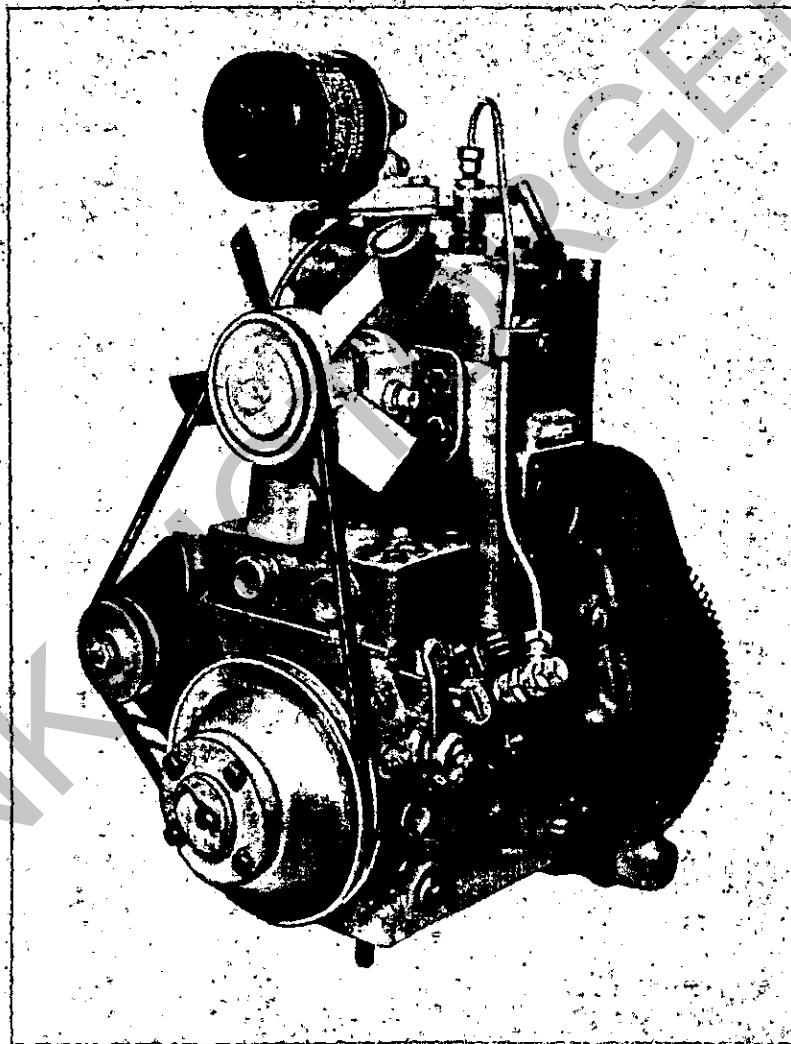


**HOLDER**

**HD 1**

# **Workshop Manual**

**Instructions for Dismantling and Reassembly**



**1974**

**Gebrüder Holder Maschinenfabrik**

7418 Metzingen Western Germany  
Telefon (07123) 2036\* Telex: 07245319

## TABLE OF CONTENTS

| Contents   | Page |
|--|------|
| Technical data .....                                     | 1    |
| Oil filter and oil pump .....                            | 2    |
| Dynamo, injection nozzle and injection pump .....        | 4    |
| Cylinder head .....                                      | 5    |
| Hydraulic pump and ventilator blade, housing cover ..... | 6    |
| Sealing cover, piston and connecting rod .....           | 7    |
| Clutch disc, pressure plate, flywheel and crown .....    | 8    |
| Regulator housing .....                                  | 10   |
| Crankshaft .....   | 12   |
| Modification kit ventilation pipe .....                  | 13   |
| Tools for engine .....                                   | 14   |

**GEBRÜDER HOLDER MASCHINENFABRIK**  
**7418 METZINGEN/WÜRTT.**

Telefon Metzingen (0 71 23) 20 361, Telex 07245319 Drahtwort Holder Metzingen/Württ.



1888

Küd/Schl. 2. Jan. 1973

**Betr.: Einstellwerte für Ölpumpen bei Holder-Motoren HD 1, HD 2, HD 3.**

|                          | Motor-Nr.     |               | Ausgang               | Prüfstandwert       | Ausgang               | Prüfstandwert       | Ausgang               | Prüfstandwert       | Ausgang               | Prüfstandwert       |
|--------------------------|---------------|---------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|
| a) Fördermenge: (Saugöl) | Bis HD2 15569 | Bis HD3 14799 | 85 cm <sup>3</sup> /h | 3,8 cm <sup>3</sup> | 85 cm <sup>3</sup> /h | 3,8 cm <sup>3</sup> | 85 cm <sup>3</sup> /h | 3,8 cm <sup>3</sup> | 85 cm <sup>3</sup> /h | 3,8 cm <sup>3</sup> |

Die Ölpumpen vorgenannter Motoren sollen auf 105 cm<sup>3</sup>/h eingestellt werden; dies entspricht einem Prüfstandwert von 4,65 cm<sup>3</sup>. Meßdrehzahl: HD 1= 2110, HD2/HD3= 6390 Prüfstandumdrehungen. (Siehe auch Betriebsanleitung für Ölpumpenprüfstand vom 15. 3. 1970)

|                              | Motor-Nr.     | Minimum-Werte          |                      | Ausgang                | Prüfstandwert        | Ausgang                 | Prüfstandwert        | Ausgang                 | Prüfstandwert       | Ausgang                 | Prüfstandwert       |
|------------------------------|---------------|------------------------|----------------------|------------------------|----------------------|-------------------------|----------------------|-------------------------|---------------------|-------------------------|---------------------|
|                              |               | Rückförderung          | Prüfstandwert        |                        |                      |                         |                      |                         |                     |                         |                     |
| b) Fördermenge: (Fallöl) HD3 | Ab 14800      | 315 cm <sup>3</sup> /h | 14 cm <sup>3</sup>   | 105 cm <sup>3</sup> /h | 4,65 cm <sup>3</sup> | 105 cm <sup>3</sup> /h  | 4,65 cm <sup>3</sup> | 52,5 cm <sup>3</sup> /h | 2,3 cm <sup>3</sup> | 52,5 cm <sup>3</sup> /h | 2,3 cm <sup>3</sup> |
| c) Fördermenge: Fallöl HD2   | Ab 15570      | 210 cm <sup>3</sup> /h | 9,3 cm <sup>3</sup>  | 105 cm <sup>3</sup> /h | 4,65 cm <sup>3</sup> | 52,5 cm <sup>3</sup> /h | 2,3 cm <sup>3</sup>  | 52,5 cm <sup>3</sup> /h | 2,3 cm <sup>3</sup> |                         |                     |
| d) Fördermenge: HD1          | Ab Serienbeg. | 105 cm <sup>3</sup> /h | 4,65 cm <sup>3</sup> | 105 cm <sup>3</sup> /h | 4,65 cm <sup>3</sup> |                         |                      |                         |                     |                         |                     |
| e) Fördermenge: HD1          | Ab 13251      | 180 cm <sup>3</sup> /h | 8,0 cm <sup>3</sup>  | 180 cm <sup>3</sup> /h | 8,0 cm <sup>3</sup>  |                         |                      |                         |                     |                         |                     |

Durch natürlichen Verschleiß der Einstellschraube (Kugelspitze) bzw. Täumelscheibe kann sich die Fördermenge der Ölpumpe nach längerer Laufzeit des Motors vermindern.

Damit kein Öl mangel entsteht, empfehlen wir, anlässlich der kostenpflichtigen Kundendienste, nach jeweils 1000 Betriebsstunden die Ölpumpe zu überprüfen. Falls kein Holder-Ölpumpenprüfstand vorhanden, kann wie folgt verfahren werden:

- a) Austausch-Ölpumpe einbauen – Pumpe muß ausgebaut werden – Achtung! Zuleitung zur Ölpumpe entlüften.

#### HD2, HD3

- b) Ohne Prüfung, Einstellschraube (E Abb.1) 1/2 Umdrehung nachstellen.  
(nach rechts drehen)

#### HD1

- c) Ohne Prüfung, Einstellschraube (E Abb.2) 1 Umdrehung nachstellen.  
(nach links drehen)

Arbeitsgang: Pumpendeckel (HD2, HD3), Verschlußdeckel für Einstellschraube (HD1) öffnen, mit Schraubenzieher Einstellschraube (E) festhalten und Kontermutter lösen. Einstellschraube (E Abb.1) bei HD2, HD3 1/2 Umdrehung nach rechts, bei HD1 (E Abb.2) 1 Umdrehung nach links drehen und Kontermutter wieder anziehen, (dabei Einstellschraube festhalten). Pumpendeckel bzw. Verschlußdeckel aufsetzen und verschrauben. Bei HD2, HD3 bitte darauf achten, daß die Druckfeder in der Deckelaus- spartung bzw. auf der Einstellschraube richtig sitzen.

D = Druckleitung, S = Saugleitung

R = Rückleitung, F = Ölzuleitung vom Öltank

#### Abb. 3

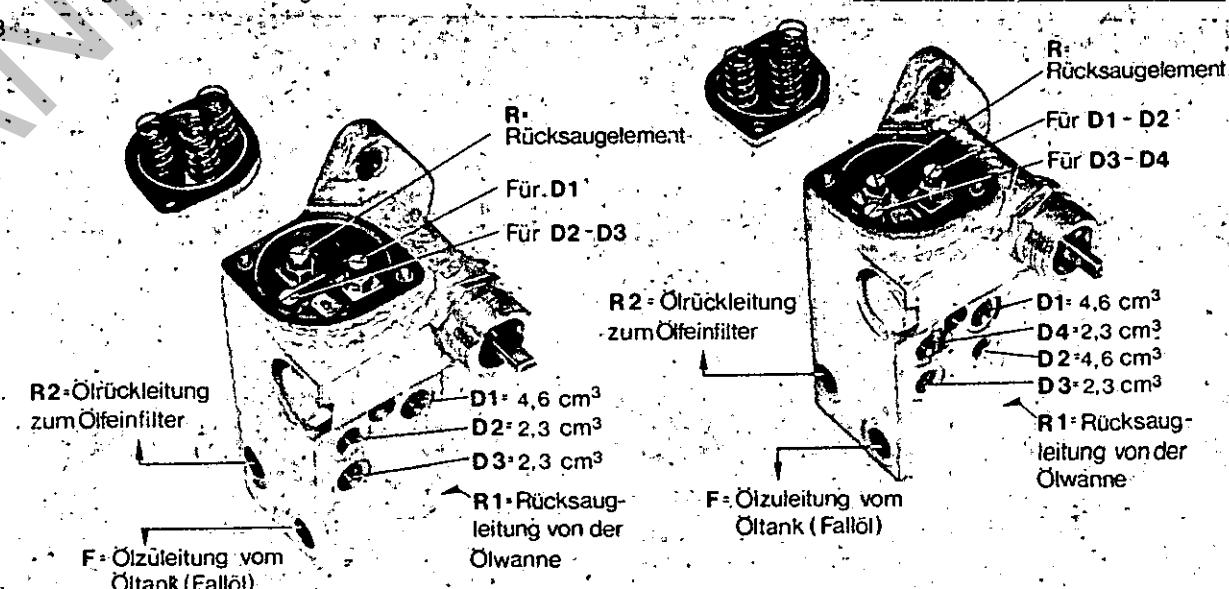


Abb. 1

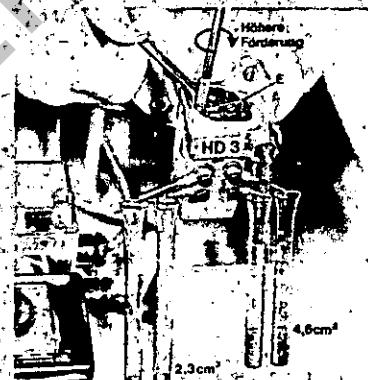
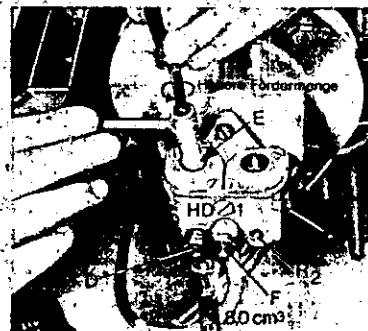
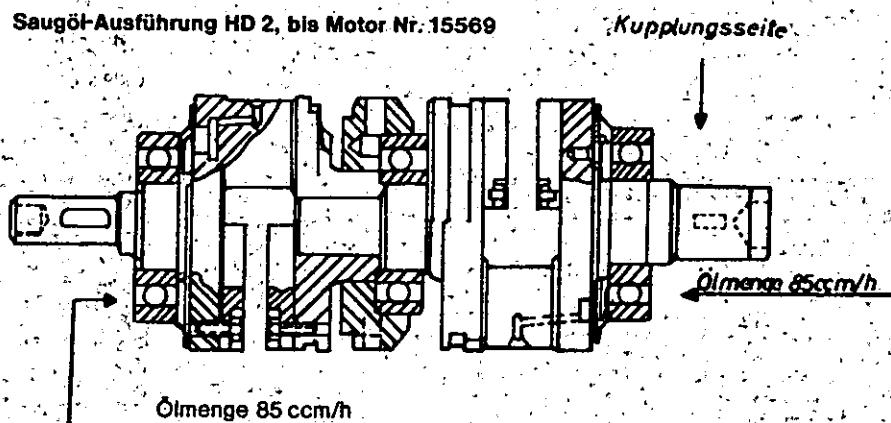


Abb. 2



Saugöl-Ausführung HD 2, bis Motor Nr. 15569



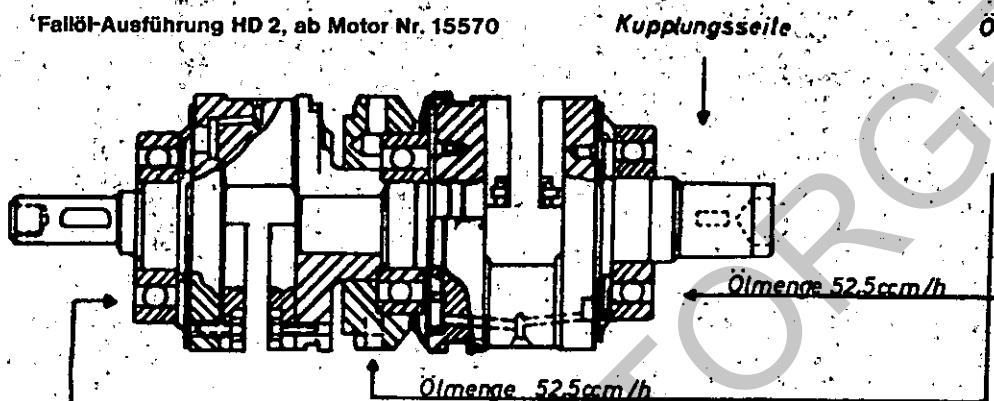
Ölpumpe Saugöl HD 2

D = Druckleitungen  
S = Saugleitung

Abb. 4

Alle Anschlüsse von 85 ccm/h auf 105 ccm/h einstellen

Fallöl-Ausführung HD 2, ab Motor Nr. 15570

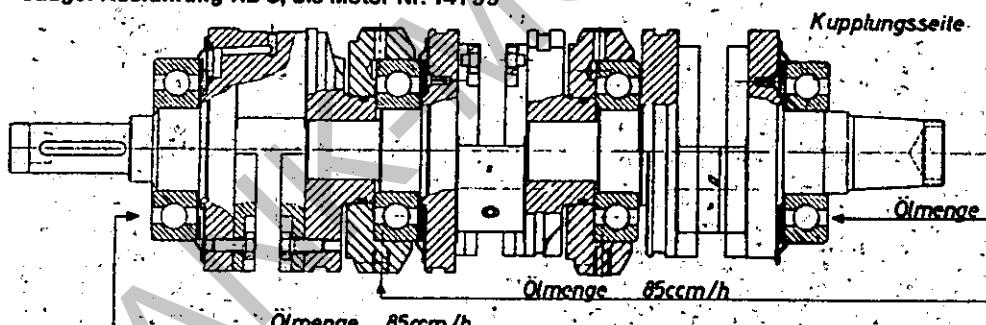


Ölpumpe Fallöl HD 2

Ölmenge 105 ccm/h

Abb. 5

Saugöl-Ausführung HD 3, bis Motor Nr. 14799

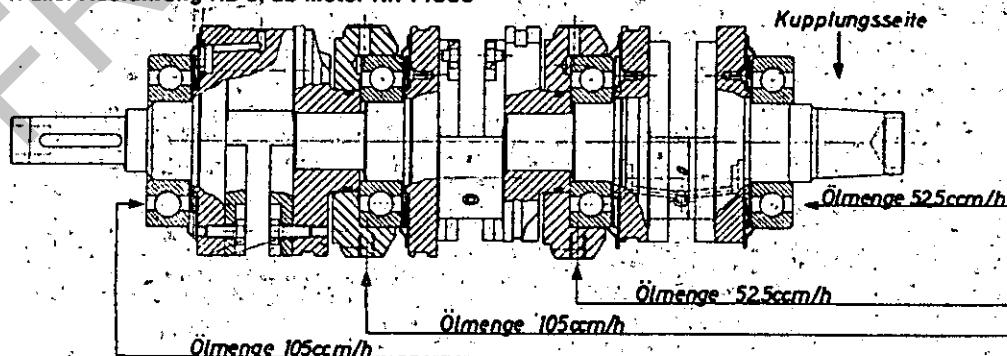


Ölpumpe HD3 Saugöl

Alle Anschlüsse von 85 ccm/h auf 105 ccm/h einstellen

Abb. 6

Fallöl-Ausführung HD 3, ab Motor Nr. 14800



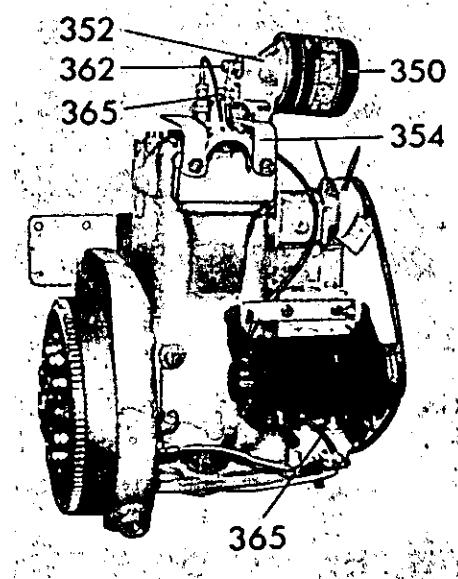
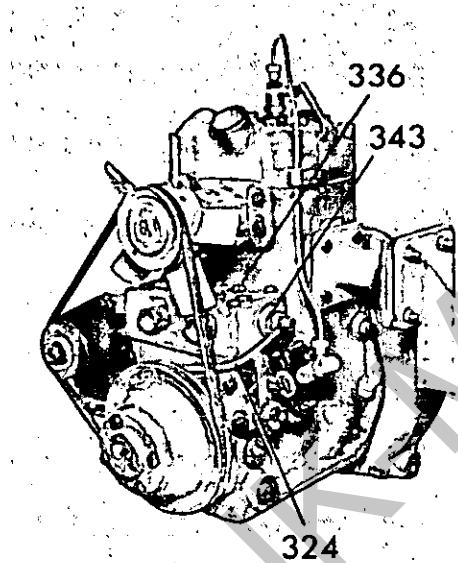
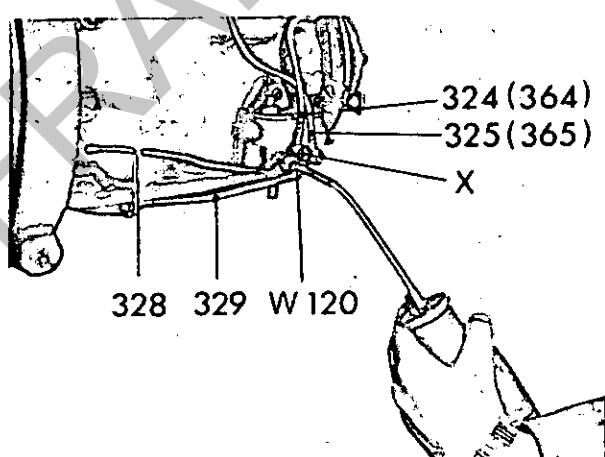
Ölpumpe HD3 Fallöl

Ölmenge 105 ccm/h

Abb. 7

**Technical data for 1-cylinder diesel engine type Holder HD 1**

|  |  |
|--|--|
| Cylinder capacity                        | 550 cc   |
| Engine capacity:                         | 12 PS – 14 HP (9 kW)   |
| Piston                                   | Ø 88   |
| Clutch                                   | K 160 D Fichtel and Sachs  |
| Upper idling speed                       | 2830 min <sup>-1</sup> (rpm)   |
| Speed at N max                           | 2600 min <sup>-1</sup> (rpm)   |
| Lower idling speed                       | 750 min <sup>-1</sup> (rpm)  |
| Injection pressure                       | 175 bar (atm)  |
| Injection timing                         | 6,6 – 6,8 mm bTDC (before top dead centre)<br>(injection pump under full load)   |
| Torque                                   | 34 NM (3,4 m kp)   |
| Oil pump transmission ratio 1 : 3        |  |
| Delivery of oil pump                     | 180 cm <sup>3</sup> /h ≈ 8,0 cm <sup>3</sup> at 2110 test bench revs   |
| Adjustment of oil pump                   | Anti-clockwise turn increasing delivery  |
| Axial crankshaft play                    | 0,4 mm   |
| Cooling water capacity                   | 3,8 litres   |
| Oil filling in regulator housing         | 0,75 litre SAE 20  |
| Regulator adjustment:                    | with position of coupler of fuel injection<br>pump 2 mm before starting end stop<br>(in this position secure adjustment spindle III. 240)<br>21 – 22 bar (atm) |
| Compression pressure:                    |  |
| Direction of revolution of engine        | anticlockwise (as viewed on flywheel disc)   |
| Grinding measurements of cylinder block: | New 88,03 + 0,01<br>1st oversize 88,53 + 0,01<br>2nd oversize 89,03 + 0,01   |
| Torque wrench breaking:                  | Cylinder head 10 m kp<br>Connecting rod 3,5 m kp<br>Crown (pillow block) 8,0 m kp  |

**I. Oil filter****II. Oil pump****HOLDER****III. 1****III. 2****III. 3****I a. Dismantling oil filter**

Unscrew retaining frame (354) complete with filter head (352), filter cartridge (350) and pipes (362, 365).

In case of older engines up to approx. serial No. D 12 13250 unscrew micro-mesh filter insert (343) with pipe (324).

**I b. Reassembling oil filter**

Refit retaining frame (354) complete with filter head (352), filter cartridge (350), and pipes (362, 365).

In case of older engines up to approx. serial No. D 12 13250 refit micro-mesh filter insert (343) and pipe.

Or a modification kit No. HD1 020 X 45 can be fitted instead.

**II a. Dismantling oil pump**

Remove oil pump (321) with bearing (318), worm gear (316) and oil pipes (328, 329, 364, 365).

Check oil pump on test bench.

**II b. Reassembling oil pump**

Before reassembling oil pipes, blow them thoroughly out with compressed air. Refit oil pump ass. (321) with bearing (318) and worm gear (316). Connect pressure pipe (328) with cylinder block.

Connect pressure pipe (328) and ventilation screw (W 120) with oil pump and fill pipe with oil using an oil injector.

Fit return flow pipe (329). Slacken hexagon nut (336) on filter housing cover (340) and ventilate („bleed“) filter area.

Bleed on hollow screw (X) free from bubbles. Fit return flow hose (325, 365).

Measuring speed: HD 1 = 2110

| Engine No.                           | Minimum values<br>Return delivery | Holder test<br>bench value<br>(D) | Outlet 1               | Test bench value<br>(Holder test bench)<br>(R <sub>2</sub> ) |
|--------------------------------------|-----------------------------------|-----------------------------------|------------------------|--|
| a.) Delivery HD 1<br>up to No. 13250 | 105 cm <sup>3</sup> /h            | 4,65 cm <sup>3</sup> /h           | 105 cm <sup>3</sup> /h | 4,65 cm <sup>3</sup> /h                                      |
| b.) Delivery HD 1<br>from No. 13251  | 180 cm <sup>3</sup> /h            | 8,00 cm <sup>3</sup> /h           | 180 cm <sup>3</sup> /h | 8,00 cm <sup>3</sup> /h                                      |

For replacement use a sealed oil pump with a delivery of 180 cm<sup>3</sup>/h.  
Have old oil pumps principally adjusted to 180 cm<sup>3</sup>/h!

Natural wear of the set screw (spherical top resp. swash-plate) is bound to reduce the delivery of the oil pump after some period of operation of the engine.

To avoid oil starvation, we strongly recommend to have the oil pump checked regularly once a year.

a.) Assembling a sealed oil pump –  
remove original pump –

Attention! Ventilate („bleed“) oil pump  
feed pipe!

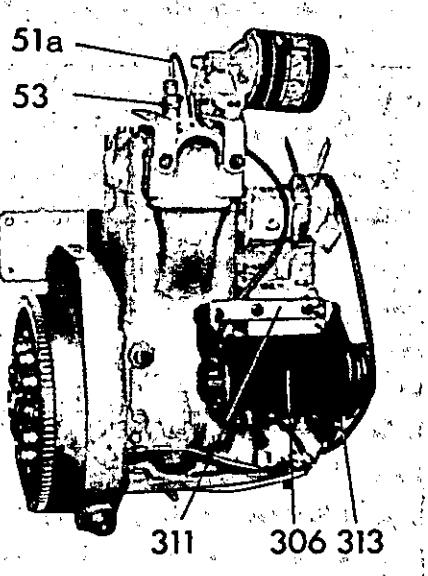
- D = Pressure pipe
- F = Oil feed pipe from oil tank
- R<sub>1</sub> = Return suction pipe
- R<sub>2</sub> = Return suction pipe to filter,  
resp. to oil tank



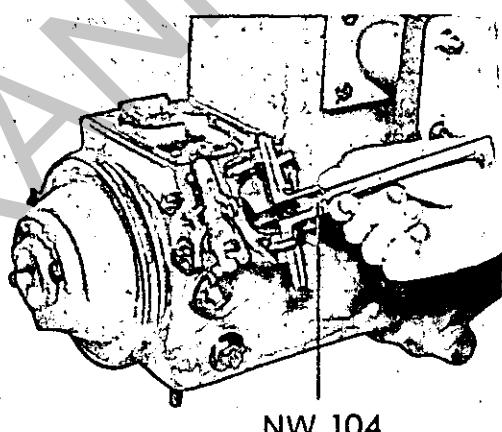
III. 4

### III. Dynamo, IV. Injection nozzle, V. Injection pump

**HOLDER**



III. 5



III. 6

#### III. a Dismantling dynamo

Take off dynamo (306) with retaining shackle (311) and hexagon screw (313).

#### III. b Reassembling dynamo

If necessary, have dynamo (306) checked by a Bosch Service Station. Refit dynamo.

#### IV. a Dismantling injection nozzle

Disconnect fuel injection pipe (51a). Dismantle injection nozzle (53). Close nozzle and pipe with blanking caps.

#### IV. b Check nozzle (52) on Bosch nozzle test bench (EFP60H). If necessary, use shims. Refit injection nozzle and take care not to forget the asbestos seal (58).

#### V. a Dismantling fuel injection pump

Slacken 3 hexagon nuts. Set cam to bottom dead centre. Open adjustment lever to full revs and press starter aid knob of fuel injection pump. Withdraw fuel injection pump in this position.

#### V. b Assembling fuel injection pump

Cam in bottom dead centre position. Use depth gauge (NW 104) to measure the distance between surface of injection pump fixing flange and bearing surface of the cam (245a). See III. 6.

(Adjusted measurement  $95 \pm 0.4$ ).

Remove pressure valve (Bosch 9) and spring (Bosch 10) from injection pump. Open adjustment lever (237) to full revs., press starter aid knob of fuel injection pump and move regulator rod (Bosch 23) to starting position. Place one shim (Bosch 51). Insert fuel injection pump. Thereby, the regulator rod (Bosch 23) must slide through the forked end of part No. (242). Tighten fuel injection pump.

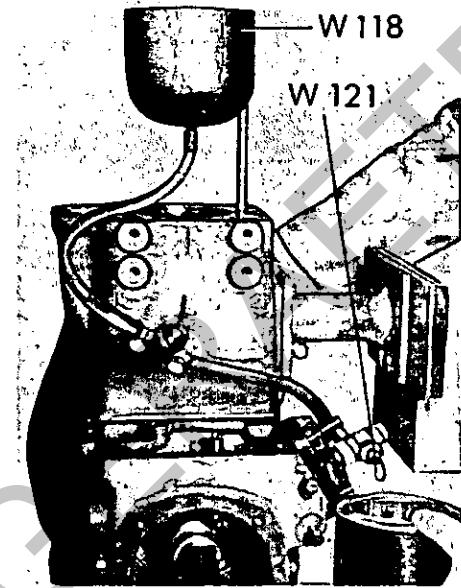
For adjustment of fuel injection timing (commencement of fuel injection), connect pipe of container (W 118).

Connect drip pipe (W 121) with fuel injection pump. Open adjustment lever (237) to full revs. (Do not press starter aid knob – Bosch 23 – of fuel injection pump), and open cock on container (W 118). Ventilate („bleed“) fuel injection pump.

## VI. Cylinder head

**HOLDER**

Move flywheel disc (158) anti-clockwise, as seen in driving direction, till piston (105) has reached 6,6–6,8 mm bTDC (before top dead centre). With correct adjustment, one drop will fall off every 10 seconds.  
If the fuel drips quicker, remove shims (Bosch 51) till the drops will fall in correct intervals.  
If fuel drip is slower, add shims till the correct dripping speed has been obtained.  
If adjusting injection timing without dismantling the cylinder head, use the guide bush for adjustment of the commencement of fuel injection (W 108).



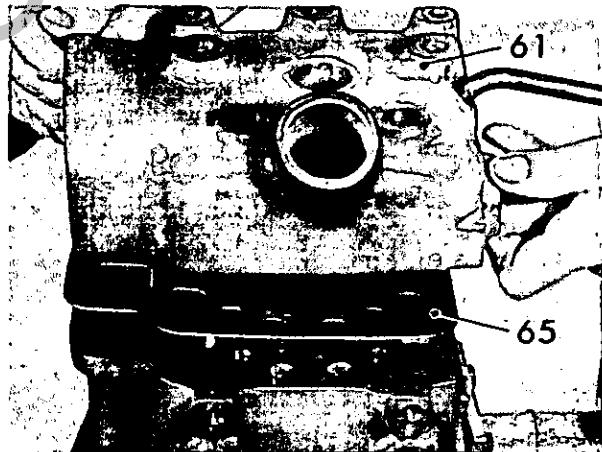
III. 7

### VI. a Dismantling cylinder head

Slacken 5 tension screws (59) and remove cylinder head (61) with gasket (65).

### VI. b Reassembling cylinder head

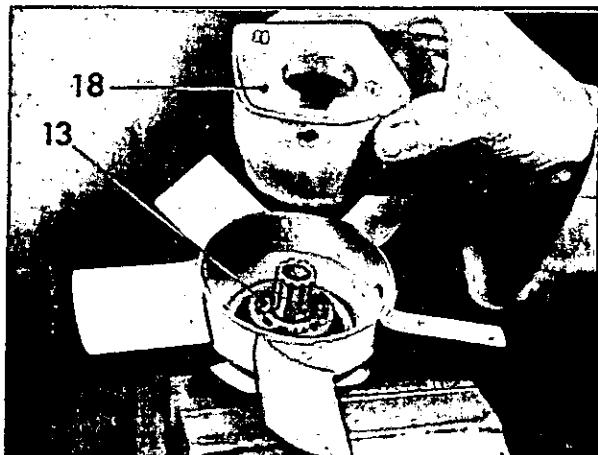
Check gasket (65), tension screws (59), and cylinder head (61), if necessary renew, then place parts correctly and tighten with torque wrench (NW 120) set to break at 10 m kp (100 Nm).



III. 8

VII. Hydraulic pump and fan blade  
VIII. Crown ass.

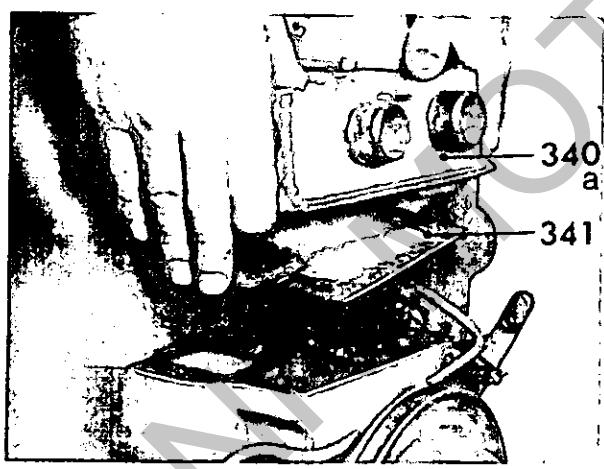
**HOLDER**



III. 9

- VII. a **Dismantling hydraulic pipe and fan blade**  
Slacken 4 hexagon screws (26). Slacken 2 hexagon screws (28) on flange (25). Hydraulic pump and ventilator blade (11) are now separated. Take off clutch (17), circlip (16), and shim (15). Dismantle ventilator blade (11) from bearing housing (18) by means of punch. Extract bearing (13).

- VII. b **Reassembling hydraulic pump and fan blade**  
Reassemble fan blade in reverse order to dismantling. Have hydraulic pump checked by a Bosch Service Station and, if necessary, replace.



III. 10

- VIII. a **Dismantling crown ass.**  
Slacken 5 hexagon screws (338) and take off crown (340a) with gasket (341).

- VIII. b **Reassembling crown ass.**  
Place gasket (341) and crown (340a) correctly and tighten with hexagon screws (338).

Before dismantling sealing cover, piston and connecting rod, procedures IV. a and VI. a must have been carried out.

#### **IX. a Dismantling sealing cover, piston and conrod**

Slacken 4 hexagon screws (76). Remove sealing cover (74), strainer (73) and oil seal (72). Bring piston (105) in bottom dead centre position, slacken screws (98) on conrod, using torque wrench (NW 120) with socket wrench (NW 102). For extracting the lower big-end bearing half-member (99), insert one socket head screw (98) several turns into bore (d) and withdraw the bearing by hand. Do not press out by force which would result in damage to bearing shell (100). Bring piston in top dead centre position. Using brass mandrel (W 102) press out connecting rod and piston. Remove spring ring (107a). Press out gudgeon pin (106) and at the same time press in needle bearing assembly sleeve. Dismantle piston rings (102, 103, 104) with piston ring pliers (NW 103).

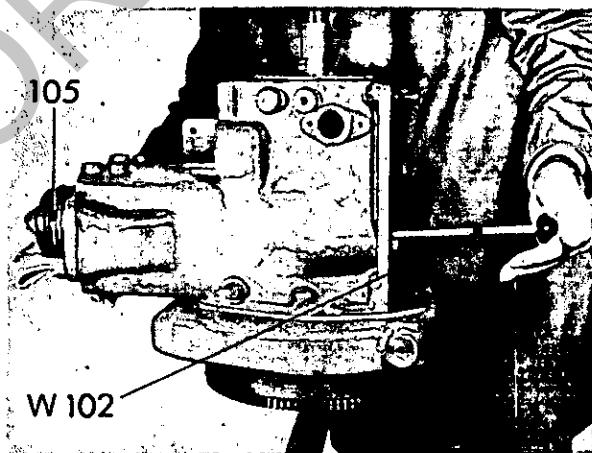


III. 11

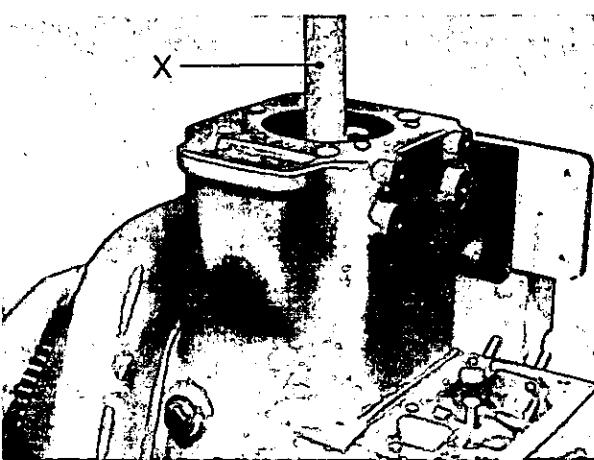
#### **IX. b. Reassembling sealing cover, piston and connecting rod**

Assemble piston (105), gudgeon pin (106), big-end bearing (101), connecting rod (99) and bearing shell (100). (When assembling the gudgeon pin, heat the piston to approx. 80° C, if necessary). Refit piston rings (102, 102a, 103 and 104). Take care that centring pins are situated between the piston rings. When making repairs, check centring pins for possible wear. The number on the conrod must point into the same direction as the arrow on the piston which must point into the direction of the exhaust. Crankpin of crankshaft (85) must be in top dead centre position.

Lubricate piston, cylinder liners and bearing. Insert piston by means of piston assembly sleeve (W 703), without using force. Bring piston to bottom dead centre position by slightly turning the flywheel disc with the handle of hammer (X). Fill crankpin bore generously with oil. Reassemble lower half of big-end bearing with half-member, and tighten with torque wrench set to break at 3.5 mfp (35 Nm). Refit sealing cover (74), strainer (73) and oil seal (72) with 4 hexagon screws (76) as shown on illustration 11.



III. 12

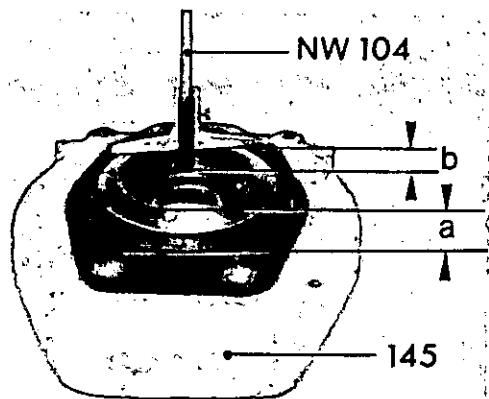


III. 13

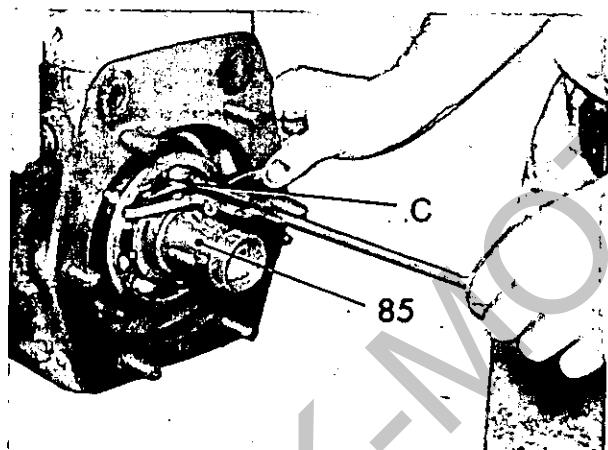
Thereafter, proceed as described under VI. b and IV. b.

X. Clutch disc, pressure plate, flywheel, crown

**HOLDER**



III. 14



III. 15

**X. a Dismantling clutch disc, pressure plate, flywheel, crown**

Dismantling, resp. reassembly will be easier if you put round bars, approx. 3,5 mm thick, underneath the pressure levers. Thereafter, the six hexagon screws (163) can be easily slackened. Remove pressure plate and clutch disc. Unfasten locking tab (164), loosen ring nut (165) by means of ring nut spanner (W 25). Use pressure pad (W 114) in order to avoid damage to the deep-groove ball bearing (93). Uniformly place extractor (W 112). Tighten spindle. A hammer blow on the spindle head will loosen the cone of the flywheel disc. Remove key (97). Unscrew nuts (156) on crown (154). Remove crown with the aid of a rubber hammer. Remove oil seal (1517).

**Attention:** Fit gear ring on flywheel disc in heated condition.  
Heat on electrical heater up to approx. 200° C.

If the position of the crankshaft has remained unchanged, the crown (154) and the shims can be reused.

**Measuring of bearing tolerance**

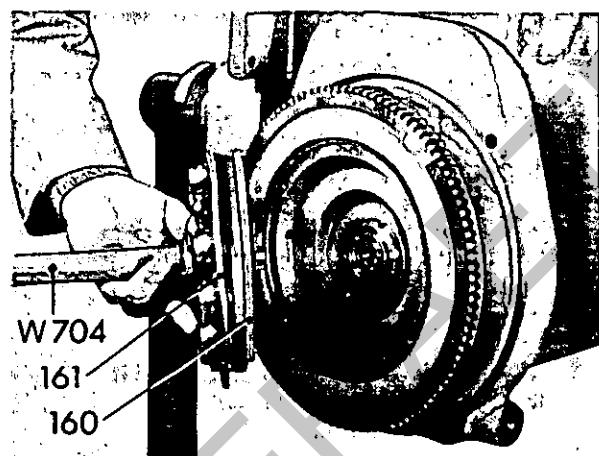
The axial play between crankshaft (85) and crown must be 0,4 mm which is calculated as follows:

|              |           |                   |
|--------------|-----------|-------------------|
| Distance a.) | e.g. 24,1 | Difference        |
| Distance b.) | e.g. 26,9 | 2,8 mm Difference |
| Distance c.) | e.g. 4,4  | 1,6 mm            |

This means, the prescribed tolerance is 0,4 mm and consequently shims of 1,2 mm thickness must be used.

**X. b Reassembling crown, flywheel, clutch disc, clutch pressure plate**

Care must be taken that the two gaskets (69) are correctly placed, if necessary use loctite. Put loctite on oil seal (151) and drive it home in crown using assembly mandrel (W 702). Screw oil seal assembly sleeve (W 106) onto crankshaft (85). Place gasket (152) and washer rings (153) in crown and drive it home with a rubber hammer. Remove assembly sleeve (W 106). Fit 6 screws with corrugated washers and tighten them with torque wrench set to break at 8 m kp (80 Nm). Place key (97) and put flywheel (158) on crankshaft. Fit locking tab (164), tighten grooved ring nut (165) with ring nut spanner (W 25) and secure. For tightening ring nut use back stop (W 127). Align clutch disc (160) by means of centring mandrel (W 704), fit pressure plate (161) and tighten uniformly with 6 lock washers and hexagon screws. Remove centring mandrel (W 704).



III. 16

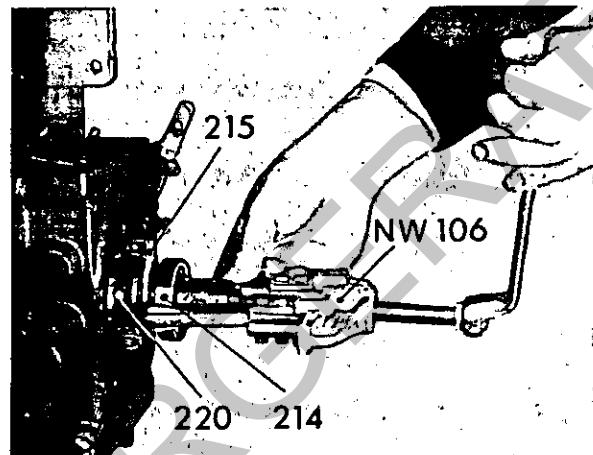
Before dismantling regulator and control elements procedures IIa, IVa and VIIIa must be finished.

#### XI. a Dismantling regulator housing

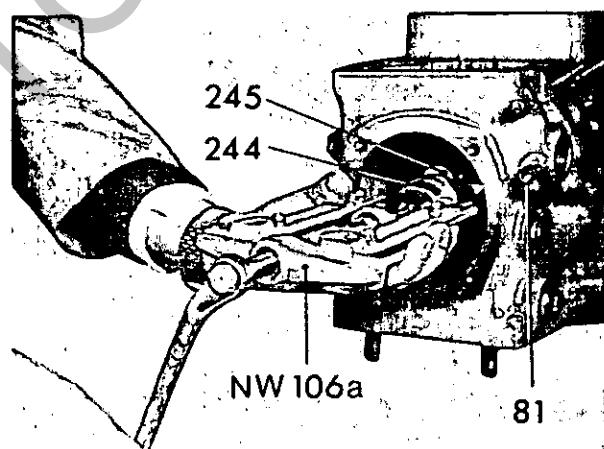
Slacken four screws (201) of starter hub (203). Take off hub (203) and V-belt (704). Unfasten ring nut (205) by means of ring nut spanner (W 22). Extract flange of V-belt pulley (206) using puller tool (NW 106). Unscrew crown (208), turn it through 45° and withdraw puller tool (NW 106). Remove key (97).

Remove shim (213a) and ring seal (212). Extract ball bearing (214) with puller tool (NW 106). Thereafter, shim (213), regulator body (215), regulator sleeve (220), bush (221), axial needle bearing (222) and check plate (223) can be withdrawn by hand.

Slacken set screw (81) on guide shaft (229) and remove adjustment lever (237). Remove radial gasket (230), guide shaft (229), bearing pin (228), spacer tube (227), torsion spring (226), regulator fork (225), spacer tube (224). Take off circlip (241). Remove adjuster spindle (240) and reversing lever (242). Extract cam (245a) and worm of oil pump gear (244) by means of extractor tool (NW 106a).



III. 17



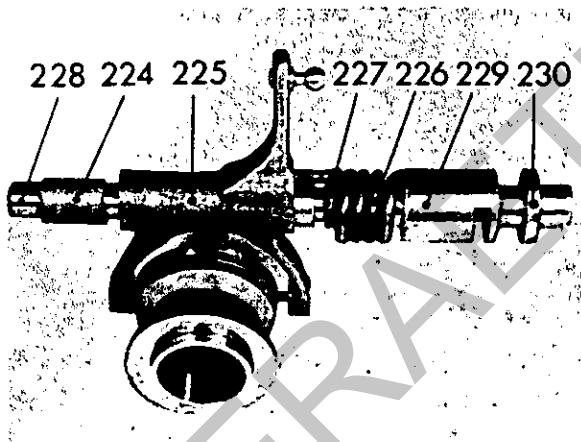
III. 18

## XI. Regulator housing

HOLDER

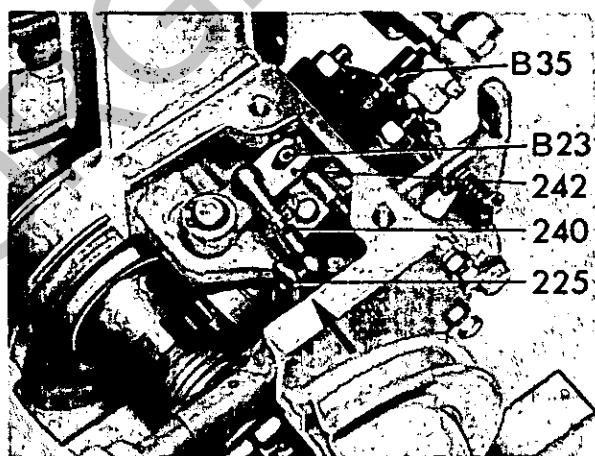
### XI. b Assembling

Assemble cam (245a) and worm (244) with assembly mandrel (W 701). Assemble adjustment lever (237), radial gasket (230), guide shaft (229), bearing pin (228), spacer tube (227), spacer tube (224), torsion spring (226) and regulator fork (225) in correct order. (See III. 18). Slide reversing lever (242) onto bearing pin (243) and secure with circlip (241). Insert check plate (223), axial needle bearing (222), bush (221), regulator sleeve (220), and shim.



III. 19

Drive home deep-groove ball bearing (214) by means of assembly mandrel (701). Insert check plate (213a) and ring seal (212). Place key (97). Fit front crown (208) using assembly tube (W 11). Fit screws (209) with loctite and tighten crown. Drive home flange (206) with assembly tube (W 11). Tighten grooved ring nuts (205) with ring nut spanner. Tighten V-belt (204) and starter hub (203) with screws (201).



III. 20

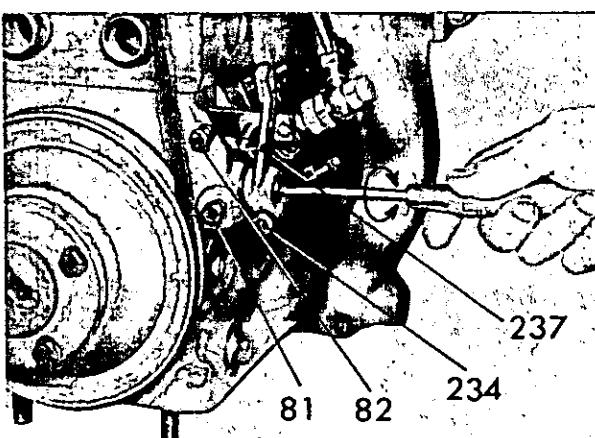
### Adjusting regulator

Position regulator rod (Bosch 23) of fuel injection pump 2 mm before full starting quantity, and at the same time push in pressure bolt (Bosch 35) of injection pump. Fit adjuster spindle (240) to regulator fork (225). Move regulator fork in direction of arrow as far as stop. Turn adjuster spindle till it can be put onto reversing lever (242) without any tolerance. Secure adjuster spindle in place with wire (see III. 20).

### Adjusting speeds (rpm)

Start engine. Slacken hexagon screw (234), move drive shaft (229) by means of a screw driver, till an idling speed of  $750 \text{ min}^{-1}$  (rpm) is obtained. Lock adjustment lever (237) in idling position with fixing screw (234). Make precision adjustment by means of set screw (82). Counter set screw. Move adjustment lever to full load position (237), adjust on set screw (81) upper idling speed of  $2830 \text{ min}^{-1}$  (rpm). Counter set screw.

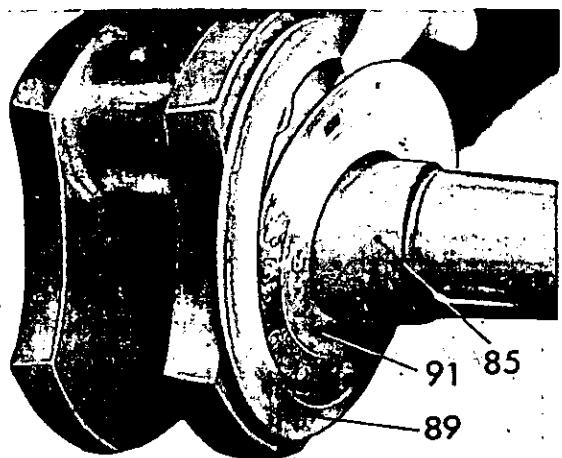
In addition, secure both set screws with wire.



III. 21

Now proceed as described under paras. VIII. b, V.b, and II. b

Before dismantling the crankshaft, procedures Ia, IIa, Va, VIa, VIIa, IXa and XI must be completed.



III. 22

**XII. a Dismantling crankshaft**

Withdraw crankshaft (85) to the rear (in direction of flywheel disc) using extractor (NW 106), whereby the arms of the extractor must be turned through  $180^\circ$ . Pressure pad (W 113) must be placed in crankshaft.

**XII. b Assembling crankshaft**

Insert crankshaft from clutch end and press home to stop with assembly tool (W 112). Place shims (84) from the crankcase side and assemble oil seal (83) with assembly tube (W 702).

**Attention!** Choose the thickness of the shims (84) so that the oil seal (83) will not be damaged by the deep-groove ball bearing (87).

Please take care that the tolerance between crankshaft and crown is being maintained as described under para. X.

**Modification kit ventilation pipe HD1 020 X 49 for HD 1 engine**

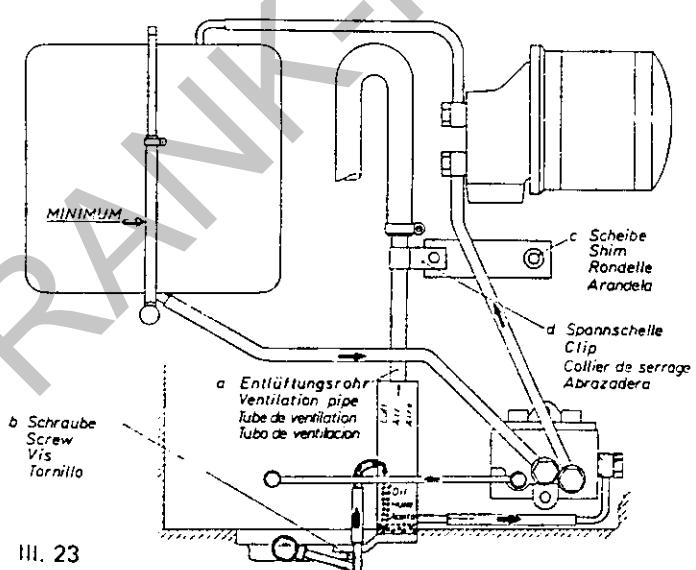
In case of heavily oiled exhaust, we recommend to install a ventilation pipe.

Before installing the modification kit in the HD 1 engine, the exhaust must be burnt out and cleaned.

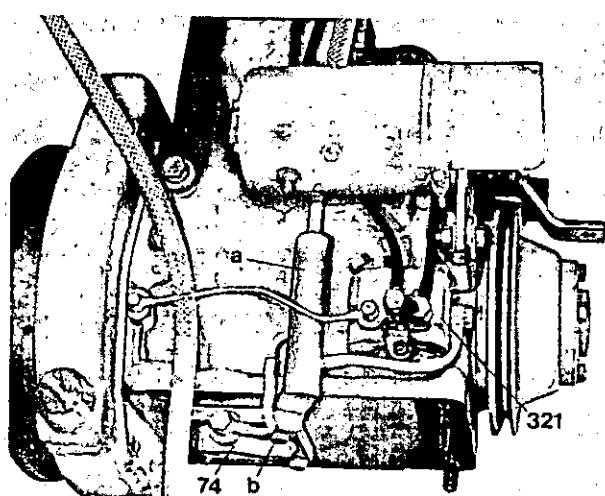
**New oil circulation:** The ventilation pipe is fitted between sealing cover (74) and oil pump (see diagramme and illustration below).

**Dismantling:** Disconnect return suction pipe (329) from oil pump (321) and from sealing cover (74). Unscrew retaining rail of dynamo (311) from cylinder block.

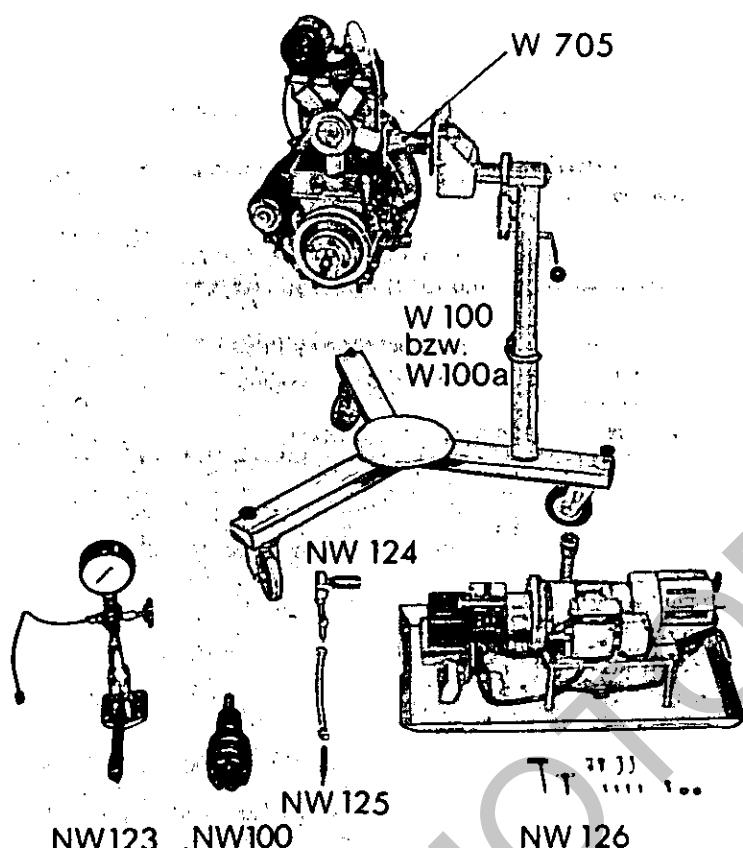
**Reassembly:** Insert ventilation pipe with hose (a) from below between cylinder block and stirrup (541). Screw retaining rail of ventilation pipe onto sealing cover by means of new hexagon screw M8x28 (B).  
Reconnect return suction pipe to oil pump and sealing cover.  
When fitting retaining rail (311) do not forget shim (c) and clamping clip (d).



III. 23



III. 24



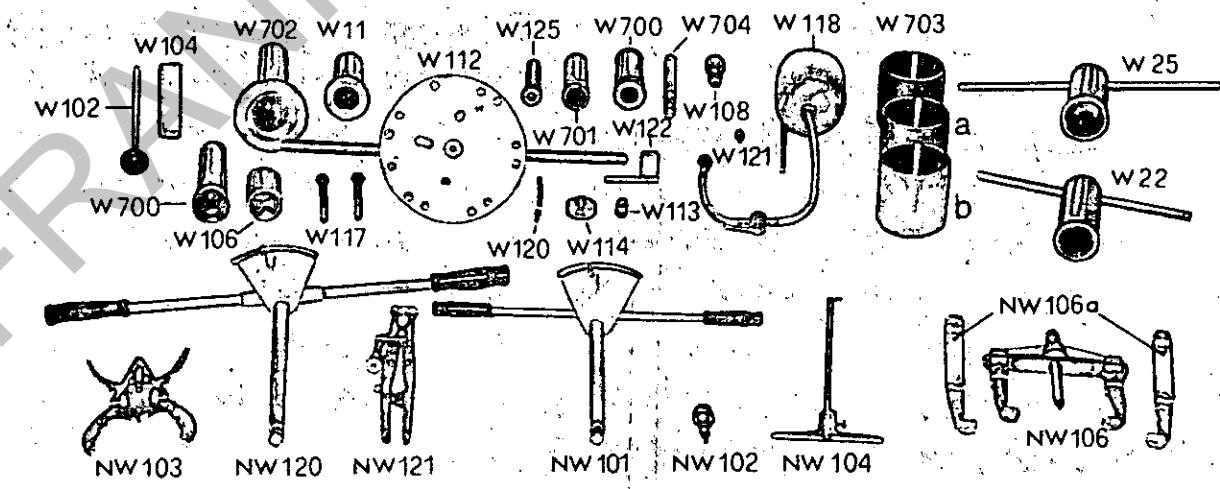
In order to carry out repairs on the Holder diesel HD 1 engine correctly, the illustrated tools are necessary.

Drawings with original measurements are attached which will enable you to have the tools made locally.

The main commercial tools are listed under the „NW“ numbers, i.e. standard tools.

A prerequisite for any workshop is to have such commercial tools as the listed circlip pliers, punch, socket head and ring nut spanners, available as basic equipment.

III. 25



III. 26

**Special, commercially available tools**

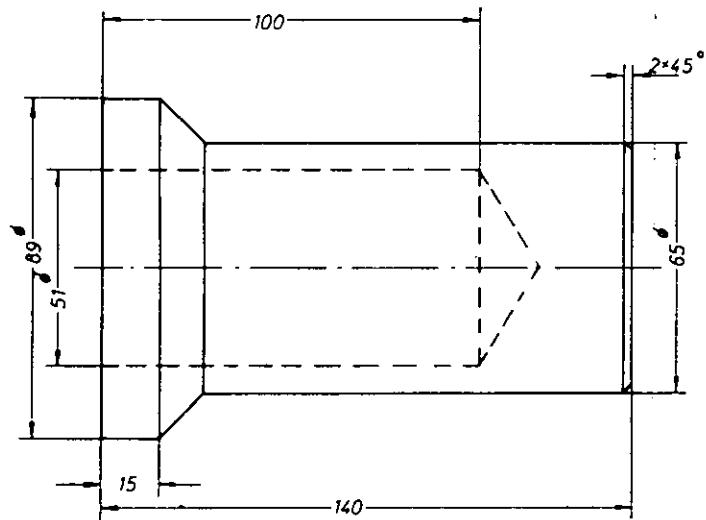
- NW 100 Special ball bearing extractor, size 5 with pliers  
(Albert Schrem, Werkzeugfabrik, 7927 Giengen)
- NW 101 Torque wrench 0–12,5 mkp No. 4560–6,4 four-square 1/2"  
(Hahn & Kolb, Stuttgart)
- NW 102 Socket head insert 6 mm (Heyco)
- NW 103 Piston ring pliers No. 1706 –2 (Heyco)
- NW 104 Depth gauge (52/200) (Blankenhorn)
- NW 106 Two-arm extractor (Kukko A 100)
- NW 106a Extension for extractor (Kukko A 200)
- NW 120 Torque wrench 1,4–6,5 mkp (No. 52240 size 6)  
(Hahn & Kolb, Stuttgart)
- NW 121 Special pliers for hose clip Corbin 280 No. K 40781  
(Tismayer, Osnabrück)
- NW 123 Injection nozzle test bench Bosch EFEP 60 H (0681 200 502)
- NW 124 Compression pressure indicator 10–40 kg/cm<sup>2</sup>, No. 23.02.1001  
(Motor-Meter, Leonberg)
- NW 125 Connection nipple for NW 124, No. 98, thread M14x1,5x90  
(Motor-Meter, Leonberg)
- NW 126 Oil pump test bench

**HOLDER Special Tools**

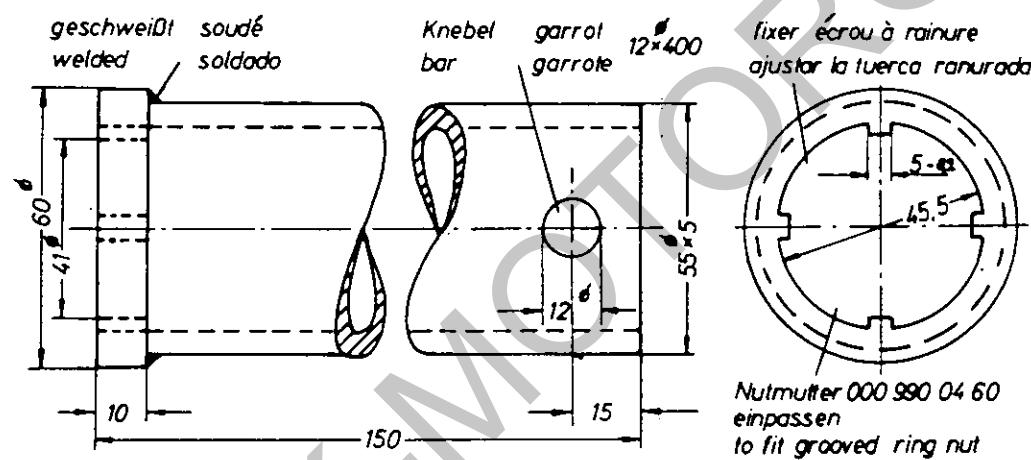
- W 11 Assembly sleeve for ball bearing (92)
- W 22 Ring nut spanner for ring nut M 30 x 1,5
- W 25 Ring nut spanner for ring nut M 40 x 1,5
- W 100 Assembly base
- W 102 Dismantling mandrel for piston
- W 104 Ruler for aligning crankshaft
- W 106 Mandrel for assembling oil seal
- W 108 Guide bush for injection timing with assembled cylinder head
- W 112 Tool for dismantling and reassembling flywheel
- W 113 Pressure pad for NW 106 to extract cam
- W 114 Pressure pad for extracting flywheel
- W 115 6 hexagon screws M 12 x 160 DIN 931 for W 112 (pressing in crankshaft)
- W 116 2 hexagon screws M 12 x 95, DIN 601 for W 112
- W 118 Container with hose and shut-off cock for injection timing
- W 120 Ventilation screw for filling oil pipe
- W 121 Drip pipe, injection timing
- W 122 Back-stop for flywheel
- W 700 Assembly mandrel for oil seal (83)
- W 701 Assembly mandrel for fan blade
- W 702 Assembly mandrel for oil seal
- W 703 Piston assembly sleeve 88 dia.
- W 703a Piston assembly sleeve 88,5 dia.
- W 703b Piston assembly sleeve 89 dia.
- W 704 Mandrel for assembling clutch
- W 705 Spacer piece for assembly base

Prices upon request.

III. and  
order No.

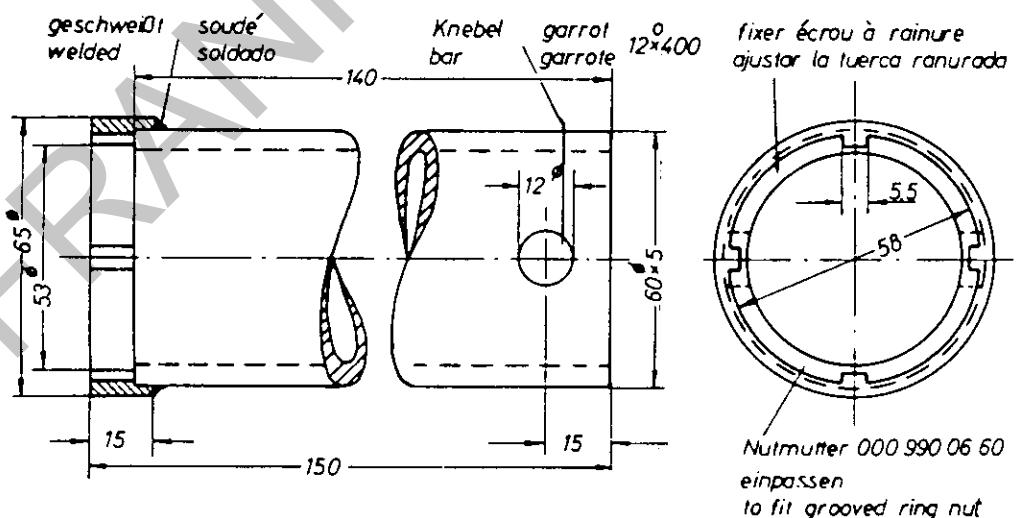


W 11



W 22

Nutmutter 000 990 04 60  
einpassen  
to fit grooved ring nut



W 25

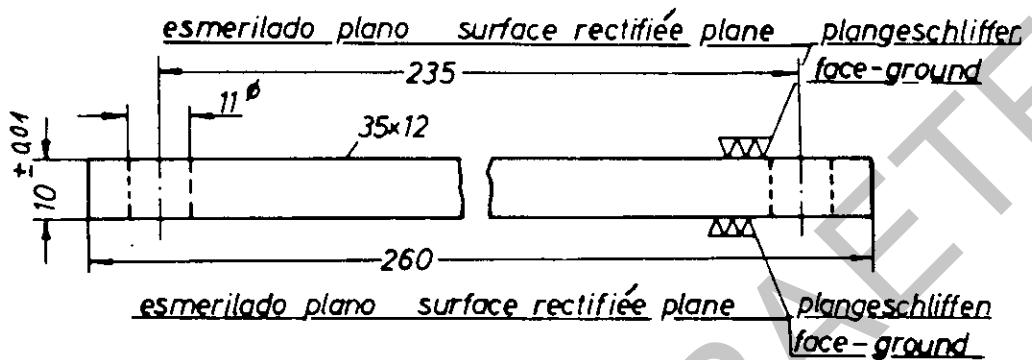
Nutmutter 000 990 06 60  
einpassen  
to fit grooved ring nut

Siehe Seite 22–23

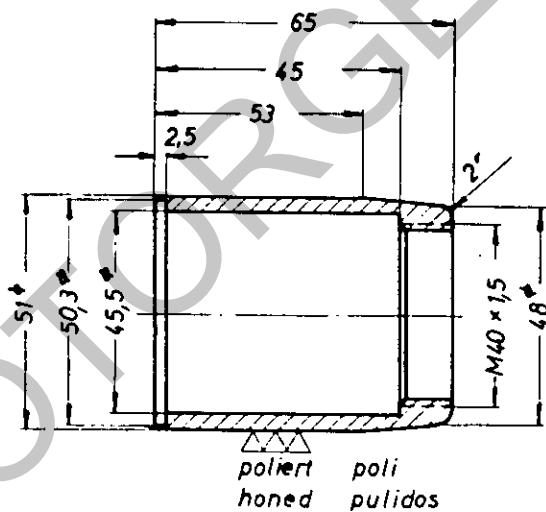
W 100

III. and  
order No.

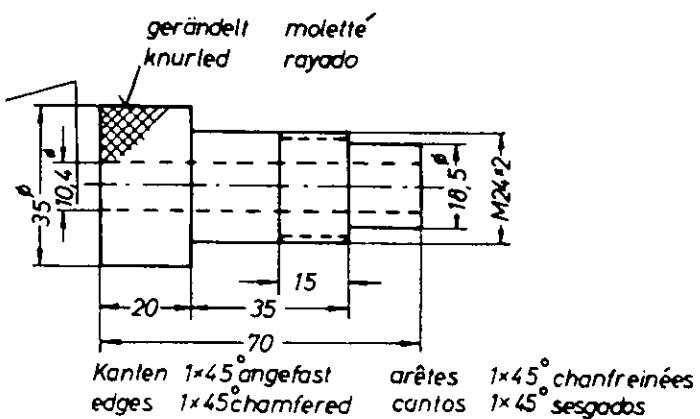
W 104

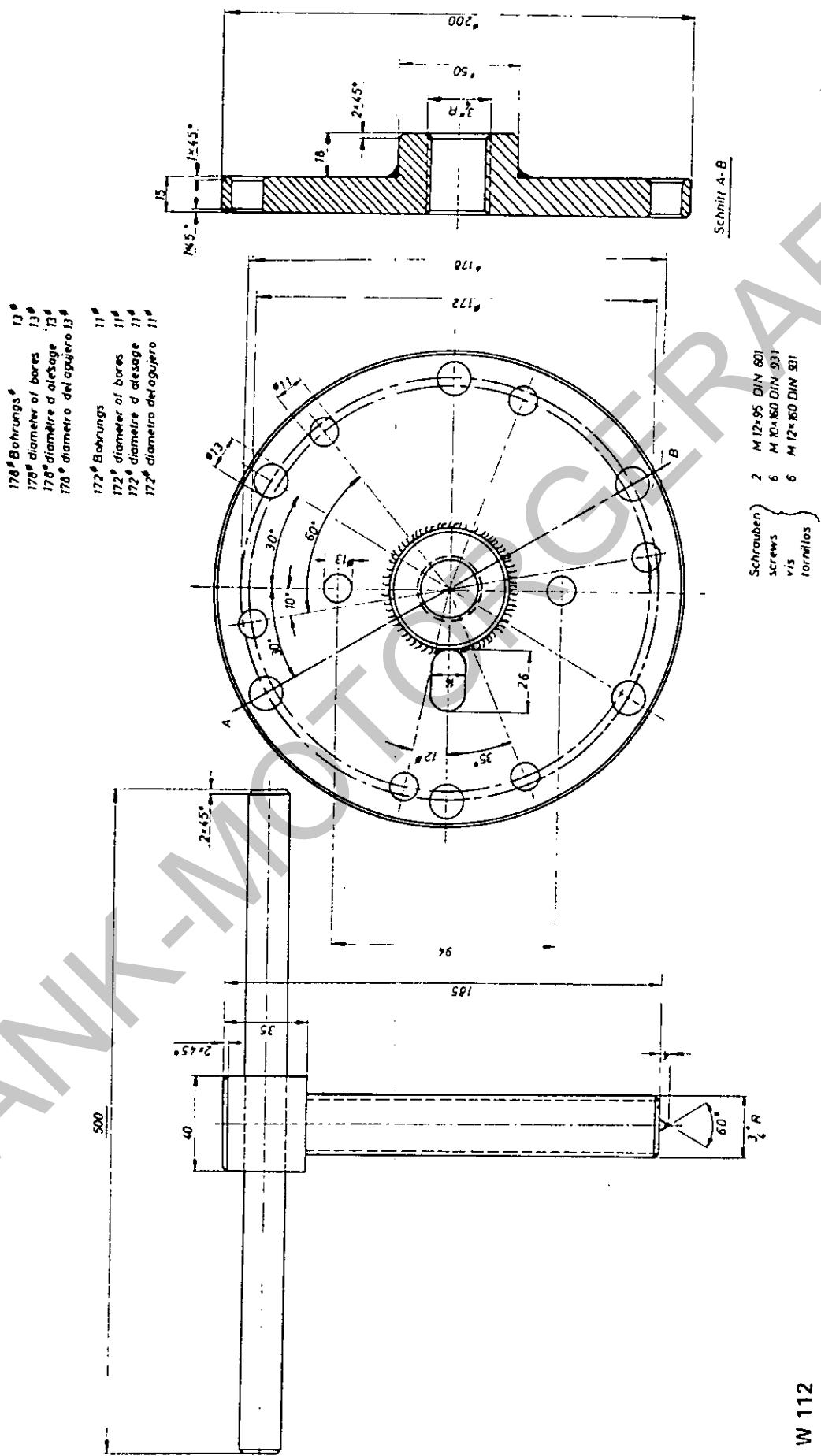


W 106



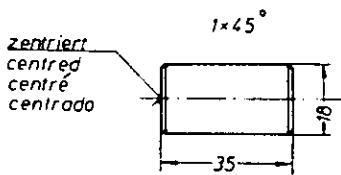
W 108



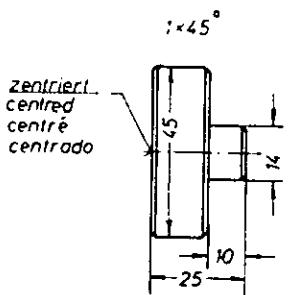


W 112

III. and  
order No.



W 113

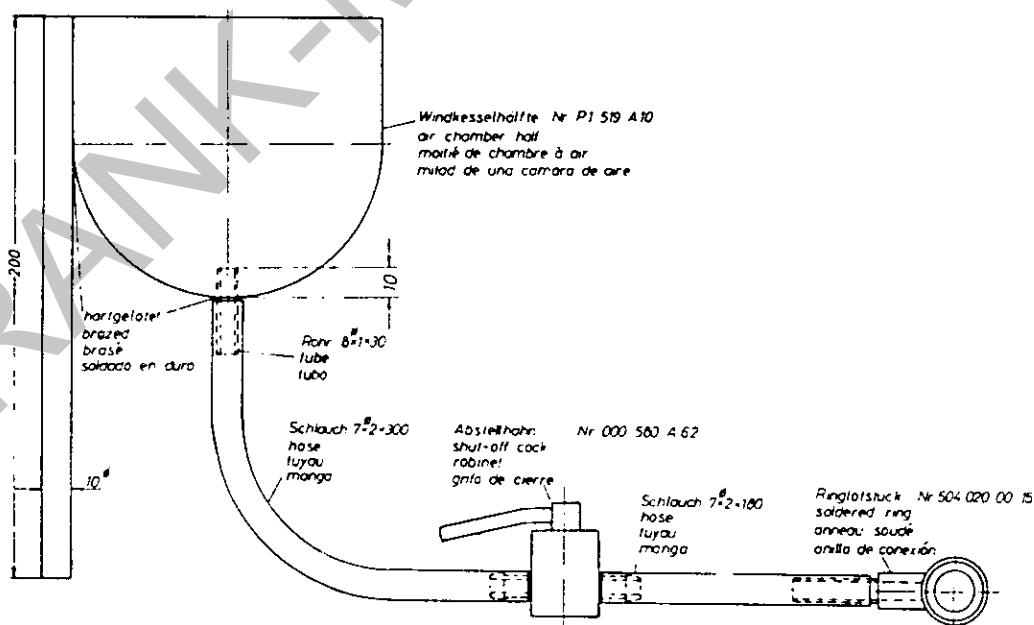


W 114

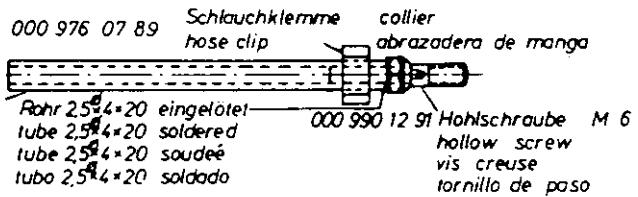
6 x Hex. screw M12 x 160 DIN 931  
— not illustrated —  
2 x Hex. screw M12 x 95 DIN 601

W 115

W 117



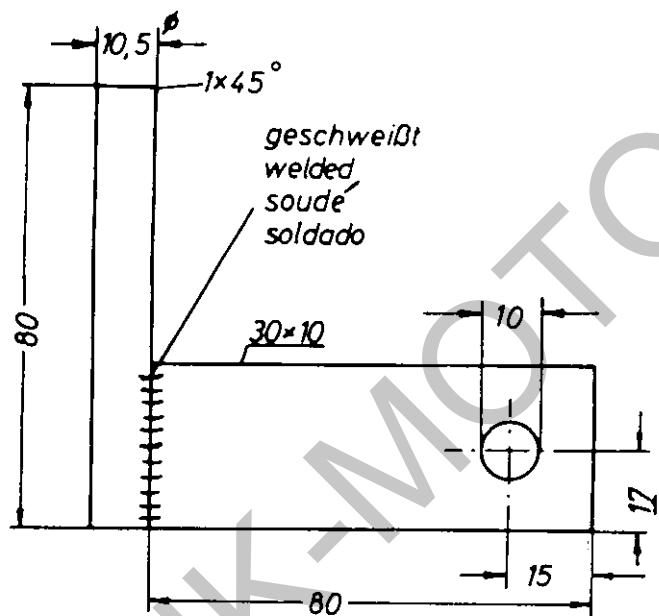
III. and  
order No.



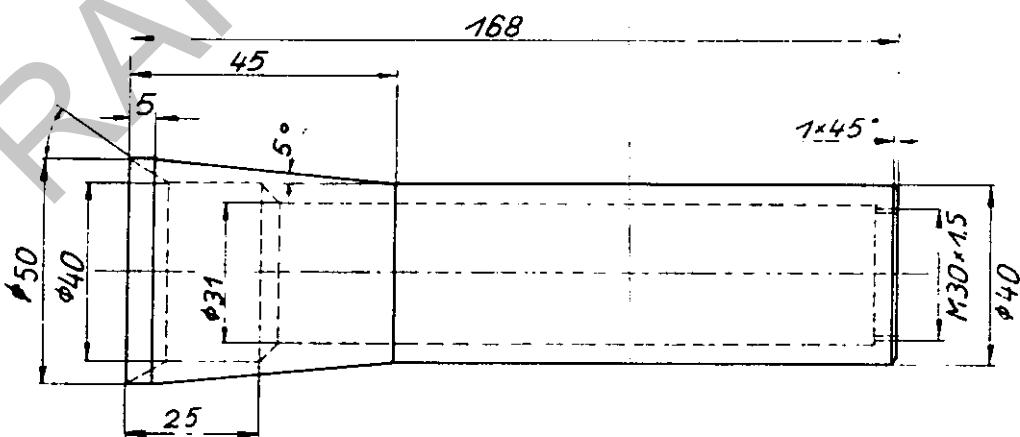
W 120

Diagonally sawn off injection pipe — not illustrated

W 121



W 122

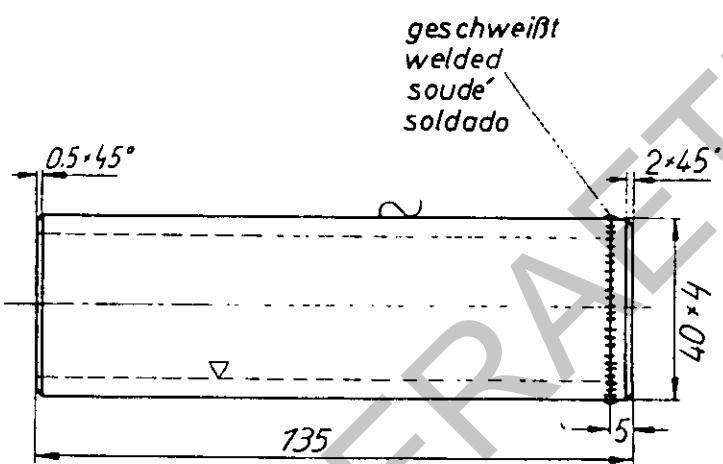


W 700

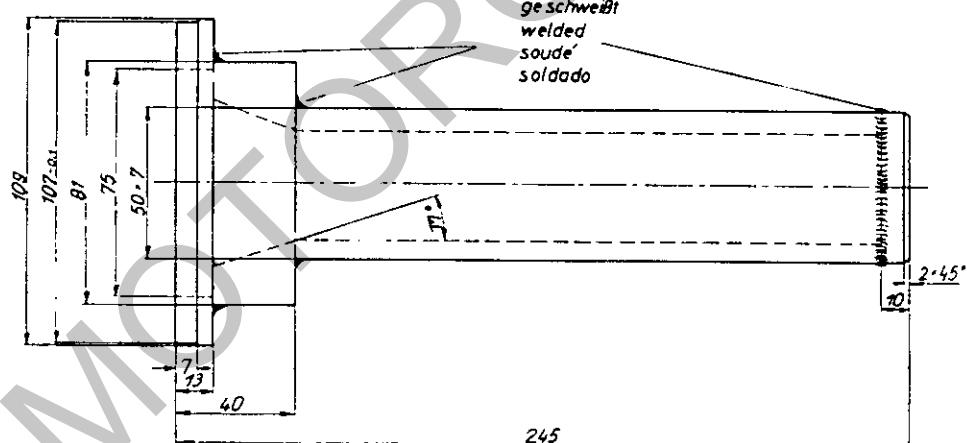
**HOLDER**

III. and  
oder No.

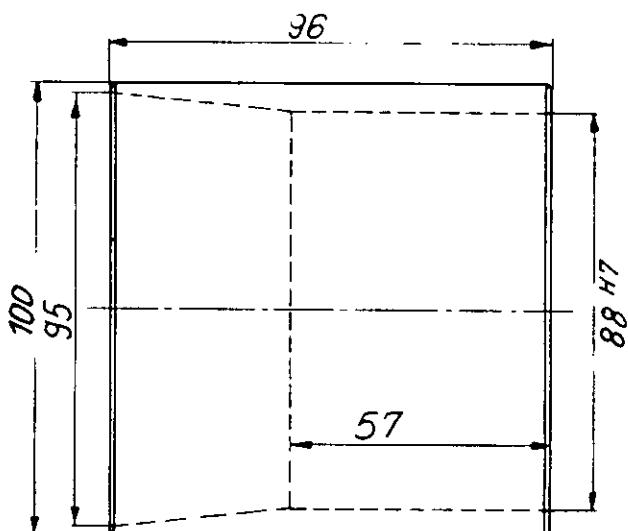
W 701



W 702



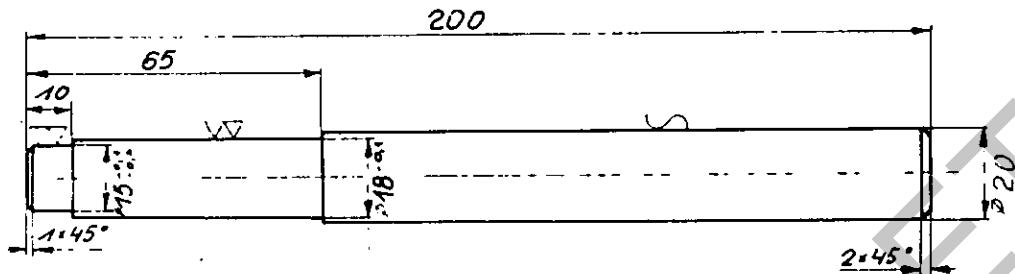
W 703  
W 703a  
W 703b



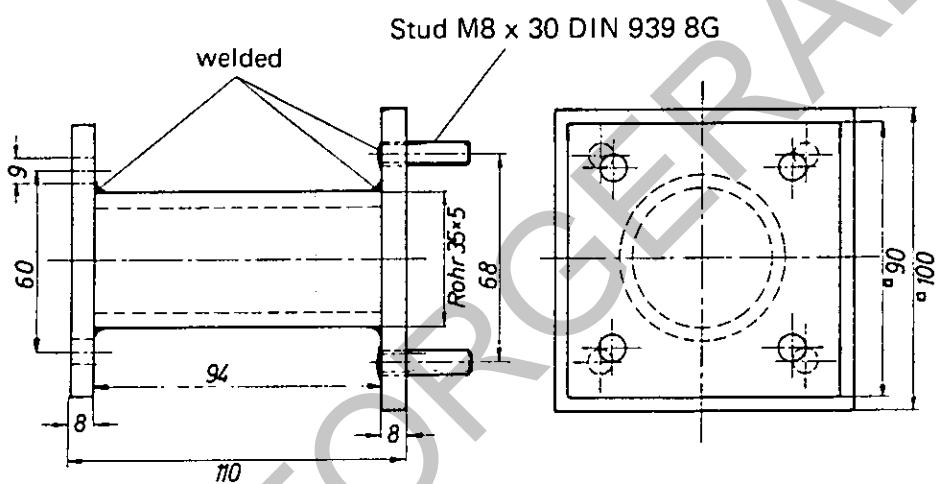
# HOLDER

III, and  
order No.

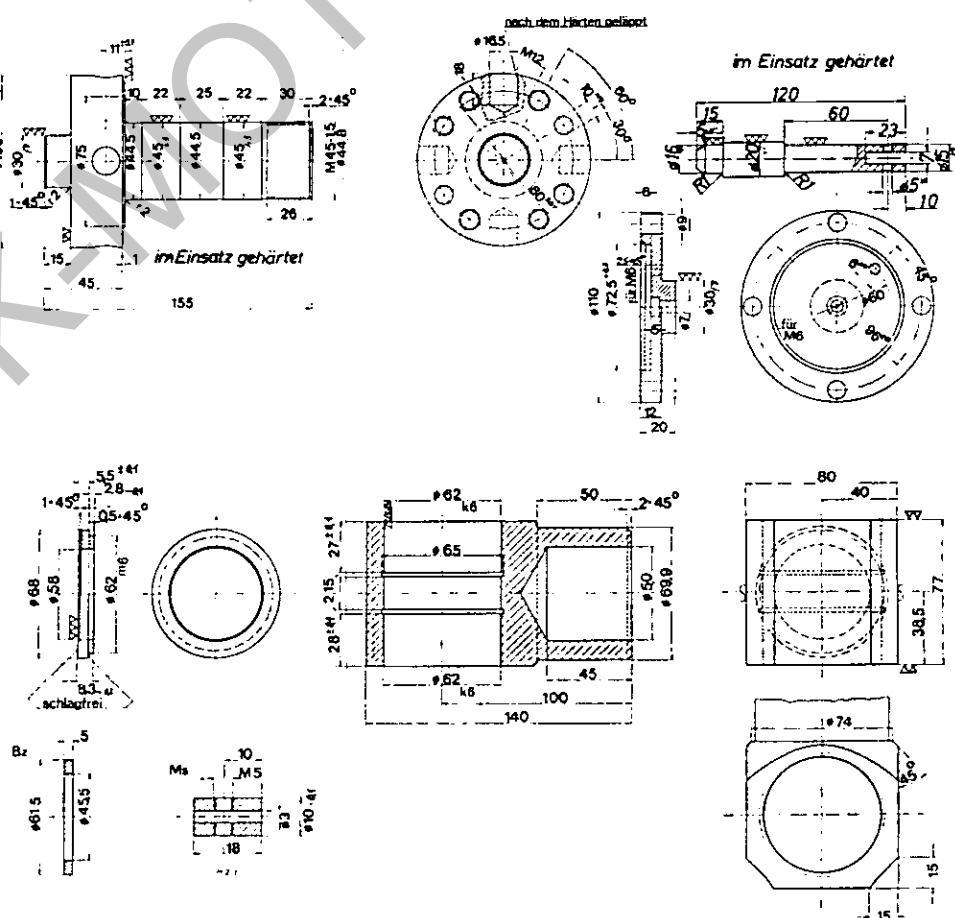
W 704

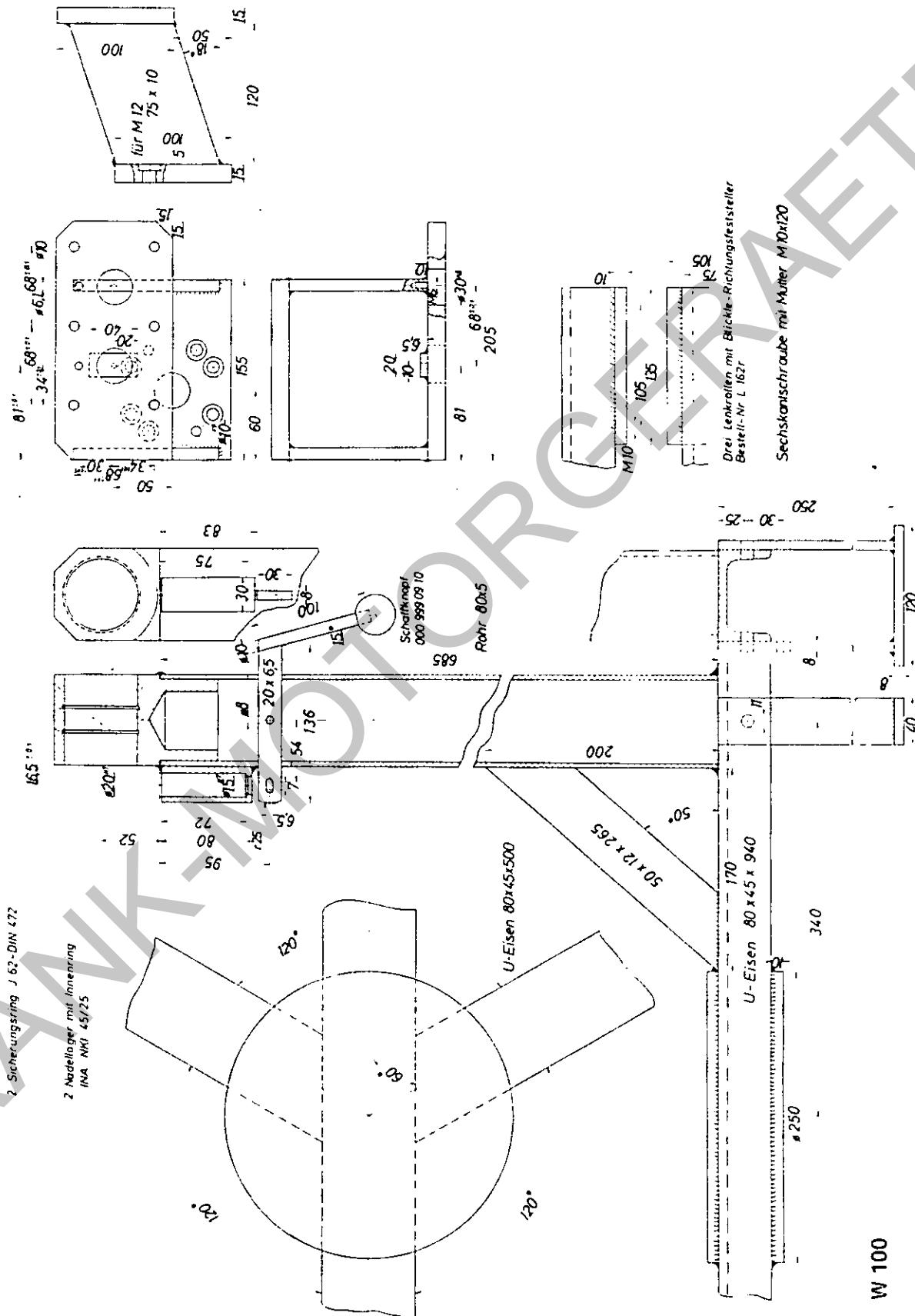


W 705



W 100





# HOLDER

## NOTES

Konvertierung der metrischen Maße  
Conversion of Metric Measurements

Conversion des mesures métriques  
Conversión de medidas métricas

Die folgenden Konvertierungen beziehen sich auf die metrischen Maße, wie sie in dieser Betriebsanleitung angegeben sind:  
The following conversions relate to the metric measurements as stipulated in this manual:  
Les facteurs suivants se rapportent aux mesures métriques indiquées dans cette notice d'emploi:  
Las siguientes conversiones se refieren a las medidas métricas como indicadas en estas instrucciones de servicio:

Capacity — Liquid Measure:

1 litre = (ltr. or l)  
= 33.815 ounces (oz)  
= 2.113 pints (pt)  
= 1.057 Quarts (qt)  
= 0.2642 Gallon (U.S. gal.)  
= 61.025 cubic inches ("in)  
= 0.0353 cubic feet ('ft)

16 ounces = 1 pint  
2 pints = 1 quart  
4 quarts = 1 gallon (U.S.)

Weight:

1 kilogram = (kg)  
= 2.2046 pounds (lbs.)

16 ounces = 1 pound

Length:

1 millimeter = (mm)  
= 0.03937 inch (in)  
= 0.00328 feet (ft)  
= 0.00109 yard (yd)

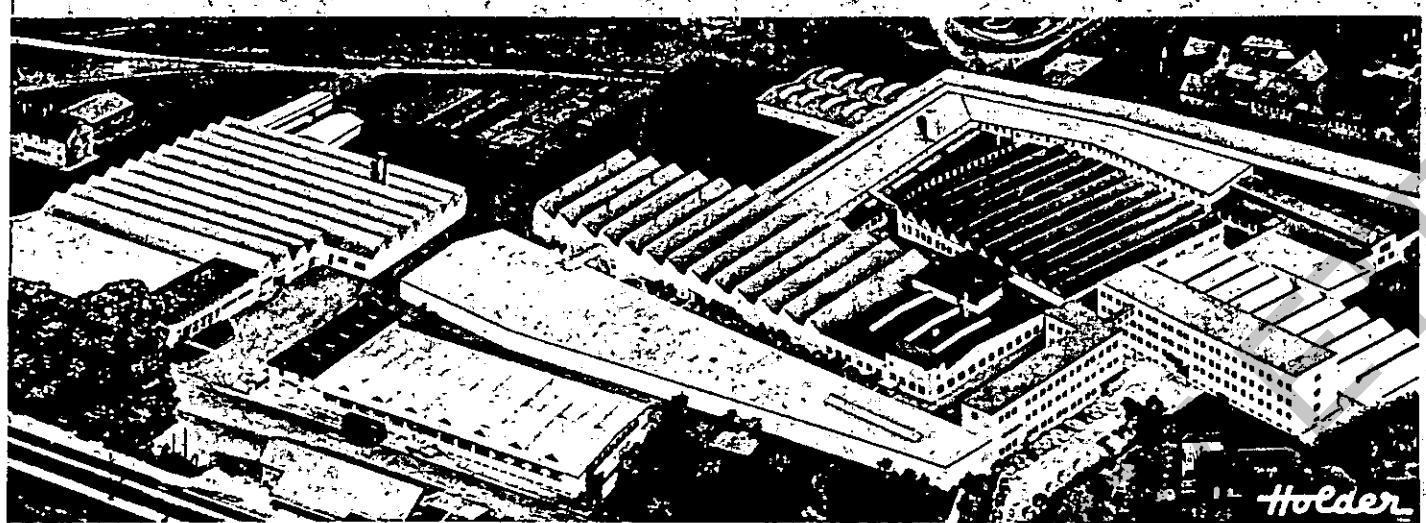
1 centimeter = (cm) = 0.3937 inches (in)  
1 meter = (m) = 39.37 inches (in)  
1 kilometer (km) = 39370 inches (in)

12 inches = 1.00 foot  
1 foot = 12 inches  
36 inches = 1.00 yard  
3 feet = 1.00 yard

Pressures:

1 atm. = 14 lb/sq. in.

Notes



*Holder*

HOLDER-  
lieferprogramm  
Motorhacken  
Einachsschlepper  
Vierradschlepper  
Rad-Antrieb-Schlepper  
Hand-Rücken-Karren-  
spritzen  
Motor-Spritzen  
Motorsprühgeräte  
Motorstäubegeräte  
Zapfwellenpumpen  
Schlepperanbauspritzen  
Anbausprühgeräte

Fordern Sie Prospekte an

**HOLDER-**  
Production Program  
Motor-Cultivators  
Two-wheel Tractors  
Four-wheel Tractors  
4-Wheel Drive Tractors  
Hand-Knapsack-Wheel-  
Barrow Sprayers  
Motor Sprayers  
Motorized Mist Blowers  
Motorized Dusters  
Power take-off Pumps  
Tractor-mounted Sprayers  
Spraying attachment

Please ask for leaflets

Programme de  
Fabrication HOLDER  
Motobineuses  
Motoculteurs Universels  
Tracteurs  
Tracteurs 4 roues motrices  
Pulvérisateurs à main —  
à dos — sur brouette  
Pulvérisateurs à moteur  
Atomiseurs — Poudreuses  
Pompes à prise de force  
Pulvérisateurs portés sur  
tracteurs  
Atomiseurs portés

Veuillez demander des  
prospectus

Programa de  
construcción HOLDER  
Motoazadas-Motocultivadores  
Tractores de 4 ruedas  
Tractores con tracción a las  
4 ruedas  
Pulverizadores de mano — de  
mochila — en carreta  
Pulverizadores de motor  
Aparatos atomizadores-motrice  
Aparatos espolvoreadores  
Bombas de tdf  
Pulverizadores para montar  
en tractores - Nebulizadores

Pidanos Vd. Prospectos