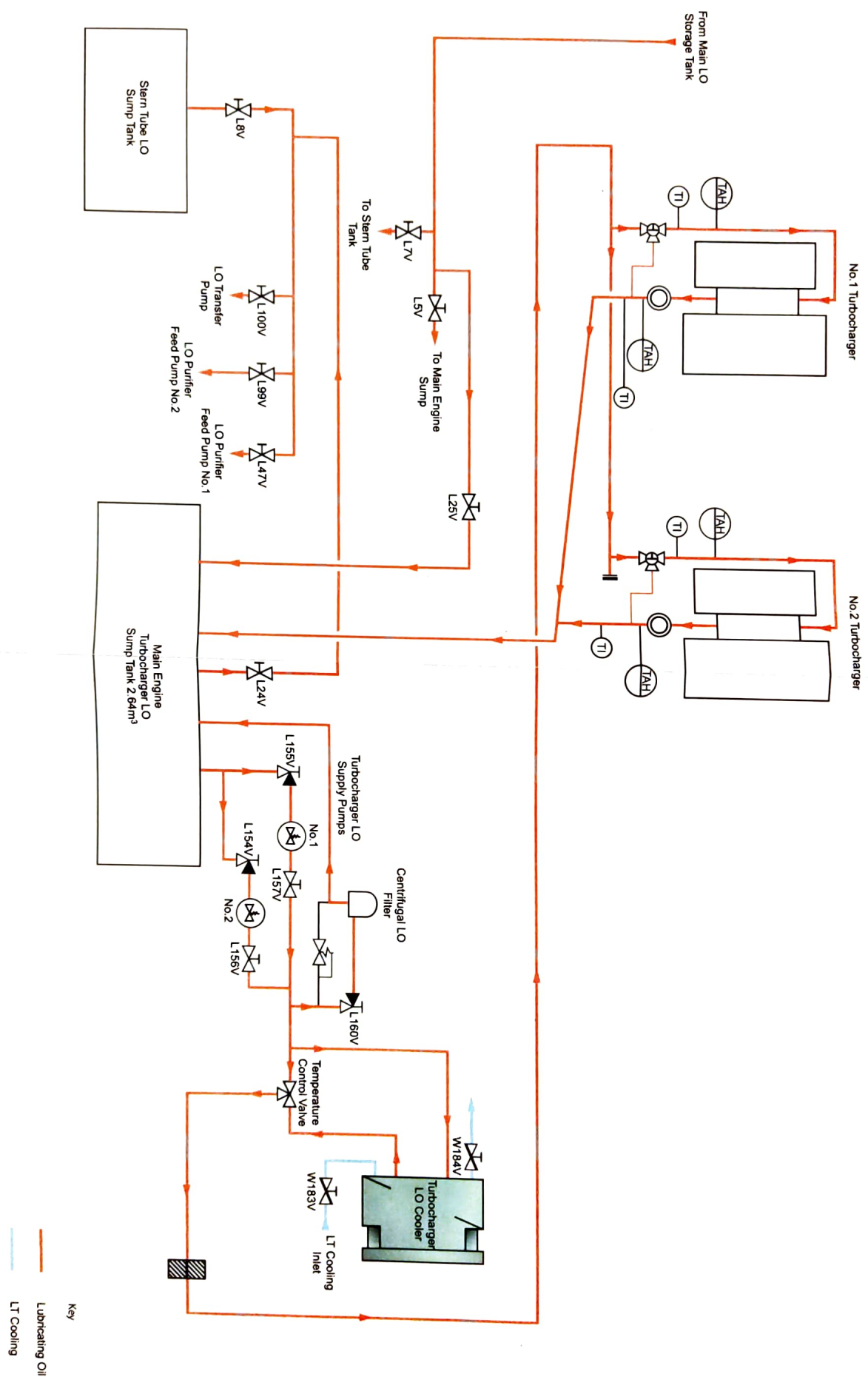
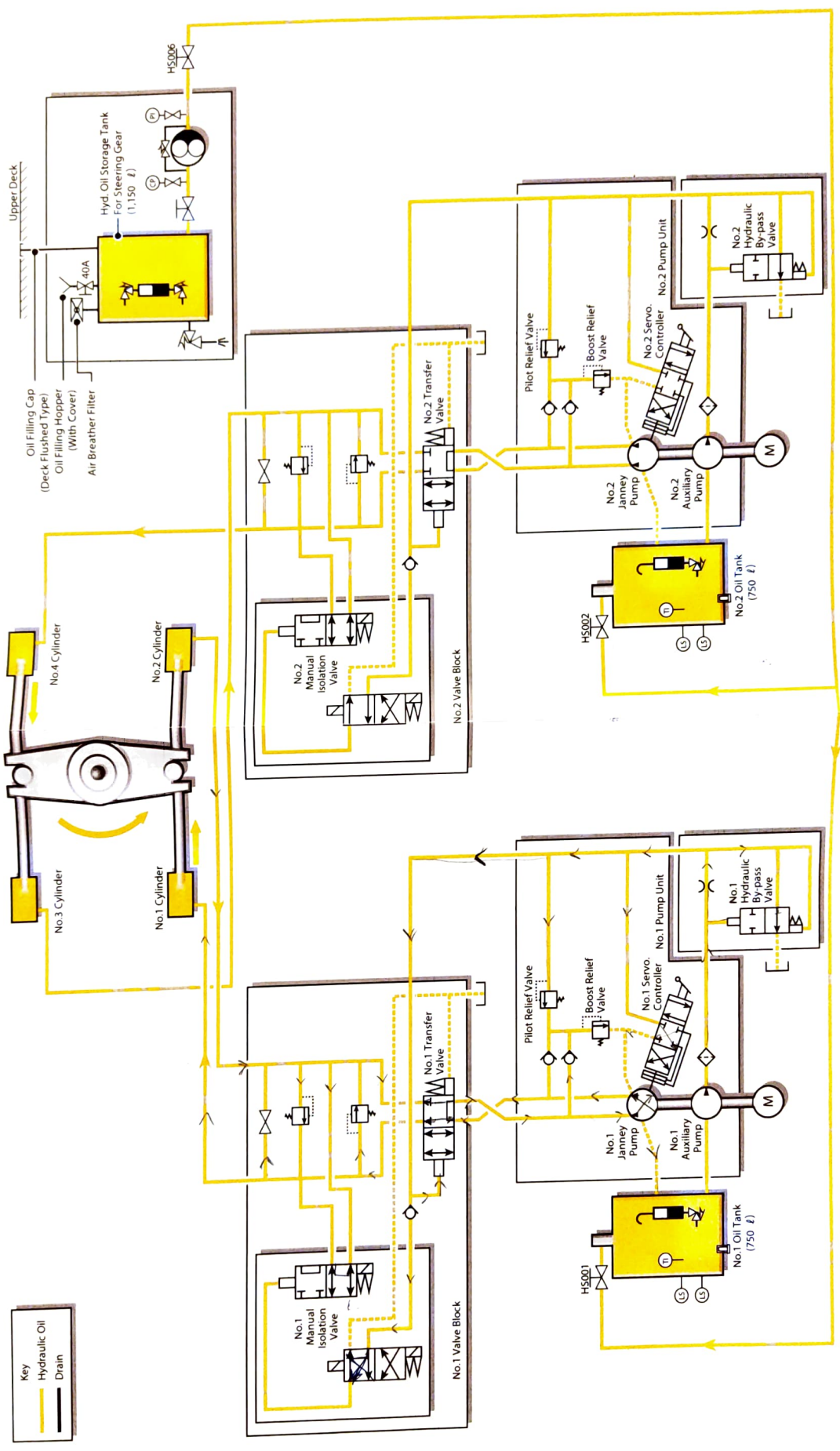


T1	SEQUENTIAL START
T2	INTERVAL
	1-99 sec.
	0.5-50 sec.



Approved by
 A. J. M.
 9/13/13



CERTIFICATES OF COMPETENCY IN THE MERCHANT NAVY
MARINE ENGINEER OFFICER

STCW 78 as amended MANAGEMENT ENGINEER REG. III/2 (UNLIMITED)

040-36 - ENGINEERING, SYSTEMS AND SHIP'S DRAWINGS

WEDNESDAY, 13 DECEMBER 2023

1315 - 1615 hrs

Materials to be supplied by examination centres

Candidate's examination workbook
Graph paper

Examination Paper Inserts

DRG - 145
DRG - 146
DRG - 147
DRG - 148
DRG - 149

Notes for the guidance of candidates:

1. Examinations administered by SQA on behalf of the Maritime & Coastguard Agency
2. Candidates are required to obtain 50% of the total marks allocated to this paper to gain a pass **AND** also obtain a minimum 40% in Sections A and B of the paper.
3. Non-programmable calculators may be used.
4. All formulae used must be stated and the method of working and ALL intermediate steps must be made clear in the answer.



ENGINEERING, SYSTEMS AND SHIP'S DRAWINGS

Attempt ALL questions.

Marks for each part question are shown in brackets.

Section A

1. DRG. 145

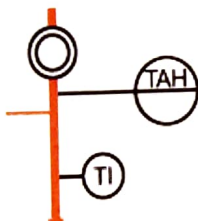
State what the following items are and describe their function in the illustrated system.

(a)



(2)

(b)



(2)

(c) Describe the flow paths of the oil from sump to sump. (4)

(d) Briefly explain the significance of a stern tube oil leak on this particular vessel, considering the oil type used in the illustrated system. (2)

2. DRG. 146

(a) Using drawing references identify the casing sections that make up the engine driven pump assembly, including the bearing casing. (2)

(b) Using drawing references describe how the pump shaft axial alignment is maintained. (2)

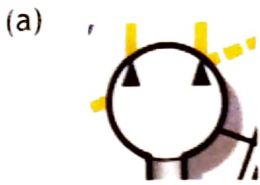
(c) Using drawing references, describe the seal arrangements incorporated in the highlighted view. (3)

(d) Describe the function of item '7' in the illustrated assembly. (3)

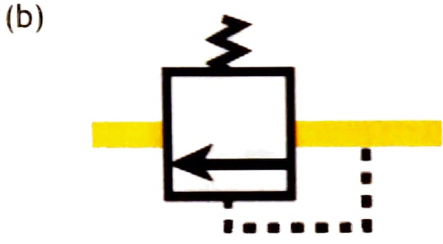
3. DRG. 147

- (a) State how the spacing between the blocks grouped under the propeller shaft can be ascertained. (2)
- (b) State why positioning of the central blocks around frame 62 is critical, describing what makes this location different from other similar locations. (3)
- (c) Describe why the keel blocks are located so closely at the aft end of the ship. (2)
- (d) Describe what information is obtained from the body line. (3)

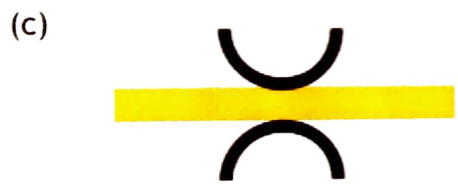
State what the following items are and describe their function in the illustrated system.



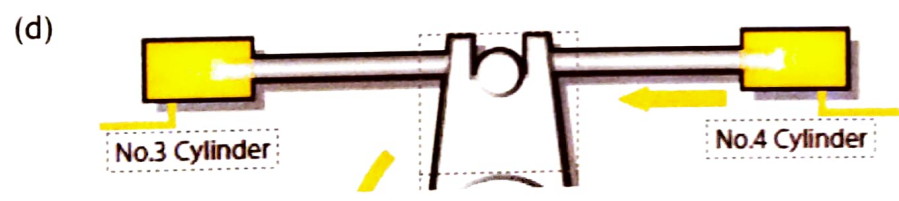
(2)



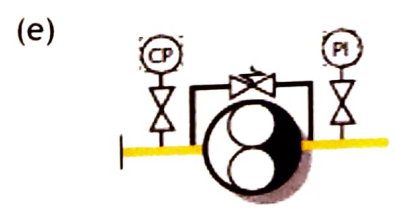
(2)



(2)



(2)



(2)

5. DRG. 149

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



(d) Describe the purpose of the illustrated circuit and the basic principle of how this is achieved. (4)

Section B

6. DRG. 148

- (a) Using drawing references describe the flow paths and operation of the illustrated system under normal conditions. (10)
- (b) Using drawing references describe the operation of the illustrated system when the in service pump oil tank level begins to drop. (15)

7. DRG. 149

- (a) Describe, using drawing references, the action and sequence of actions involved in local starting of the motor in fwd mode.

Include all auxilliary contacts activated in the circuit by the start sequence and circuit voltage. (20)
- (b) Describe, using drawing references, the action and sequence of actions involved in stopping the motor. (5)