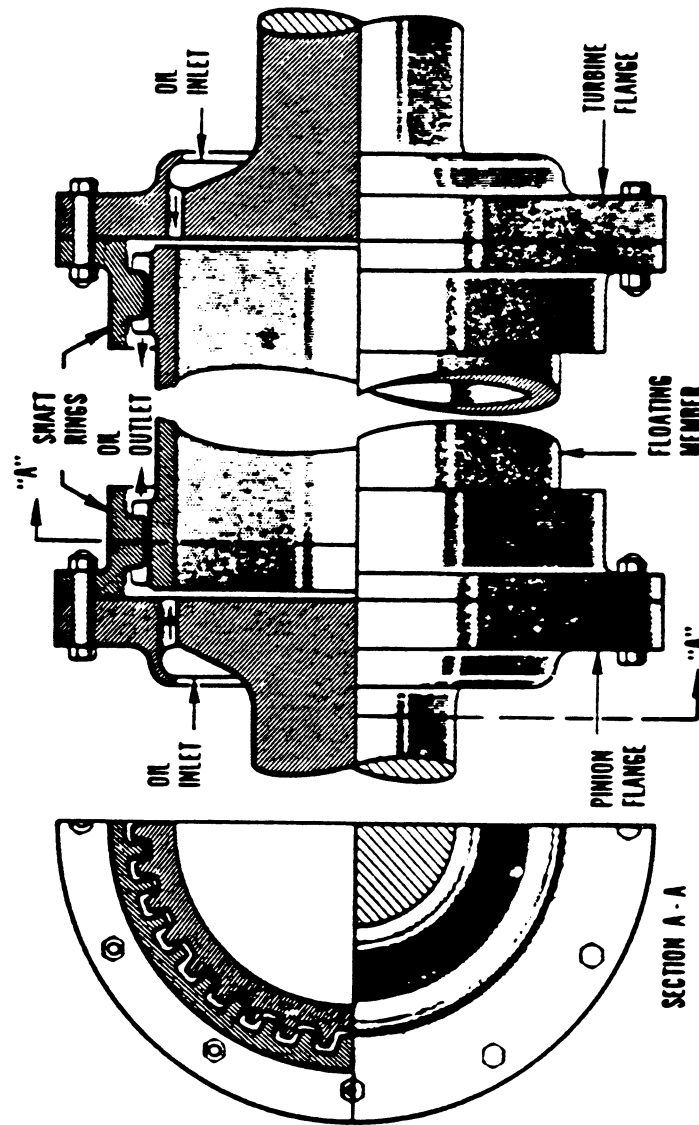
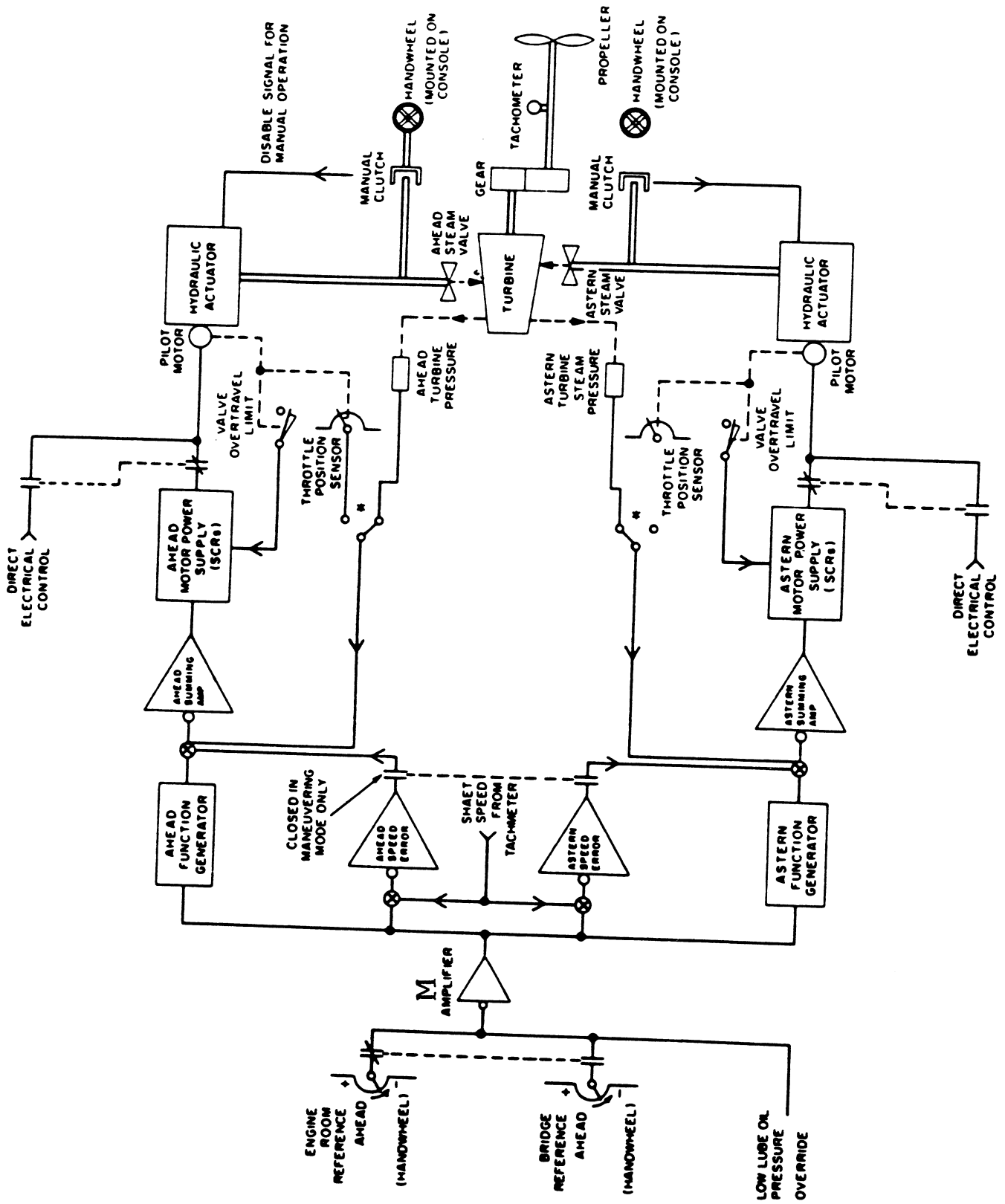


# CHAPTER 4 STEAM ENGINES

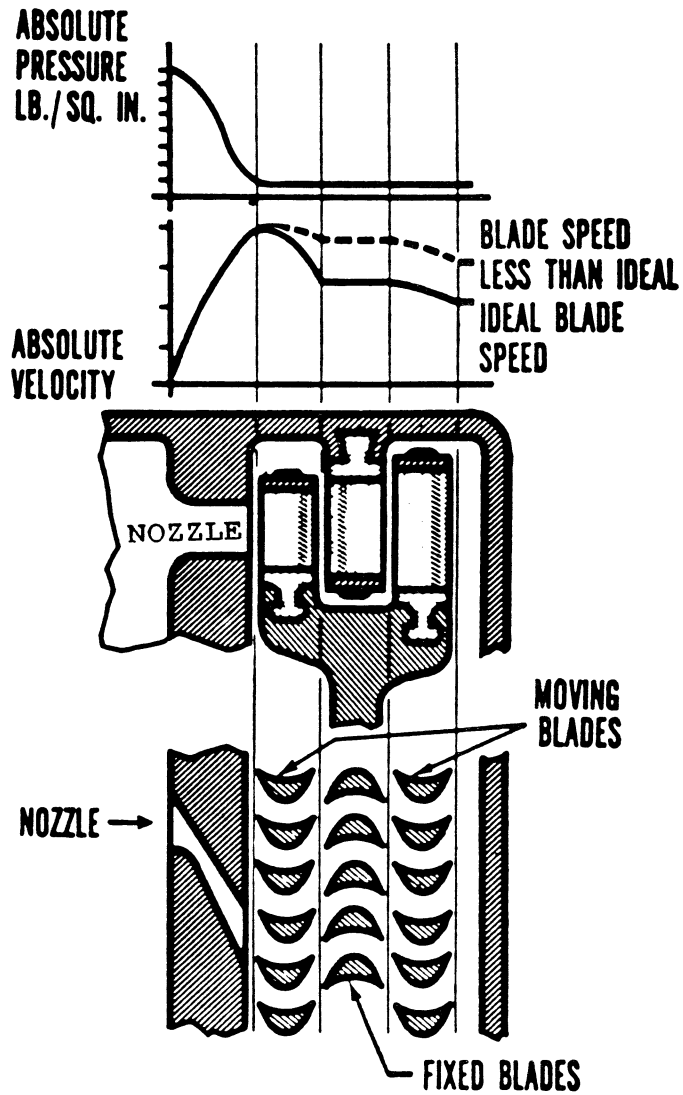
SE-0001



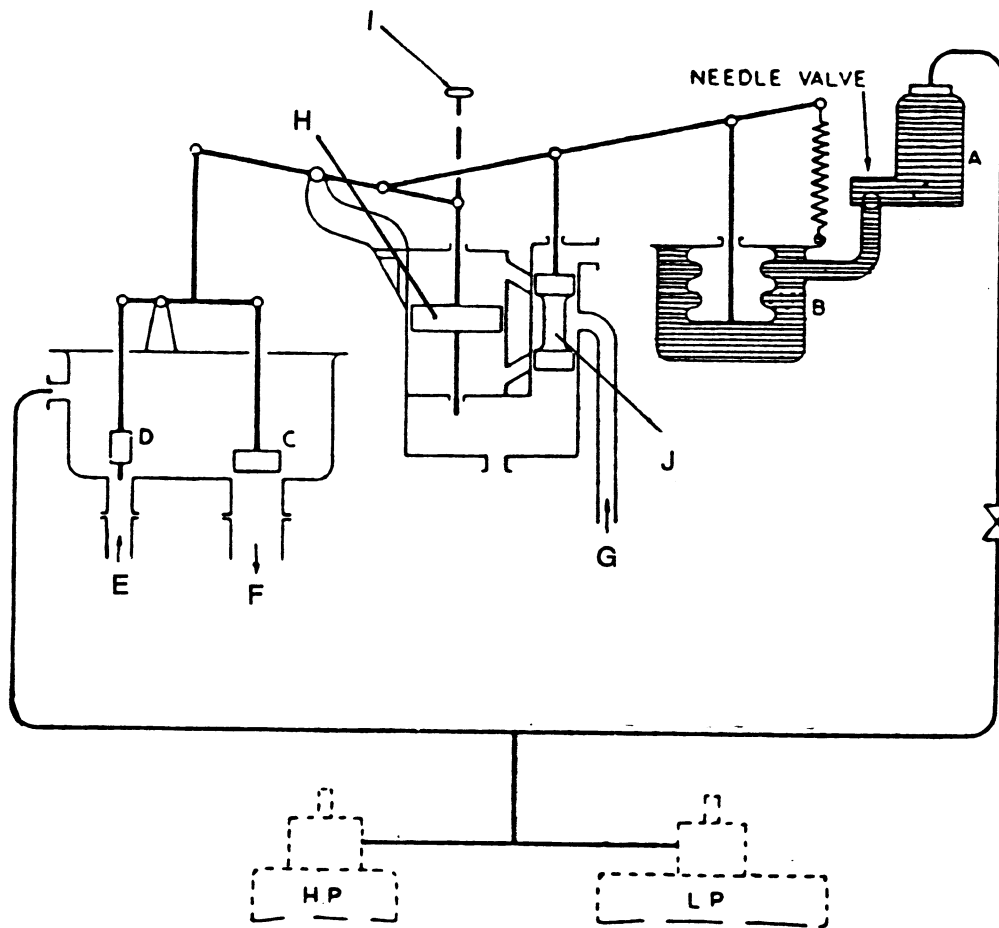
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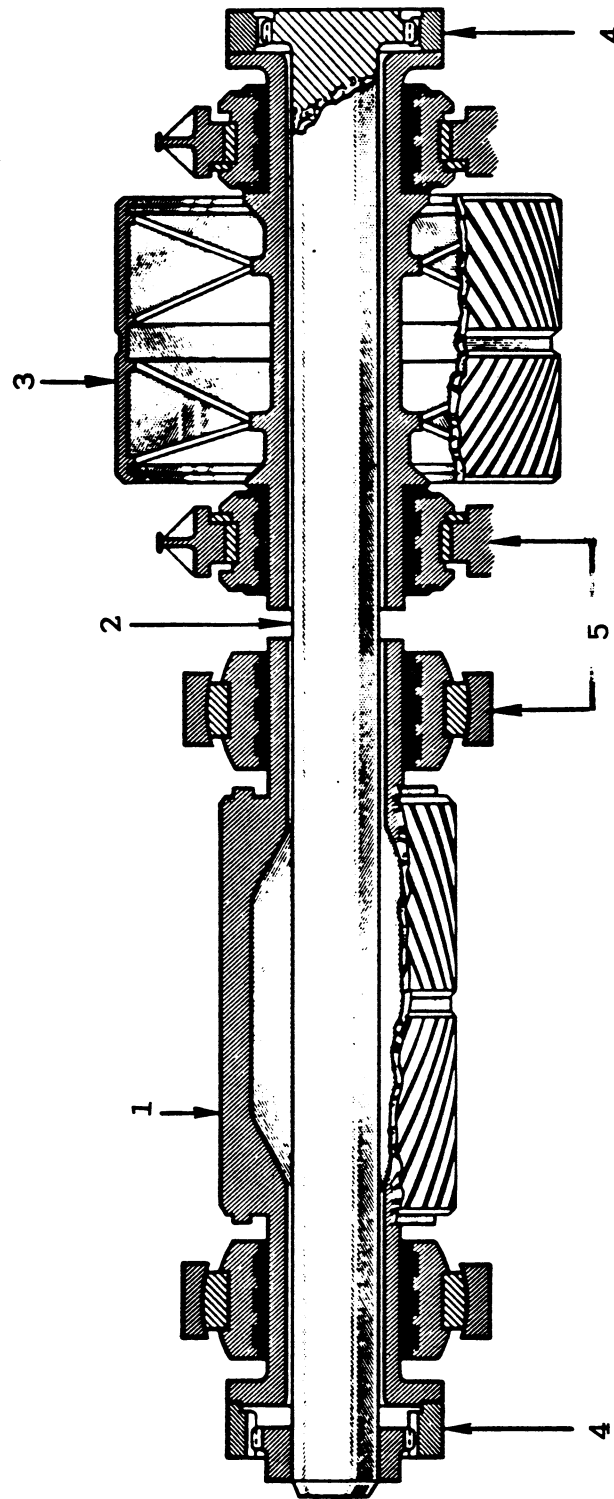
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SE-0004

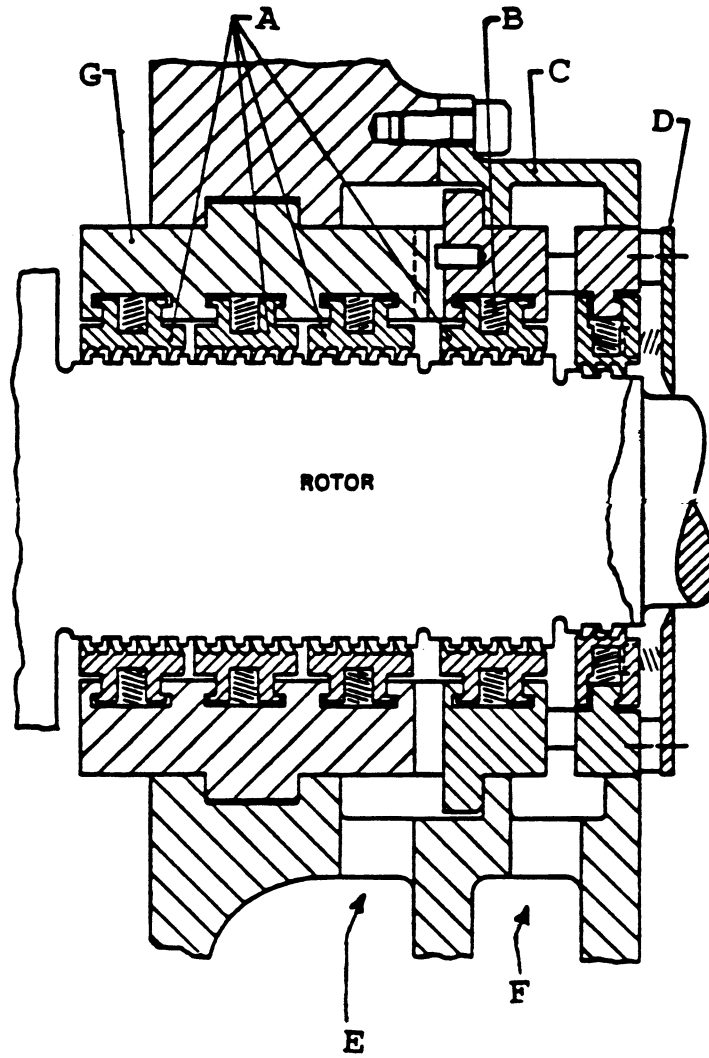


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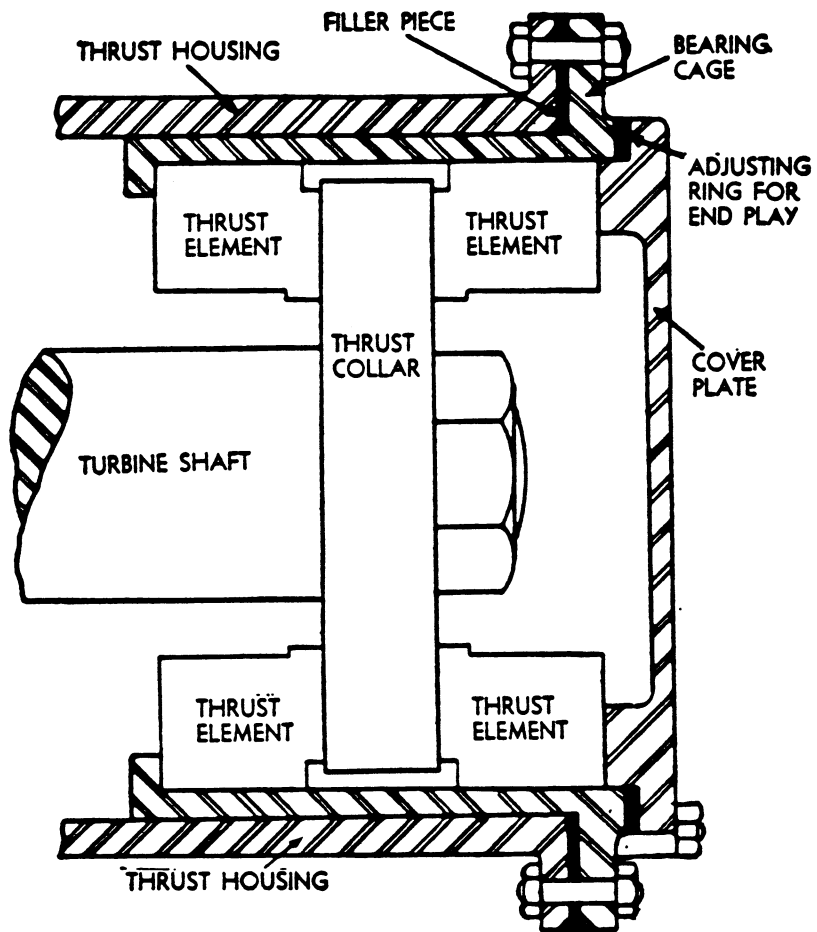


4-5

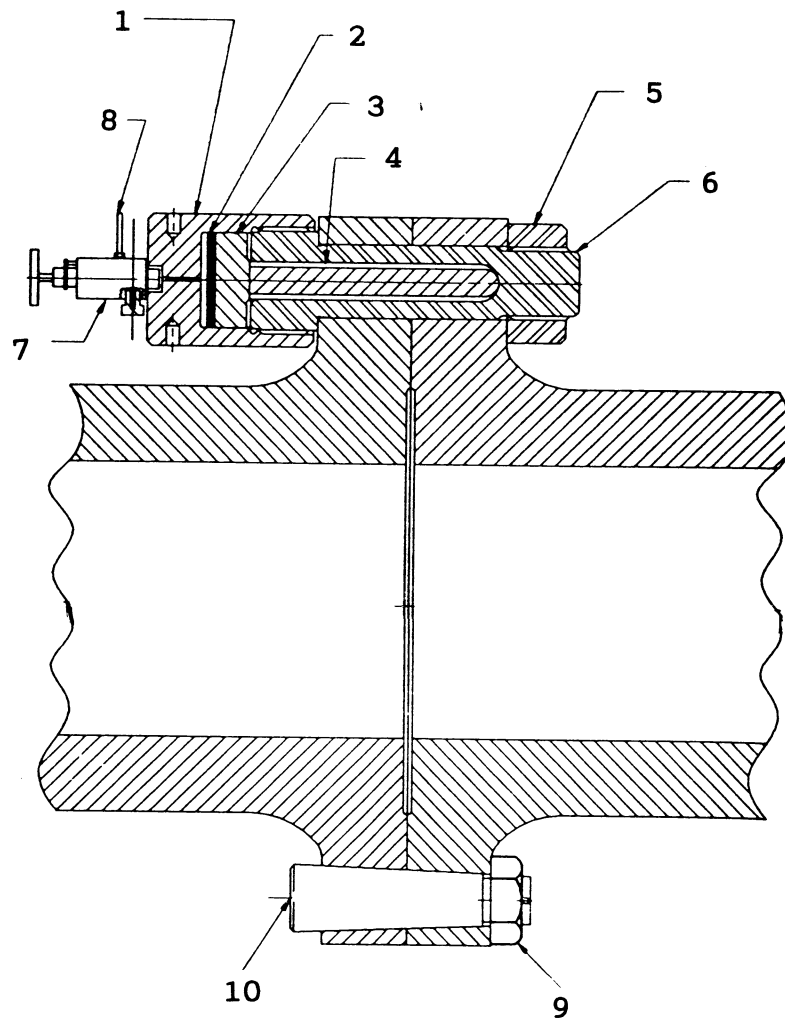
SE-0006



SE-0007

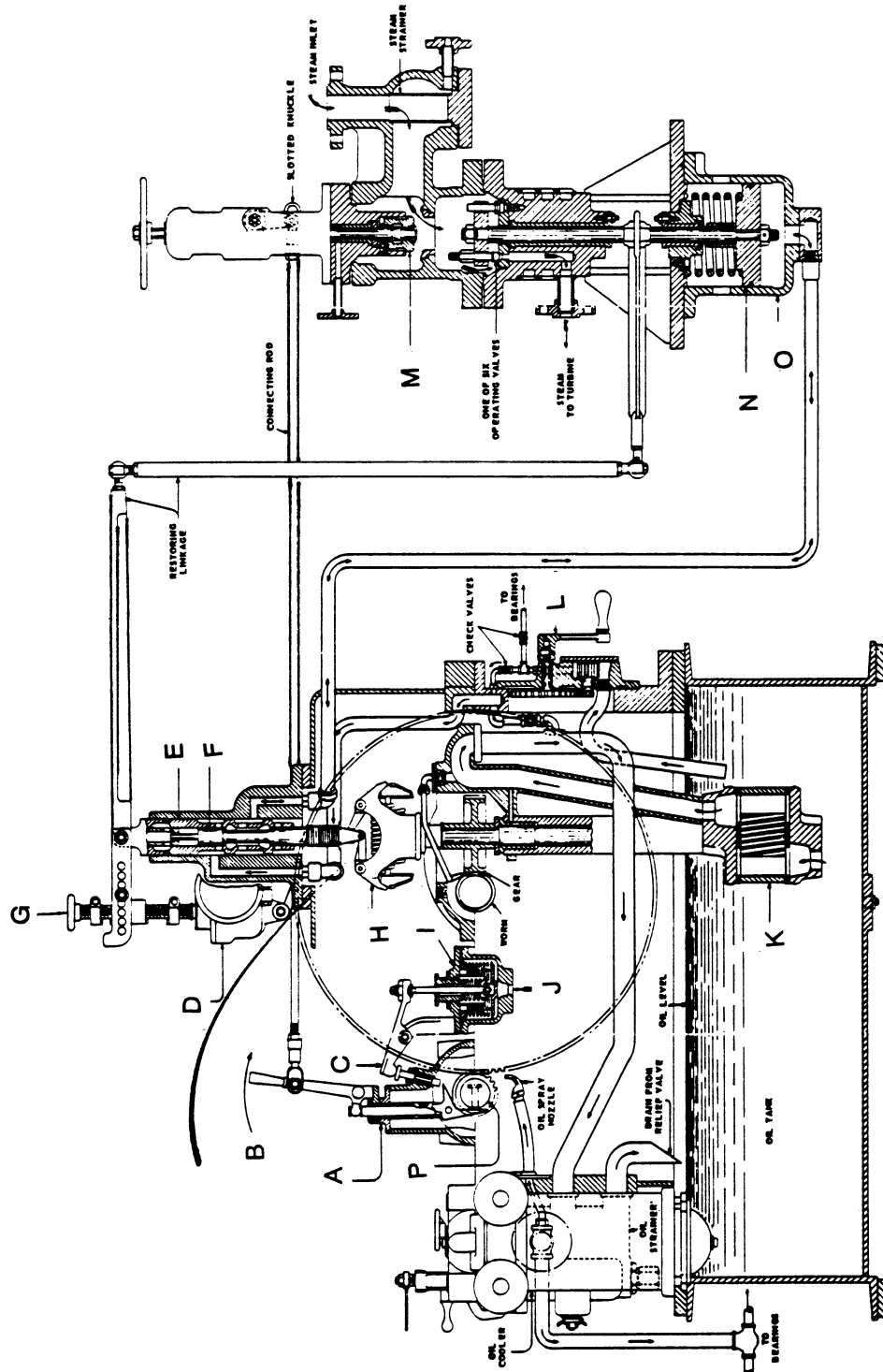


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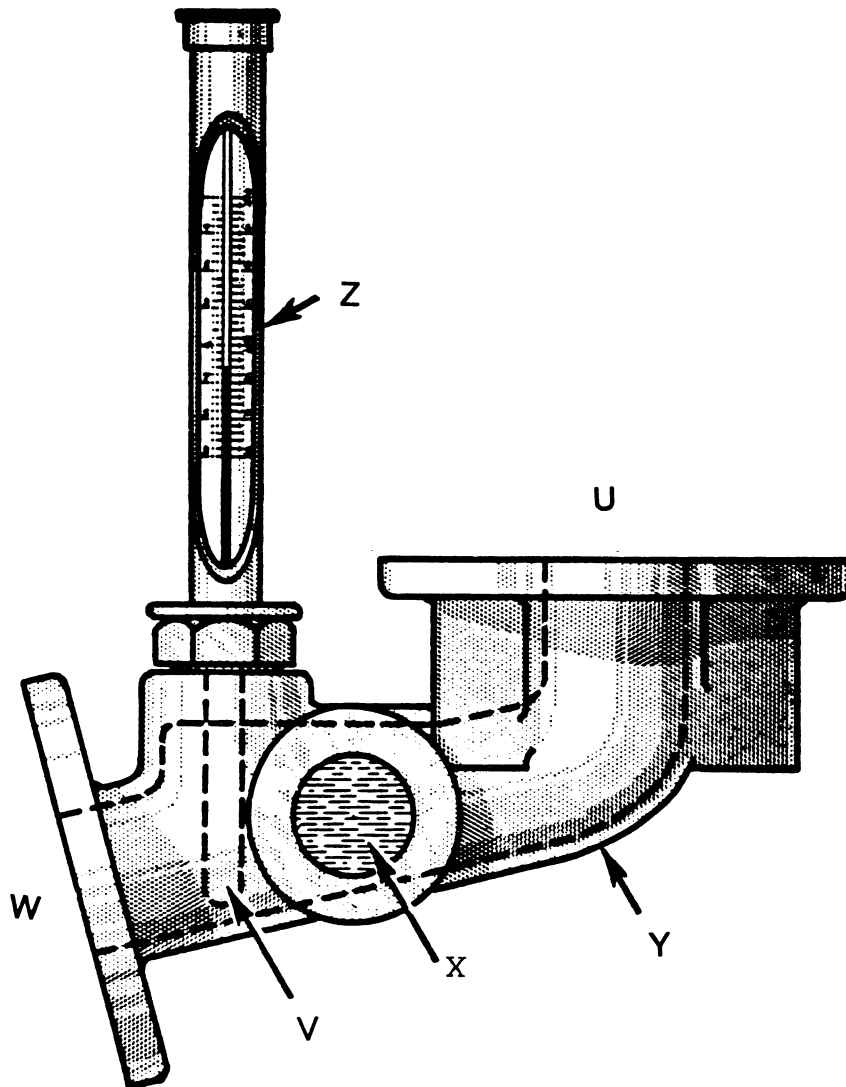




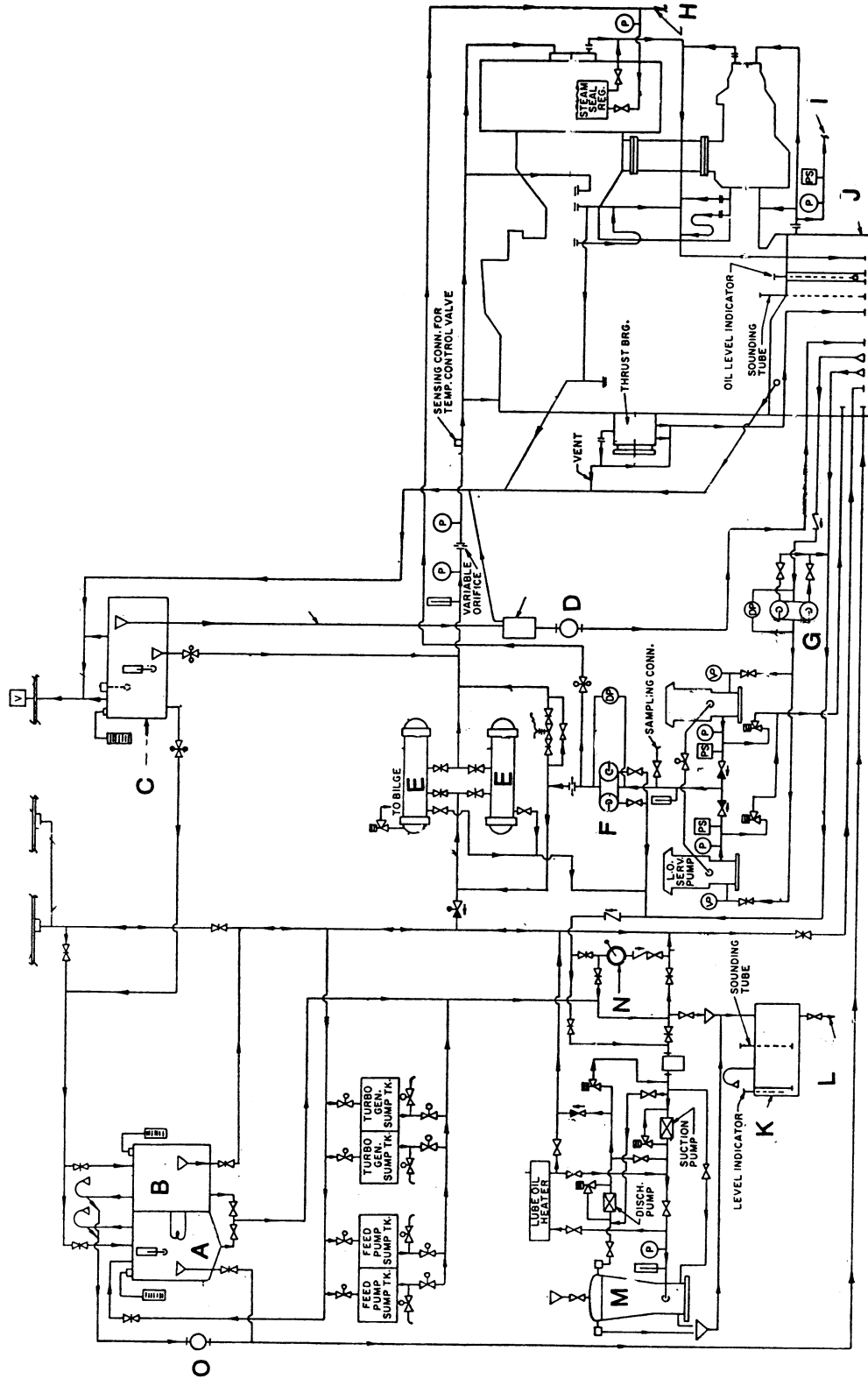
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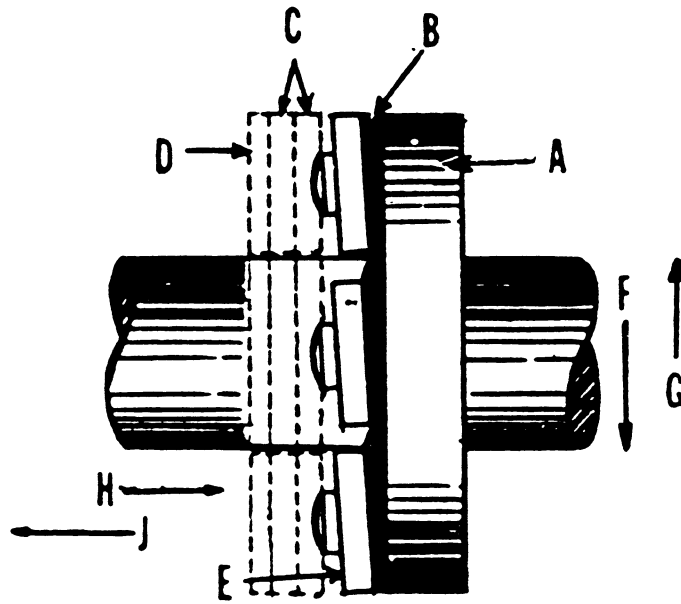
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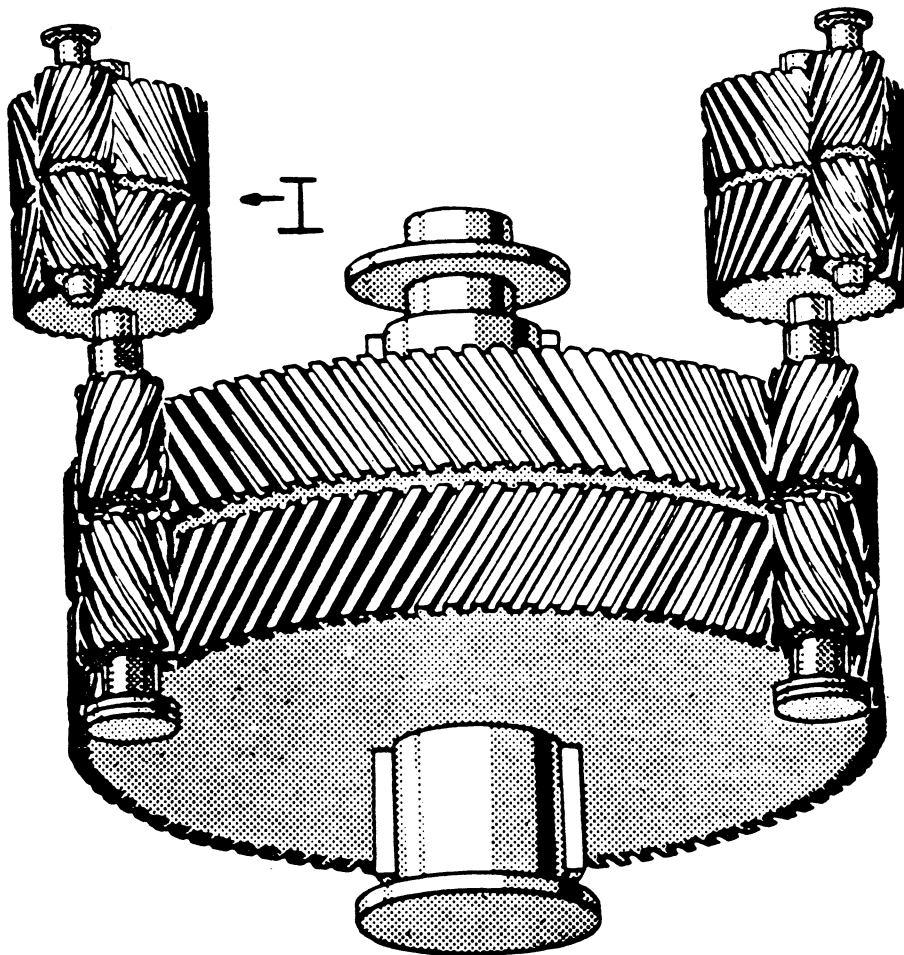
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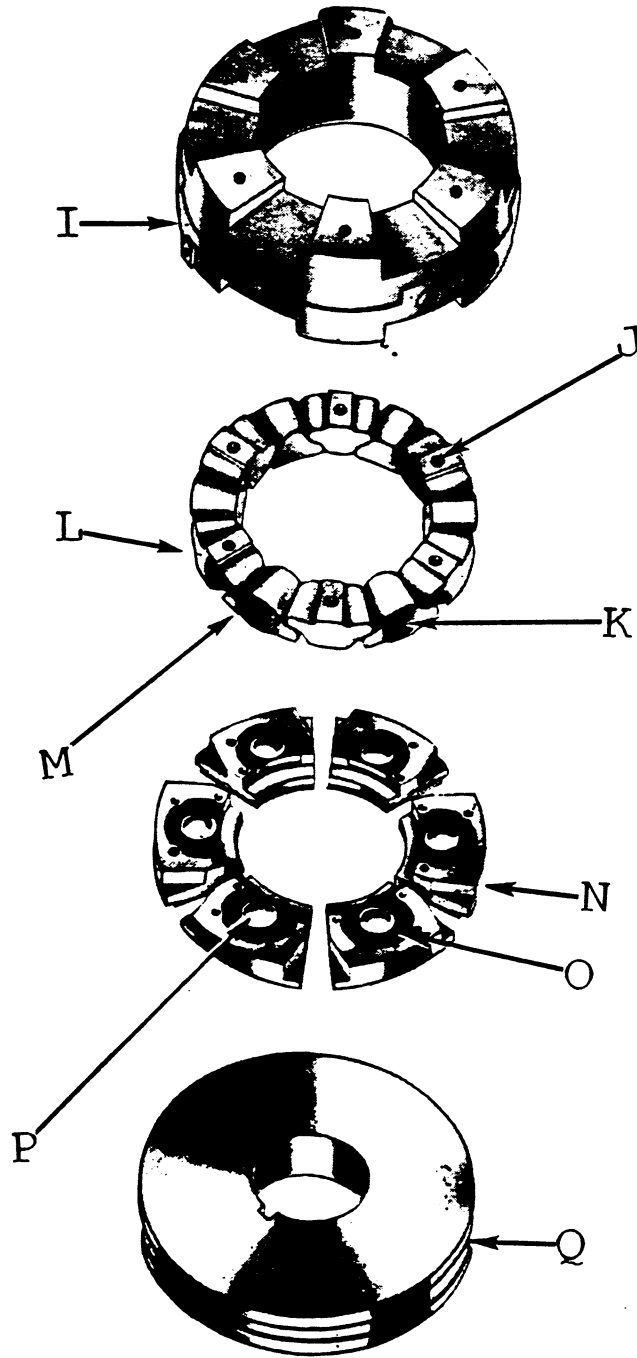
SE-0012



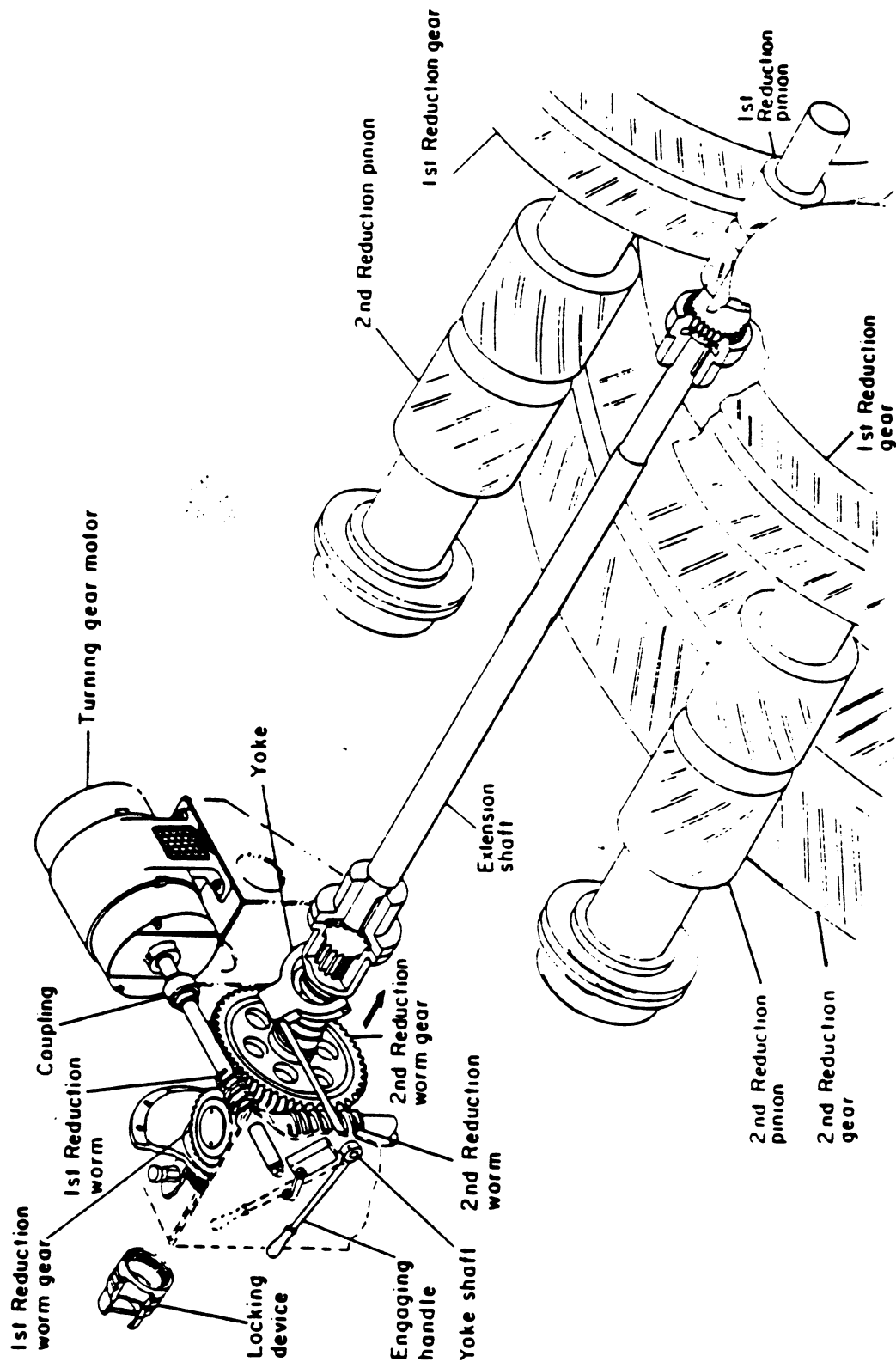
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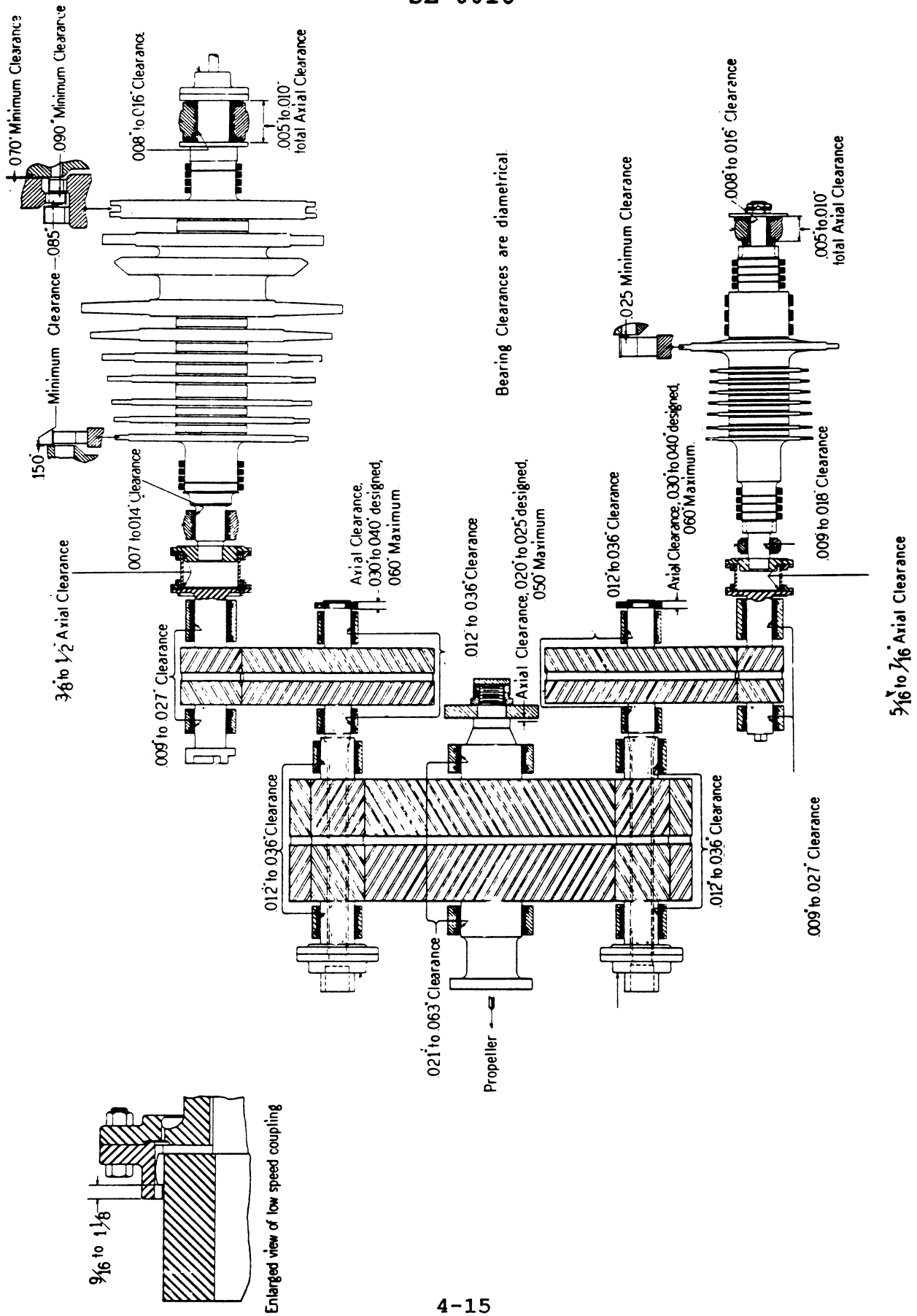
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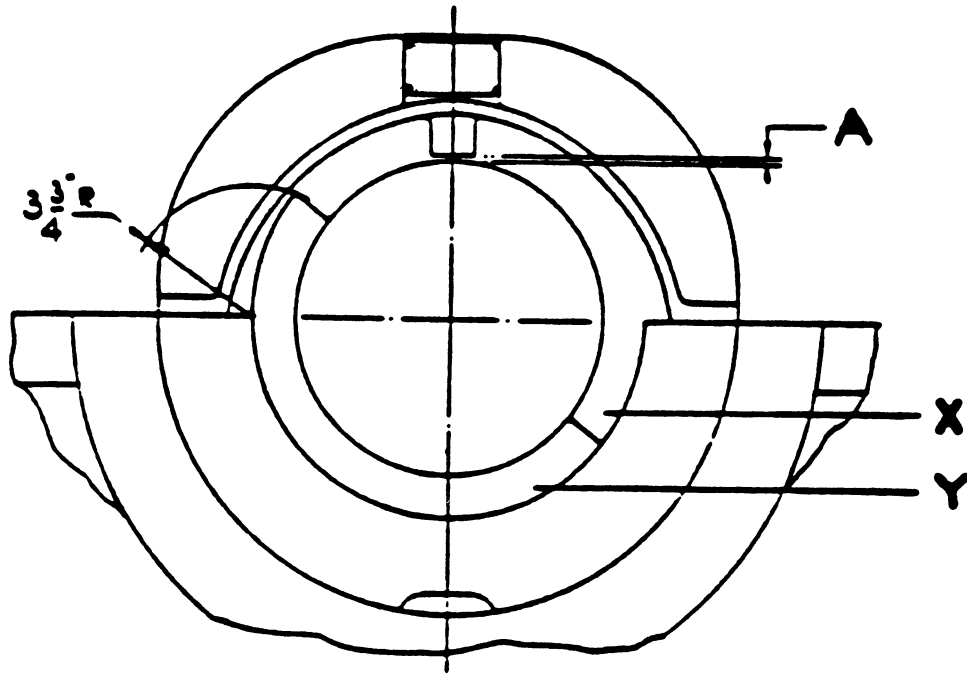
SE-0015



SE-0016

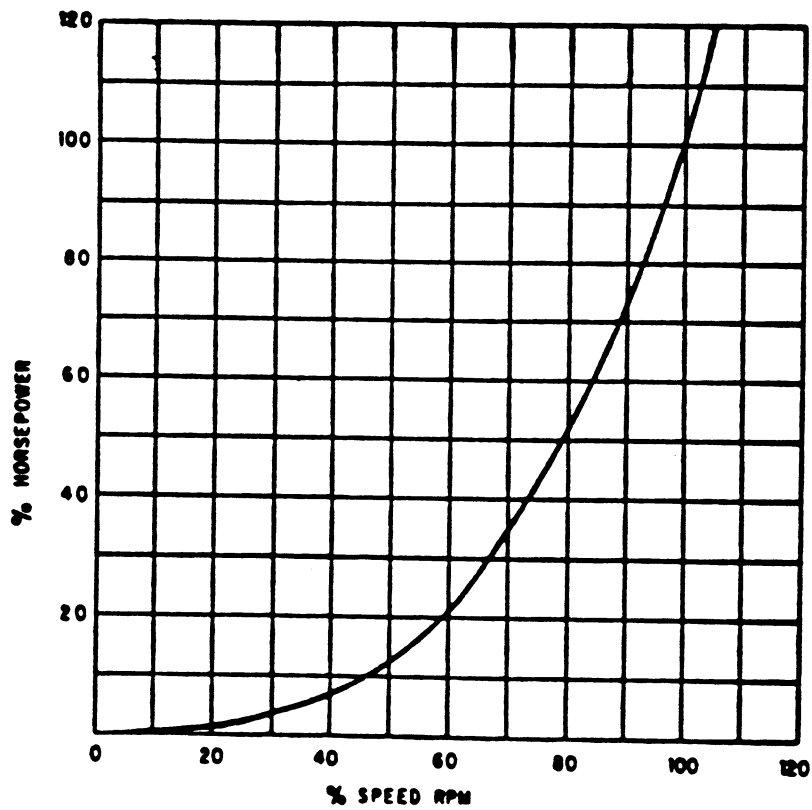


SE-0017



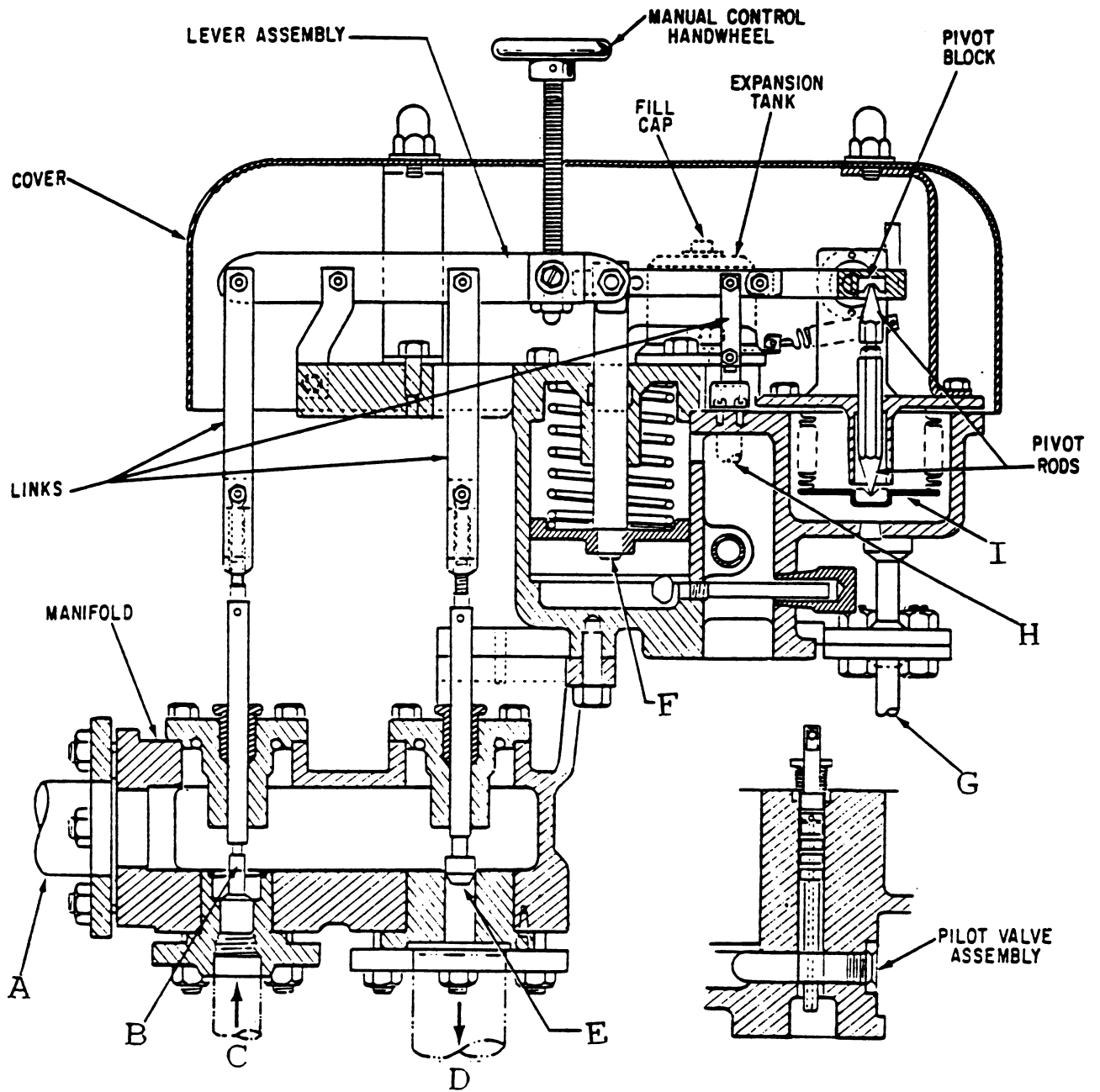
### GEAR BEARINGS

SE-0018

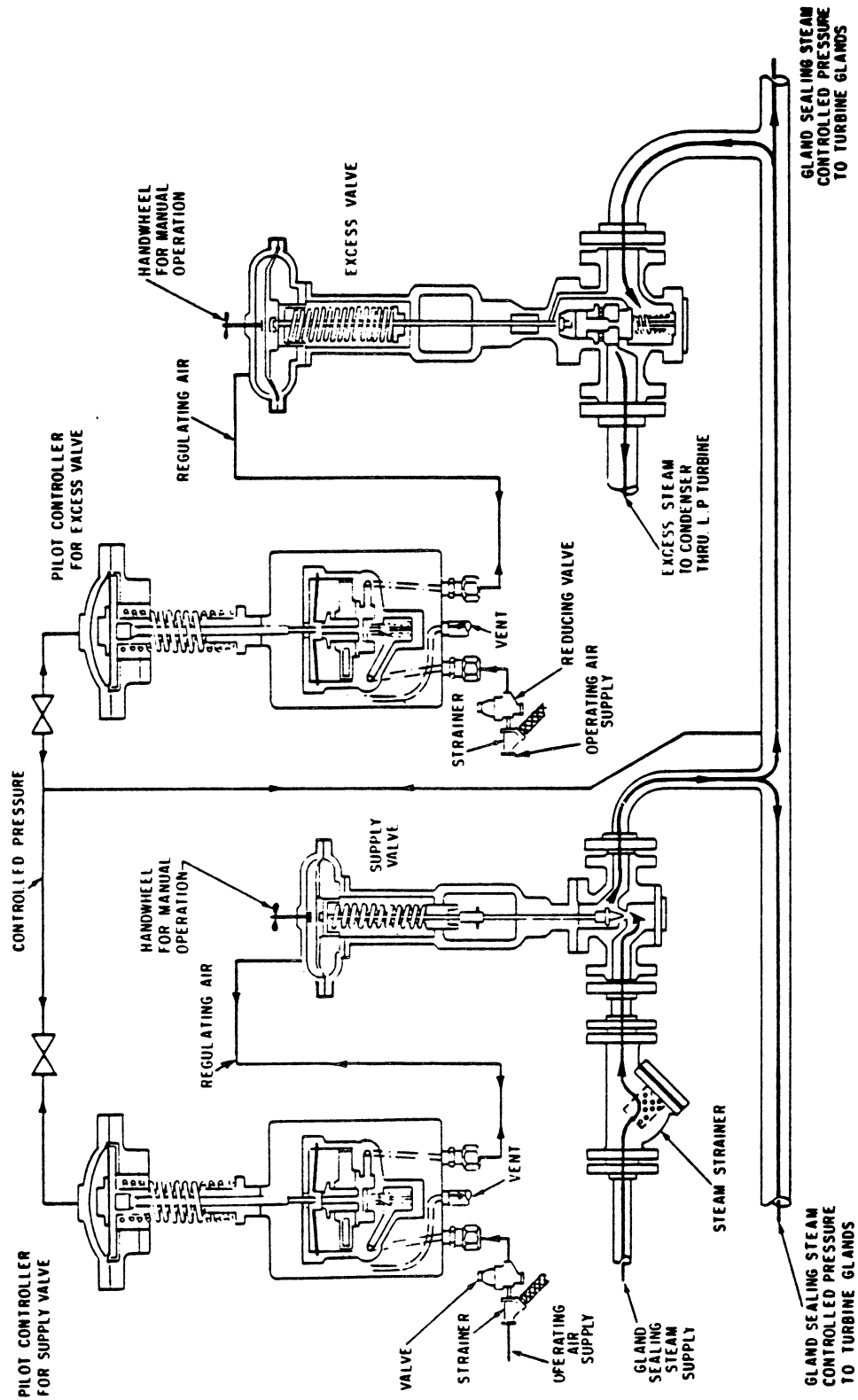




SE-0019

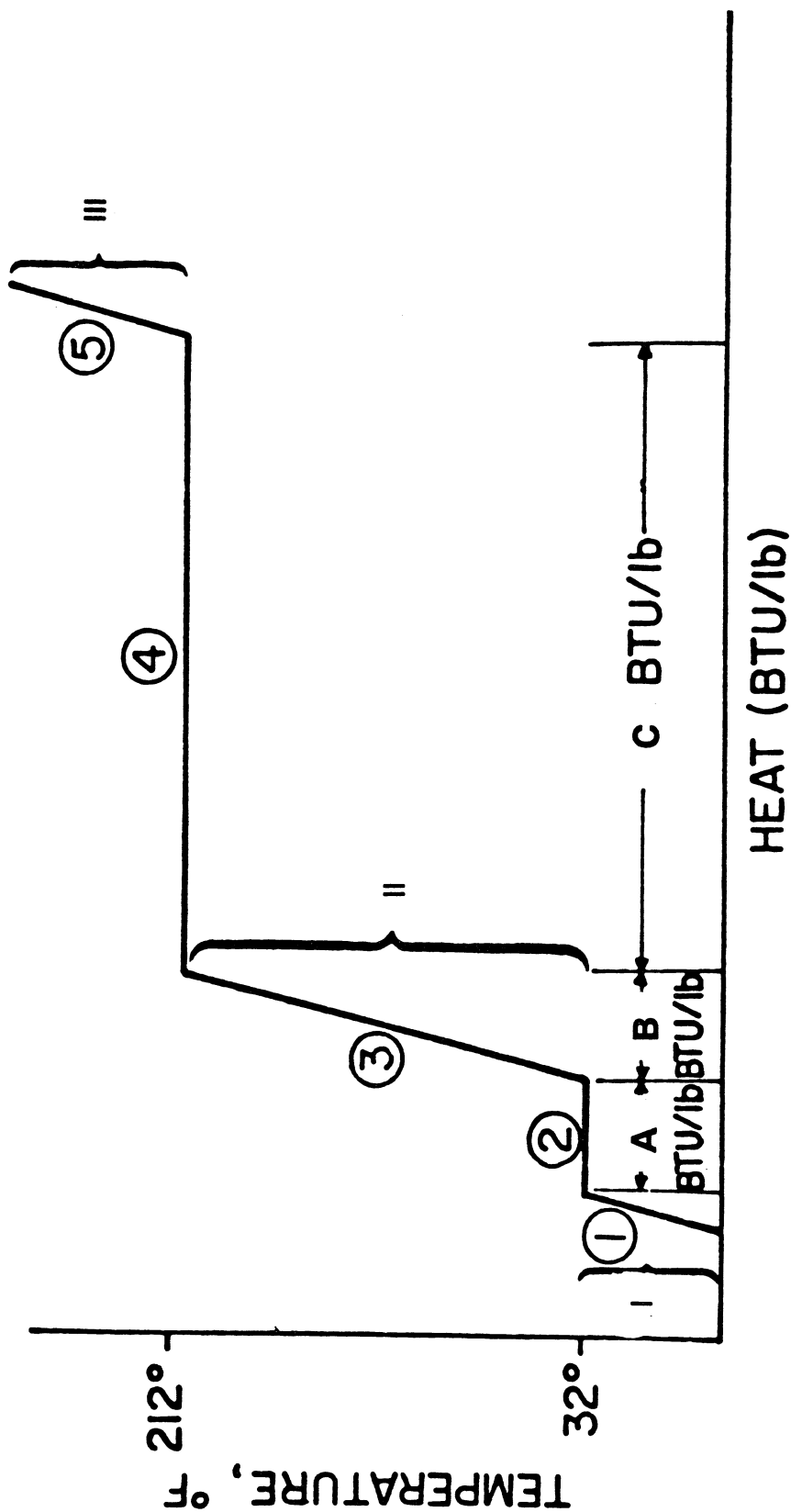


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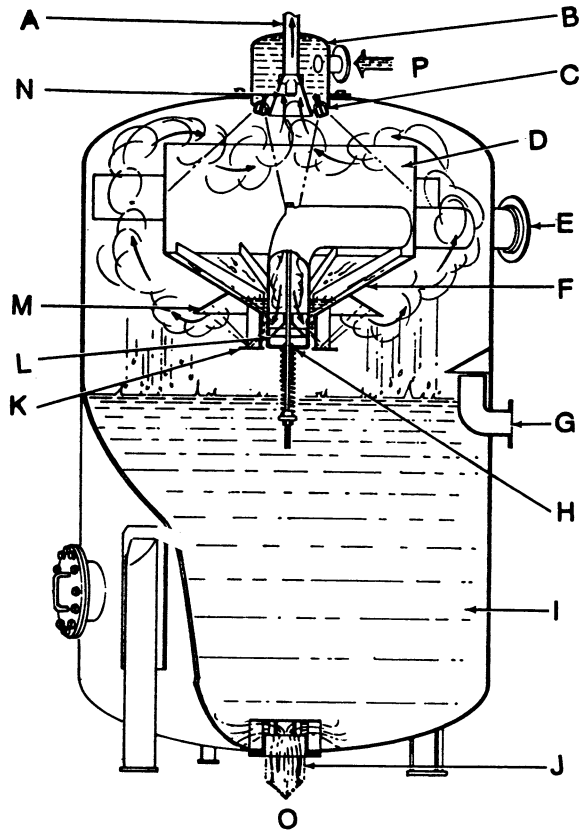


# CHAPTER 6 STEAM GENERATORS

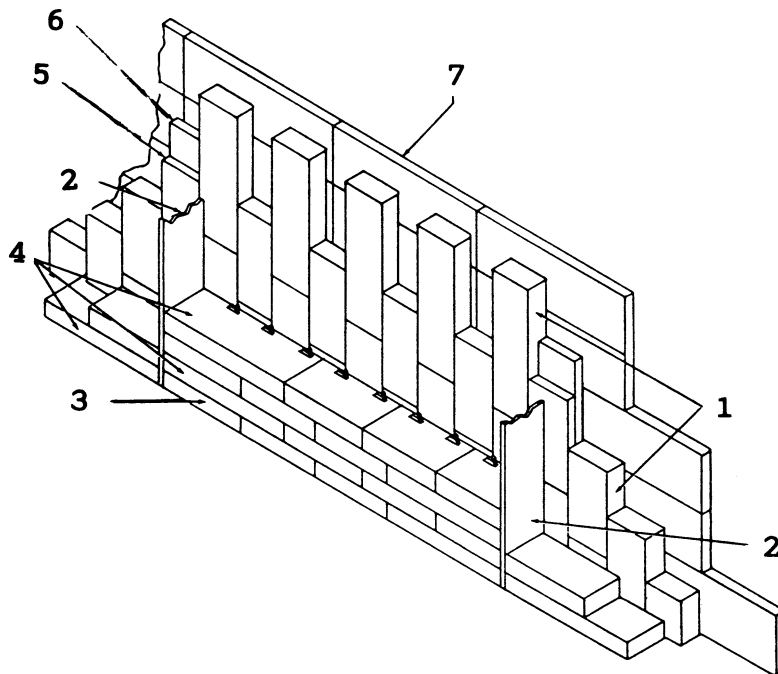
SG-0001



SG-0002



SG-0003



SG-0004

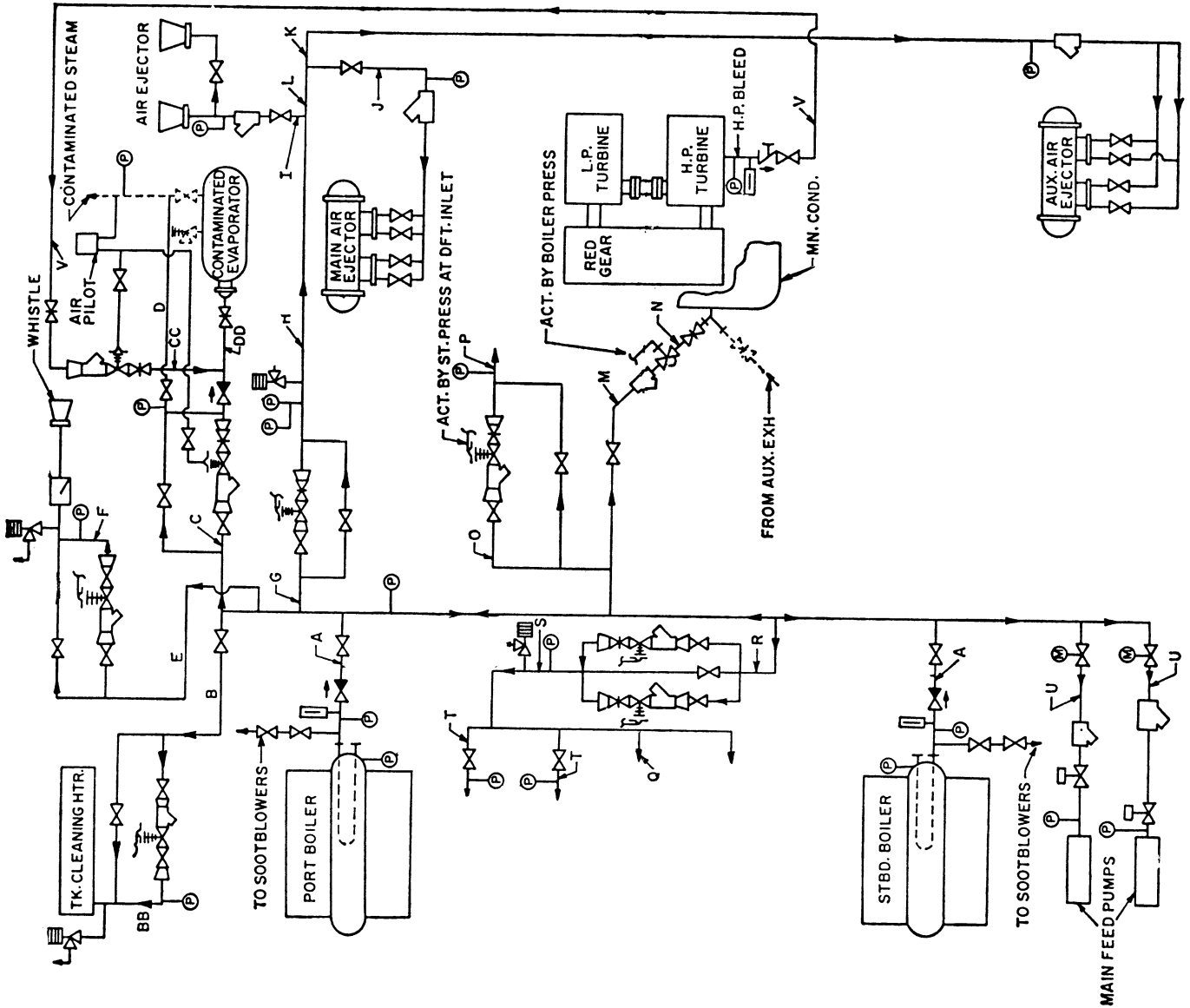
**Table 2. Saturation, Pressures**

Abs press, psi	Temp, °F	Specific vol		Enthalpy (heat)	
		Sat liquid	Sat vapor	Sat liquid	Sat vapor
0.50	79.58	0.01608	641.4	47.6	1048.8
1.0	101.74	0.01614	333.6	69.7	1036.3
5.0	162.24	0.01640	73.52	130.1	1001.0
10	193.21	0.01659	38.42	161.2	982.1
14.7	212.00	0.01672	26.80	180.0	970.4
15	213.03	0.01672	26.29	181.1	969.7
20	227.96	0.01683	20.089	196.2	960.1
25	240.07	0.01692	16.303	208.5	952.1
30	250.33	0.01701	13.746	218.8	945.3
40	267.25	0.01715	10.498	236.0	933.7
50	281.01	0.01727	8.515	250.1	924.0
60	292.71	0.01738	7.175	262.1	915.5
70	302.92	0.01748	6.206	272.6	907.9
80	312.03	0.01757	5.472	282.0	901.1
90	320.27	0.01766	4.896	290.6	894.7
100	327.81	0.01774	4.432	298.4	888.8
110	334.77	0.01782	4.049	305.7	883.2
120	341.25	0.01789	3.728	312.4	877.9
130	347.32	0.01796	3.455	318.8	872.9
140	353.02	0.01802	3.220	324.8	868.2
150	358.42	0.01809	3.015	330.5	863.6
200	381.79	0.01839	2.288	355.4	843.0
250	400.95	0.01865	1.8438	376.0	825.1
300	417.33	0.01890	1.5433	393.8	809.0
350	431.72	0.01913	1.3260	409.7	794.2
400	444.59	0.0193	1.1613	424.0	780.5

**Table 1. Saturation, Temperatures**

Temp, °F	Abs press, psi	Specific vol		Enthalpy (heat)	
		Sat liquid	Sat vapor	Sat liquid	Sat vapor
32	0.08859	0.01602	3304.7	0.01	1075.5
40	0.12170	0.01602	2444	8.05	1071.3
50	0.17811	0.01603	1703.2	18.07	1065.6
60	0.2563	0.01604	1206.7	28.06	1059.9
70	0.3631	0.01606	867.9	38.04	1054.3
80	0.5069	0.01608	633.1	43.02	1048.6
90	0.6982	0.01610	468.0	57.99	1042.9
100	0.9492	0.01613	350.4	67.97	1037.2
110	1.2748	0.01617	265.4	77.94	1031.6
120	1.6924	0.01620	203.27	87.92	1025.8
130	2.2225	0.01625	157.34	97.90	1020.0
140	2.8886	0.01629	123.01	107.9	1014.1
150	3.718	0.01634	97.07	117.9	1008.2
160	4.741	0.01639	77.29	127.9	1002.3
170	5.992	0.01645	62.06	137.9	996.3
180	7.510	0.01651	50.23	147.9	990.2
190	9.339	0.01657	40.96	157.9	984.1
200	11.526	0.01663	33.64	168.0	977.9
212	14.696	0.01672	26.80	180.0	970.4
220	17.186	0.01677	23.15	188.1	965.2
240	24.969	0.01692	16.323	208.3	952.2
280	49.203	0.01726	8.645	249.1	924.7
300	67.013	0.01745	6.466	269.6	910.1
340	118.01	0.01787	3.788	311.1	879.0
380	195.77	0.01836	2.335	353.5	844.6
400	247.31	0.01864	1.8633	375.0	826.0

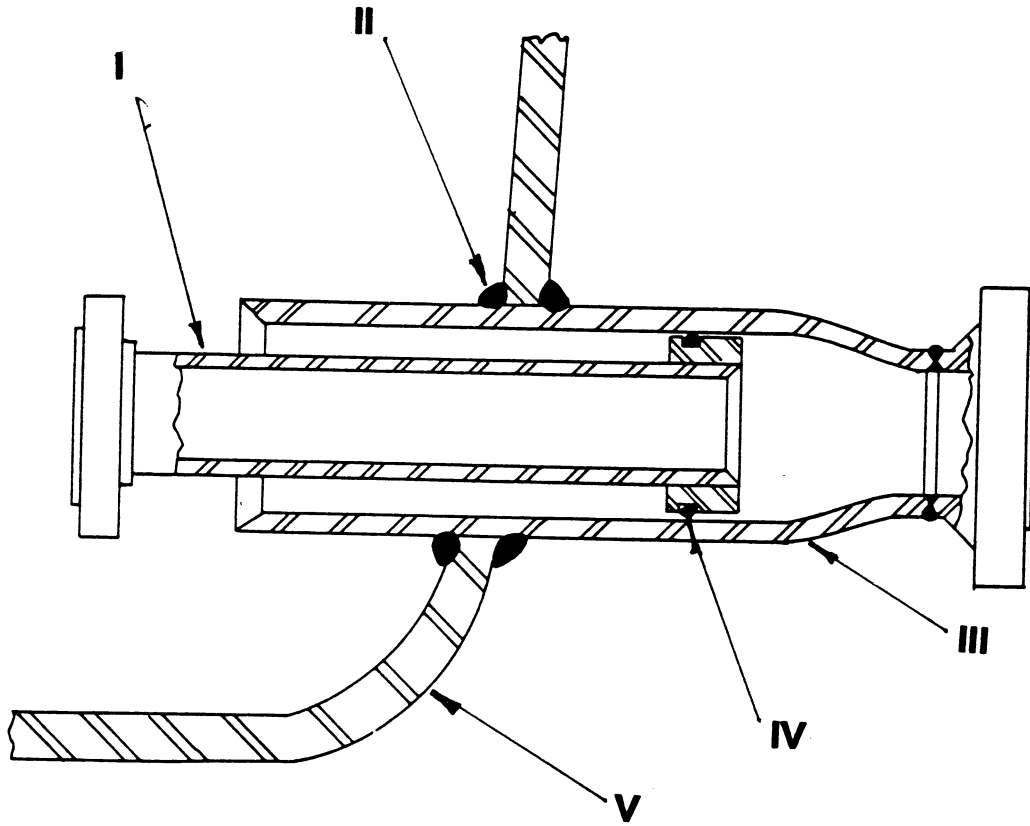
SG-0005



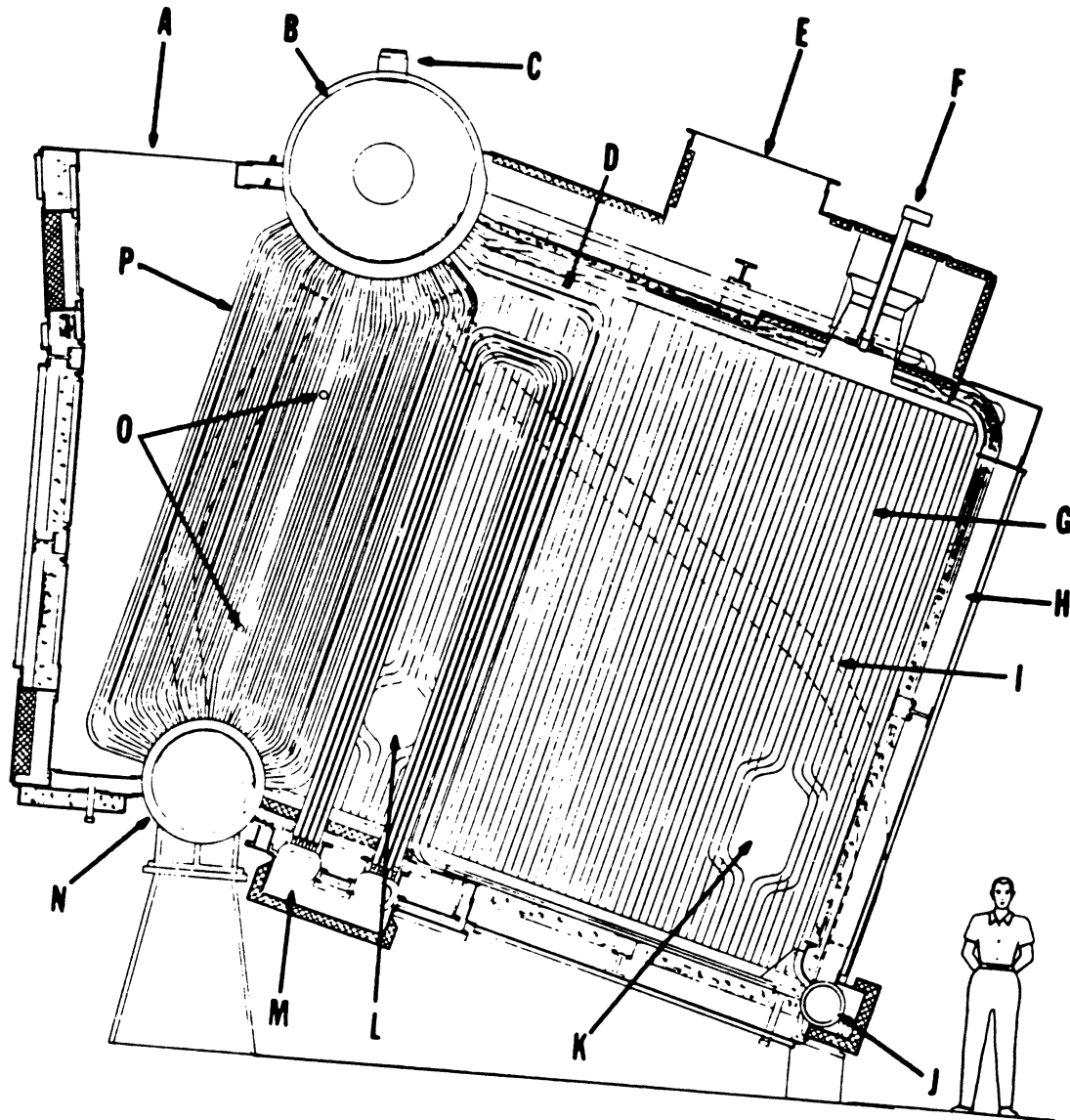
**FLOWS AND VELOCITIES**

SYM	IPS	NOM. PSIG	FT/SEC	FT/SEC	LB/HR	CONDITION	SERVICE
A	4	775	45.7	20000	MAXIMUM	DESUPTR STM. LOOP	
B	2 1/2	850	64.1	12000	RATED	850/130 RED. STA.	
BB	5	130	81.8	12000	RATED	850/130 RED. STA. TO TK. CLEANING HEATER	
C	2 1/2	850	53.4	10000	RATED	850 PSIG TO PORT MAIN FEED PUMP	
CC	4	185	42.0	4190	FULL POWER	850 PSIG TO RED. STA. TO CONTAM. EVAP.	
D	4	130	91.3	8500	RATED	CONTAM. EVAP. BY-PASS	
DD	4	350	42.5	10000	RATED	RED. V. TO CONTAM. EVAP.	
E	1	850	47.2	1500	RATED	850/140 RED. STA.	
F	2	140	57.0	1500	RATED	850/140 RED. VALVE TO WHISTLE	
G	1 1/2	850	16.2	1260	RATED	850/143 RED. STA.	
H	2	143	47.0	1260	RATED	850/143 RED. VALVE TO AIR EJECTORS	
I	1 1/4	143	47.6	570	RATED	143 PSIG TO DIST. VALVES	
J	1 1/4	143	41.0	490	RATED	PLANT AIR EJECTOR AIR PSIG TO JUNK	
K	1	143	28.9	200	RATED	143 PSIG TO AUX. AIR EJECTORS	
L	1 1/2	143	42.4	690	RATED	143 PSIG TO MN. B. AIR EJECTORS	
M	2	850	202	20000	RATED	850 PSIG TO RED. VALVE UNLOADING VALVE	
N	4	7.8	1302	20000	RATED	UNLOADING VALVE TO UNLOADING HEADER	
O	3	850	72.0	21000	ASTERN	850/32 RED. STA.	
P	8	32	176	21000	ASTERN	850/32 RED. VALVE TO MAIN FEED PUMP	
Q	1 1/4	143	78.2	935	RATED	850/143 RED. STA. SEAL REGULATOR	
R	1 1/2	850	17.4	1355	FULL POWER	850/143 RED. STA.	
S	2	143	50.5	1355	FULL POWER	850/143 RED. VALVE SEAL & BURNER ATOM.	
T	1 1/4	143	35.1	420	FULL POWER	143 PSIG TO BURNER ATOM. STIM.	
U	2 1/2	850	58.8	11000	RATED	850 PSIG TO FEED PUMP	
V	2 1/2	205	10.1	4190	RATED	HP TURBINE BLEED	

**SG-0006**

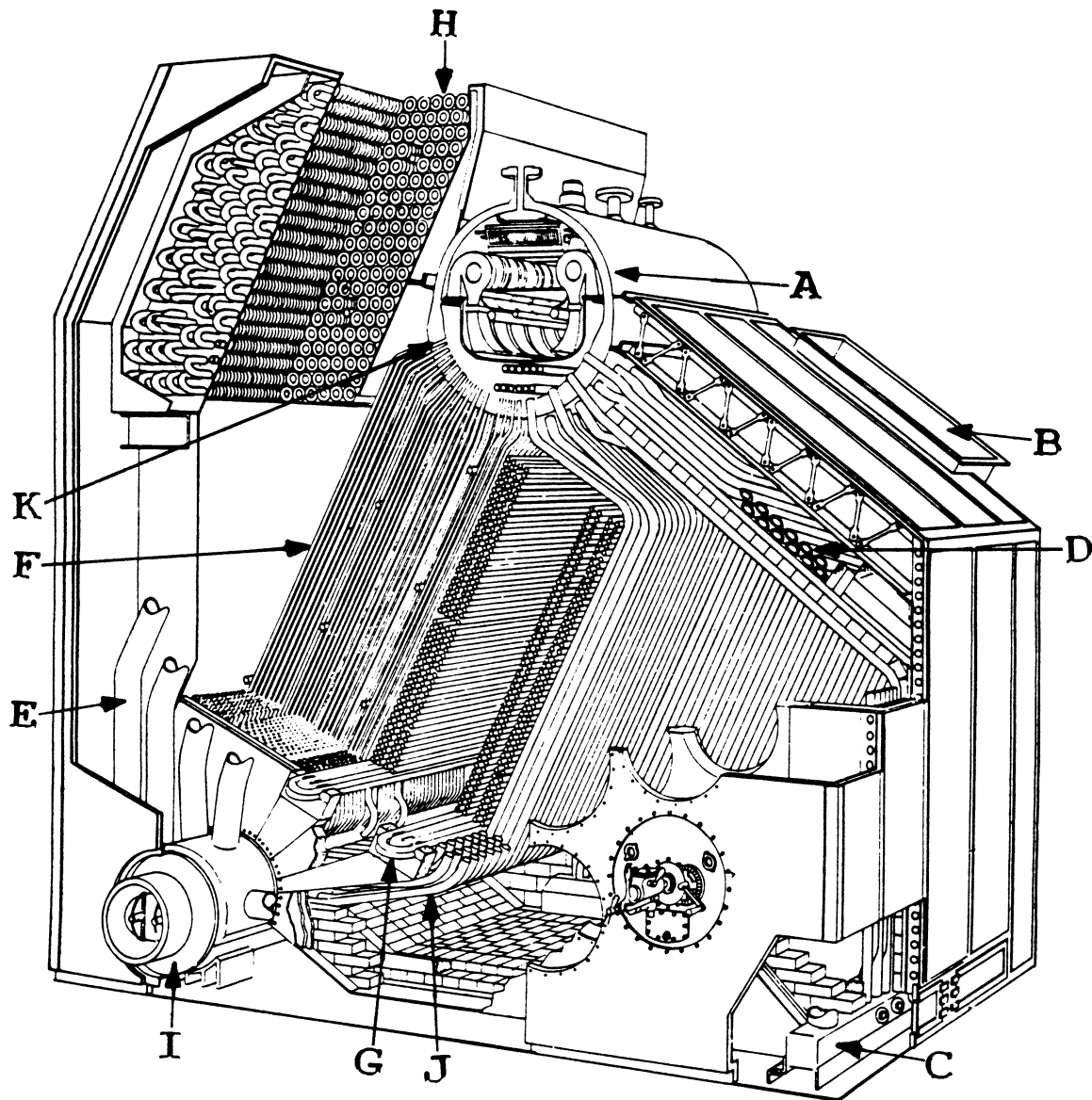


SG-0007

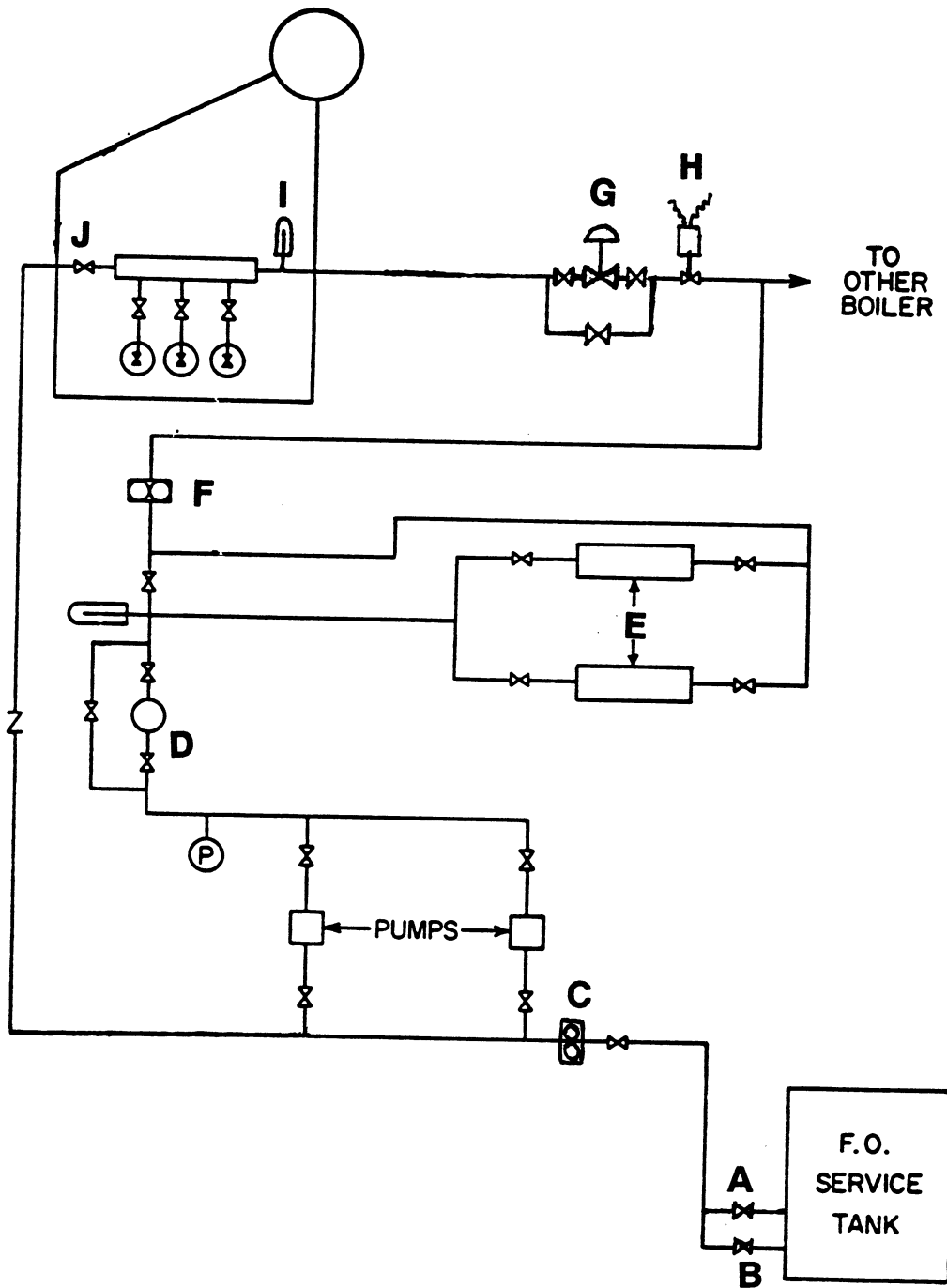




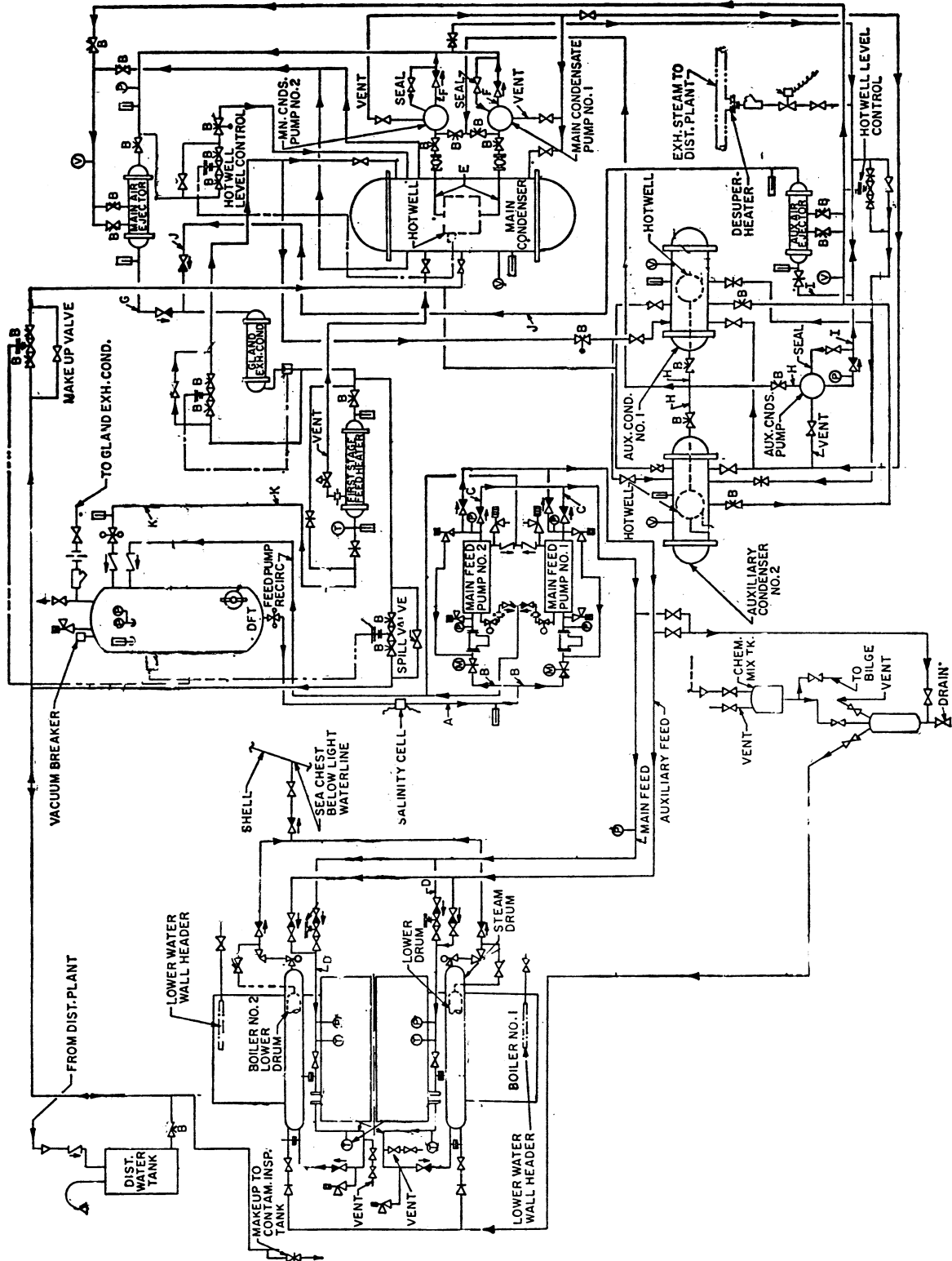
SG-0008



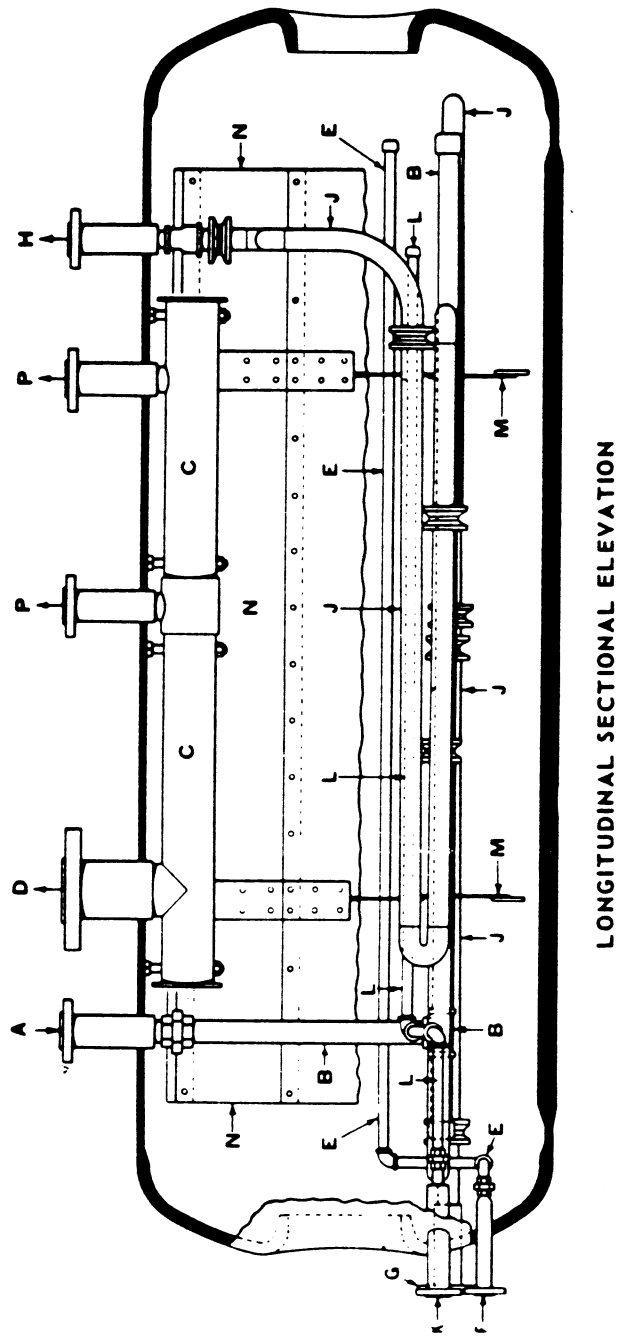
SG-0009



SG-0010

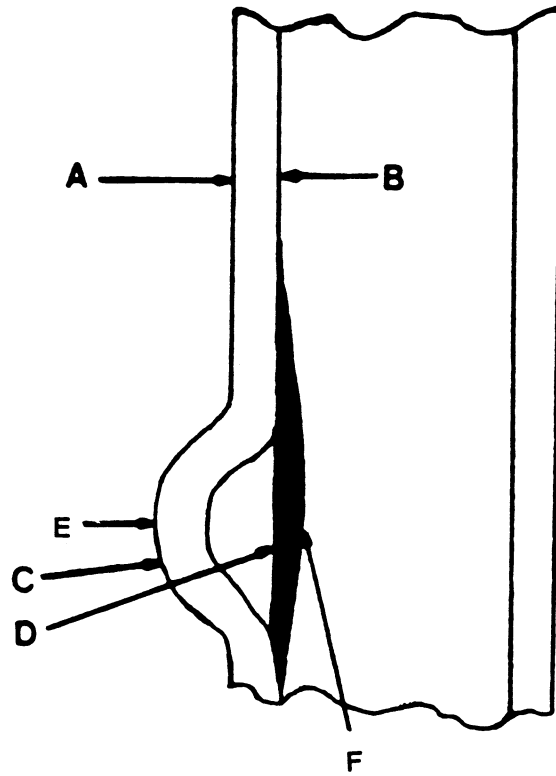


SG-0011

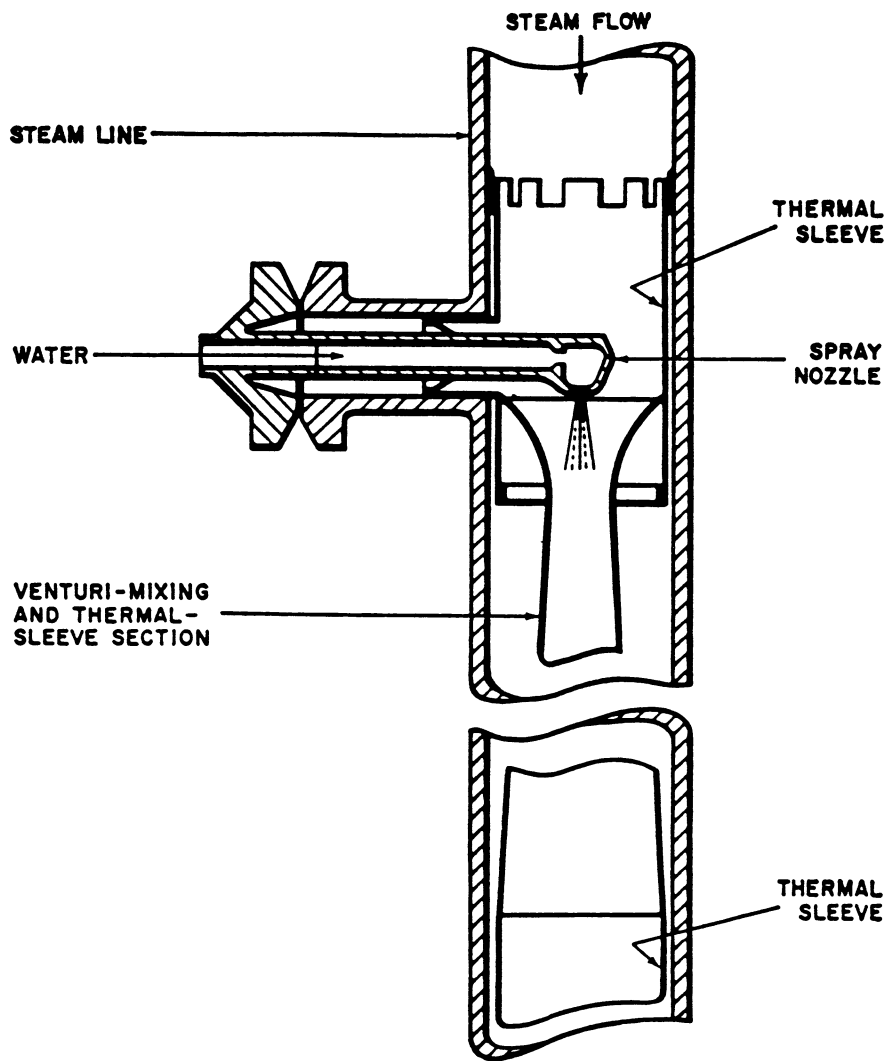


LONGITUDINAL SECTIONAL ELEVATION

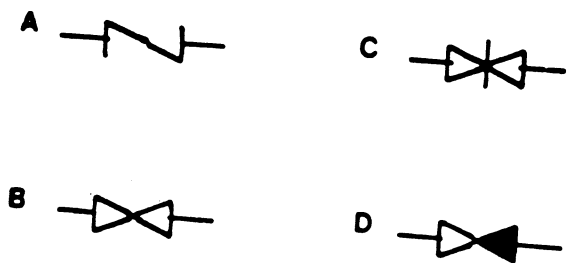
SG-0012



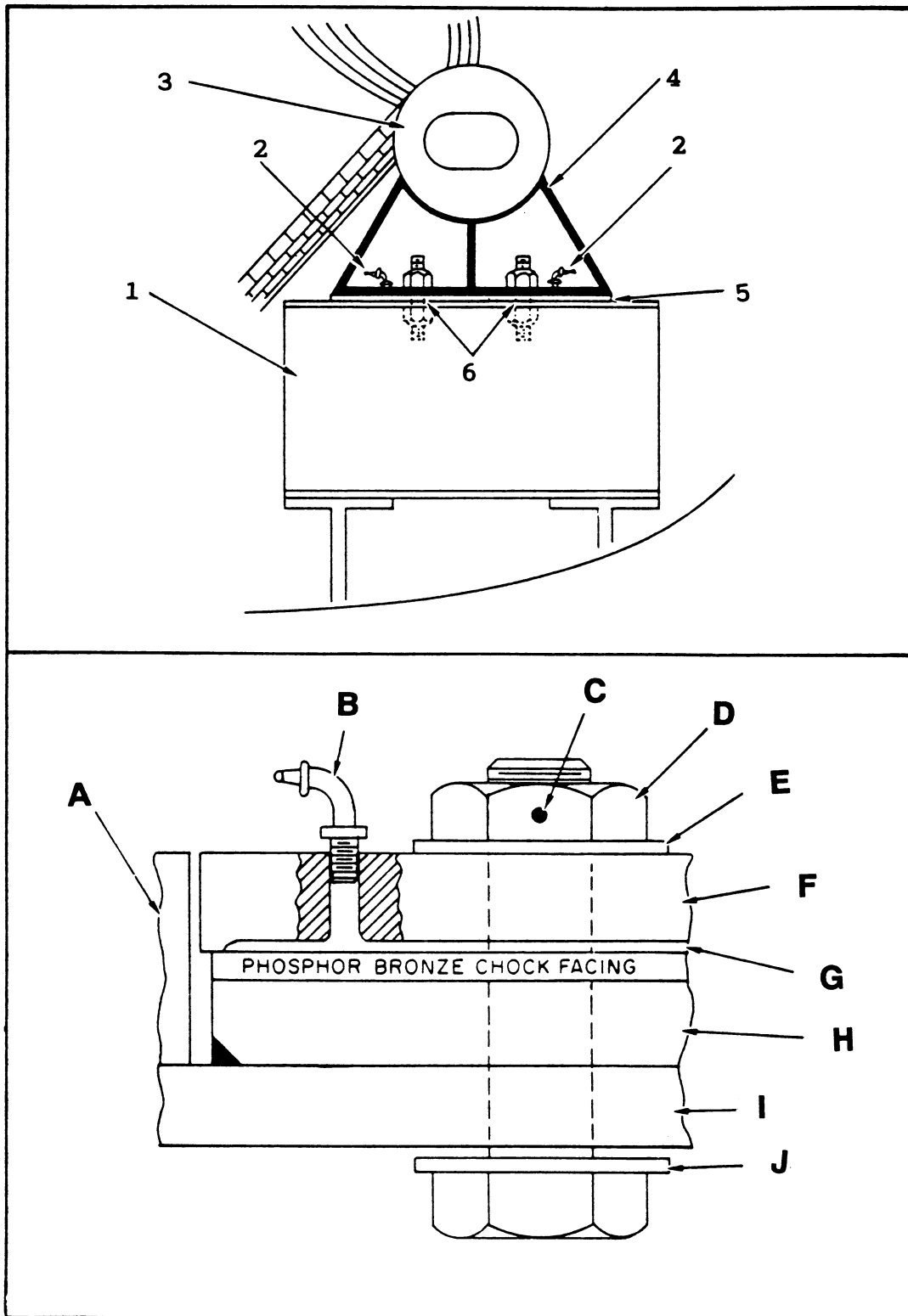
SG-0013



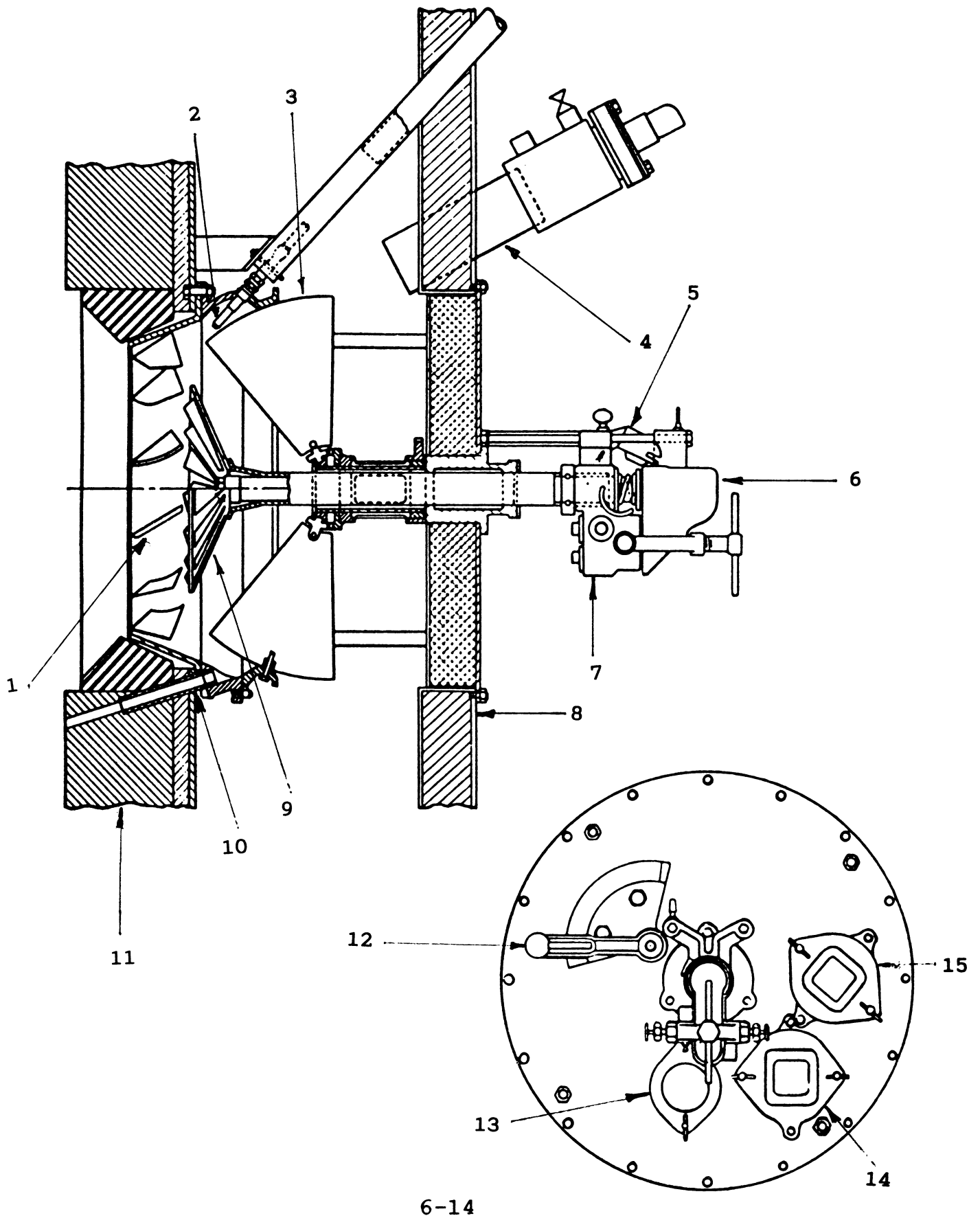
SG-0014



SG-0015

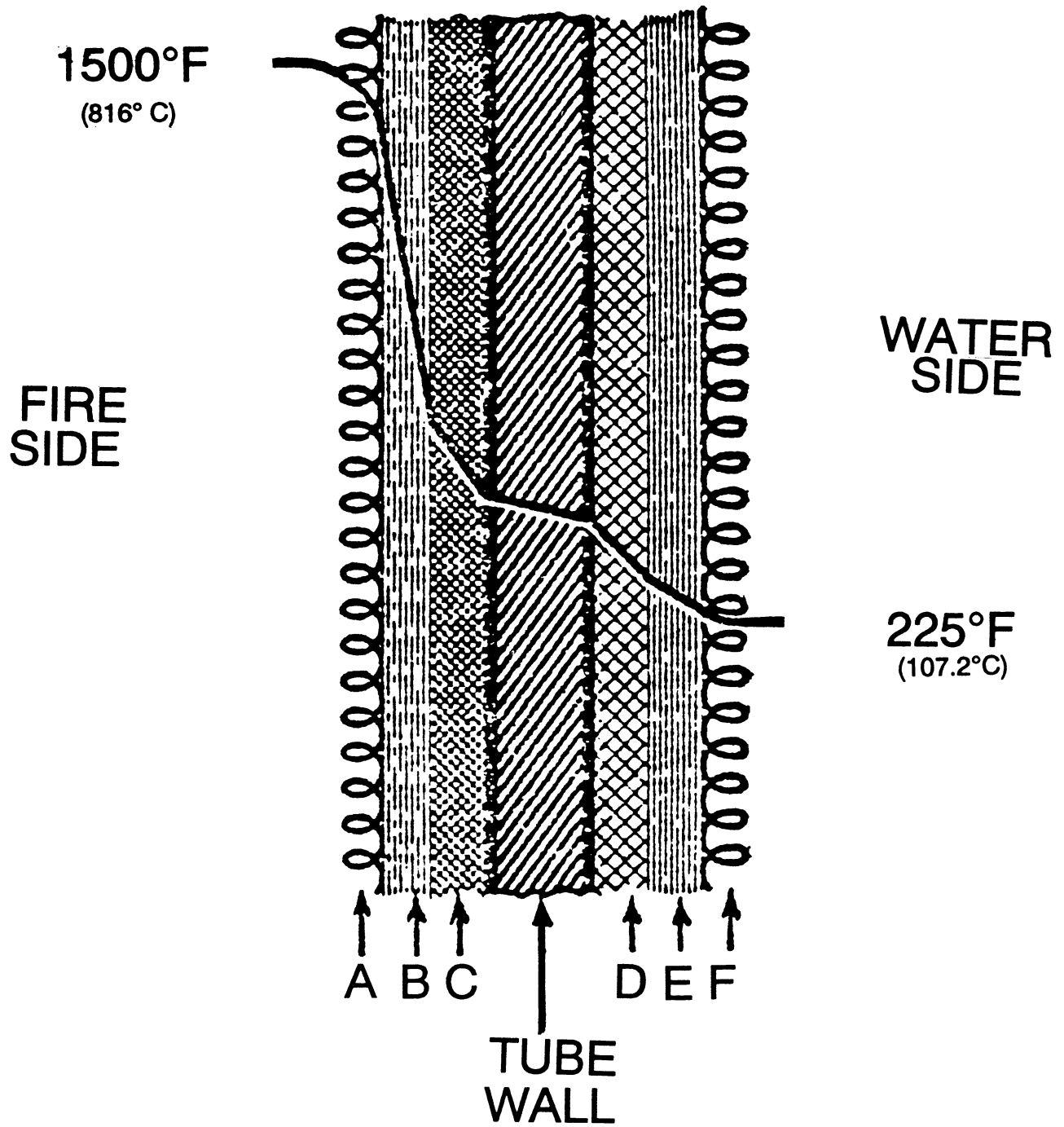


SG-0016

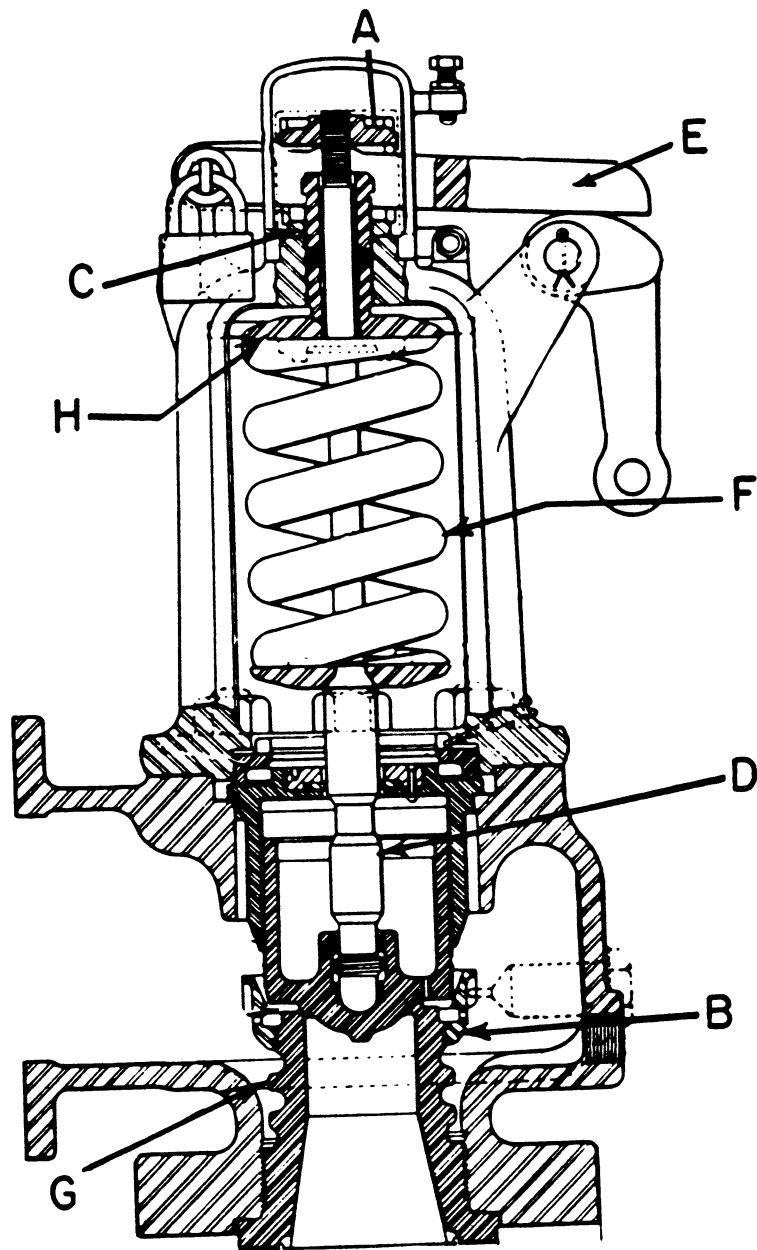




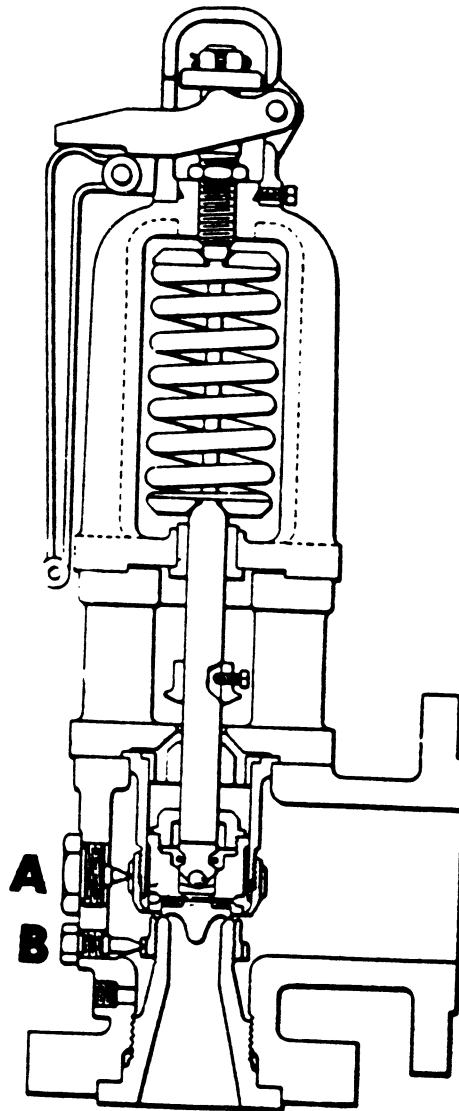
SG-0017



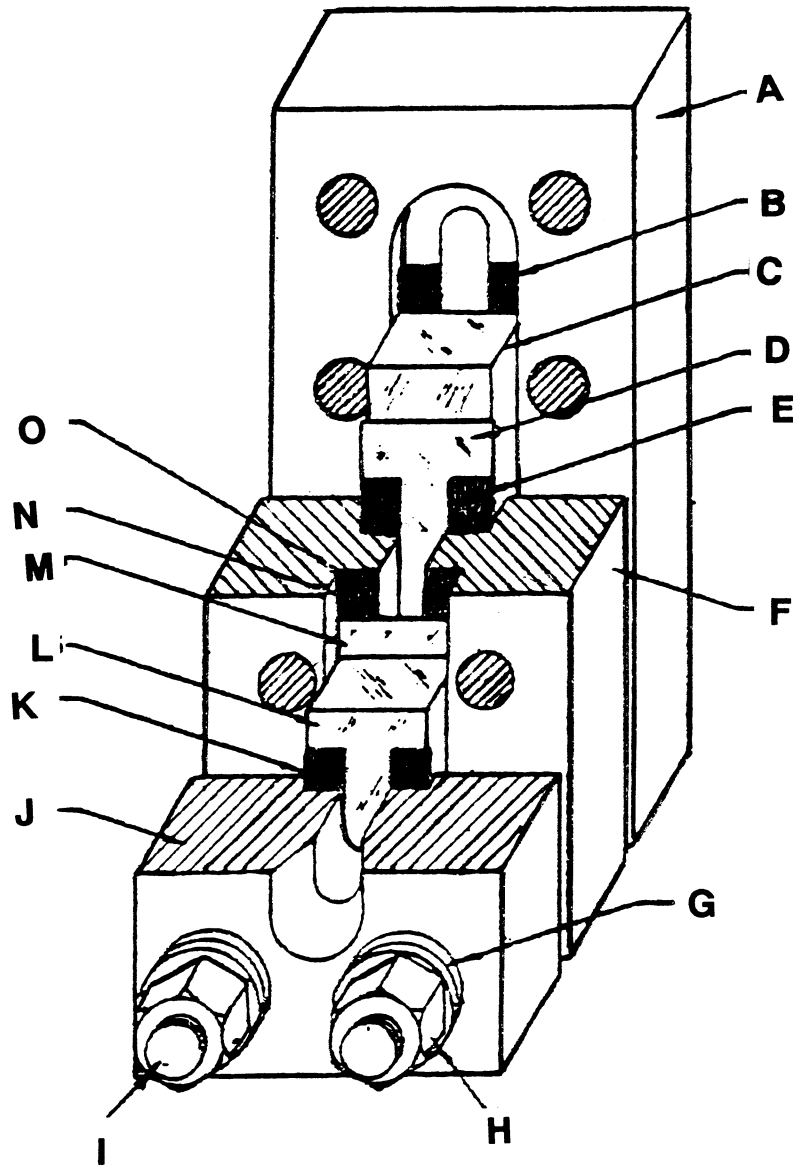
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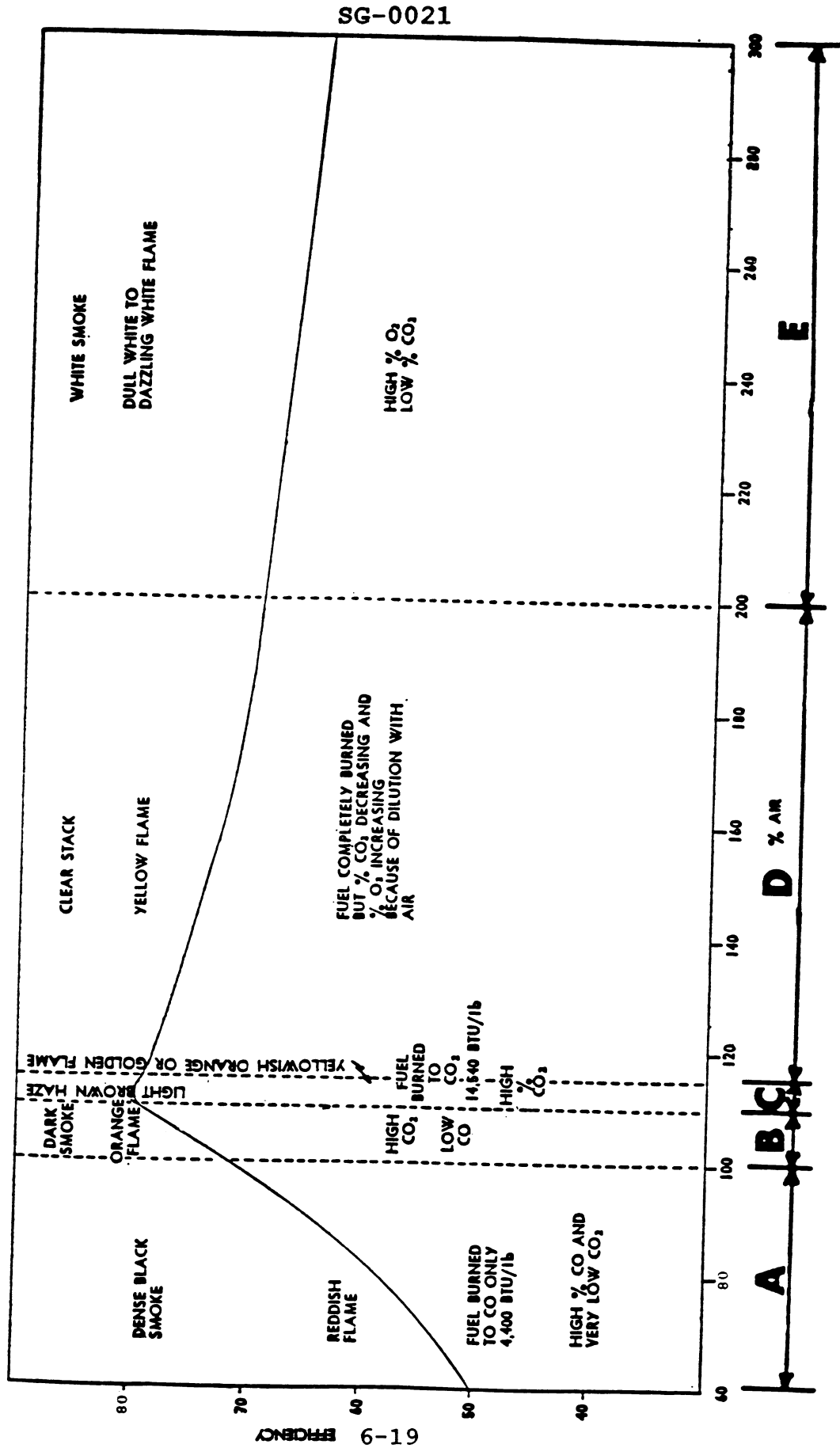


**SG-0019**

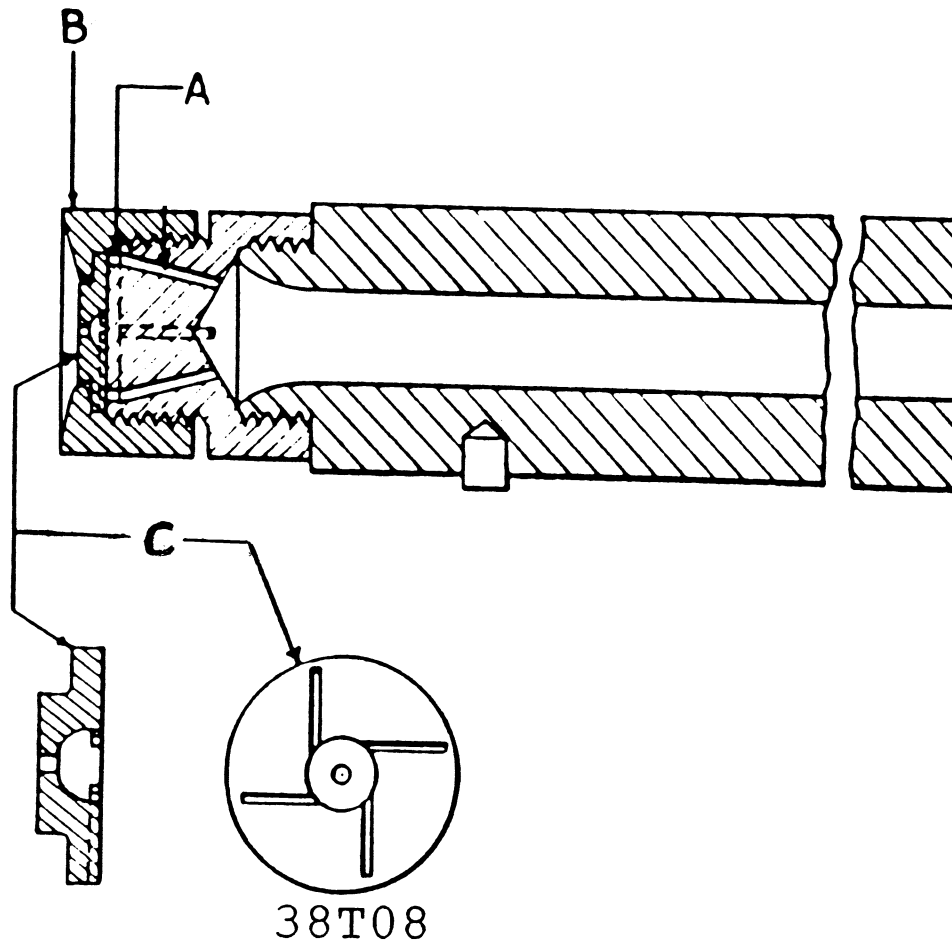


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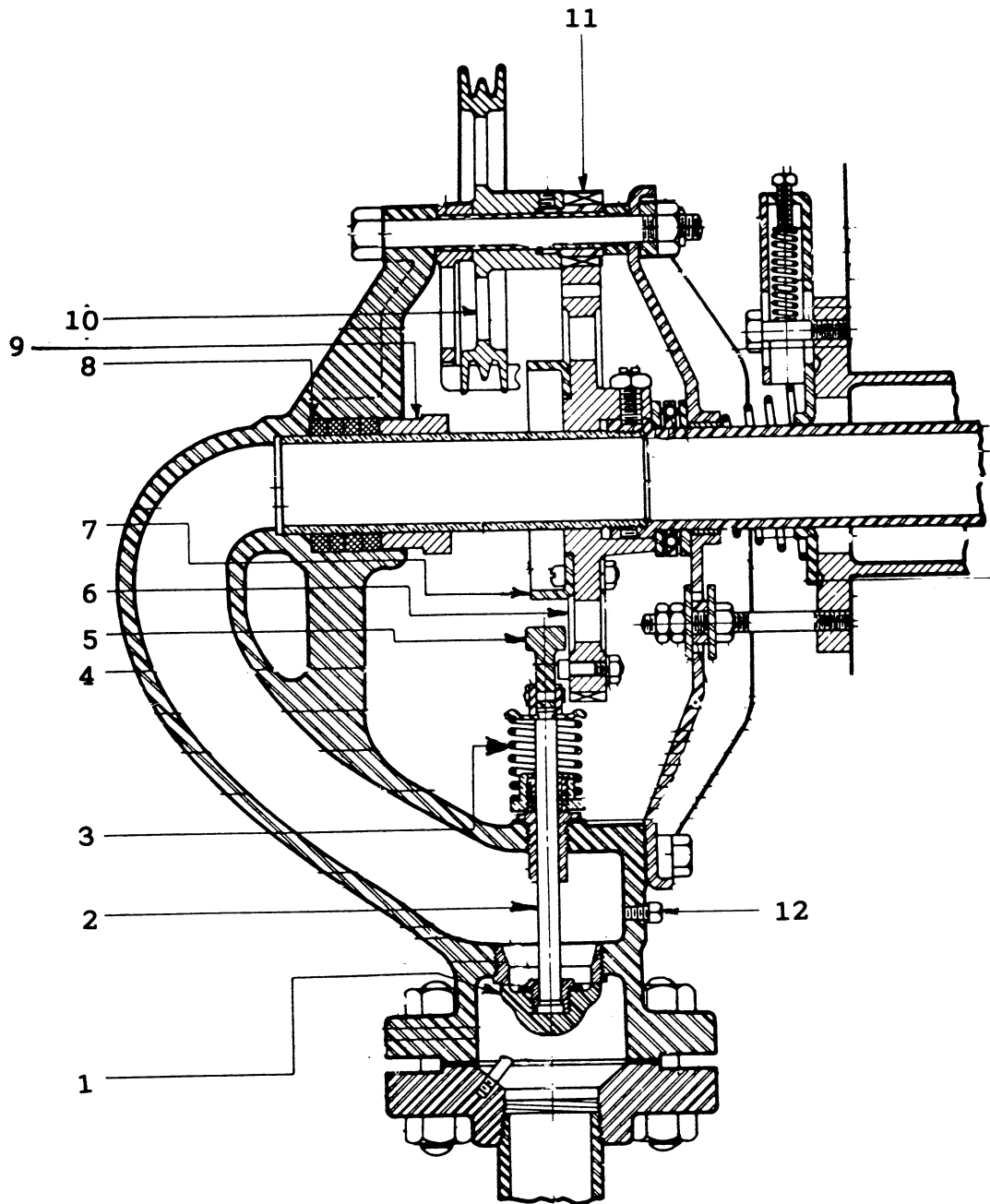




SG-0022



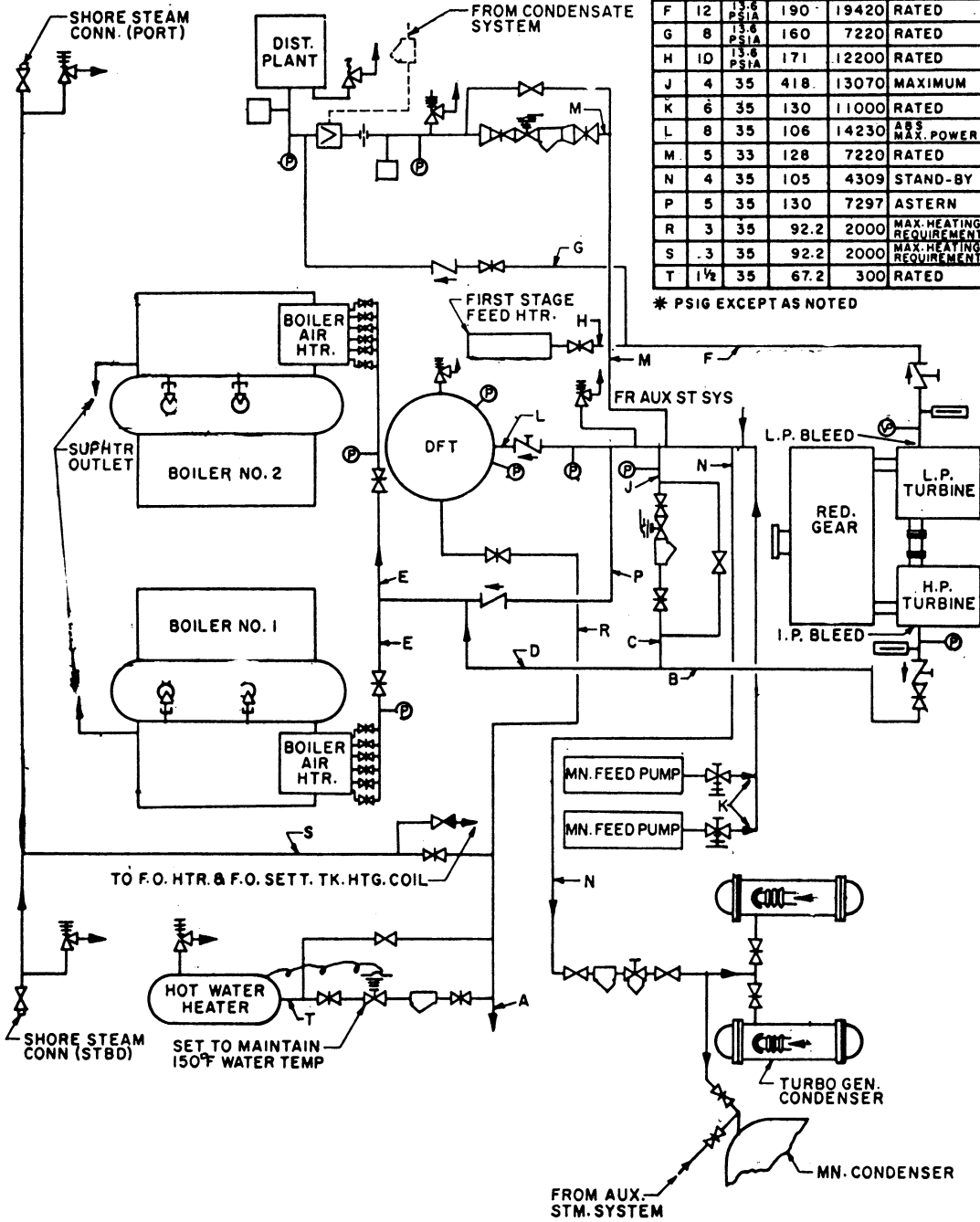
SG-0023



SG-0024

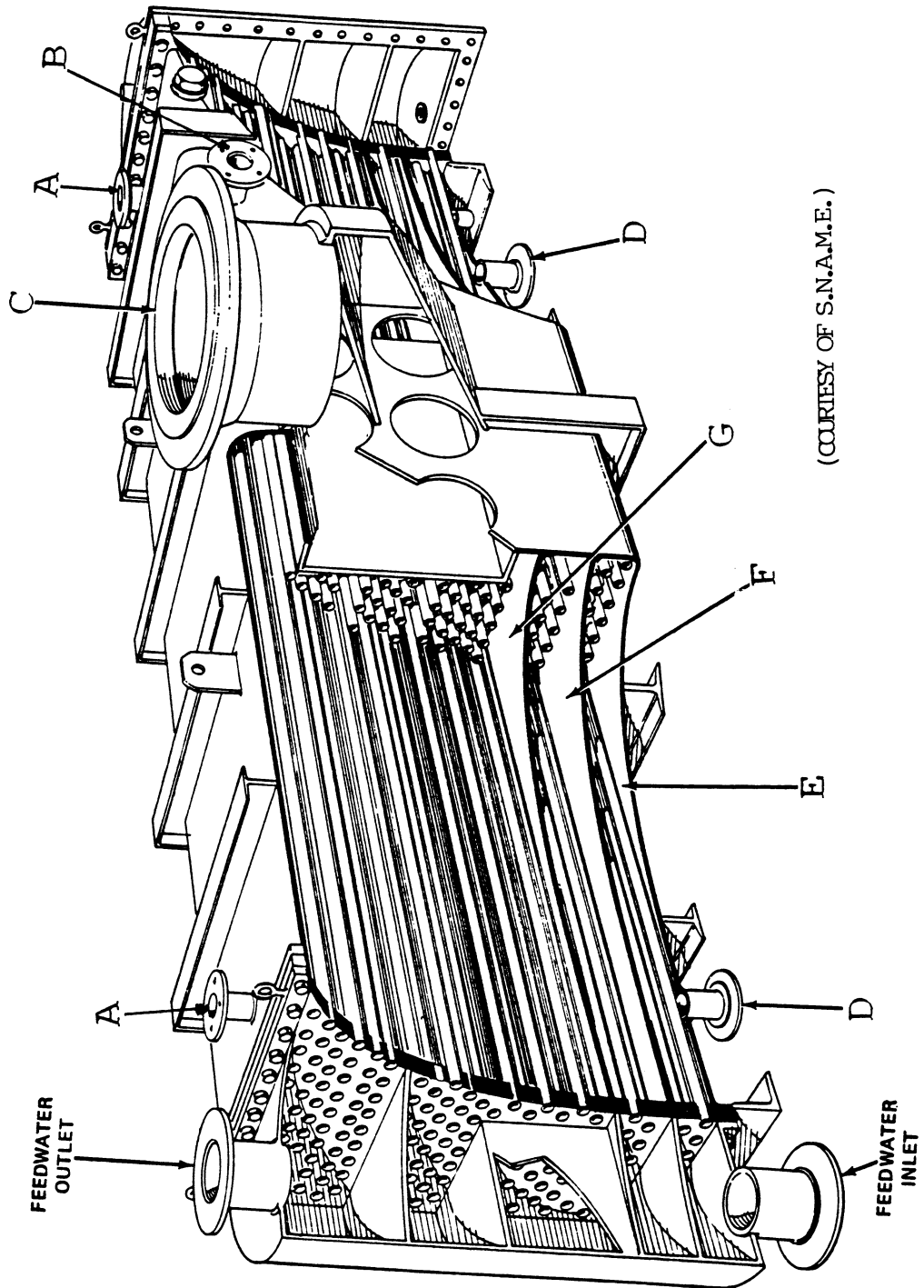
FLOWS AND VELOCITIES						
SYM	SIZE IN.	NOMM PRESS	VEL. FT. SEC	FLOW LB. HR	CONDITION	SERVICE
A	3	35	78.2	1700	MAX. HEATING REQUIREMENT	STM. TO GALLEY, LAV. & SHIP HEATING
B	6	67	203	22610	MAXIMUM	I.P. TURBINE BLEED
C	4	67	267	13070	MAXIMUM	I.P. BLEED TO EXH. MN.
D	5	67	124	9540	ABS. MAX. POWER	2 BOILER-AIR HEATERS
E	3 1/2	67	125	4770	ABS. MAX. POWER	1 BOILER-AIR HEATER
F	12	13.6 PSIA	190	19420	RATED	L.P. TURBINE BLEED
G	8	13.6 PSIA	160	7220	RATED	L.P. BLEED TO DISYIL. PLANT
H	10	13.6 PSIA	171	12200	RATED	L.P. BLEED TO FIRST STAGE FEED HEATER
J	4	35	418	13070	MAXIMUM	I.P. BLEED TO EXH. MN.
K	6	35	130	11000	RATED	EXH. - 1 MN. FD. PUMP
L	8	35	106	14230	ABS. MAX. POWER	EXH. TO DFT.
M	5	33	128	7220	RATED	EXH. TO DISTL. PLANT
N	4	35	105	4309	STAND-BY	EXH. UNLOAD TO DUMP VALVE
P	5	35	130	7297	ASTERN	EMER. EXH. TO BLR. AIR HEATERS
R	3	35	92.2	2000	MAX. HEATING REQUIREMENT	STM. TO H.W. HTR. GALLEY, LAV. & SHIP HEATING
S	3	35	92.2	2000	MAX. HEATING REQUIREMENT	SHORE SYN. TO HW. HTR. GALLEY, LAV. & SHIP HTG.
T	1 1/2	35	67.2	300	RATED	STM. TO H.W. HEATER

\* PSIG EXCEPT AS NOTED





SG-0025



(COURTESY OF S.N.A.M.E.)