ENGINEERING, SYSTEMS AND SHIP'S DRAWINGS

Attempt ALL questions.

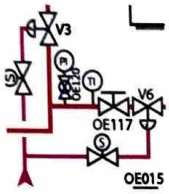
Marks for each part question are shown in brackets.

Section A

1. DRG.170

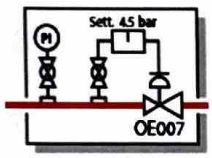
State what the following items are and describe their specific function in the illustrated system.

(a)



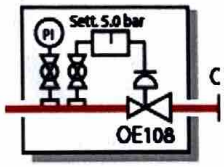
(2)

(b)



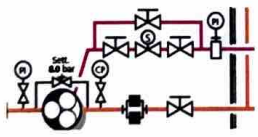
(2)

(c)



(2)

(d)



(2)

(e)

(2)

2. DRG.171

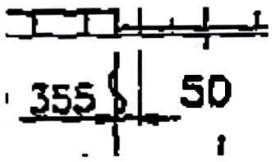
(a) State which of the flanges A & B is the suction flange. (2)

(b) Explain why both upper and lower bearings are simple ball bearings. (4)

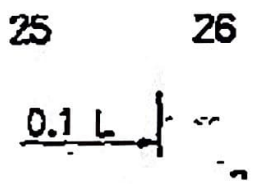
(c) Describe using drawing references how the pump shaft vertical position is fixed. (4)

3. DRG.172

(a) Describe the information provided in the below illustrations:

(i) 

(2)

(ii) 

(2)

(b) State the frame number that the flat bottom of the hull starts. (2)

(c) State the approximate length and thickness of the plate section running ford from frame 47, forming the shear strake. (2)

(d) State where the flat side of the hull starts. (2)

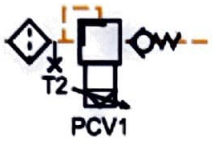
4. DRG.173

State what the following items are and describe their specific function in the illustrated system.

(a)

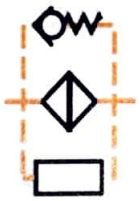
(2)

(b)



(2)

(c)



(2)

(d)

(2)

(e)

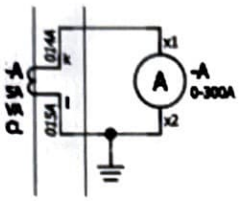
(2)

[OVER

5. DRG174

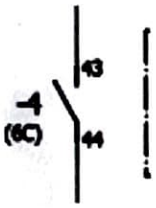
State what the following items are and describe their specific function in the illustrated system.

(a)



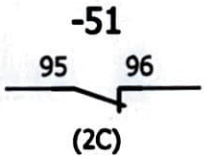
(2)

(b)



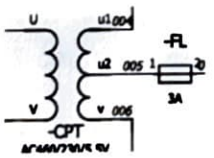
(2)

(c)



(3)

(d)



(3)

Section B

6. DRG.172

A collision has caused a significant indentation in the hull running between frames 52 to 62 and extending over 8 longitudinals starting at and running below deck level.

(a) Describe the checks that were undertaken around the damaged area after the collision. (10)

(b) Describe the complexities that influence the cost and duration of the repairs required to the damaged area. (15)

7. DRG.173

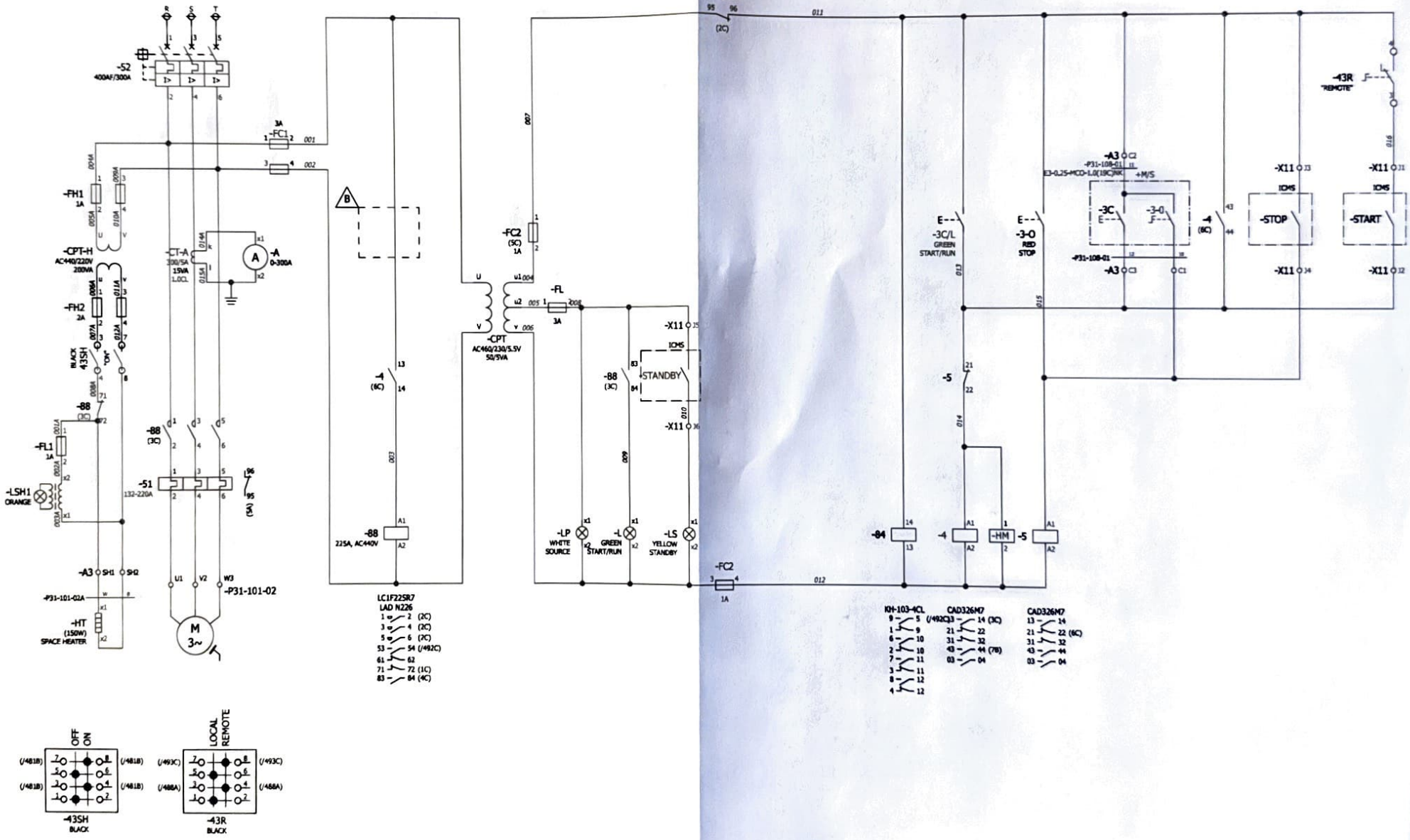
(a) Describe the function of the illustrated system. (3)

(b) Describe the power pack and it's means of generating hydraulic power. (5)

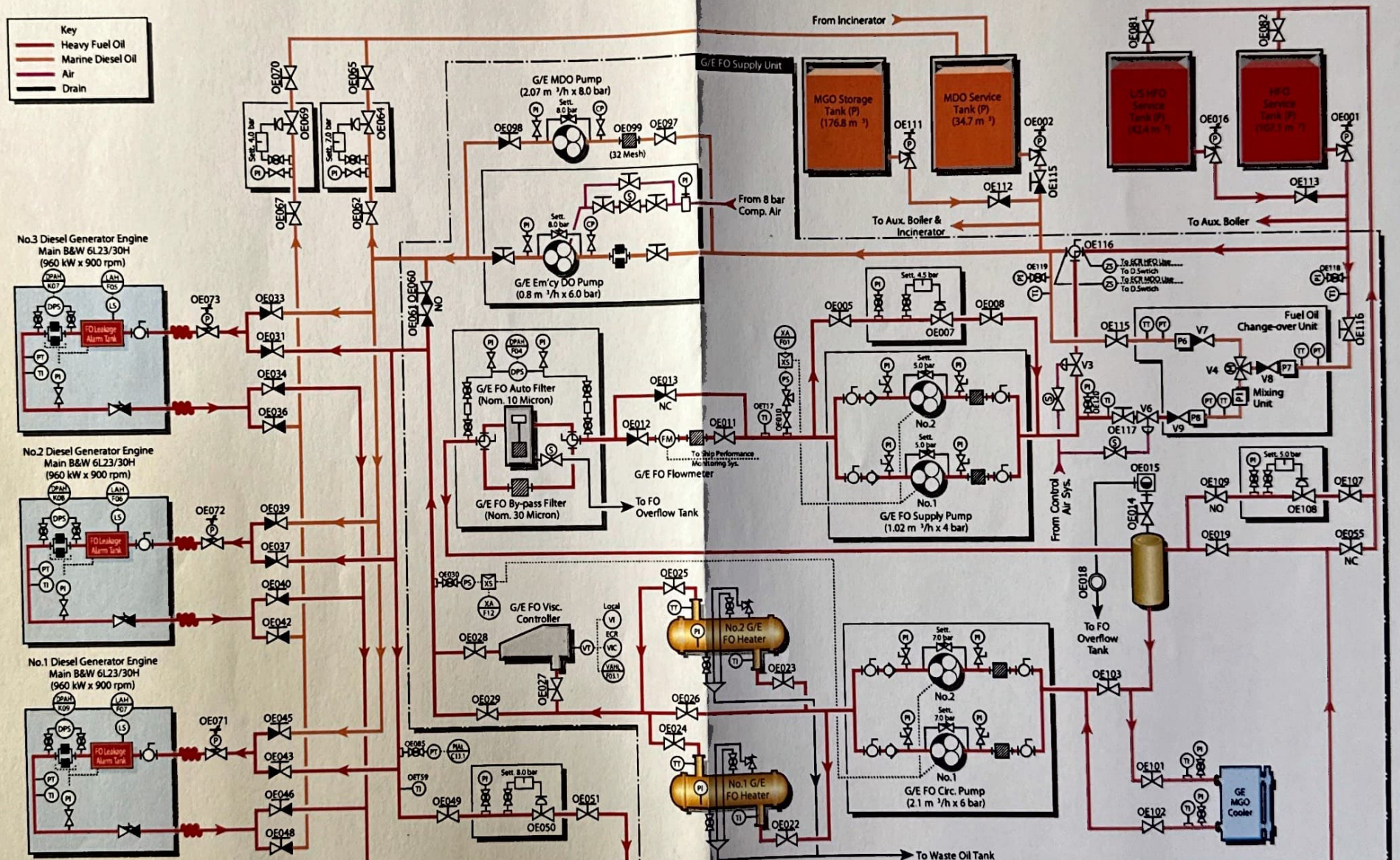
(c) Using drawing references, describe how the main system pressure is regulated. (5)

(d) Describe using drawing references the flows, how the illustrated system operates, including the purpose and function of the feed pumps. (12)

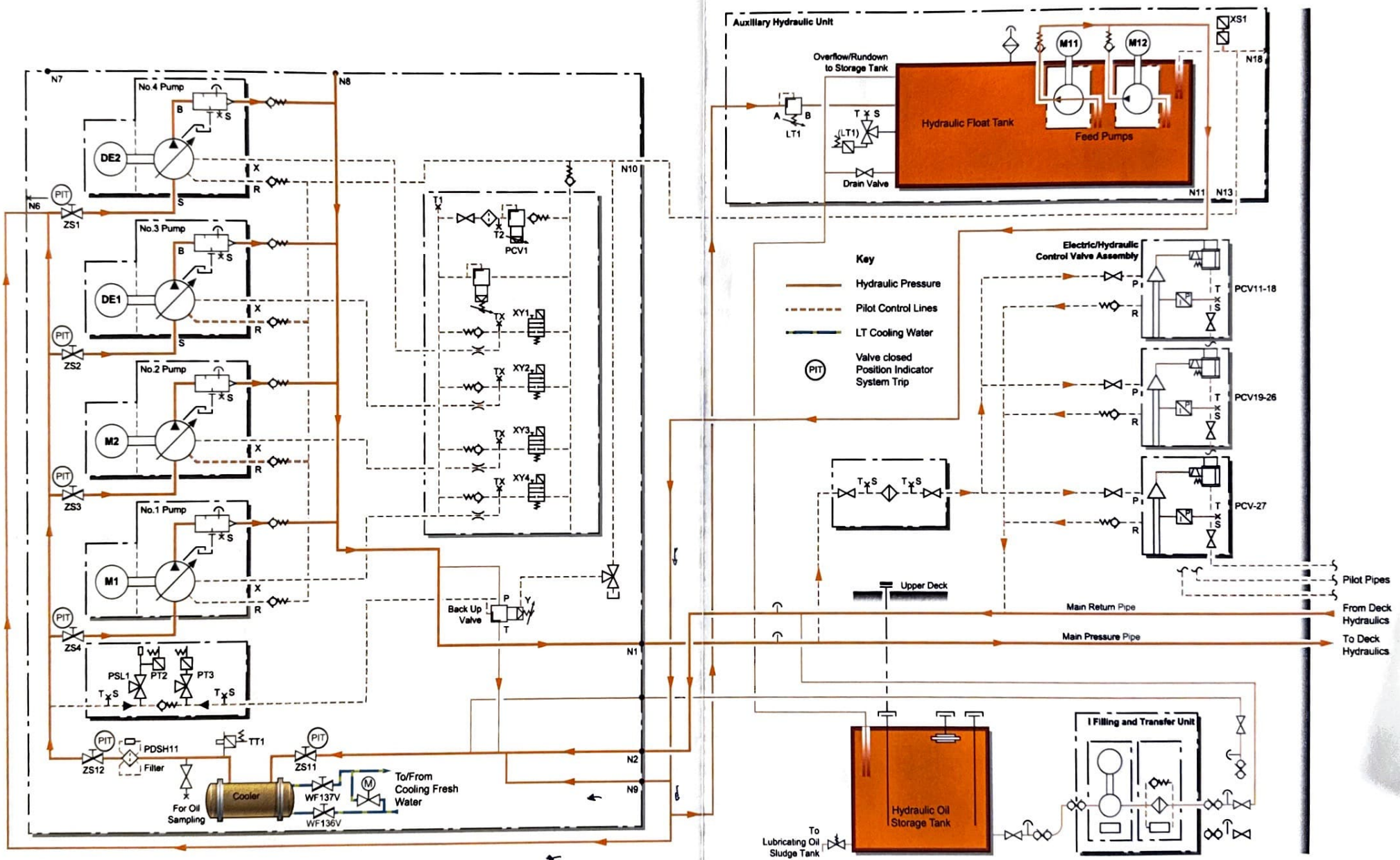
DRG. 174


-S2
400AF/300A
-FC1
3A
-FH1
1A
-CPT-H
AC440/220V
200VA
-FH2
2A
BLACK
43SH
"ON"
-88
(3C)
-FL1
1A
-LSH1
ORANGE
-A3
-P31-101-02A
-HT
(150W)
SPACE HEATER
-CT-A
300/5A
15VA
1.0CL
-A
0-300A
-51
132-220A
-P31-101-02
M
3~
-4
(6C)
-88
225A, AC440V
LC1F225R7
LAD N226
-FC2
(5C)
1A
-CPT
AC460/230/5.5V
50/5VA
-FL
3A
-X11
ICMS
-88
(3C)
STANDBY
-LP
WHITE
SOURCE
-L
GREEN
START/RUN
-LS
YELLOW
STANDBY
-51
(2C)
-FC2
1A
-84
-4
-HM
-5
-3C/L
GREEN
START/RUN
-3-O
RED
STOP
-A3
-P31-108-01
E3-0.25-MCD-1.0(18C)NK
+M/S
-3C
-3-O
-4
(6C)
-X11
ICMS
-STOP
-START
-43R
"REMOTE"
KH-103-4CL
(/492C)
CAD326M7
CAD326M7
OFF
ON
-43SH
BLACK
LOCAL
REMOTE
-43R
BLACK

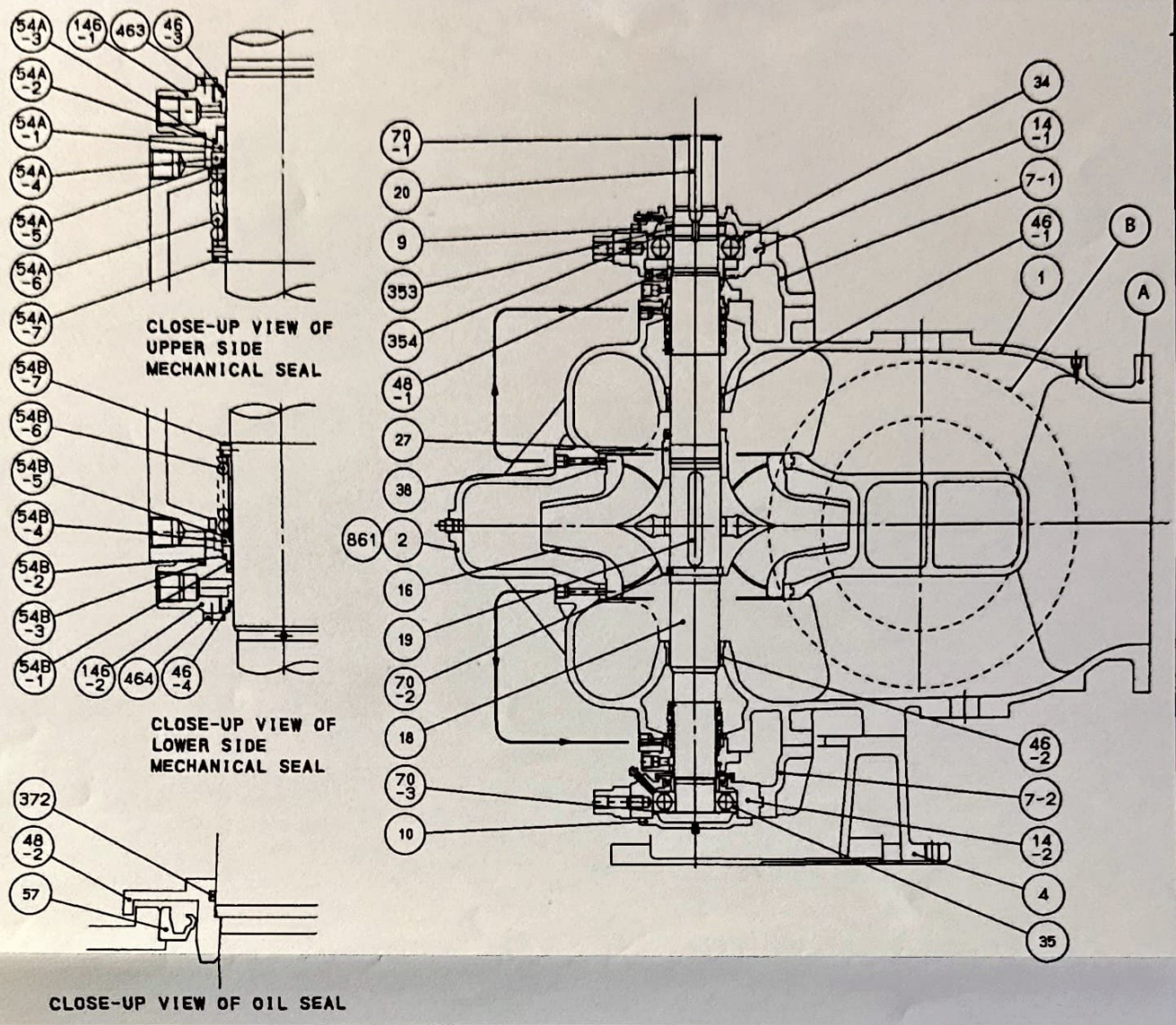
DRG. 170


Key
Heavy Fuel Oil
Marine Diesel Oil
Air
Drain
From Incinerator
G/E FO Supply Unit
MGO Storage Tank (P) (176.8 m ³)
MDO Service Tank (P) (34.7 m ³)
L/S HFO Service Tank (P) (42.4 m ³)
HFO Service Tank (P) (102.1 m ³)
G/E MDO Pump (2.07 m ³/h x 8.0 bar)
(32 Mesh)
From 8 bar Comp. Air
G/E Em'cy DO Pump (0.8 m ³/h x 6.0 bar)
To Aux. Boiler & Incinerator
To Aux. Boiler
No.3 Diesel Generator Engine Main B&W 6L23/30H (960 kW x 900 rpm)
No.2 Diesel Generator Engine Main B&W 6L23/30H (960 kW x 900 rpm)
No.1 Diesel Generator Engine Main B&W 6L23/30H (960 kW x 900 rpm)
FO Leakage Alarm Tank
G/E FO Auto Filter (Nom. 10 Micron)
G/E FO By-pass Filter (Nom. 30 Micron)
G/E FO Flowmeter
To FO Overflow Tank
G/E FO Visc. Controller
No.2 G/E FO Heater
No.1 G/E FO Heater
No.2 G/E FO Supply Pump (1.02 m ³/h x 4 bar)
No.1 G/E FO Circ. Pump (2.1 m ³/h x 6 bar)
Fuel Oil Change-over Unit
Mixing Unit
From Control Air Sys.
To FO Overflow Tank
GE MGO Cooler
To Waste Oil Tank

DRG. 173


Auxiliary Hydraulic Unit
Overflow/Rundown to Storage Tank
Hydraulic Float Tank
Feed Pumps
M11
M12
XS1
N18
LT1
(LT1)
Drain Valve
N11
N13
Key
Hydraulic Pressure
Pilot Control Lines
LT Cooling Water
Valve closed Position Indicator System Trip
Electric/Hydraulic Control Valve Assembly
PCV11-18
PCV19-26
PCV-27
Pilot Pipes
From Deck Hydraulics
To Deck Hydraulics
Main Return Pipe
Main Pressure Pipe
Upper Deck
N7
N8
N10
No.4 Pump
No.3 Pump
No.2 Pump
No.1 Pump
DE2
DE1
M2
M1
PIT
ZS1
ZS2
ZS3
ZS4
N6
PCV1
T1
T2
XY1
XY2
XY3
XY4
Back Up Valve
N1
N2
N9
PSL1
PT2
PT3
PDSH11
Filter
TT1
ZS11
ZS12
For Oil Sampling
Cooler
WF137V
WF136V
To/From Cooling Fresh Water
Hydraulic Oil Storage Tank
To Lubricating Oil Sludge Tank
Filling and Transfer Unit

DRG. 171



PART NO.	NAME OF PART	MATERIAL		REQ. NO. FOR 1 PUMP	PART NO.	NAME OF PART	MATERIAL		REQ. NO. FOR 1 PUMP
		NAME	JIS				NAME	JIS	
1	VOLUTE CASING	BRONZE	CAC402	1	54A-3	PACKING	RUBBER	.	1
2	VOLUTE COVER	〃	〃	1	54A-4	SEAL RING	STAINLESS STEEL	SUS316	1
4	PUMP BED	CAST IRON	FC200	1	54A-5	PACKING RING	RUBBER		1
7-1	BEARING HOUSING	〃	〃	1	54A-6	SPRING	STAINLESS STEEL	SUS316	1
7-2	BEARING HOUSING	〃	〃	1	54A-7	STOPPER RING	〃	〃	1SET
9	BEARING COVER	〃	〃	1	54B-1	FLOATING SEAT	CARBON		1
10	BEARING COVER	〃	〃	1	54B-2	PACKING RING	RUBBER		1
14-1	BEARING INNER CASE	〃	〃	1	54B-3	PACKING	〃		1
14-2	BEARING INNER CASE	〃	〃	1	54B-4	SEAL RING	STAINLESS STEEL	SUS316	1
16	IMPELLER	STAINLESS STEEL	SCS14	1	54B-5	PACKING RING	RUBBER		1
18	IMPELLER SHAFT	STAINLESS STEEL	SUS329J1	1	54B-6	SPRING	STAINLESS STEEL	SUS316	1
19	IMPELLER KEY	〃	SUS304	1	54B-7	STOPPER RING	〃	〃	1SET
20	COUPLING KEY	CARBON STEEL	S55C	1	57	PACKING RING	RUBBER		1
27	IMPELLER NUT	SPECIAL AL BRONZE		1	70-1	SNAP RING	CARBON TOOL STEEL	SK5	1
34	BALL BEARING	SPECIAL STEEL		1	70-2	SPLIT RING	STAINLESS STEEL	SUS304	1SET
35	BALL BEARING	〃		1	70-3	SNAP RING	CARBON TOOL STEEL	SK5	1
38	MOUTH RING	SYNTHETIC RESIN	-	2	146-1	MECHA. SEAL COVER	BRONZE	CAC406	1
46-1	THROTTLE BUSH	BRONZE	CAC604	1	146-2	MECHA. SEAL COVER	〃	〃	1
46-2	THROTTLE BUSH	〃	〃	1	353	BEARING NUT	STEEL	SS400	1
46-3	OIL SEAL	RUBBER		1	354	BEARING WASHER	〃	〃	1
46-4	OIL SEAL	〃		1	372	PACKING RING	RUBBER		1
48-1	FLINGER	BRONZE	CAC403	1	463	OIL SEAL STOPPER	STEEL	SS400	2
48-2	FLINGER	STAINLESS STEEL	SCS13	1	464	OIL SEAL STOPPER	〃	〃	2
54A-1	FLOATING SEAT	CARBON		1	861	SEAT PACKING (t=0.3mm)	THREE SEAT		1
54A-2	PACKING RING	RUBBER		1					

SECTIONAL DRAWING	MODEL	
	DRAW. NO.	

DRG. 172

NO.9 HOLD

NO.8 HOLD

ENGINE ROOM