

HEIMDAL PROPULSION NORWAY AS

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CP PROPELLER

&

MARINE GEAR

SERVICE

&

PARTS

MANUAL

FOREWORD

This service and parts manual relates to a complete cp-propeller with marine reduction gear, or shaftline servo unit manufactured by
HEIMDAL PROPULSION NORWAY AS.

However, where a HEIMDAL product is part of a propulsion system that incorporates products of other manufacture, this manual is only valid for such equipment as is manufactured or supplied by
HEIMDAL PROPULSION NORWAY AS.

Torsion data for equipment of HEIMDAL supply is provided to the Engine Supplier or Shipyard prior to delivery of the cp-propeller plant to enable a torsional vibration analysis to be carried out.

It is a condition of the HEIMDAL warranty that the responsible party prior to the vessel entering service gives torsional approval of the complete driveline.

Such approval is to include ancillary equipment driven from the engine and/or gear, and is to be without barred speed ranges.

When ordering replacement parts, please give the reduction gear serial number, and the specific drawing number, position number and part description, in addition to the part number.

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EQUIPMENT SPECIFICATIONS PROJECT NO. 8502,8503,8506,8507**MARINE GEAR.**

Gear Model	PB100 SAE 1
Serial Number	1100-1107
Reduction Ratio	3:1
Engine Make and Model	Detroit 8V-92
Rated	324Hp @ 1800rpm
Elastic Coupling	Twin Disc 14"
Rubber Cone Blocks	
Main Oil-Pump	2PL146 CPDSBE
Oil-Filter Element	Cat 3S3875
Relief Valve Setting	40 Bar
Clutch Pressure Setting	20 Bar
Clutch Solenoid Valve	N.A.
Oil-Cooler Inlet Water Flow	Max 150 L/min.
Oil-Cooler Inlet Water Temp	Max 35 Deg. Celsius
Gear Weight	650 kg
Temperature Sensor	VDO
Pressure Sensor	VDO
Sender Alarm	N.A.

CP-PROPELLER

Propeller Model	K300 Drwg. 104-008
Shaft Arrangement	Drwg. 105-031, H=2038mm, K=2126mm.
Propeller Blade Design	1065H V HS Drwg. 302-008/302-009
Propeller Diameter	1065mm
Rotation viewed from aft	Right Handed and Left Handed
Propeller Shaft Diameter	108mm Drwg. 202-088
Stern Tube Arrangement	Drwg. 202-089
Inboard Stern tube Seal	DSS EJ-108
Outboard Stern tube Seal	Water Lubricated
Seawater flow for Inboard Seal	108 Ltrs/Hour - minimum
Level Alarm Switch	N.A.
Nozzle Type and Diameter	N.A.
Propeller and Shaft weight	Approx. 550 kg
Stern tube and Fittings	Approx. 150 kg
Classification Society	ABS
Service Manuals Supplied	3 sets English/Norwegian

RECOMMENDED LUBRICANTS**Marine Gear**

CASTROL	Alpha	SP150
BP	Energol	GR/XP-150
ESSO	Spartan	EP150
MOBIL	Mobilgear	629
SHELL	Omala	100
SHELL	Omala	150
TEXACO	Meropa	100
STATOIL	Loadway	EP100/EP150
TOTAL	Carter	EP150

First oil change at 200 hours, regular oil change at 1000 to 2000 hours, dependent on operating conditions.

Oil capacity (dry):

HG200 Gear 35 litre

HG300 Gear 60 litre

HG400 Gear 130 litre

Propeller Hub (except K600)

BP	Energrease	MM-EP2
ESSO	Beacon	No. 2
MOBIL	Grease	No. 2
SHELL	Alvania	EP2/3
CASTROL	CL Grease	1616
TEXACO	Novatex	EP2
TEXACO	Multifak	EP2
STATOIL	Uniway	Li62
TOTAL	Multis	EP2/3

The propeller hub must be greased with the blades set in the full ASTERN position to avoid over-filling and possible hub damage.

DESCRIPTION OF CP-PROPELLER

The Heimdal K-Series propeller is of Three or four bladed design, with the hub and blades manufactured in NiAl bronze.

On the three-bladed type, the hub is split radially at the blade centre-line, and the propeller blade journals each have a rubber seal ring fitted. The hub is grease packed and movement of the pitch control rod forces grease to the blade journals.

On the four-bladed, the hub is manufactured as a single part and fitted with an end cover. The propeller blades are bolted to a carrier and each have a rubber seal ring fitted. The hub is oil lubricated from the sterntube gravity tank through borings in the propeller shaft.

The pitch control rod is manufactured in stainless steel and is supported in the hollow-bored propeller shaft by two bearings. Linear movement of the control rod is converted to a circular motion by a positioner slide and slide blocks that engage gudgeon pins fitted to the propeller blades.

The propeller shaft is manufactured in high-tensile steel and is secured at the hub (3-bladed models) by a key, taper and lock nut arrangement. The K600 (4-bladed model) hub is a shrink-fit on the propeller shaft. All models are mounted to the gear output flange by a split-type coupling.

The sterntube is manufactured in seamless steel tubing and is mounted to the hull in a way that allows for axial movement at the inboard end. Propeller shaft bearings are of iron-backed white metal and are oil-lubricated from a gravity supply tank mounted 2-3 meters above the waterline. The type of sterntube seals fitted are given in the equipment specification.

CP-PROPELLER DESIGN.

The hull design and type of operation determine the blade shape while the propeller speed dictates the optimum diameter for the horsepower used. The propshaft and hub diameter are determined by the maximum torque to be transmitted.

The design pitch of a cp-propeller is identical to that which would be used for a fixed-pitch propeller operating in a vessel of the same specifications.

However the advantage with a cp-propeller is that the blades may be rotated to compensate for variations in operating conditions that are outside the original design concept.

With minor changes to the blade setting, it is possible to keep the engine at its most effective operating speed irrespective of vessel speed. Engine driven alternators and hydraulic pumps can run at the rpm consistent with best performance.

Manoeuvrability is greatly improved, and in an emergency the propeller can be moved to the astern position while the vessel is running ahead for a much reduced stopping time.

PROPELLER OPERATION

The propeller should be in the neutral position with the engine set at idle when the clutch is engaged.

Increase the engine speed to high idle after engaging the clutch and apply a few degrees of pitch to bring the vessel under way.

Then while moving the engine to maximum speed, progressively increase the pitch to obtain the required speed.

AVOID OVERLOAD - USE FULL PITCH ONLY WHEN THE VESSEL IS MOVING.

Maximum performance is obtained when the blade setting is such that it absorbs the power for which the propeller is specified.

MANOEUVRING AT LOW SPEED.

Set the engine speed to approximately 70% of maximum rpm and use just the pitch control to manoeuvre the vessel ahead and astern. The propeller will travel from the full ahead to the full astern position in 10-15 seconds at this engine speed, depending on the oil-pump capacity and size of equipment installed.

THE PITCH CONTROL LEVER WILL ALWAYS FOLLOW THE MOVEMENT OF THE SERVO PISTON AND FORCING IT WILL HAVE NO EFFECT ON THE SPEED OF PITCH LEVER AS IS NECESSARY TO OVERCOME FRICTION IN THE CONTROL SYSTEM..

EMERGENCY STOPPING.

In an emergency, the propeller pitch can be moved from the full ahead to the full astern position while the vessel is running ahead at maximum speed, although this may severely overload the engine.

For the quickest possible stopping time, it is best to reduce the engine speed at the propeller is reversed and then increase the engine speed at the propeller begins to bite in astern. This reduces propeller cavitation (which can limit the braking effect) and vibration.

ECONOMICAL OPERATION.

For the most economical operation, bring the engine up to full power and the vessel to full speed, then leaving the pitch lever as set, gradually reduce the engine rpm (8-10%) until the vessel speed is marginally affected.

At this setting the minimum horsepower necessary is being used to maintain the vessel speed and both fuel consumption and engine wear will be reduced.

DESCRIPTION OF MARINE GEAR.

The HG-Series Marine Gears are of vertical-offset, single-stage design offered as a free-standing unit or with an SAE bellhousing for direct mounting to the engine.

Power is transmitted through a flexible coupling connected to the flywheel. The primary shaft has a hydraulic multi-disc clutch and a gear-type oil pump, which is driven directly from the engine flywheel to provide oil-pressure immediately on starting-up.

The gear pinion is integral with the primary shaft and supported by one spherical and one cylindrical roller bearing. The secondary shaft is supported at the forward end by a iron-backed white metal bearing and at the aft end by a spherical roller bearing. The pitch servo cylinder and piston are mounted in the centre of the gear wheel and output shaft. The servo piston is connected to the pitch setting mechanism in the propeller hub by a control rod.

Movement of the servo piston is controlled by oil fed to either side of the piston through oil-ways drilled in the piston shaft, via the servo slide valve. The servo slide valve is operated by a control lever and the position of the valve determines the pitch setting.

GEAR LUBRICATION SYSTEM.

Oil is drawn by a pump from the gear sump via a filter element fitted with magnets to trap any steel particles and delivered through an oil-cooler to the oil distribution valve block. While the clutch is disengaged the oil is diverted to the propeller shaft-brake. When the clutch is engaged oil is directed to the clutch. When correct clutch working pressure has been reached a valve opens and oil is fed to the valve block provides oil to the slide bearing should there be insufficient oil-pressure to open the valve.

The valve block has a safety valve and oil-feed outlets for the lubrication of bearings and gear-wheels.

Oil flow from the distribution block to the clutch is adjustable and should clutch engagement be too sharp, then the regulator may be turned clockwise to reduce the flow and extend the engagement time. Correctly set, the clutch will fully engage in 2--5 seconds.

Should oil-pump failure or leakage in the oil system prevent the clutch engaging, it can be engaged mechanically by fitting the emergency bolts that are mounted on the gear top-cover. These are screwed into the clutch housing to lock the discs. The propeller must be wedged in ahead position by using a bar through the slots in the shaft coupling, and locked in this position to prevent the propeller going astern.

SERVO LUBRICATION SYSTEM

Oil is drawn by a pump from the servo sump via a filter element and delivered through an oil-cooler and safety valve to the oil distribution valve, and further to the oil inlet ring and servo cylinder.

Pipelines fitted to the main feed line between the cooler and the safety valve provide lubrication to bearings.

Should an oil-pump or drive-chain failure prevent the pitch servo operating, the electric standby lubrication system (where fitted) may be brought into use. (AFTER first checking that no mechanical damage will result from the failure. E.g. A broken chain damaging the sprockets of shaft.)

Where there is no electric standby lubrication system fitted, and no spare parts are held onboard, the propeller must be wedged in the ahead position by using a bar through the slots in the shaft coupling, and locked in this position to prevent the propeller going astern.

INSTALLATION OF STERN TUBE.

Wooden Vessel.

The stern tube for a wooden vessel is installed from the engine room in seats bored in the stern boss and inner bulkhead. First bolt the stern tube to the inner bulkhead, ensuring that the mounting flange lies absolutely flat against it. Next, ensuring that the outer flange is absolutely flat against the stern post, fit the stern nut with attached o-ring. Check that the o-ring is well seated in the groove, before tightening the nut. Finally countersink the two set-screws into the stern tube and securely fasten.

Please refer to the installation drawing, and the data sheet for the stern tube seals included with this service manual.

Steel Vessel.

The Stern tube for steel vessel is installed from astern after the stern boss has been bored to in accordance with the dimensions shown on the installation drawing. This will give a press fit and will ensure a secure mounting in the stern. Next the stern tube mounting flange with attached o-ring, is fitted .

The stern tube is supported radially at the inner bulkhead flange to allow for axial expansion. Two o-rings fitted to the oil inlet ring provide a seal between the flange and the stern tube.

Please refer to the installation drawing, and the attached data sheet for the stern tube seals.

PROPELLER SHAFT INSTALLATION.

It is essential that the sterntube and propeller shaft are free of burrs and well cleaned and lubricated before fitting.

The propeller shaft, with the outer seals prefitted, is carefully pushed into the sterntube. Next the inner seal assembly is fitted loosely on the shaft and then the thrust-ring and shaft coupling are mounted on the forward end. The distance between the faces of the propeller coupling flange and gear output flange is measured and the gear and propeller shaft aligned.

The distance between the flanges must correspond to the preload specified by the manufacturer for the outer sterntub seal. Refer to propeller arrangement drawing. Failure to observe the correct clearanse could lead to water entering the sterntube or may causes oberheating of the seal, leading to premature failure.

If it is not possible to position the engine and marine gear at the specified distance then a shim should be inserted behind the outer seal seat or between the flange faces to obtain the correct clearance.

INSTALLATION OF MARINE GEAR.

Holset Coupling Fitted.

Where the marine gear is to be directly coupled to the engine and a Holset Coupling is fitted, it is necessary to drill a 14mm hole in the engine fly-wheel housing. This hole must match the pre-drilled hole in the marine gear housing, which is designed to allow oil-spray from the gear to drain back to the gear sump.

THE ENGINE FLYWHEEL HOUSING MUST BE COMPLETELY SEALED WHEN THE MARINE GEAR HAS BEEN DELIVERED WITH A HOLSET FLEXIBLE COUPLING.

Vulkan Coupling Fitted.

Where the marine gear is to be directly coupled to the engine and a Vulkan Coupling is fitted, it is essential that the air vents in the marine gear housing are not obstructed.

THE ENGINE FLYWHEEL HOUSING MUST BE VENTILATED WHEN THE MARINE GEAR HAS BEEN DELIVERED WITH A VULKAN FLEXIBLE COUPLING.

Both the HOLSET and VULKAN Couplings are mounted as a complete assembly, and access is gained through the marine gear top and side covers. Mounting bolts to be secured with spring-washers.

A dial gauge must be used to check that the coupling runs true.

The marine gear is bolted to the flywheel housing using Permatex or a similar sealant between the flange faces. Mounting bolts to be secured with spring washers.

GEAR OIL-COOLER.

The oil-cooler fitted to the marine gear is suitable for use with freshwater or seawater cooled engines. It is designed to provide adequate cooling for the gear under normal working conditions, in any climate.

The inlet water flow, maximum heat dissipation, piping dimensions and fittings are shown on the relevant installation drawing.

Maximum inlet water temperature must be held to approximately 25 degrees Celsius to ensure that the gear working temperature stays between 40 and 55 degrees Celsius (measured at the filter cover).

It is suggested that a gate valve be fitted in the cooling water line, so that the flow may be regulated on sea trials to obtain the correct gear working temperature. In colder climates, this is essential to allow the gear to achieve the required temperature.

Operating the gear outside the specified temperature range could result in propeller pitch fluctuation, poor clutch engagement, or damage to the bearings and seals.

BRIDGE CONTROLS

The propeller pitch system is operated from the bridge position by mechanical, hydraulic or electric controls. Pneumatic control systems are NOT recommended for the propeller pitch actuation.

Mechanical control systems are NOT recommended for use where the cable run would exceed 10 meters or include more than four bends.

Electric controls will normally provide the best overall solution and we can recommend a Newbury (NDC) system or the Heimdal Remote Controls. (Where Heimdal controls are part of the scope of supply please refer to page 24 for a Description/Setting-up procedure.

For correct pitch operation, the control system must have a total stroke of 10cms (4 inches) through a 55 degree travel arc, and it should be possible to limit the astern stroke to 65% of the ahead travel that is actually determined during the sea-trials.

A minimum operating torque of 10Nm is necessary to overcome the friction in the servo system linkage. Maximum torque should not exceed 50Nm, or mechanical damage to the gear will result.

As the response time of the servo is determined by engine speed any bridge control system that gives a torque in excess of 50Nm MUST incorporate a telescopic link that is capable of absorbing the full 10cms travel either direction.

It is ESSENTIAL that there is no backlash in the control system as this will allow movement of the pitch operating lever, which will give fluctuations in the pitch setting.

PITCH INDICATOR

The PT1 Bridge Panel offered as an option with the Gear or Servo unit includes two gauges for monitoring the oil temperature and pressure, clutch buttons (with gear only) and a pitch indicator.

Please refer to the drawing/wiring diagram at the back of this manual for installation data. All the connections must be checked before electrical current is applied as the potentiometer/circuit board will be damaged by a voltage across the wrong terminals.

When the unit is installed, the vessel is run at high idle and with the shaft rotating, the true zero pitch is established by moving the pitch lever around the zero point until the vessel remains stationary. (No "creep" in either direction.)

The potentiometer should then be centralised on its mounting to obtain a zero reading on the pitch meter, there is a pre-set for fine adjustment. After the propeller travel has been correctly set on trials (see next page), the pre-set for scale deflection should be adjusted to give reading of 100% load at the maximum travel in the ahead position.

SETTING TO WORK.

It is ESSENTIAL that the shaft alignment is re-checked within two to three days of the vessel being launched, and before the vessel is taken to sea for trials.

Heimdal will not consider any claim for damage to the equipment where this is caused by miss-alignment.

The Marine Gear/HPC servo unit is fitted with mechanical stops on the pitch lever to limit the maximum travel in both ahead and astern, the following procedure should be adopted to set the pitch correctly.

1. Check that the clearance between the propeller push-pull rod and the gear/servo shaft rod at the connector in the coupling flange is in accordance with the installation drawing.

2. **Marine Gear Fitted.**

With the engine set at high idle and the clutch DIS-ENGAGED operate the pitch from full ahead to full astern. Should the servo pressure gauge give a sudden increased reading in the full ahead or full astern positions, then the servo piston is butting against the cylinder end cover and the travel must be reduced by adjusting the mechanical stop.

HPC Servo Unit Fitted.

The same test is carried out with the engine switched off and the electric standby lubrication pump operating.

3. The engine is set at high idle and the propeller rotated with the pitch lever set in the zero position. The true neutral is established by moving the pitch lever round the zero position until the vessel does not "creep" ahead or astern.
4. The bridge control handle should now be reset to indicate the zero pitch position, and where the gear/servo is fitted with a pointer on the pitch lever, this may also be reset by using the allen key adjustment at its base.
5. The vessel should be taken out to sea in its normal departure condition and the engine run up to maximum "no Load" rpm. The propeller pitch is progressively increased until the engine speed sinks to the rpm consistent with specified power output.

The mechanical stop for maximum ahead pitch should be locked up at the point where the propeller loads the engine to the rpm/temperature/boost pressure specified by the manufacturer for maximum output. (refer to the engine test-bed report).

6. The mechanical stop for maximum astern pitch should be set at 60-65% of the maximum ahead pitch setting by reading from the scale on the side of the gear/servo unit.

PROPELLER MAINTENANCE.

Daily Inspection.

1. Check the oil level in the sterntube supply tank.
2. Check the sterntube for excessive heat and leakage through the inner sterntube seal. (Check shaft alignment and preload on inner seal if heat or leakage evident).

Vessel Slipped

1. Check propeller blades and hub for wear or damage and with the ropeguard removed inspect condition of the outer seal.
2. Try to twist and rock each blade, and if there is discernible movement contact Heimdal for advice.

(The following ONLY applies to three-bladed propellers)

3. Remove the seal plug in the hub nose-piece and the drain plug below and behind No.1 blade. With the propeller in FULL ASTERN POSITION ONLY, pack with grease until all the original grease/water mixture has been expelled.

IF THE HUB IS GREASED WITH THE PROPELLER BLADES IN OTHER THAN IN THE FULL ASTERN POSITION A HYDRAULIC LOCK CAN OCCUR AND THIS MAY DAMAGE THE HUB AND PREVENT THE VESSEL GOING ASTERN!.

Regular greasing of the propeller hub is a major factor in the service life of the propeller and should be carried out at least once each year.

Five Year Inspection.

1. Remove and check the propeller shaft and bearing surfaces for corrosion.
2. Inspect all sliding surfaces on the inner and outer sterntube seals for corrosion.
3. Check for excessive clearance in the inner/outer white-metal sterntube bearings.

GEAR MAINTENANCE.

Daily Inspection.

1. Run engine and check clutch pressure and gear temperature are as specified in the front of the Service Manual.
2. Check oil level, engine running with marine gear warm and clutch disengaged.
3. Inspect gear and pipework for oil or water leaks.

After 200 hours then at 1000-1500 hour intervals.

1. Oil change (more frequently in severe operating conditions).
2. Check the old oil for water or abnormal metal particles.
3. Clean the oil filter and magnetic strips.
4. Check the condition of the zink anodes in the oil-cooler.

Annual Inspection.

1. Remove top cover and check gearwheel and pinion for damage or uneven tooth contact.
2. Check the condition of the flexible coupling and replace worn or damaged rubber elements.
3. Remove the oil-cooler end cover and check the tube-stack for leaks or excessive silt and replace eroded zink anodes.
4. Remove oil pump and drive shaft and check spines for wear or damage.
5. Lubricated the output shaft seals through the grease nipple on the top of the gear end cover.
6. Check the propeller pitch control lever for smooth operation and absence of backlash.

It is recommended that the rubber elements in the coupling are replaced after 10 years service as they tend to harden in use.

TROUBLE-SHOOTING GUIDE PROPELLER**Symptoms.****Possible Cause**

Abnormal hull vibration

Propeller or shaft is misaligned bent or badly worn. The sterntube or shaft coupling flange bolts are loose. Outer bearing damaged.

Sterntube temperature high.

Sterntube oil level is too low or wrong oil grade is in use.
Sterntube bearings are damaged or propeller shaft is misaligned.

High oil consumption.

An incorrect oil grade is in use. Leakage from the inner or outer seal due to damage wear or dirt on sliding surfaces. Excessive throw in propeller shaft. (Max 0.05mm).

TROUBLE-SHOOTING GUIDE MARINE GEAR.

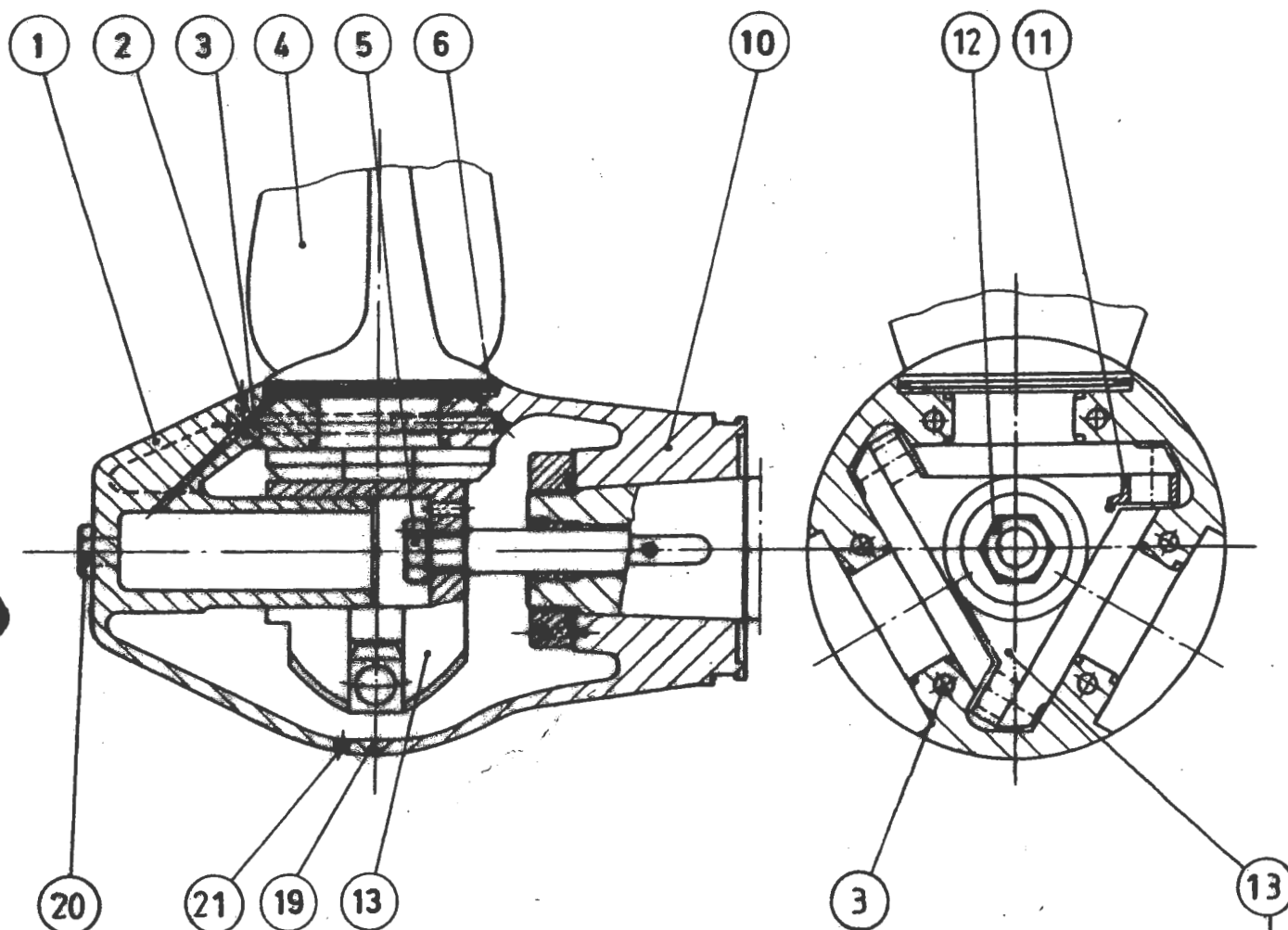
Symptoms	Possible Cause
Water in the gear oil.	Leak in the oil cooler tubes. Water entry from bilge through the gear output flange seals.
Abnormal oil consumption.	Leak in the oil cooler tubes or at the gear output flange seals.
Noise in the gear at all rpm.	Damage or wear in the gearwheels flexible coupling or bearings.
Noise in the gear at one rpm.	Idle rpm set too low causes gear hammering or critical speed range in the driveline - AVOID THIS RPM!
No clutch pressure.	Oil pump defective or pump drive shaft broken.
Low clutch pressure. (Clutch engaged)	Incorrect oil level or wrong oil type in use. Leakage at the inlet ring on the primary shaft. Broken or weak spring or sticking piston in the main valve block. Leak in the suction line between the sump and the oil-pump or worn oil-pump. Flow regulator screw in the valve block or pressure regulator valve incorrectly set or leakage at the clutch piston.
High servo pressure reading.	Servo piston sticking or butting against the cylinder end cover. Propeller is damaged or hub and blades are worn. Water in the hub.
Sluggish or movement of the propeller.	Wrong oil type. Worn servo slide. Wear in the white metal bearing (oil inlet for servo cylinder) or leakage in the pipes/ Hoses from the main valve block or sticking safety valve.
Gear temperatur to high	Oil level low. Slipping clutch. Oil cooler blockage or cooling water flow restricted. Damaged bearings.
Propeller Pitch unstable	Backlash in the control cables or the pitch lever mechanism.
Oil Leakage from the gear output flange	Seal has been overgreased-remove grease nipple to evacuate excess.

MOUNTING THE PROPELLER BLADE.

Drawing 408-013 refers.

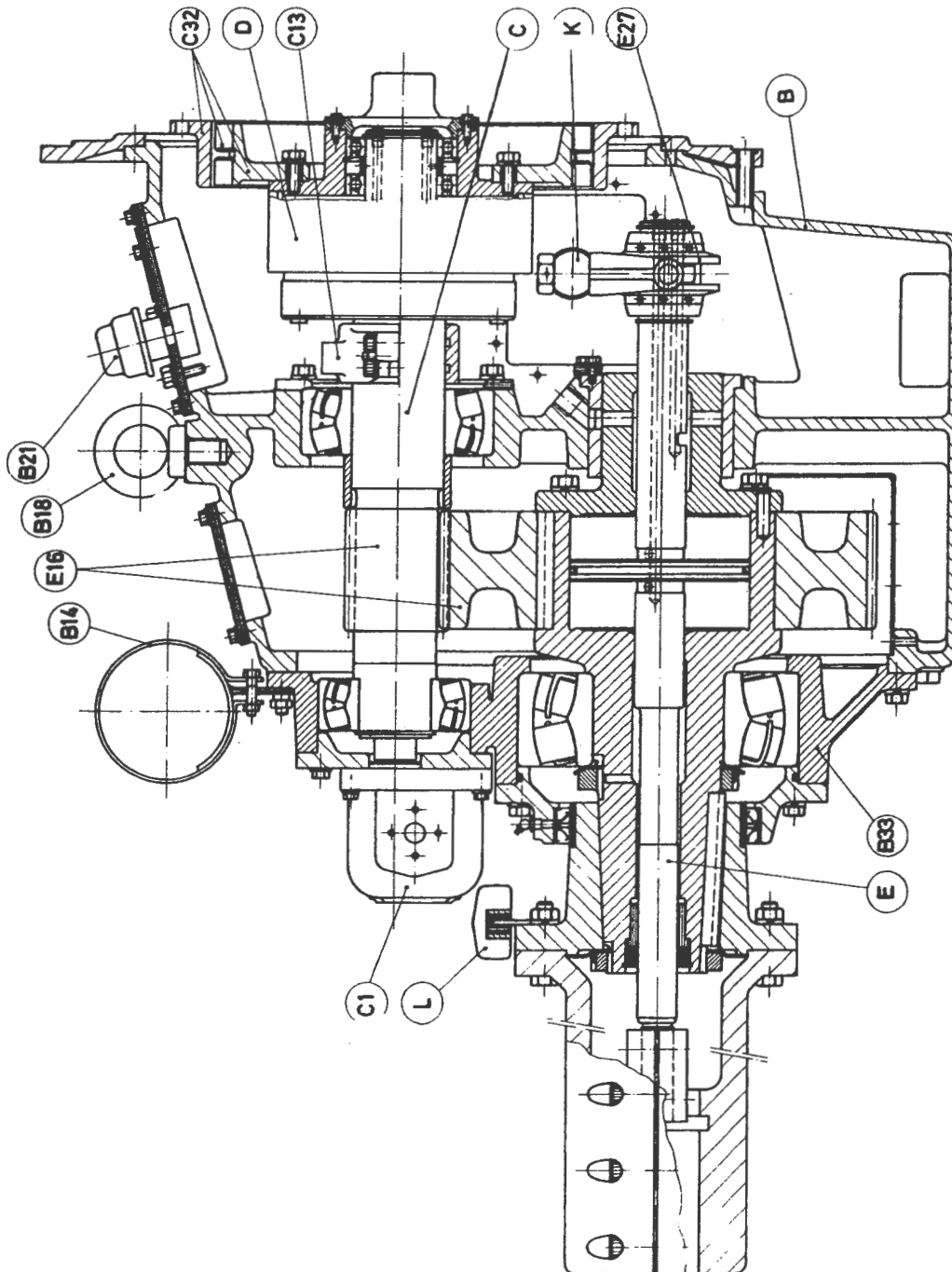
The CP-propeller is normally supplied with the blades dismounted to reduce the possibility of damage in transit. Mounting of the propeller blades is carried out in accordance with the following step-by-step procedure:

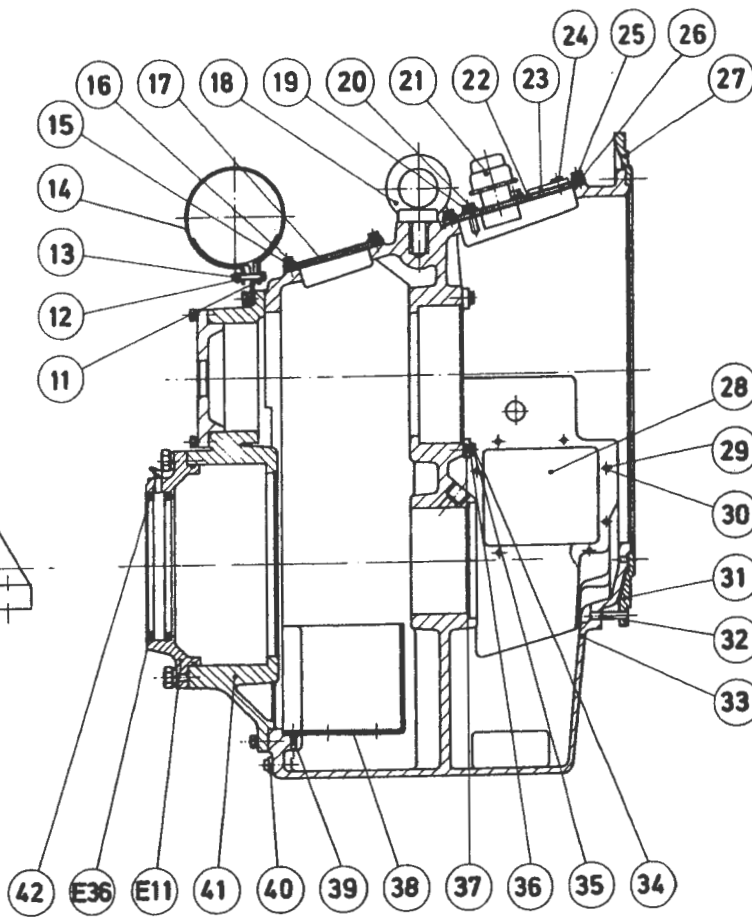
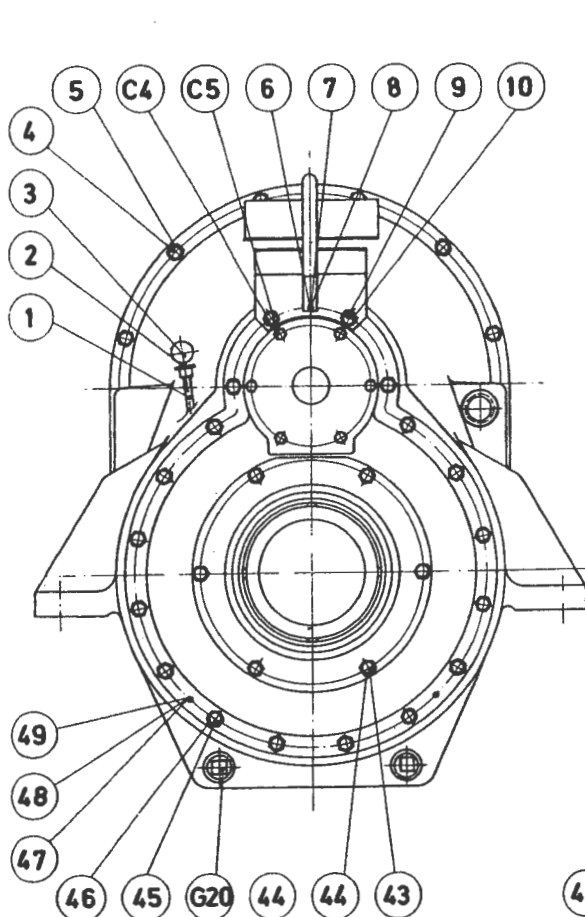
1. Support the propeller hub and shaft so that it may be rotated after each blade is fitted in place. (Blade installation may be carried out after the shaft is fitted in the hull).
2. Remove the rear half of the propeller hub (Item 1.) by undoing 6 allen-headed lockscrew (Item 2.) and then by unscrewing the 5/8 inch "square-headed" bolts (Item 3.)



REFERS TO INSTRUCTION 402-028 PAGE 22.

POS.	GJENSTAND	ANT.	MATERIALE	TEGN.NR.	MODEL NR.	MERK.
	PROPELLER-K-SERIES			Tegn.: 13/9.91 KF	Erst. for:	
	MOUNTING THE PROPELLER BLADES			Trac:		
				Kfr.:		
				Målestokk:		
	HEIDMAL				408-013	



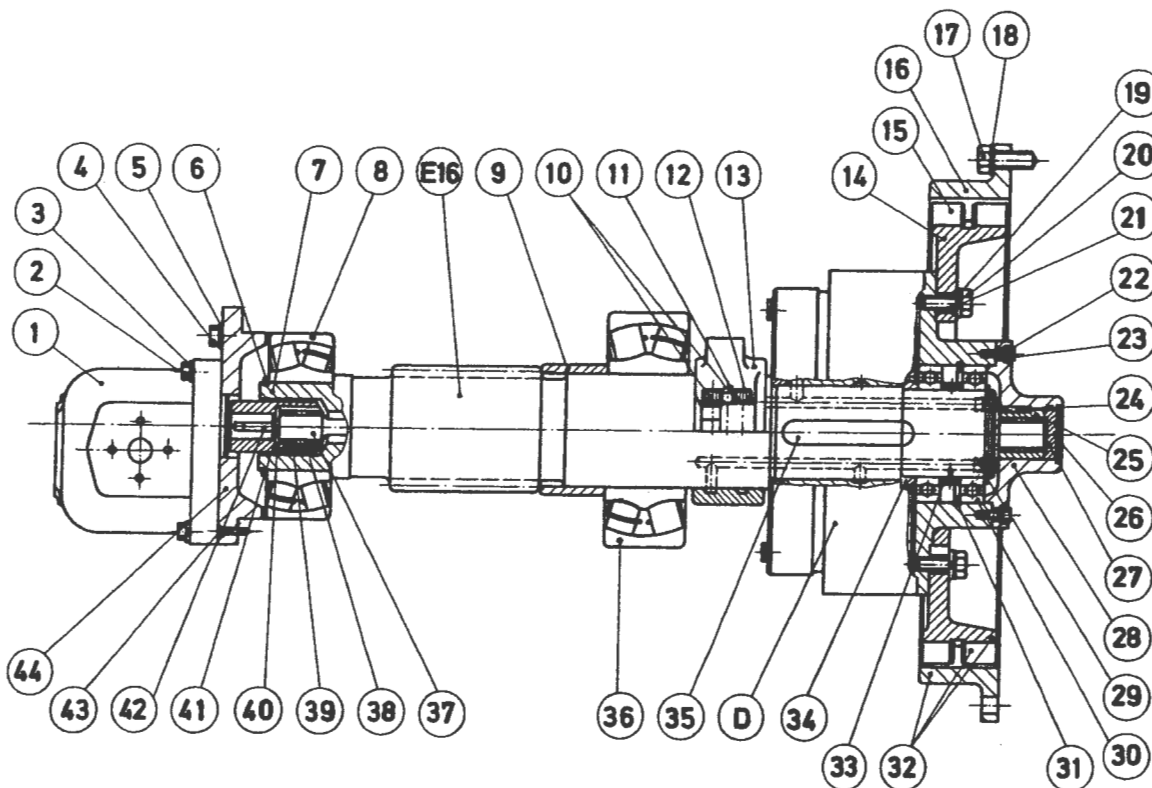


ITEM	DESCRIPTION	QTY.	PART NO.
1	PIPE FOR DIPSTICK	1	04.529054
2	DIPSTICK WITH BALL	1	04.529055
3	BALL FOR DIPSTICK	1	04.526031
4	LOCKWASHER	12	3B4507
5	BOLT	12	0T0320
6	DOWEL	1	04.526037
7	NUT	1	03.133860
8	SPACER	1	04.526039
9	LOCKWASHER	2	3B4508
10	BOLT	2	0S1587
11	NUT	1	1D4717
12	LOCKWASHER	1	3B4506
13	BOLT	1	0S1591
14	BRACKET	1	74.522061
15	BOLT	4	1B7182
16	LOCKWASHER	1	3B4505
17	TOP COVER	1	04.529039
18	EYEBOLT	1	04.526032
19	CLUTCH EMERGENCY BOLT	4	04.529056
20	CLUTCH EMERGENCY LOCKWASHER	4	3B4507
21	BREATHER	1	8B6992
22	TOP COVER	1	04.529026
23	NAMEPLATE	1	04.528052
24	RIVET	4	04.526036
25	BOLT	8	1B7182

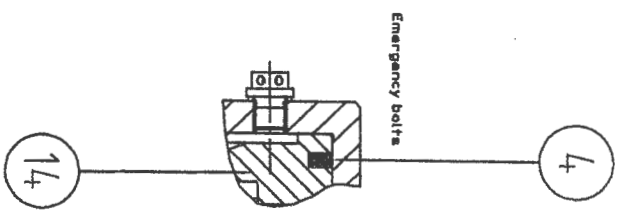
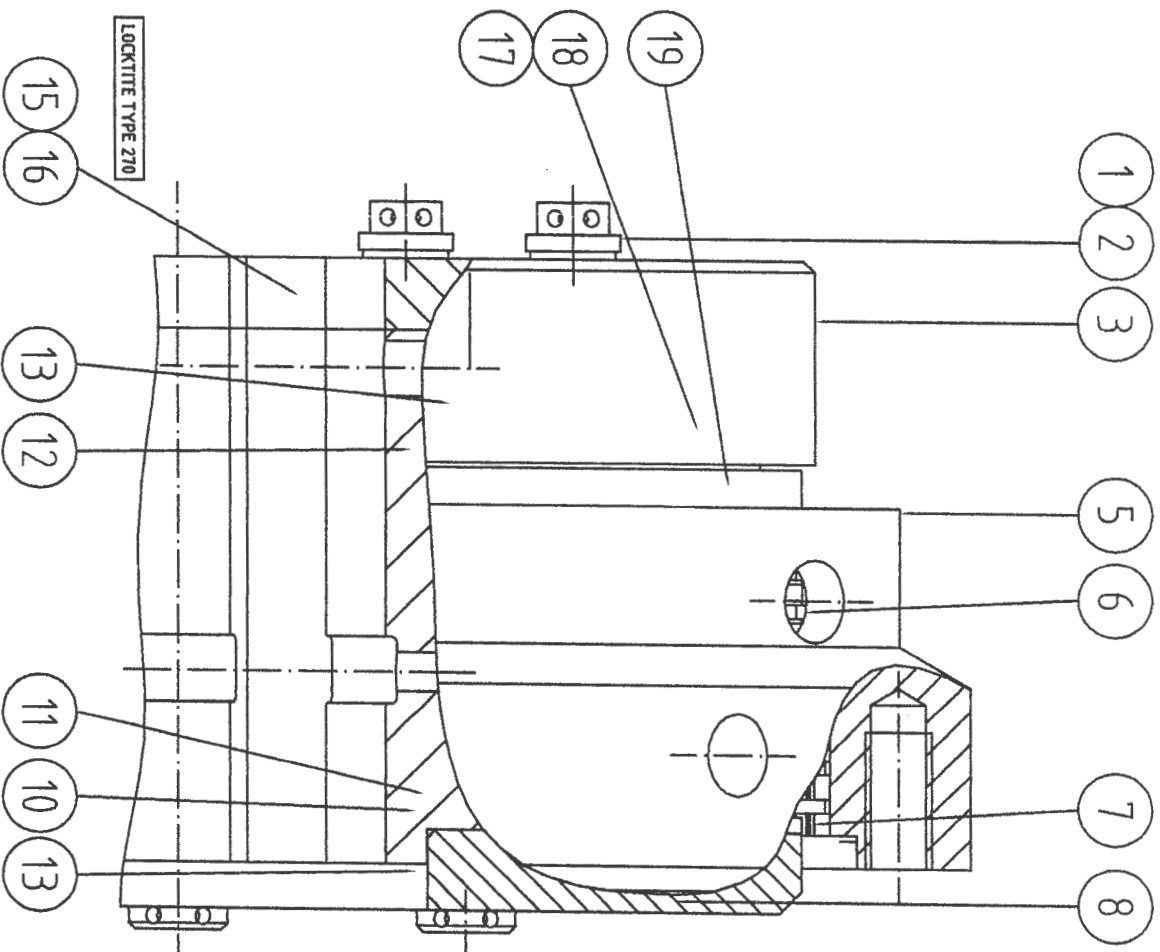
ITEM	DESCRIPTION	QTY.	PART NO.
26	LOCKWASHER	8	3B4505
27	FLANGE PB 146 ONLY	1	04.529057
28	SIDE COVER LEFT HAND	1	04.529025
29	BOLT	8	1B7182
30	LOCKWASHER	8	3B4505
31	O-RING PB 146 ONLY	1	4F5675
32	DRAIN TUBE PB 146 ONLY	1	04.529058
33	UNBRAKO PLUG PB 146 ONLY	1	03.133640
34	GEARBOX WITH END COVER	1	04.529000
35	BOLT	4	6H1717
36	LOCKWASHER	4	3B4508
37	LOCK PLATE FOR OIL INLET RING	2	04.526040
38	THRUSTRING	1	04.529059
39	OIL SHIELD	1	04.529060
40	UNBRAKO BOLT COUNTERSUNK	4	03.131422
41	UNBRAKO PLUG	1	03.034416
42	COVER PART OF 04.529000	1	
43	NIPPLE	1	3B8485
44	BOLT	6	0S1585
45	LOCKWASHER	6	3B4508
46	BOLT	16	0S1585
47	LOCKWASHER	16	3B4508
48	DOWEL	2	04.526037
49	NUT	2	03.133860
	SPACER	2	04.526039

HEMDAL**PROPULSION A-S**

Post Box 2091 Moldegård - 6401 Molde, Norway

PRIMARY SHAFT WITH OIL PUMPTYPE:
PB 100DATE:
JAN. 1, 1981PAGE:
38GROUP: **C**DRAW.NO:
M1-1263

ITEM	DESCRIPTION	QTY.	PART NO	ITEM	DESCRIPTION	QTY.	PART NO.
1	OIL PUMP	1	04.522050	23	UNBRAKO BOLT	6	03.130209
2	BOLT	4	1A9579	24	DOWEL, PART OF: 04.529032	1	
3	LOCKWASHER	4	3B4505	25	SLEEVE, PART OF: 04.529032	1	
4	BOLT	4	0S1588	26	LOCK RING, PART OF: 04.529032	1	
5	LOCKWASHER	4	3B4506	27	WASHER, PART OF: 04.529032	1	
6	LOCK RING	1	03.150070	28	END COVER WITH SPLINE SLEEVE		
7	SPLINE SLEEVE	1	04.522033		COMPLETE	1	04.529032
8	BEARING	1	04.521080	29	UNBRAKO PLUG	3	03.133610
9	SPACER	1	04.529043	30	ROLLER BEARING	1	04.521125
10	UNBRAKO BOLT, PART OF: 04.529029 ..	4	03.130535	31	LOCK RING	1	03.151110
11	DOWEL, PART OF: 04.529029	2	04.522029	32	FLEXIBEL COUPLING COMPLETE	1	74.280051
12	LOCKWASHER, PART OF: 04.529029 ..	4	3B4506	33	SPACER	1	04.529046
13	OIL INLET RING	1	04.529029	34	SPACER	1	04.529047
14	INNER MEMBER	1	04.521123	35	KEY	1	04.529022
15	MOULDED BLOCK	52	2N4619	36	BEARING	1	03.181009
16	OUTER MEMBER	1	04.521121	37	PUMP DRIVE SHAFT	1	04.529021
17	BOLT	8	0S1585	38	DOWEL, PART OF: 04.522033	1	
18	LOCKWASHER	8	3B4508	39	SLEEVE, PART OF: 04.522033	1	
	WASHER	8	4B4280	40	WASHER, PART OF: 04.522033	1	
19	LOCKWASHER	6	3B4508	41	UNBRAKO BOLT	1	03.131505
20	BOLT	6	03.130147	42	KEY (PART OF OIL PUMP)	1	04.522036
21	DOWEL	3	04.529044	43	UNBRAKO BOLT	2	03.130529
22	LOCKWASHER	6	3B4504	45	MOUNTING FLANGE FOR OIL PUMP. ...	1	04.526023

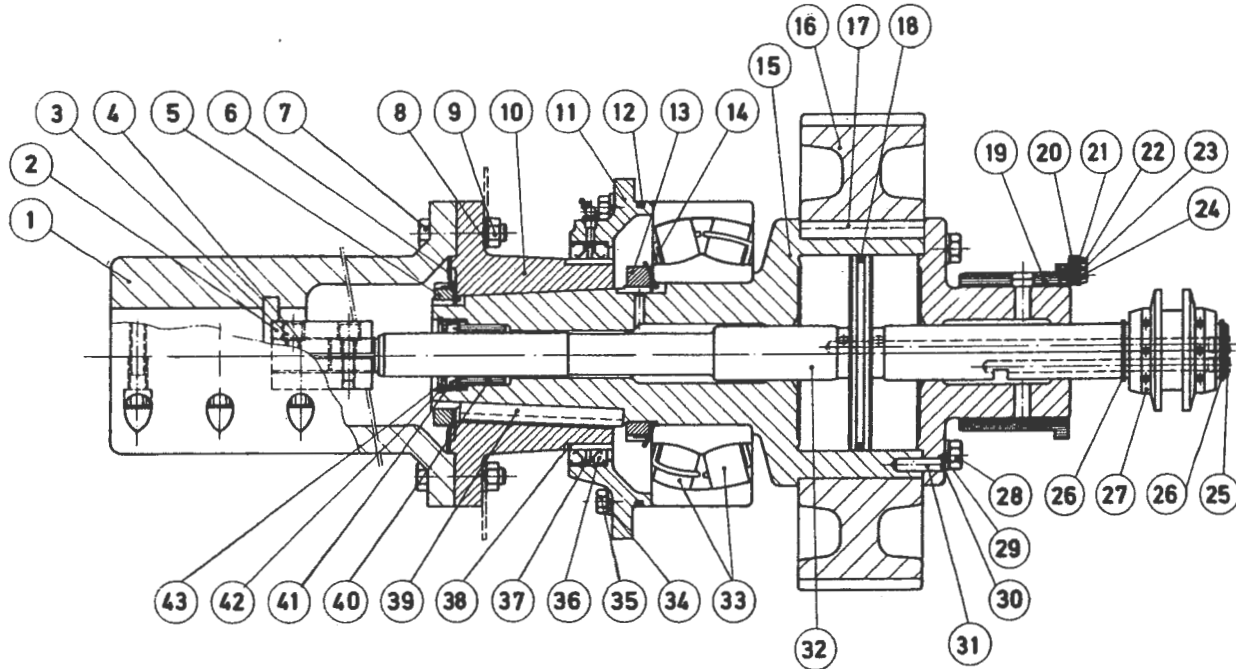


Partlist 413-020

Material		Description		Quantity		Unit		Material		Description		Quantity		Unit	
Part No.	Rev.	Part No.	Rev.	Part No.	Rev.	Part No.	Rev.	Part No.	Rev.	Part No.	Rev.	Part No.	Rev.	Part No.	Rev.
0	1	HEIMDAL	HEIMDAL	0	1	HEIMDAL	HEIMDAL	0	1	HEIMDAL	HEIMDAL	0	1	HEIMDAL	HEIMDAL
PB1 GRUPE D CLUTCH															
PB1 GROUP D CLUTCH															
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207-076															
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GRUPPE D PARTLIST 413-020 DRAWING 207-076 PRODUCT PB100

POS	BESKRIVELSE	DESCRIPTION	QTY	PARTNO
1	PLUGG FOR NØDSKRUE	PLUG FOR EMERGENCY BOLT	4	3G0327
2	TETNINGSRING	SEALING RING	4	3G0094
3	SYLINDER	CYLINDER	1	3G0107
4	YTRE STEMPELFJÆR	OUTER PISTON RING	2	3G0104
5	MEDERINGERRING	TRANSFER RING	1	3G0106
6	YTRE LAMELL	OUTER CLUTCH PLATE	7	3G0105
7	INDRE LAMELL	INNER CLUTCH PLATE	8	3G0108
8	ANSLAGSSKIVE	RETAINING DISC	1	3G0099
9	UNBRAKOSKRUE	UNBRAKO BOLT	6	3G0096
10	FJÆR	SPRING	12	3G0102
11	FJÆR	SPRING	12	3G0098
12	BÆRER	CARRIER	1	3G0101
13	INDRE STEMPELFJÆR	INNER PISTON RING	1	3G0103
14	STEMPEL	PISTON	1	3G0100
15	UNBRAKOSKRUE	UNBRAKO BOLT	6	3G0095
16	SYLINDRISK PINNE	PARALLEL PIN	2	3G0097
17	UNBRAKOSKRUE	UNBRAKO BOLT	3	3G0086
18	SYLINDRISK PINNE	PARALLEL PIN	2	3G0090
19	THRUSTSKIVE	THRUST DISC	1	
20	CLUTCH KOMPLETT	CLUTCH ASSEMBLY	1	3G0091

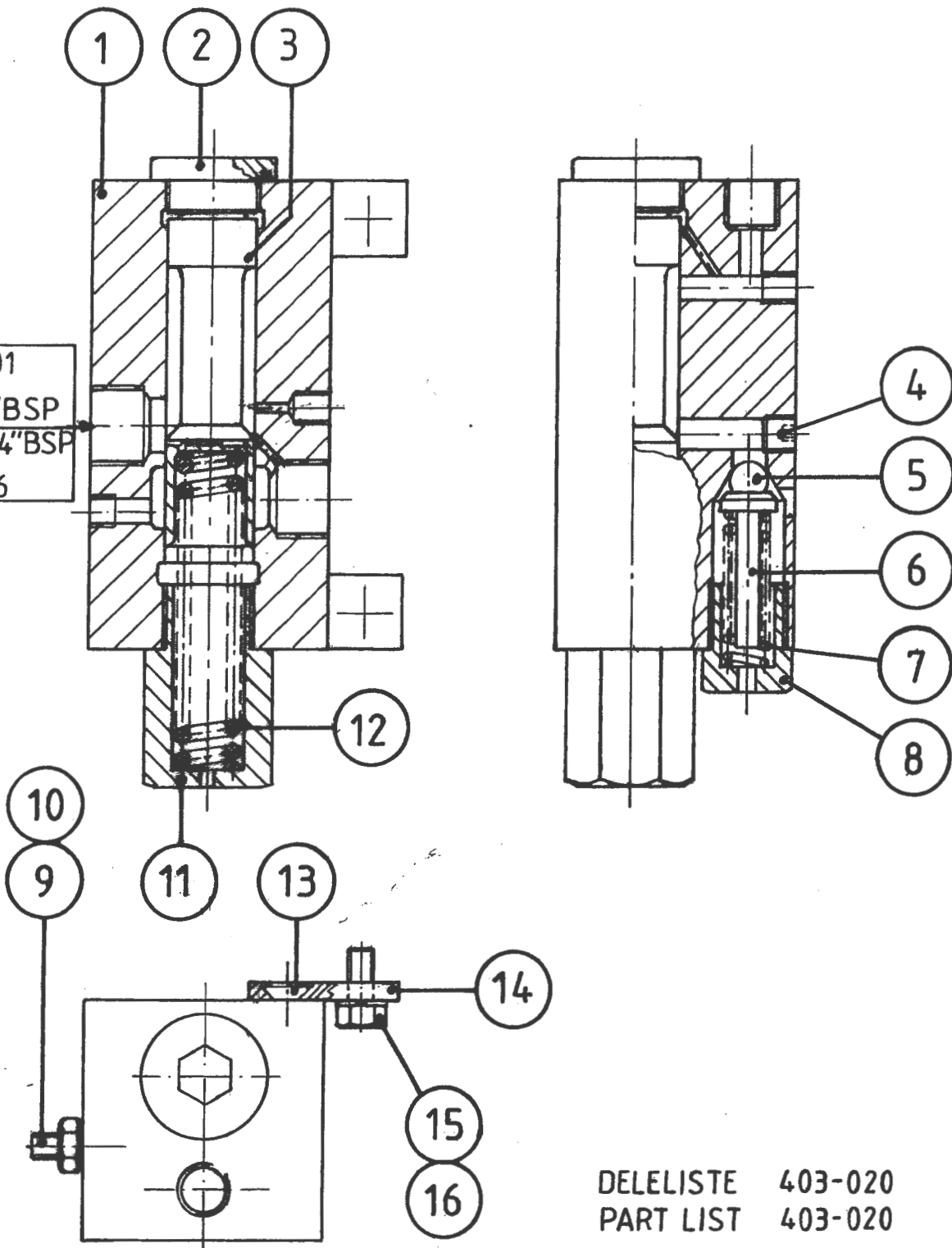


ITEM	DESCRIPTION	QTY.	PART NO.
1	FLANGE 120 MM PROP. SHAFT	1	04.529036
	FLANGE 130 MM PROP. SHAFT	1	04.529037
2	ROD CONNECTOR	1	04.529038
3	LOCKWASHER	4	3B4508
4	UNBRAKO BOLT	4	03.130546
5	NUT	1	03.181010
6	LOCK	1	03.181011
7	REAMED BOLT	8	04.529045
8	LOCKWASHER	8	04.529048
9	NUT	8	04.529049
10	GEAR FLANGE	1	04.529028
11	REAR END COVER	1	04.529031
12	O-RING	1	03.053096
13	NUT	1	03.181012
14	LOCK	1	03.181013
15	SERVOSHAFT WITH COVER	1	04.529020
16	HELICAL GEAR & PINION SHAFT 4,6:1 ..	1	04.529001
	HELICAL GEAR & PINION SHAFT 4,9:1 ..	1	04.529002
17	KEY	1	04.529023
18	PISTON RING	1	04.529027
19	BEARING	1	04.522009
20	LOCK PLATE FOR BEARING	1	04.522008
21	SPACER	1	04.522007

ITEM	DESCRIPTION	QTY.	PART NO.
22	BOLT	2	1B7182
23	LOCKWASHER	3	3B4505
24	BOLT	1	2H3755
25	UNBRAKO PLUG	3	03.133640
26	LOCK RING	2	03.150050
27	SLIDE	1	04.529033
28	BOLT	8	0S1587
29	LOCKWASHER	8	3B4508
30	LOCK RING FOR DOWEL	2	04.529050
31	DOWEL	2	04.527069
32	SERVO PISTON AND SHAFT	1	04.529034
33	BEARING COMPLETE	1	03.181017
34	LOCKWASHER	8	3B4508
35	BOLT	8	0S1585
36	SEALING RING	2	04.529042
37	SPACER	1	04.529051
38	WEAR RING	1	04.529035
39	KEY	1	04.529030
40	BEARING	1	04.522017
41	SEALING RING	1	03.053656
42	SPACER	1	04.522019
43	LOCK RING	1	03.151065
44	UNBRAKO BOLT	6	03.130567

F

OG0501
HG4: 1" BSP
HG2: 3/4" BSP
OG0016



DELELISTE 403-020
PART LIST 403-020

FOR PROD. 403-067

POS.	GJENSTAND	ANT.	MATERIALE	TEGN.NR	MODEL NR.	MERK.
	HG 2/4 GRUPPE F OLJEVENTIL			Tegn 23068730	Erst. for:	
	HG 2/4 GROUP F OIL VALVE			Trac:		
				Kfr:		403-017
				Målestokk:		

HEIMDAL
PROPULSION A/S

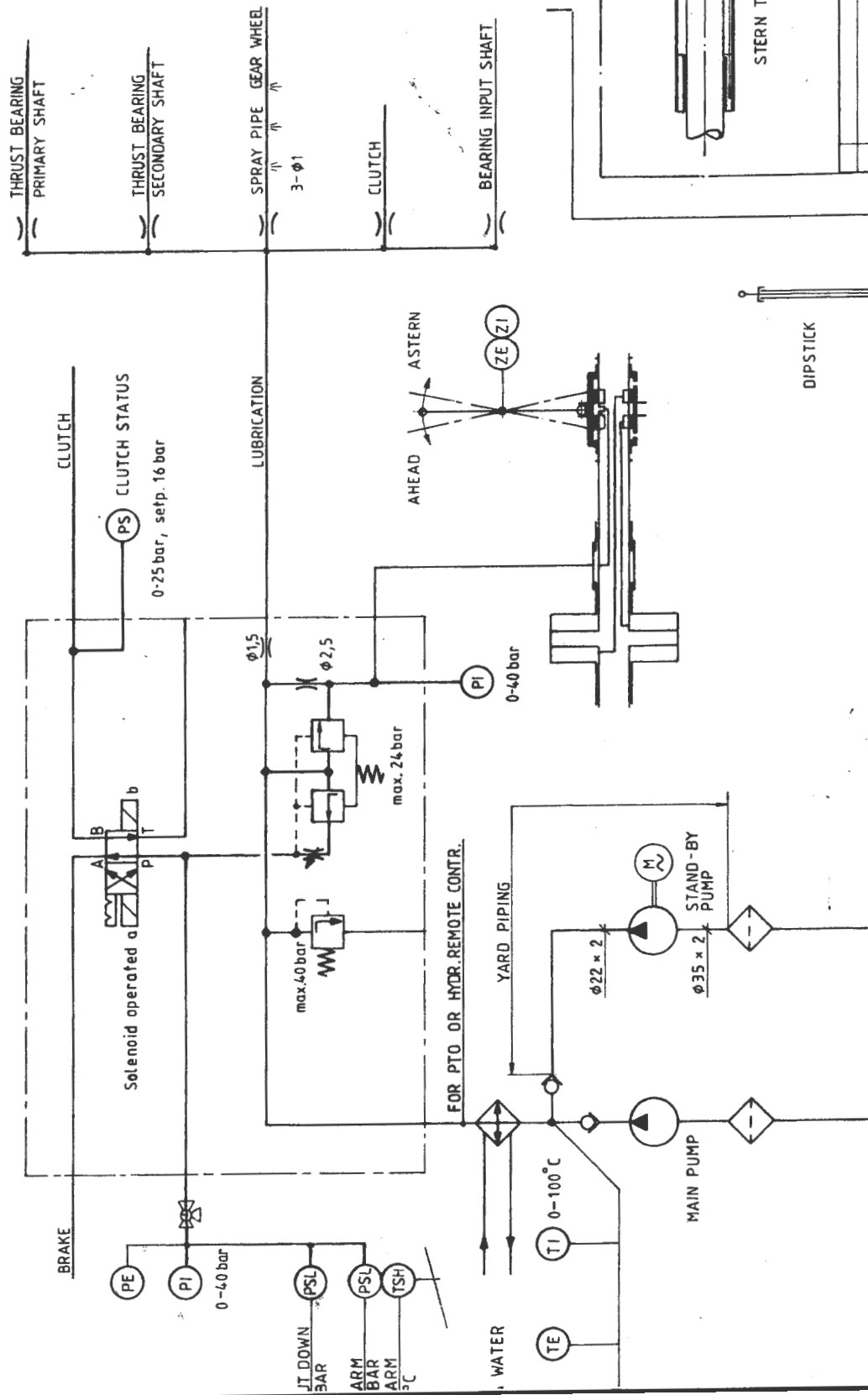
HEDMDAL**PROPULSION A-S**

Post Box 2091 Moldegård - 6401 Molde, Norway

403-020**GRUPPE F PARTLIST 403-067 DRAWING 403-017 PRODUCT HG200**

POS	BESKRIVELSE	DESCRIPTION	QTY	PARTNO
1	VENTILBLOKK-HG200 GEAR	VALVE BLOCK-HG200 GEAR	1	2G0295
1	VENTILBLOKK-HG400 GEAR	VALVE BLOCK-HG400 GEAR	1	2G0415
2	PLUGG	PLUG	1	6S0100
3	STEMPEL I KONTROLLVENTIL	PISTON IN CONTROL VALVE	1	2G0300
4	UNBRAKOPLUGG	UNBRAKO PLUG	1	6S0066
5	KULE	BALL	1	7S0002
6	FJÆR	SPRING GUIDE	1	2G0288
7	FJÆR	SPRING FOR SAFETY VALVE	1	4G0090
8	KAPSEL FOR SIKKERHETSVENT	CAP FOR SAFETY VALVE	1	2G0298
9	STRUPESKRUE	THROTTLE SCREW	1	5S0202
10	MUTTER	NUT	1	5S0109
11	KAPSEL FOR KONTROLLVENTIL	CAP FOR CONTROL VALVE	1	2G0299
12	FJÆR	SPRING FOR CONTROL VALVE	1	4G0089
13	UNBRAKOSKRUE	UNBRAKO BOLT	2	5S0153
14	MONTERINGSLASK	MOUNTING PLATE	2	2G0233
15	SKRUE	BOLT	2	5S0204
16	SPRENGSKIVE	LOCKWASHER	2	5S0158

Mechanically operated



THE EXTENT OF SUPPLY MAY
NOT INCLUDE ALL THE ABOVE.

NOTE:

ALARMS AND SAFETY ARRANGEMENTS
FOR UNATTENDED ENGINE ROOMS.
WITH CLASS NOTATION.

POS.	QUANT.	QTY.	UNIT	TECH. NO.	MODEL NO.	REMARKS
1	1	1	KG	16/9.83	KF	Eng. No.
2	1	1	KG	16/9.83	KF	Eng. No.
3	1	1	KG	16/9.83	KF	Eng. No.
4	1	1	KG	16/9.83	KF	Eng. No.
5	1	1	KG	16/9.83	KF	Eng. No.
6	1	1	KG	16/9.83	KF	Eng. No.
7	1	1	KG	16/9.83	KF	Eng. No.
8	1	1	KG	16/9.83	KF	Eng. No.
9	1	1	KG	16/9.83	KF	Eng. No.
10	1	1	KG	16/9.83	KF	Eng. No.
11	1	1	KG	16/9.83	KF	Eng. No.
12	1	1	KG	16/9.83	KF	Eng. No.
13	1	1	KG	16/9.83	KF	Eng. No.
14	1	1	KG	16/9.83	KF	Eng. No.
15	1	1	KG	16/9.83	KF	Eng. No.
16	1	1	KG	16/9.83	KF	Eng. No.
17	1	1	KG	16/9.83	KF	Eng. No.
18	1	1	KG	16/9.83	KF	Eng. No.
19	1	1	KG	16/9.83	KF	Eng. No.
20	1	1	KG	16/9.83	KF	Eng. No.
21	1	1	KG	16/9.83	KF	Eng. No.
22	1	1	KG	16/9.83	KF	Eng. No.
23	1	1	KG	16/9.83	KF	Eng. No.
24	1	1	KG	16/9.83	KF	Eng. No.
25	1	1	KG	16/9.83	KF	Eng. No.
26	1	1	KG	16/9.83	KF	Eng. No.
27	1	1	KG	16/9.83	KF	Eng. No.
28	1	1	KG	16/9.83	KF	Eng. No.
29	1	1	KG	16/9.83	KF	Eng. No.
30	1	1	KG	16/9.83	KF	Eng. No.
31	1	1	KG	16/9.83	KF	Eng. No.
32	1	1	KG	16/9.83	KF	Eng. No.
33	1	1	KG	16/9.83	KF	Eng. No.
34	1	1	KG	16/9.83	KF	Eng. No.
35	1	1	KG	16/9.83	KF	Eng. No.
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37	1	1	KG	16/9.83	KF	Eng. No.
38	1	1	KG	16/9.83	KF	Eng. No.
39	1	1	KG	16/9.83	KF	Eng. No.
40	1	1	KG	16/9.83	KF	Eng. No.
41	1	1	KG	16/9.83	KF	Eng. No.
42	1	1	KG	16/9.83	KF	Eng. No.
43	1	1	KG	16/9.83	KF	Eng. No.
44	1	1	KG	16/9.83	KF	Eng. No.
45	1	1	KG	16/9.83	KF	Eng. No.
46	1	1	KG	16/9.83	KF	Eng. No.
47	1	1	KG	16/9.83	KF	Eng. No.
48	1	1	KG	16/9.83	KF	Eng. No.
49	1	1	KG	16/9.83	KF	Eng. No.
50	1	1	KG	16/9.83	KF	Eng. No.
51	1	1	KG	16/9.83	KF	Eng. No.
52	1	1	KG	16/9.83	KF	Eng. No.
53	1	1	KG	16/9.83	KF	Eng. No.
54	1	1	KG	16/9.83	KF	Eng. No.
55	1	1	KG	16/9.83	KF	Eng. No.
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63	1	1	KG	16/9.83	KF	Eng. No.
64	1	1	KG	16/9.83	KF	Eng. No.
65	1	1	KG	16/9.83	KF	Eng. No.
66	1	1	KG	16/9.83	KF	Eng. No.
67	1	1	KG	16/9.83	KF	Eng. No.
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71	1	1	KG	16/9.83	KF	Eng. No.
72	1	1	KG	16/9.83	KF	Eng. No.
73	1	1	KG	16/9.83	KF	Eng. No.
74	1	1	KG	16/9.83	KF	Eng. No.
75	1	1	KG	16/9.83	KF	Eng. No.
76	1	1	KG	16/9.83	KF	Eng. No.
77	1	1	KG	16/9.83	KF	Eng. No.
78	1	1	KG	16/9.83	KF	Eng. No.
79	1	1	KG	16/9.83	KF	Eng. No.
80	1	1	KG	16/9.83	KF	Eng. No.
81	1	1	KG	16/9.83	KF	Eng. No.
82	1	1	KG	16/9.83	KF	Eng. No.
83	1	1	KG	16/9.83	KF	Eng. No.
84	1	1	KG	16/9.83	KF	Eng. No.
85	1	1	KG	16/9.83	KF	Eng. No.
86	1	1	KG	16/9.83	KF	Eng. No.
87	1	1	KG	16/9.83	KF	Eng. No.
88	1	1	KG	16/9.83	KF	Eng. No.
89	1	1	KG	16/9.83	KF	Eng. No.
90	1	1	KG	16/9.83	KF	Eng. No.
91	1	1	KG	16/9.83	KF	Eng. No.
92	1	1	KG	16/9.83	KF	Eng. No.
93	1	1	KG	16/9.83	KF	Eng. No.
94	1	1	KG	16/9.83	KF	Eng. No.
95	1	1	KG	16/9.83	KF	Eng. No.
96	1	1	KG	16/9.83	KF	Eng. No.
97	1	1	KG	16/9.83	KF	Eng. No.
98	1	1	KG	16/9.83	KF	Eng. No.
99	1	1	KG	16/9.83	KF	Eng. No.
100	1	1	KG	16/9.83	KF	Eng. No.

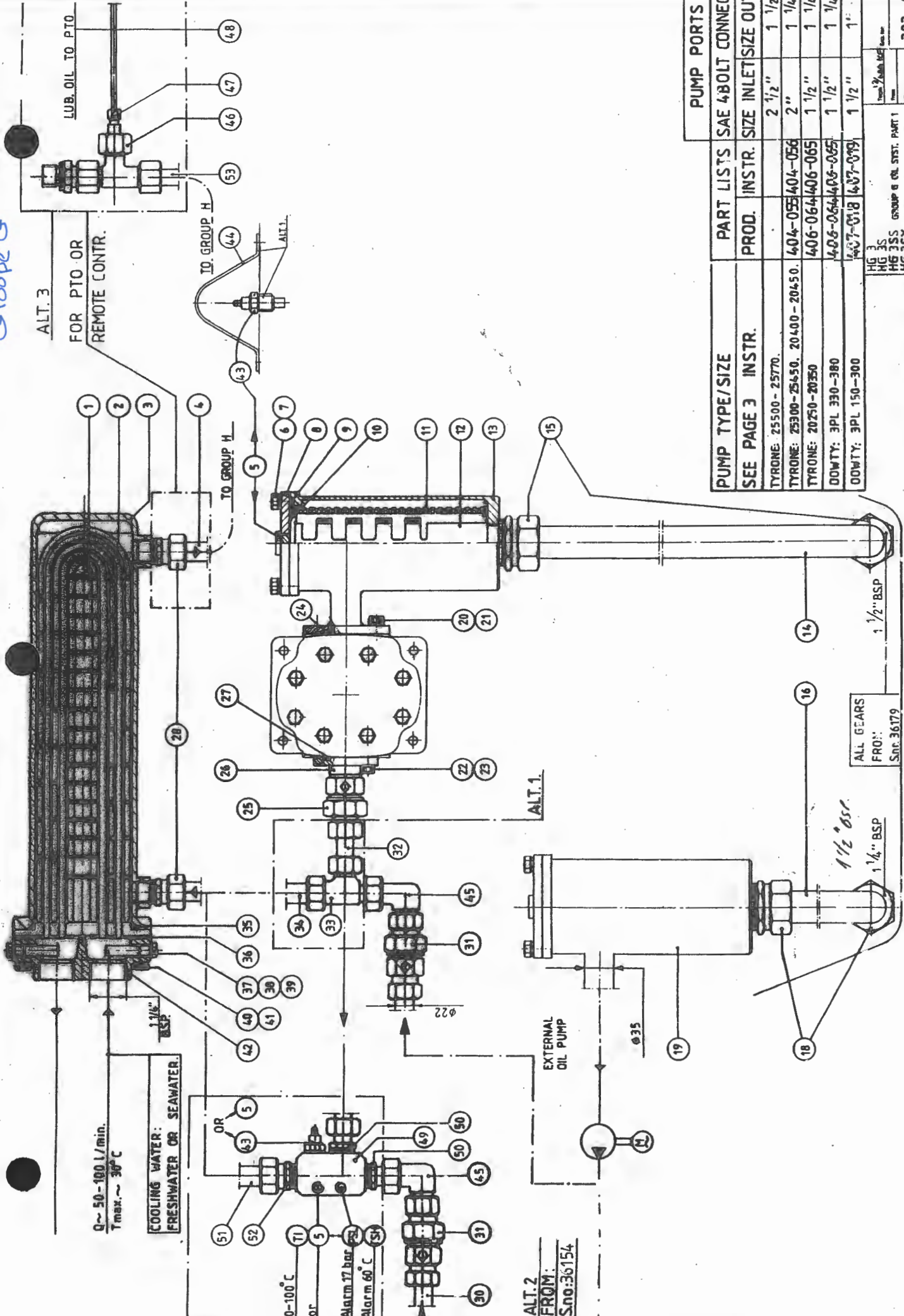
HG2-HG3-HG3S

OIL SYSTEM SCHEMATIC

HYDRAULIC

304-04

Group G



PUMP TYPE/SIZE		PUMP PORTS	
SEE PAGE 3	INSTR.	PART LISTS	SAE 4-BOLT CONN.
TYRONE: 25500-25770.		PROD. INSTR.	SIZE INLET/OUT
TYRONE: 25300-25450.	20400-20450.	404-055	404-056
TYRONE: 20250-20350		406-064	406-065
DOWTY: 3PL 330-380		406-064	406-065
DOWTY: 3PL 150-300		407-018	407-019
		HG 3	1 1/2"
		HG 3S	1 1/2"
		HG 3SS	1 1/2"
		HG 3SX	1 1/2"

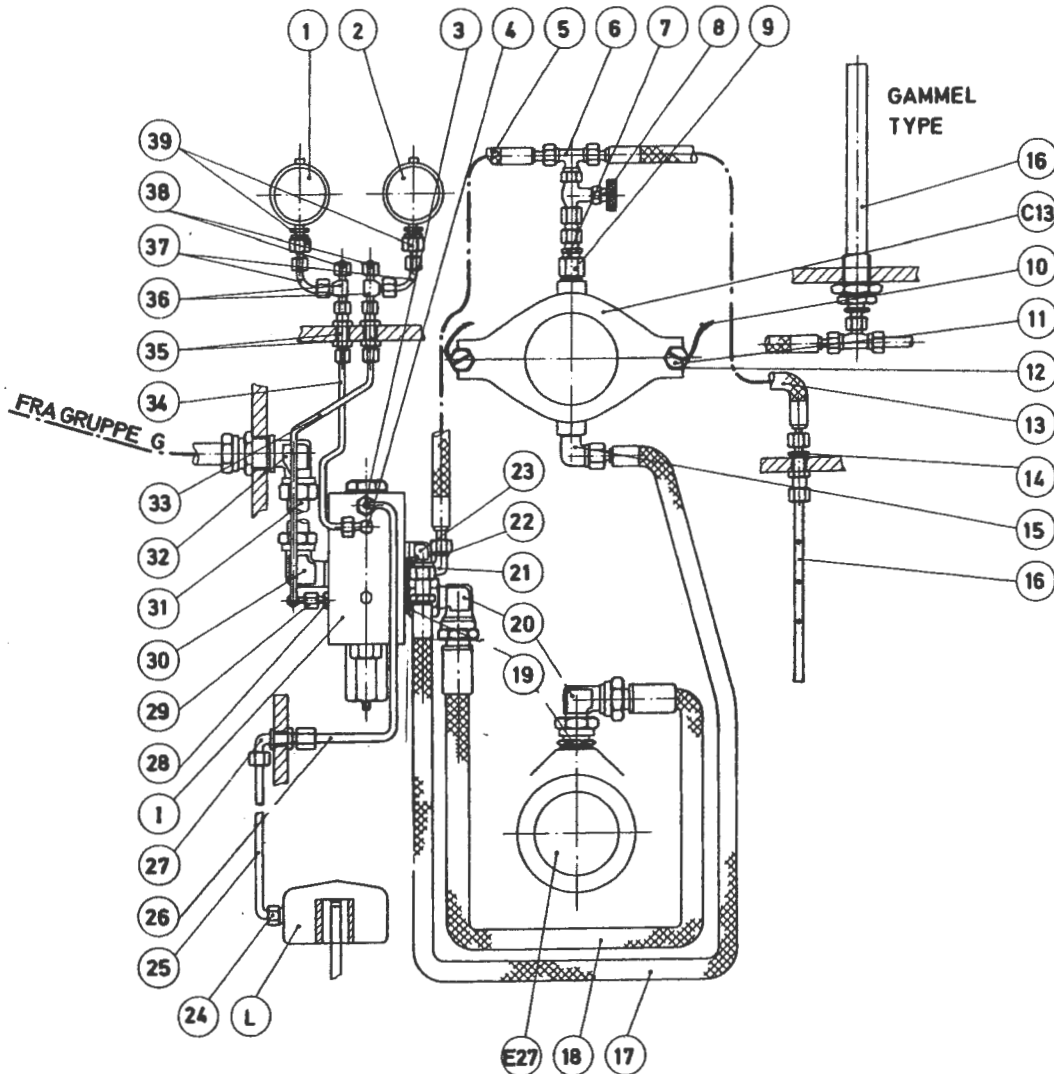
ALL GEARS FROM: Snc 36179

ALT. 2 FROM: Snc 36154

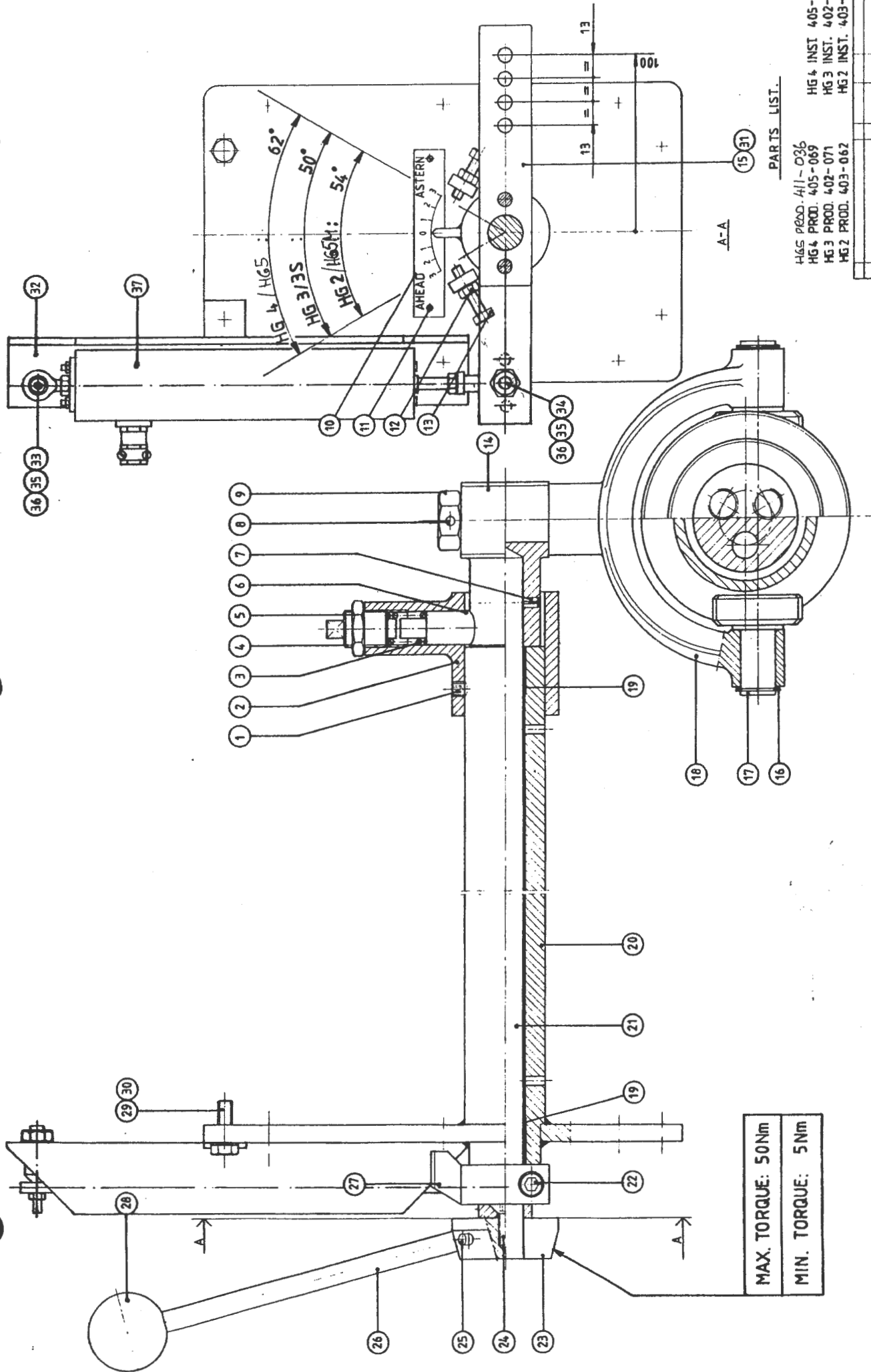
MI-1246

GRUPPE G PARTLIST 407-019 DRAWING 303-039 PRODUCT HG354S

POS	BESKRIVELSE	DESCRIPTION	QTY	PARTNO
1	OLJEKJØLER KOMPLETT	OIL-COOLER COMPLETE	1	0G0005
2	RØR	TUBE STACK	1	2G0248
3	SKALL	COOLER BODY	1	2G0250
4	PRESISJONSTÅLRØR	STEEL PIPE	1	6S0082
5	PLUGG	PLUG	1	6S0101
6	SPRENGSKIVE	LOCKWASHER	4	5S0139
7	SKRUE	BOLT	4	5S0231
8	OLJEFILTER TOPPLUKE	OIL FILTER TOP COVER	1	2G0283
9	O-RING	O-RING	1	8S0044
10	FJÆR	SPRING	1	3G0139
11	FILTER	FILTER	1	3G0140
12	MAGNETINNSATS	MAGNETIC INSERT	1	3G0141
13	OLJEFILTERHUS	OIL FILTER BODY	1	2G0433
14	PRESISJONSTÅLRØR	STEEL PIPE	1	6S0072
15	RETT KOPLING	STRAIGHT COUPLING	2	6S0071
16	PRESISJONSTÅLRØR	STEEL PIPE	1	6S0084
18	RETT KOPLING	STRAIGHT COUPLING	2	6S0051
19	OLJEFILTER KOMPLETT	OIL FILTER COMPLETE	1	0G0011
20	UNBRAKOSKRUE	UNBRAKO BOLT	4	5S0232
21	SPRENGSKIVE	LOCKWASHER	4	5S0164
22	UNBRAKOSKRUE	UNBRAKO BOLT	4	5S0138
23	SPRENGSKIVE	LOCKWASHER	4	5S0164
24	O-RING	O-RING	1	8S0173
25	TILBAKESLAGSVENTIL	NON-RETURN VALVE	1	6S0031
26	PUMPE FLENS UTGÅENDE 3/4"	PUMP FLANGE OUTLET 3/4"	1	2G0285
27	O-RING	O-RING	1	8S0043
28	RETT KOPLING	STRAIGHT COUPLING	2	6S0009
30	PRESISJONSTÅLRØR	STEEL PIPE	1	6S0085
31	TILBAKESLAGSVENTIL	NON-RETURN VALVE	1	6S0032
32	PRESISJONSTÅLRØR	STEEL PIPE	1	6S0124
33	T-KOPLING	T-COUPLING	1	6S0190
34	PRESISJONSTÅLRØR	STEEL PIPE	1	6S0125
35	O-RING	O-RING	1	8S0042
36	PAKNING	GASKET	1	8S0092
37	PLUGG	PLUG	2	6S0063
38	TETTESKIVE	BONDED SEAL	2	8S0072
39	SINK ANODE	ZINC ANODE	2	6S0094
40	SPRENGSKIVE	LOCKWASHER	10	5S0139
41	SKRUE	BOLT	10	5S0216
42	ENDELOKK	END COVER	1	1G0191
43	TEMPERATUR FØLER	TEMPERATURE SENSOR	1	9S0010
44	BØYLE FOR TEMP. FØLER	SHIELD FOR TEMP. SENSOR	1	2G0431
45	VINKELKOPLING	ELBOW COUPLING	1	6S0191
46	STILLBAR T-KOPLING	SWIVEL T-COUPLING	1	6S0199
47	REDUKSJONSKOPLING	REDUCTION COUPLING	1	6S0200
48	PRESISJONSTÅLRØR	STEEL PIPE	1	6S0201
49	MONTERINGSBLOKK	MOUNTING BLOCK	1	2G0442
50	INSTILLINGSTAPP	SWIVEL TAP	2	6S0204
51	PRESISJONSTÅLRØR	STEEL PIPE	1	6S0207
52	RETT KOPLING	STRAIGHT COUPLING	1	6S0009
53	PRESISJONSTÅLRØR	STEEL PIPE	1	6S0213



ITEM	DESCRIPTION	QTY.	PART NO	ITEM	DESCRIPTION	QTY.	PART NO.
1	GAUGE CLUTCH PRESSURE 0—25 kg/cm ²	1	04.521363	22	WASHER	1	03.054009
2	GAUGE SERVO PRESSURE 0—40 kg/cm ²	1	04.521364	23	COUPLING	1	03.033014
3	COUPLING	1	03.033001	24	COUPLING	1	03.033001
4	COUPLING	1	03.033011	25	PIPE 6" x 1,5 x 1200	1	Special-order
5	HOSE ASSMBLY	1	04.528036	26	PIPE 6" x 1,5 x 350	1	Special-order
6	TEE COUPLING	1	03.033178	27	COUPLING	1	03.033151
7	WASHER	1	03.054012	28	WASHER	1	03.054006
8	NIPPLE	1	03.033262	29	COUPLING	1	03.033161
9	VALVE	1	04.528039	30	COUPLING	1	03.033017
10	LOCK WIRE, SOLD IN CM	100	04.528072	31	PIPE 22" x 1,5 x 42	1	Special-order
11	BOLT	2	04.528065	32	COUPLING	1	03.033157
12	SPACER	2	04.528071	33	PIPE 6" x 1,5 x 215	1	Special-order
13	HOSE ASSMBLY	1	04.528037	34	PIPE 6" x 1,5 x 160	1	Special-order
14	COUPLING	1	03.033142	35	COUPLING	2	03.033141
15	COUPLING	1	03.033014	36	TEE COUPLING	2	03.033260
16	OIL JETS, FROM S.NO. 1001 TO S.NO. 1029 REINSTALL NEW TYPE	1	04.529041	37	PIPE 6" x 1,5 x 150	2	Special-order
17	HOSE ASSMBLY	1	04.528044	38	BALL	2	04.526062
18	HOSE ASSMBLY	1	04.528041	39	GAUGE COUPLING	2	03.033220
19	WASHER	1	03.054019				
20	COUPLING	1	03.033170				
21	COUPLING	1	03.033162				



PARTS LIST.

HG 4 PROD. 405-07
 HG 3 PROD. 402-01
 HG 2 PROD. 403-01
 HG 1 PROD. 403-01

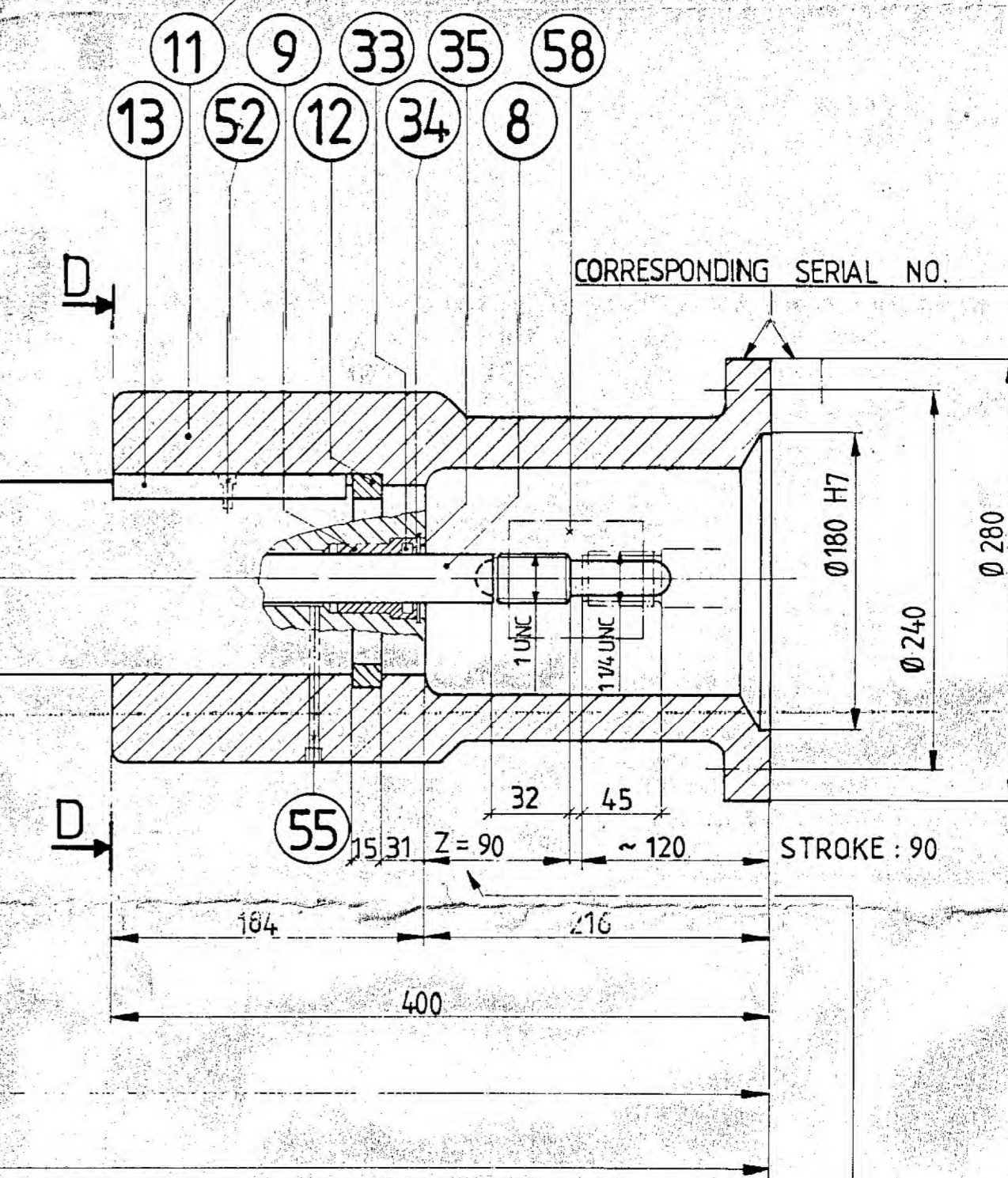
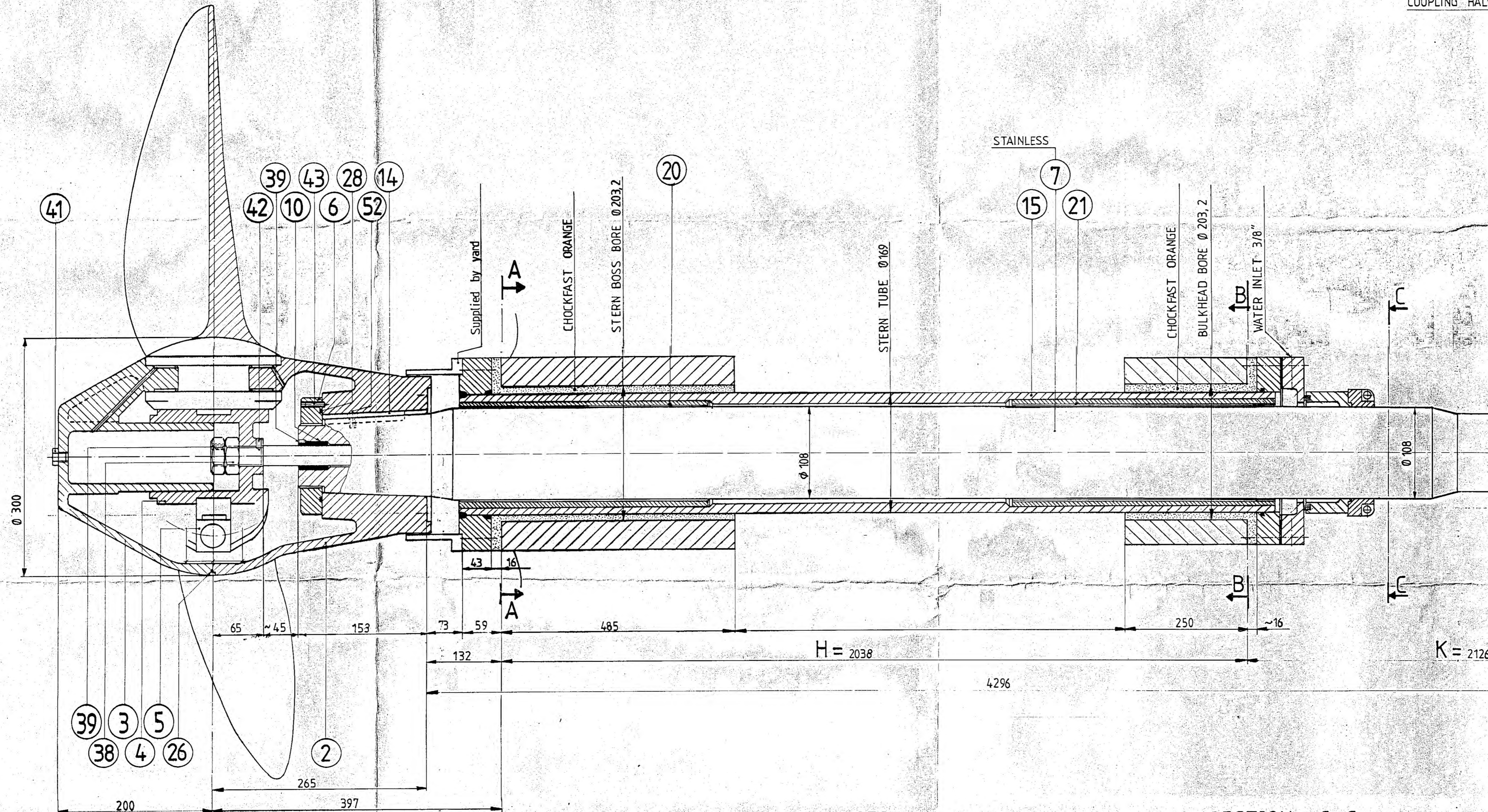
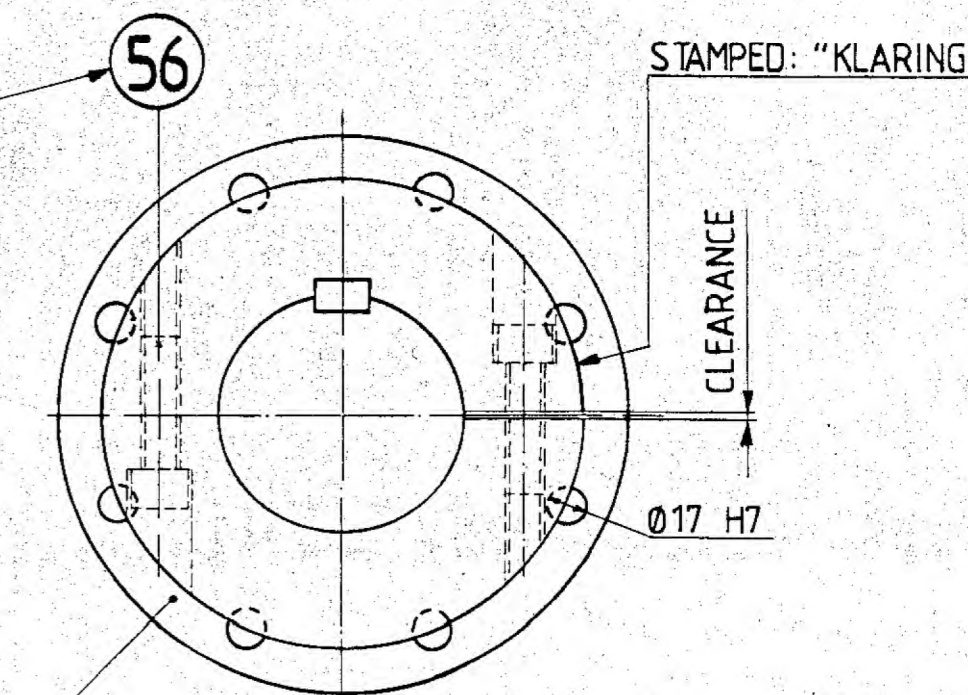
QTY	DESCRIPTION	UNIT	REMARKS
1	HG 4 INST. 405-07	1	
1	HG 3 INST. 402-01	1	
1	HG 2 INST. 403-01	1	
1	HG 1 INST. 403-01	1	

GRUPPE I PARTLIST 402-071 DRAWING 106-066 PRODUCT HG300

POS	BESKRIVELSE	DESCRIPTION	QTY	PARTNO
1	GJENGESTIFT	SET SCREW	2	5S0201
2	BREMSEHUS	BRAKE HOUSING	1	1G0255
3	FJÆR	SPRING	1	4G0098
4	STILLSKRUE	ADJUSTMENT SCREW	1	2G0253
5	LASEMUTTER	LOCKNUT	1	2G0289
6	FRIKSJONSTAPP	FRICTION PAD	1	2G0252
7	SPENNHYLSE	SPLIT SLEEVE	1	7S0054
8	SPLINT	SPLIT-PIN	1	7S0038
9	FLENSMUTTER	FLANGE NUT	1	5S0183
10	SKILT "PITCH READING"	NAMEPLATE	1	4G0100
11	RIFLENAGLE	GROOVED RIVET	2	5S0212
12	MUTTER	NUT	2	5S0206
13	SKRUE	BOLT	2	5S0203
14	BOSS FOR GAFFEL	HUB FOR YOKE	1	2G0305
15	TELEFLEXARM	TELEFLEX ARM	1	2G0290
16	LASERING	SNAP-RING	2	7S0022
17	GLIDESTYKKE	SLIDING SLEEVE	2	2G0195
18	GAFFEL	YOKE	1	1G0184
19	GLIDELAGER	SLEEVE BEARING	1	3G0150
20	SIDELUKE MED BRAKETT	SIDE COVER WITH BRACKET	1	2G0136
21	MANØVERAKSEL	MANOEUVRE SHAFT	1	2G0211
22	UNBRAKOSKRUE	UNBRAKO BOLT	1	5S0200
23	BOSS FOR MANØVERAKSEL	BOSS FOR HANDLE	1	2G0306
24	UNBRAKO SENKSKRUE	UNBRAKO BOLT COUNTERSUNK	2	5S0177
25	KONISK PINNE	TAPER PIN	1	7S0052
26	MANØVERHENDEL	MANOEUVRE HANDLE	1	2G0292
27	SLAGBEGRENSER	STROKE LIMITER	1	2G0293
28	GRIPEKULE	BALL FOR HANDLE	1	7S0005
29	SKRUE	BOLT	10	5S0213
30	SPRENGSKIVE	LOCKWASHER	10	5S0140
31	TELEFLEX/PITCH METER ARM	TELEFLEX/PITCH METER ARM	1	2G0413
32	BRAKETT FOR POTENSIOMETER	BRACKET FOR POTENTIOMETER	1	2G0447
33	SKRUE FOR POTENSIOMETER	BOLT FOR POTENTIOMETER	1	2G0445
34	SKRUE FOR MANØVER ARM	BOLT FOR MANOEUVRING ARM	1	2G0446
35	MUTTER	NUT	2	5S0307
36	MUTTER	NUT	2	5S0109
37	POTENSIOMETER	POTENTIOMETER	1	PAGE 3

TIGHTEN UP THE BOLTS IN THE
FLANGE— FIRST ON THE SIDE
WHERE THERE SHALL BE NO
CLEARANCE BETWEEN THE
COUPLING HALVES.

SECTION D-D

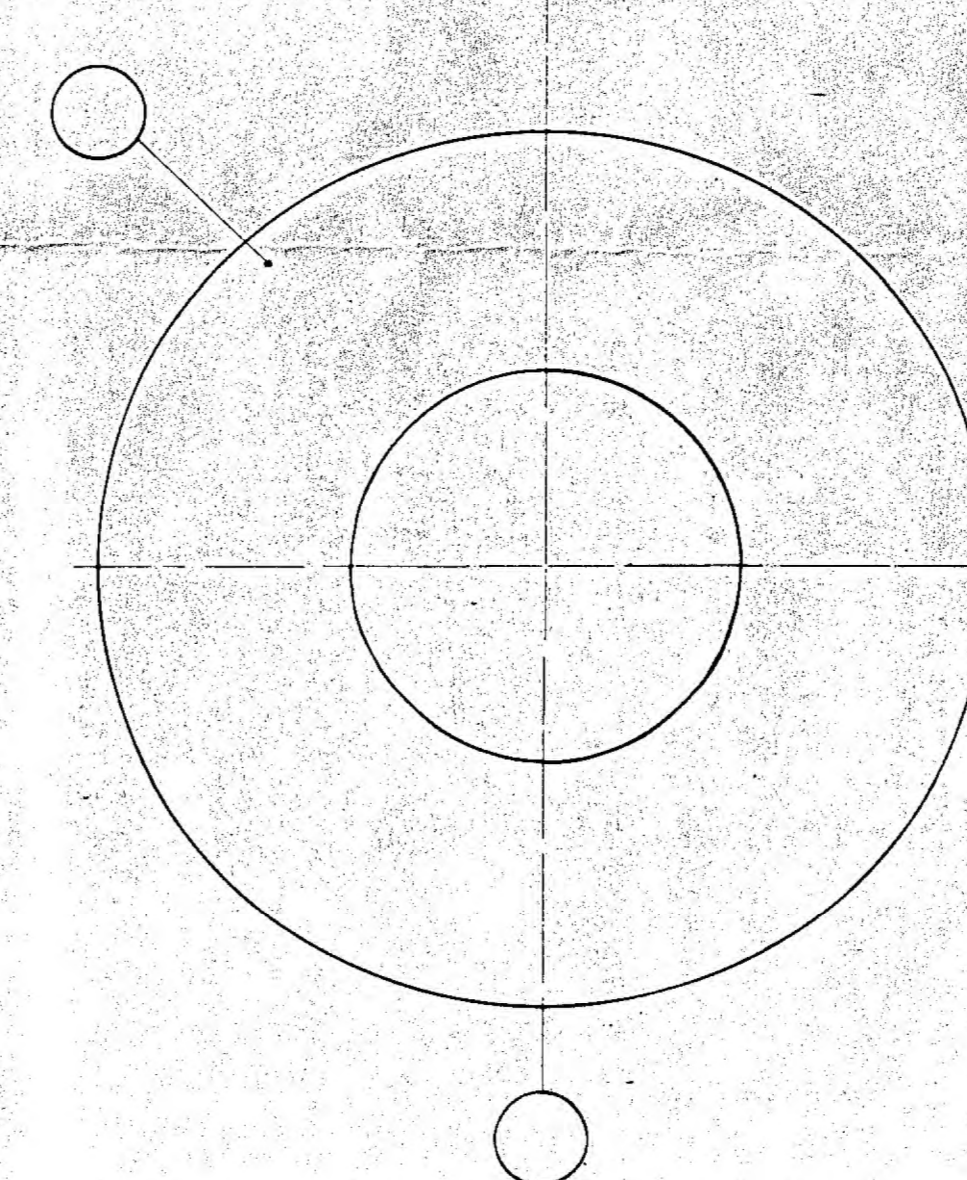
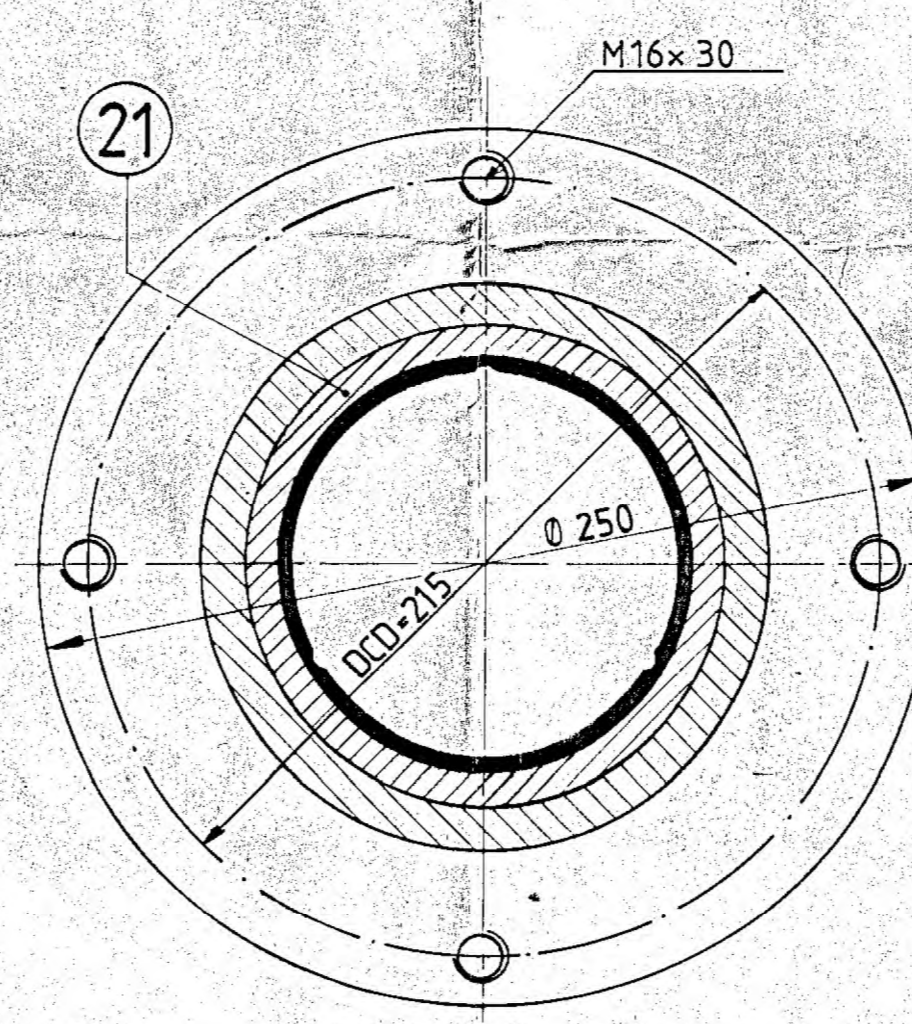
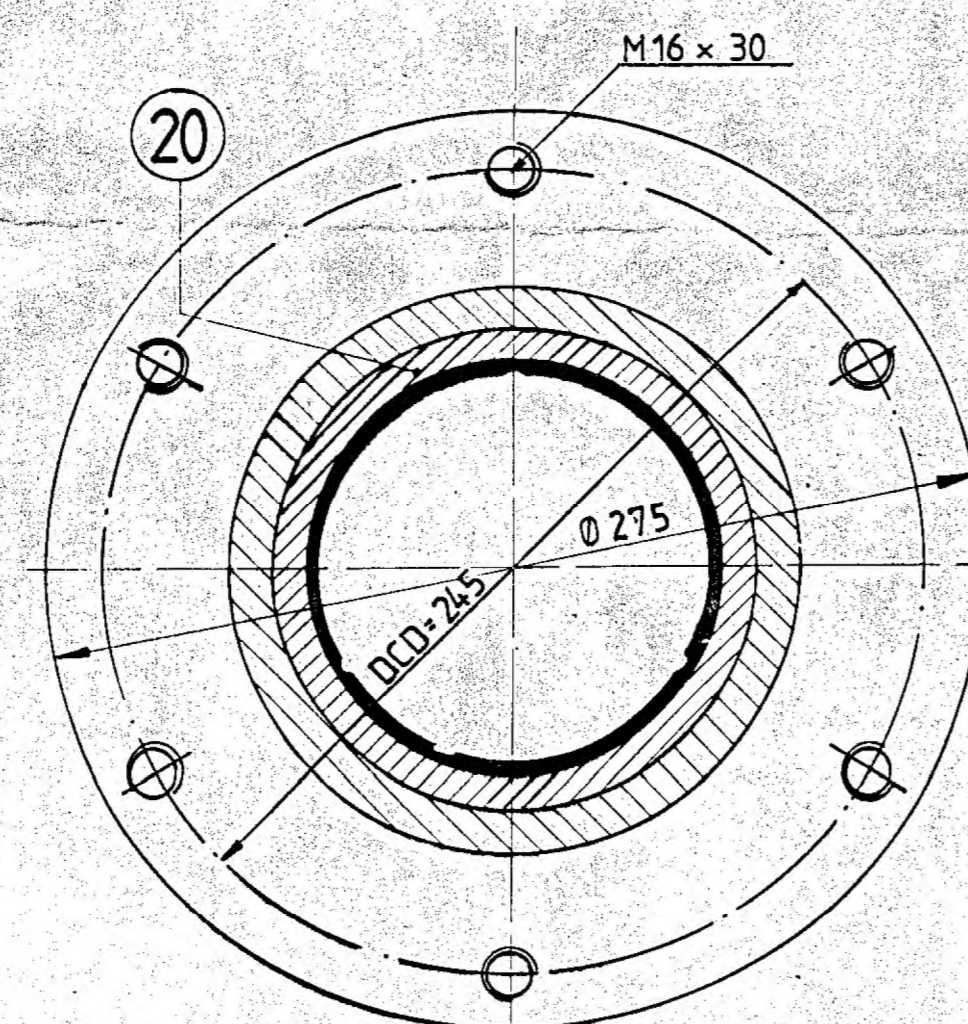
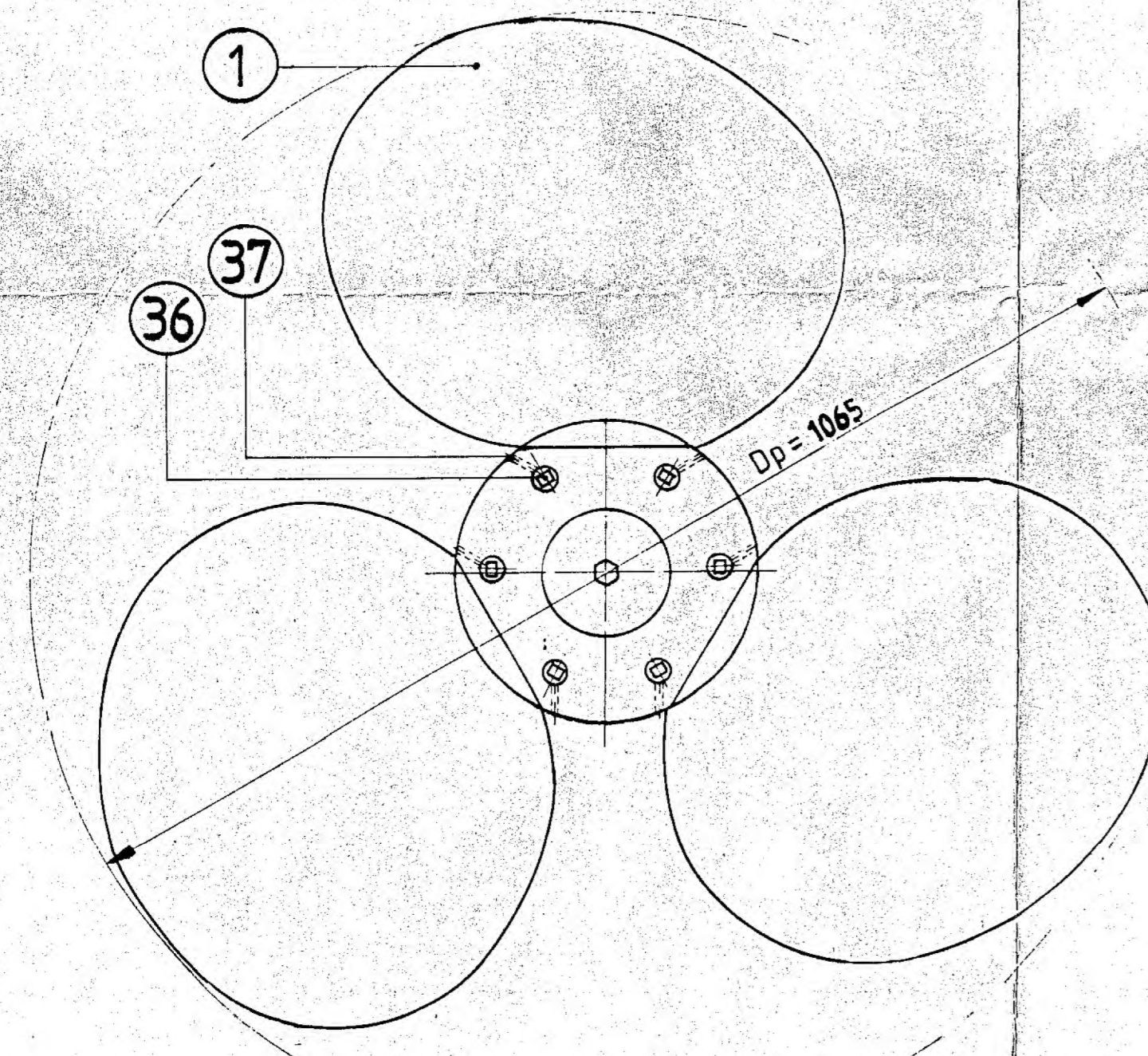


CONTROL MEASUREMENT "Z":
PROPELLER-BLADES IN MIDDLE POSITION.

SECTION A-A

SECTION B-B

SECTION C-C



Dokument 410-034					
Ant	Gjenstand	Pos	Materiale	Tegning nr.	Mod. nr. Anmerking
	PROPELLER ARRANGEMENT			Tegn. 2/10. 80. K.F.	Erst. for
	K300/100-108-HS1065HV/WL. - PB-130			Trac.	
				Kfr.	
	A/S HEIMDALMOTOR			Målestokk	105-31
	6401 MOLDE				Erst. av

HEIMDAL PROPULSION NORWAY A/S

Postboks 2091 Moldegård
6401 Molde - Norway
Foretak-/Enterprise no.: 966112379MVA

Tel.no.: + 47 71 25 21 55
Fax.no.: + 47 71 25 17 78
E-mail: tande@heimdal.com

410-034

Deleliste til Tegning / Drawing no: 105-031

Ant.	Pos.:	Delenavn:	Anmerkning:
3	1	Propeller Blade	Right
3	1	Propeller Blade	Left
1	2	Propeller head, inner	
1	3	Propeller head, outer	
1	4	Positioner Slide	Right
1	4a	Positioner Slide	Left
3	5	Slide Block	
1	6	Nut. Prop. Head-Shaft	Right
1	6a	Nut. Prop. Head-Shaft	Left
1	7	Propeller Shaft	
1	8	Push Pull Rod	
1	9	Bushing, inner	
1	10	Bushing, outer	
1	11	Flange	
1	12	Thrust Ring	
1	13	Key Shaft Coupling	
1	14	Key Prop. Hub	
1	15	Stern Tube	
1	20	Shaft Bushing, outer	
1	21	Shaft Bushing, inner	
3	26	Sealing Strap	
1	28	O-Ring	
1	33	Sealing Ring	
1	34	Retainer for S. Ring	
1	35	Snap Ring	
6	36	Bolt Prop. Head	
6	37	Set Screw-stainless	
2	38	Hexagon Nut	
2	39	Set Screw-stainless	
1	55	Sealing Plug	
1	58	Connecting Piece	