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, 17 JULY 2024

1315 - 1615 hrs

Materials to be supplied by examination centres

Candidate's examination workbook
Graph paper

Examination Paper Inserts

DRG - 155
DRG - 156
DRG - 157
DRG - 158
DRG - 159

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.

Maritime & Coastguard Agency

SQA

ENGINEERING, SYSTEMS AND SHIP'S DRAWINGS

Attempt ALL questions.

Marks for each part question are shown in brackets.

Section A

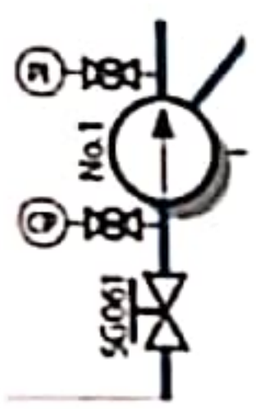
1. DRG. 155

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

(a)

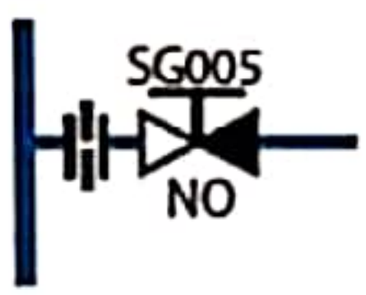
(2)

(b)



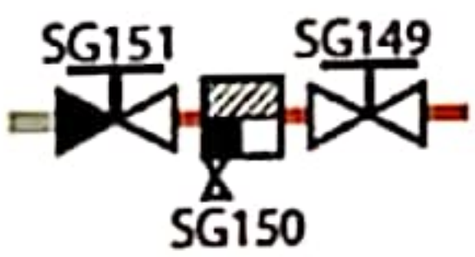
(2)

(c)



(2)

(d)



(2)

(e)

(2)

[OVER

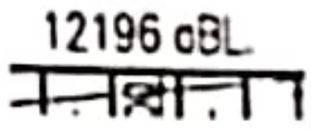
2. DRG. 156

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

(b) Using drawing references, describe the operation of the illustrated assembly. (7)

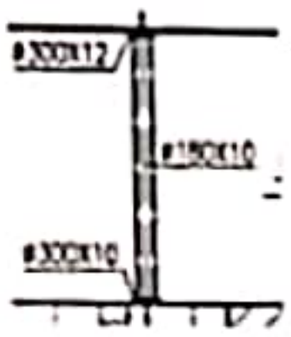
3. DRG. 157

(a) State the information provided in EACH of the following images.



(2)

(b)



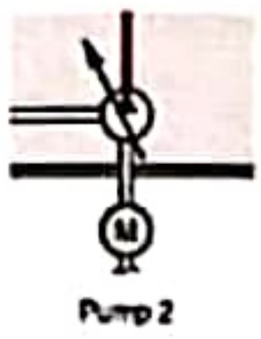
(4)

(c) Describe the construction of the stern frame, including what the hatched area indicates. (4)

4. DRG. 158

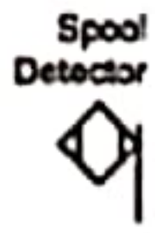
State what EACH of the following items are and describe their function in the illustrated system.

(a)



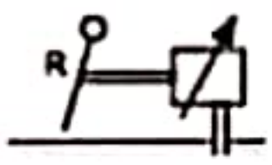
(2)

(b)



(2)

(c)



(2)

(d)

(2)

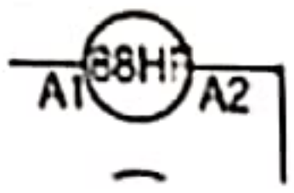
(e)

(2)

5. DRG. 159

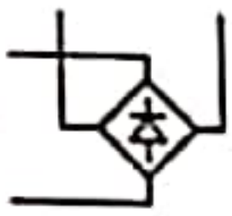
State what EACH of the following items are and describe their function in the illustrated system.

(a)



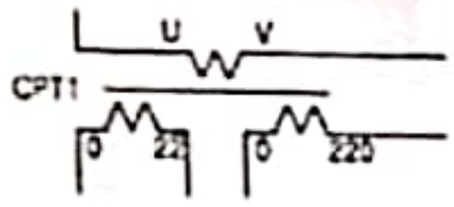
(2)

(b)



(2)

(c)



(2)

(d) Describe the basic function of the illustrated circuit, explaining the basic principle of how this is achieved.

(4)

Section B

6. DRG. 159

(a) Describe using drawing references the action and sequence of actions involved in local starting of the motor in high speed forward mode. Include all auxilliary contacts activated in the circuit by the start sequence circuit voltage. (20)

(b) Describe using drawing references, the action and sequence of actions involved in stopping the motor. (5)

7. DRG. 158

(a) Using drawing references, describe the operation of the illustrated system, when it is operating under normal conditions. Include description of flow paths and function of all components within the hydraulic circuit. (10)

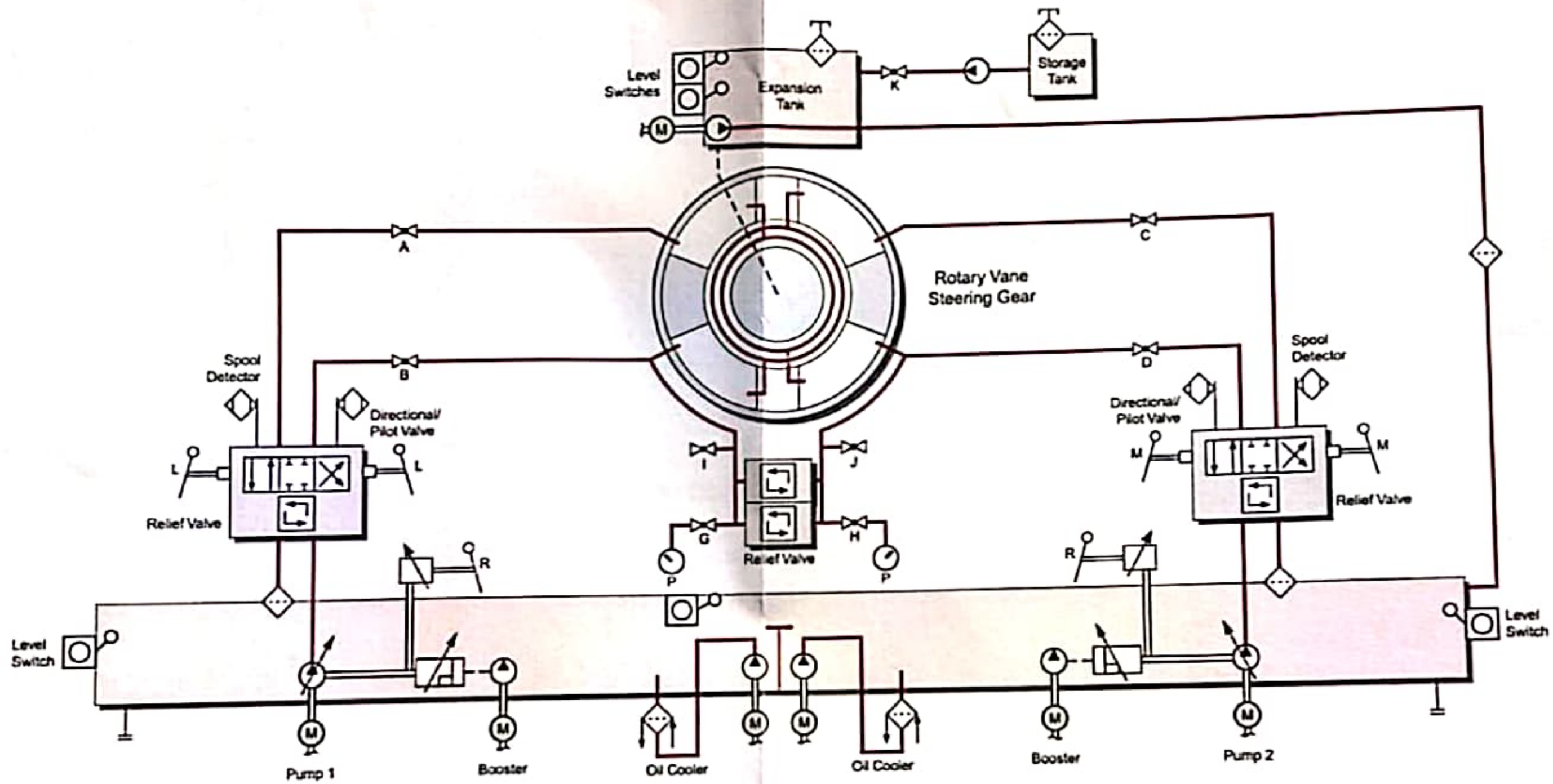
(b) Using drawing references, describe the operation of the illustrated system if the running system develops a leak. (10)

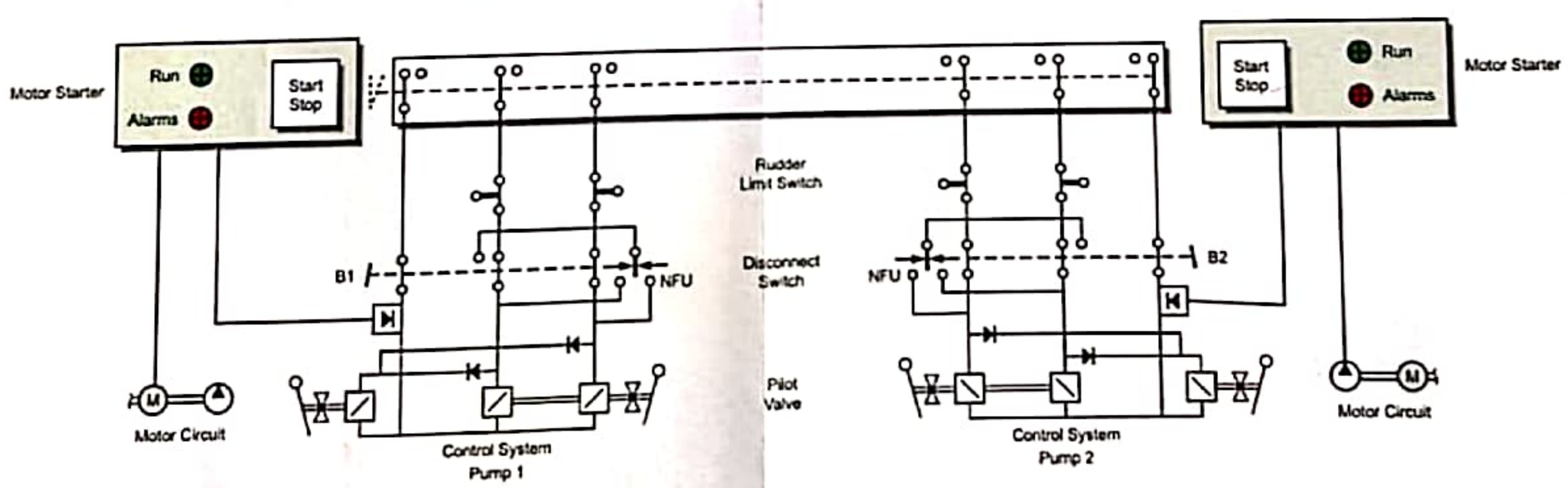
(c) Describe the function of the pump located within the expansion tank. (5)

Hydraulic System

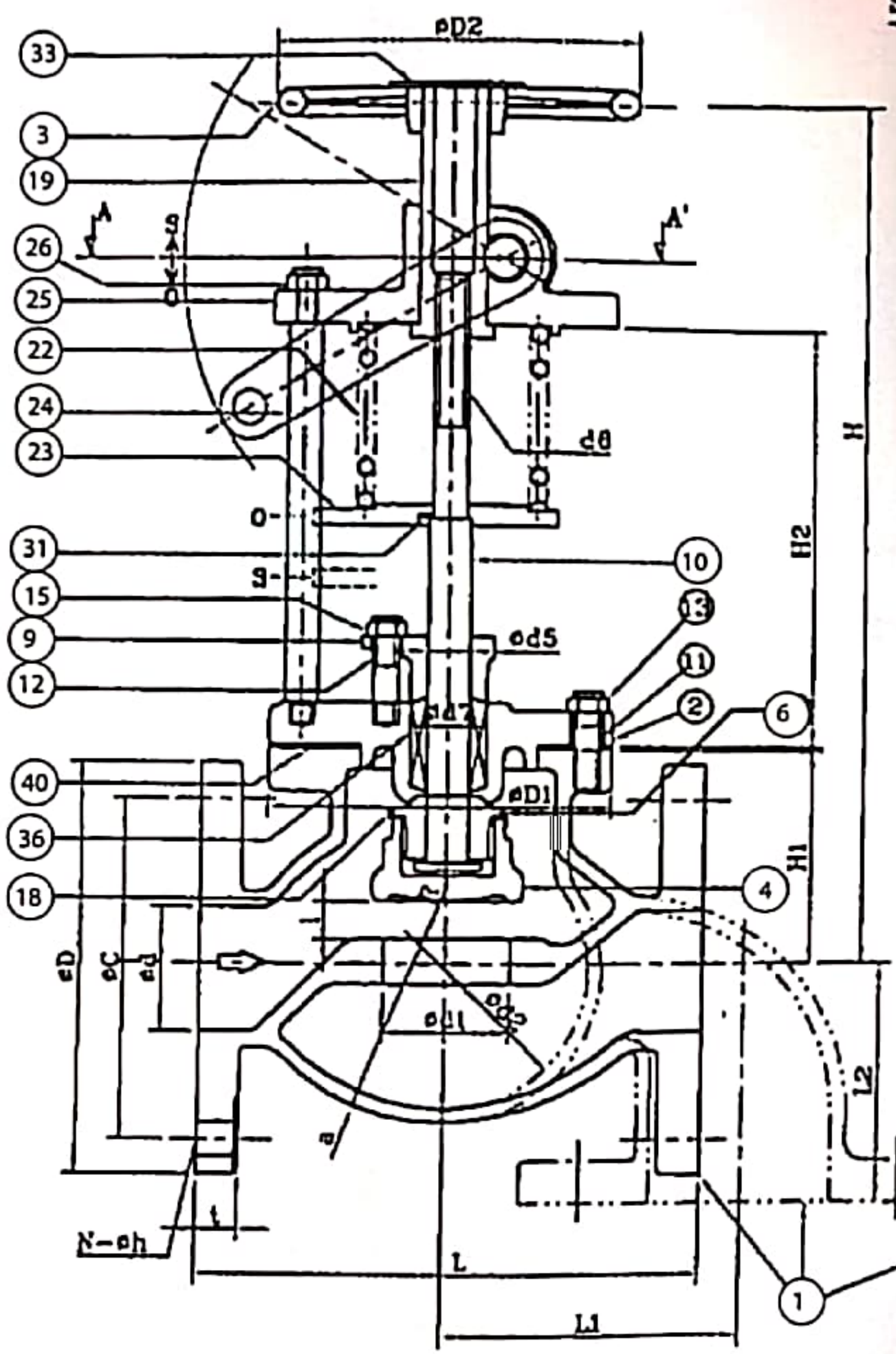
Oil Tank

Electrical System

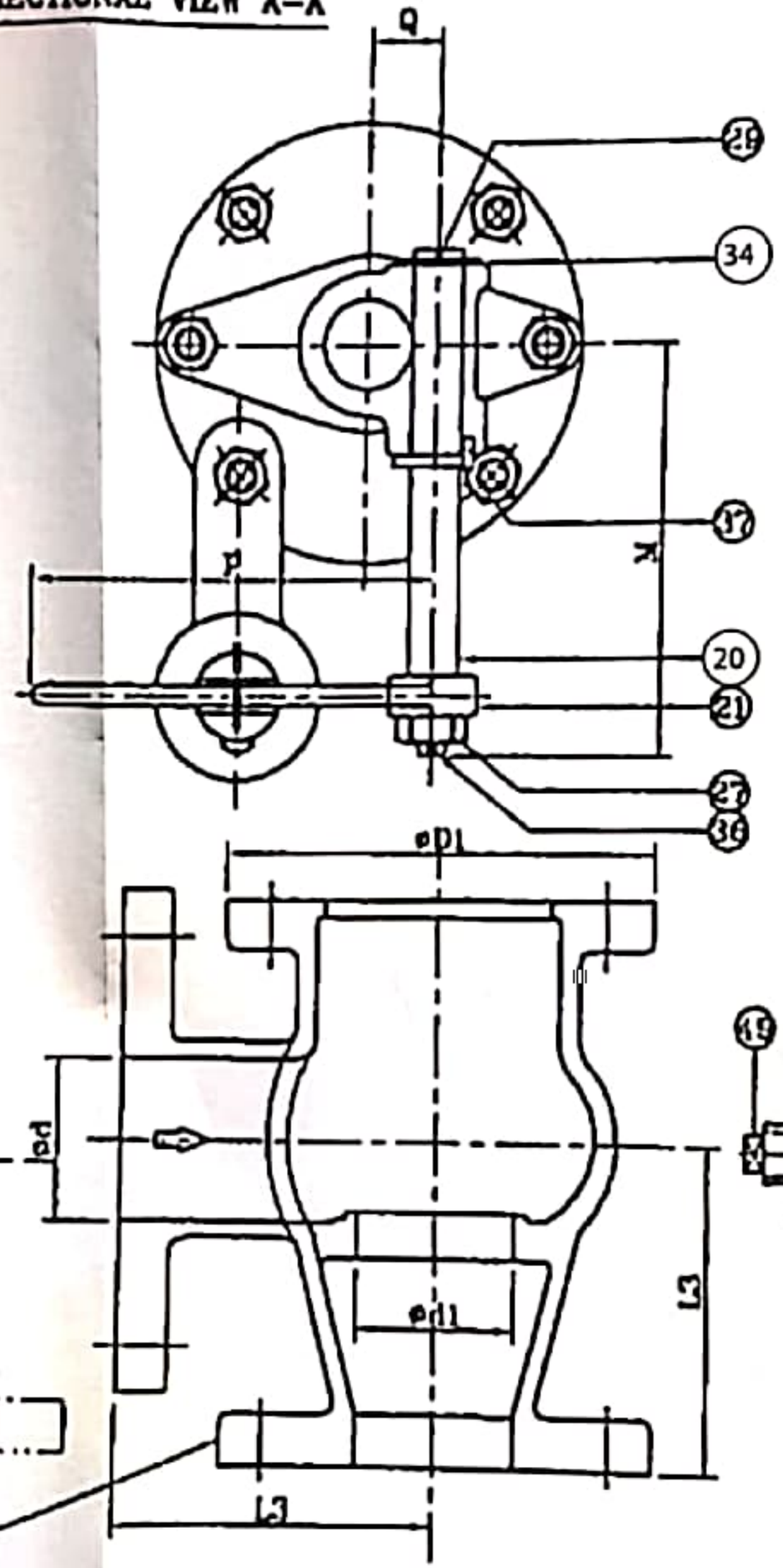




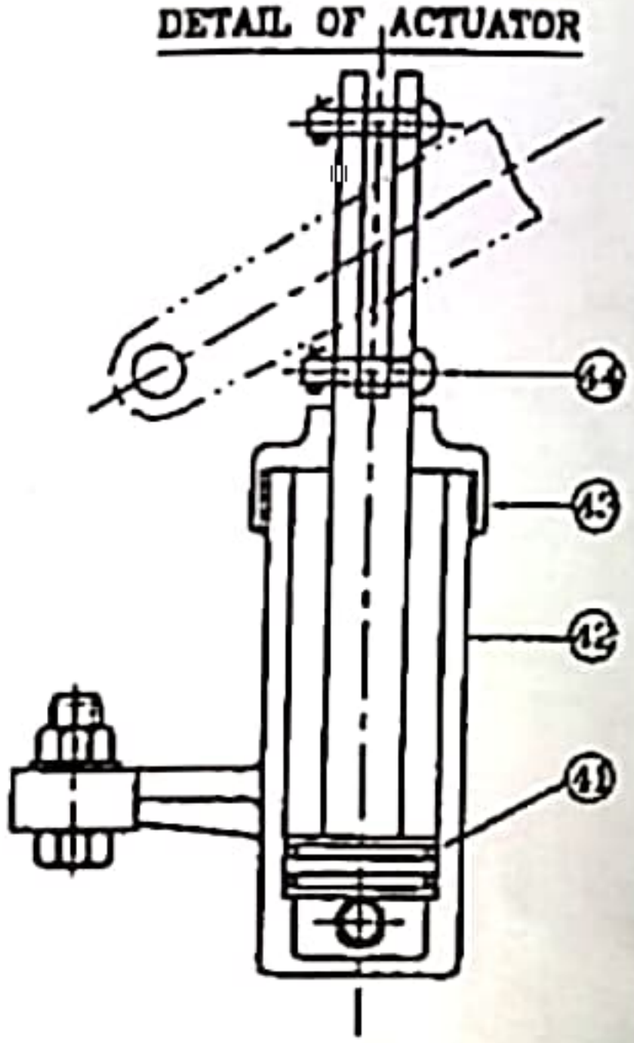
DRG. 156

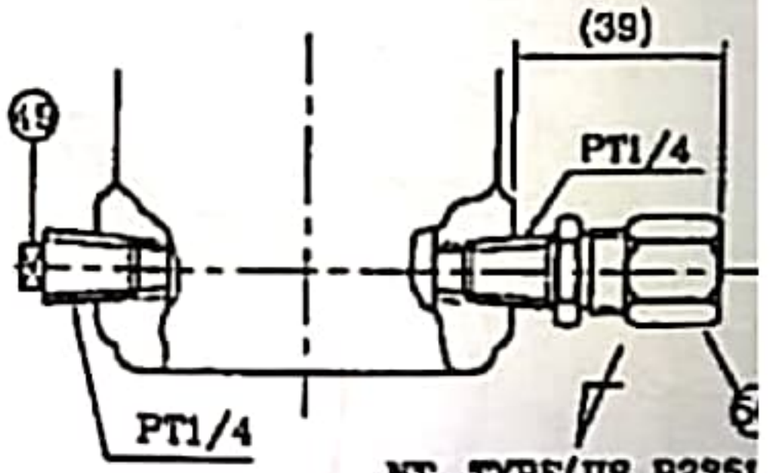


SECTIONAL VIEW A–A'



DETAIL OF ACTUATOR





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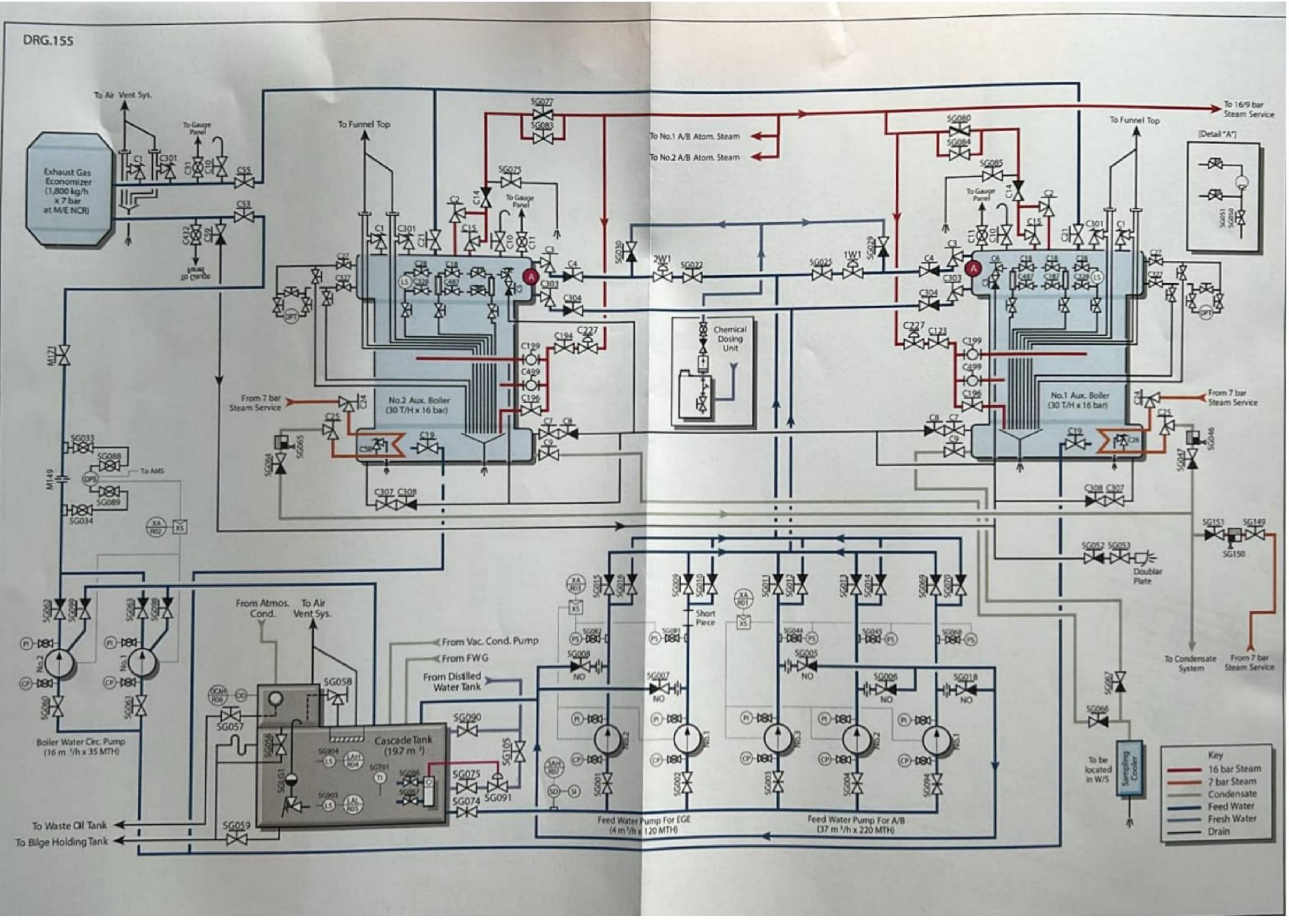
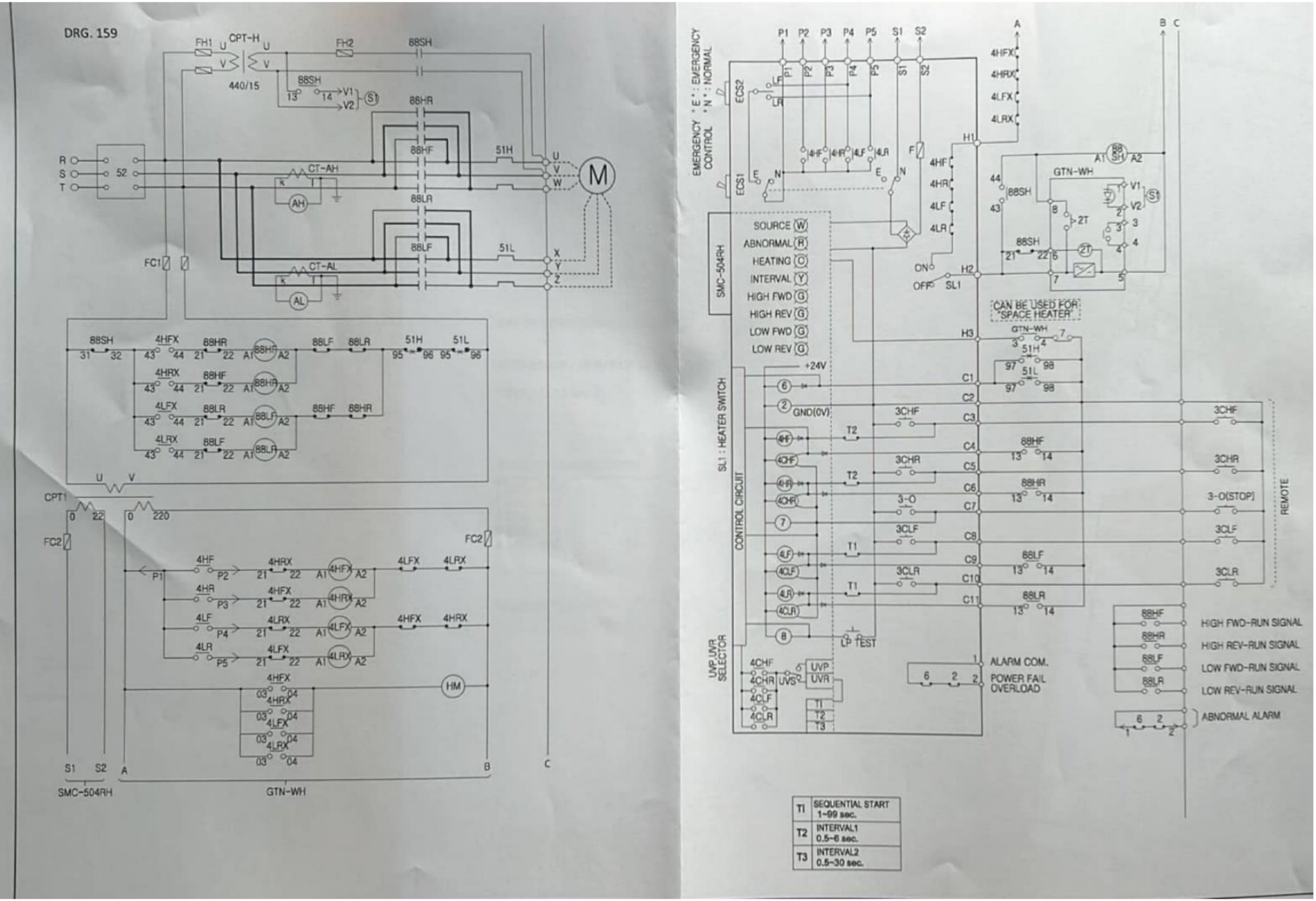
SIZE	OUT DIA
6A	10.5

SUS

DRG.155



DRG. 159



T1	SEQUENTIAL START 1~99 sec.
T2	INTERVAL1 0.5~6 sec.
T3	INTERVAL2 0.5~30 sec.

DRG.157