Marine Reversing Gearbox
HBW 15

Operating Instructions
Maintenance Instructions

C A R L H U R T H

MASCHINEN-UND ZAHNRADFABRIK-MÜNCHEN

MBW 15 - 2 R or L

MBW 15 - 2.8 R or L

MBW 15 - 2.8 RV or LV

MARINE REVERSING GEARBOX UNITS

TABLE OF CONTENTS

431/2 - (KS 1513) 4.61 5000

A. Brief description

HURTH marine reversing gearbox units of the HBW 15 line are helical gear transmissions shifted via a mechanical friction clutch. The maximum input torque is 18 mkg (130 ft lb), the maximum power input 100 hp. The transmissions are designed to permit reversing operations, e.g. in the event of danger, at full engine speed.

The clutches for gear changing are exactly rated to suit the nominal torque, so that shock loads originating from the output side will not be transmitted to the gearbox or engine.

The gearbox housing is made of a high-strength aluminium alloy that is resistant to sea water. The transmission is equipped with shaved and casehardened helical gears and with shafts running on heavy-duty roller bearings.

Gear shifting is mechanical and requires only a minimum displacement of the gear lever from its stop-controlled midway (neutral) position. Precision setting or readjustment of the operating member (e.g. Morse or Teleflex single-lever control) is not required.

B. Initial servicing

The transmissions are NOT filled with oil at the factory.

1. Initial servicing of new gearbox

(a) HBW 15 - 2 R or L
HBW 15 - 2.8 R or L

Fill the gearbox with the prescribed oil up to the mark on dipstick ①.

The dipstick is provided on the filler screw. For checking the oil lever just stick in the dipstick, but do not screw in the filler screw.

Tighten filler screw firmly after pouring in the oil or checking the oil level.

(b) HBW 15 - 2.8 RV or LV

Slowly fill the gearbox with the prescribed oil through filler hole ⑥ until oil overflows at oil level screw ⑦. Wait until excessive oil has flown out at oil level screw, then fit filler screw and oil level screw and tighten firmly.

131/2 - (KS 1510) 4.61 5000

2. Initial servicing after storage

If the gearbox was filled with an oxidation inhibitor for preservation, drain preserving agent, flush thoroughly with a flushing oil before proceeding as described in para. 1

If the gearbox was completely filled with oil for preservation, make sure to reduce the oil level as required (see para 1) Use fresh oil if necessary.

3. Oil quantity

Required quantity approx. .75 to .85 ltr (1-1/2 pints or 1 US quart), depending on model and position after installation (see para 1 (a) and (b) above).

4. Oil grade

Automatic Transmission Fluid, Type A,

WARNING: Additives such as molybdenum sulphide or the like must not be contained in the oil under any circumstances.

C. Maintenance

1. Oil level checks

The oil level in the transmission should be checked at monthly intervals.

(a) HBW 15 - 2 R or L and
HBW 15 - 2,8 R or L

The oil level should be up to the mark on dipstick 1 . For checking the oil level just stick in the dipstick, but do not screw in the filler screw on which the dipstick is provided.
Always use the same grade and type of oil for topping up.

(b) HBW 15 - 2,8 RV or LV

Remove oil level screw 7 . Oil level should reach the lower edge of tapped hole. (oil level in basic unit is self controlling through overflow therefore no oil-level checks necessary)

If required, top up by pouring in oil through filler hole 6 until it flows out at oil level bore 7 . Always use the same grade and type of oil for topping up.

1/2 - (KS 2513) 4.59 5000

When excessive oil has flown out, fit filler screw and oil level screw and tighten firmly.

2. Changing the oil

Change the oil for the first time after 100 hours of operation, then every 300 hours of operation, but at least at intervals of one year.

Remember to remove BOTH drain plugs (8) for draining the oil on HBW 15 - 2.8 RV or LV transmissions.

3. Putting the transmission out of operation

If the transmission is put out of operation for a prolonged period of time under unfavourable environmental conditions, it should be protected against corrosion, preferably by filling it completely with oil of the same grade and type, or else it should be operated briefly with a good oxidation inhibiting oil to allow the inhibitor to wet all parts of the transmission.

D. Notes on assembly and installation

1. General

If the gearbox is painted, care should be taken to protect all running surfaces as well as the sealing lips of the radial sealing rings provided on the input and output shafts. Make certain that the venting hole on the oil filler screw (1) or (6) is not closed by the paint.

The flange surface for the gearbox on the coupling cage should be machined to enclosed drawing 2o6759-947.97.211.o1.4. The centering bore must be 2o9,55 H8 mm (8.25oo"/8.2528").

The engine-gearbox assembly must be flexibly suspended in the boat to avoid distortions of the gearbox housing.

2. Position after installation

(a) HBW 15 - 2 R or L
HBW 15 - 2.8 R or L

The angular inclination of the gearbox in a longitudinal direction must not exceed an angle of 18° relative to the water line in operation; see Fig. 3.

(b) HBW 15 - 2.8 RV or LV

The angular inclination of the gearbox in a longitudinal direction must not exceed an angle of 5° or 10°, respectively, between the input shaft and the water line in operation; see Fig. 4.

3112 - (KS 1513) 4.69 5000

3. Operating temperature

Ensure proper ventilation of engine and transmission compartment. Operating temparature of gearbox should not exceed 130° C

An accumulation of extremely unfavorable operating conditions - very high environmental temperature, peaks in continuous higher range, especially gear "B" to be the main operating direction - may require installation of a cooling device. In such a case please contact manufacturer of gearbox.

4. Flexible couplings

Input and output shafts should be provided with flexible couplings. The coupling between engine and gearbox must be a torsio-elastic one and capable to compensate deviations from true shaft alignment. The torque at the limit of flexible condition of coupling should be approx. 30 mkg (215 ft/lbs)

The connection to the propeller shaft must be torsio-elastic for absorbing chiefly bending stresses, in order to compensate minor angular deviations after installation. If possible, radial forces should be eliminated from acting on the output shaft. The coupling has to transmit axial thrust forces because bearings of the transmission can take the propeller thrust and therefore no special propeller thrust bearing is necessary.

Information on suitable couplings available on the market will be furnished upon request.

5. Gear change system

Gear changing requires only little effort so that the gearbox provides good conditions for single lever control.

Upon loosening the retaining screw 3 , shifting lever 2 (Fig 1) can be rotated to any position required for the actuating element. The latter (operating cable or rod assy) must, must - in neutral position of shifting lever - be positioned at right angle to the shifting lever in the plane of lever operation.
The shifting travel, measured at the pivot point of the shifting lever, must be at least 35mm(1-3/8") to each side (shifting position A and B) from the stop-controlled midway position (see Fig 1).Lager shifting movements have no detrimental effects on the transmission.

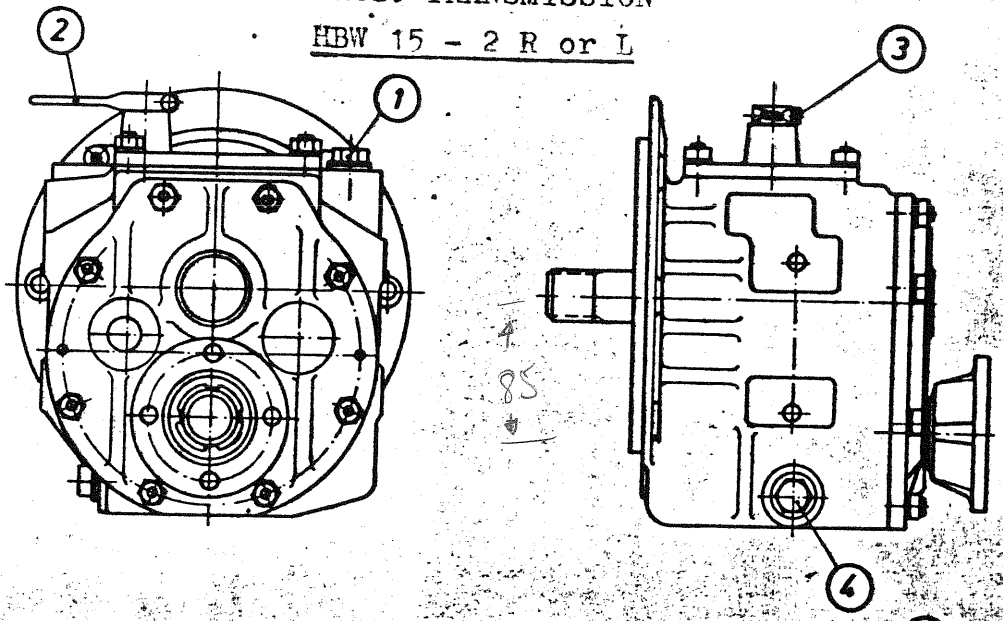
6. Transport

When moving gearbox or engine/gearbox assembly, care should be taken to protect the gearbox from excessive shocks and impacts, especially on input and/or output-shaft.

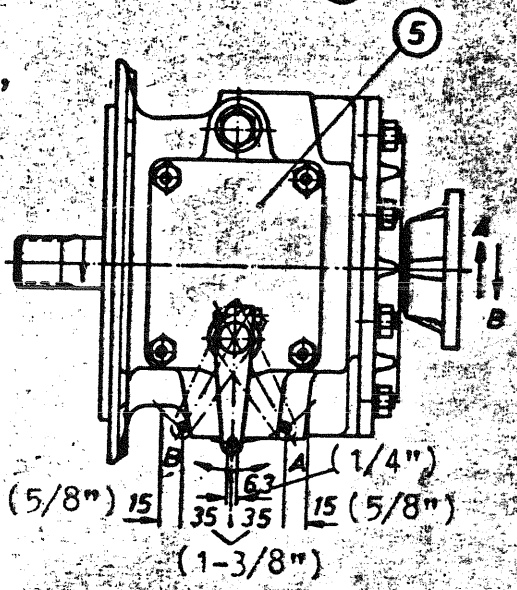
431/2 - (KS 1513) 4.69 5000

Fig. 1

BASIC TRANSMISSION
HBW 15 - 2 R or L



① Oil filler screw with dipstick, venting hole
② Shifting lever
③ Retaining screw for shifting lever
④ Oil drain plug
⑤ Cover



BASIC TRANSMISSION
WITH FINAL DRIVE UNIT
HBW 15 - 2.8 R or L

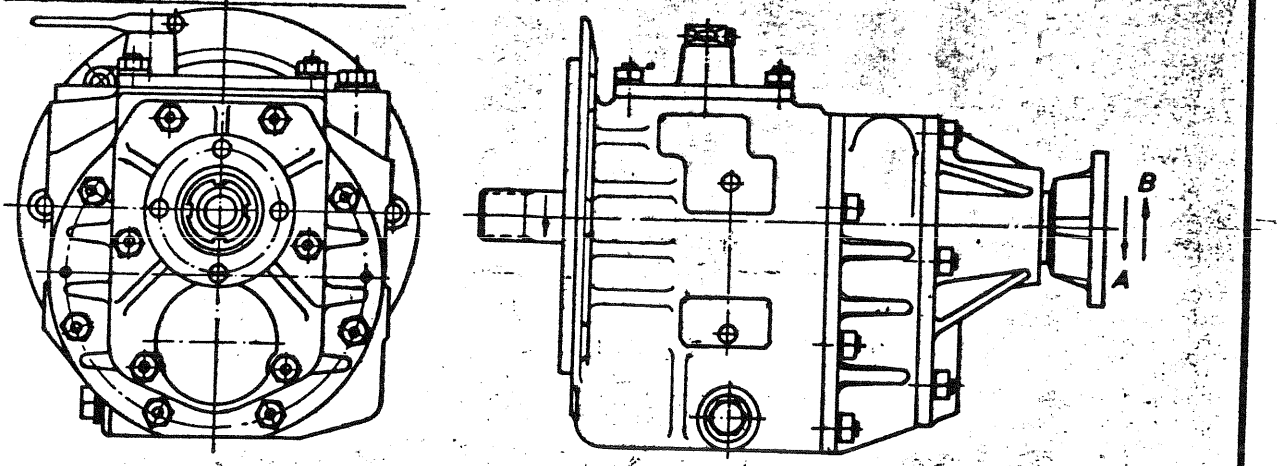


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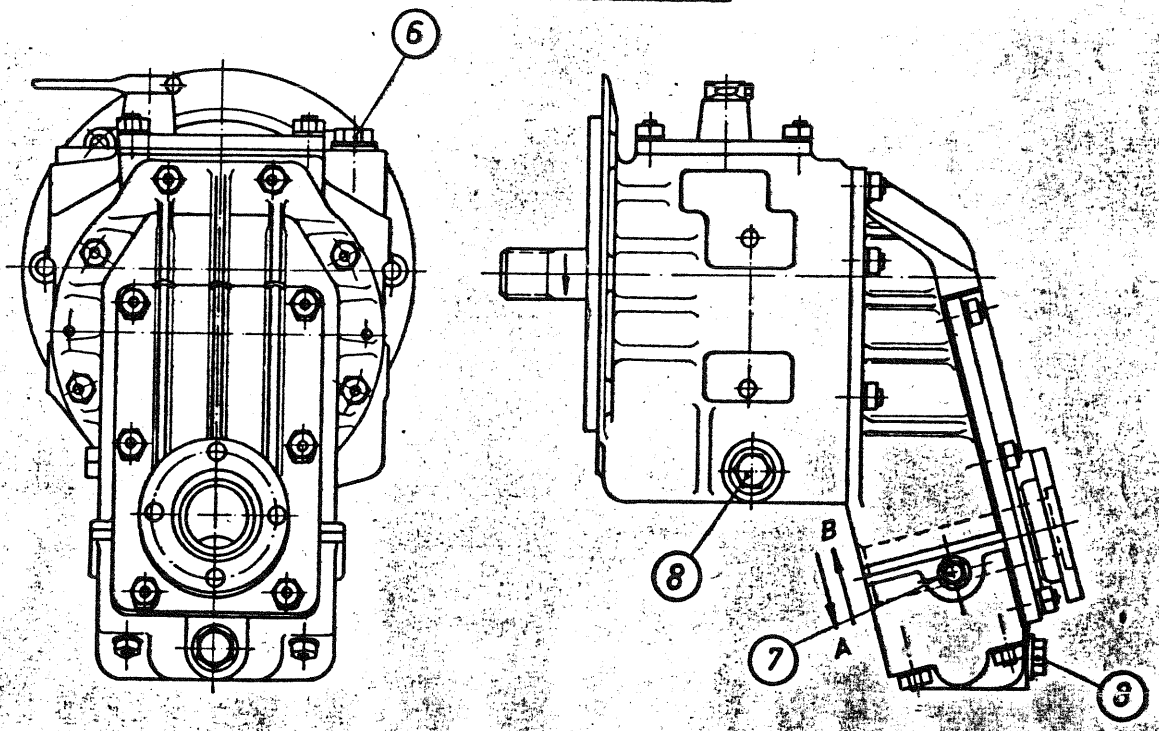
Fig. 2, BASIC TRANSMISSION WITH V-DRIVE

HBW 15 - 2.8 RV or LV



⑥ Oil filler screw, venting hole

⑦ Oil level screw

⑧ Oil drain plugs

1/2 - (KS 1513) 4.69 5000

Fig. 3

HBW 15 - 2 R or L
HBW 15 - 2.8 R or L

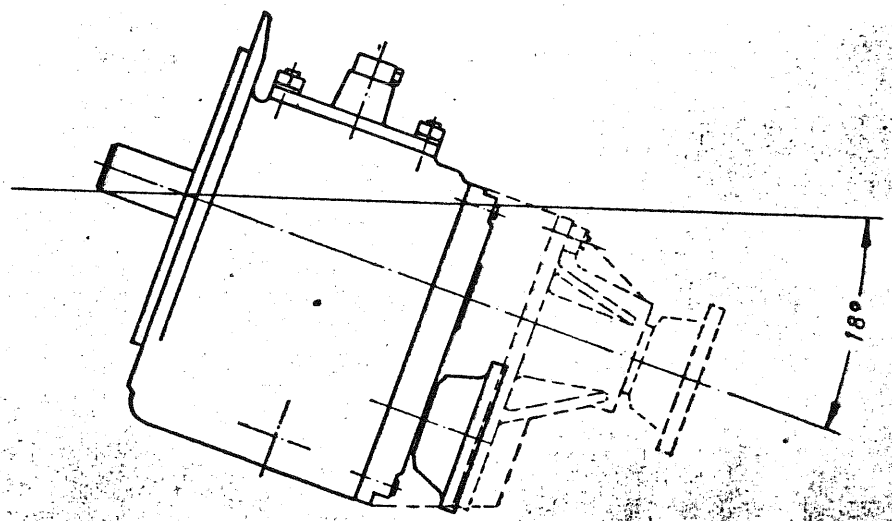
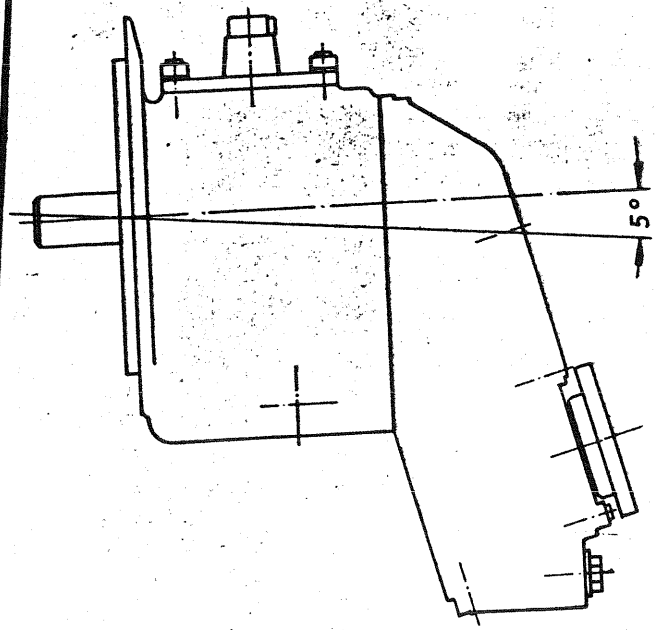
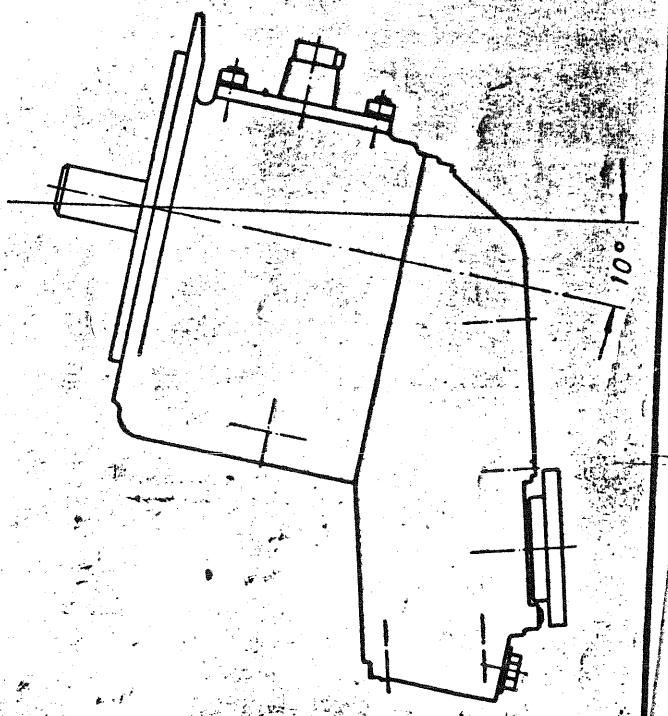


Fig. 4

HBW 15 - 2.8 RV or LV



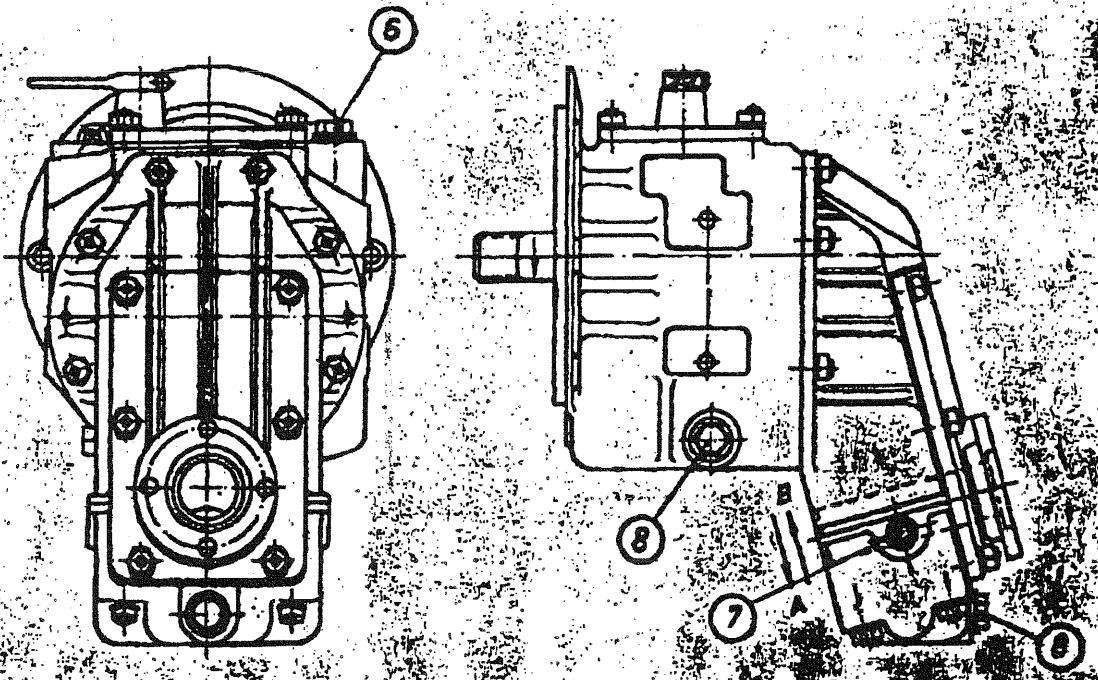


(KS 1413) 4.69 5000

Fig. 2

BASIC TRANSMISSION WITH V-DRIVE

HBW 15 - 2.8 RV or LV



⑥ Oil filler screw, venting hole

⑦ Oil level screw

⑧ Oil drain plugs

Fig. 3 HBW 15 - 2 R or L
HBW 15 - 2.8 R or L

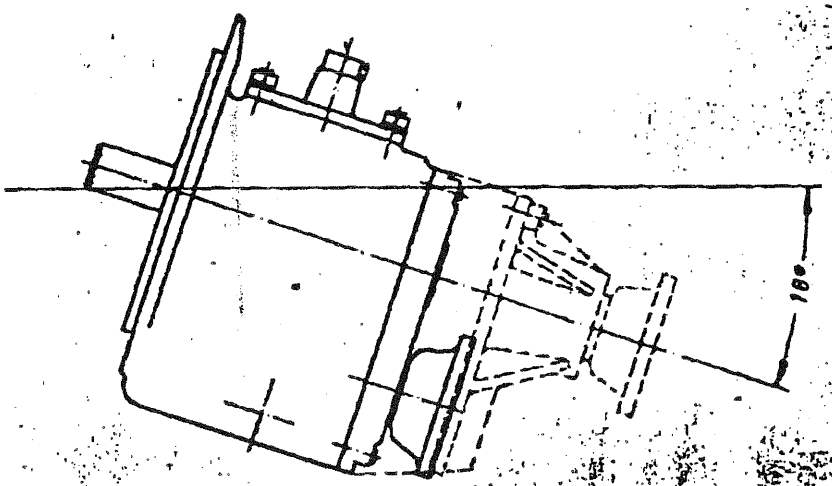
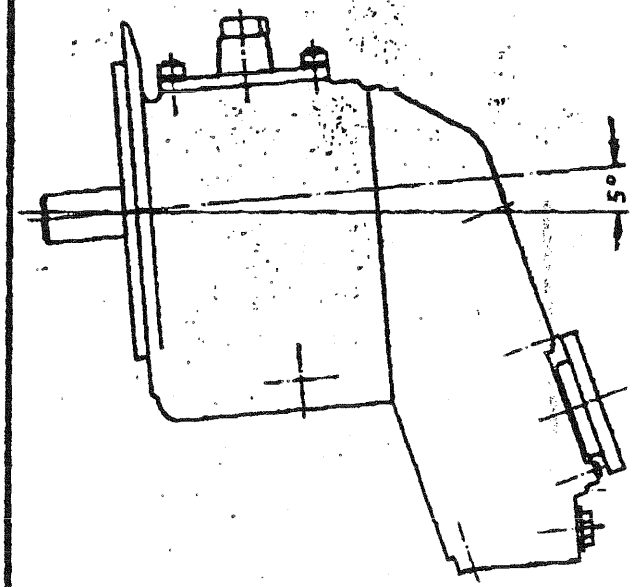
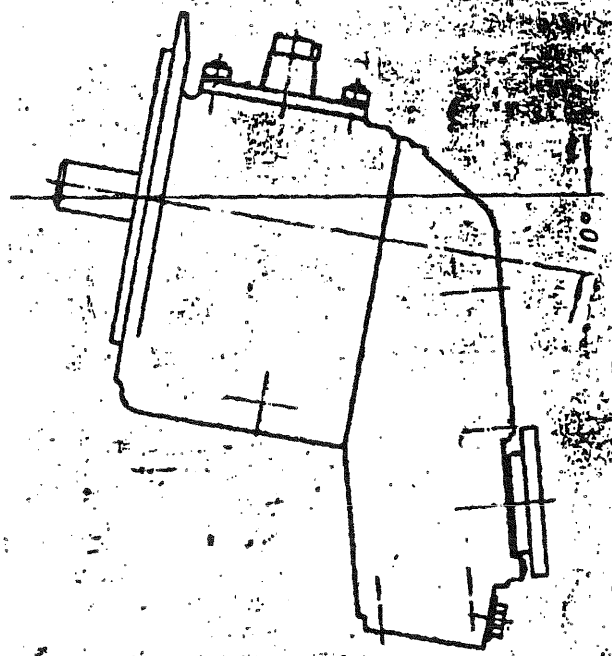


Fig. 4 HBW 15 - 2.8 RV or LV





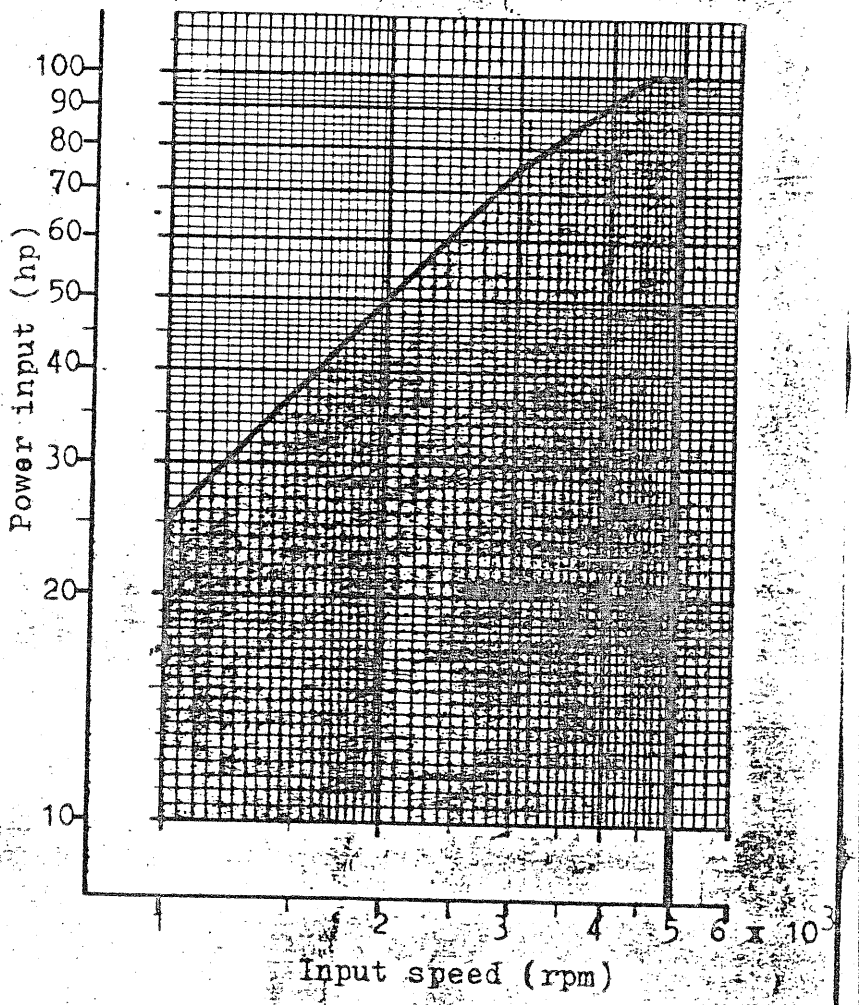
E. Technical data

Max. input torque 18 mkg (130 ft lb)
Max. input speed 5000 rpm
Max. power input 100 hp

The diagram is based on engine power output rating B, German standard specification DIN 6270.

For engines with fewer than four cylinders, a shock factor of K = 1.25 should be taken into account.

* The suffix letters A and B denote the shifting lever positions; see Fig. 1.
i = gear ratio.



Model	Gear ratios*	Weight
HBW 15 - 2 R or L	i_A = 2.0 i_B = 1.75	approx. 21.5 kg (47 lb)
HBW 15 - 2.8 R or L	i_A = 2.8 i_B = 2.5	approx. 29 kg (64 lb)
HBW 15 - 2.8 RV or LV	i_A = 2.8 i_B = 2.5	approx. 31 kg (68 lb)

R and L indicate the direction of rotation of the input shaft: R = clockwise; L = anticlockwise (if viewed toward input shaft).

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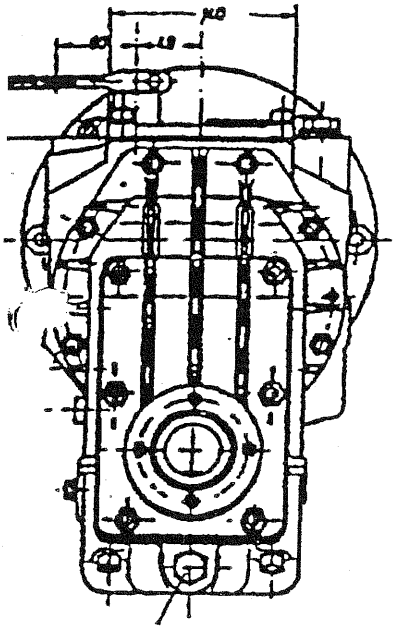
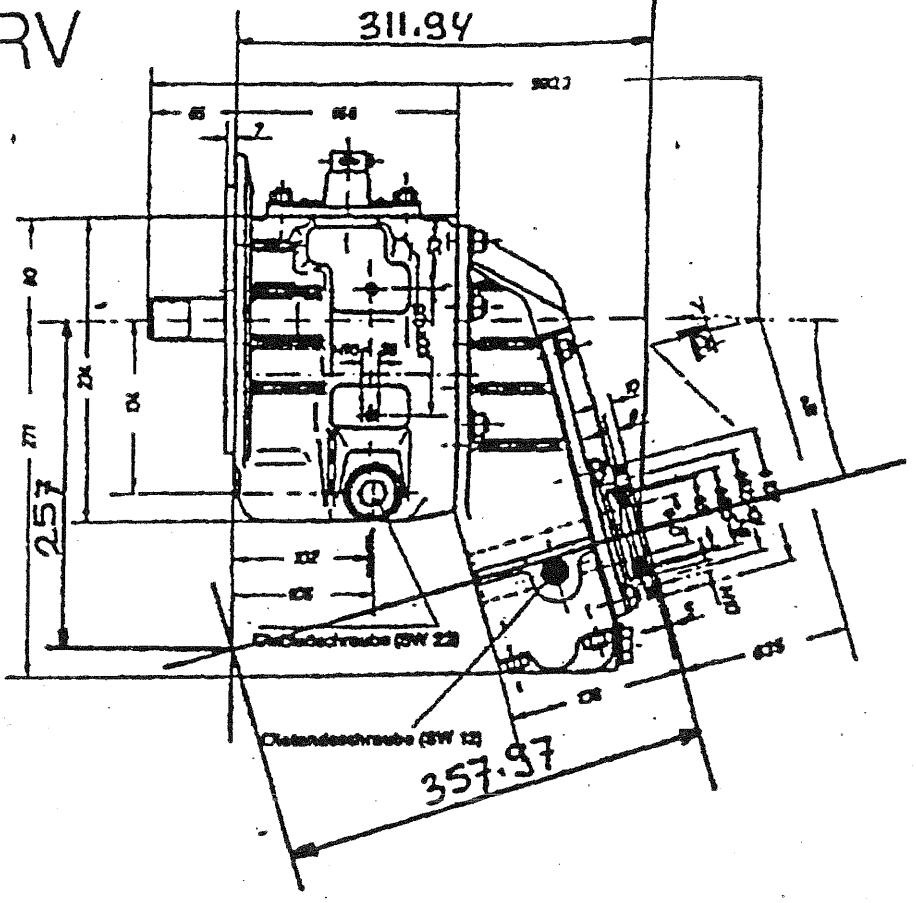
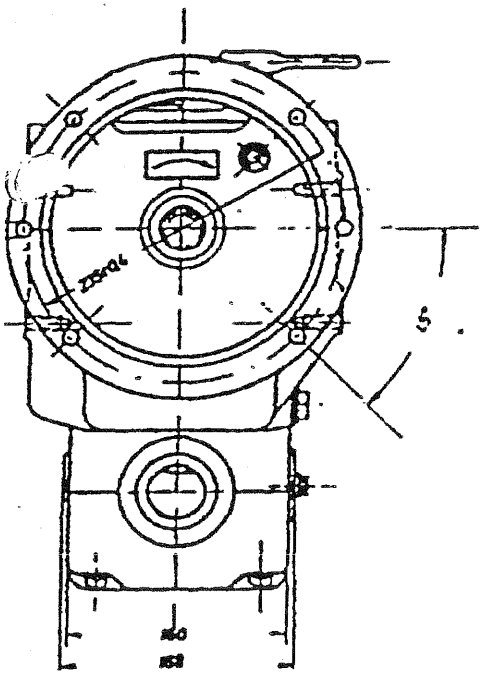
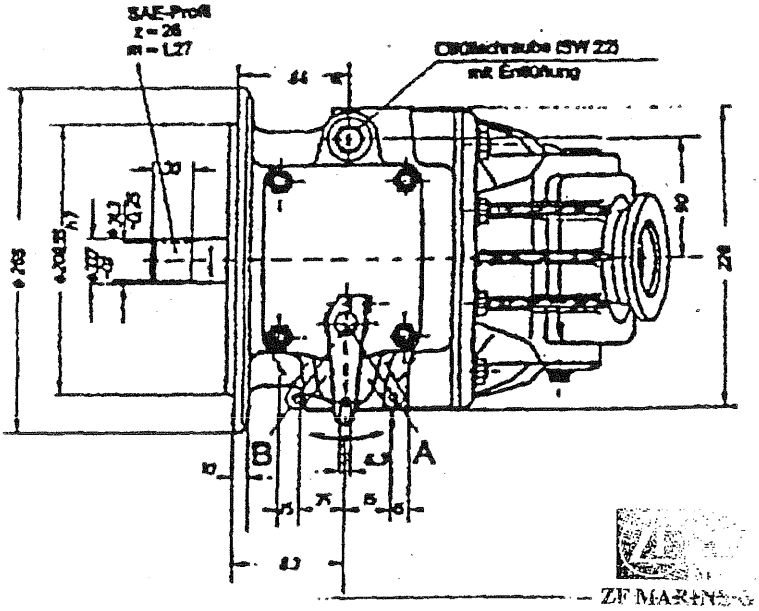
HBW 15 - 2,8 RV









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