x40x6x80	4	St 37-2		
2	L 60x40x6x255	3	St 37-2		
1	FI 260x6x305	2	MR St 42-2		
1	Welded part	1			Parts 2 to 5

When no limit is given tolerance  $\pm 0.25$ ;  $\pm 30'$  applies

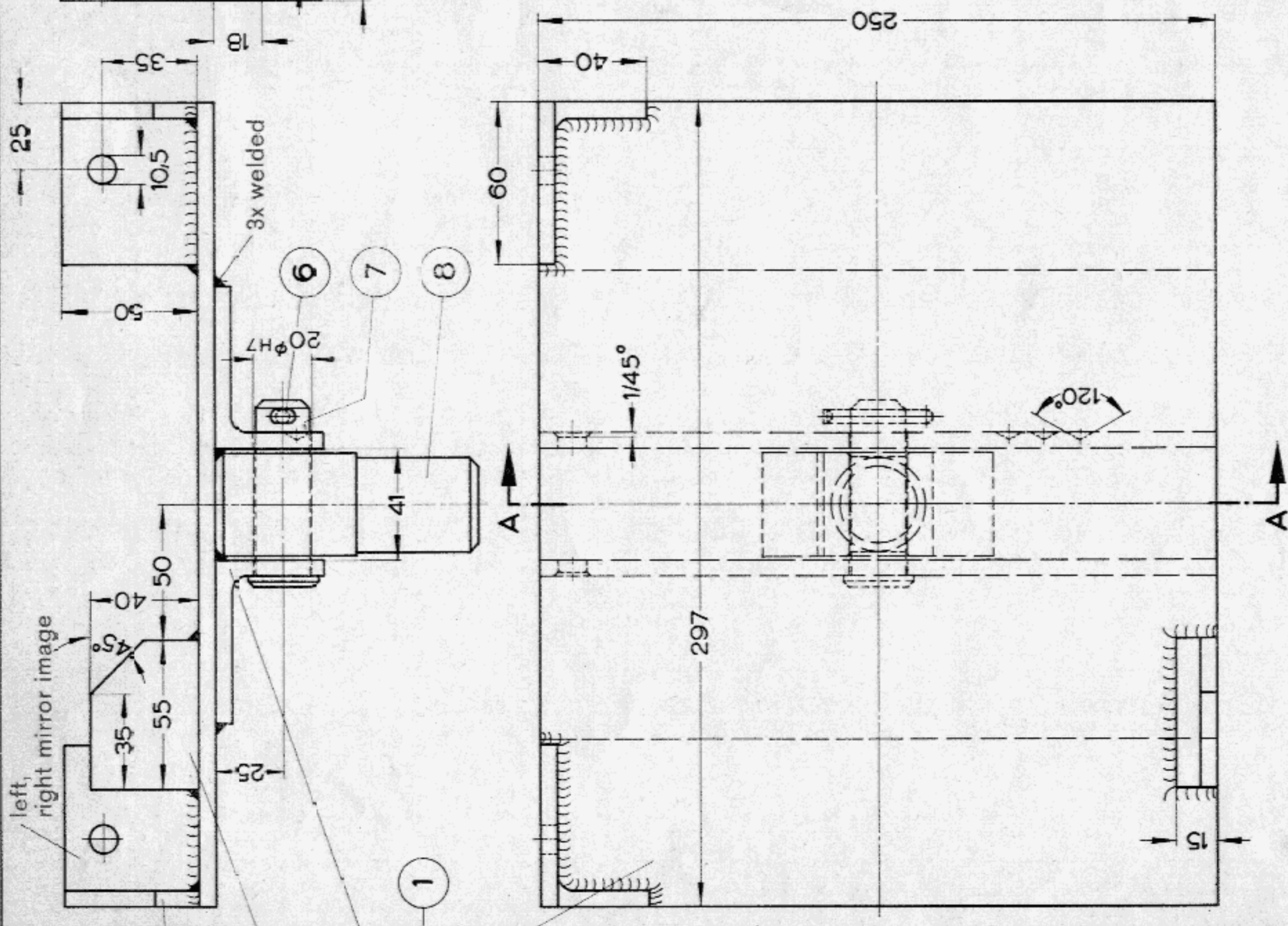
**VOLKSWAGENWERK AG**  
 WOLFSBURG  
 Service Department

Drawn: 19. 6. 67 Krumbholz  
 Checked: 19. 6. 67 Giesekeing

**Engine Support Plate**

**VW 612/2**

No of Sheets 1  
 Sheet no. 1

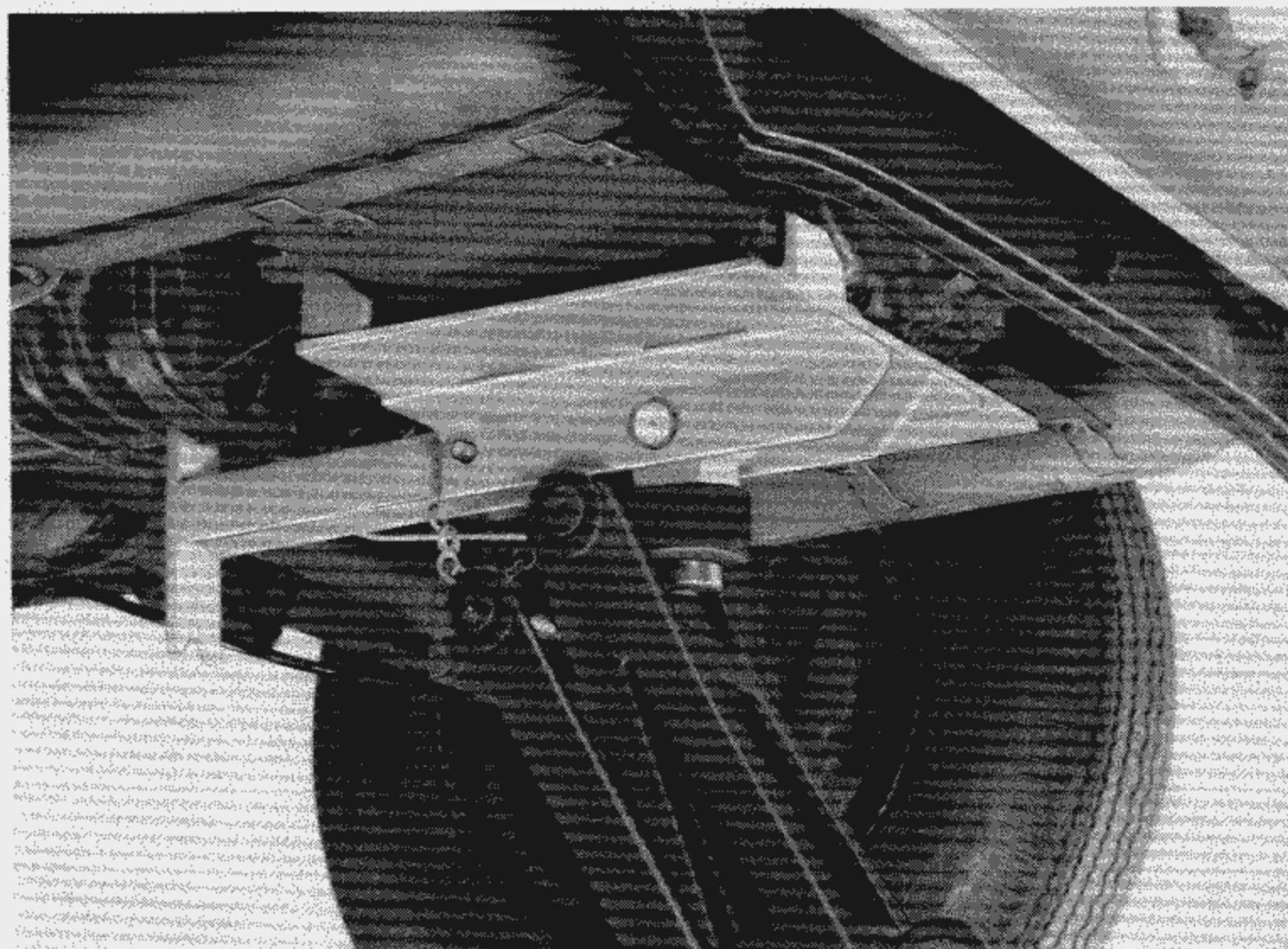


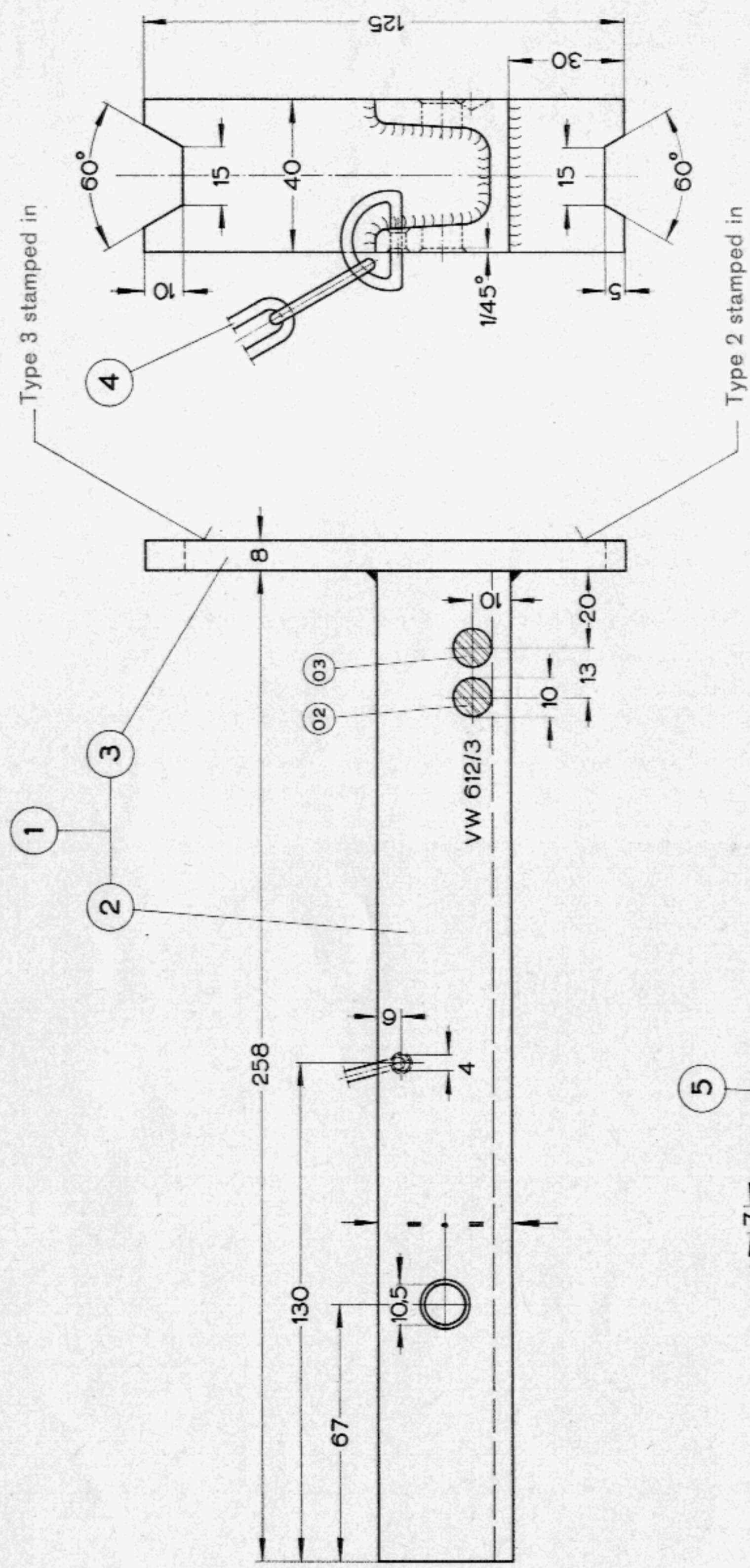
- Colour identification marks
- 01 orange
  - 02 blue
  - 03 violet
  - 04 green
  - 05 black
- RAL 2004  
 RAL 5015  
 RAL 4003
- Surfaces in given colours (synthetic resin) shown thus



**Additional Transmission Support  
for Engine Support Plate  
Type 2, 3**

The additional transmission support is used in conjunction with the engine support plate VW 612/2 and a trolley jack. The appliance supports the engine-transmission unit whilst it is being removed or installed. This enables the work to be carried out by one fitter only.





Type 3 stamped in

Type 2 stamped in

Chamfer edges

1	Rd 15x95	5	C 15
1	Chain	3x26x200	4 St 37 DIN 5685
1		FI 40x10x130	3 MR St 37-2
1		U 40x260	2 St 37-2 DIN 1026
1	Welded part		1

**Additional Transmission Support  
for Engine Support Plate**

VW 612/3

When no limit is given tolerance  
± 0.25; ± 30' applies

**VOLKSWAGENWERK AG**  
WOLFSBURG  
Service Department

Drawn: 13.6.67 H. Krumbholz  
Checked: 13.6.67 Giesekeing

**Colour identification marks**

(01) orange	RAL 2004	(04) green	RAL 6018
(02) blue	RAL 5015	(05) black	RAL 9005
(03) violet	RAL 4003		

Surfaces in given colours  
(synthetic resin) shown thus

No of Sheets 1  
Sheet no. 1

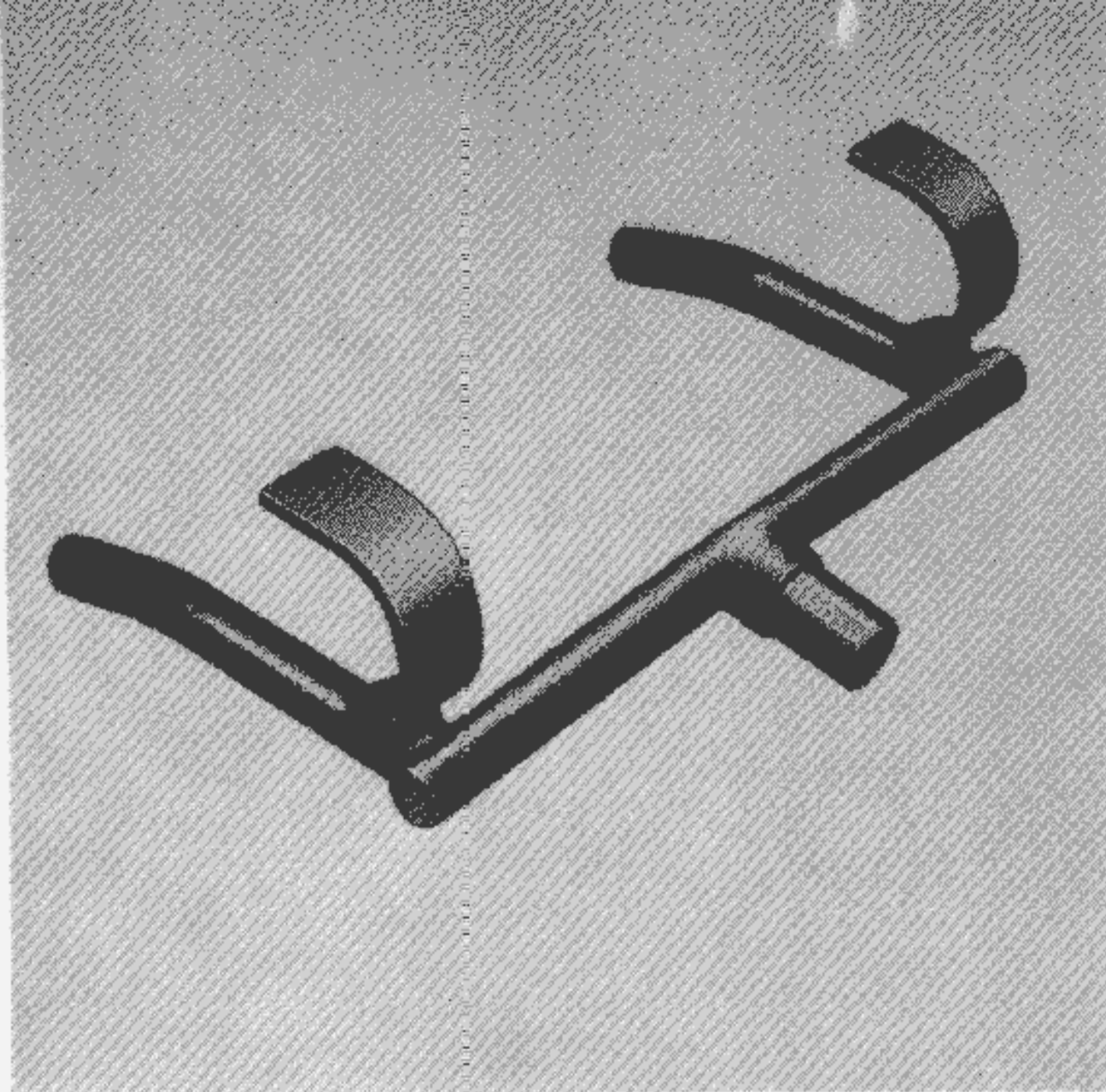
Qty. Designation

Part Material

Part No. or Standard spec.

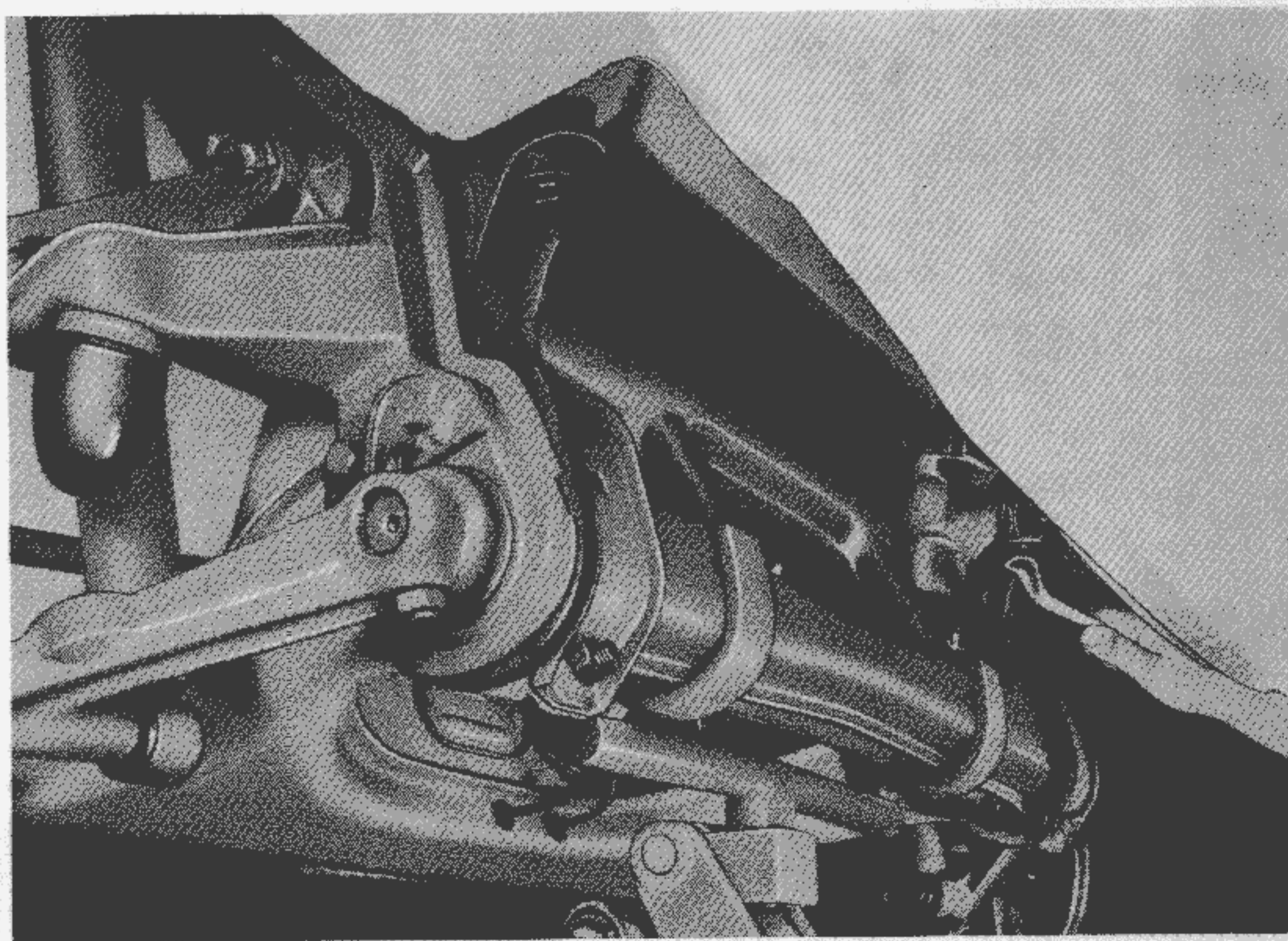
Remarks

Parts 2 and 3



**Front Axle Cradle  
for Trolley Jack**

The front axle cradle used in conjunction with a trolley jack greatly assists the process of removing and refitting the front axle unit. The axle is held in the cradle in such a manner that it can be easily pulled out from or fitted into the axle mounting.

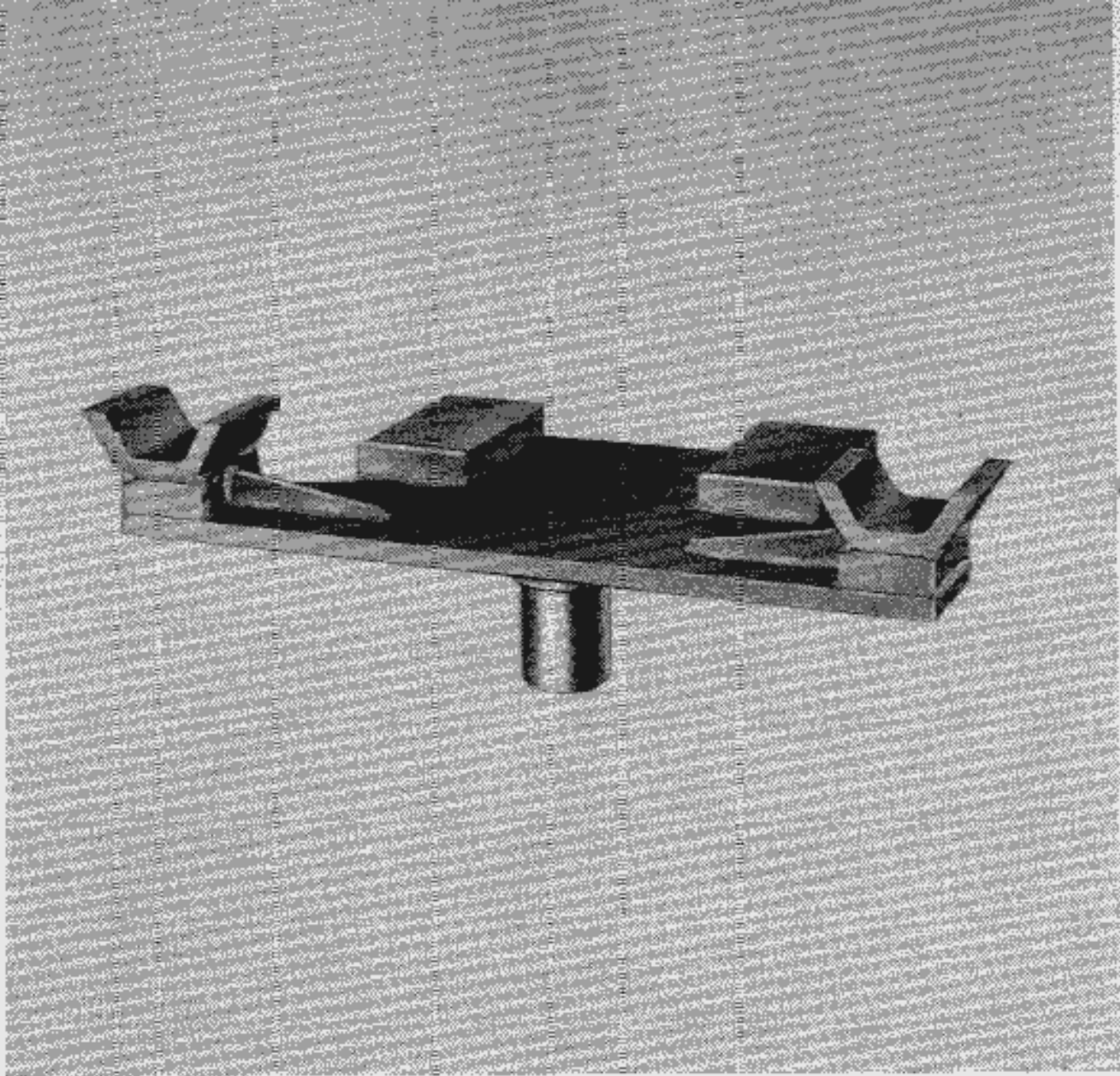




### **Construction Details for VW 613**

- 1 — Cut all parts to dimensions in parts list.
- 2 — Part (1) bend as shown in drawing. Finish to length.
- 3 — Chamfer top end of tube.
- 4 — Finish lower end of tube as shown in drawing.
- 5 — Finish part (2) to 25 mm dia. chamfer both edges.
- 6 — Put 5 mm radius on part (3) and chamfer both sides.
- 7 — Bend as shown in drawing.
- 8 — Flatten the end to be welded.
- 9 — Finish part (4) to length.
- 10 — Chamfer both ends of the tube.
- 11 — Turn part (5) as shown in drawing.
- 12 — Carry out all welding as shown in drawing.
- 13 — Smooth welded seams.
- 14 — Paint the Front Axle Cradle.

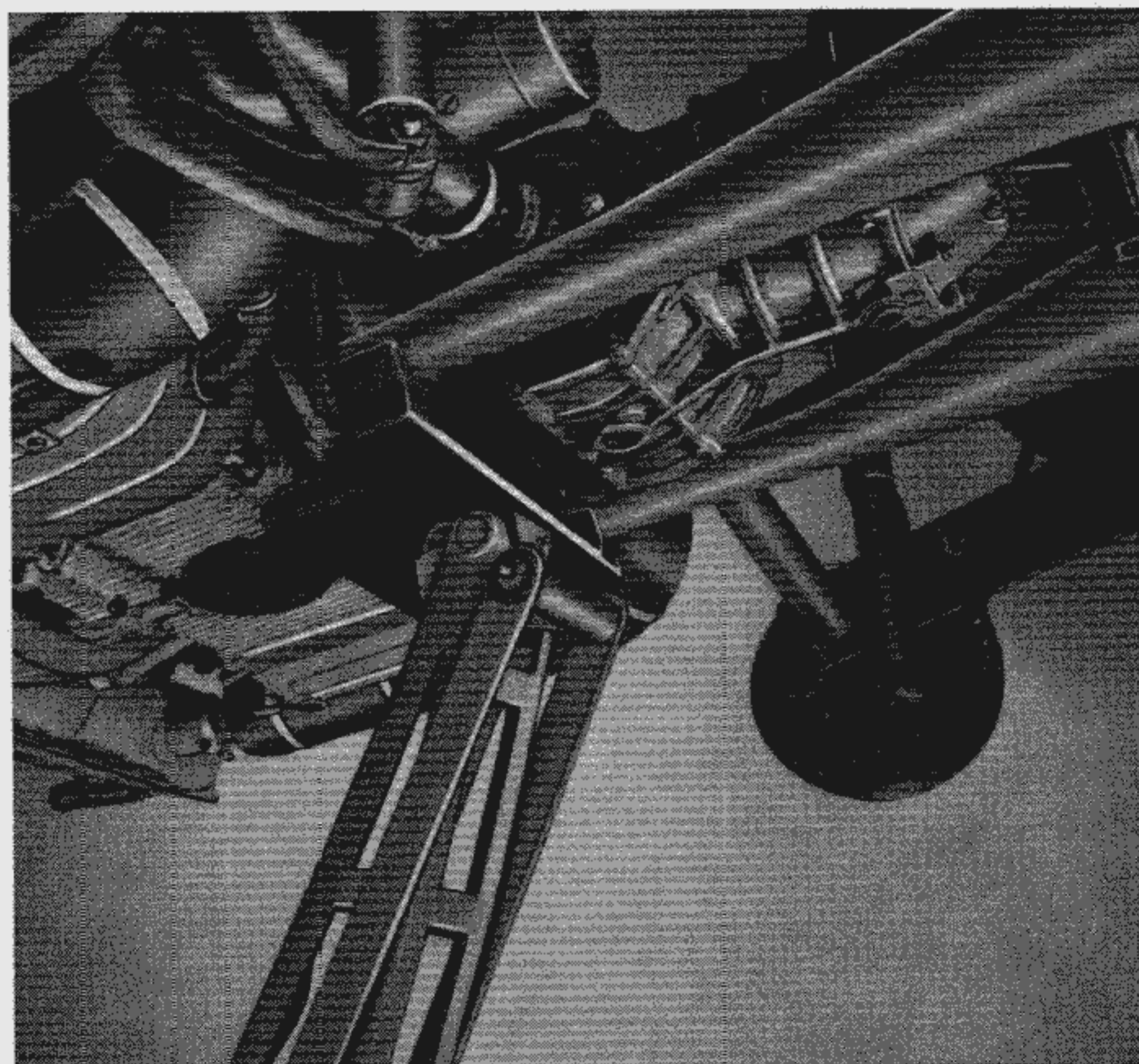




**Sub Frame Cradle  
for Trolley Jack**

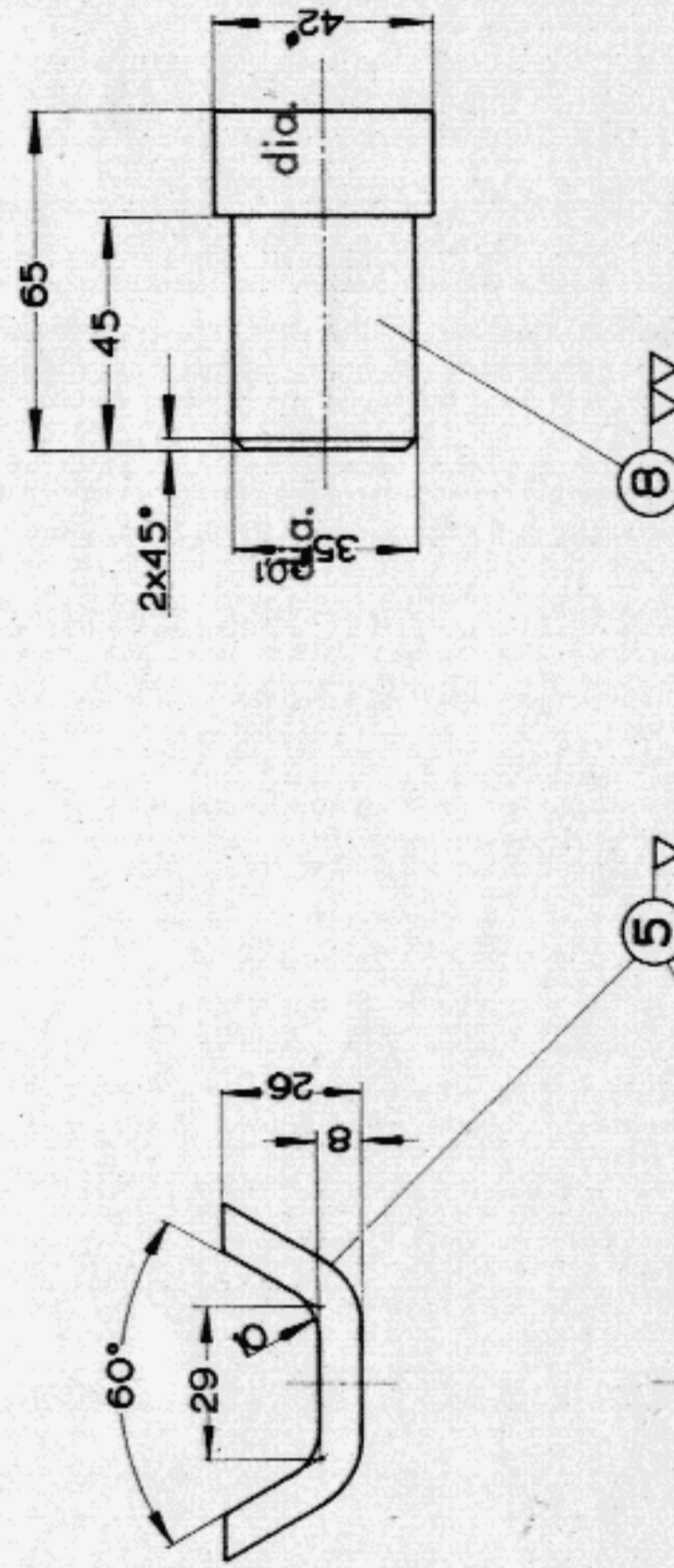
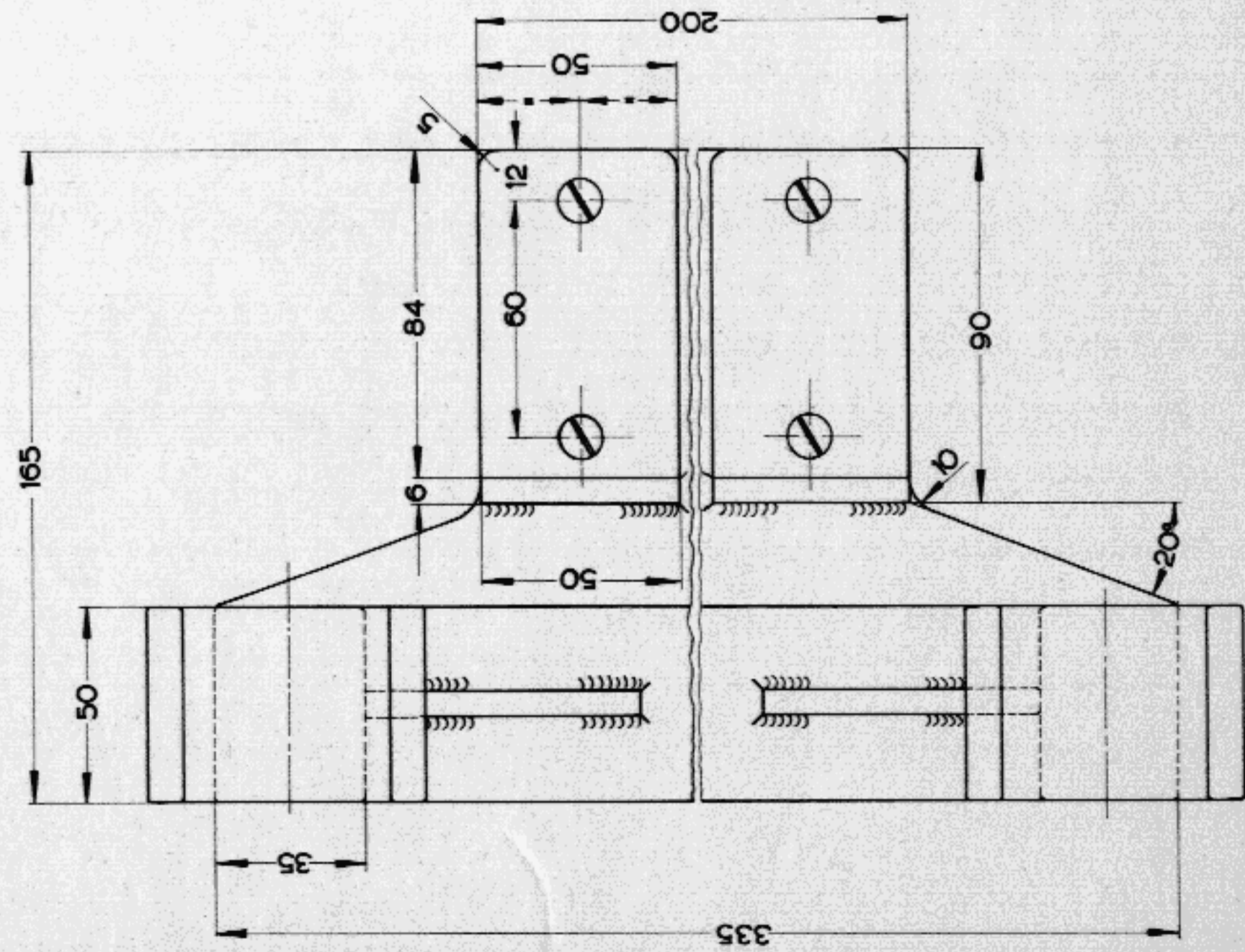
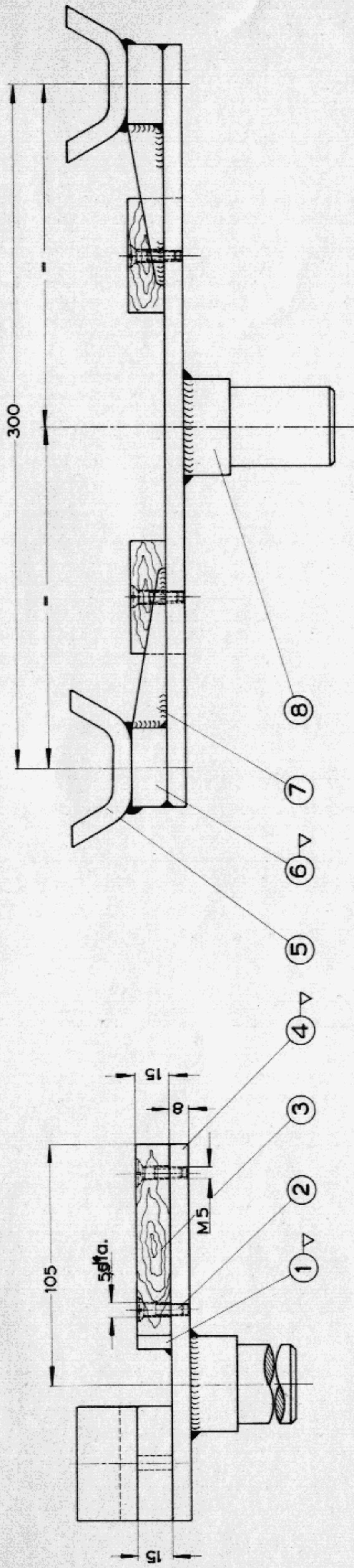
The sub frame cradle used in conjunction with a trolley jack facilitates the removal and re-installation of the complete sub frame.

The cradle fits underneath the sub frame and the crankcase thus giving good support for the whole unit.



#### **Construction Details for VW 614**

- 1 — Cut all parts to dimensions given in list of parts, have standard parts ready to hand.
- 2 — Finish part 1 as shown in drawing.
- 3 — Mark off part 3, drill and finish as shown.
- 4 — Mark off length and breadth of base plate part 4, and finish as shown in drawing.
- 5 — Mark out M 5 threaded holes, drill out using 4 mm drill, cut internal M 5 threads.
- 6 — Mark out and centre punch all weld points on part 4.
- 7 — Work part 5 to 50 mm length.
- 8 — Shape as shown in drawing and rework to 26 mm height.
- 9 — Finish parts 6 and 7 as shown in drawing.
- 10 — Turn part 8 as shown in drawing.
- 11 — Carry out all welding work as shown.
- 12 — Smooth out all welded seams.
- 13 — Screw on part 3.
- 14 — Paint cradle.



Chamfer edges

∇ (VV)

8	1	Guide bolt	45 φ X 70	C 15
7	2	Brace	15 X 6 X 75	St 37
6	2	Support piece	50 X 15 X 35	St 37
5	2	Adaptor	50 X 8 X 100	St 37
4	1	Base plate	170 X 8 X 340	MR St 42-2
3	2	Support block	55 X 15 X 90	Beechwood
2	4	Countersunk screws	M5 X 20	DIN 87-5
1	2	Stop plate	15 X 8 X 55	St 37

Part No. or standard spec. Material

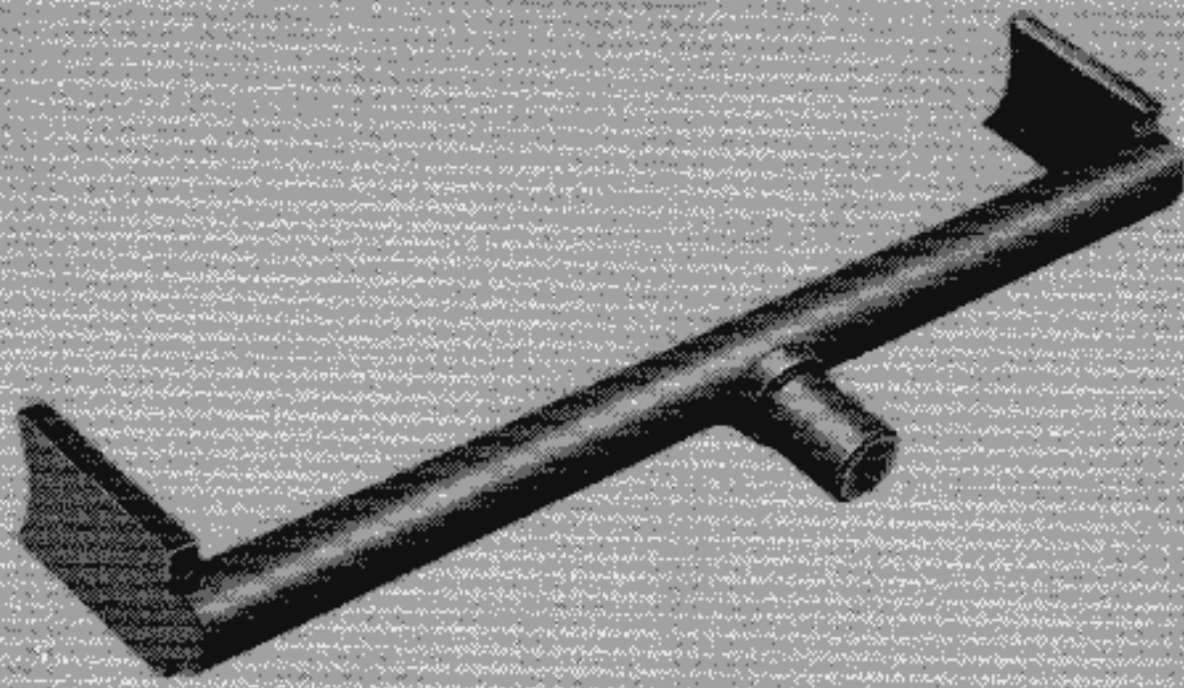
**VOLKSWAGENWERK AG**  
**WOLFSBURG**  
 Service Department

Drawn  
 3. 8. 61 Raebel

Checked  
 B. 8. 61 Gieseking

**Sub Frame Cradle for Trolley Jack**

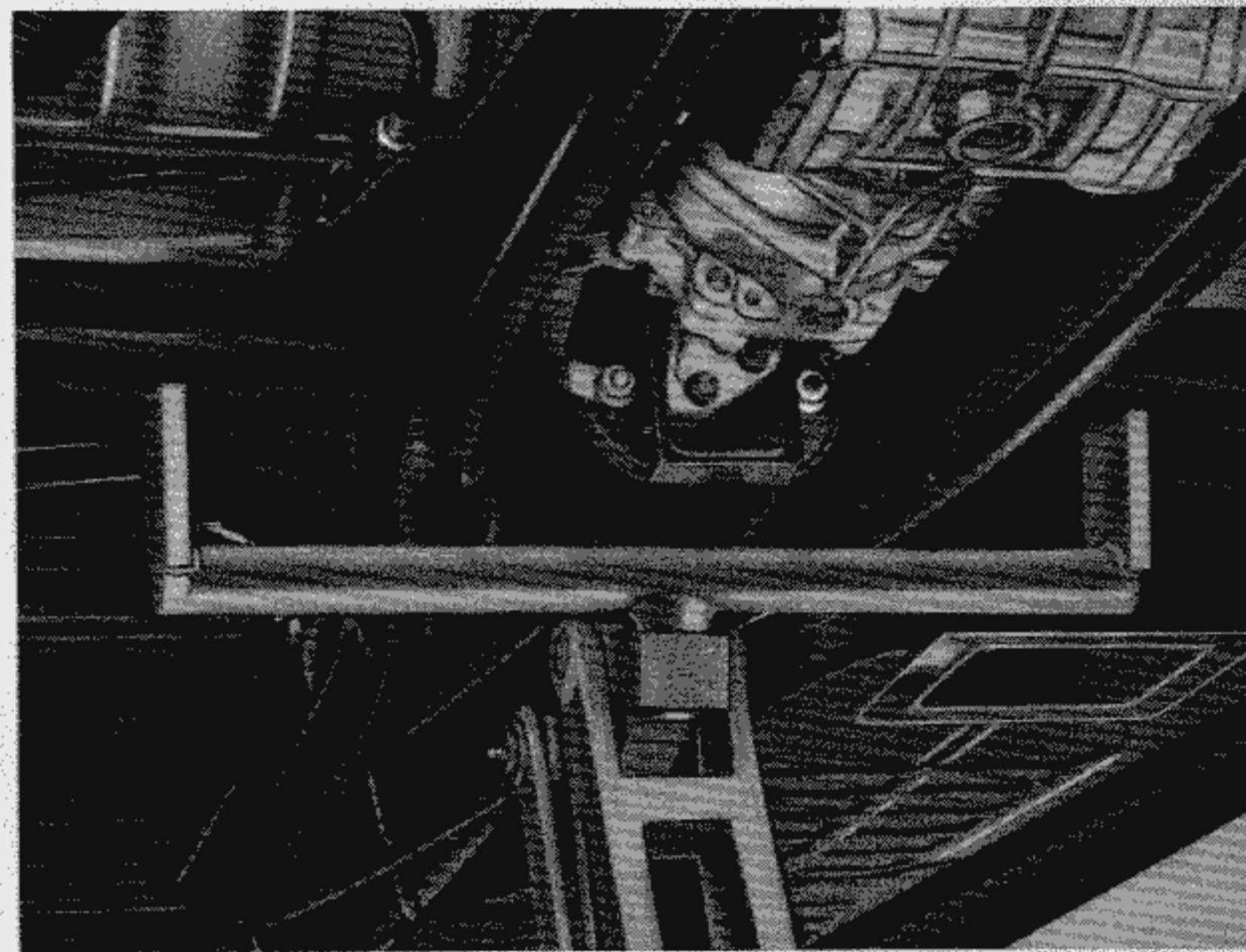
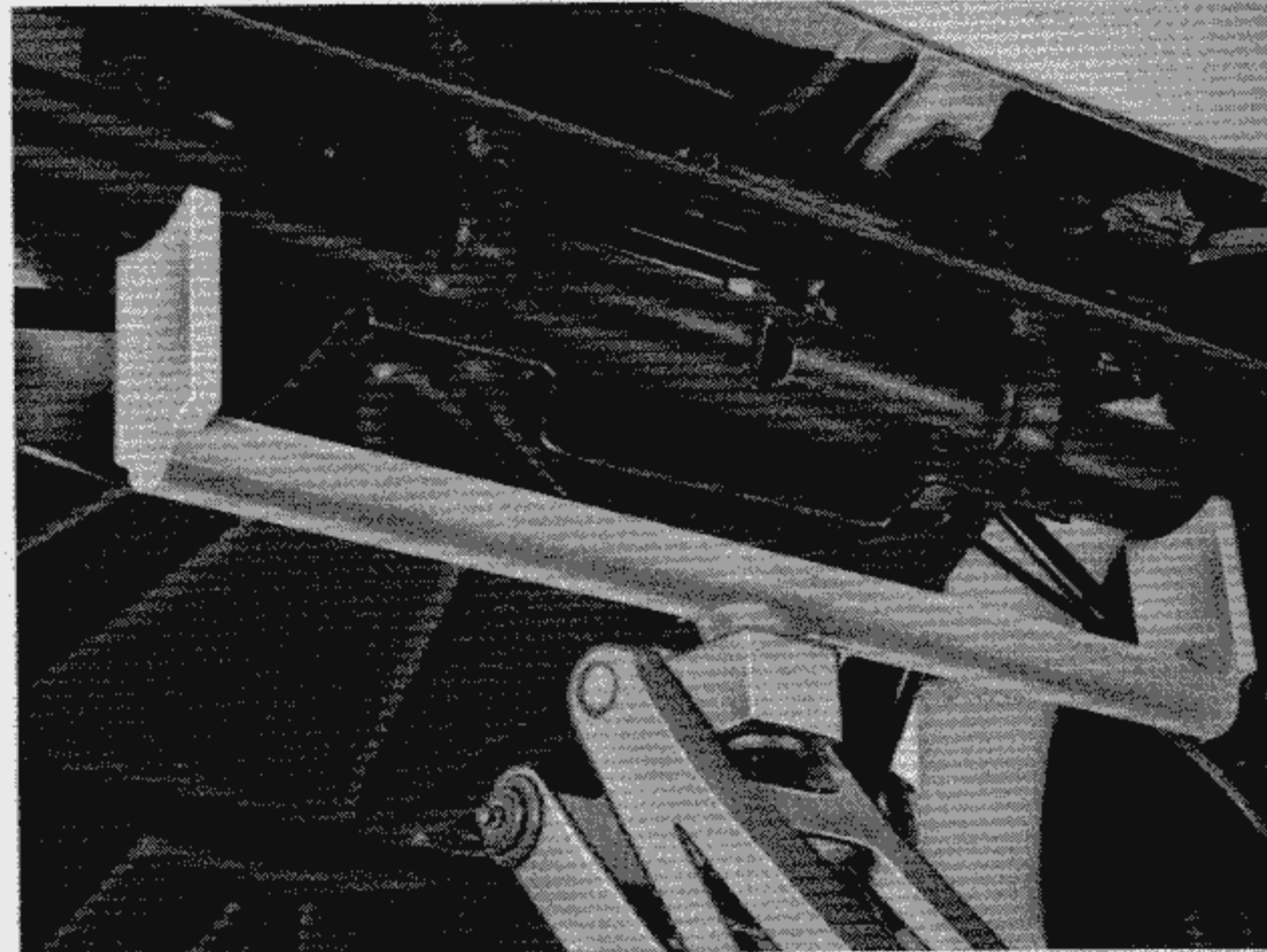
**VW 614**



Adaptor  
for Trolley Jack

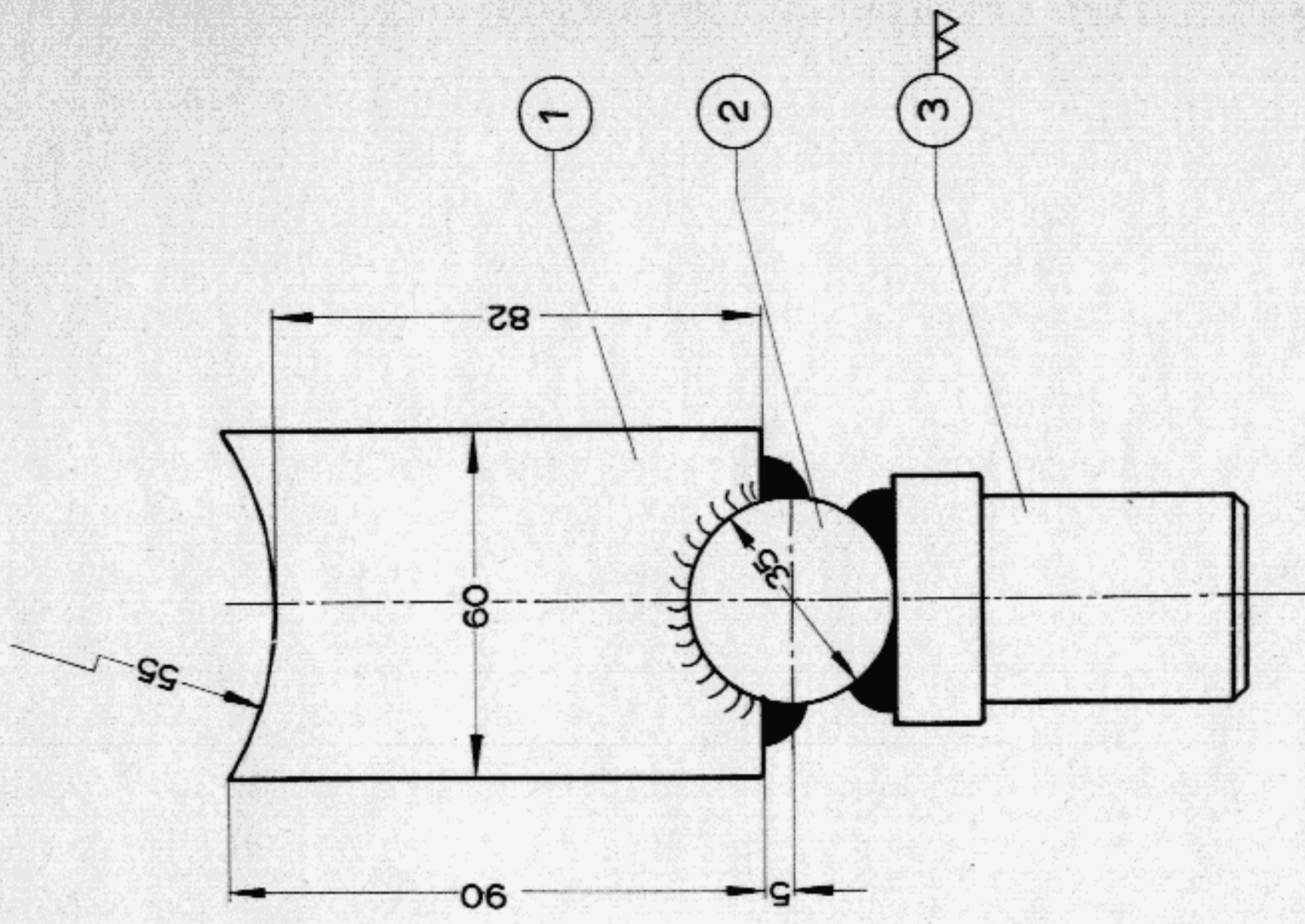
The adaptor when used in conjunction with a trolley jack permits the raising of all VW vehicles.

The adaption grips either under front axle or under the rear cross tube.

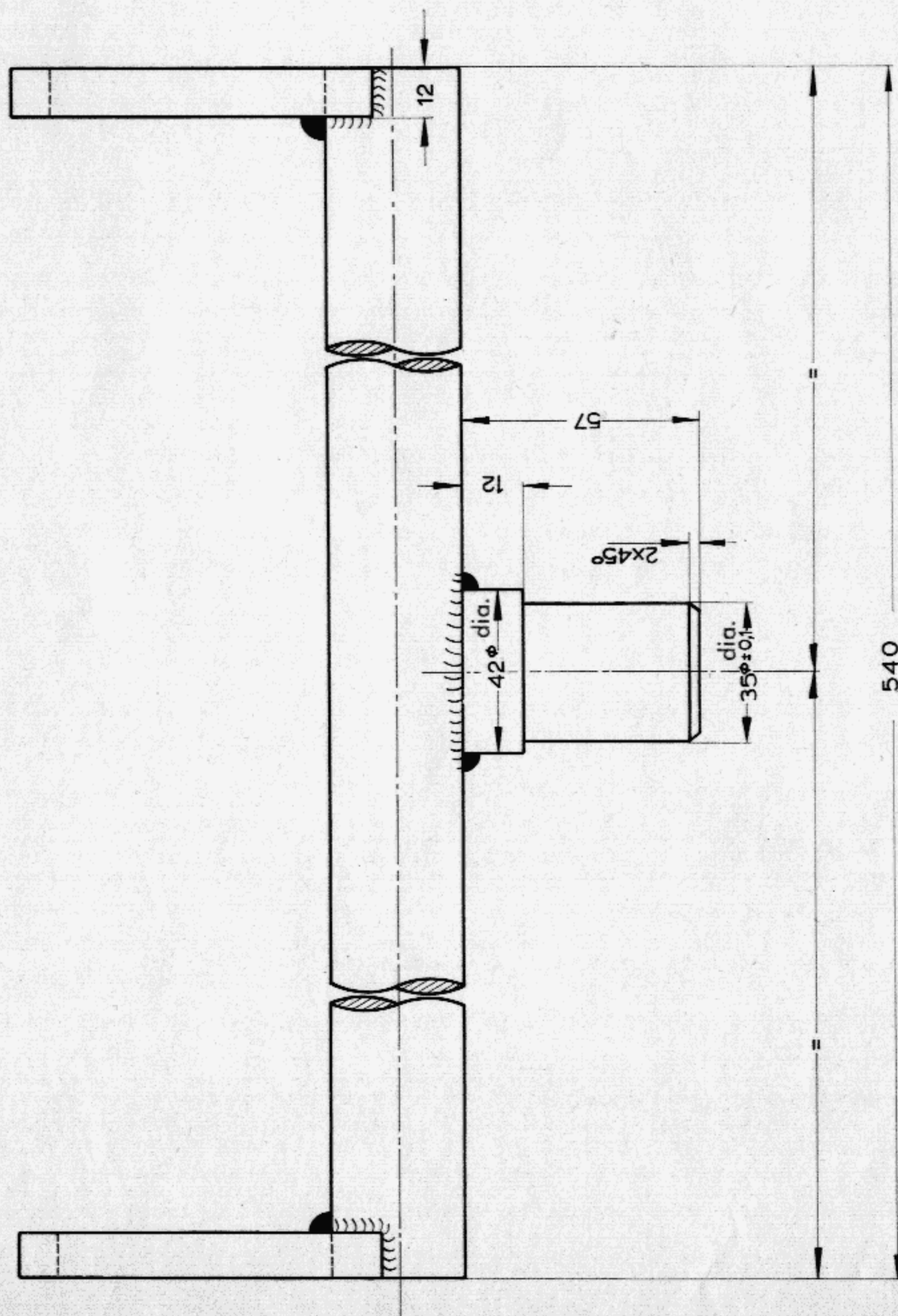


**Construction Details for VW 615**

- 1— Cut all parts to size as shown in list of parts.
- 2— Mark off part 1 as shown in drawing, centre punch, and work to shape as shown.
- 3— Turn part 2 to length.
- 4— Turn part 3 to size as shown.
- 5— Carry out all welding work as shown in drawing.
- 6— Smooth down welds.
- 7— Paint adaptor.



Chamfer Corners



3	1	Spigot	45 dia. X 60	C 15
2	1	Beam	35 dia. X 550	Sr 60
1	2	End plate	60 X 12 X 95	St 37
Part No.		Description		Material
No. required				

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 Service Department

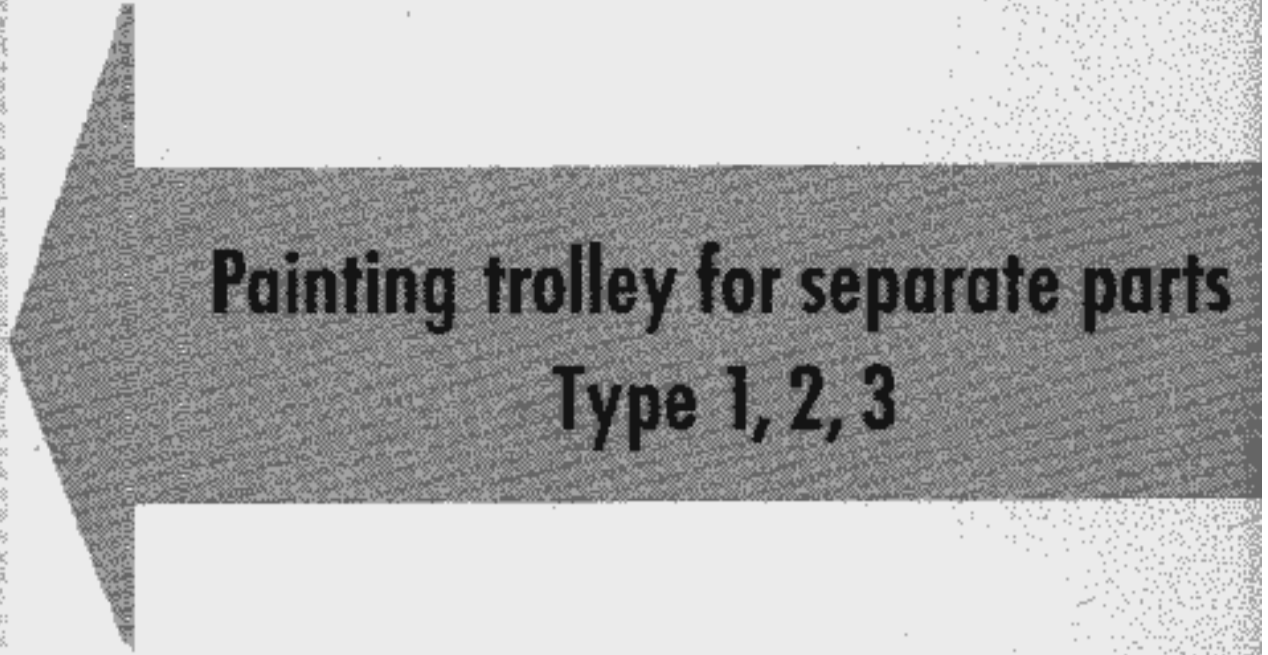
Drawn  
 17. 10. 61 Raebel

Checked  
 18. 10. 61 Giesecking

**Adaptor for Trolley Jack**

**VW 615**



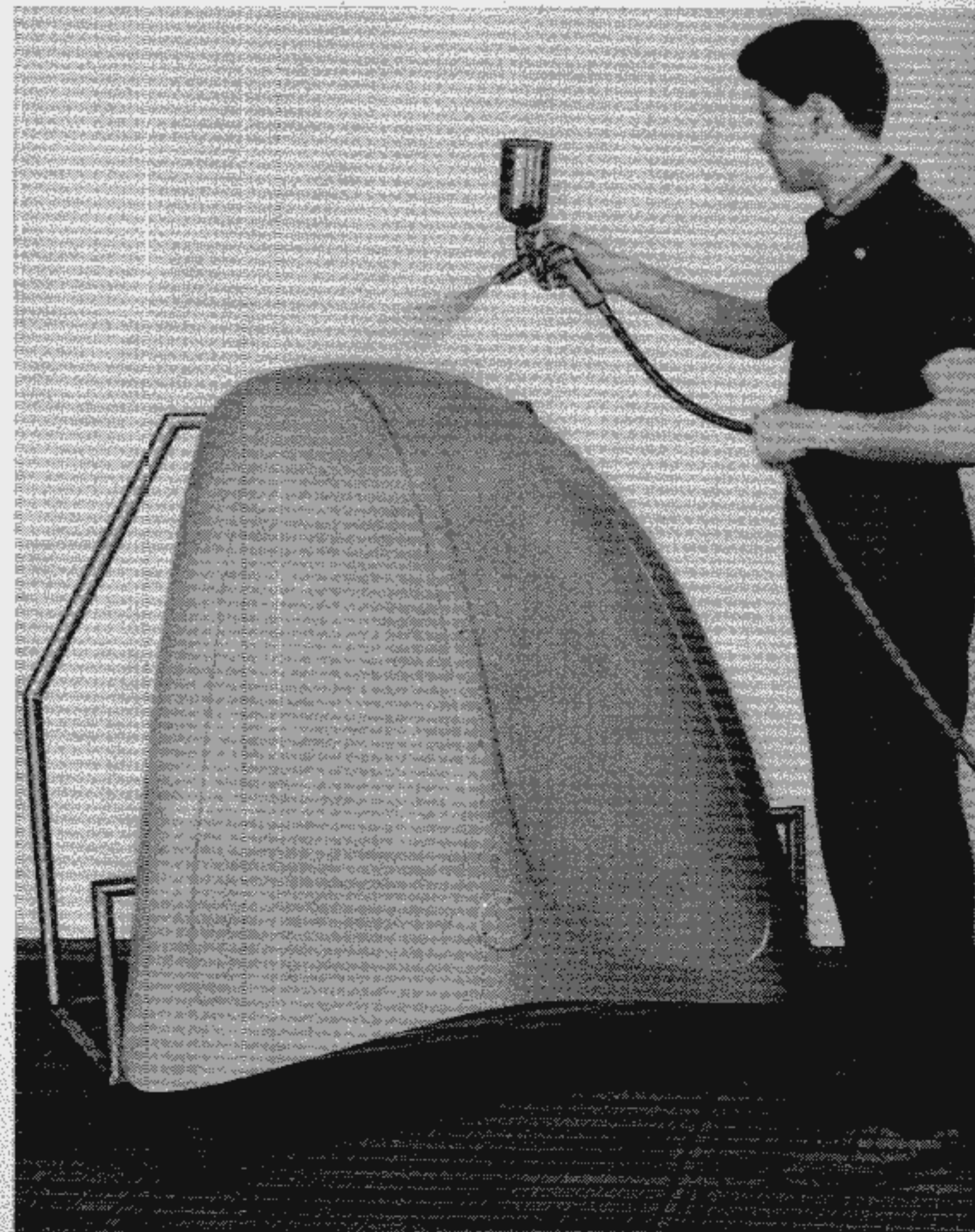


Painting trolley for separate parts  
Type 1, 2, 3

Separate parts of the body can be easily painted when they are hung on the painting trolley. The various parts are hung on specially shaped hooks. The painted parts remain on the trolley during the drying process thereby reducing the risk of damage to the freshly painted parts.

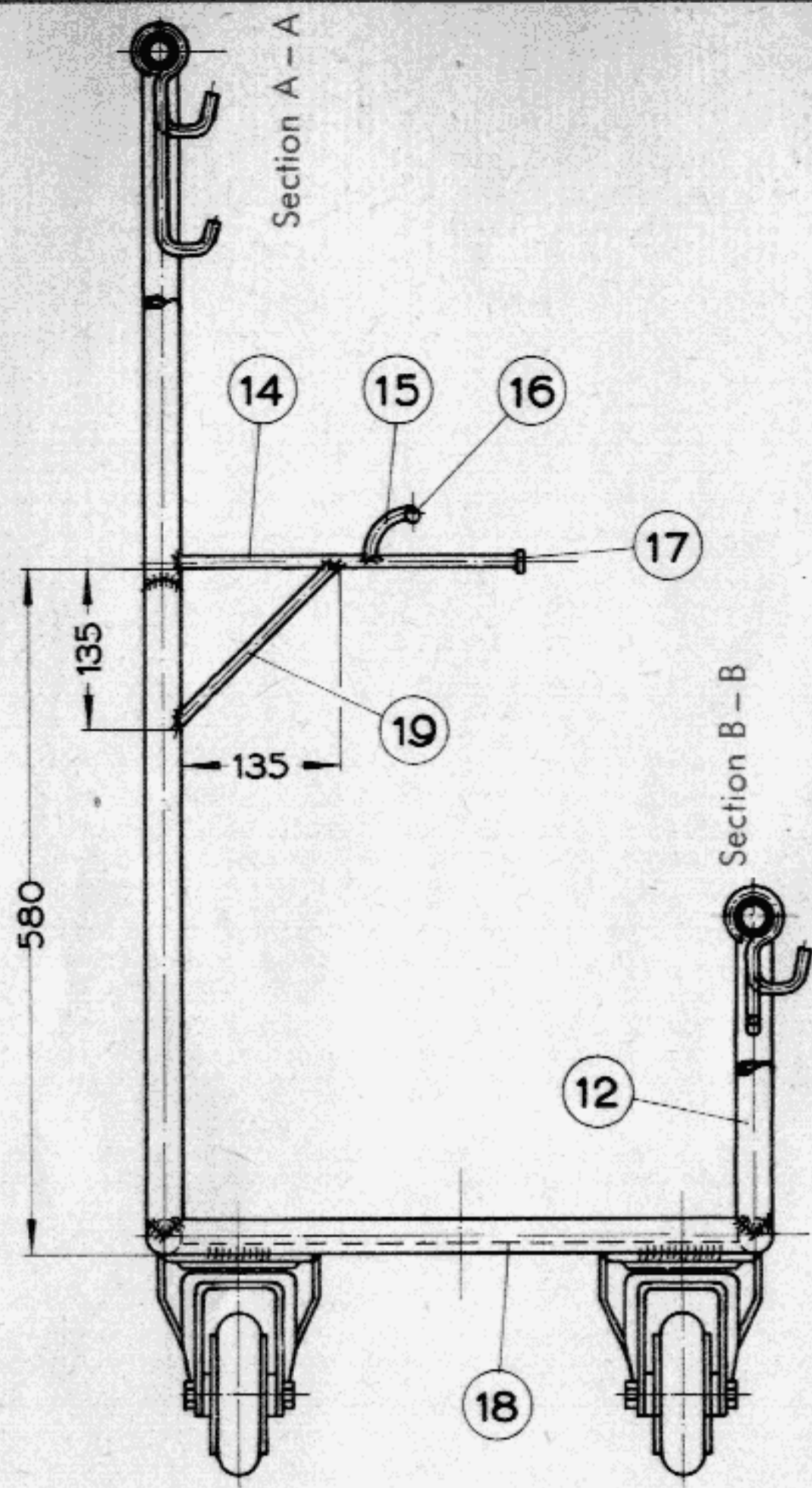
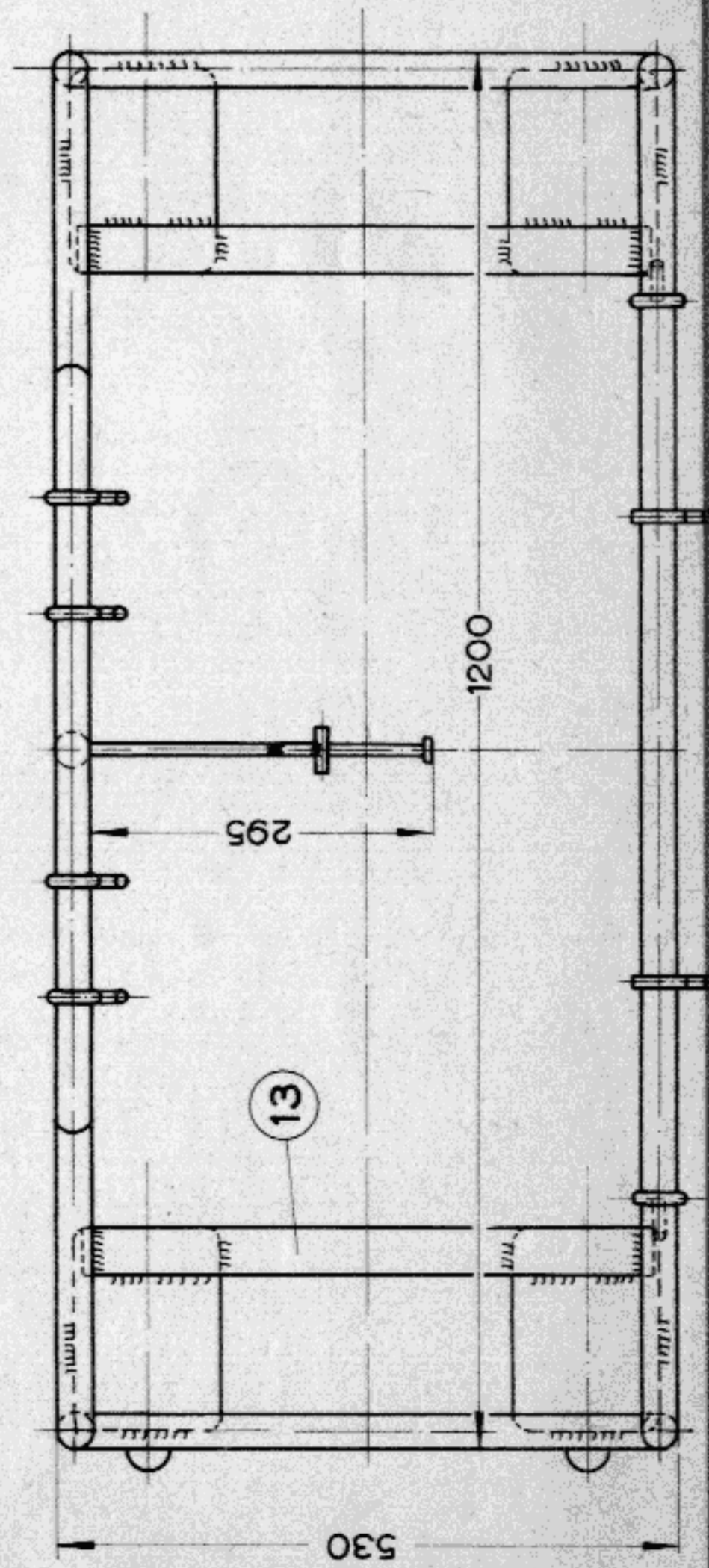
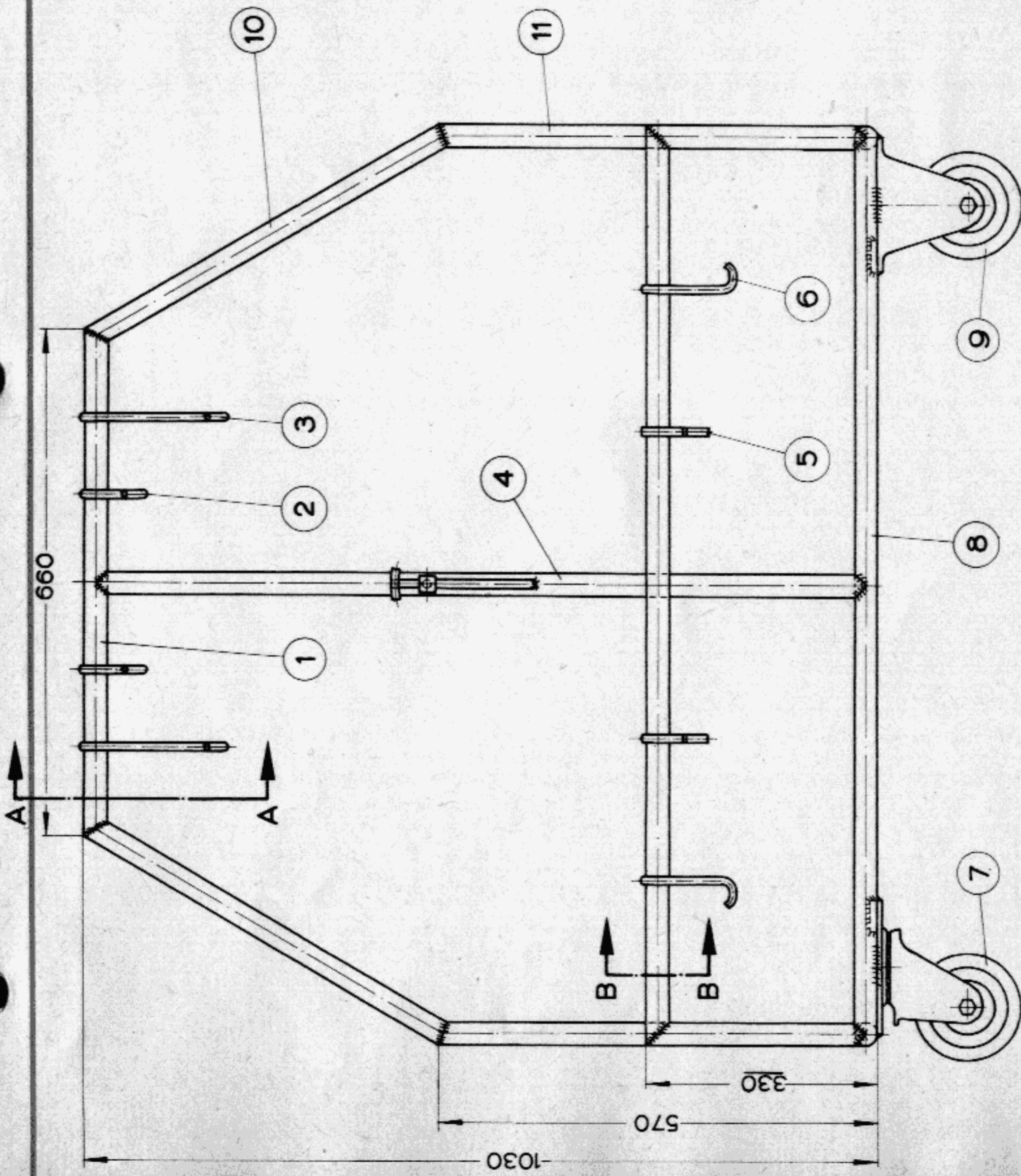
The parts are to be hung on the hooks as follows:

Type	Part	Hook No.			
		2	3	5	6
1	Fender front, left or right Fender rear, left or right Door, left or right Hood front Engine Compartment Lid	x x x x			x
2	Door without window frame (drivers cab) left or right Wing door, side Rear panel lid Engine Compartment Lid	x x	x	x	
3	Fender front, left or right Fender rear, left or right Door, left or right Hood front Hood rear	x x	x x x		



### Construction Details for VW 616

- 1 — Cut all parts to the dimensions given in the parts list.
- 2 — Bend and rework parts 2, 3, 5 and 6.
- 3 — Bend part 15 and weld onto parts 16 and 14.
- 4 — Weld parts 14 and 17.
- 5 — Cut mitres on ends of tubes 8 and 18 and weld together.
- 6 — Cut mitres on ends of tube 8 and 12.
- 7 — Put on parts 5 and 6.
- 8 — Weld parts 8 and 12 together.
- 9 — Cut mitres on the end of parts 1, 10 and 11.
- 10 — Put on parts 2 and 3.
- 11 — Weld parts 1, 10 and 11 together.
- 12 — Weld side part with frame.
- 13 — Make parts 4 and 13 to fit and weld in position.
- 14 — Weld part 14 and 19 to part 4.
- 15 — Weld on swivelling and fixed castors.
- 16 — Smooth down all welded joints.



Part No.	No. required	Description	Material	Remarks
19	1	Stay 10 dia. X 200	St. 37	
18	2	Tube 30 X 1.5 X 540	St. 35	DIN 2385
17	1	Plate 20 X 5 X 25	St. 37	
16	1	Round steel 10 dia. X 40	St. 37	
15	1	Round steel 10 dia. X 80	St. 37	
14	1	Round steel 10 dia. X 300	St. 37	
13	2	Stay 40 X 8 X 480	St. 37	
12	2	Tube 30 X 1.5 X 340	St. 35	DIN 2385
11	2	Tube 30 X 1.5 X 590	St. 35	DIN 2385
10	2	Tube 30 X 1.5 X 545	St. 35	DIN 2385
9	2	Fixed castor 140 dia.		Rubber tyred
8	3	Tube 30 X 1.5 X 1210	St. 35	DIN 2385
7	2	Swivelling castors 140 dia.		Rubber tyred
6	2	Hooks 6 dia. X 280	St. 37	
5	2	Hooks 10 X 6 X 270	St. 37	
4	1	Tube 30 X 1.5 X 980	St. 35	DIN 2385
3	2	Hooks 6 dia. X 370	St. 37	
2	2	Hooks 6 dia. X 260	St. 37	
1	1	Tube 30 X 1.5 X 670	St. 35	DIN 2385

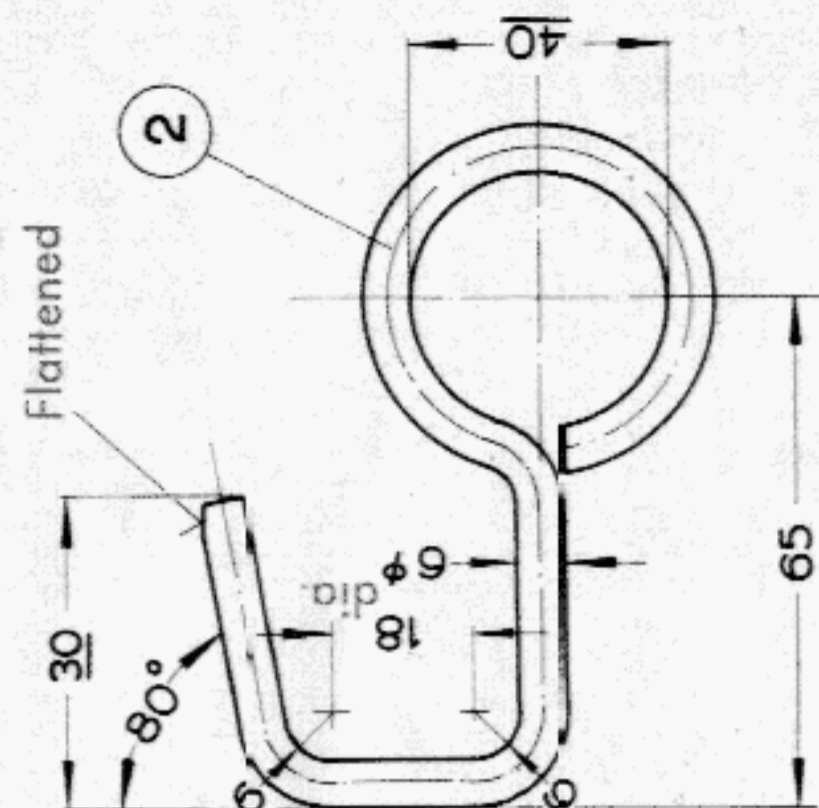
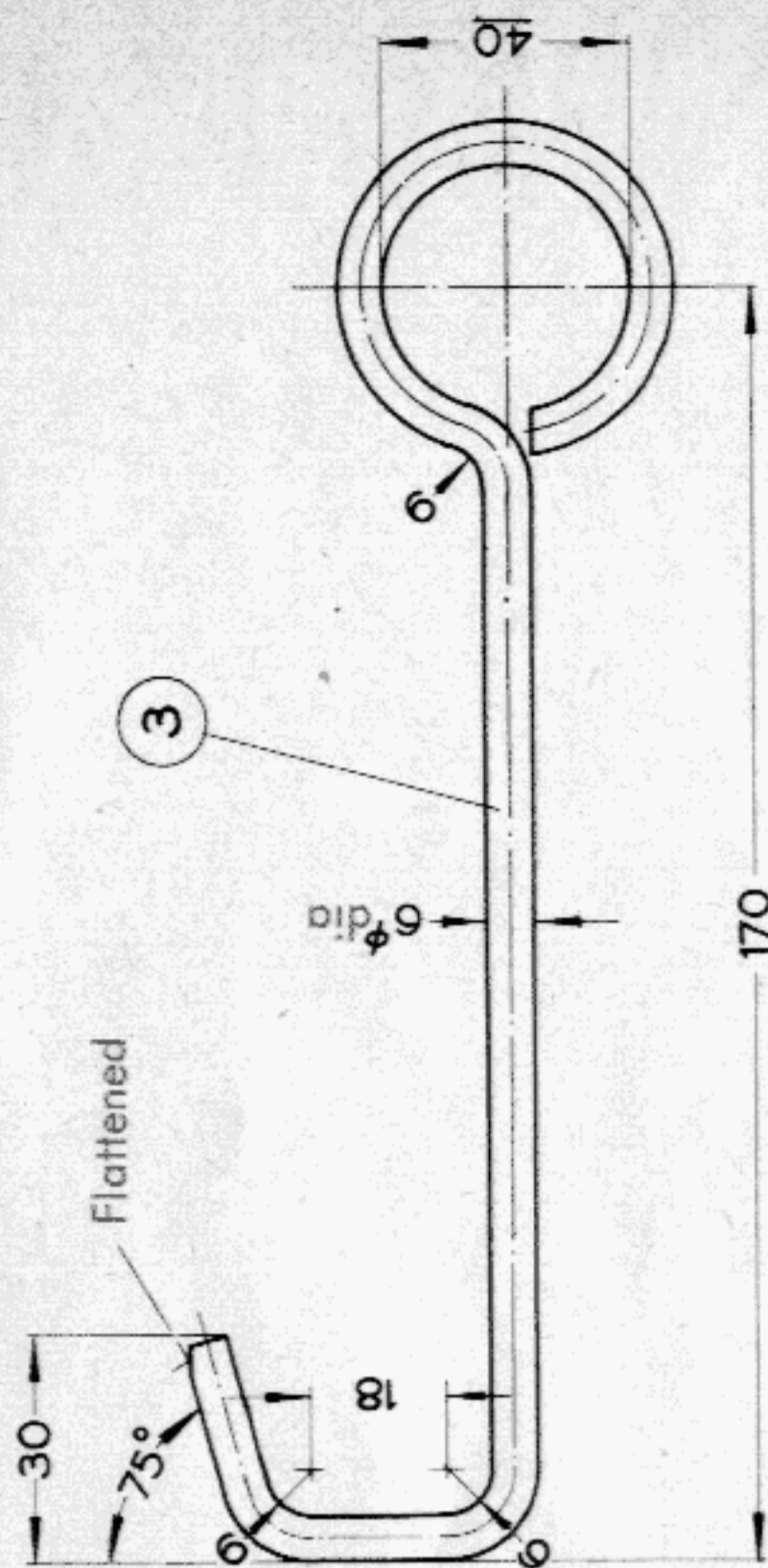
**VOLKSWAGENWERK AG**  
**WOLFSBURG**  
 Service Department

Drawn: 18.4.63 Krumbholz  
 Checked: 30.4.63 Gieseking

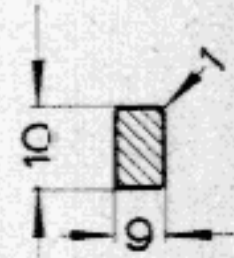
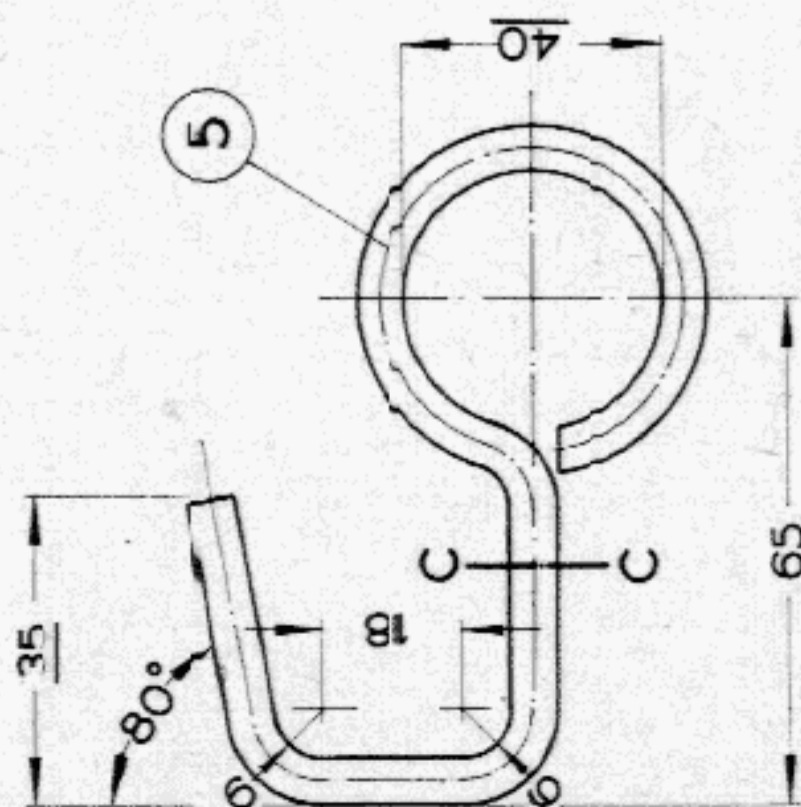
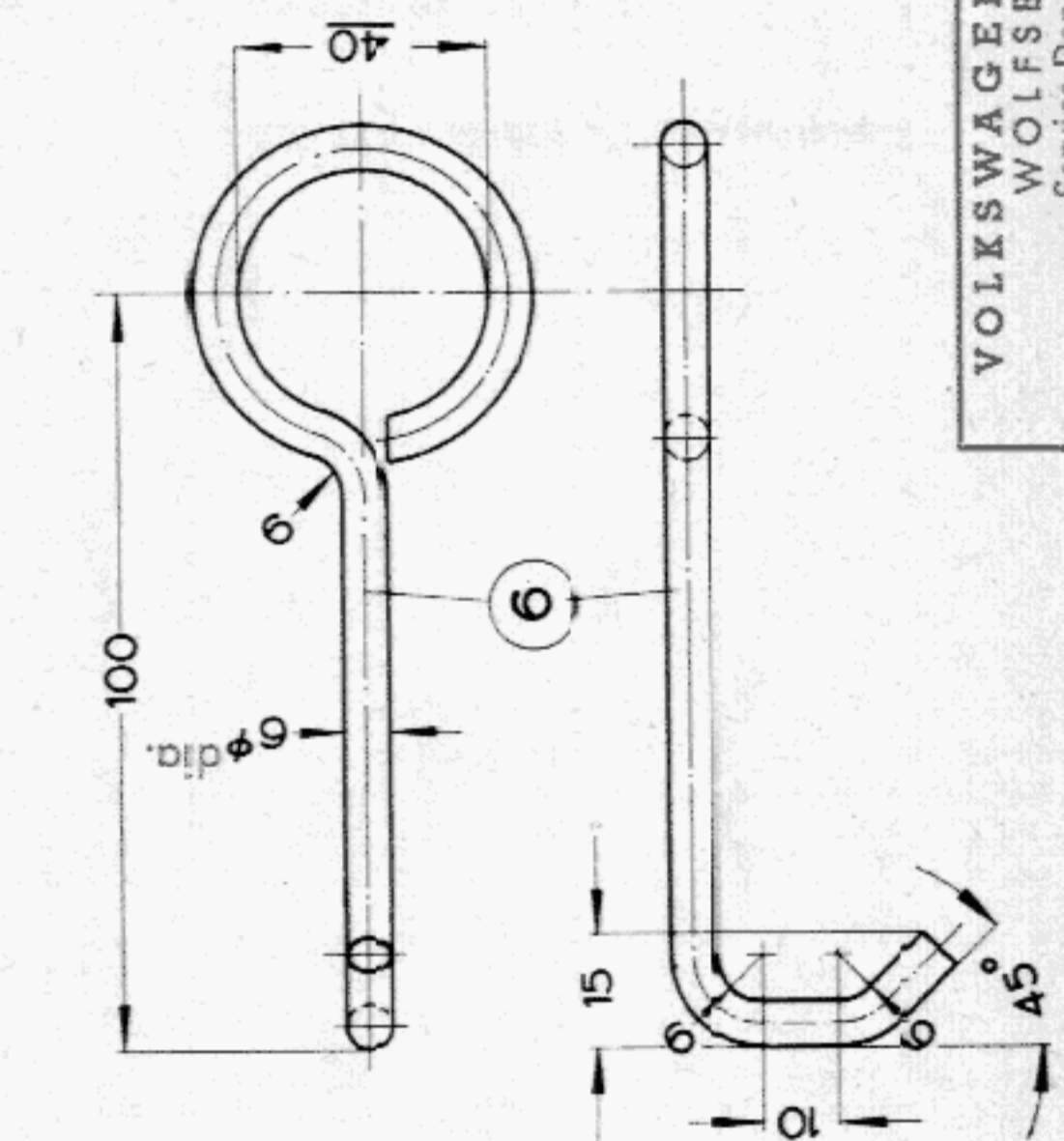
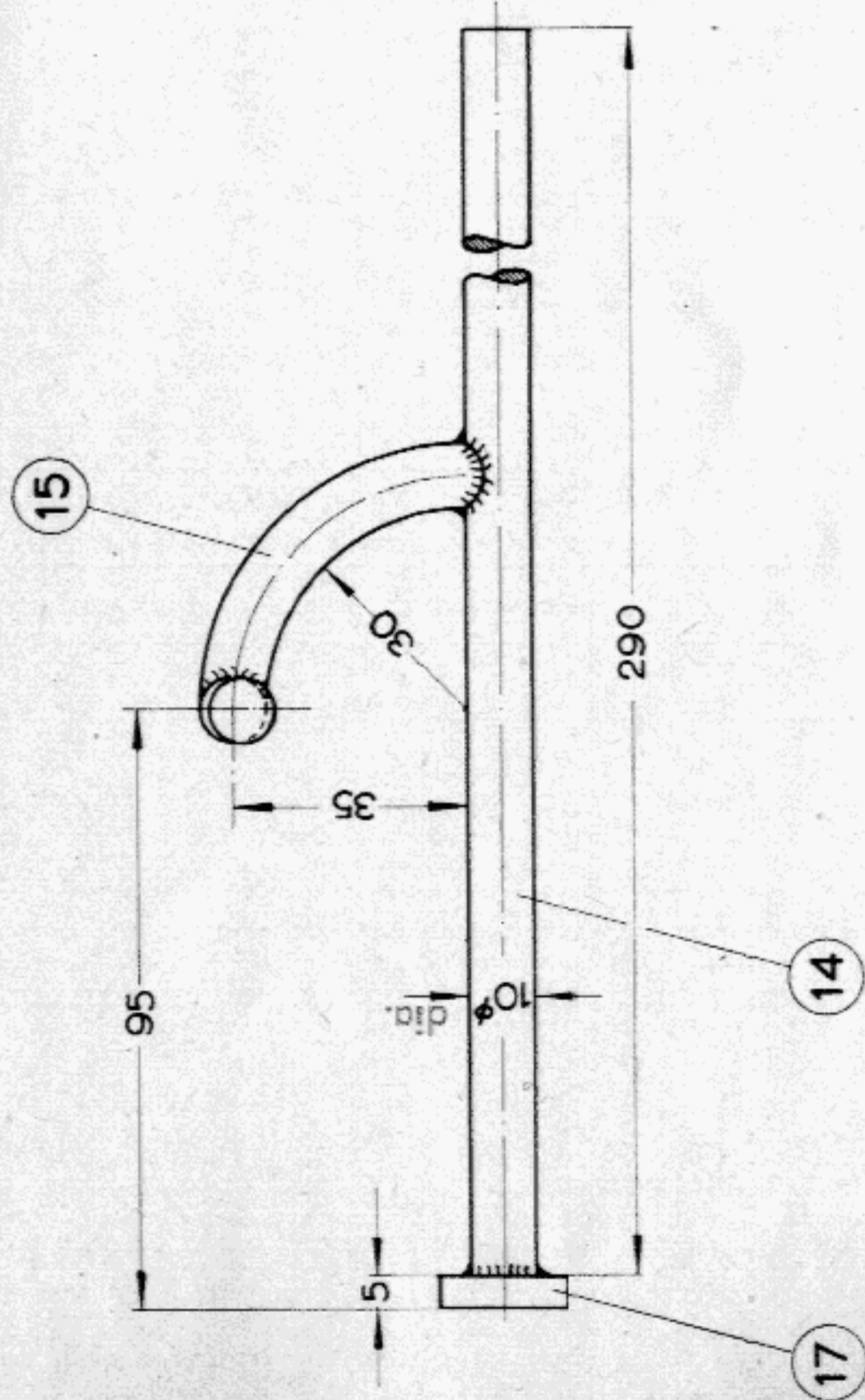
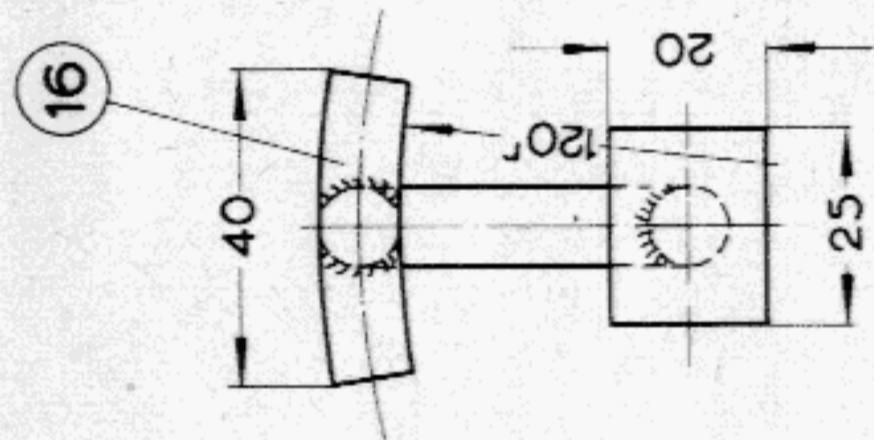
**Painting Trolley for Separate Parts**

**VW 616**

No. of Sheets 2  
 Sheet No. 1



Section C-C



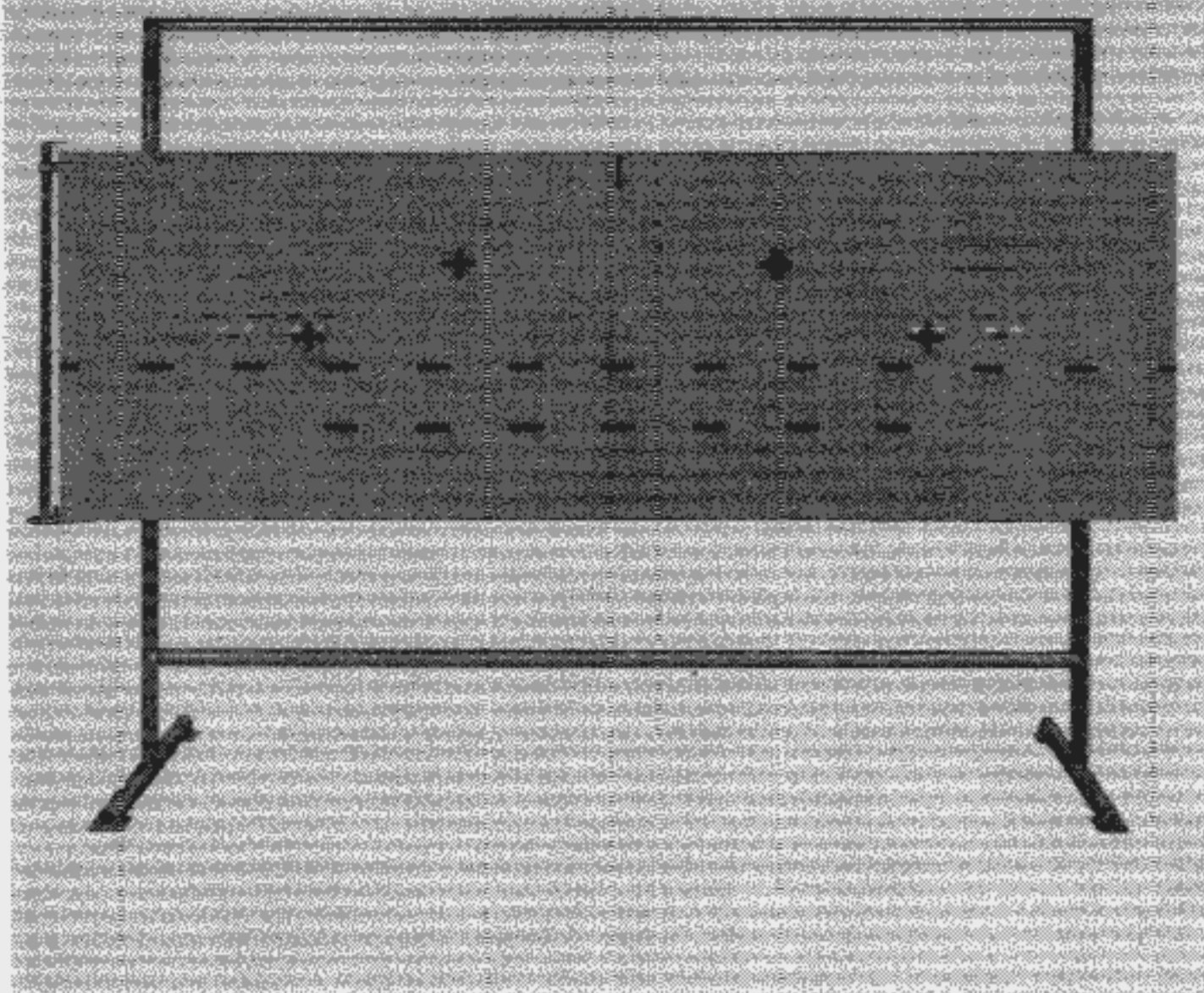
Painting Trolley for Separate Parts

VOLKSWAGENWERK AG  
WOLFSBURG  
Service Department

Drawn: 18.4.63 Krumbholz  
Checked: 30.4.63 Giesecking

VW 616

No. of Sheets 2  
Sheet No. 2



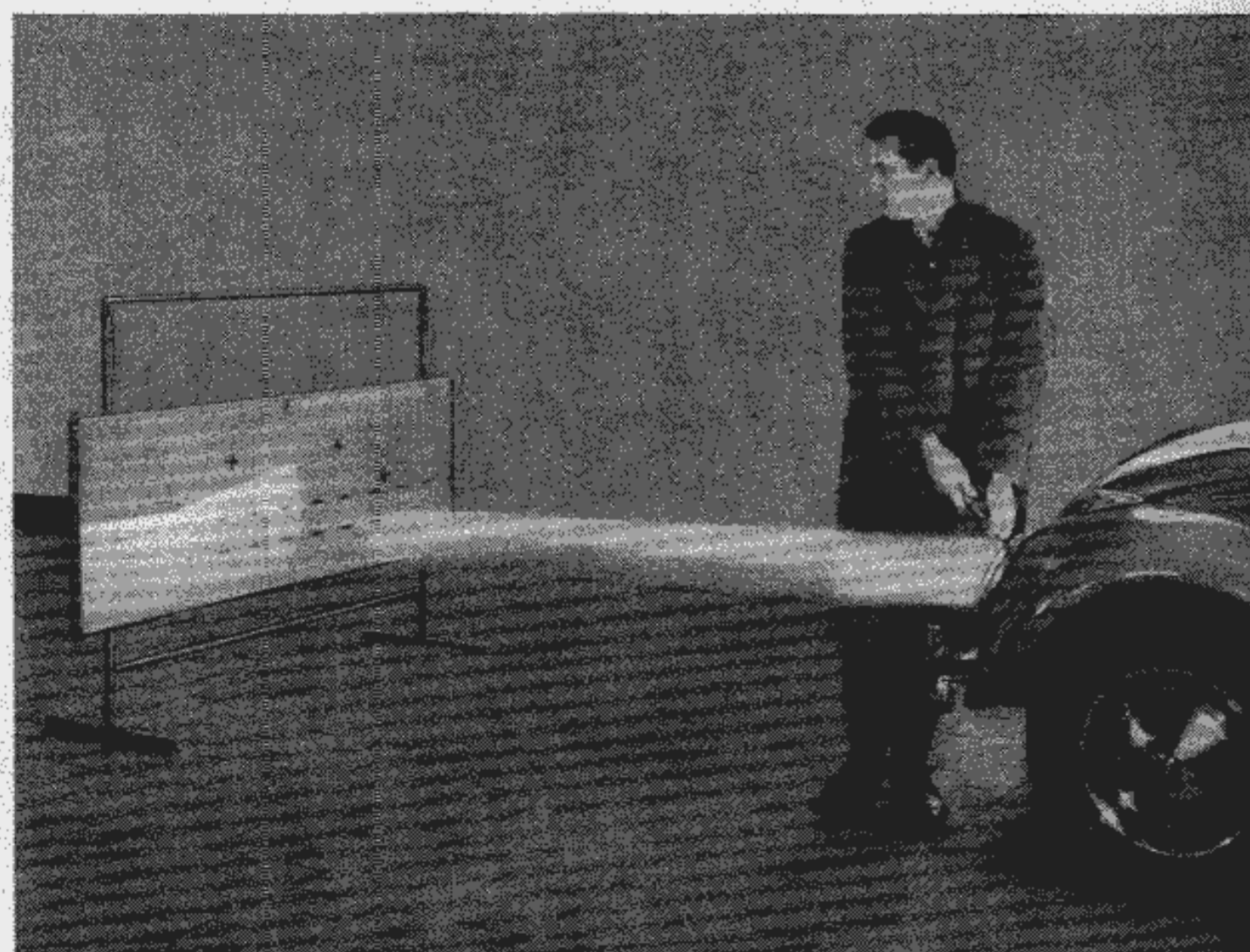
**Headlight Aiming Screen for  
Types 1, 2 and 3**

The headlights of all VW vehicles with symmetric and asymmetric low beams can be adjusted with the aid of this screen. The height of the screen can be adjusted. The centre of the vehicle can be lined up with the centre of the aiming screen by means of the aiming line on the top edge of the screen. The distance from the vehicle to the screen must be 5 m.

The three thin dotted lines above the insertable crosses are the marking lines for the centre of the headlights with asymmetric low beams of the various types of vehicle. With the adjustable height gauge the distance from the floor to the centre of the headlight is ascertained and transferred to the marking line on the aiming screen. The angle of the light-dark zone must run through the centres of the inserted crosses.

On the other hand with symmetric low beams the inserted crosses must be aligned with the centres of the vehicles headlights. The light-dark zone then appears on the painted line 50 mm below.

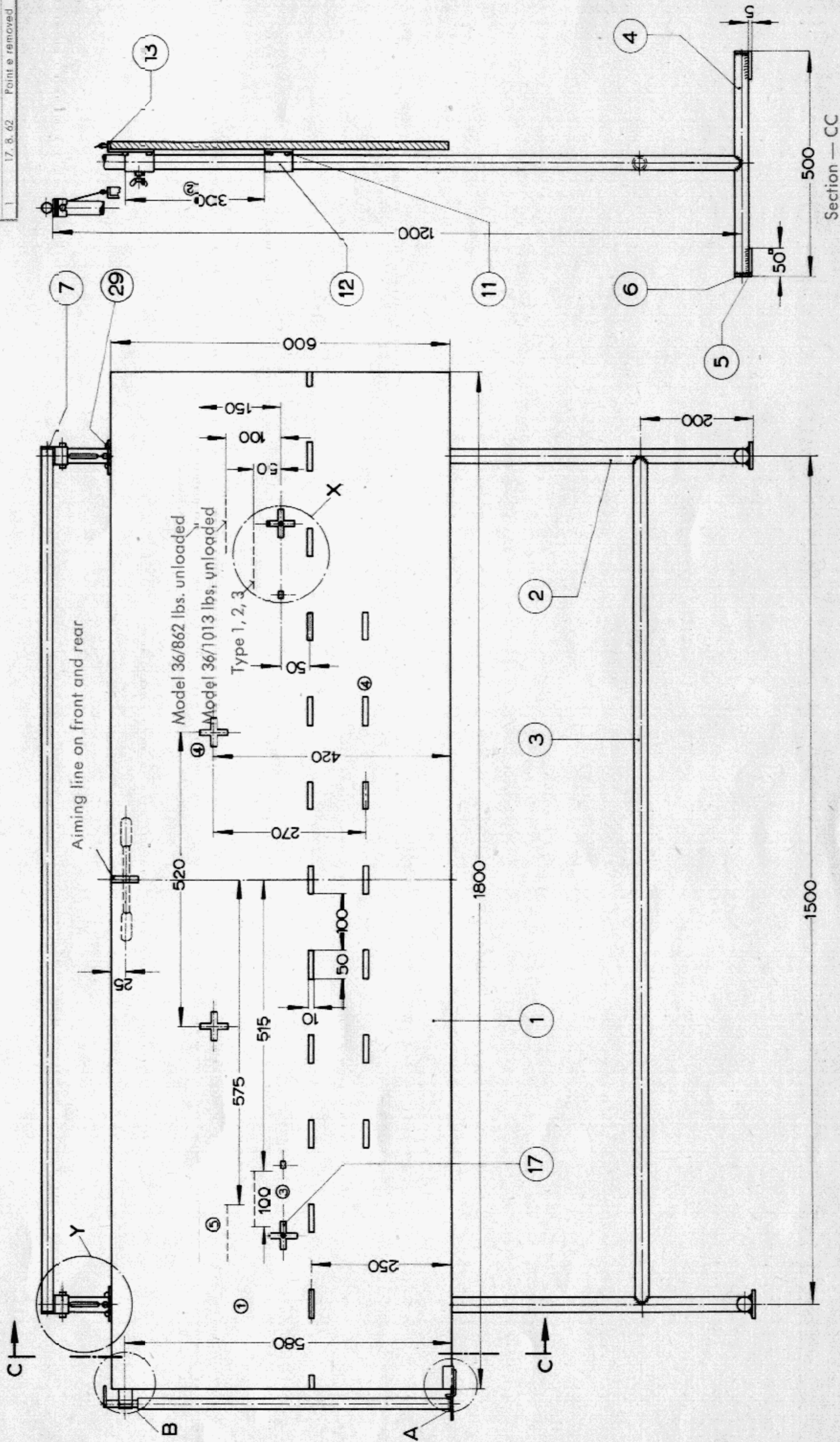
The fixed crosses in conjunction with the lower painted line serve for adjusting the fog lamps on the 1500 Karmann Ghia.



### Construction Details for VW 635/2

- 1 — Cut all parts as detailed in list of parts.
- 2 — Fit discs (6) to ends of tubes (4) and weld in position closing the ends of the tubes.
- 3 — Weld foot plates (5) to tubes (4).
- 4 — Drill, cut and shape tubes (2) as shown at section "Y" and fit lower ends to tubes (4).
- 5 — Tack weld tubes (2) to tubes (4) align and weld as shown on drawing.
- 6 — Fit both ends of tube (3) to tubes (2). Weld in position.
- 7 — Fit discs (8) to tube (7) and weld in position closing ends of tube.
- 8 — Fit discs (9) to tubes (10) and weld in position, cut tubes (10) as shown on drawing and weld to tubes (7).
- 9 — Finish parts (21) and (40) as shown on drawing.
- 10 — Finish counter weights (consisting of parts 34, 35 and 14) as shown on drawing. Fill with molten lead, pull in cables (25) install counter weights.
- 11 — Finish screen plate (1) as shown on drawing, cut slots as shown at section "X".
- 12 — Finish parts 31 and 32 as well as parts 19 and 33 and screw to screen plate as shown on drawing.
- 13 — Finish top guides (12—15) also bottom guides (11 and 12) and screw onto screen plate as shown on drawing.
- 14 — Bend tube (16) in cold condition, beat out ends of tube, drill and screw onto screen.
- 15 — Finish crosses (17 and 18) as shown on drawing and paint with a flat black paint.
- 16 — Paint the front of the screen in a yellow colour (RAL 10/12) (colour register 840 R). Mark in the dotted lines, crosses and aiming mark correct to sizes given, using a black matt paint. Wording according to drawing VW 635/2 sheets 1 and 2.
- 17 — Paint the whole of the tubular frame (except in the area of the screen guides on tubes (2), these areas should be lightly oiled).
- 18 — Mount the screen on tubes (2) install the cable pulleys (21) in the upper ends of tubes (2) secure with screws (22) and pull cables (25) out of tubes (2) towards the front.
- 19 — Place top connecting tubes (7—10) on tubes (2) and screw on.
- 20 — Secure cables (25) to the eyes (14).
- 21 — Finish off adjustable measuring device as shown on drawing, paint and place in the seatings provided.

No.	Date	Description of alterations
1	11. 8. 61	Point e included
2	11. 8. 61	was 400
3	17. 8. 62	Slot altered
4	1	Foglamp Karmann included
5	1	Adjustment line included
1	17. 8. 62	Point e removed



VOLKSWAGENWERK AG  
WOLFSBURG  
Service Department

Drawn:  
17. 7. 59 Sandau

Checked:  
10. 3. 60 Gieseke

Headlight Aiming Screen

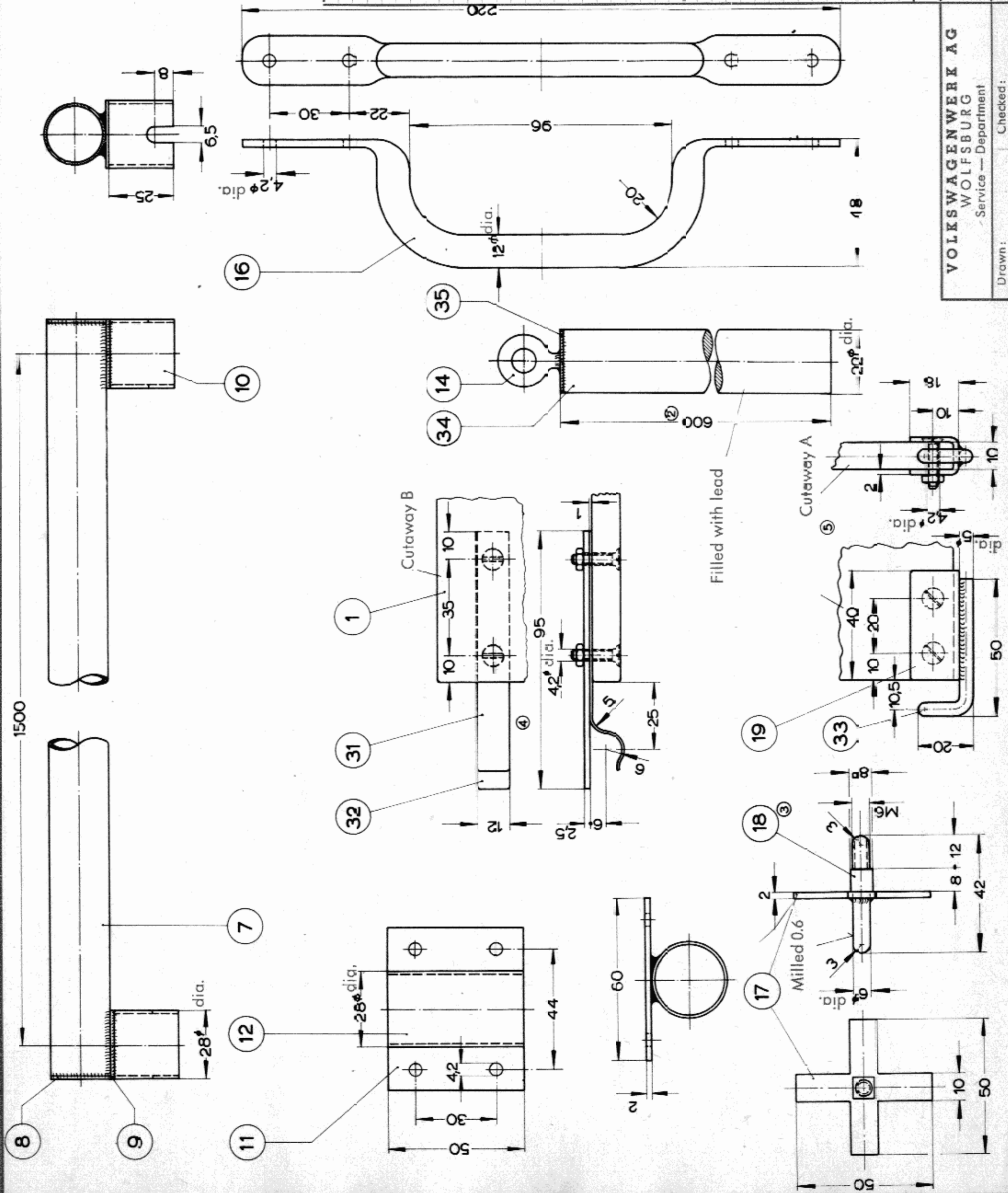
VW 635/2

No. of Sheets 3  
Sheet No. 1





No.	Date	Description of alterations
1	14. 8. 61	Cable length was 500
2	14. 8. 61	was 800
3	17. 8. 62	Part 18 redrawn
4	1	Parts 31 und 32 altered
5	17. 8. 62	Cutaway A redrawn



41	Round rod	8 dia. X 465	St 37
40	Metal brackets	12 X 2 X 30	St 37
39	Wing bolts	M 5 X 12	DIN 316
38	Measuring rod	5 dia. X 40	Round steel
37	Tube	18 dia. X 1.5 X 550	Steel tube
36	Tube	14 dia. X 2 X 390	Steel tube
35	Discs	22 dia. X 2	Sheet steel
34	Tube	22 dia. X 1 X 600	Steel tube
33	Hook	5 dia. X 70	Round steel
32	Plate	12 X 2.5 X 95	Sheet steel
31	Spring steel	17 X 1 X 100	Sheet steel
30	Pawl spring	Pt. No. 111 711 319	Length 550
29	Wood screw	4 X 25	DIN 96 St
28	Nut	M 4	DIN 934
27	Base plate	3 X 5 dia.	St 37
26	Countersunk screw	M 4 X 18	DIN 913
25	Cable	16 dia. X 690	Local purchase
24	Disc	3 X 10 dia.	St 37
23	Disc	5.3	DIN 125
22	Screw	M 5 X 35	DIN 931
21	Cable roller	20 dia. X 25	Round steel
20	Spring steel wire	2 dia. X 100	Steel
19	Bracket	40 X 2 X 50	St 37
18	Square with thread	8 X 45	Steel
17	Cross	50 X 2	Sheet steel
16	Grip	12 dia. X 0.75 X 300	steel tube
15	Hex. nut	M 5	DIN 555
14	Eye	5 dia. X 60	Round steel
13	Platin	16 X 2 X 60	Sheet steel
12	Tube	28 dia. X 1.2 X 50	Steel tube
11	Plate	50 X 2 X 60	Sheet steel
10	Tube	28 dia. X 1 X 25	Sheet steel
9	Disc	27 dia. X 2	Sheet steel
8	Disc	20 dia. X 7	Sheet steel
7	Tube	22 dia. X 1 X 1530	Steel tube
6	Disc	25 dia. X 2	Sheet steel
5	Foot plate	50 X 5	Flat steel
4	Tube	25 dia. X 1 X 500	Steel tube
3	Tube	25 dia. X 1 X 500	Steel tube
2	Tube	15 dia. X 1 X 1200	Steel tube
1	Screen plate	10 X 1800 X 600	Fiber board

Part No.	Designation	Rough size or standard spec.	Remarks

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 Service — Department

Checked:  
 10. 3. 60 Giesecking

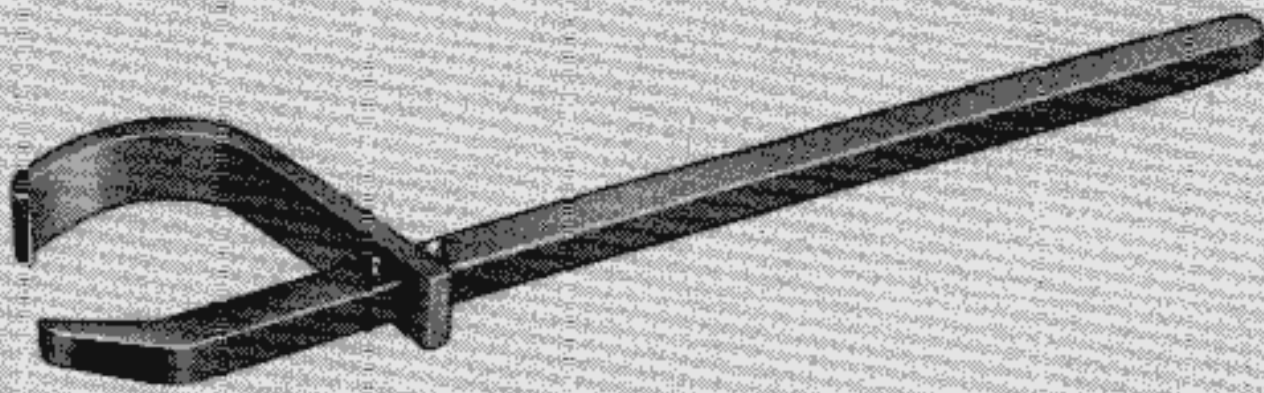
Drawn:  
 17. 7. 59 Sandau

**Headlight Aiming Screen**

No. of sheets 3  
 Sheet No. 3

VW 635/2

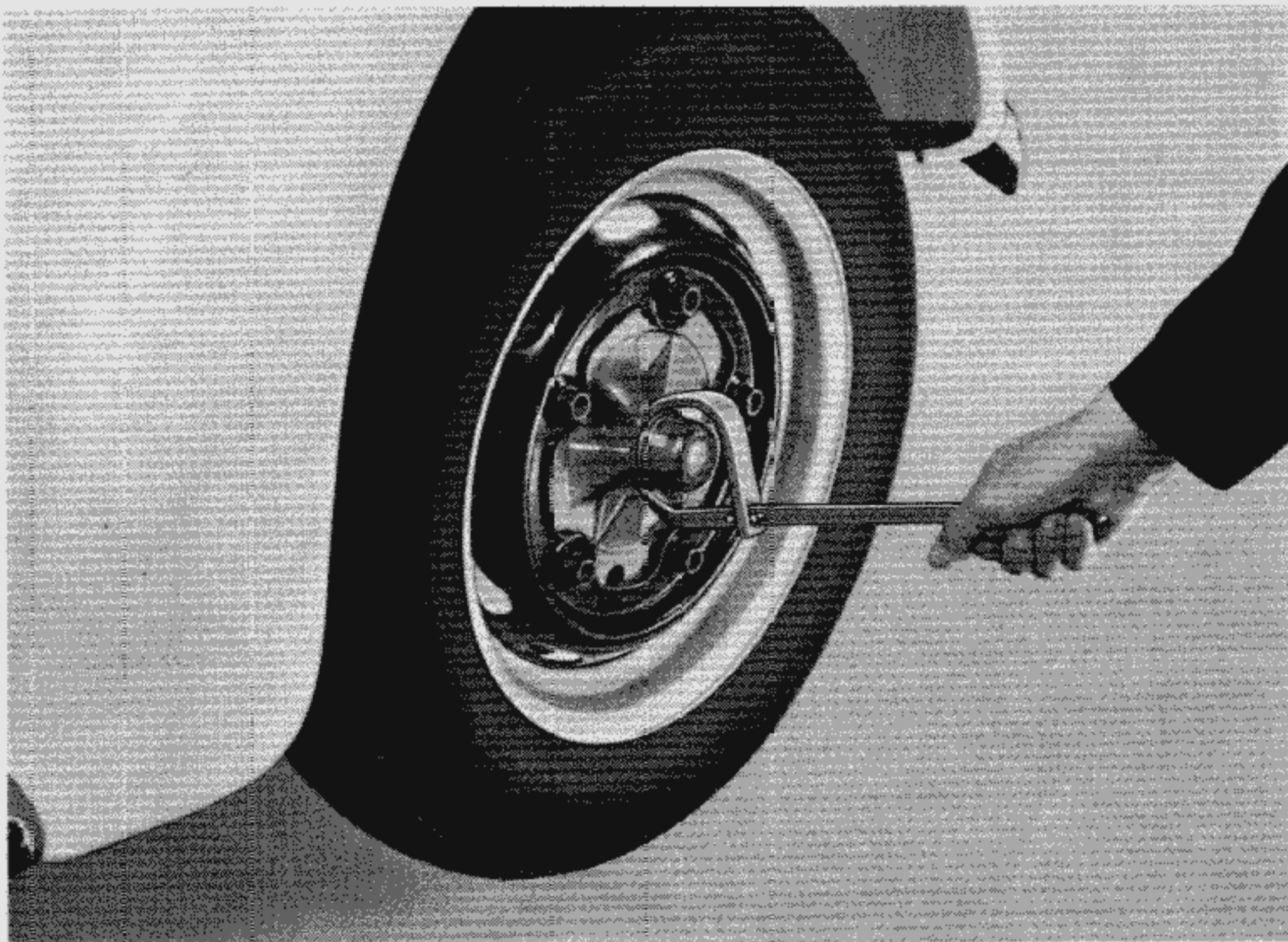
DEC 10 1965 VW 637/1



Inner Hub Cap Puller  
Type 1, 2, 3

The inner hub caps on all VW vehicles can be removed with this tool. The puller is placed so that the long lever is supported against the face of brake drum hub. The angled puller hook grips behind the rim of the hub cap.

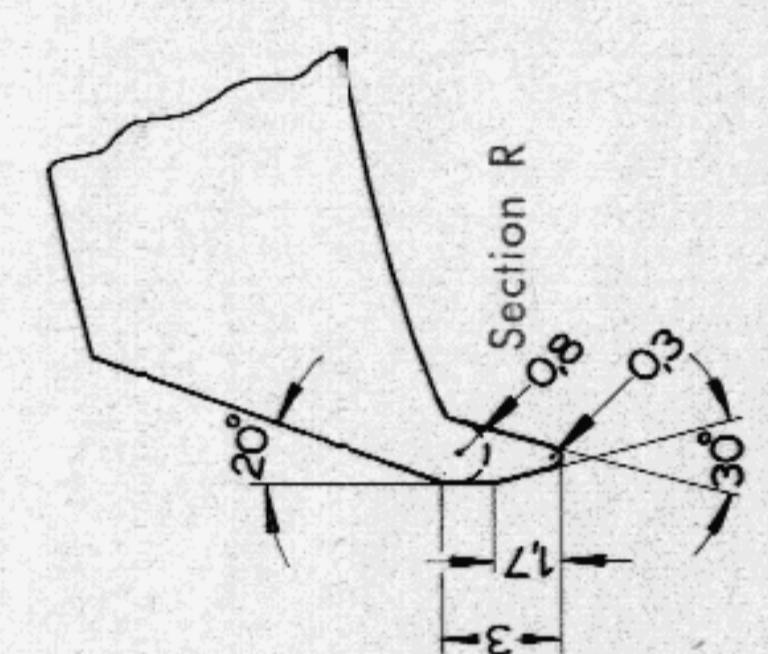
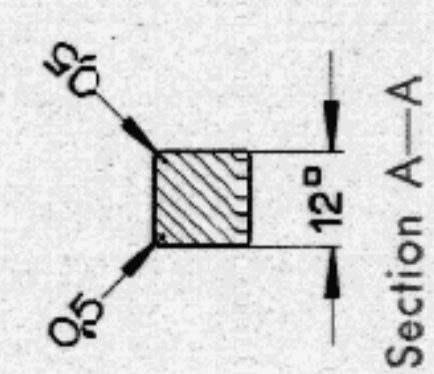
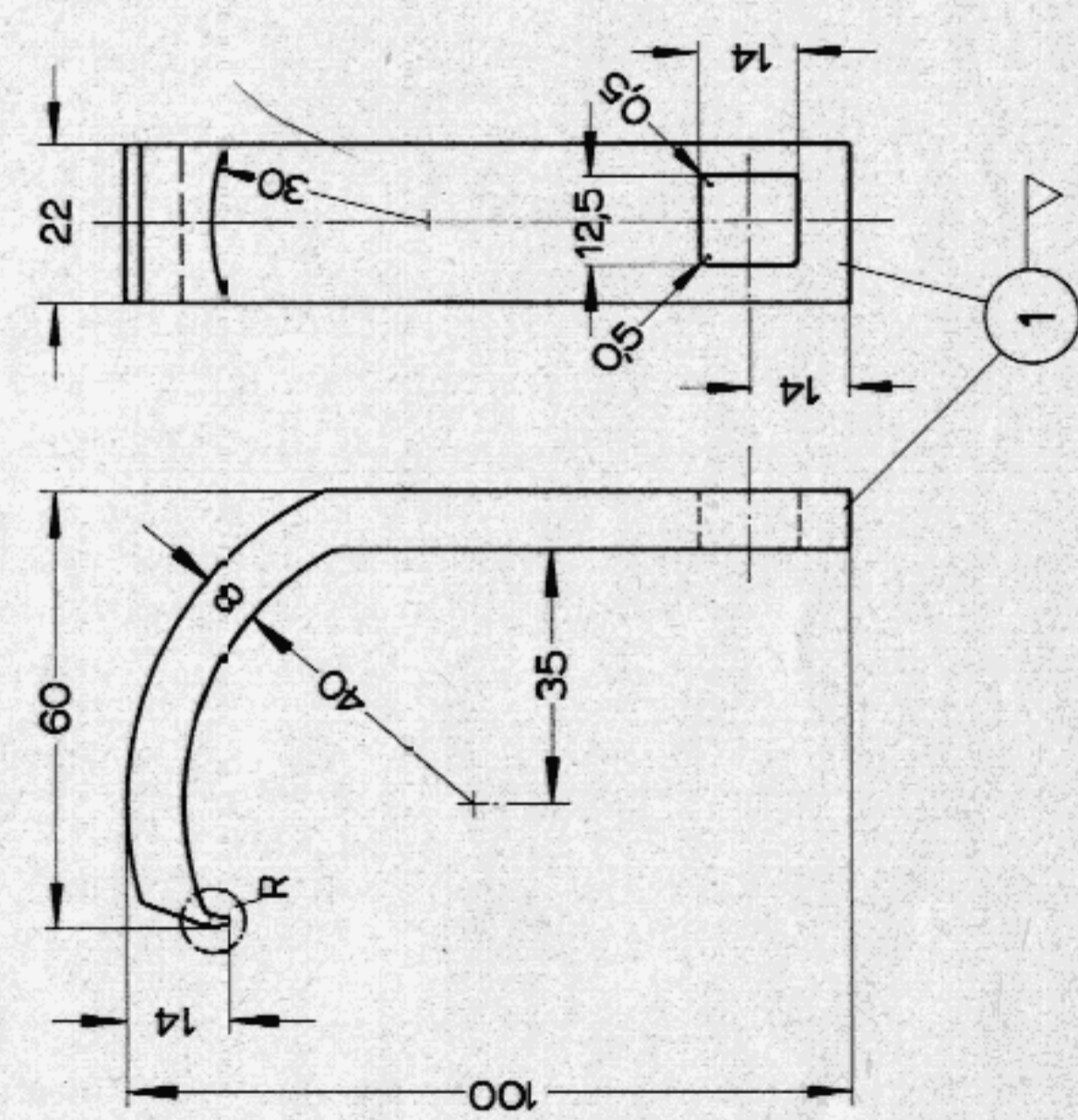
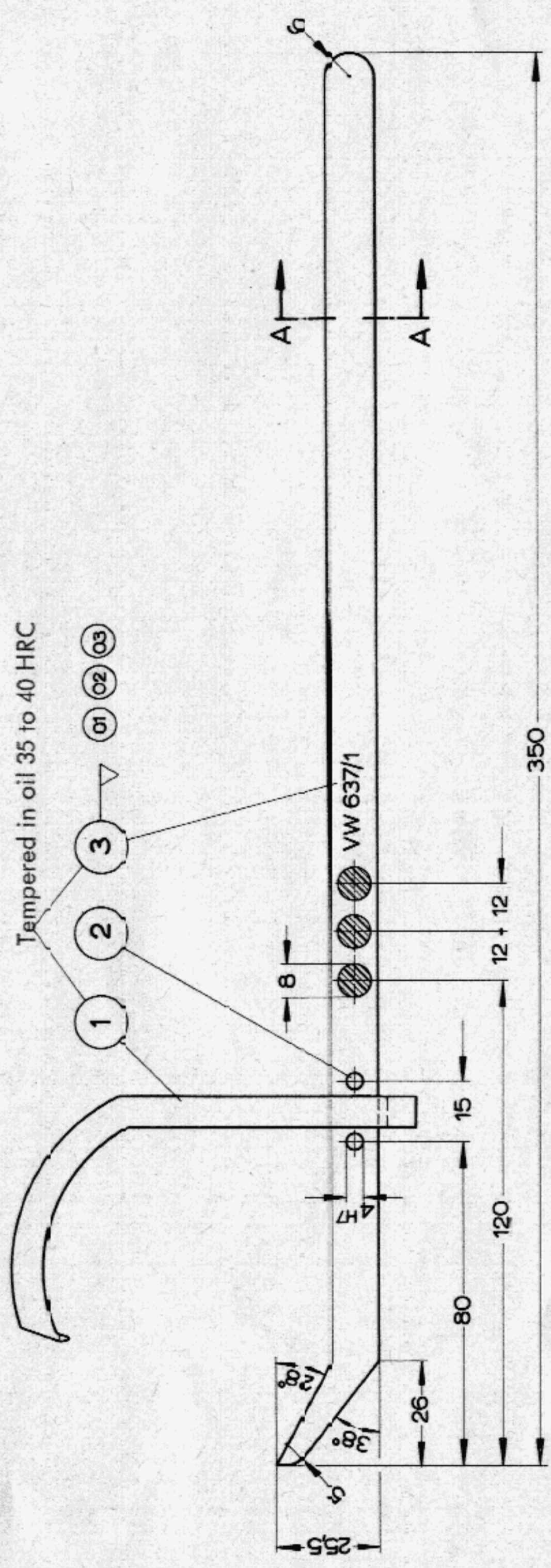
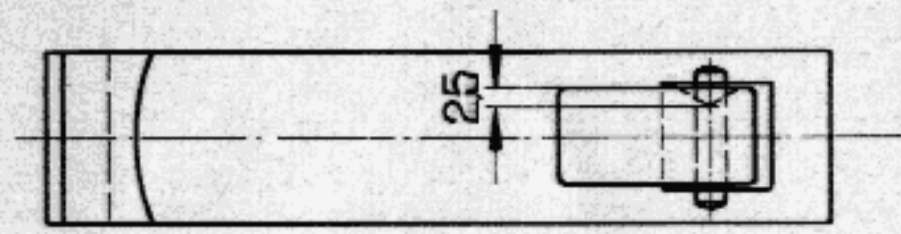
When using the puller it is advisable to turn the tool round once during the operation thus enabling the hub cap to be pulled off evenly.



#### **Construction Details for VW 637/1**

- 1 — Cut out parts 1 and 3 have cylindrical pin ready to hand.
- 2 — Finish part 1 to 22 mm width.
- 3 — Mark out 12.5 x 14 mm square hole and cut out.
- 4 — Bend the upper part of the inner hub cap puller to shape and finish off.
- 5 — Bend part 3 to shape.
- 6 — Rework the end of the lever.
- 7 — Drill 4 mm dia. pin holes mark out and centre punch 8 mm dia. countersunk holes.
- 8 — Drill 3.8 mm dia. holes and ream out to 4 H 7.
- 9 — Drill 8 mm dia. countersunk holes.
- 10 — Paint inner hub cap puller dark green (RAL 6011).

Date 28.5.65 Description of Modification New drawing



Remove sharp edges

When no limit is given tolerance  $\pm 0.25$ ;  $\pm 30'$  applies

1	12	X 360	3	C 45
2	4 m 6 X	20	2	DIN 6325
1	FI 25 X 8 X 150	1		C 45
quantity	Description	Part	Material	Part No. or Standard spec.

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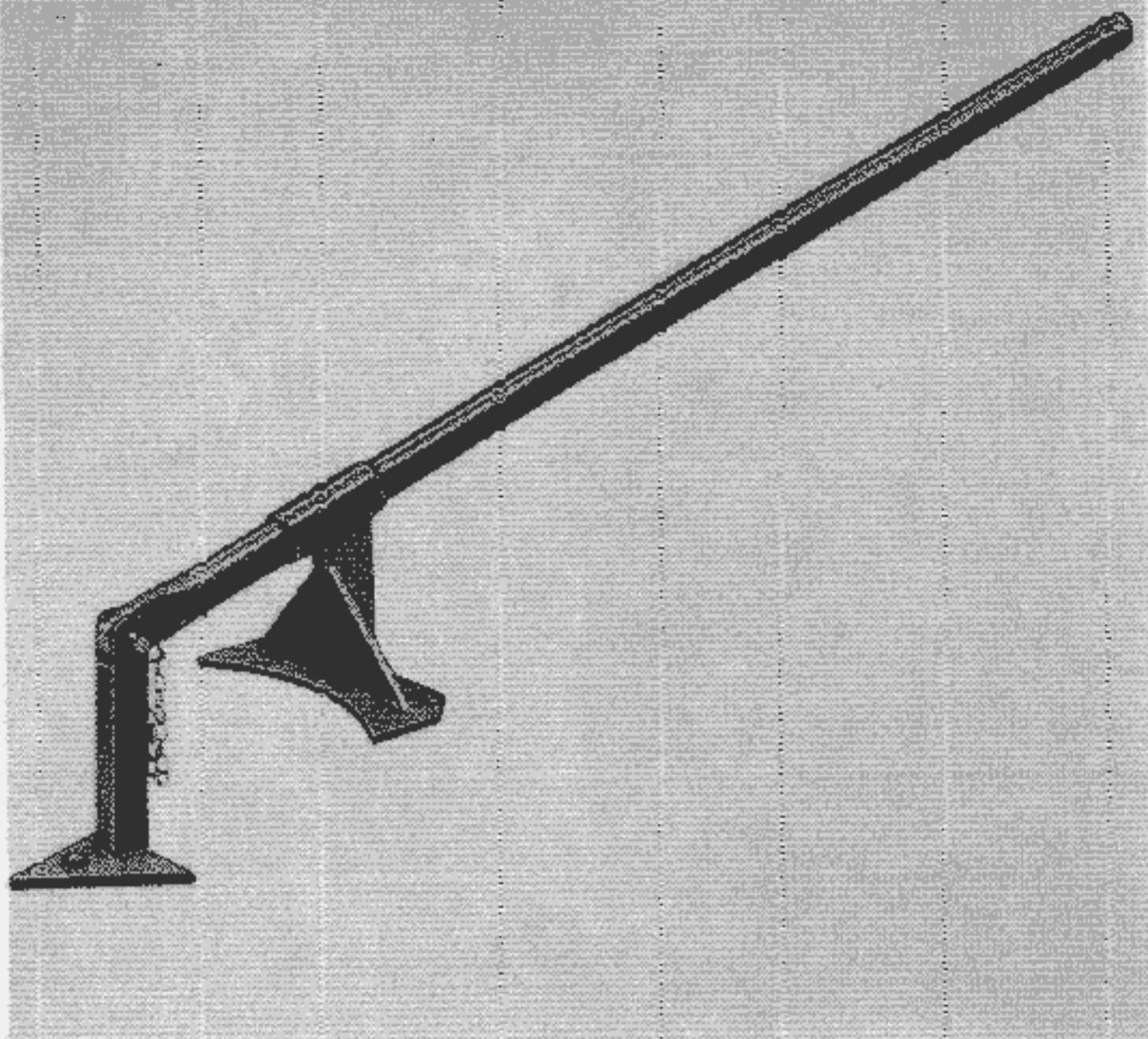
Drawn: 28.5.65 Giesekeing  
Checked: 31.5.65 Ratte

**Colour identification marks**

(01)	orange	RAL 2004
(02)	blue	RAL 5015
(03)	violet	RAL 4003
(04)	green	RAL 6018
(05)	black	RAL 9005

Surfaces in given colours (synthetic resin) shown thus

**Inner Hub Cap Puller**  
**VW 637/1**

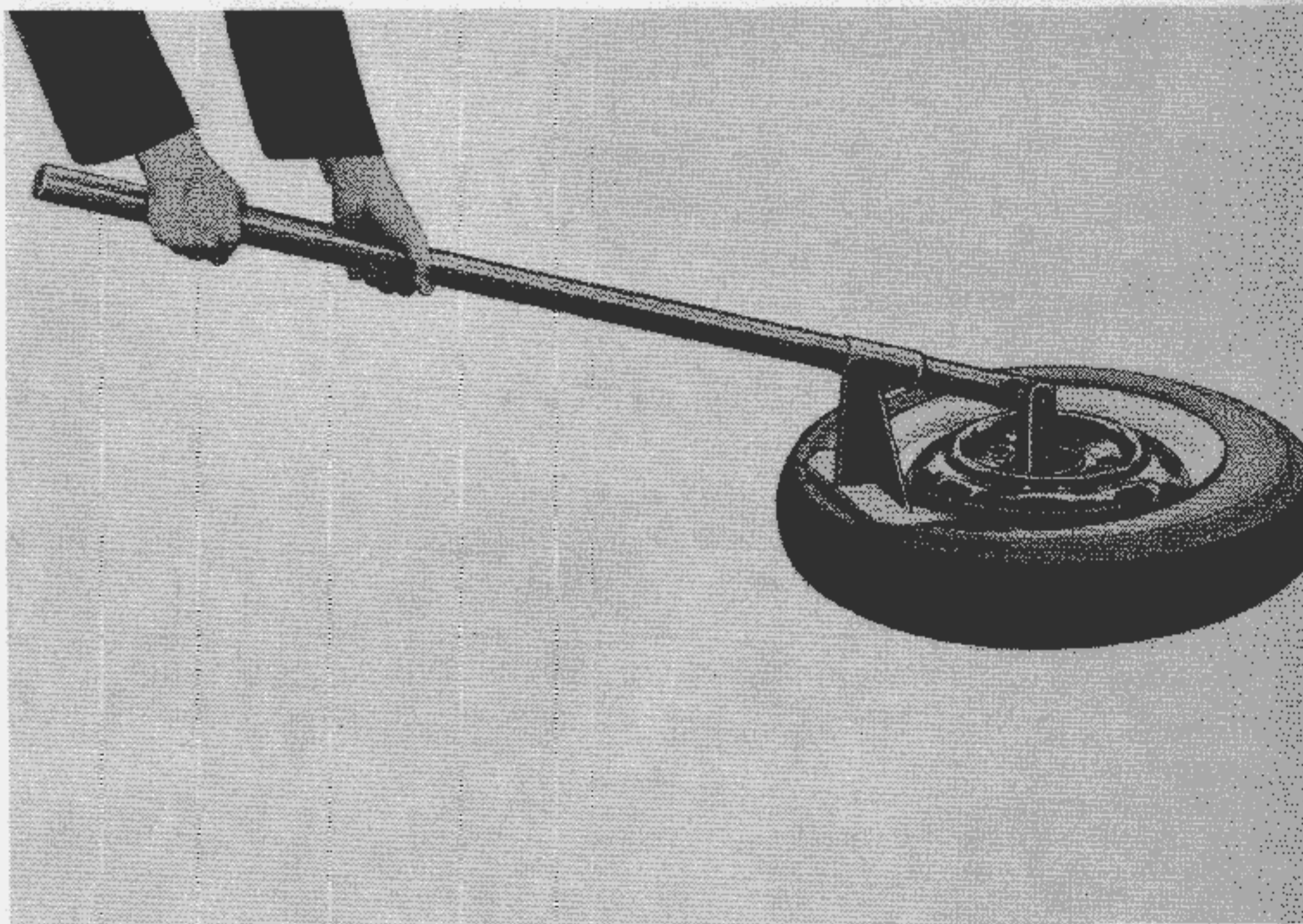


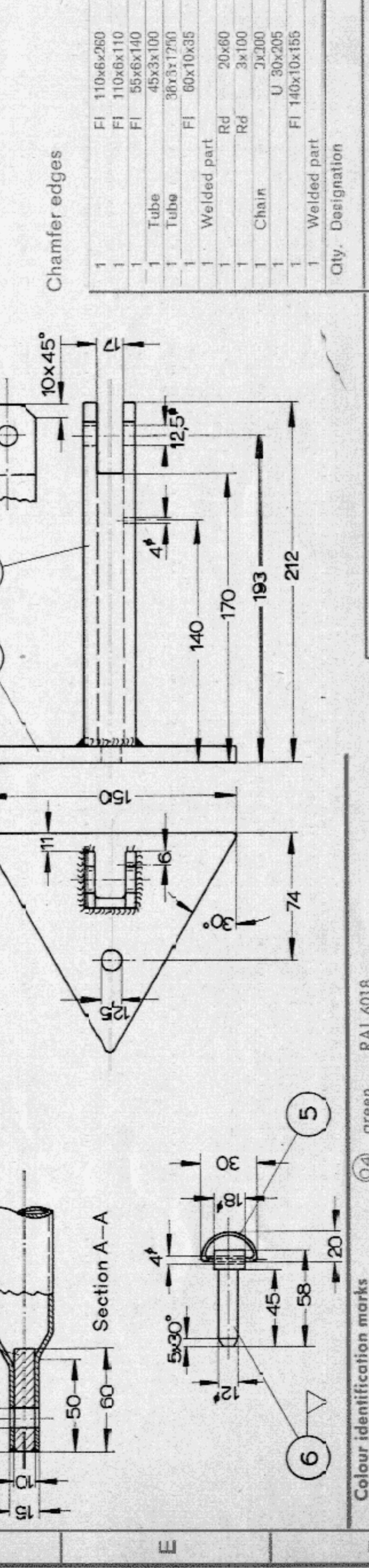
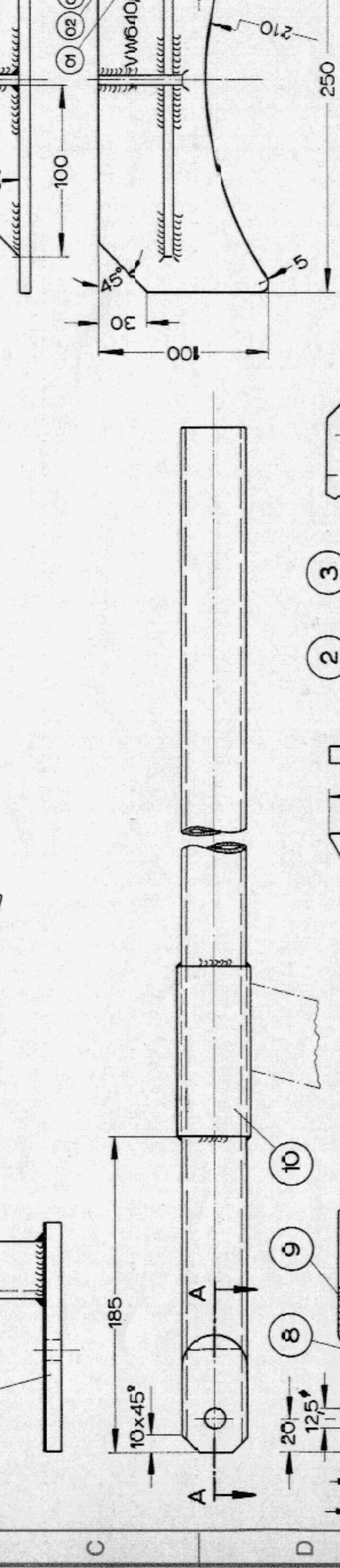
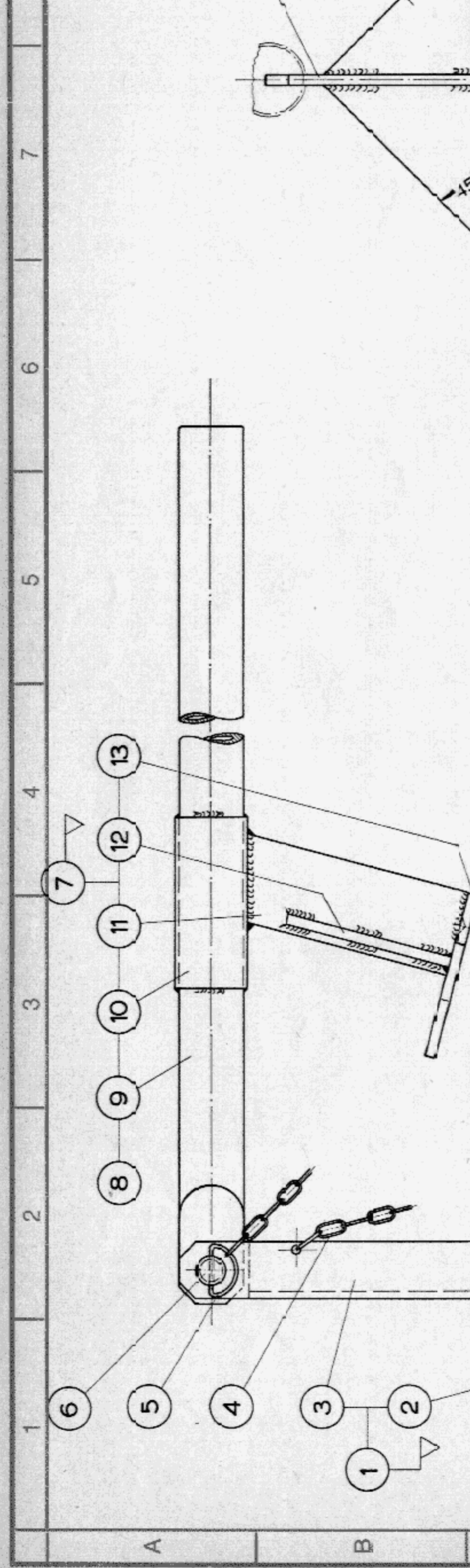
**Bead Breaker  
Type 1, 2, 3**

The bead breaking appliance is used for pressing the bead of the tyre off the shoulder of the rim.

When doing this, the pressure plate should be positioned immediately behind the edge of the rim. In the event of the tyre being very tight, it is advisable to rotate the wheel and apply pressure at other points.

The foot of the appliance should be screwed to the workshop floor or to a work bench.





Chamfer edges

When no limit is given tolerance  $\pm 0.25$ ;  $\pm 30'$  applies

Qty.	Designation	Part No.	Material	Standard part or standard spec.	Remarks
1	FI 110x6x260	13	MR St 42-2		separate
1	FI 110x6x110	12	MR St 42-2		
1	FI 55x6x140	11	MR St 42-2		
1	Tube	45x3x100	St 35		Parts 8 to 13
1	Tube	38x3x170	St 35		
1	Welded part	FI 60x10x35	MR St 37-2		Parts 2 and 3
1	Rd	20x60	St 37		
1	Rd	3x100	St 37		
1	Chain	3x200	St 37	DIN 5685	
1	U	30x205	TU St 37		
1	Welded part	FI 140x10x155	MR St 42-2		

Colour identification marks

- 01 orange
- 02 blue
- 03 violet
- 04 green
- 05 black

RAL 6018 green  
RAL 9005 black

Surfaces in given colours (synthetic resin) shown thus

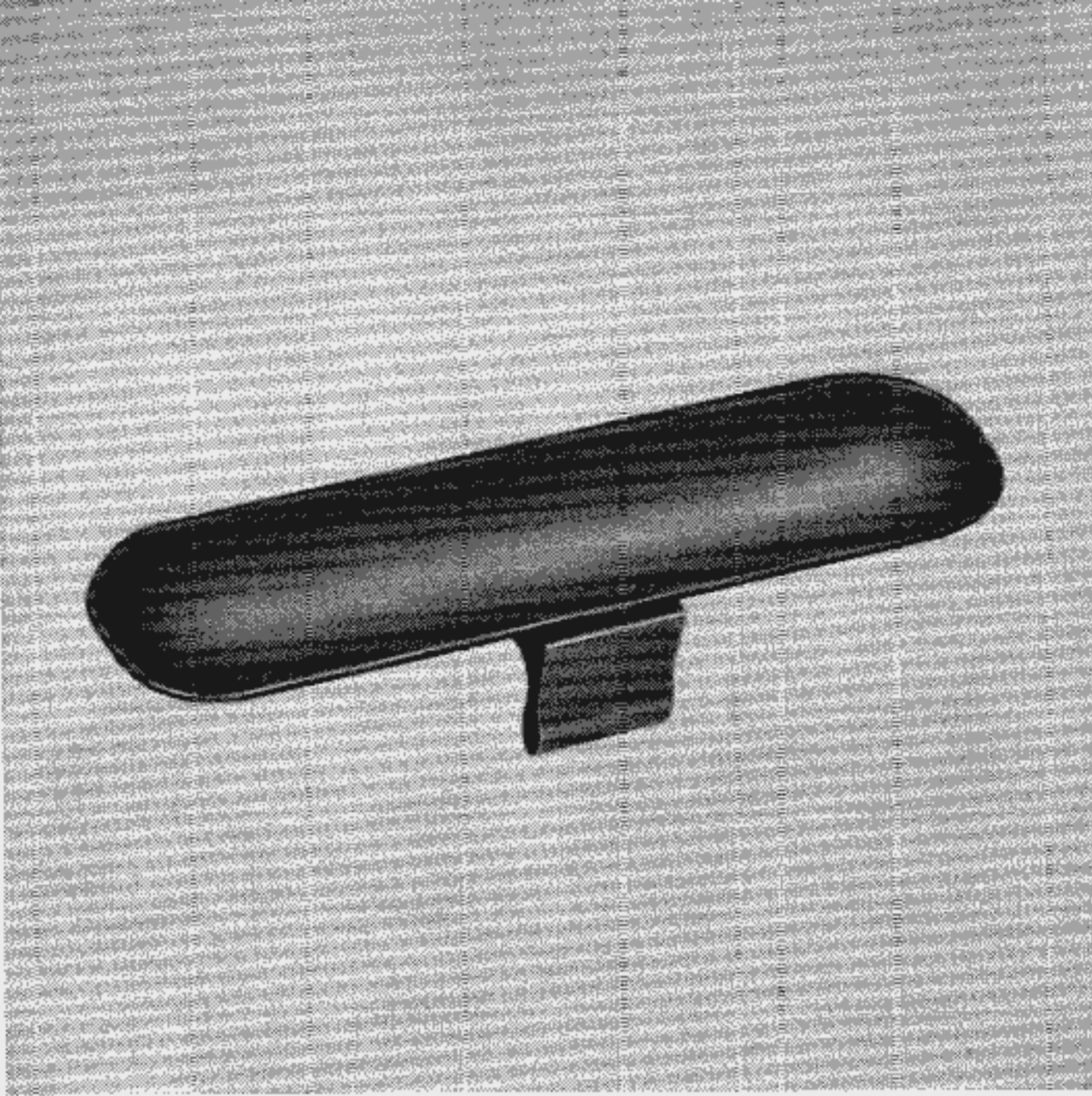
VOLKSWAGENWERK AG  
WOLFSBURG  
Service Department

Drawn: 23. 3. 67 Giesecking  
Checked: 23. 3. 67 Ratte

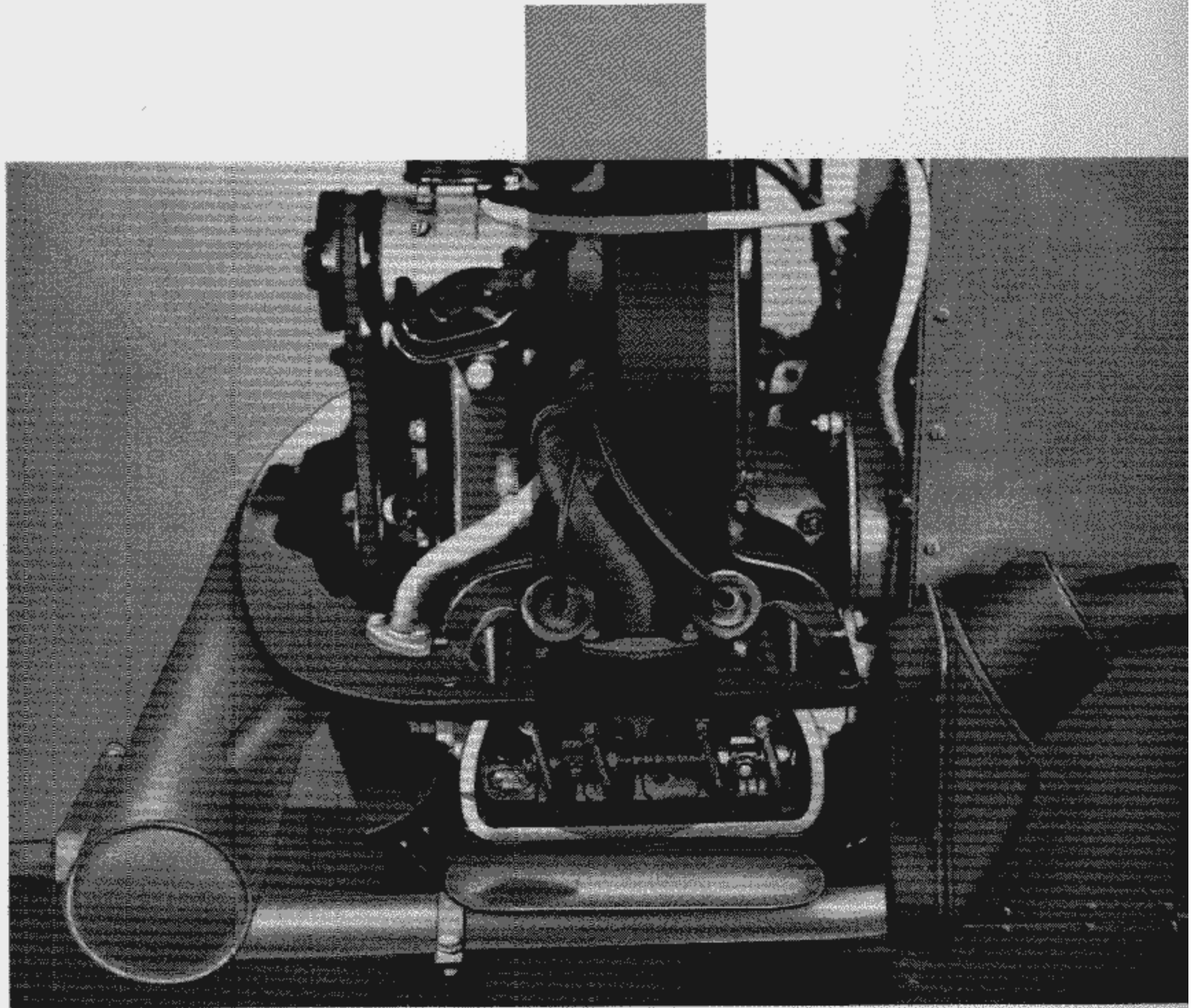
**Bead Breaker**

**VW 640/1**

Sheet No. 1  
No. of Sheets 1



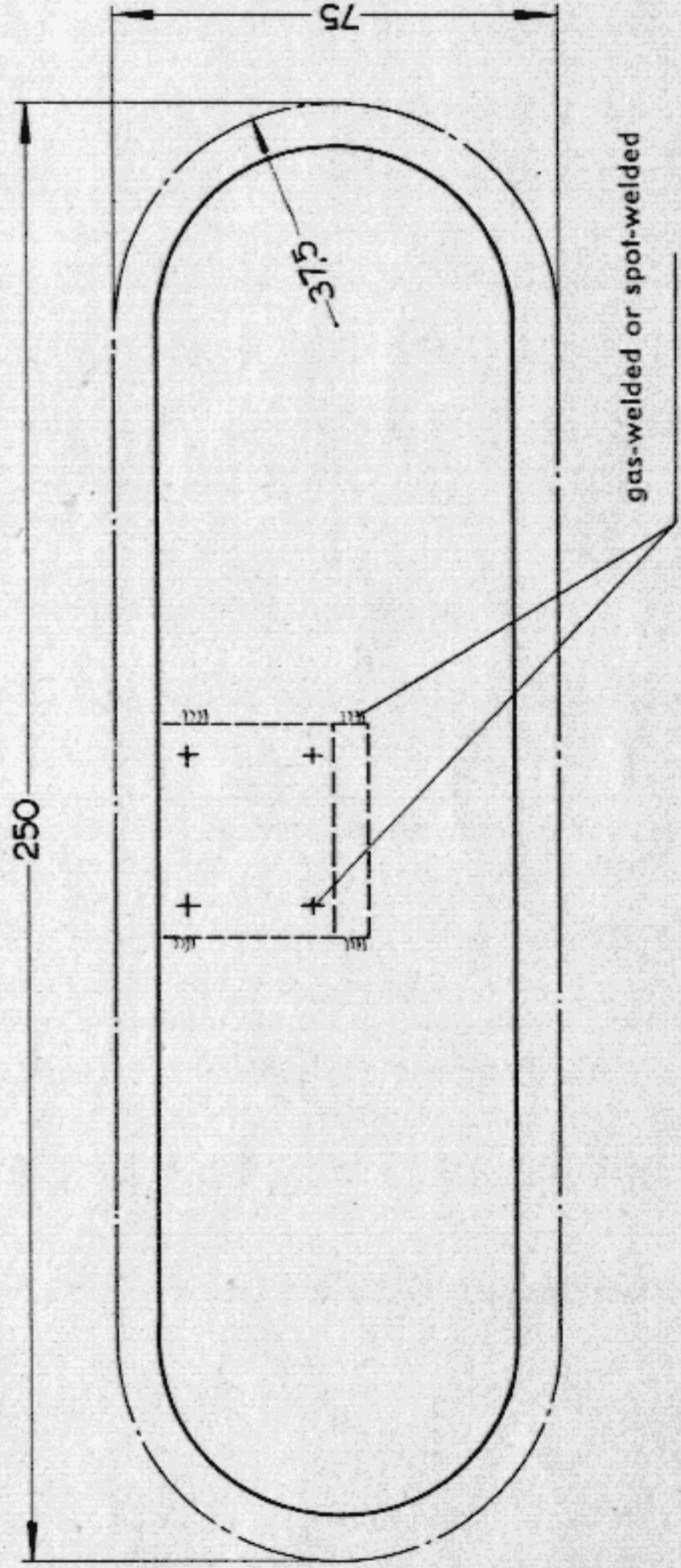
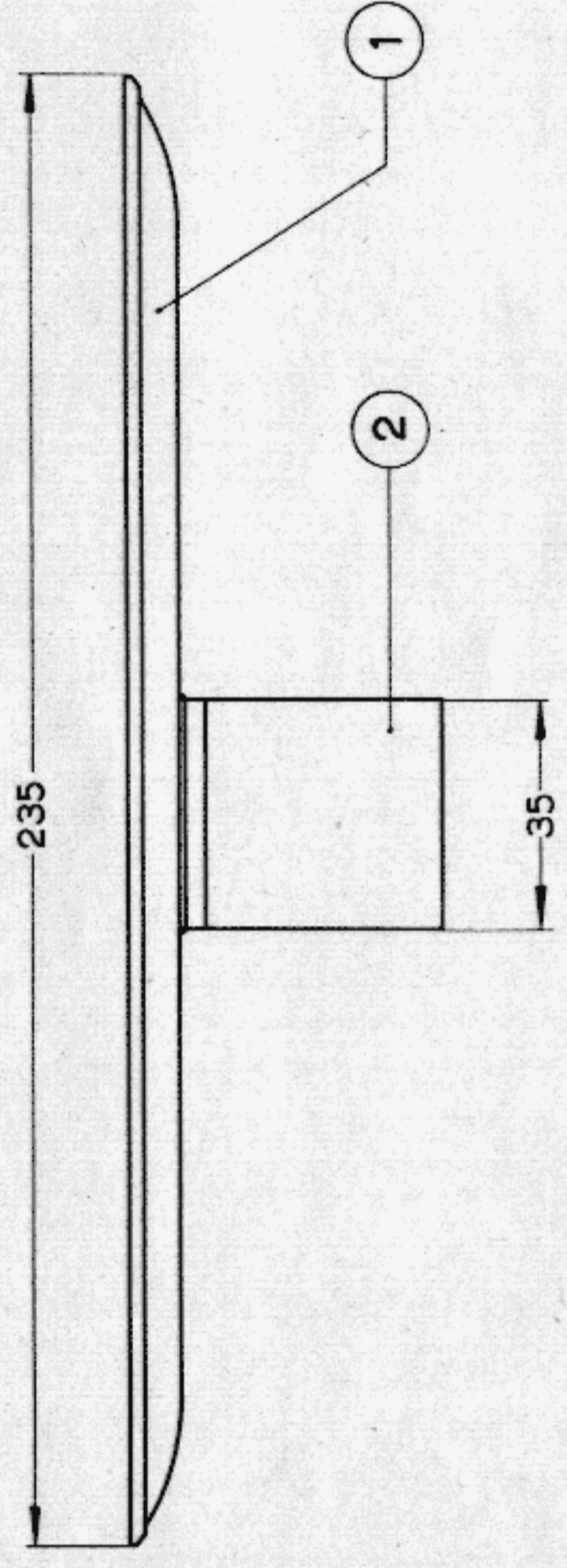
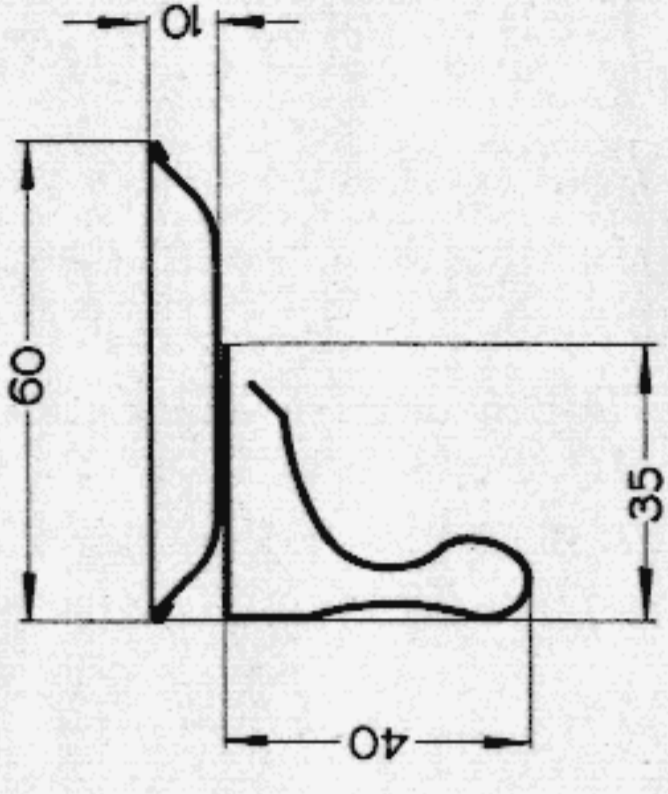
The oil tray is to be clamped with the spring-loaded foot between the heating channel and the exhaust pipe leading from the heating junction box to the silencer. It serves to catch dripping oil when the valves are adjusted with the cylinder head cover removed.



#### **Construction Details for VW 641**

- 1 - Cut the sheet metal parts to the specifications of the parts list.
- 2 - Work the tray (1) as shown in the drawing (flange the tray and bend the flange).
- 3 - Bend the foot (2) as shown in the drawing.
- 4 - Gas-weld or spot-weld the foot (2) to the tray (1).
- 5 - Paint the oil tray in the prevailing color of equipment and machinery in the shop.





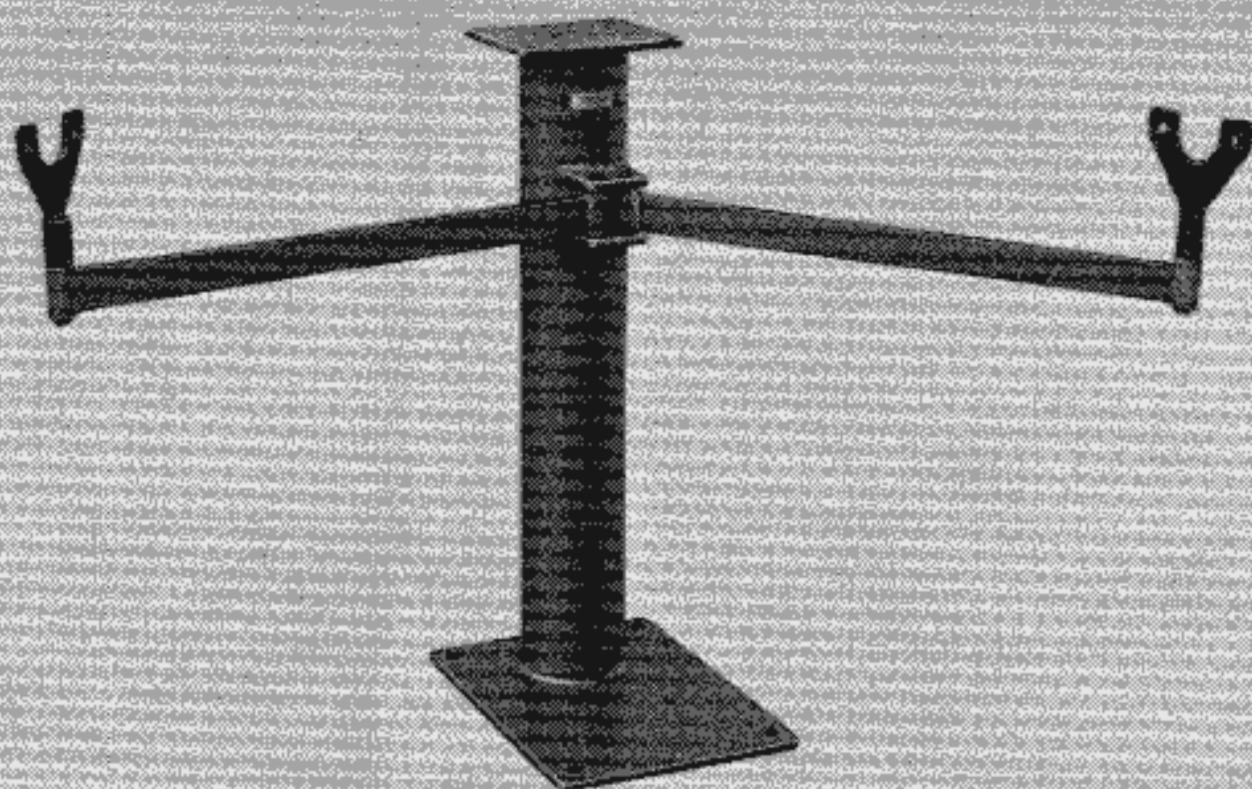
2	1	Foot	0.8 x 35 x 150	Sheet metal
1	1	Tray	0.8 x 75 x 250	Sheet metal
Part No. required		Description	Rough size or Standard Spec.	Remarks

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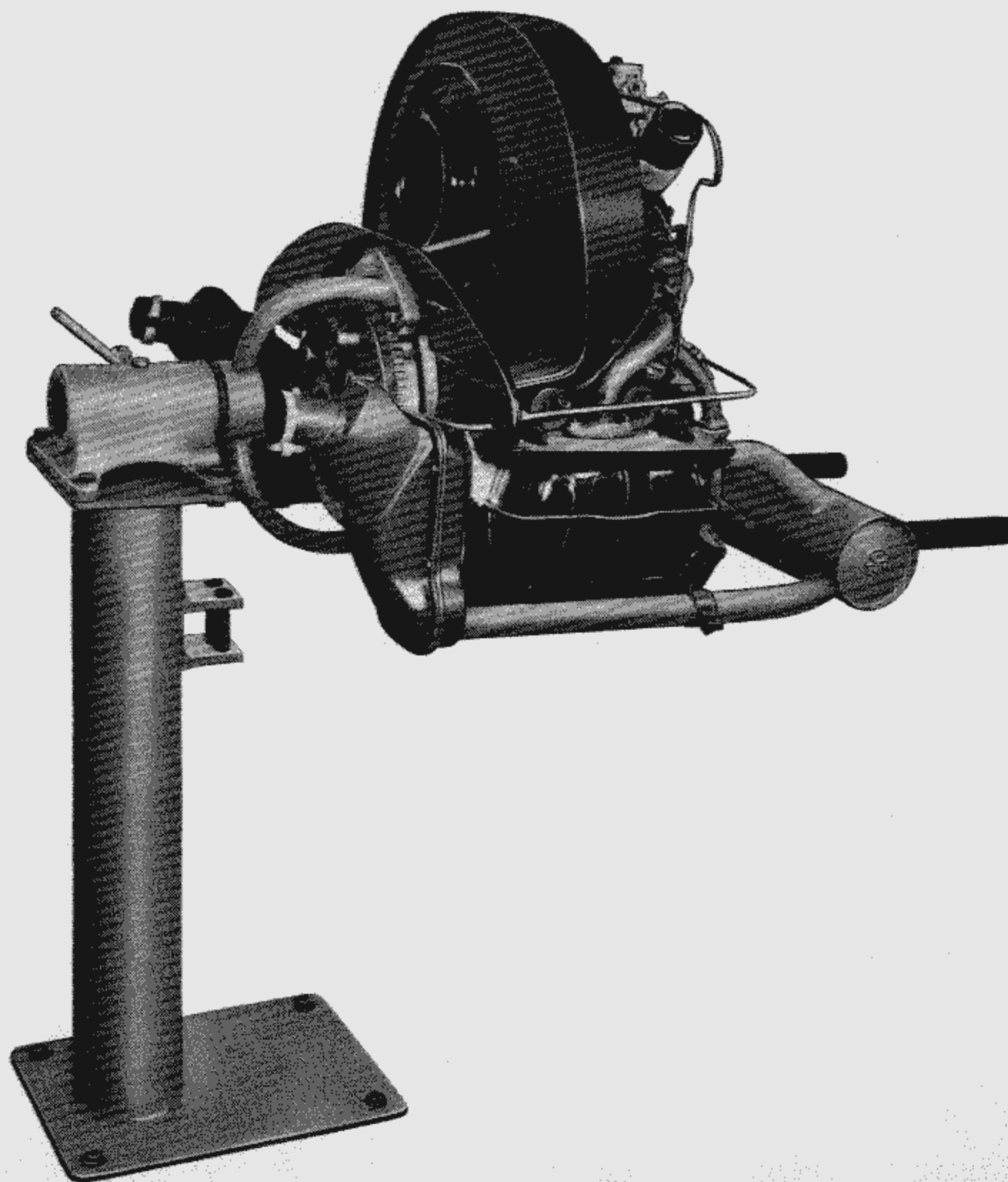
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 May 15, 57 Senf

**Oil Tray**

**VW 641**

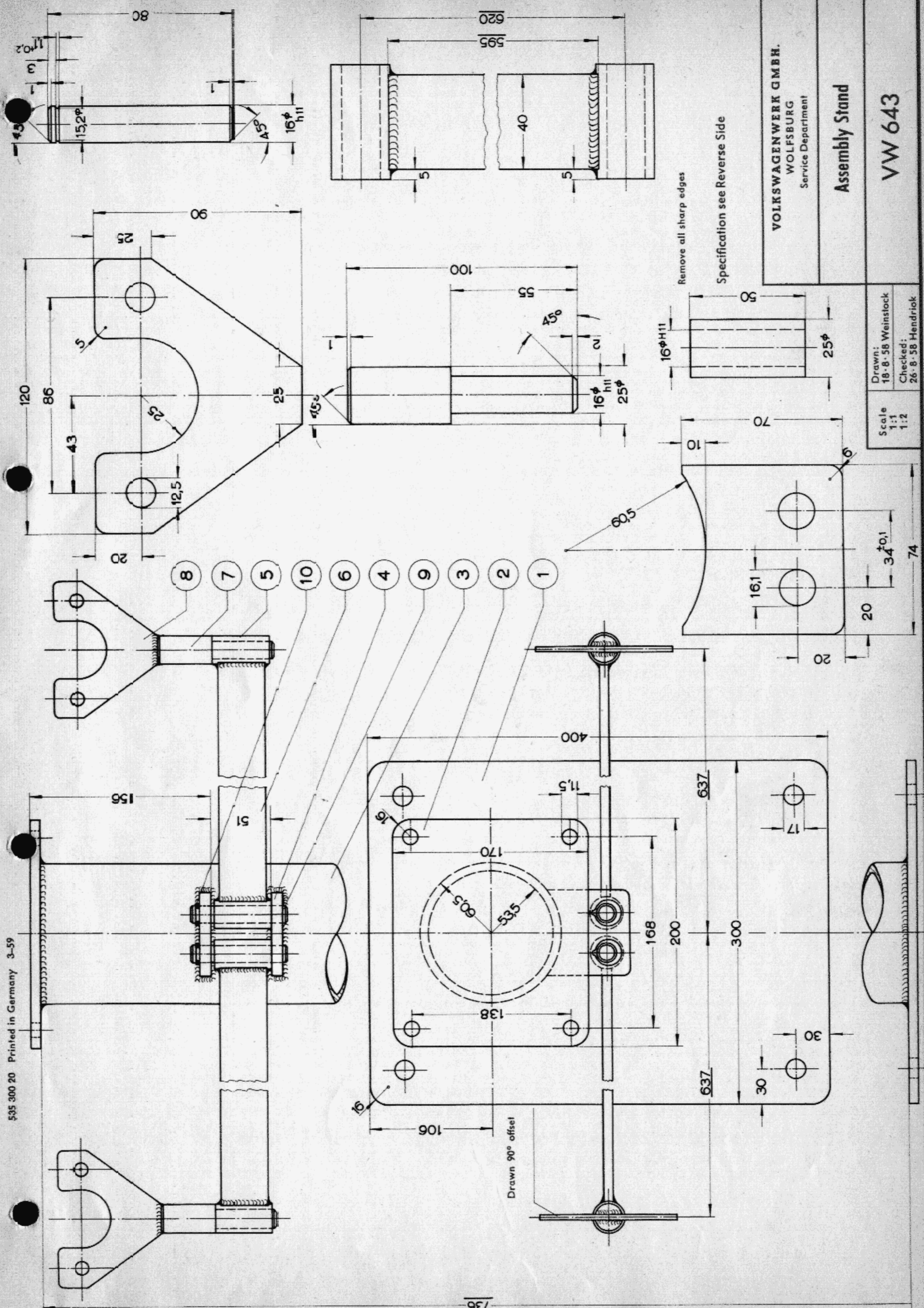
**Assembly Stand**

The assembly stand in conjunction with special fixture VW 313 facilitates the holding of fixture VW 307 during assembly and disassembly of engine, fixture VW 307 during assembly and disassembly of transmission holder VW 309 during assembly and disassembly of front axle.



### Construction Details for VW 643

- 1 - Cut the flat and round steel and also steel tubing according to the specification.
- 2 - In the flat steel piece (1) drill holes 17 mm dia. and round off corners as shown on the drawing.
- 3 - In the flat piece of steel (2) drill holes 11.5 mm dia. and round off corners as shown on the drawing.
- 4 - Both cut ends of the tube (3) should be parallel.
- 5 - In the two flat pieces (4) drill holes 16.1 mm dia. and finish the pieces as shown on drawing.
- 6 - Place tube (3) on the flat steel piece (1) as shown on drawing, and fix in position by welding around the circumference of the tube.
- 7 - Place flat steel pieces (4) on the tube (3) as shown on the drawing and weld both pieces in position.
- 8 - Place flat steel piece (2) on top of tube (3) as shown on drawing and fix in position by welding around the circumference of the tube.
- 9 - Drill out the tubes (5) to the correct size, cut them to correct length with ends parallel.
- 10 - Flat steel pieces (6) work to specified dimensions.
- 11 - Weld two of the tubes (5) to each flat piece of steel (6) as shown on drawing.
- 12 - Turn the round steel pieces (7) to size and remachine as shown on drawing.
- 13 - Make the plate out of flat steel piece (8). Mark out twice, drill holes 12.5 mm dia., shape each flat steel piece as shown on drawing.
- 14 - Weld each of the finished flat steel pieces (8) onto a round steel piece (7).
- 15 - Shape round steel pieces (9) to dimensions shown on drawing.
- 16 - Place each arm (1 x part 6 and 2 x part 5) under a drilling in the flat steel piece (4) insert a round steel part (9) from the top of the drilling and fit a lock ring.
- 17 - In the open tube part of the arm insert a plug (part 7 and part 8 welded together).
- 18 - Paint the assembly stand in the prevailing colour of the equipment and machines in the shop.



Remove all sharp edges  
Specification see Reverse Side

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**Assembly Stand**

**VW 643**

Scale  
1:1  
1:2

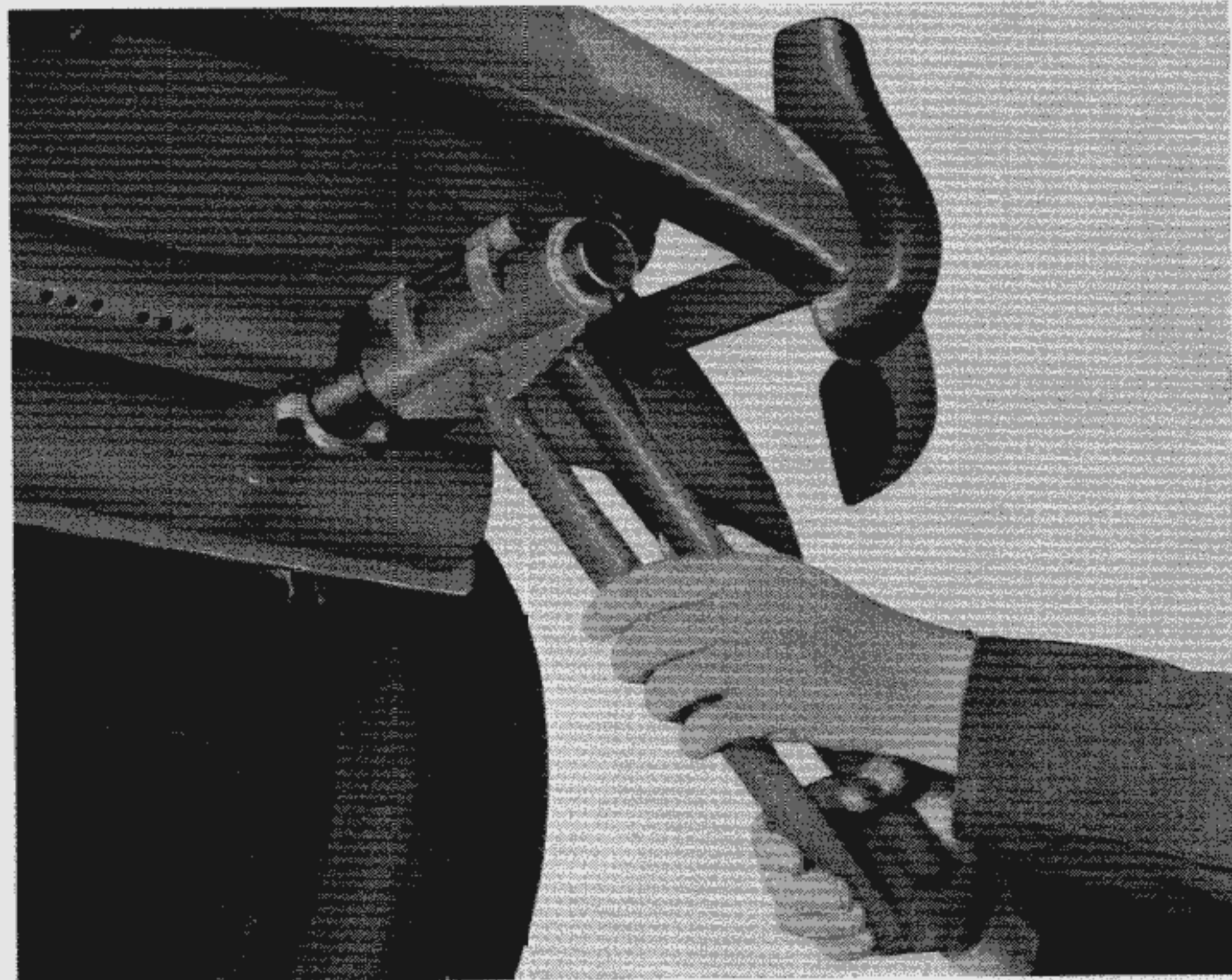
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18.8.58 Weinstock

Checked:  
26.8.58 Hendriok



**Exhaust Tail Pipe  
Removal Tool**

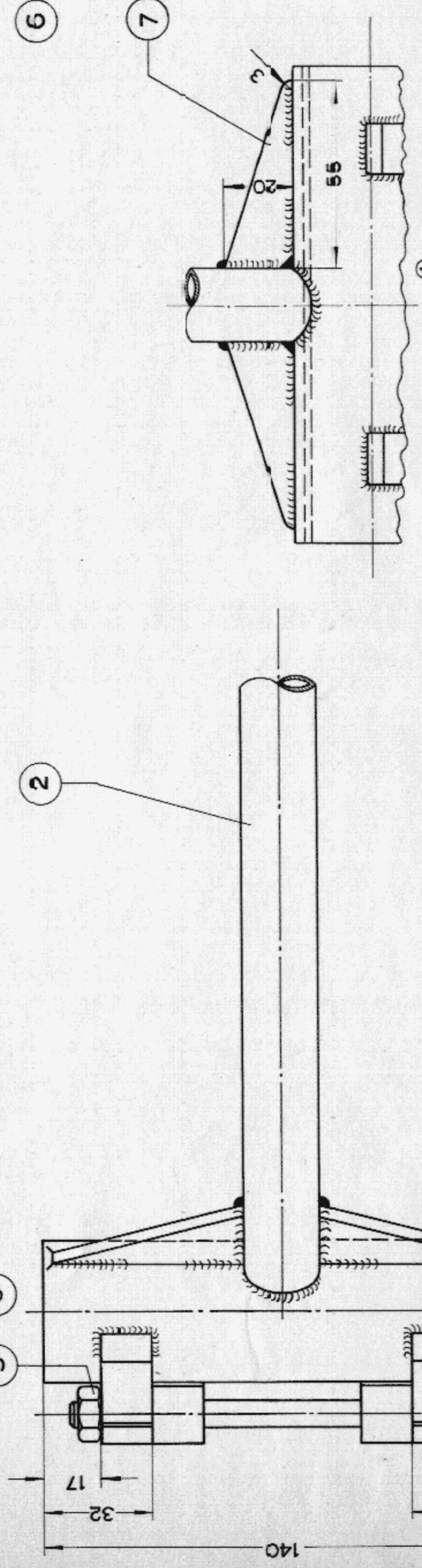
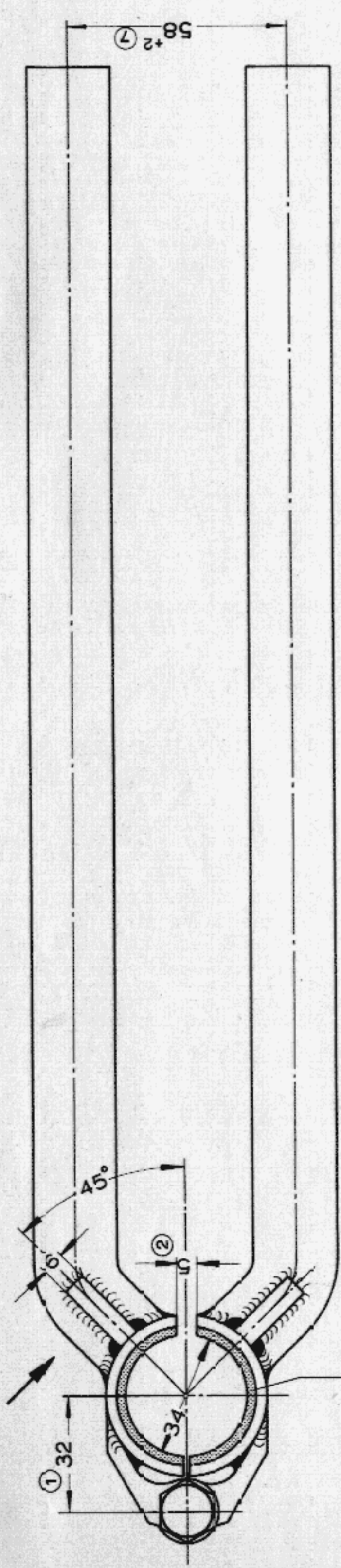
With this appliance the exhaust tail pipes can easily be removed from the muffler after having first slackened the tail pipe clamps.



#### **Construction Details for VW 644**

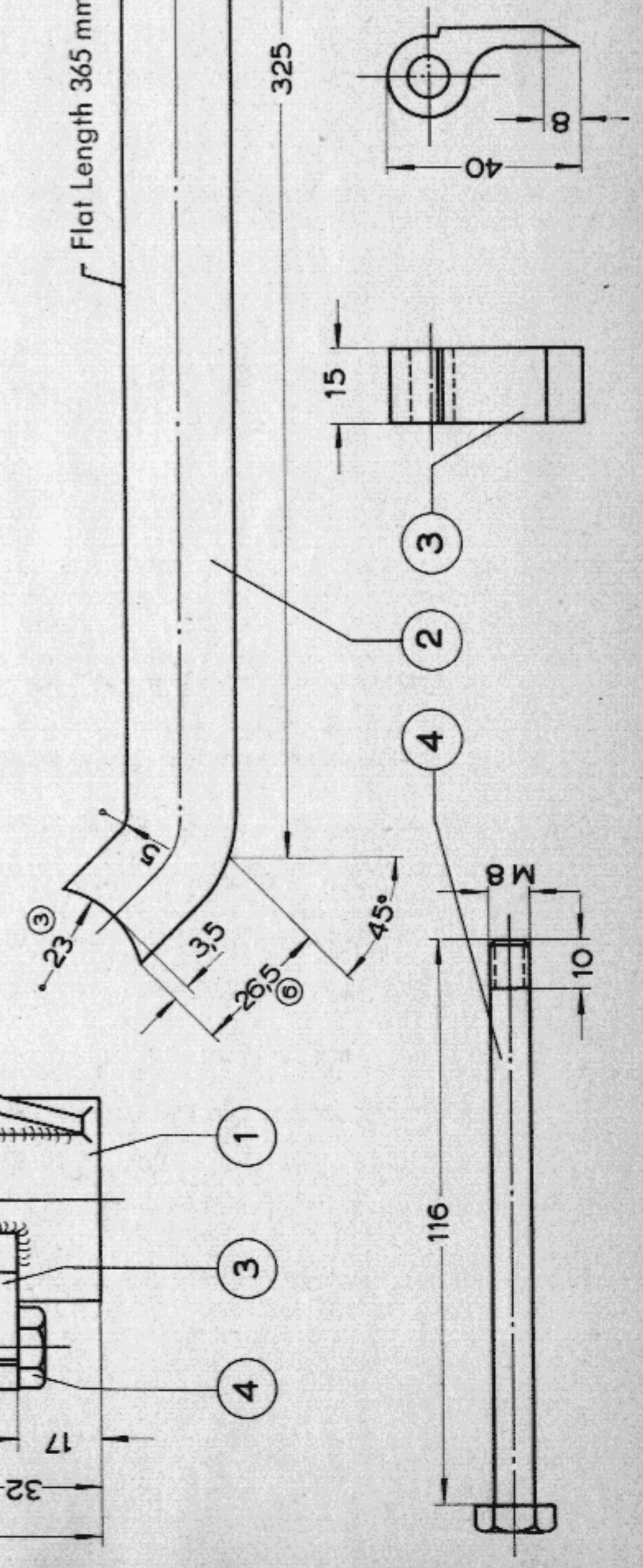
- 1 — Cut all parts as detailed in parts list, have standard parts ready to hand.
- 2 — Cut both door hinges (part no. 111 831 401 A) in half as shown in drawing.
- 3 — Cut steel tube (1) lengthways down the centre and work according to drawing.
- 4 — Bend and finish off steel tube (2) as shown in drawing.
- 5 — Finish off part (7) as shown in drawing.
- 6 — Carry out all welding work as shown in drawing.
- 7 — Smooth down welded seams.
- 8 — Stick in piece of leather and cut.
- 9 — Paint the appliance.
- 10 — Assemble the appliance.

No.	Date	Description of Modification
1	24. 10. 61	Was 30
2	24. 10. 61	Measurement 5 added
3	24. 10. 61	Was 21
4	24. 10. 61	Section A added
5	24. 10. 61	Was 42 X 3 X 150
6	24. 10. 61	Was 28
7	24. 10. 61	Tolerance + 2 added



Section A

Flat Length 365 mm



Part No.	Description	Part No. or standard spec.	Remarks
7	Wedge	20 X 6 X 60	St 37
6	Leather piece	60 X 2 X 150	Chrome leather.
5	Nut	M 8	DIN 555
4	Bolt	M 8 X 120	DIN 601
3	Hinge	111 831 401 A	cut into 4 parts
2	Steel tube	22 X 3 X 370	DIN 2385
1	Steel tube	45 X 3.5 X 145	DIN 2385

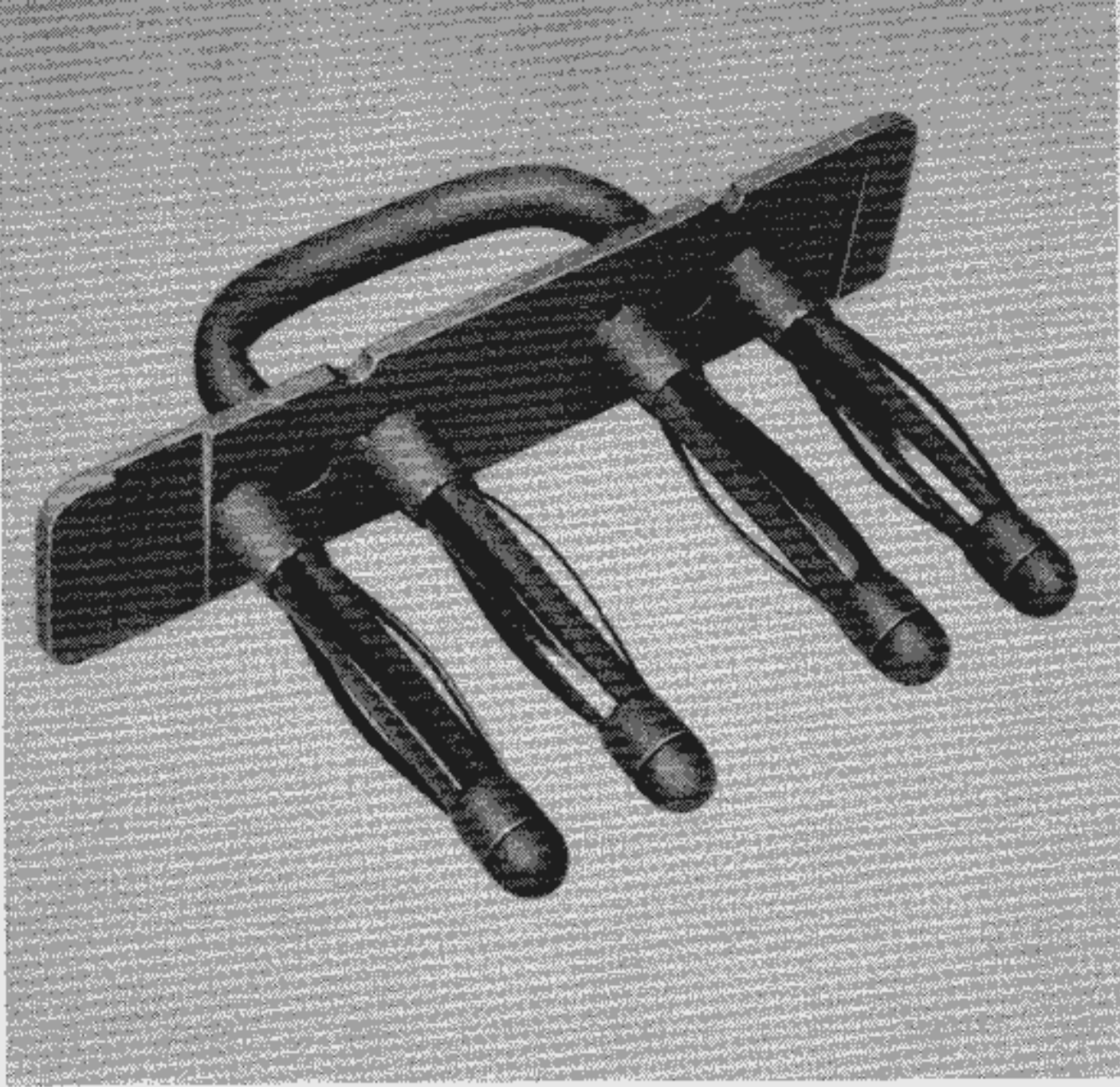
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Exhaust Tail Pipe Removal Tool

VW 644

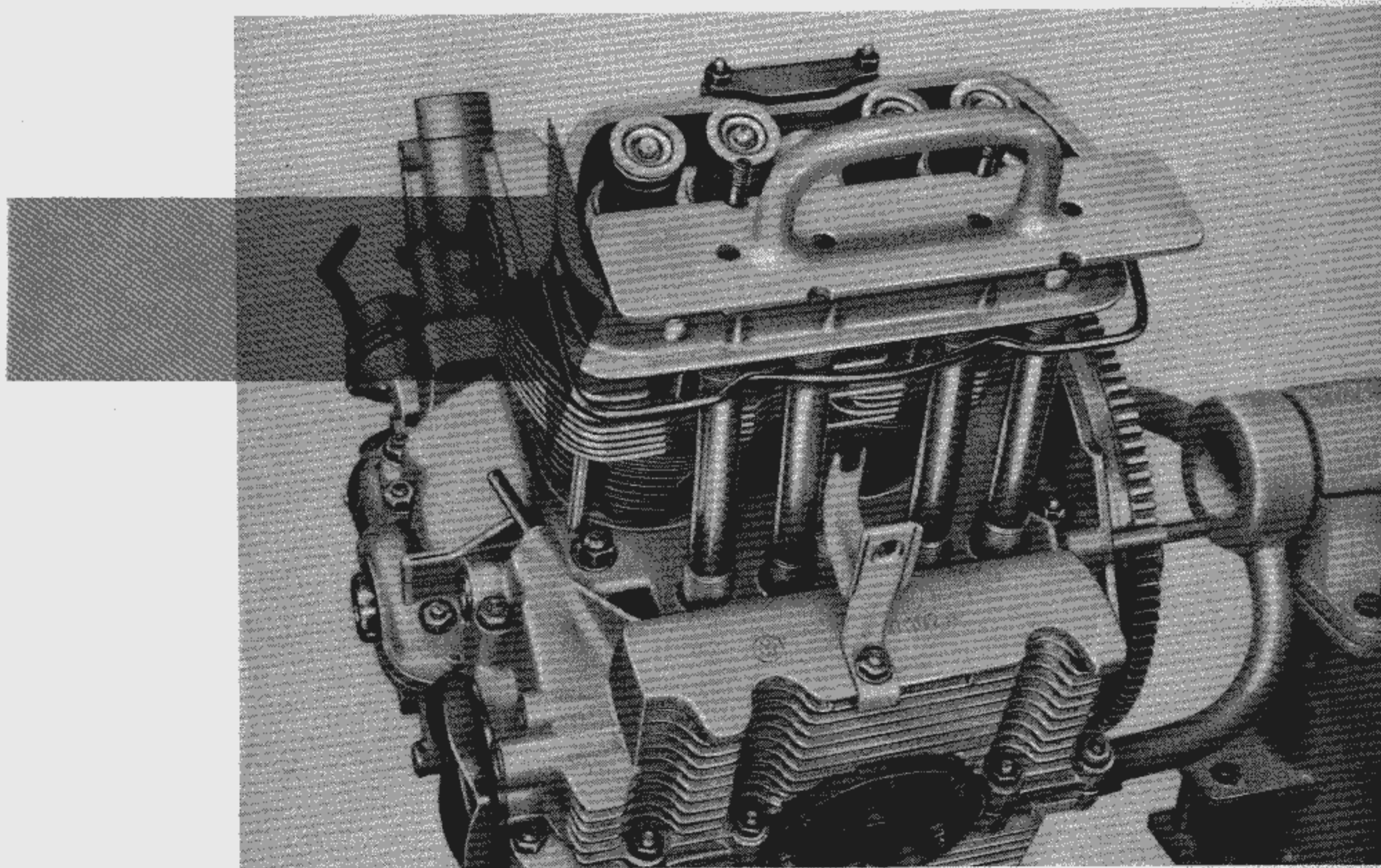


Push rod tube centering tool

The centering tool facilitates quick and proper fitting of the push rod tubes when installing the cylinder heads. The tubes are accurately located during the assembly operation and this helps to prevent leakage and damage to the tubes.

The sequence is as follows:

- 1 - Push the tool through the push rod holes in the cylinder head from the valve gear side.
- 2 - Slide the push rod tubes with seals over centering tool guides and locate tubes in the cylinder head recesses.
- 3 - Place the cylinder head complete with tool on the cylinders as usual.
- 4 - Remove the tool.

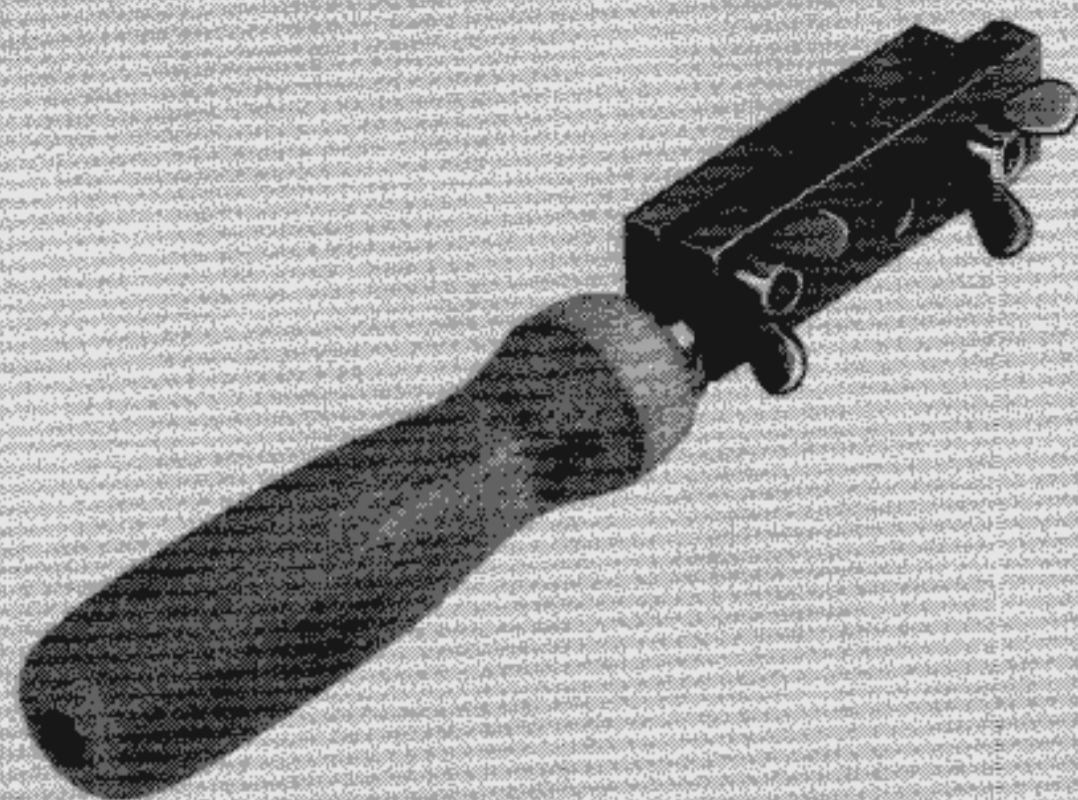




#### **Construction Details for VW 645**

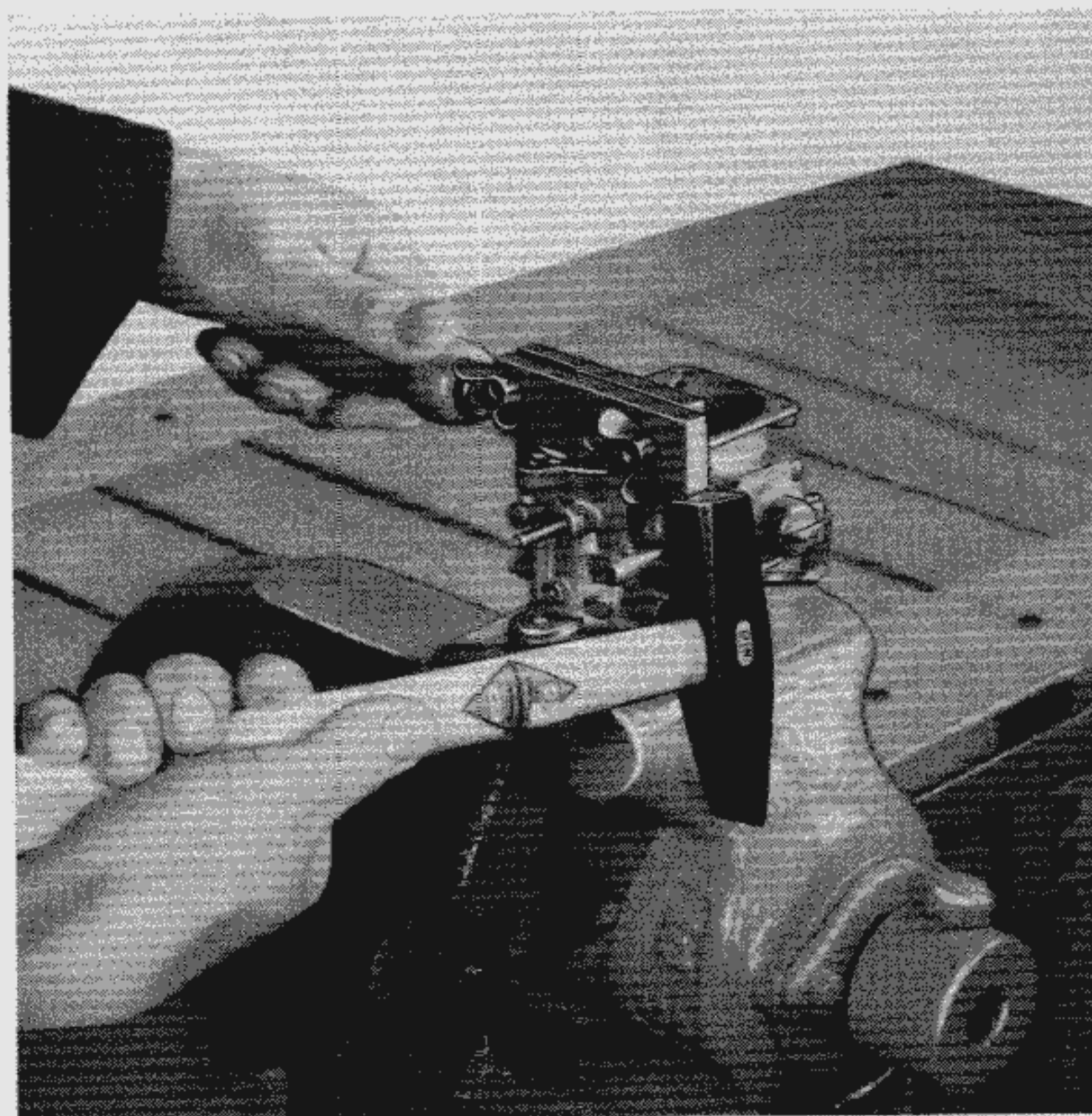
- 1 — Cut flat steel and tubing according to the materials list.
- 2 — Turn tubes (3, 4, 6) and plug (7) as shown in drawing.
- 3 — Drill and machine the plate (1) as shown in drawing. Ream holes out to fit tubing.
- 4 — Bend the tube (2) to form a handle, insert in the appropriate holes and weld.
- 5 — Fit the tubes (4) in the plate as shown in drawing and weld.
- 6 — Braze tubes (3) and (6) on tubes (4) as shown in drawing.
- 7 — Bend springs (5) as shown in drawing and insert in the grooves in the tubes (3,4) and (6).
- 8 — Insert plugs (7) into tubes (4).
- 9 — Paint plate and handle.





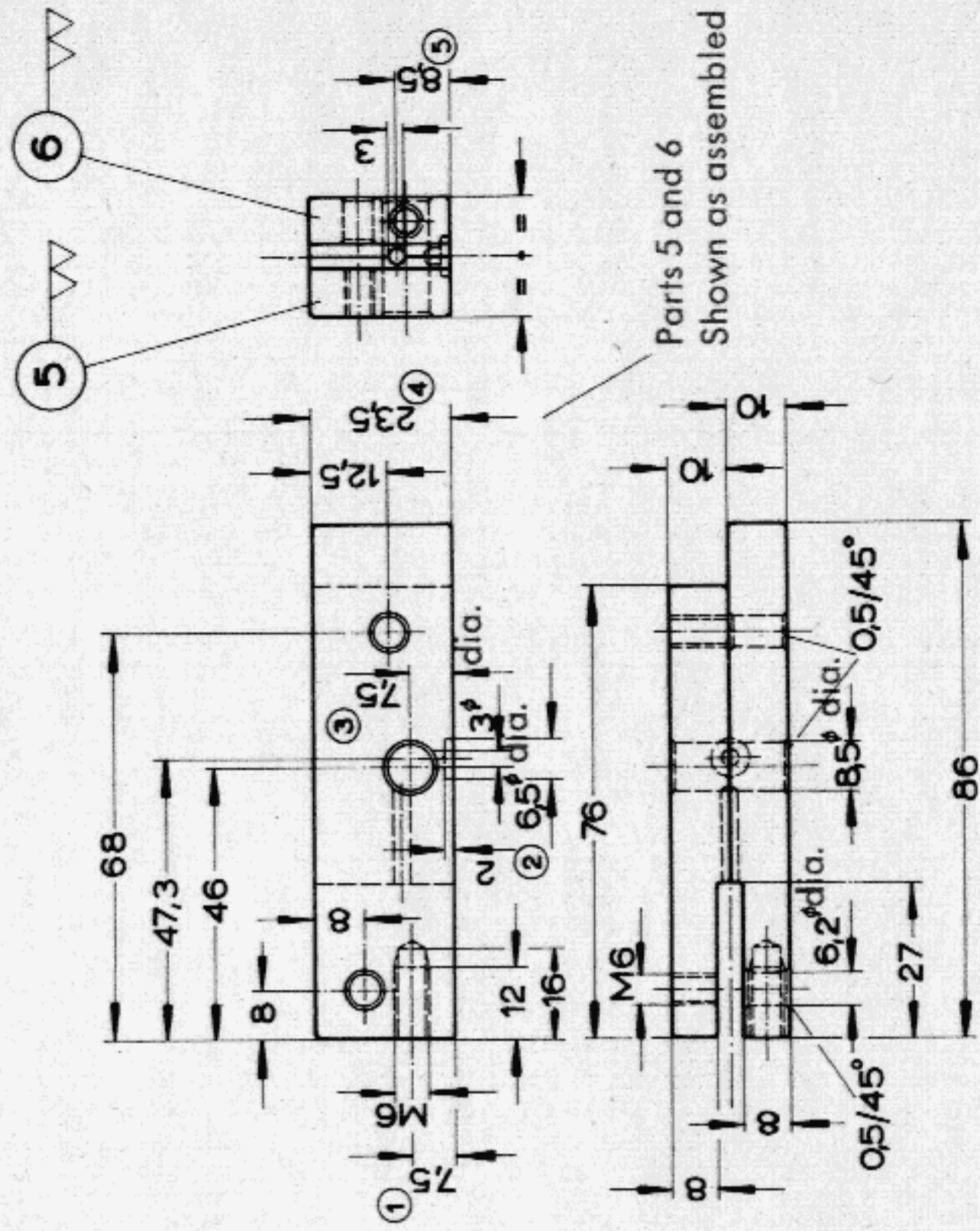
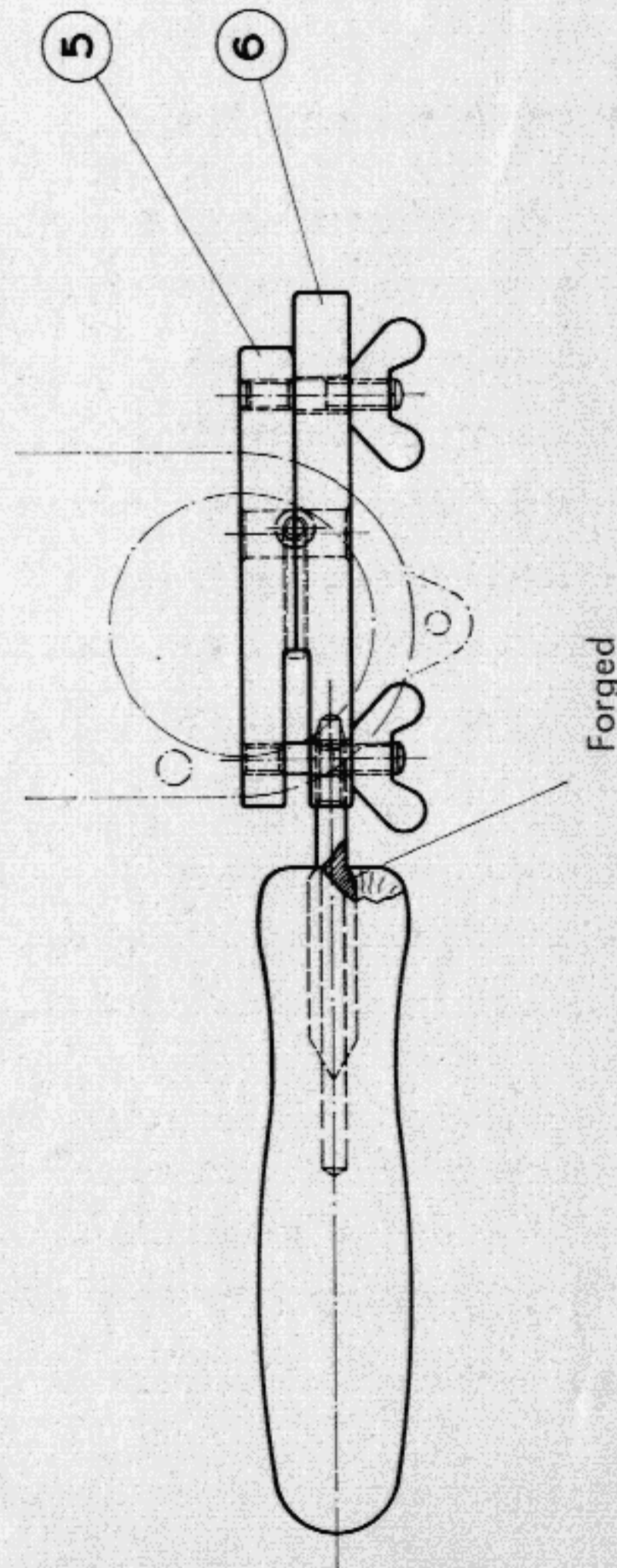
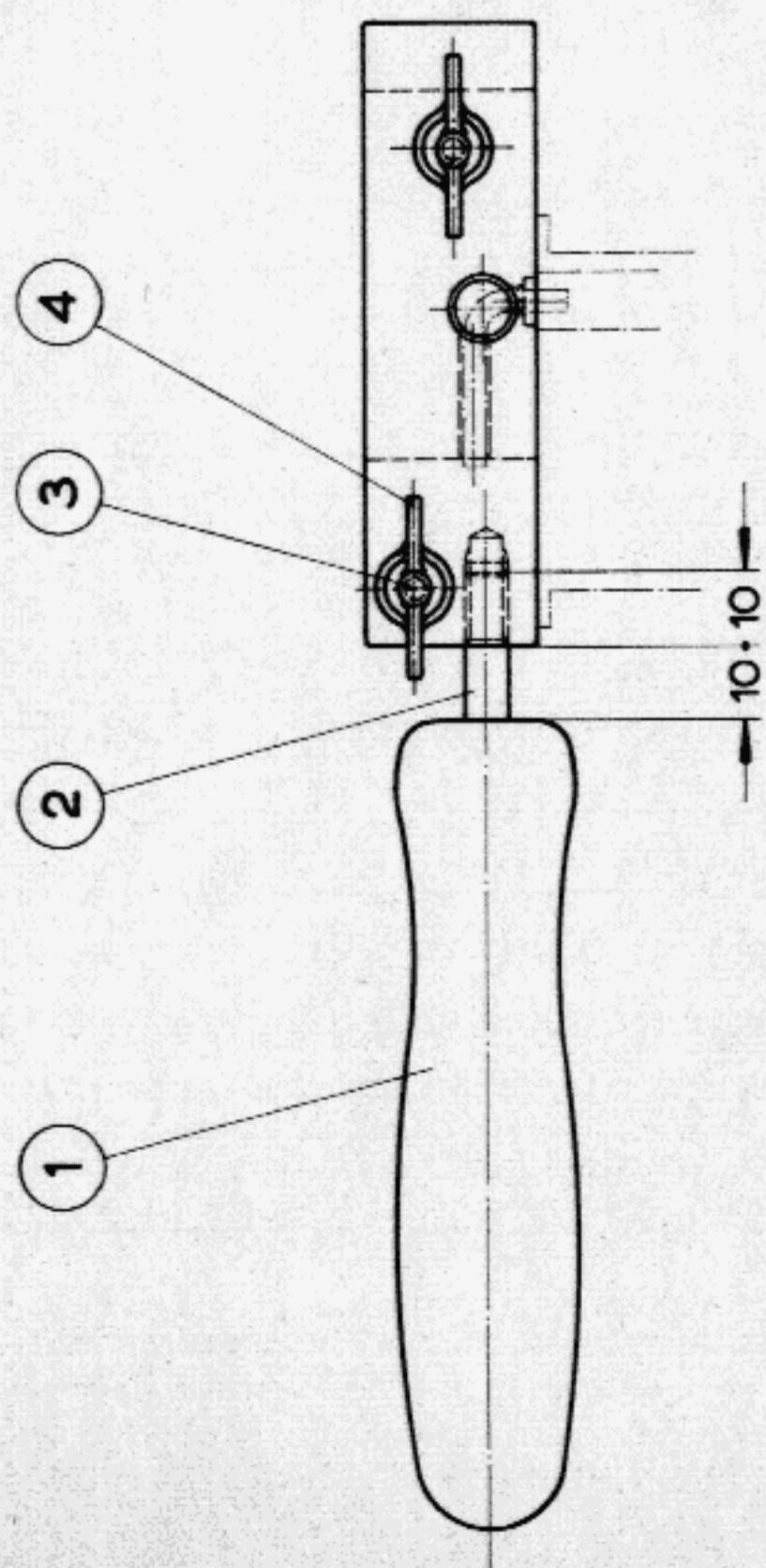
**Discharge tube Tool -  
28 PICT Carburetor**

The discharge tube of the accelerator pump on the 28 PICT carburetor can be removed or replaced with the aid of this tool. The clamp grips the discharge tube which can be removed from its seating by a few light taps of a hammer applied to the lower surface of the protruding end of the clamp jaw. Installation of the tube is carried out by tapping the upper surface of the clamp jaw.



### **Construction Details for VW 646/1**

- 1 — Cut clamp jaws parts 5 and 6 as detailed in parts list, have standard parts to hand.
- 2 — Finish clamp jaws to length and width as detailed in drawing.
- 3 — Position clamp jaws in vice, 8 mm above vice jaws.
- 4 — Mark off part 6 ready for drilling (except the 6.5 mm and 3 mm drillings).
- 5 — Clamp both jaw pieces firmly together.
- 6 — Drill 8.5 mm dia. hole.
- 7 — Mark out positions of 6.5 mm dia. and 3 mm dia. holes and drill using a 3 mm drill.
- 8 — Bore out the 3 mm vertical hole to 6.5 mm dia.
- 9 — Drill out the thread holes in part 5 and the clearance holes in part 6 to 4.7 mm.
- 10 — Unclamp jaw pieces and cut a M 6 thread in both 4.7 mm clearance holes.
- 11 — Bore out the clearance holes in part 6 to 6.2 mm.
- 12 — Drill 4.7 mm hole in end of part 6 and cut thread using a M 6 tap.
- 13 — Forge part 2 (stud) as shown, and knock into file handle.
- 14 — Remove burrs on all parts.
- 15 — Screw (studs) part 3 into part 5.
- 16 — Fit jaws together and screw on wing nuts.
- 17 — Paint tool.



6	1	Clamp jaw, long	25 X 10 X 90	St 50
5	1	Clamp jaw, short	25 X 10 X 80	St 50
4	2	Wing nut	M 6	DIN 315 mg 4 D
3	2	Stud A	M 6 A X 31	N 14 401 1 Shortened to 26
2	1	Stud A	M 6 A X 49	N 14 403 1
1	1	File handle	25	DIN 395

Part No. required	Description	Material	Order No. or standard spec.	Remarks
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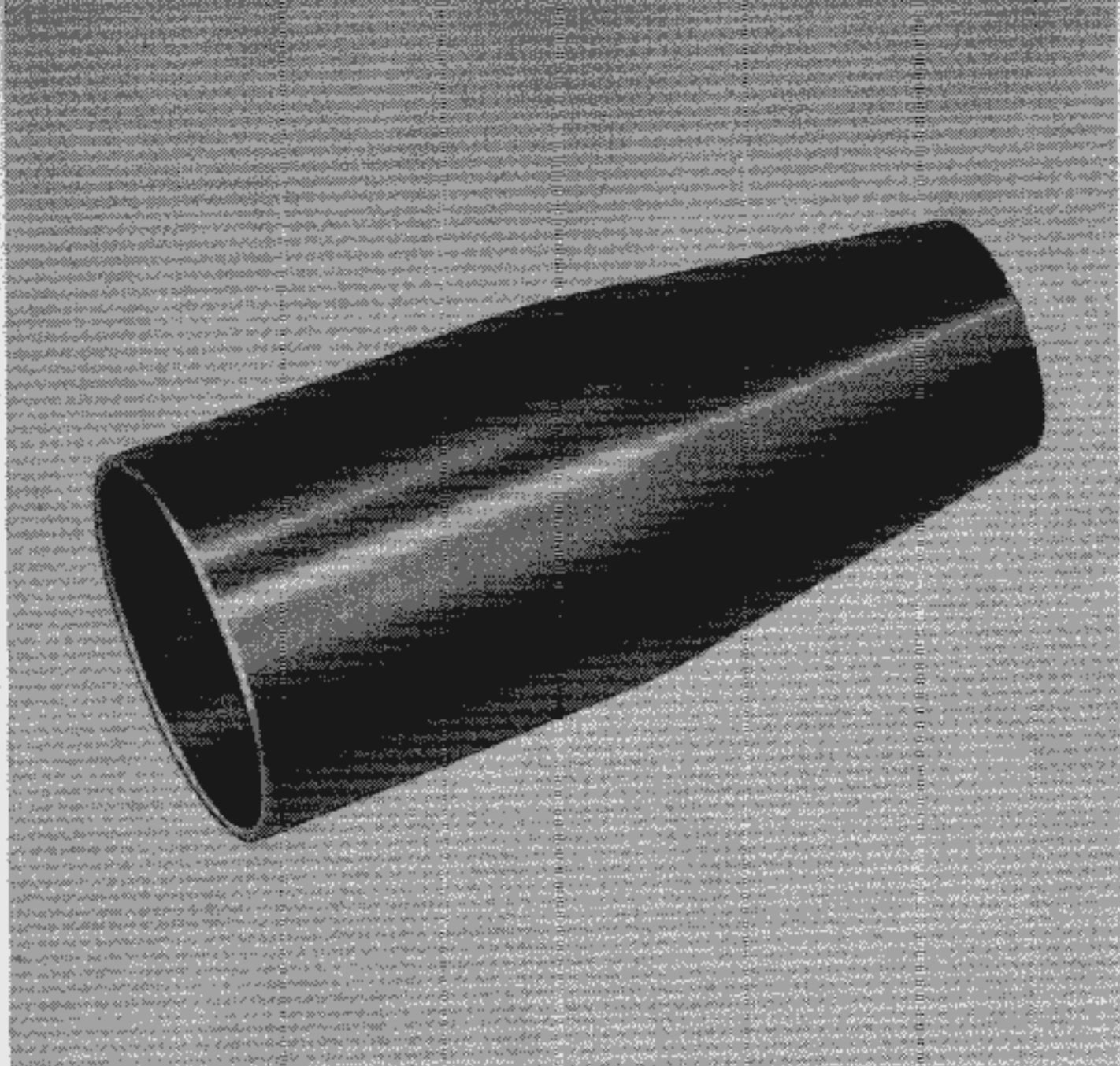
**VOLKSWAGENWERK AG**  
**WOLFSBURG**  
 Service — Department

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 1. 2. 61 Gieseking

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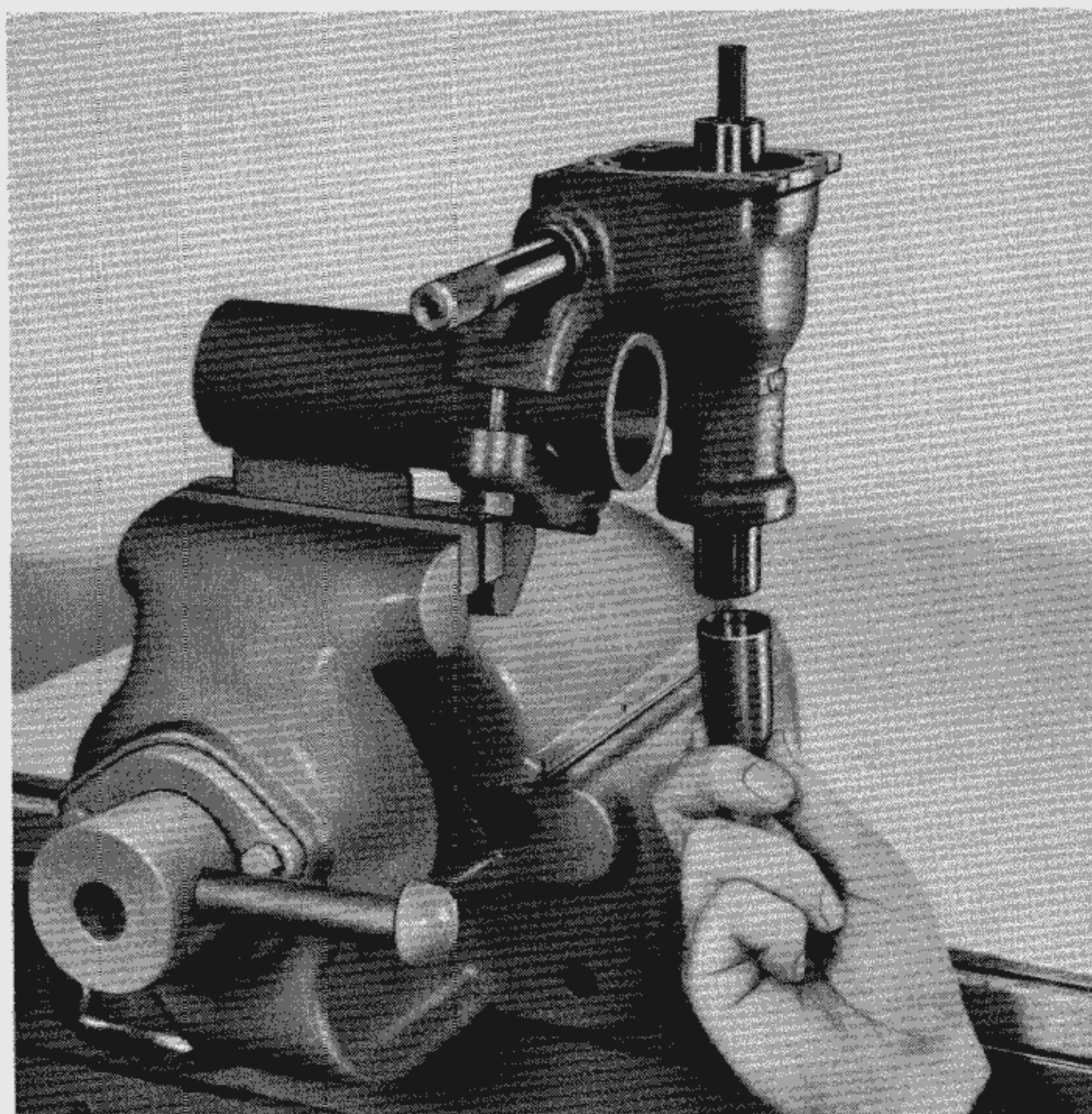
**Discharge Tube Tool - 28 PICT Carburetor**

VW 646/1



**Guide Sleeve for Steering Roller Shaft**

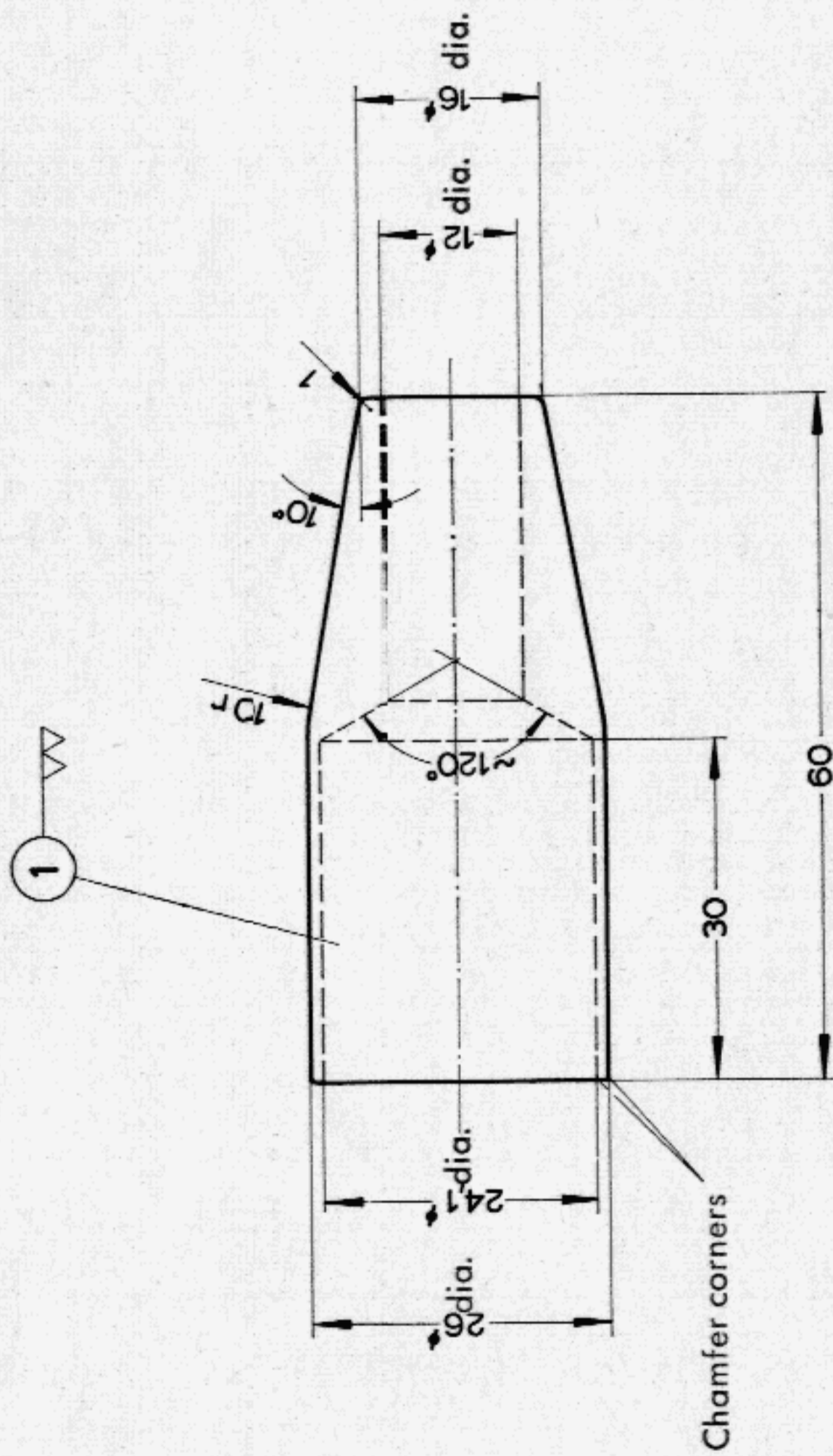
The guide sleeve protects the oil seal from damage when removing or installing the steering roller shaft. The sleeve is pushed over the lip of the oil seal and prevents the spline in the shaft from coming into contact with the oil seal.



**Construction Details for VW 409**

**1 — Turn as shown in drawing**

**2 — Lightly smear the sleeve with grease**



Part No.	Description	Material
1	Guide Sleeve 30 dia. X 65 C 15	
<b>Guide Sleeve for Steering Roller Shaft</b>		
<b>VOLKSWAGENWERK AG</b> <b>WOLFSBURG</b> Service — Department		Checked 19. 4. 61 Sent
Drawn 19. 4. 61 Gieseking	<b>VW 649</b>	