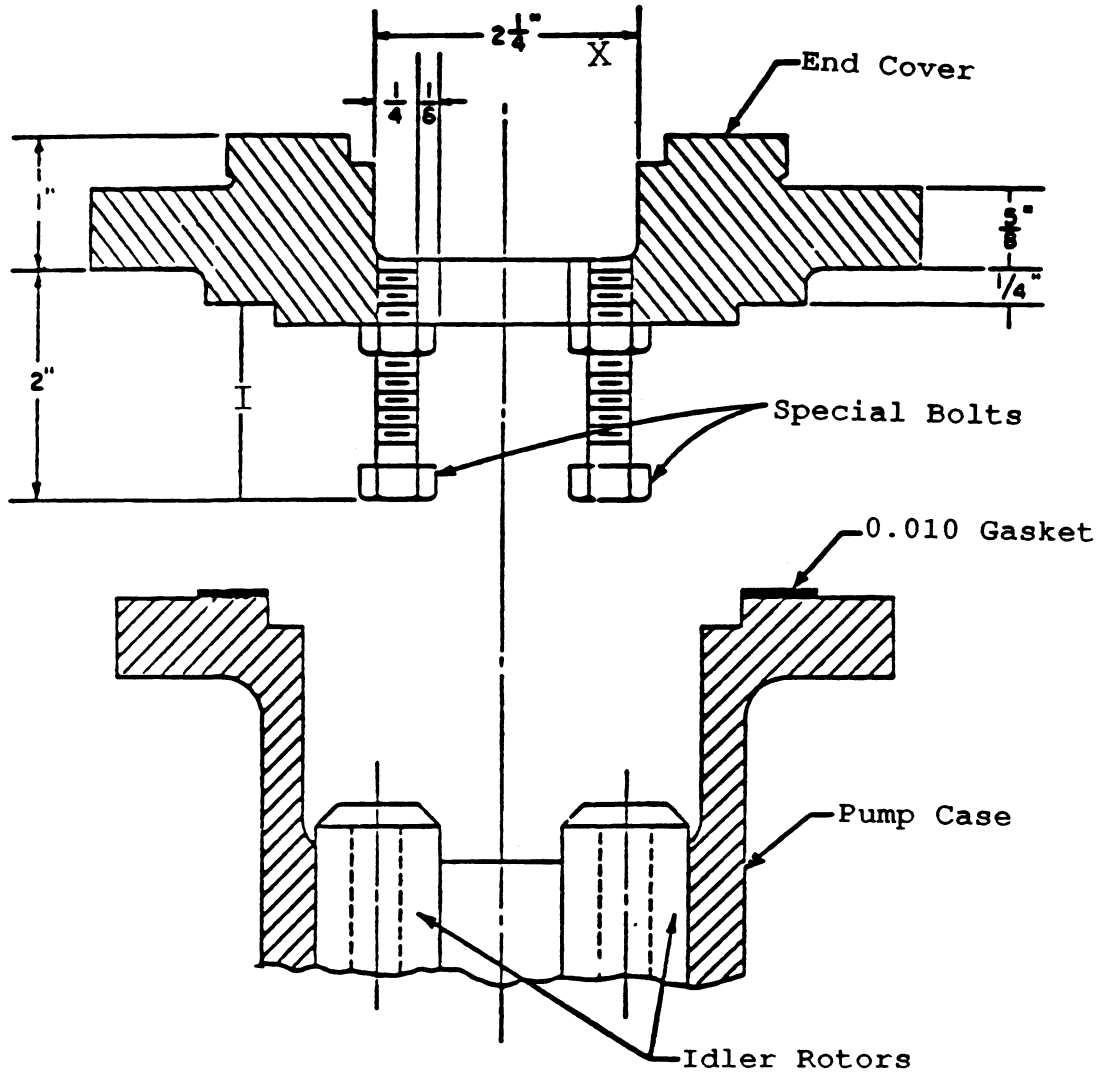
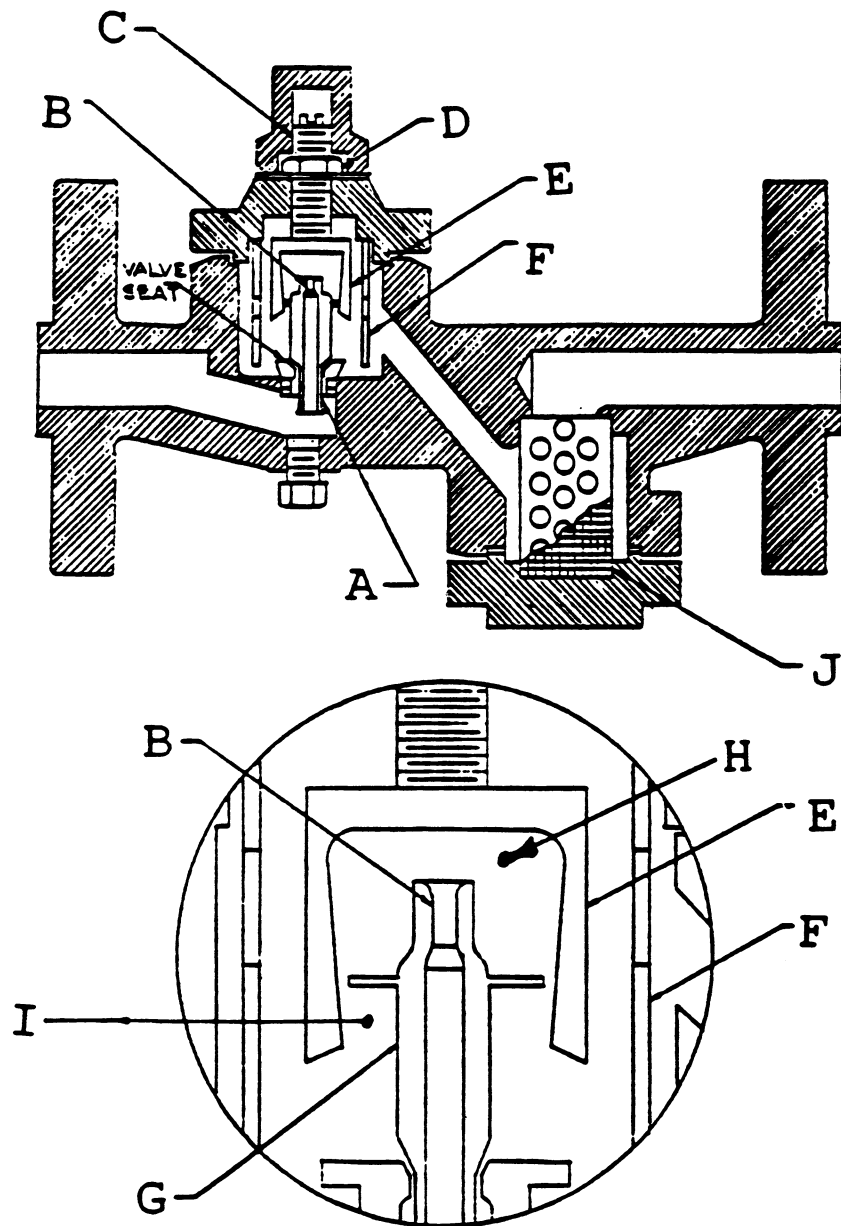


CHAPTER 2 GENERAL SUBJECT

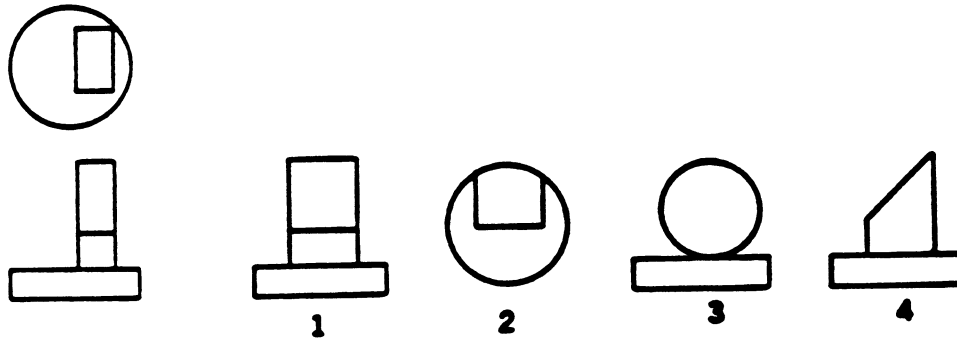
GS-0001



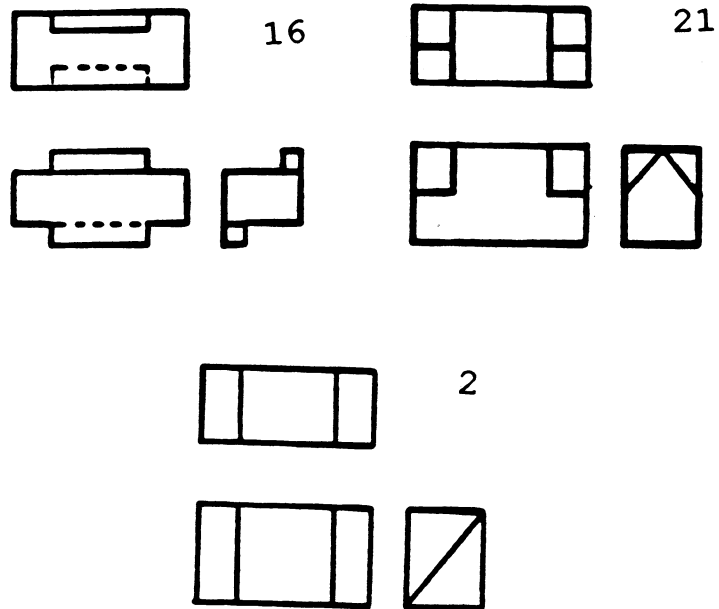
GS-0002



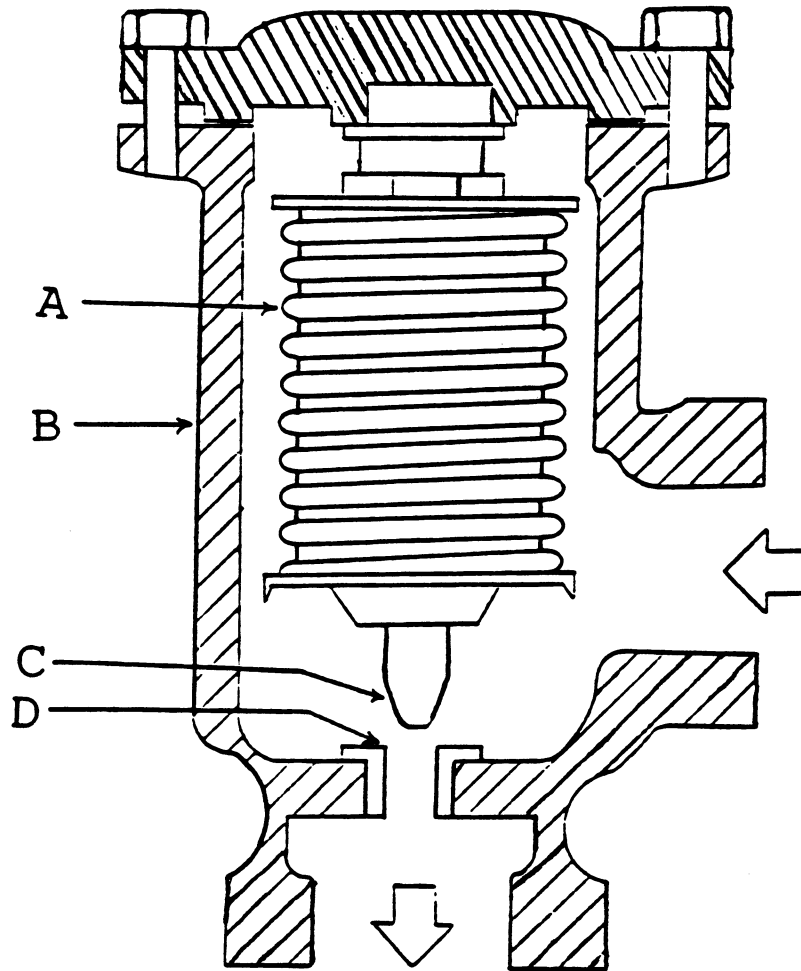
GS-0003



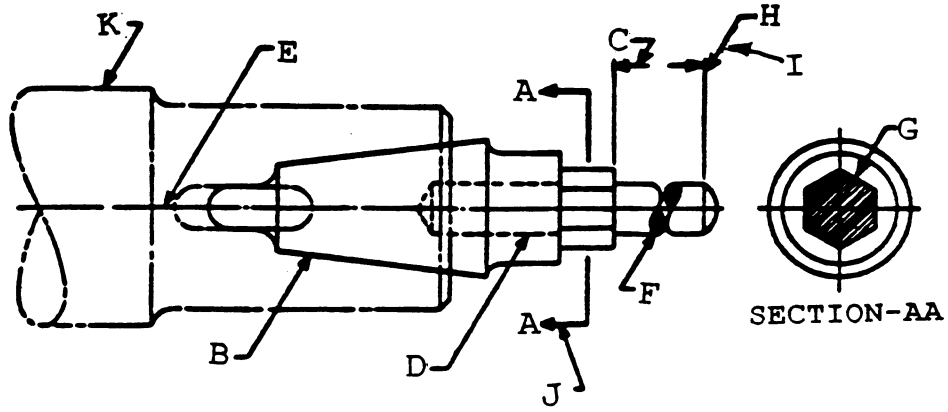
GS-0004



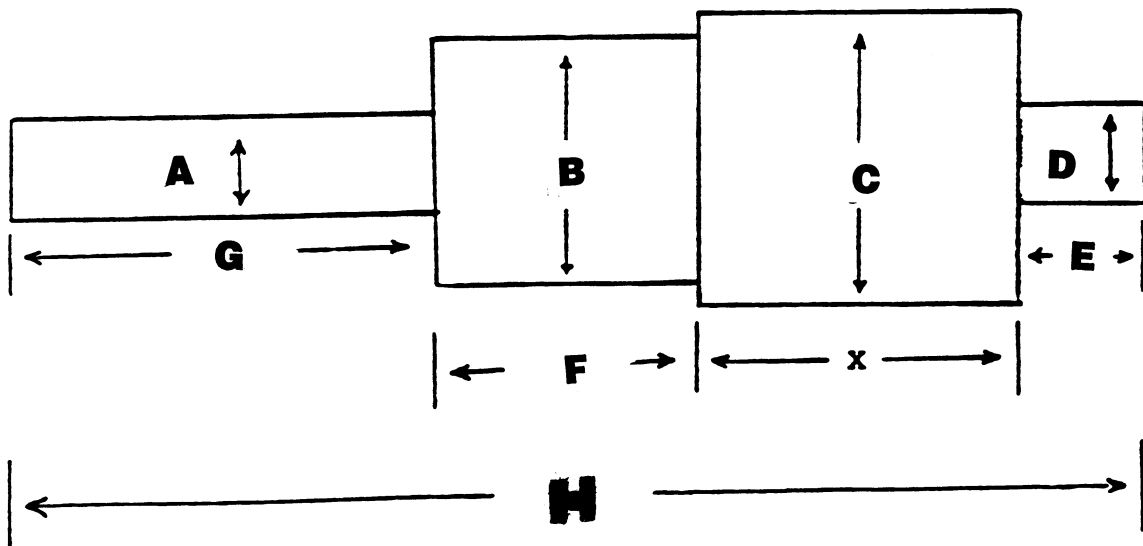
GS-0005



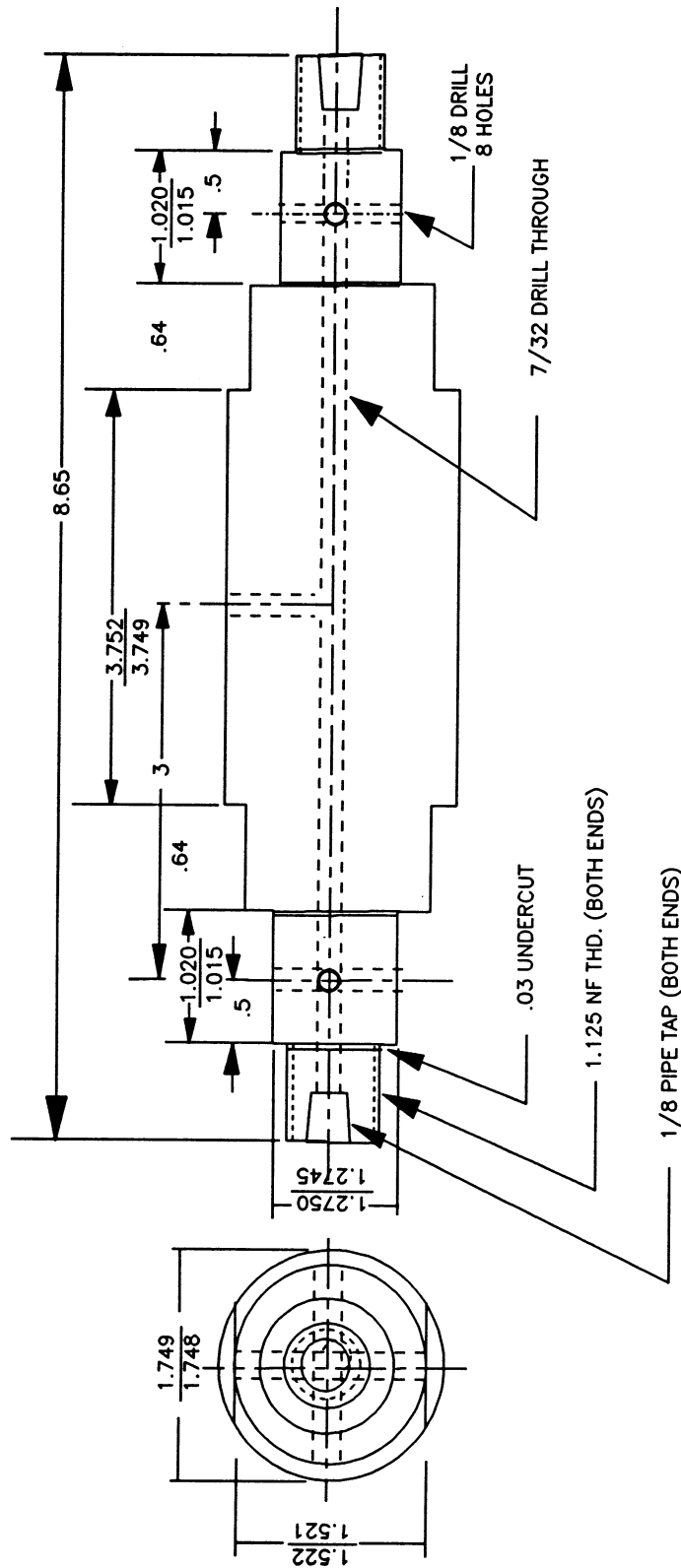
GS-0006



GS-0007



GS-0008



DET --- 56 --- SHAFT
6 --- TYPE SAE 1095 STEEL
STK 2 DIA WT 7.92 LBS.
HARDEN --- ROCKWELL 52-64
GRIND

GS-0009

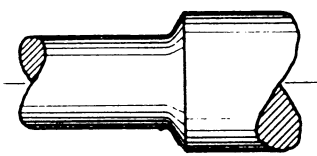
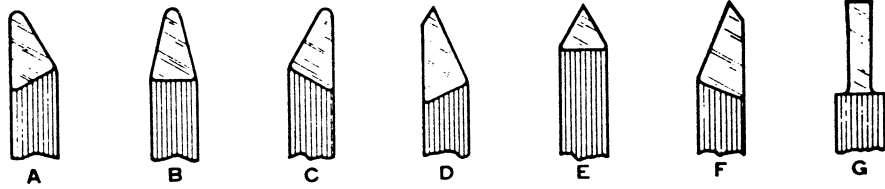


FIG. I

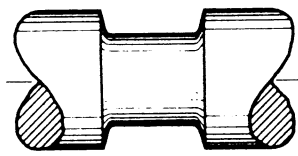


FIG. II

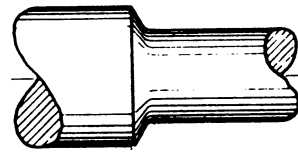


FIG. III

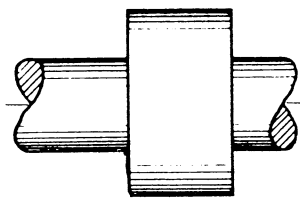


FIG. IV

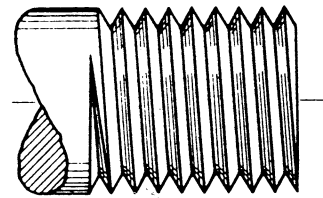


FIG. V

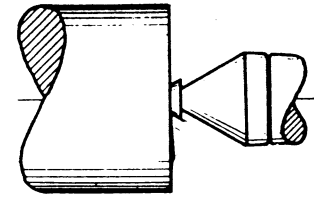


FIG. VI

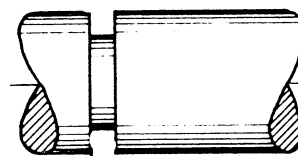
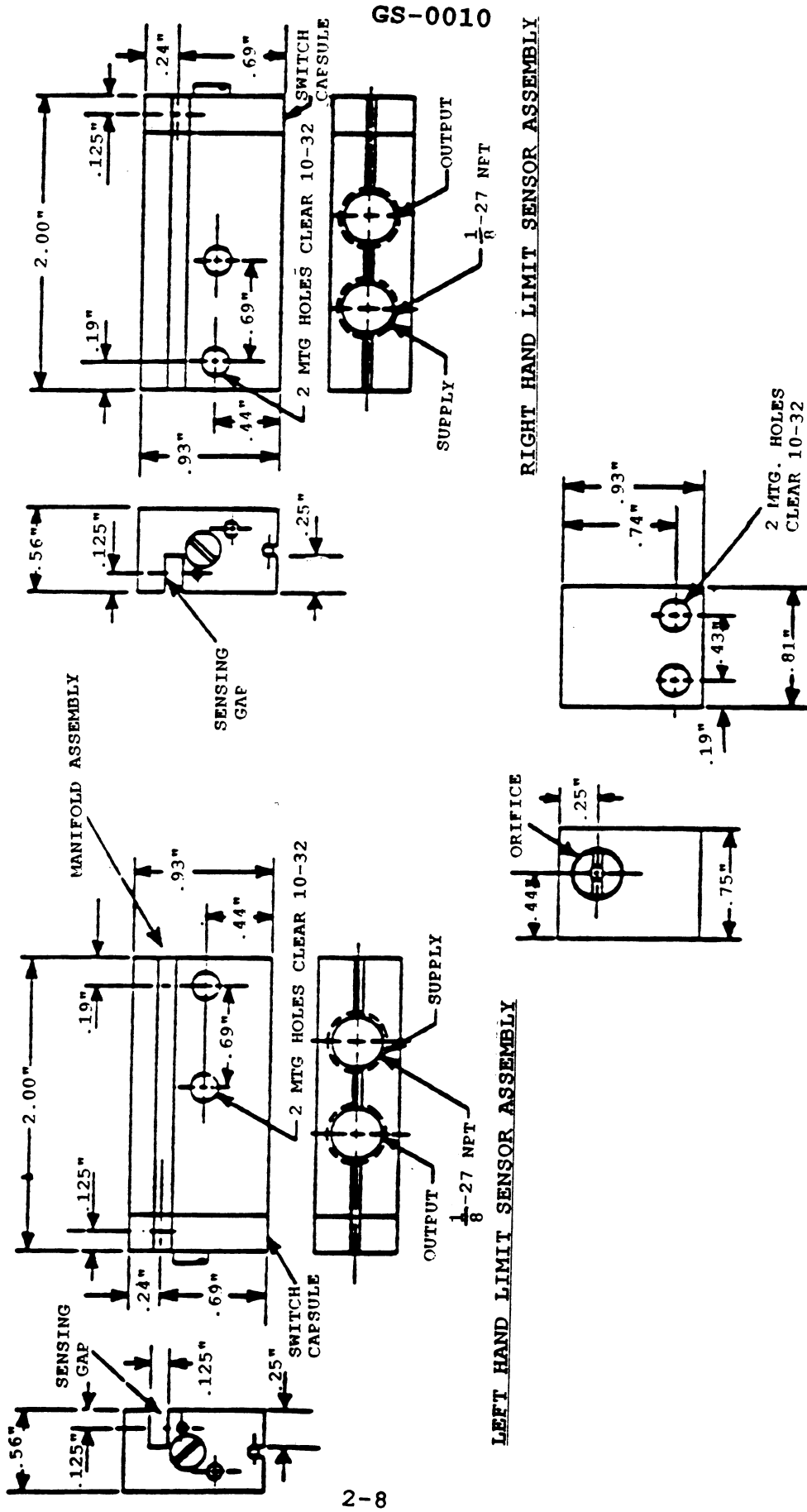
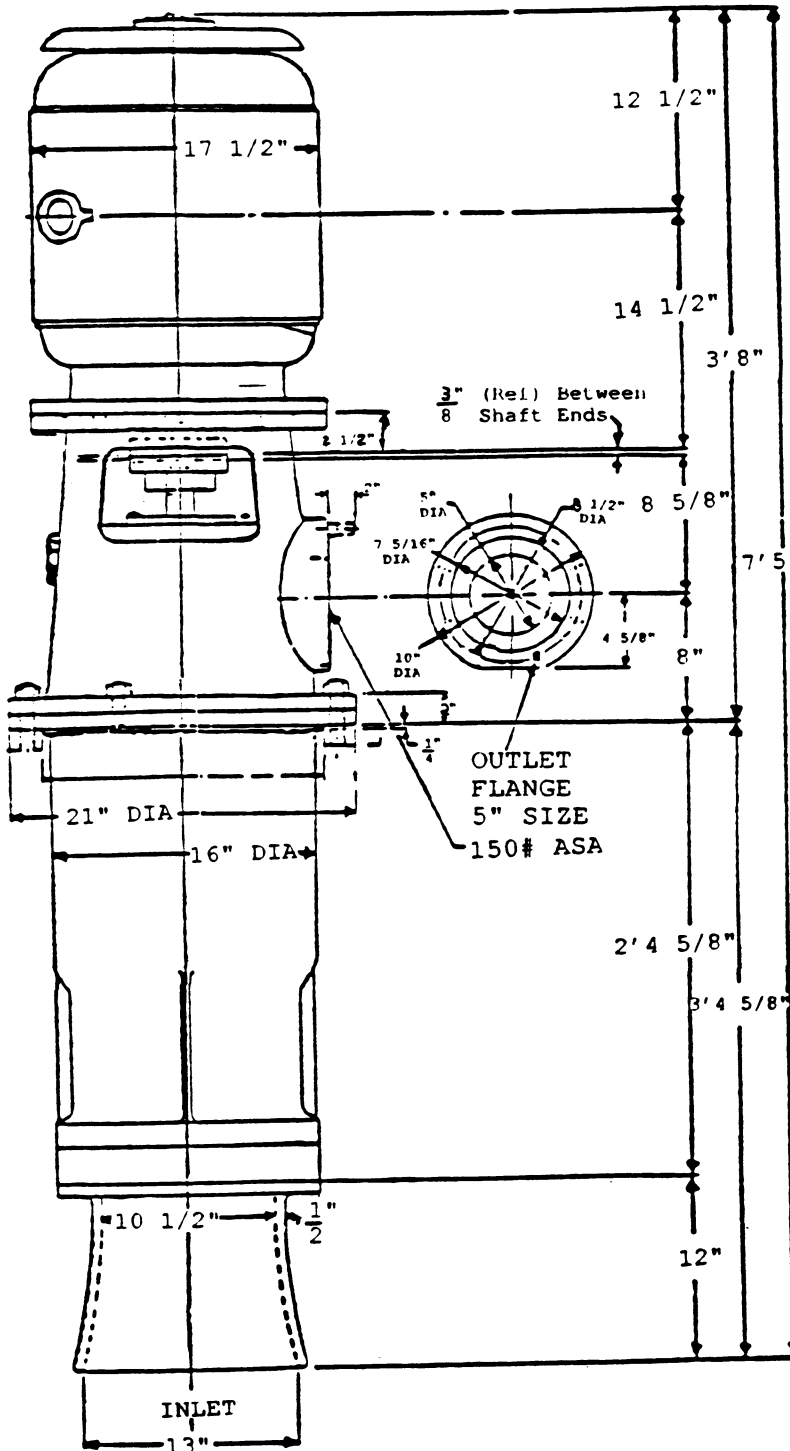


FIG. VII



GS-0011



MOTOR CHARACTERISTICS

MOTOR (D.C.)	ELECTRO DYNAMIC
RATING H.P.	25
SPEED R.P.M.	1150
FRAME	405 VY
TYPE	R
VOLTS	250/210-355

MOTOR CHARACTERISTICS

MOTOR (A.C.)	ELECTRO DYNAMIC
RATING H.P.	25
SPEED R.P.M. (SYN.)	1200
FRAME	365 VY
TYPE	TN
VOLTS	440
CYCLES	60
PHASE	3

PUMP CHARACTERISTICS

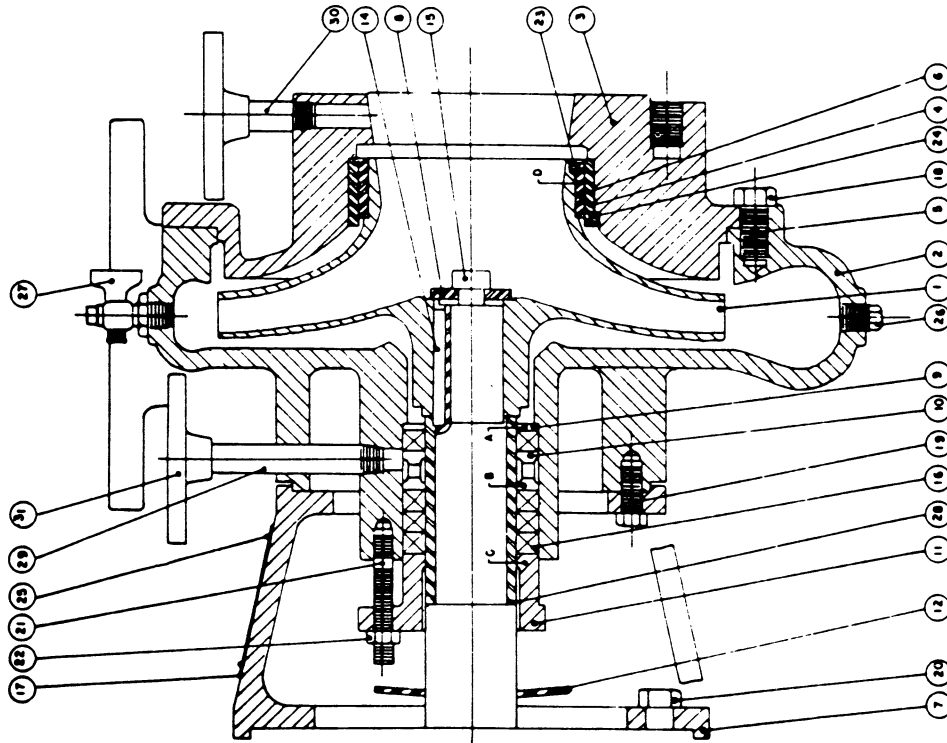
CAPACITY G.P.M.	400
SPEED R.P.M.	1150
SUCTION LIFT "HG	10
E.H.P @ 1200	
SSU-75°F	24.9
OIL VISCOSITY RANGE, SSU	74-7000
VISCOSITY NORMAL SSU @ 140°F	155
DISCHARGE NORMAL PSIG	55
FLUID HANDLED, LUBE OIL	2190 TEP.
NAVY SPECIFICATION	MIL-L-17331
OIL TEMPERATURE RANGE °F	40-180

GS-0012

REVISIONS		
ZONE	LTR	DATE

- NOTE
1. SUCTION & DISCHARGE FLANGES ARE PER ASA 1500
 2. MIN RADIAL CLEARANCE AT
 - A. .022
 - B. .007
 - C. .009
 - D. .008
 3. WHEN ORDERING REPLACEMENT PARTS ALWAYS GIVE PUMP SERIAL NO. LOCATED ON THE PUMP NAMEPLATE.
 4. FOR ORIENTATION OF DISCHARGE CONNECTION REFER TO APPLICABLE OUTLINE AND CERTIFICATION DATA SHEET DRAWING D-CHN-0 98 001

NOTE INSIDE DIA OF BEARING RING, PC NO. (4) IS .020 UNDERSIZE
 OUTSIDE DIA OF BEARING RING, PC NO. (6) IS .020 OVERSIZE
 WHEN FURNISHED AS REPAIR PARTS AND ARE DESIGNATED AS PART '00', '5', 'ASH180A-1' & 'AND 3H180-1'.



2-10

ITEM NO.	QUANTITY	DESCRIPTION	MATERIAL SPEC.	PART NO. OR IDENTIFYING NO.	NAME OF MANUFACTURER	REMARKS OR PATTERN NO.
1	1	IMPELLER	NI-CU-ALLOY	3H1A-1	CARVER PUMP COMPANY	
2	1	IMPELLER WASHER	NEOPRENE	3H1C-9	MUSCATINE IOMA	
3	1	SLINGER	BRONZE	3H1B-1		
4	1	VOLUTE WEAR RING	4-S9ESTOS	3H37		
5	1	IMPELLER GASKET	4-S9ESTOS	3H37		
6	1	IMPELLER BRACKET	CAST STEEL	3H180-1		
7	1	SHAFT SLEEVE	NI-CU-ALLOY	4126-4		
8	1	THROAT BUSHING	NI-CU-ALLOY	4126-3		
9	1	LANTERN RING	NI-CU-ALLOY	4126-3		
10	2	GLAND HALF	BRONZE	8-017-5AH-A		
11	2	IMPELLER KEY	CAST STEEL	213C-2		
12	1	IMPELLER WASHER	NEOPRENE	3H1C-9		
13	1	IMPELLER WASHER	NEOPRENE	3H1C-9		
14	1	IMPELLER WASHER	NEOPRENE	3H1C-9		
15	1	IMPELLER WASHER	NEOPRENE	3H1C-9		
16	5	PACKING RINGS	PLASTIC-MILC	A-226-00M-0-03		
17	1	HEAD CASPERE 4	NI-CU-ALLOY	00-N-281C CLASS A		
18	1	HEAD CASPERE 4	NI-CU-ALLOY	00-N-281C CLASS A		
19	4	HEAD CASPERE 4	NI-CU-ALLOY	00-N-281C CLASS A		
20	4	HEAD CASPERE 4	NI-CU-ALLOY	00-N-281C CLASS A		
21	1	HEAD CASPERE 4	NI-CU-ALLOY	00-N-281C CLASS A		
22	2	STUD	TYPE 316	3/8-18UNC-2		
23	2	HEAD NUT	TYPE 316	3/8-18UNC-2		
24	1	HEAD NUT	TYPE 316	3/8-18UNC-2		
25	1	HEAD NUT	TYPE 316	3/8-18UNC-2		
26	1	HEAD NUT	TYPE 316	3/8-18UNC-2		
27	1	HEAD NUT	TYPE 316	3/8-18UNC-2		
28	1	HEAD NUT	TYPE 316	3/8-18UNC-2		
29	1	HEAD NUT	TYPE 316	3/8-18UNC-2		
30	1	HEAD NUT	TYPE 316	3/8-18UNC-2		
31	1	HEAD NUT	TYPE 316	3/8-18UNC-2		

MA HULL NUMBERS
 1ST VESSEL MA HULL 236
 2ND VESSEL MA HULL 757
 3RD VESSEL MA HULL 757
 MA PLAN NUMBER 25-5-672-1-108
 MA DESIGN NUMBER 25-5-730
 CLASS OF SHIPS: HELI-SWELL SCREW
 B/M HULL NUMBER: 37-355-357
 PURCHASE ORDER NO: B/M 157-4-C
 OWNER'S NAME: AMER. EXPLOIT ISBRANDISEN LINES

CONTRACT NO.
 DATE 10 26 70
 PREPARED/DISTOPM
 CHECKED
 SECTIONAL ASSEMBLY
 3H PUMP
 CLOSE COUPLED
 STEEL CODE IDENT NO
 DRAWING NO
 19941
 D-04H-0-99-001
 SCALE-NONE
 SHEET 1 of 1

GS-0013

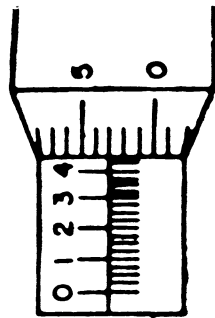


FIG. A

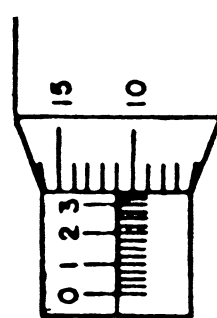


FIG. B

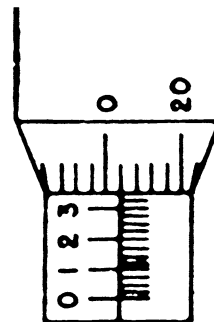


FIG. C

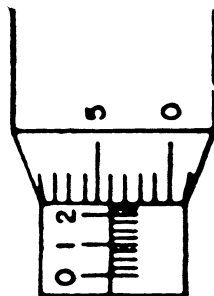


FIG. D

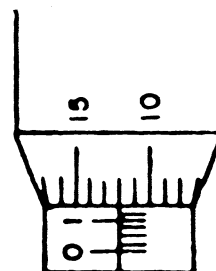


FIG. E

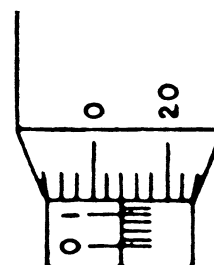


FIG. F

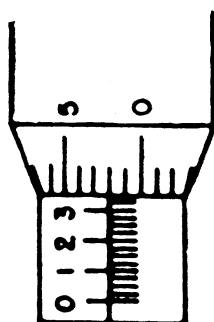


FIG. G

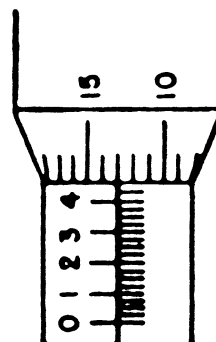


FIG. H

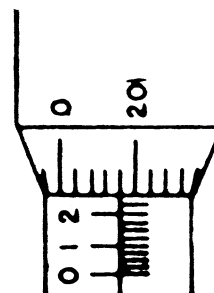
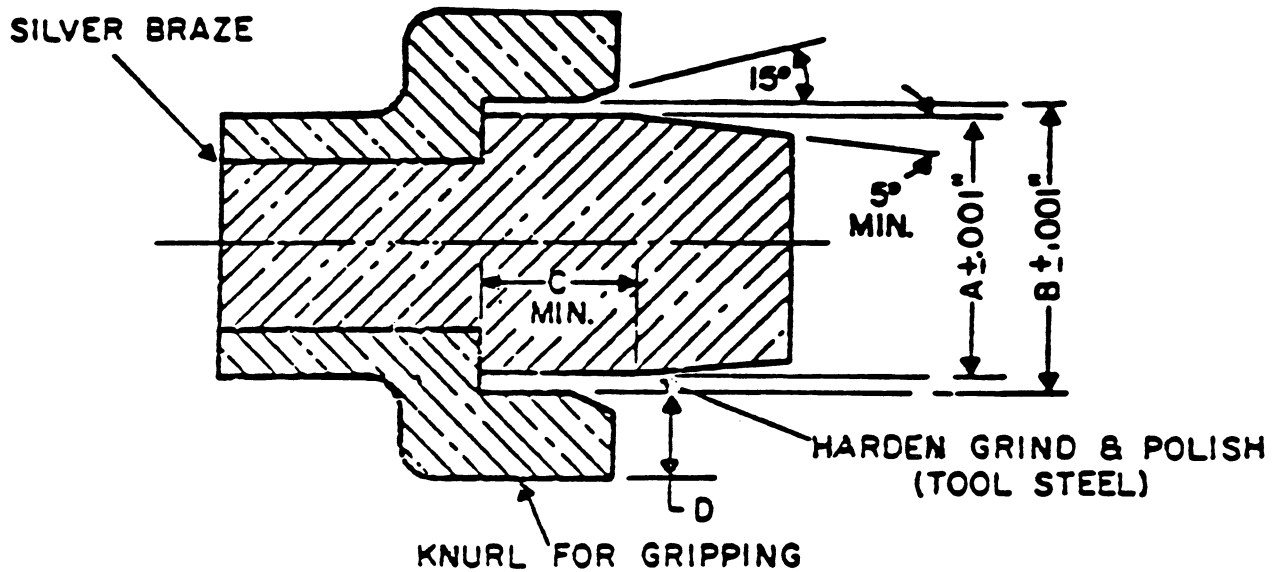


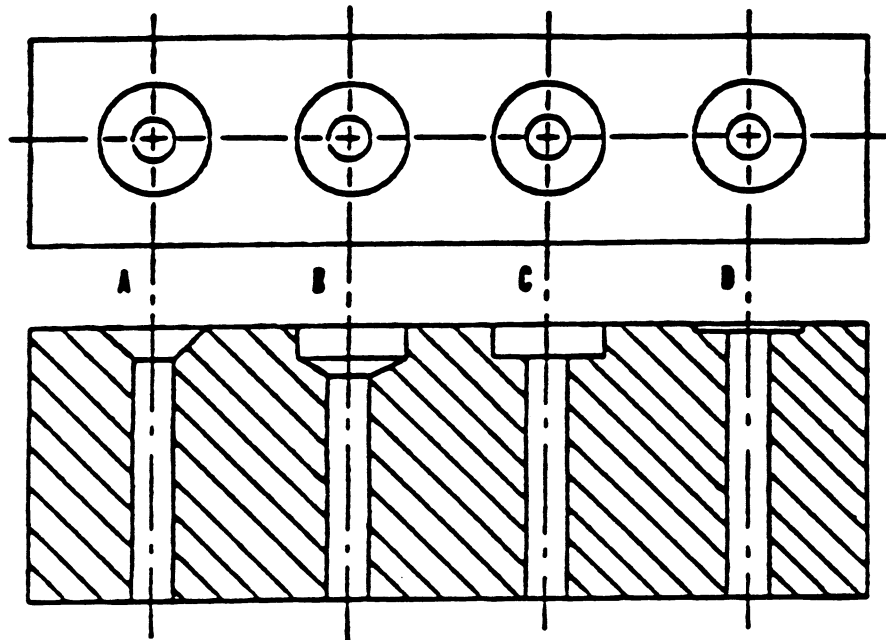
FIG. I

GS-0014

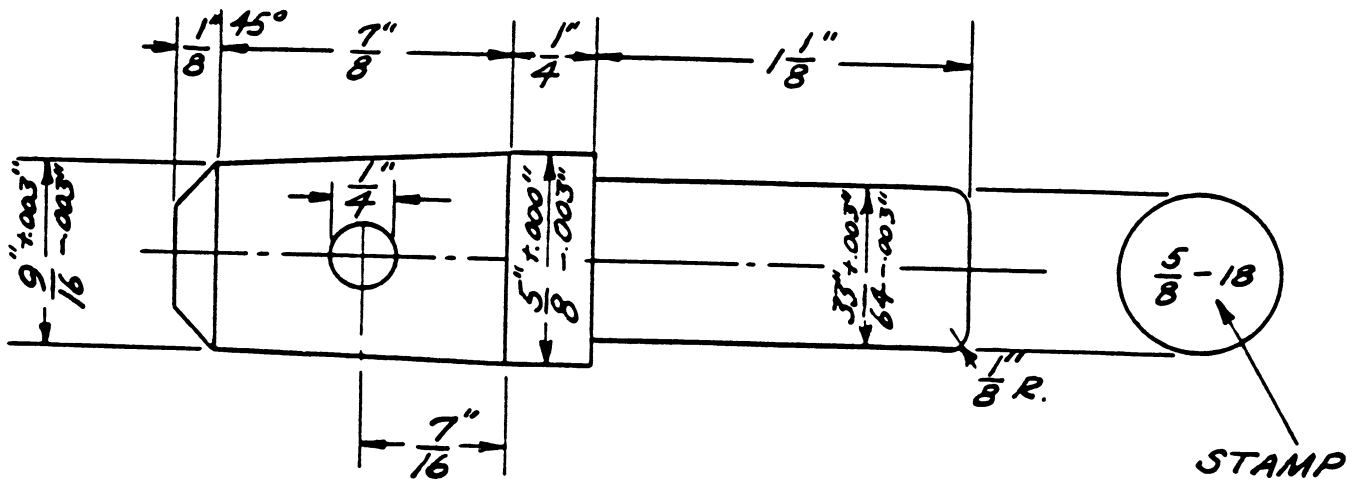


FITTING SIZE (INCH)	A	B	C	D
1/4	.400	.500	33/64	1/4
3/8	.535	.675	9/16	1/4
1/2	.700	.840	5/8	1/4
3/4	.910	1.050	21/32	1/4
1	1.175	1.315	11/16	3/8
1 1/4	1.520	1.660	3/4	3/8
1 1/2	1.760	1.900	7/8	7/16
2	2.235	2.375	27/32	1/2

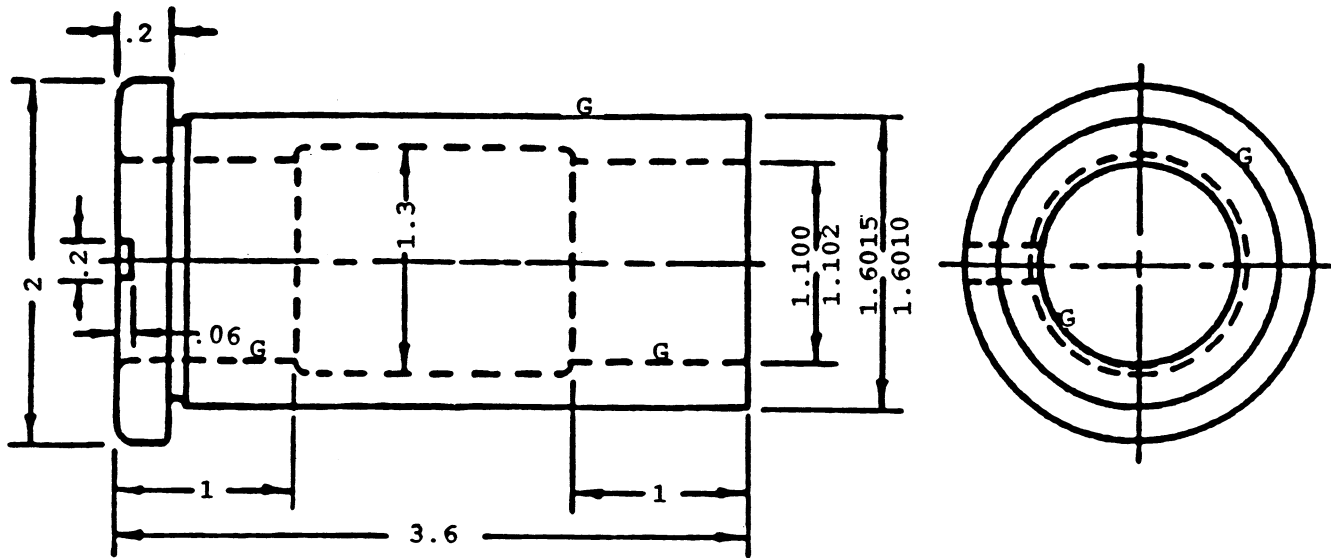
GS-0015



GS-0016

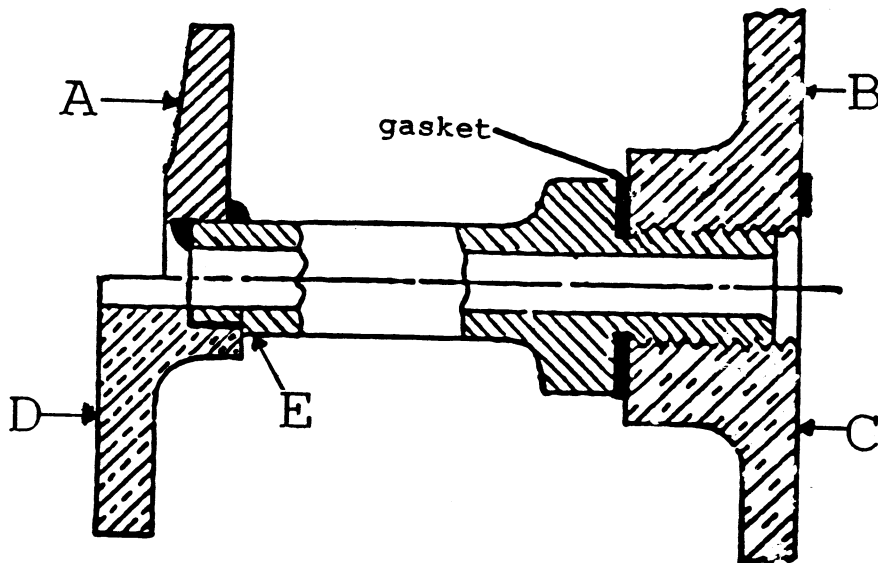


GS-0017

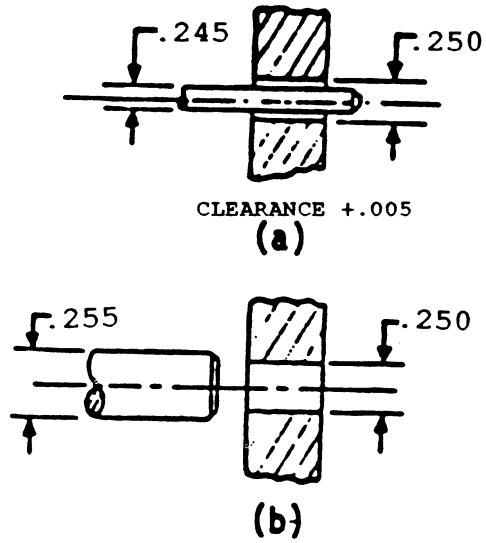


DET. 7--- BUSHING
 1 --- SAE 1095 STEEL
 STK. 2 1/8 DIA.
 HARDEN & GRIND

GS-0018

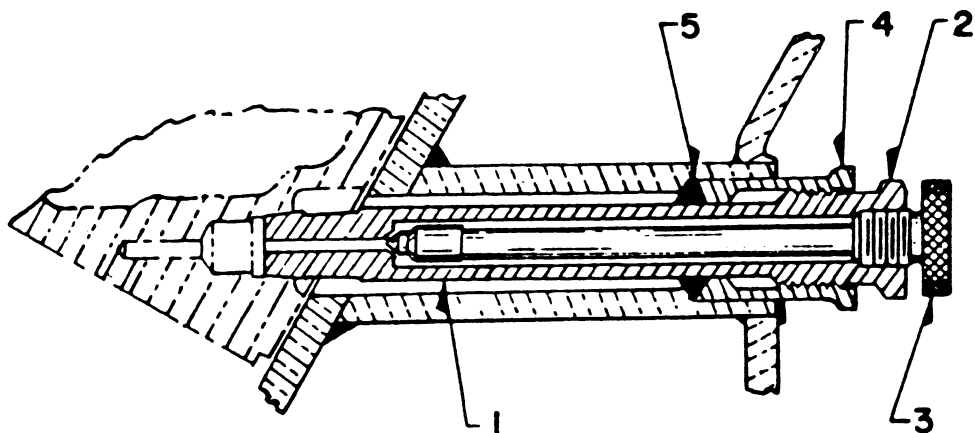


GS-0019

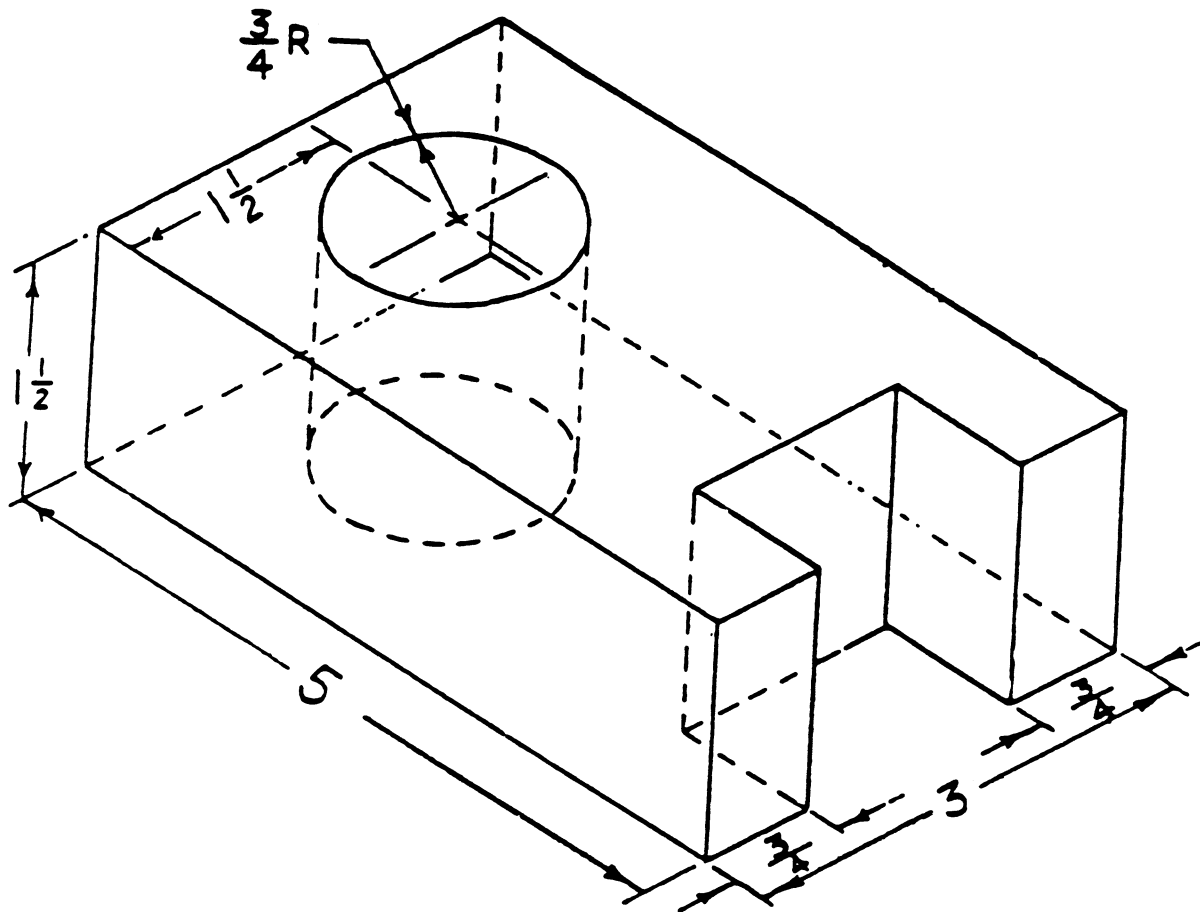


GS-0020

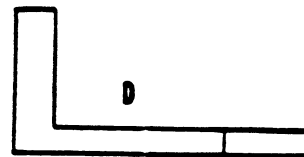
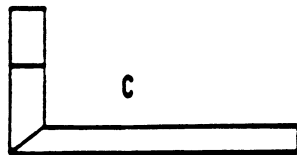
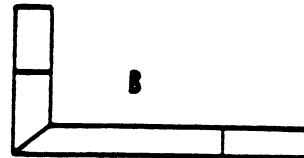
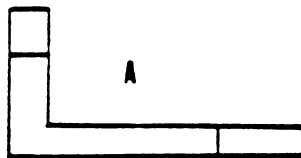
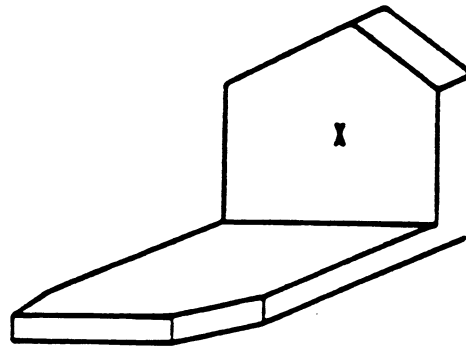
Cylinder Test Valve
All 8,12,16 and 20-645 Engines



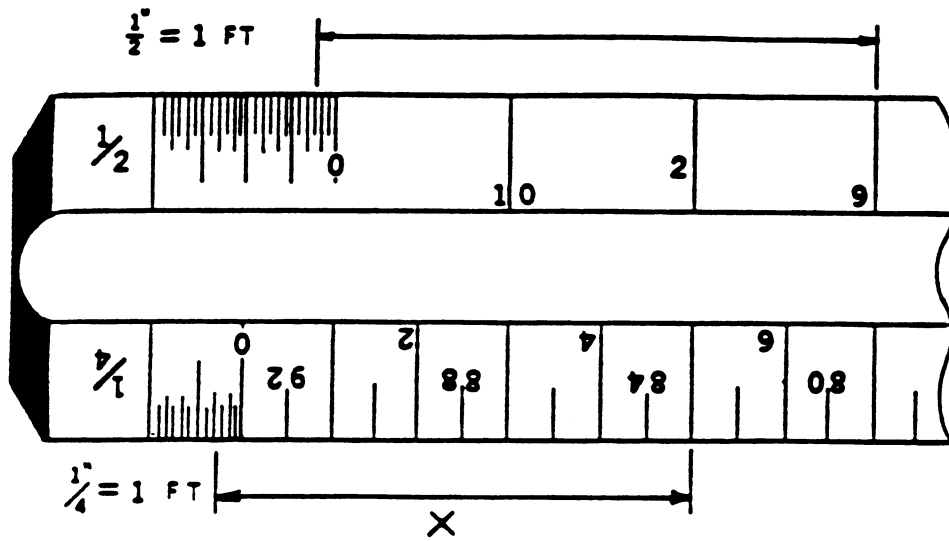
GS-0021



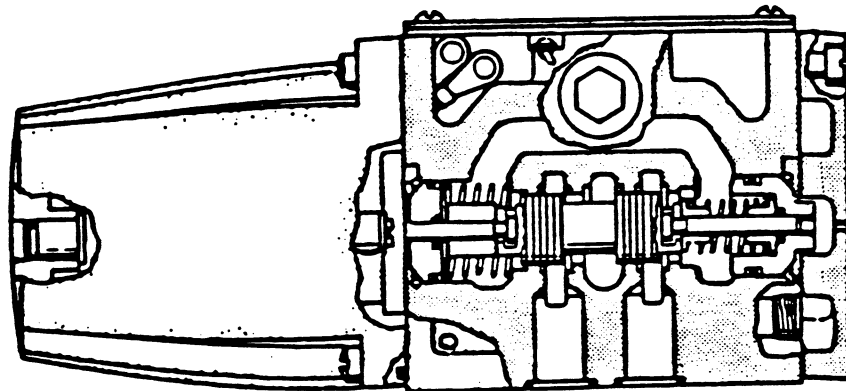
GS-0022



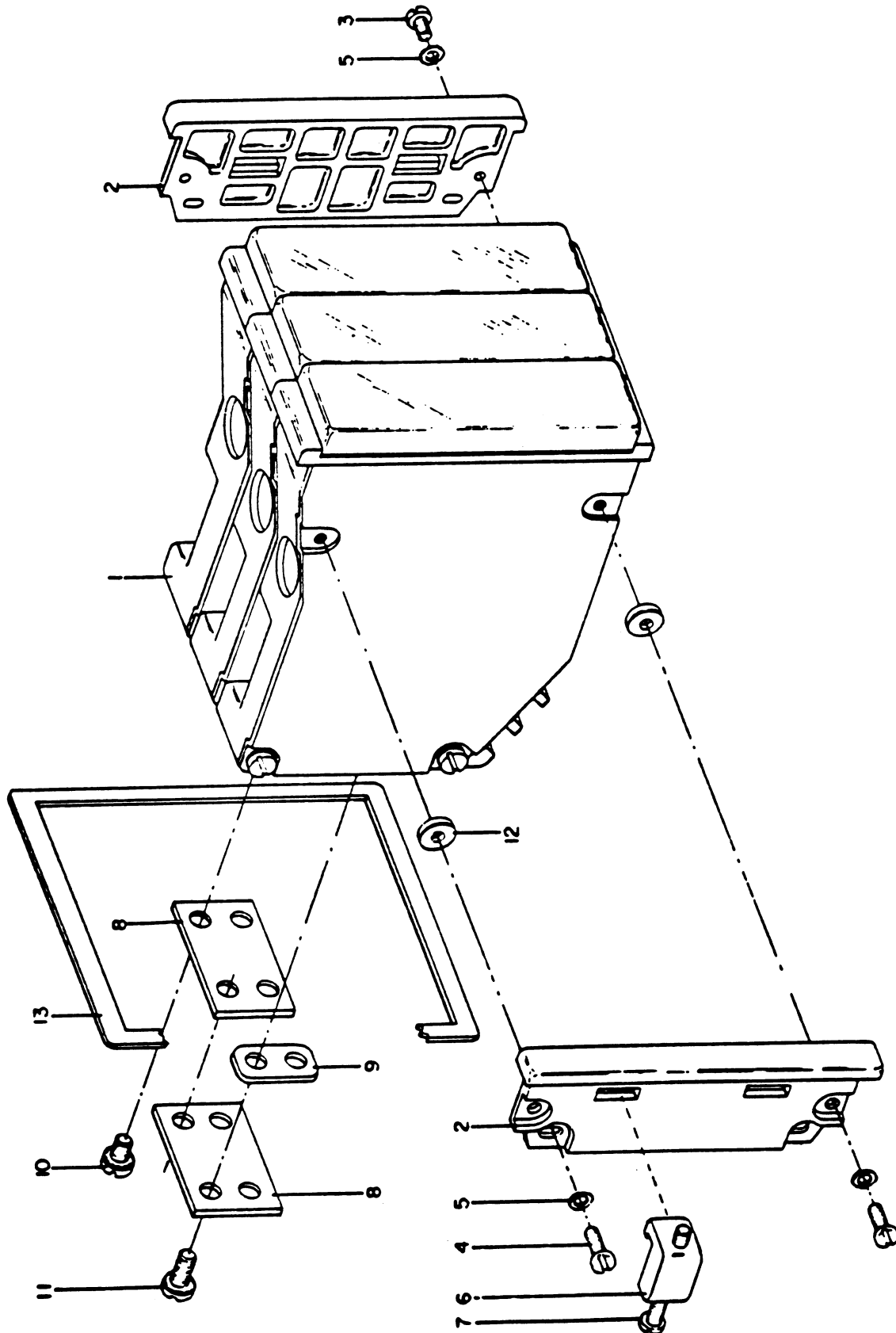
GS-0023



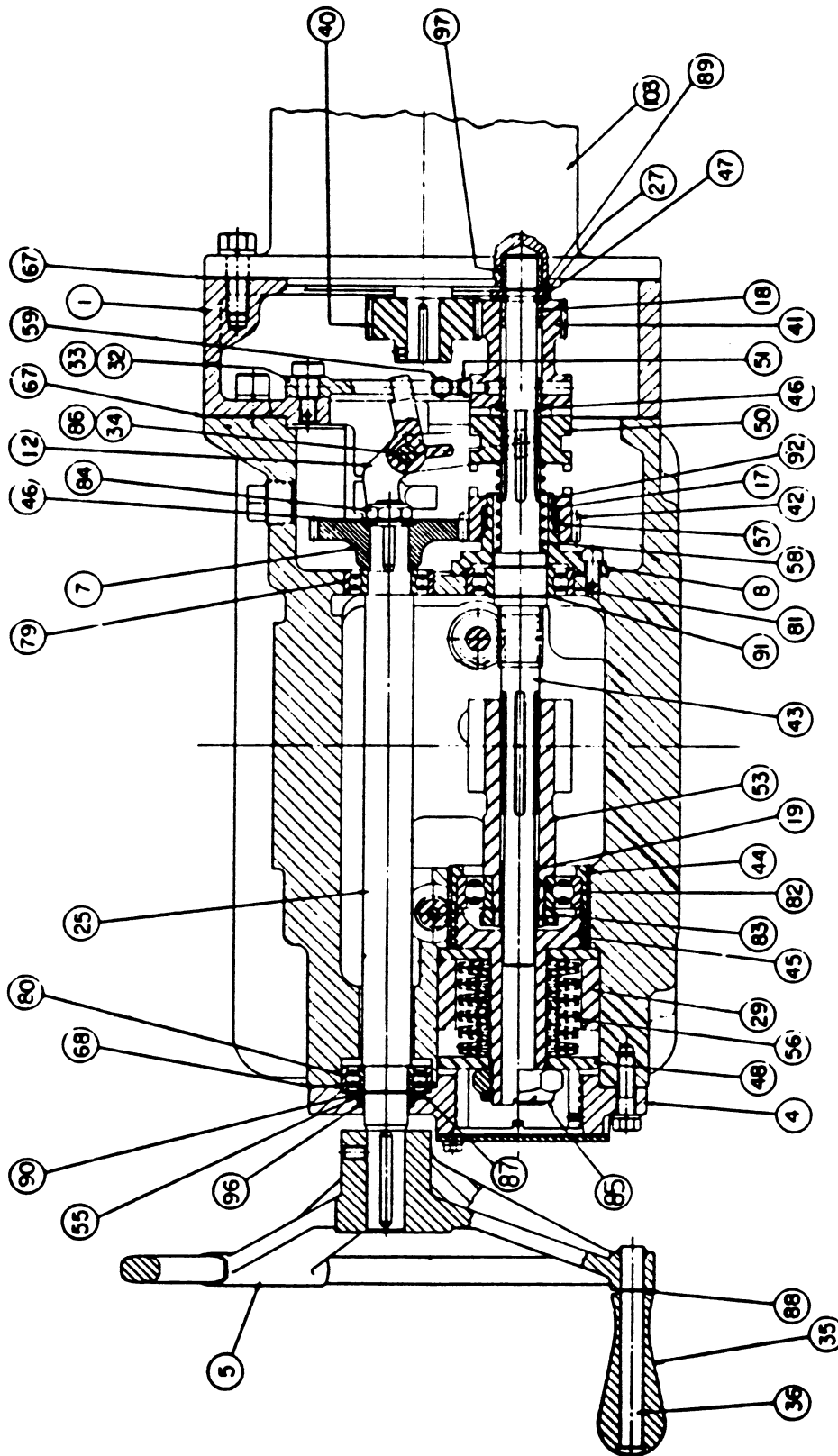
GS-0024



GS-0025

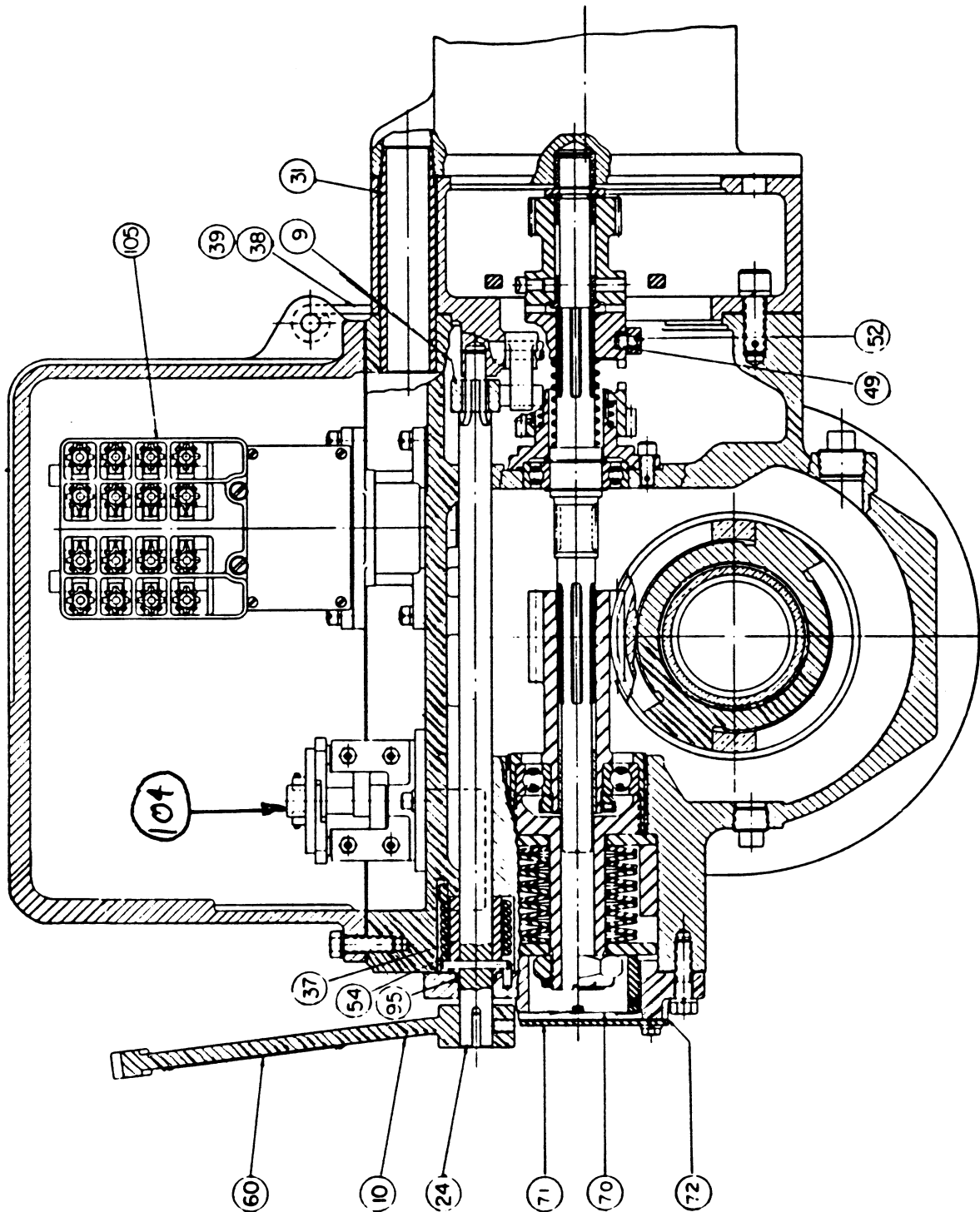


GS-0026



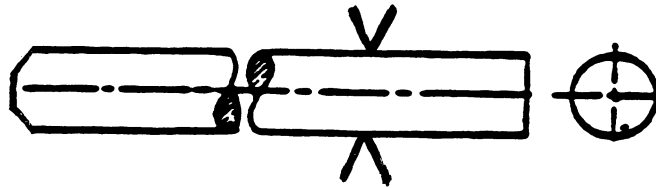
(COURTESY OF LINTORQUE CORP.)

GS-0027

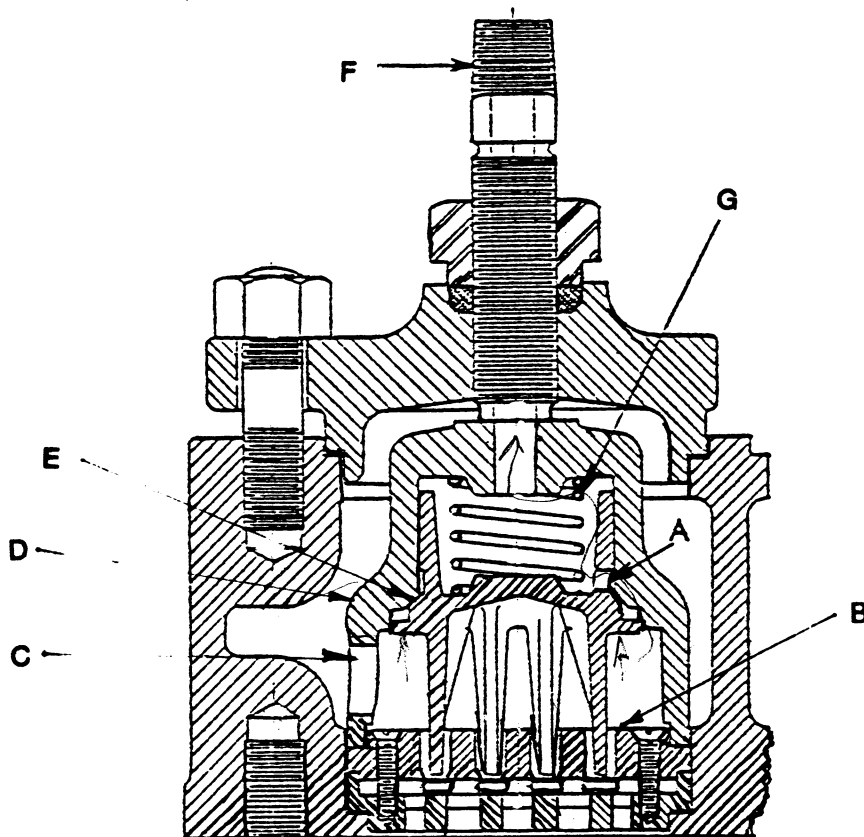


(COURTESY OF LIMITEC CORP.)

GS-0028



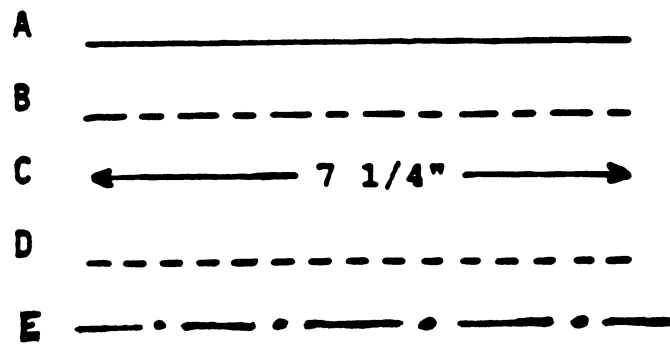
GS-0029



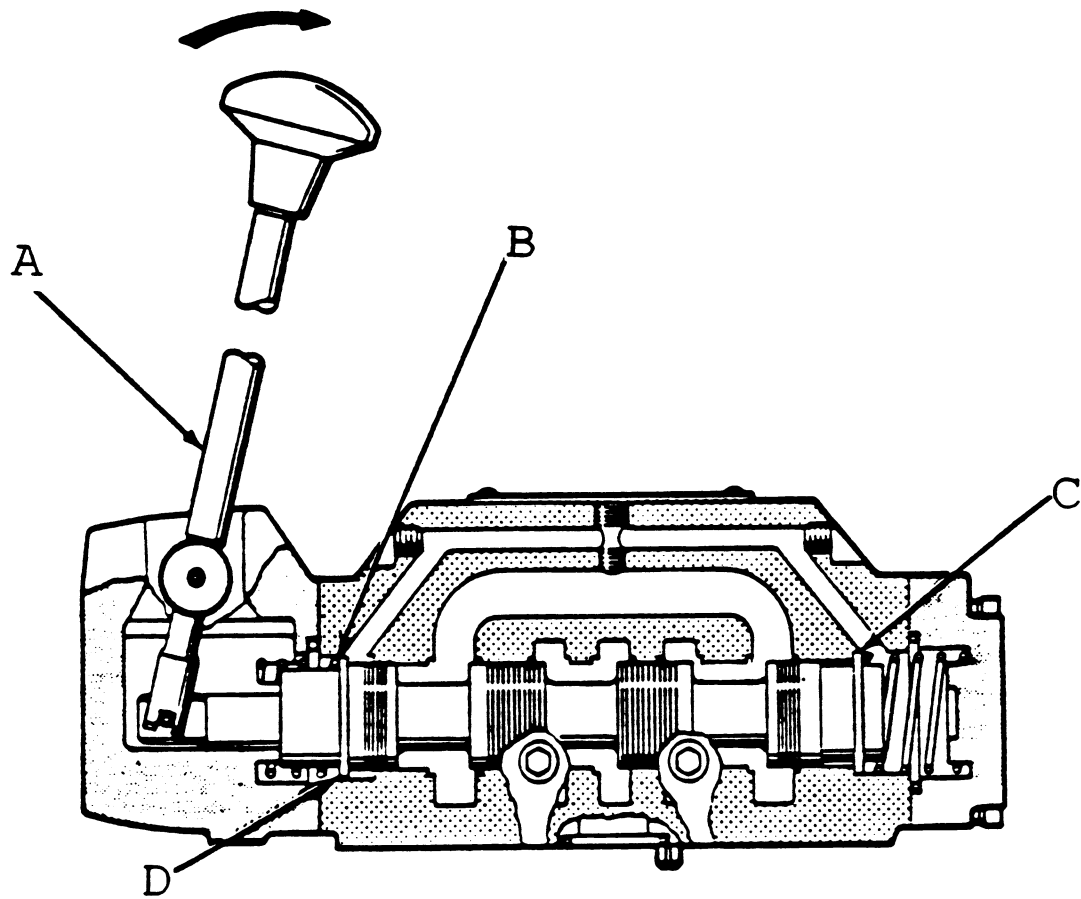
GS-0030



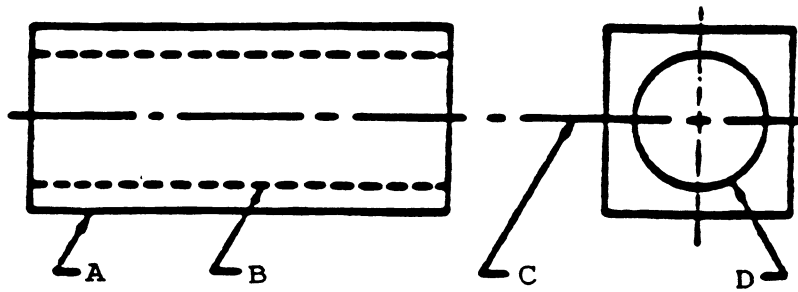
GS-0031



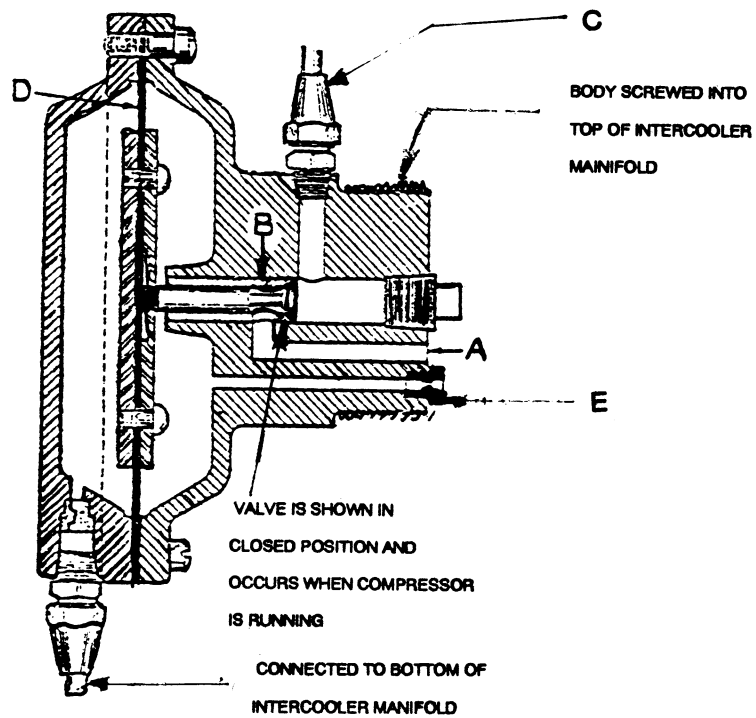
GS-0032



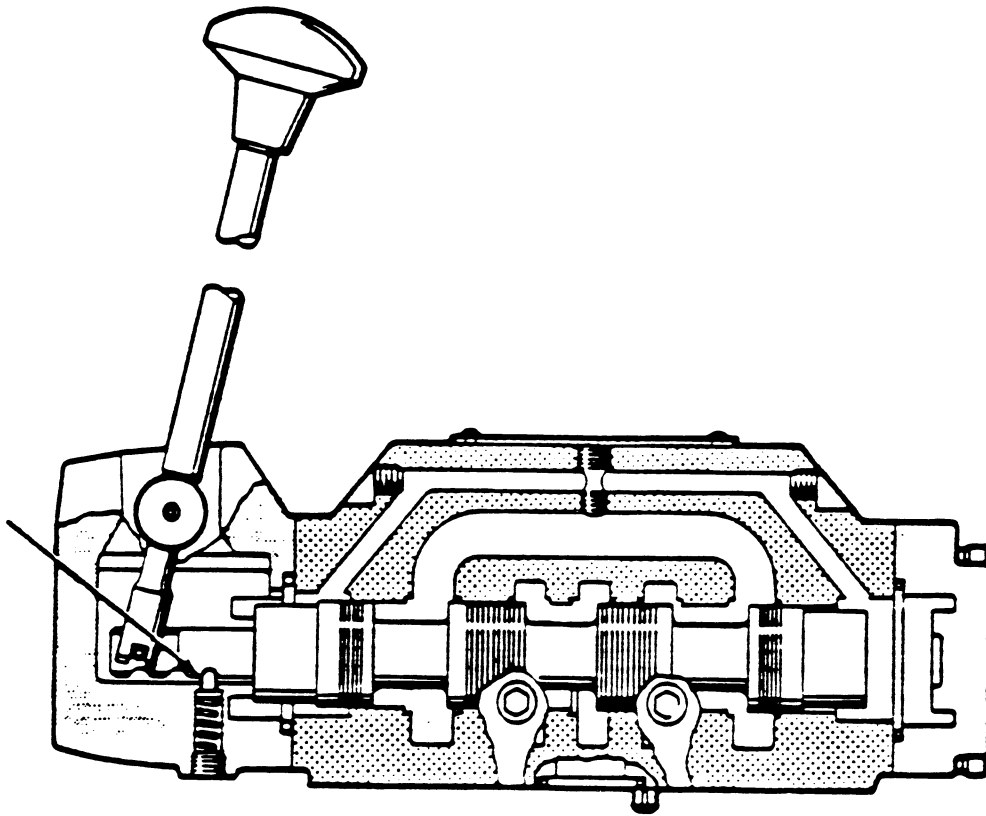
GS-0033



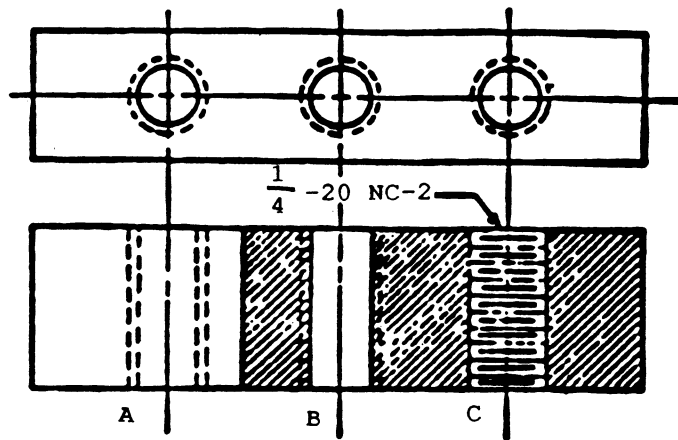
GS-0034



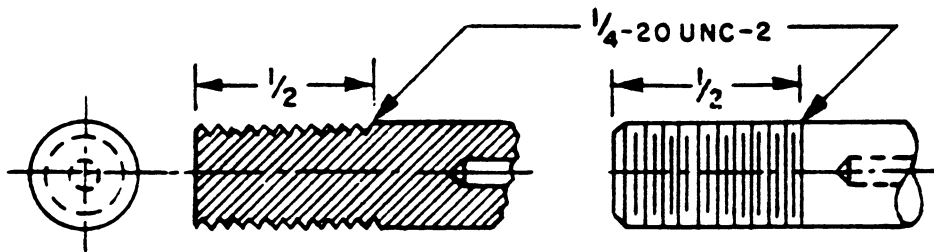
GS-0035



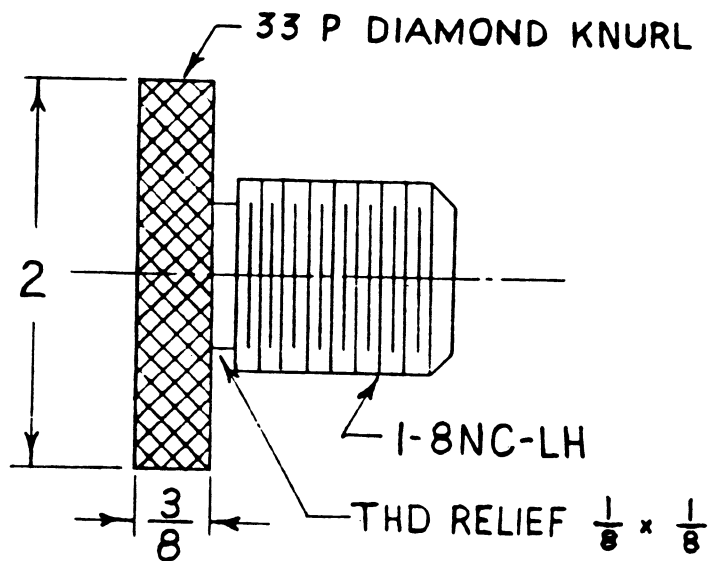
GS-0036



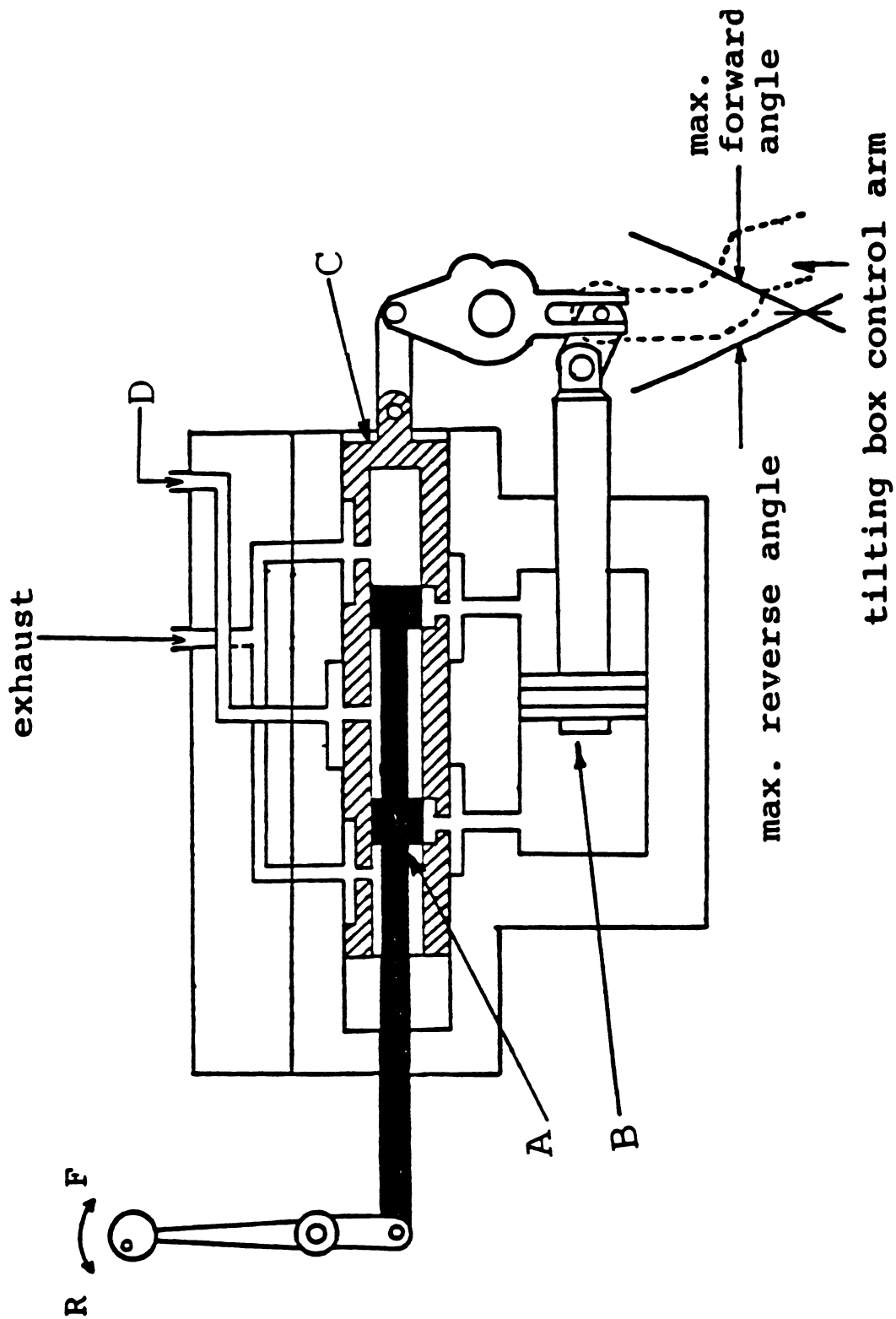
GS-0037



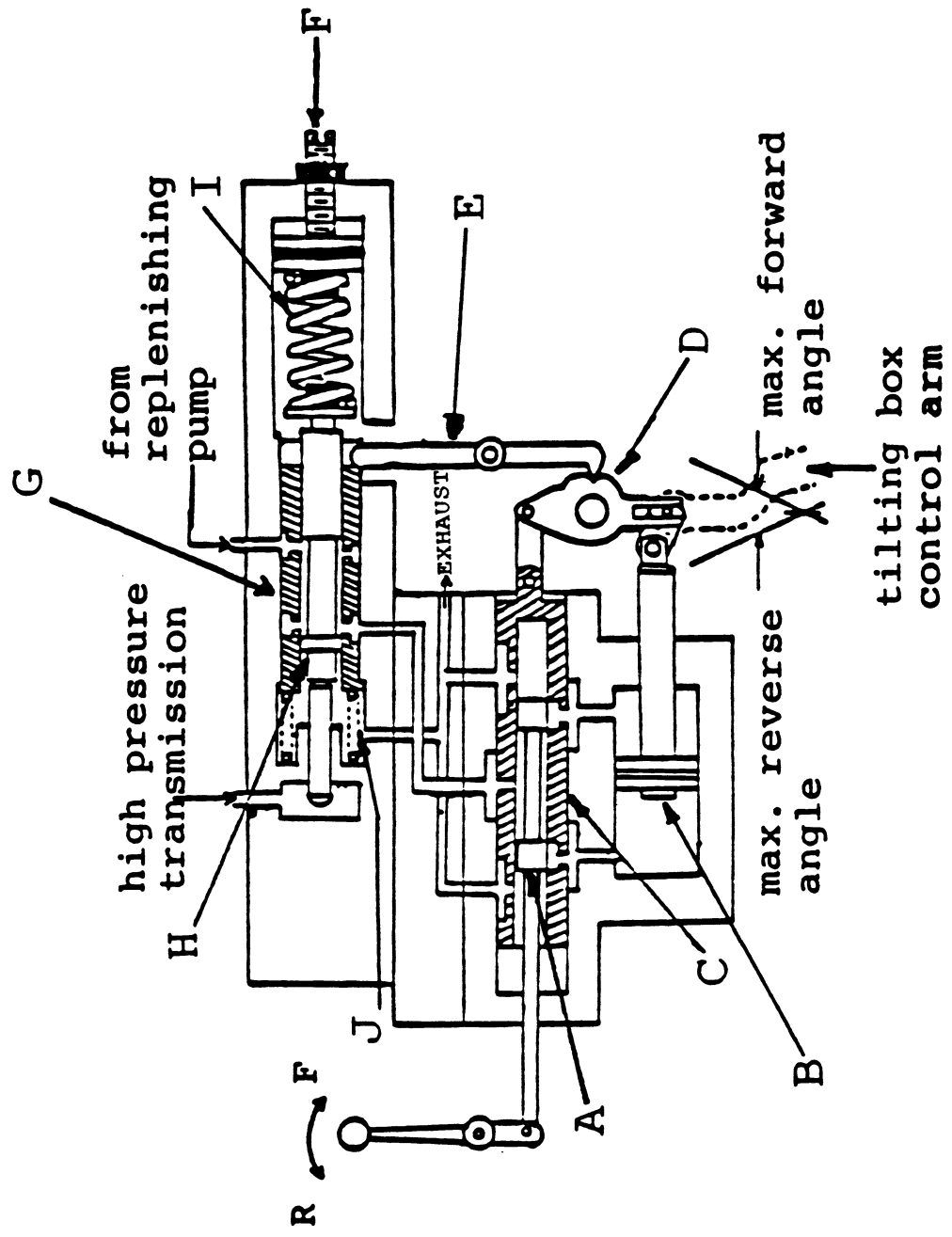
GS-0038



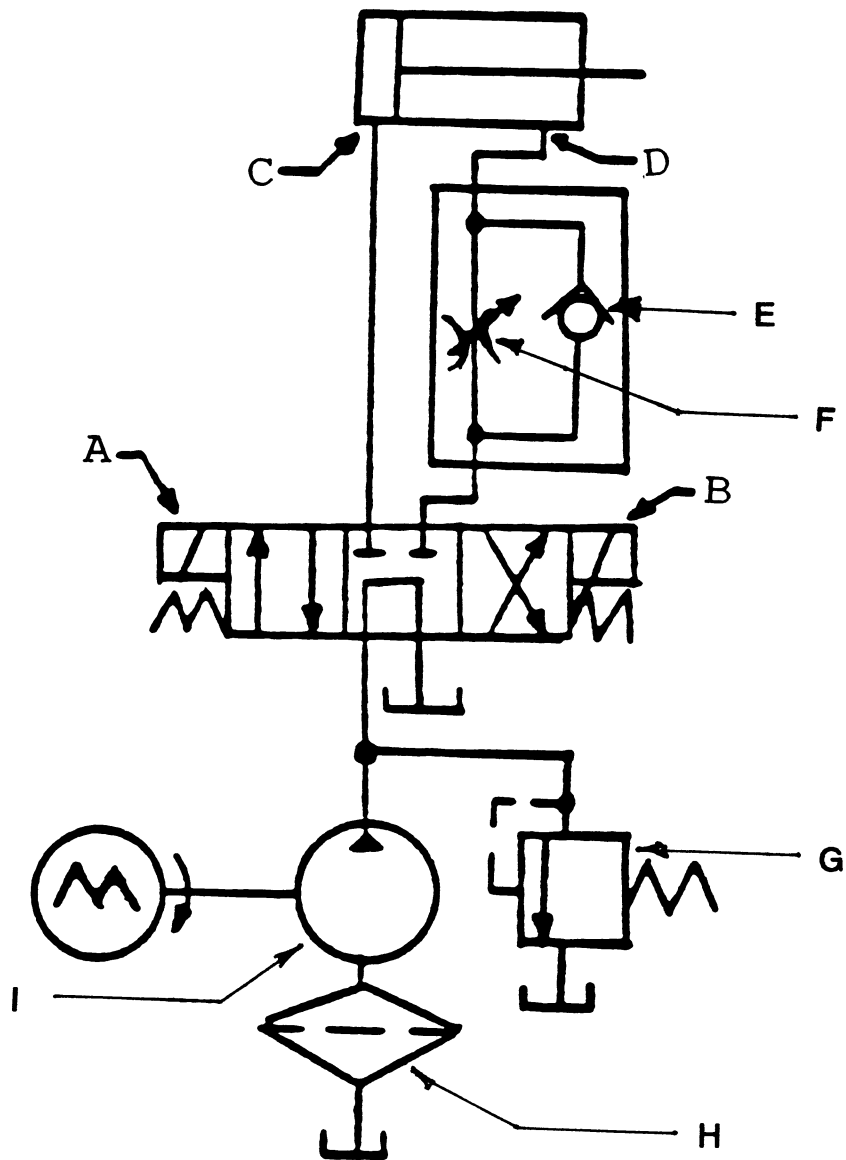
GS-0039

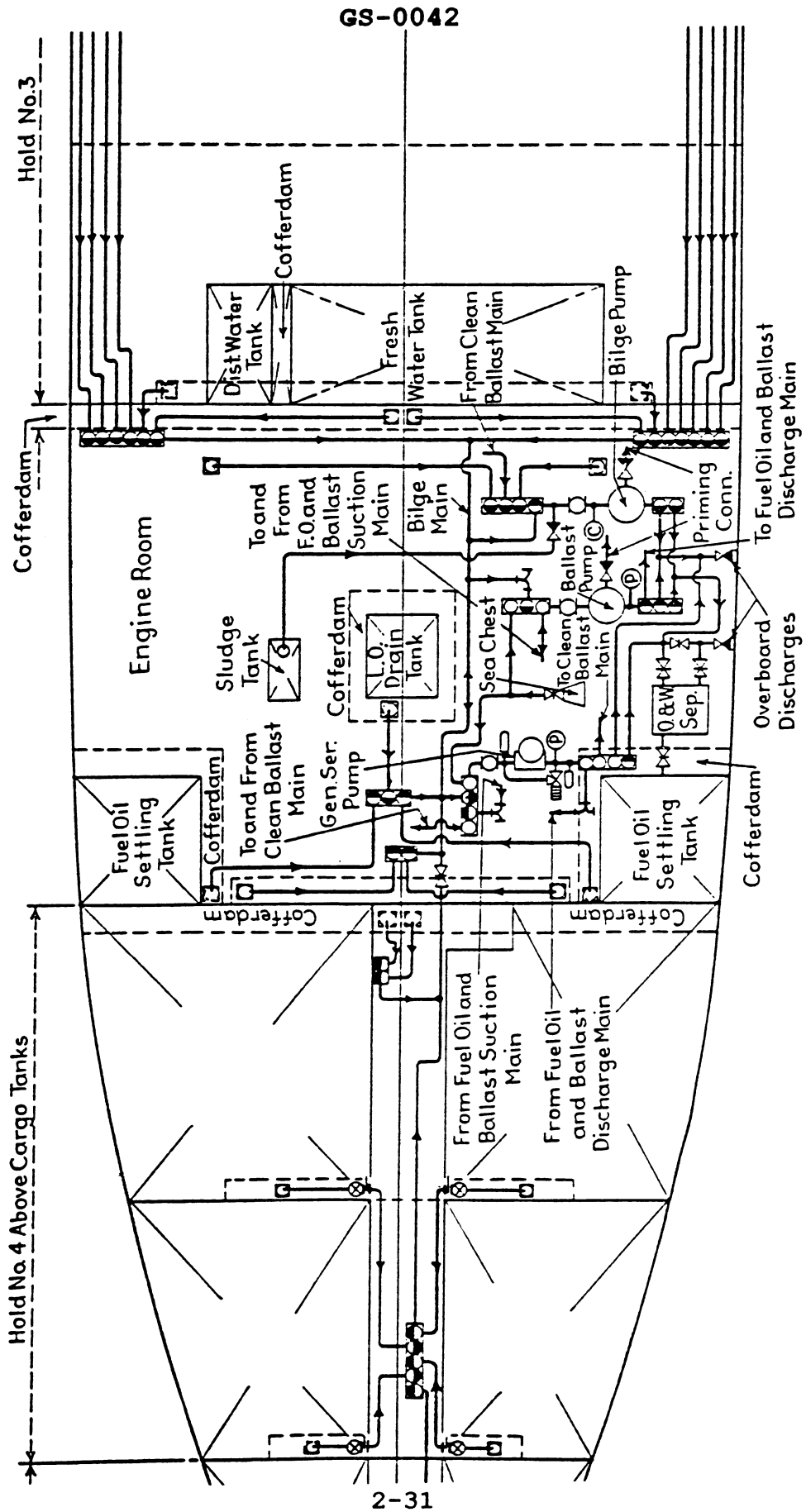


GS-0040

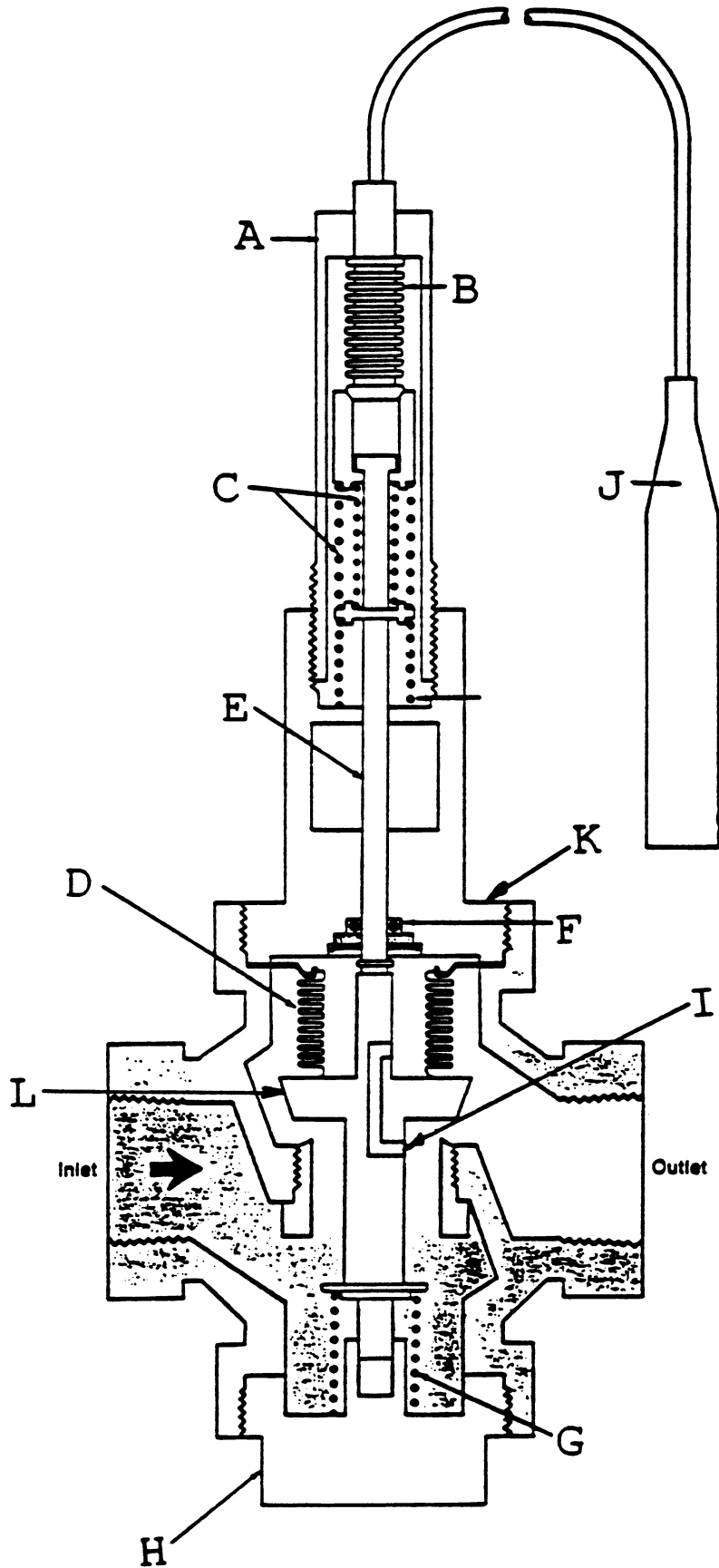


GS-0041

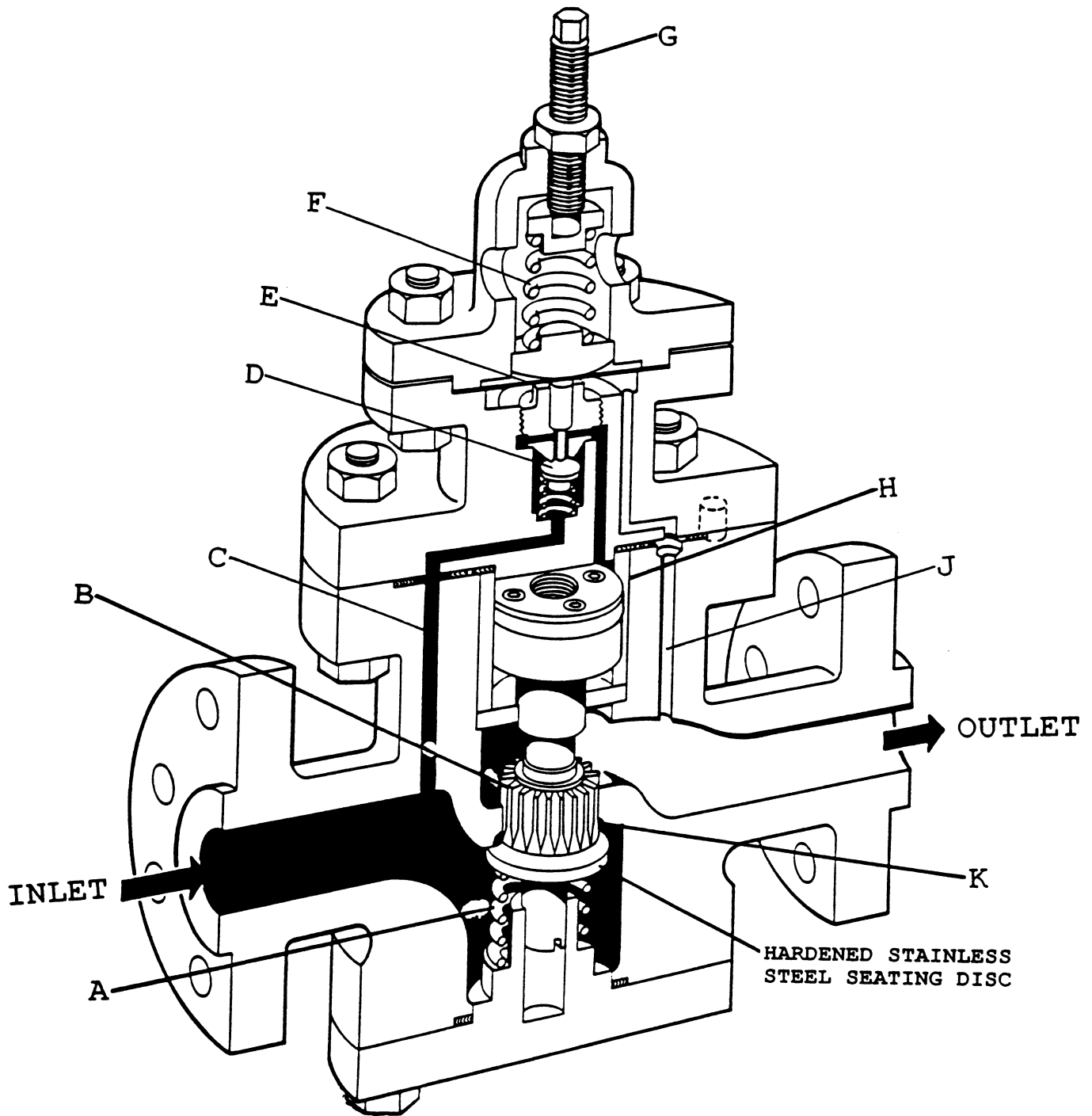




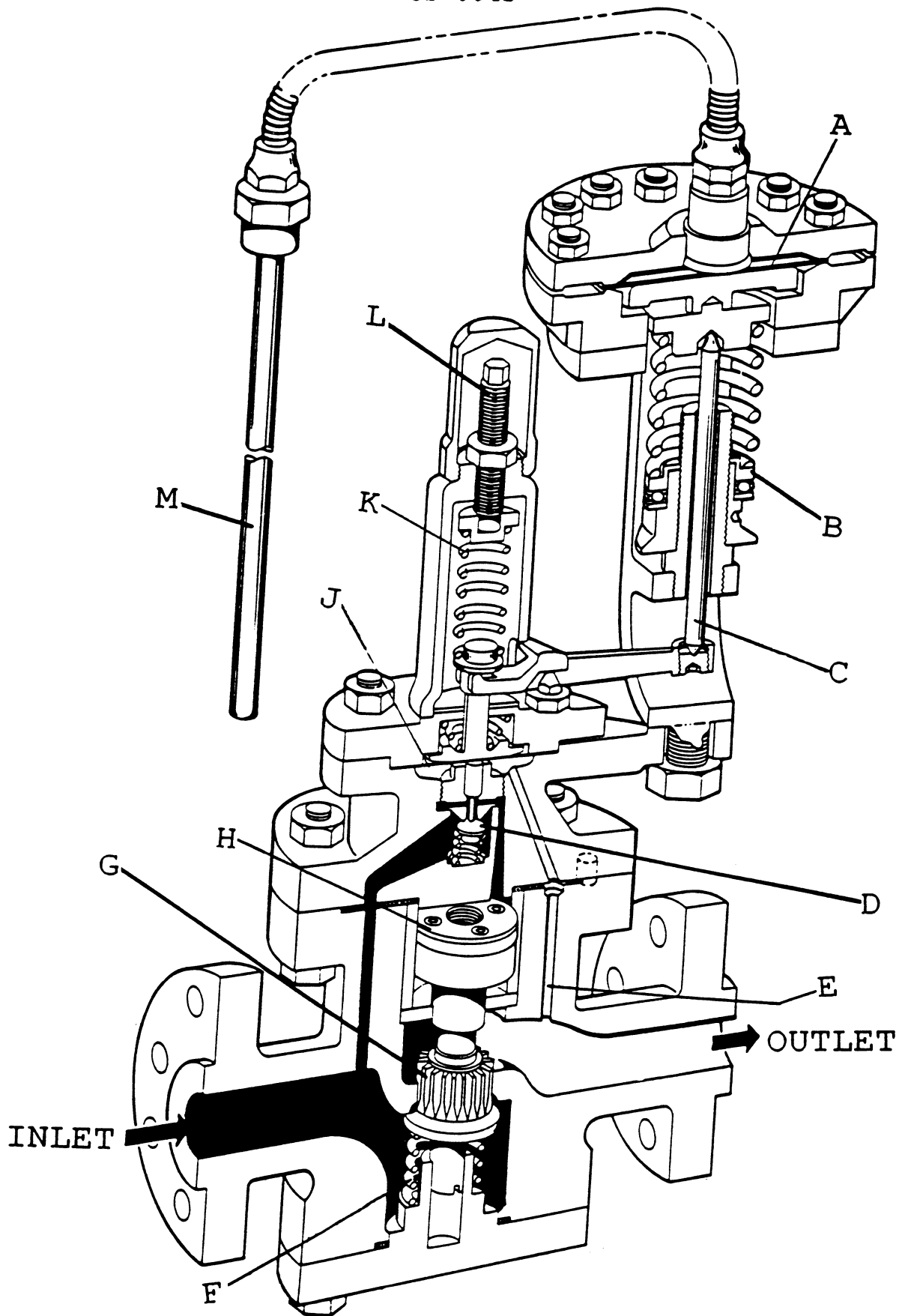
GS-0043



GS-0044

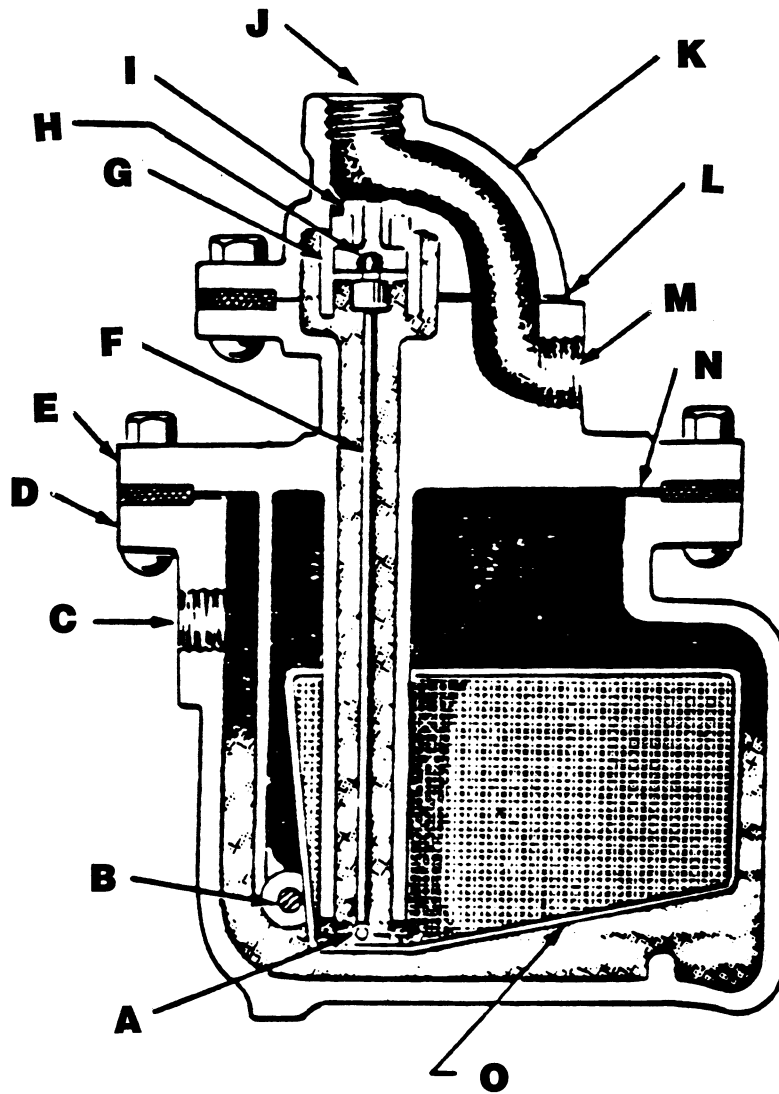


GS-0045

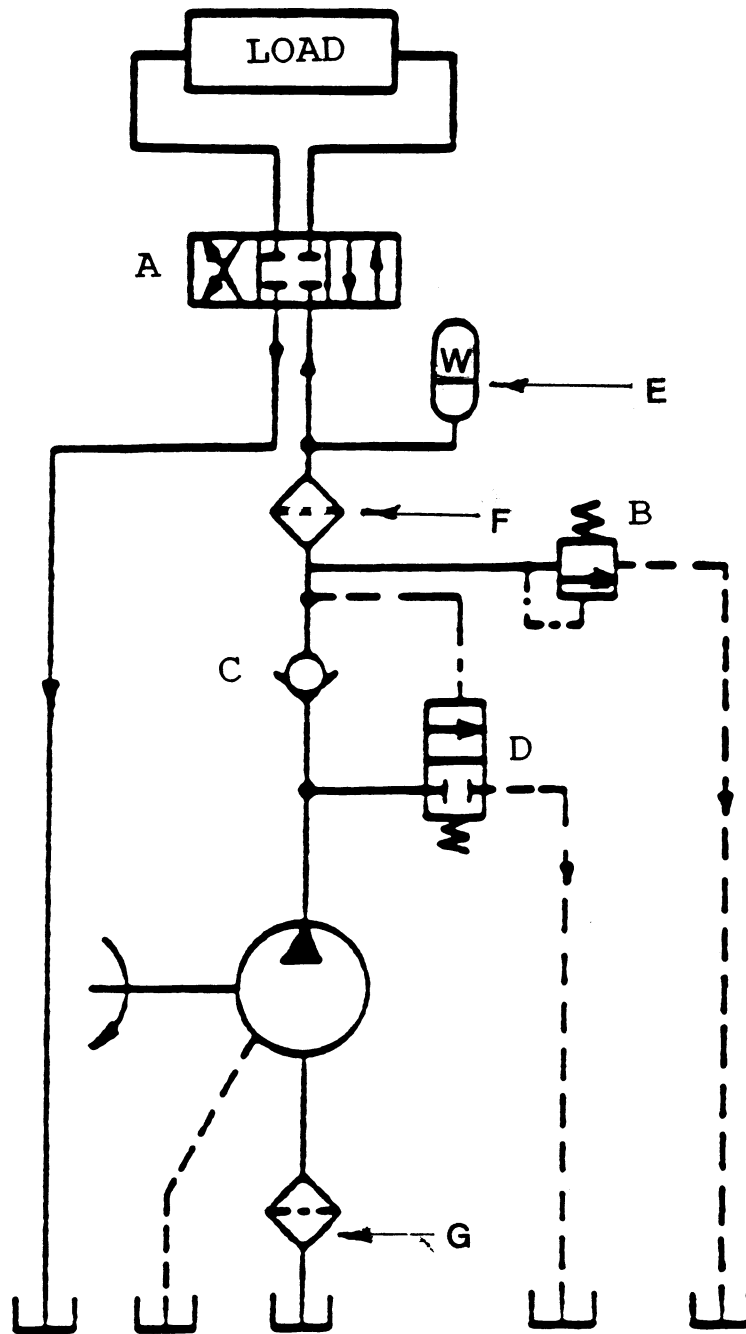


2-34

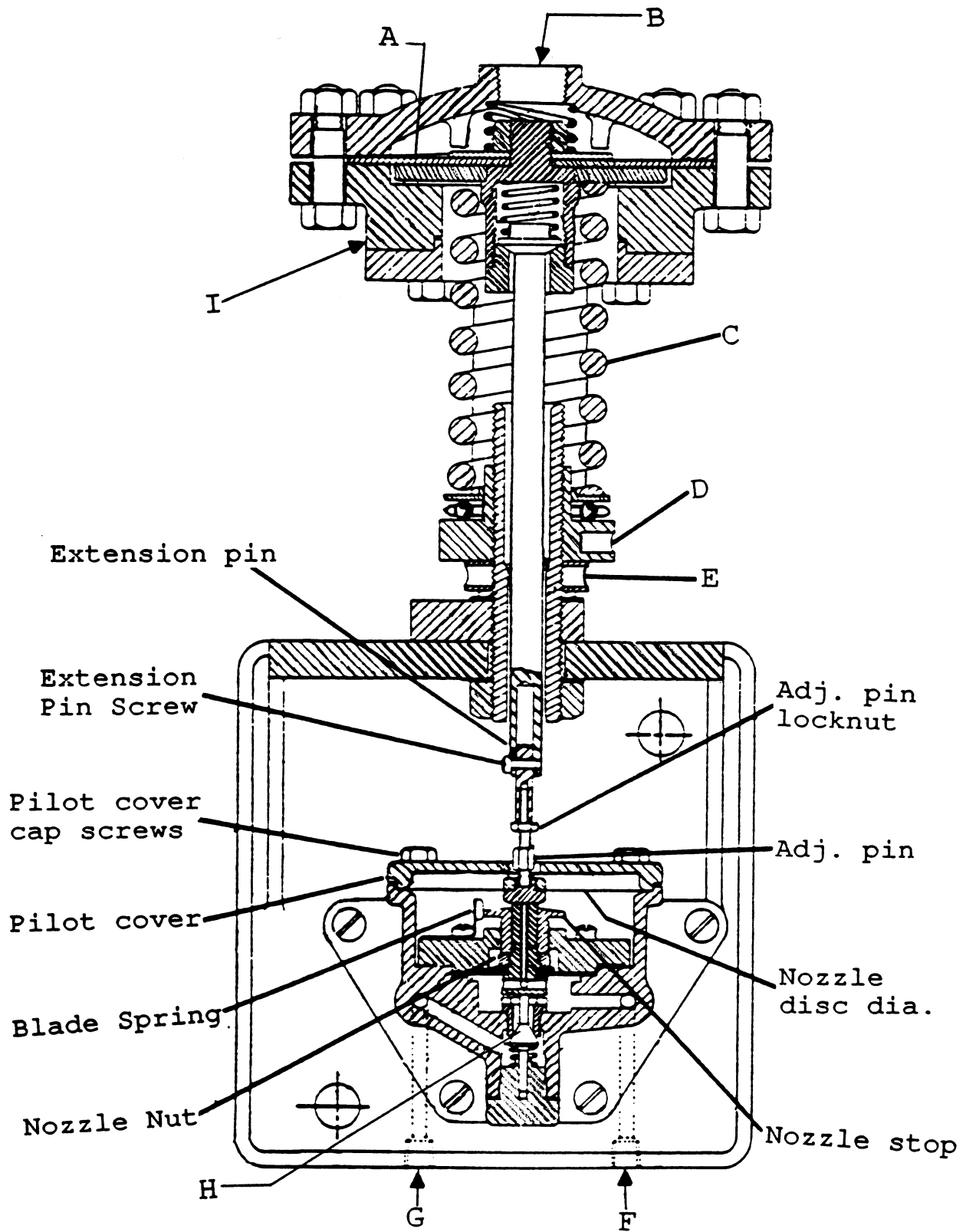
GS-0048



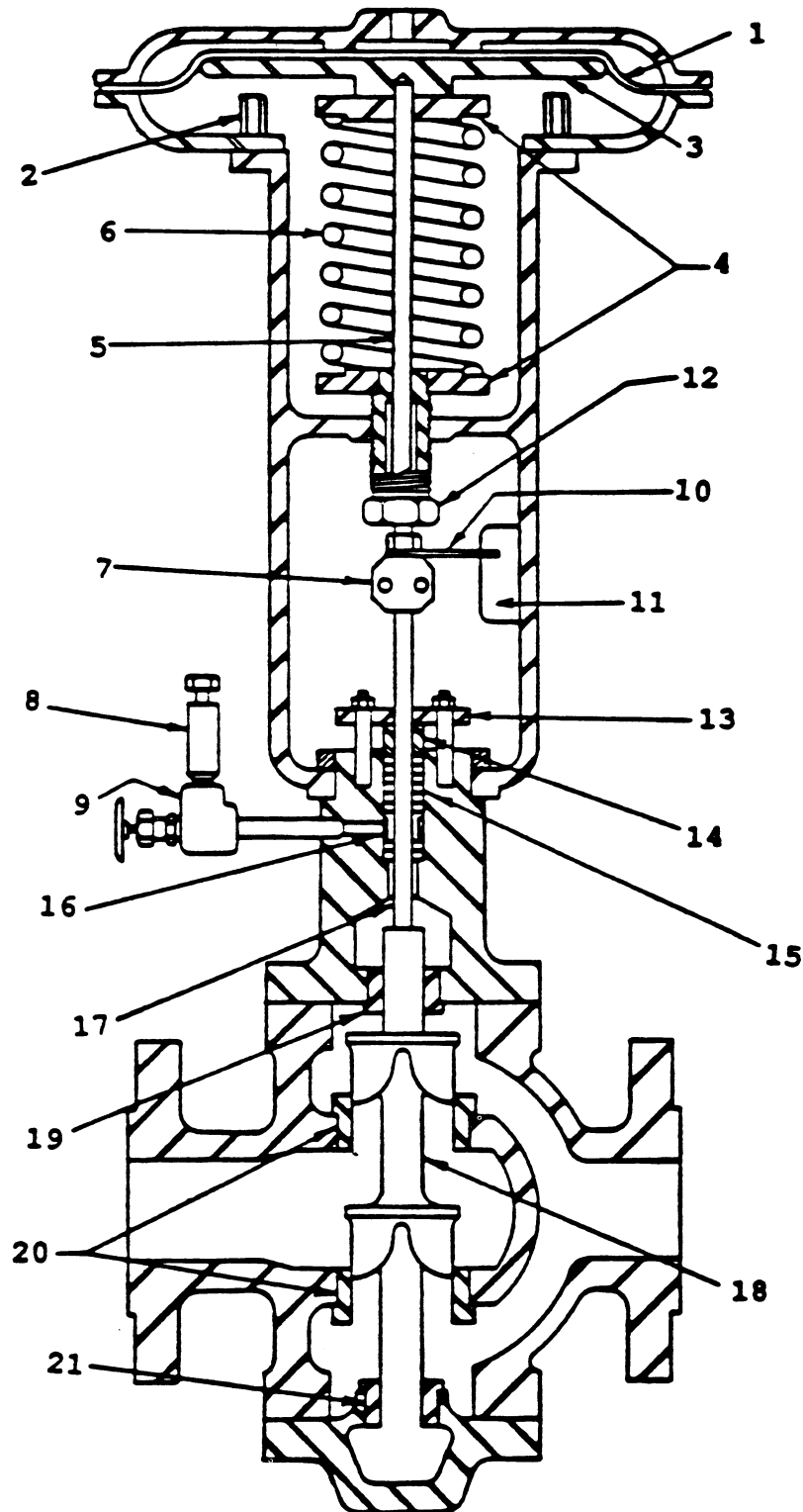
GS-0049



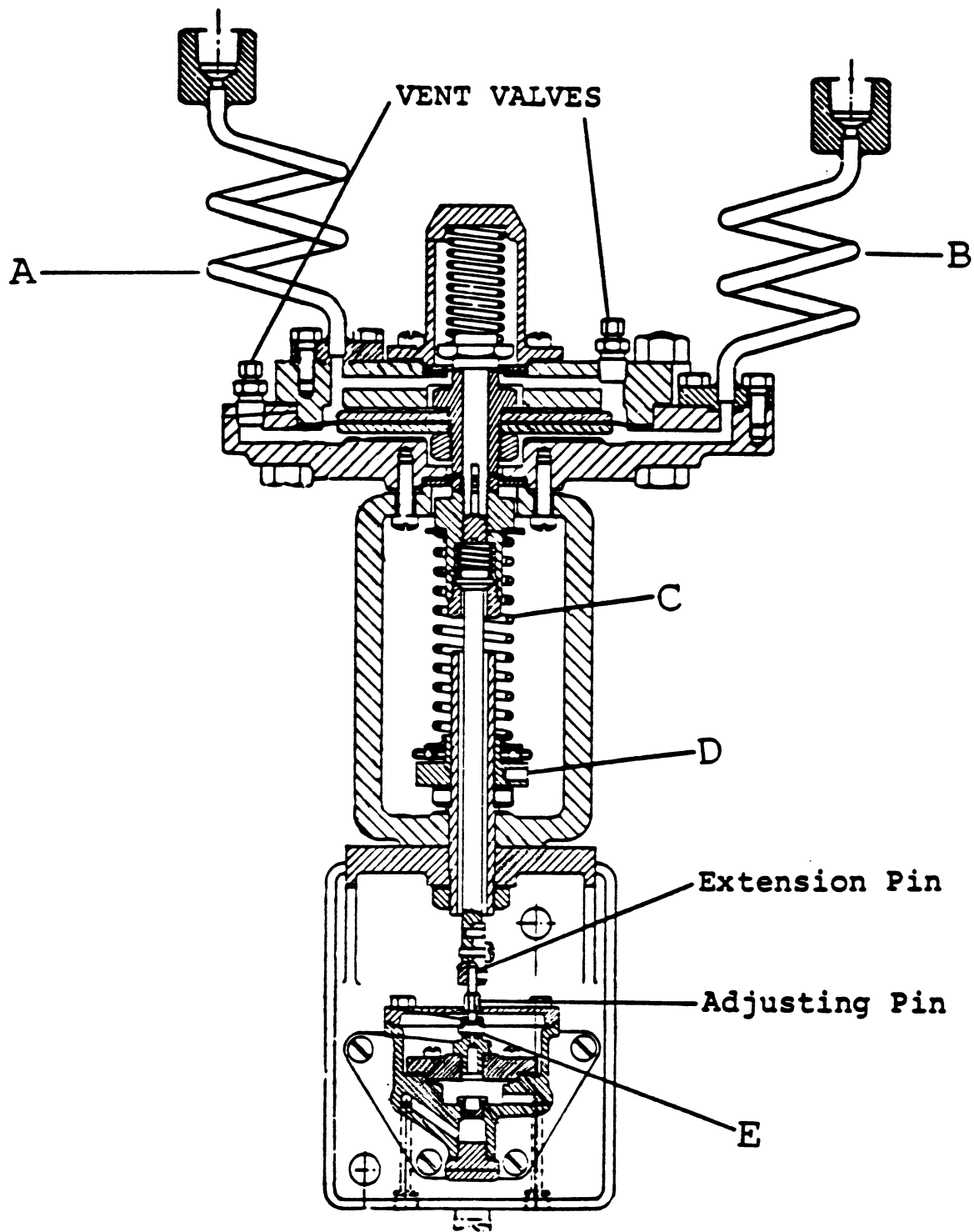
GS-0050



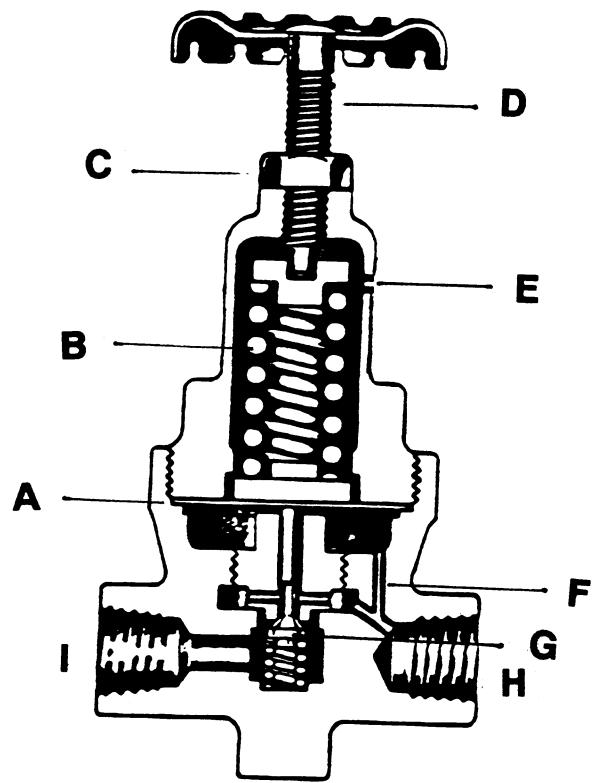
GS-0051



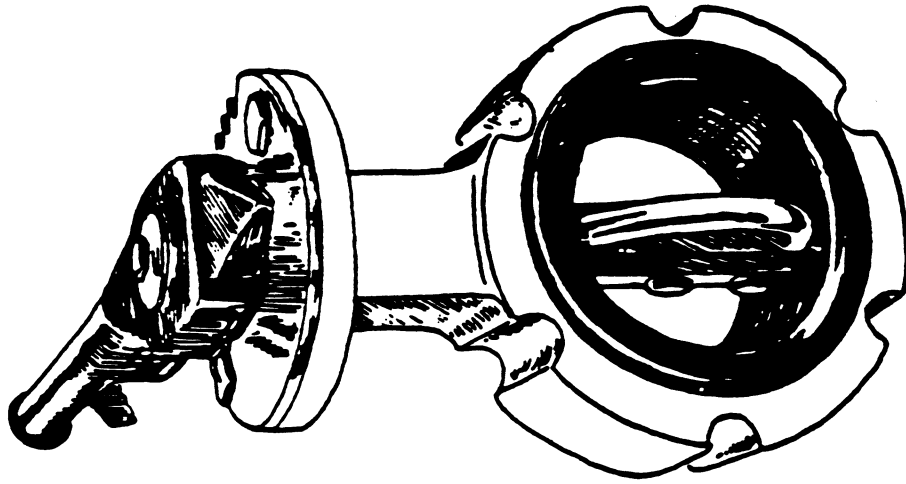
GS-0052



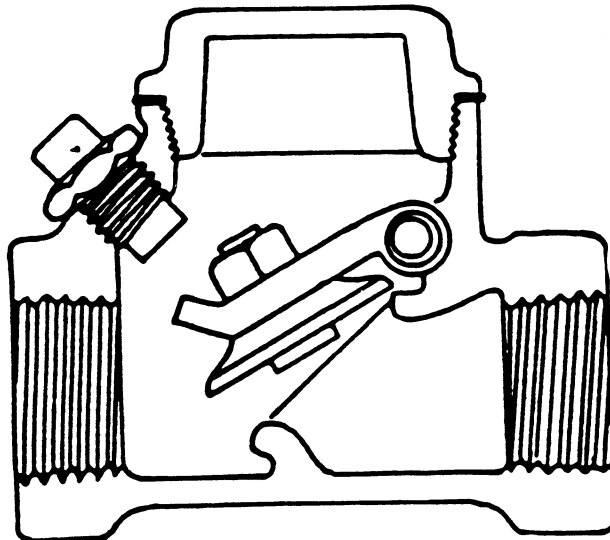
GS-0054



GS-0055

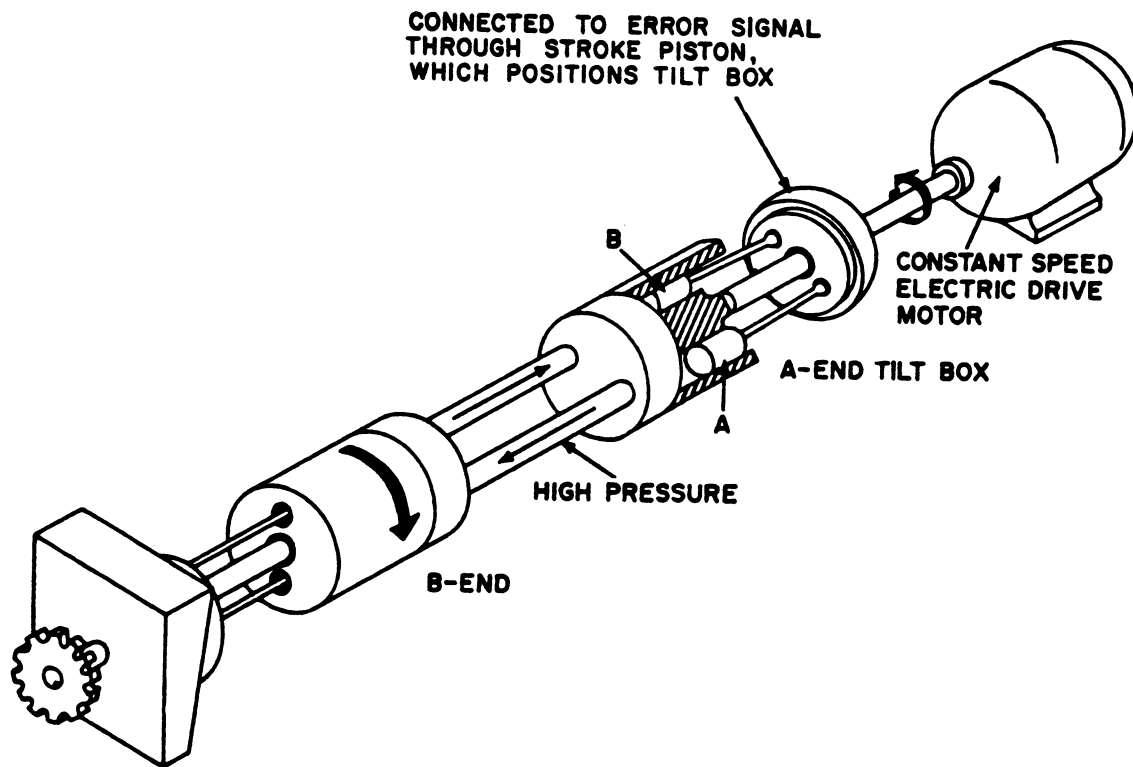


GS-0056

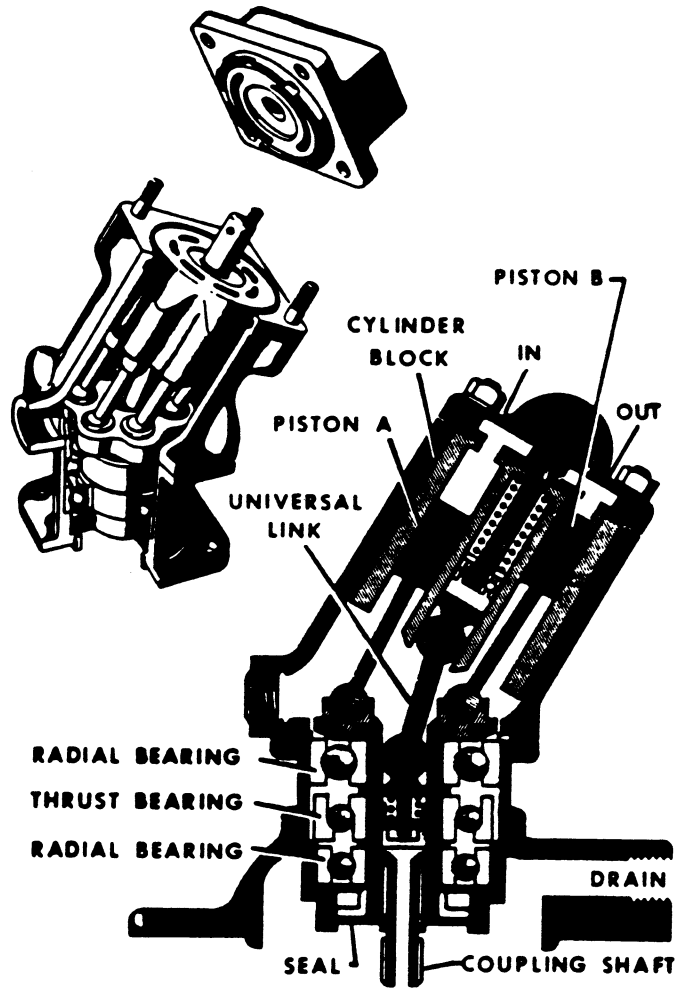


2-43

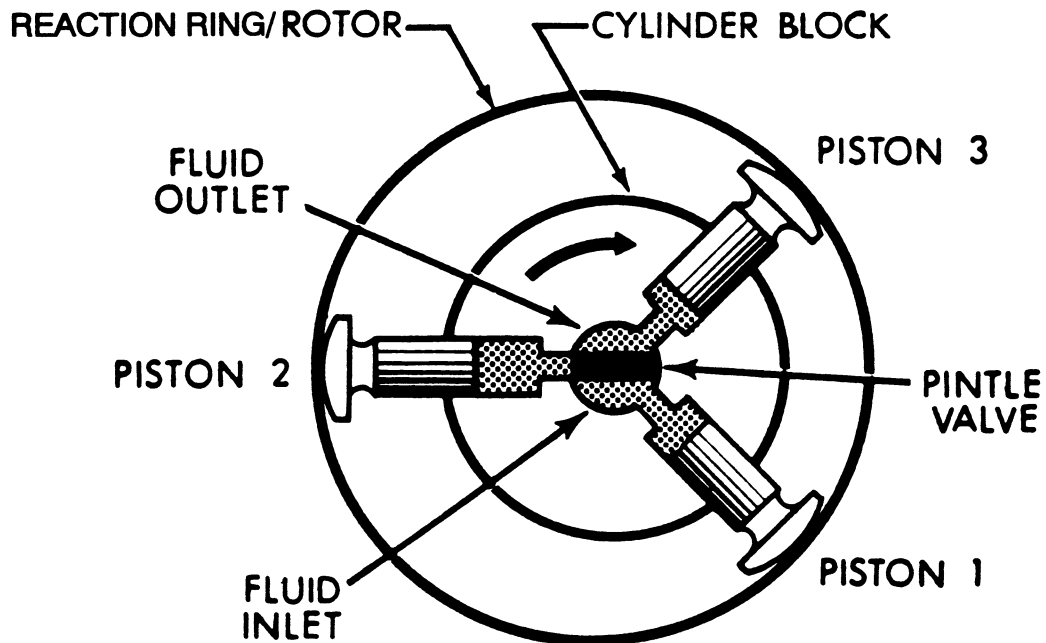
GS-0057



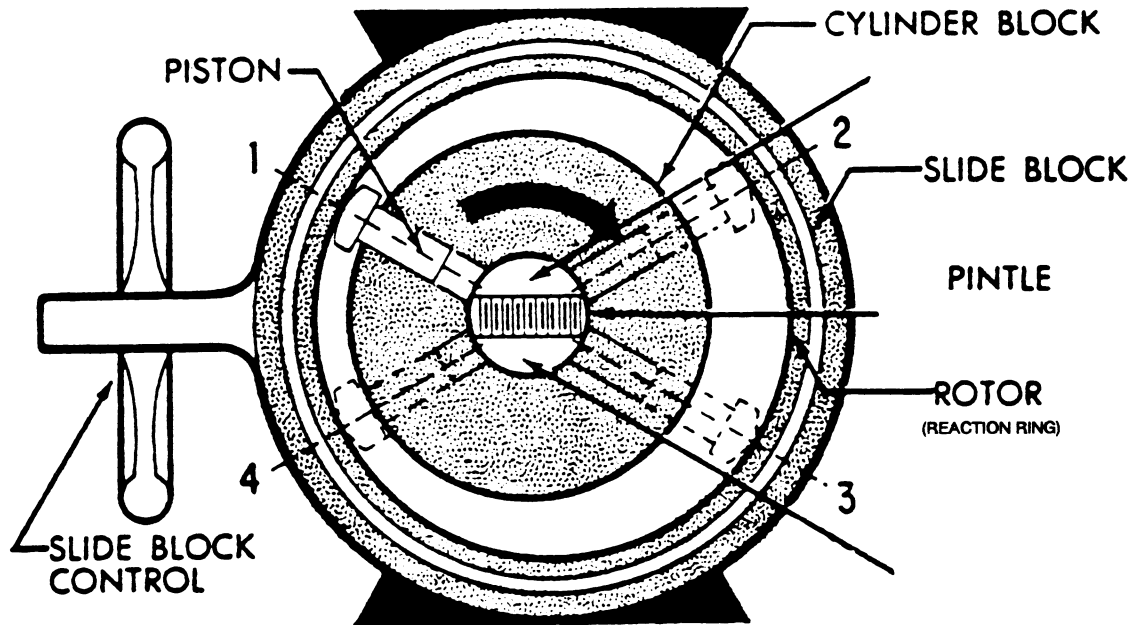
GS-0058



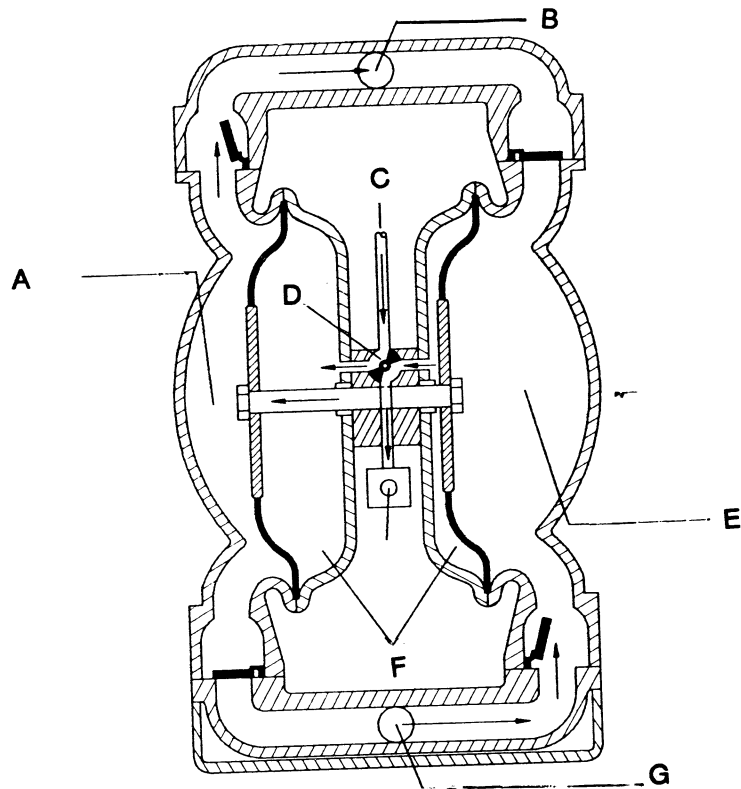
GS-0059



GS-0060

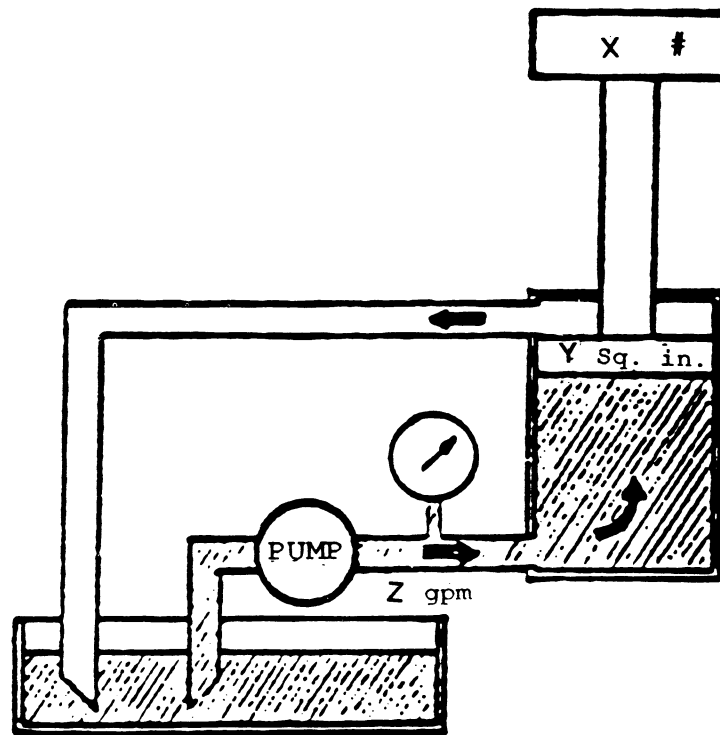


GS-0061

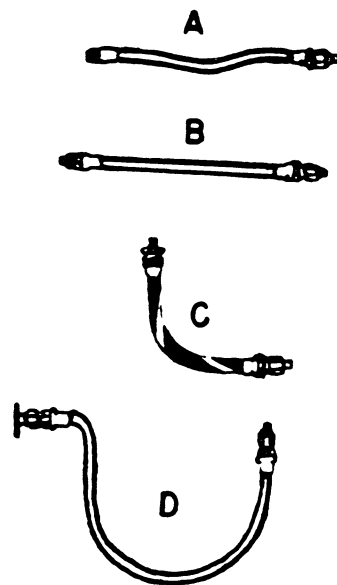


2-46

GS-0062



GS-0063

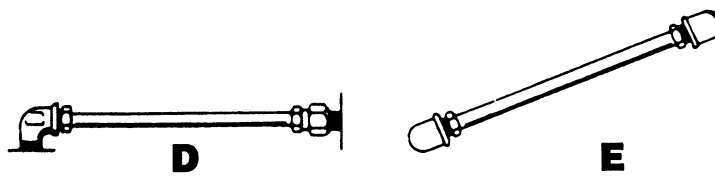
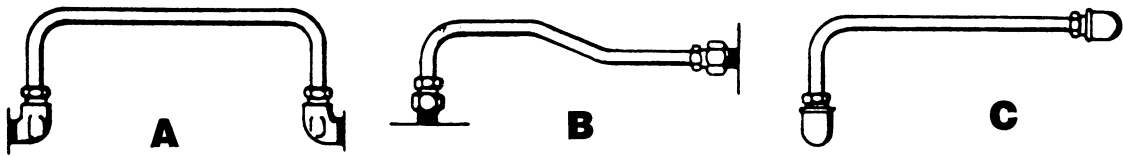


2-47

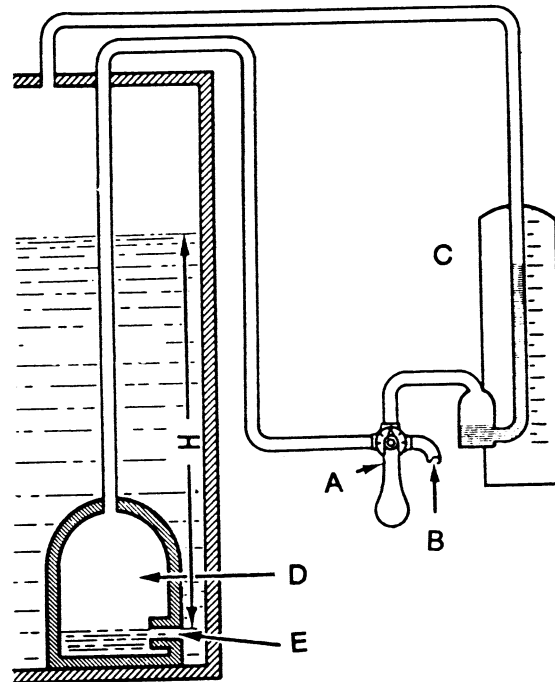
GS-0064



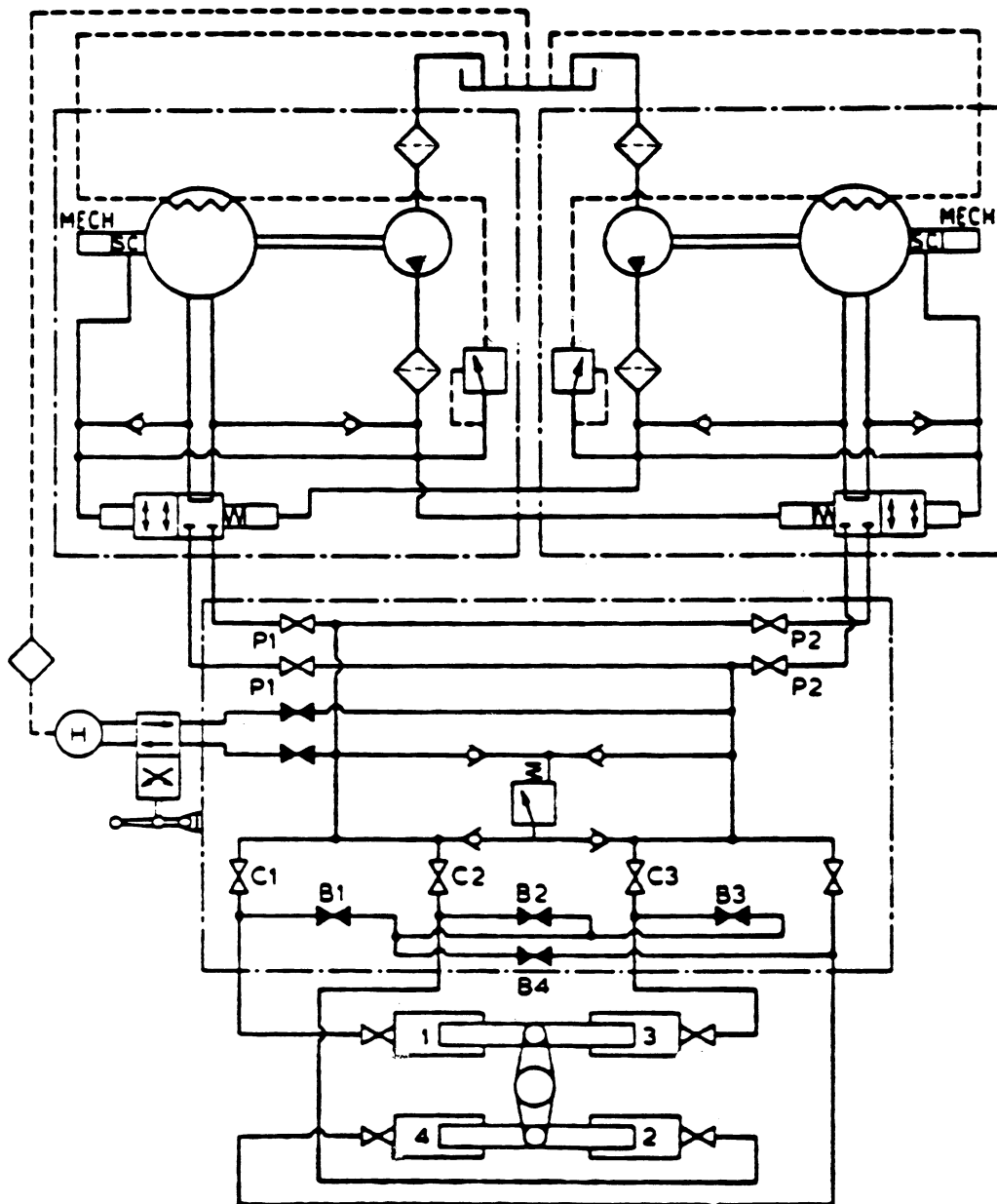
GS-0065



GS-0066



GS-0067



GS-0068



Fig. A

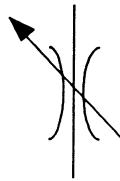


Fig. B

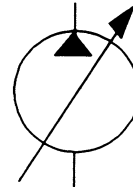


Fig. C

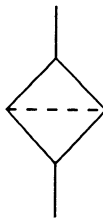


Fig. D

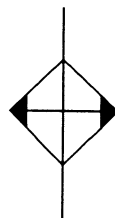


Fig. E

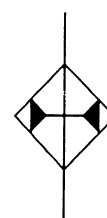
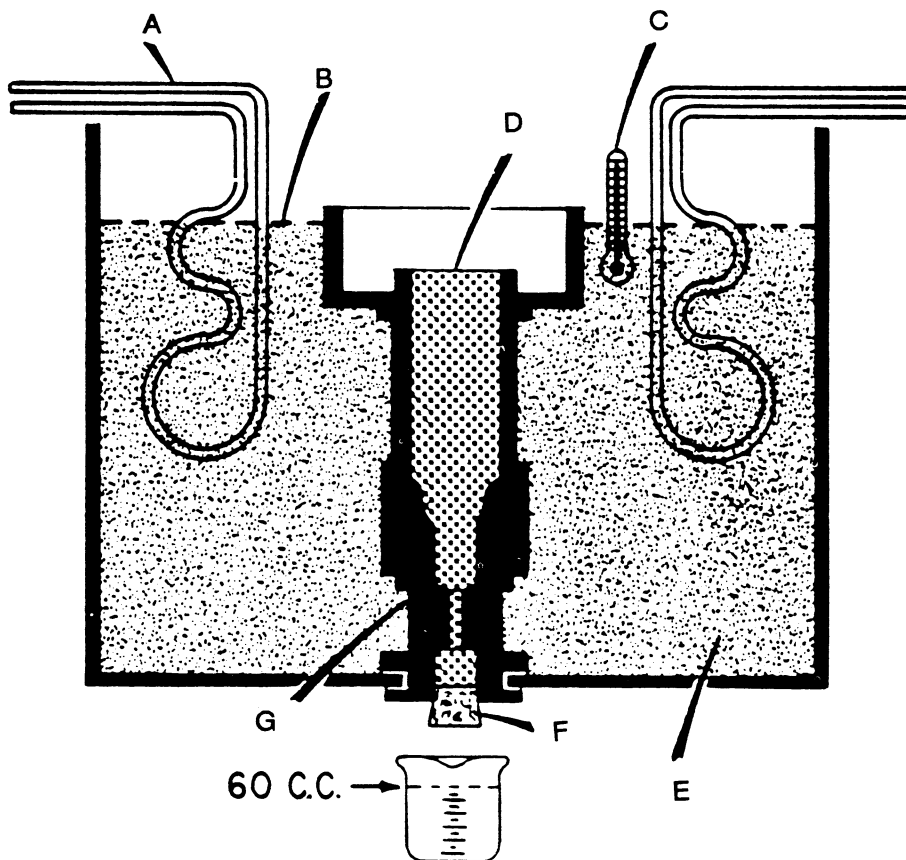
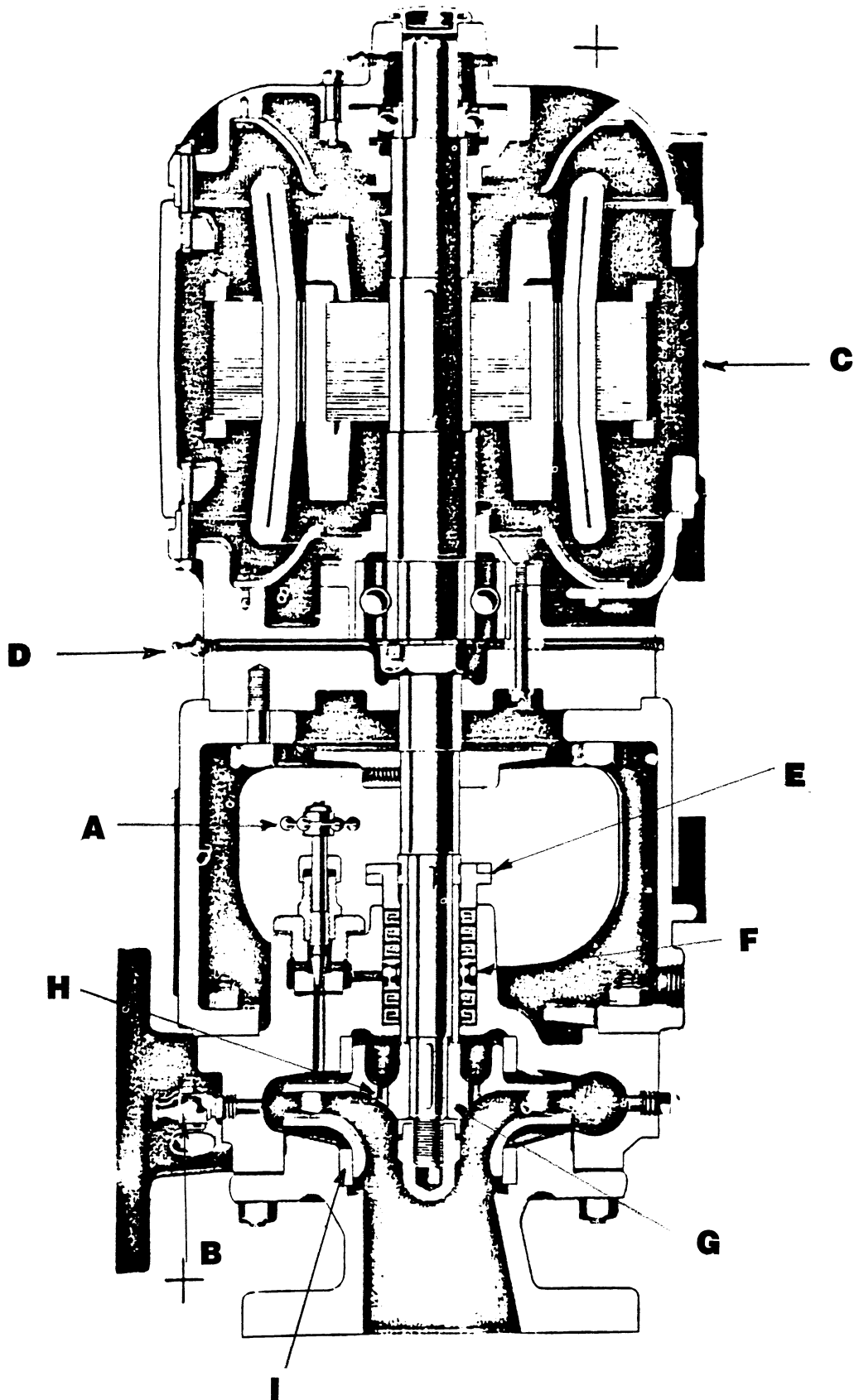


Fig. F

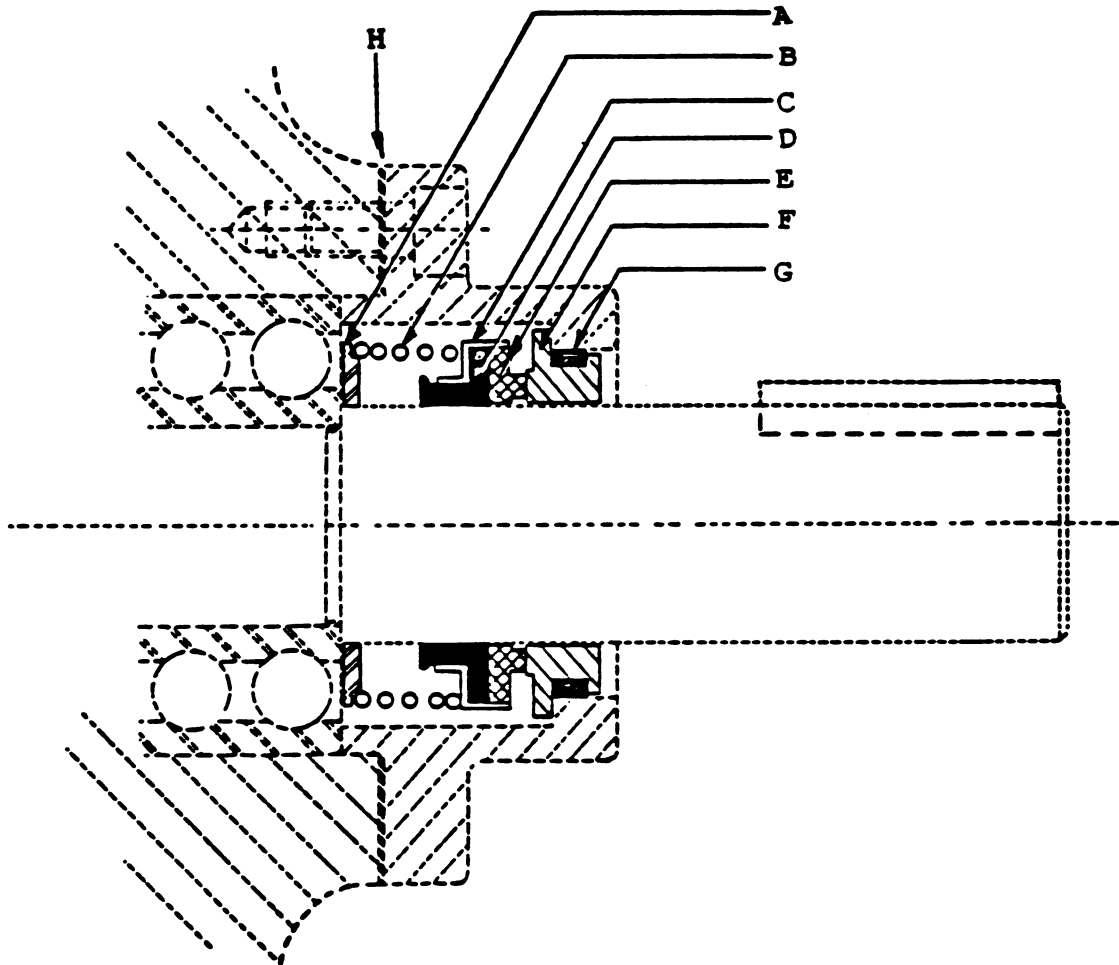
GS-0069



GS-0070

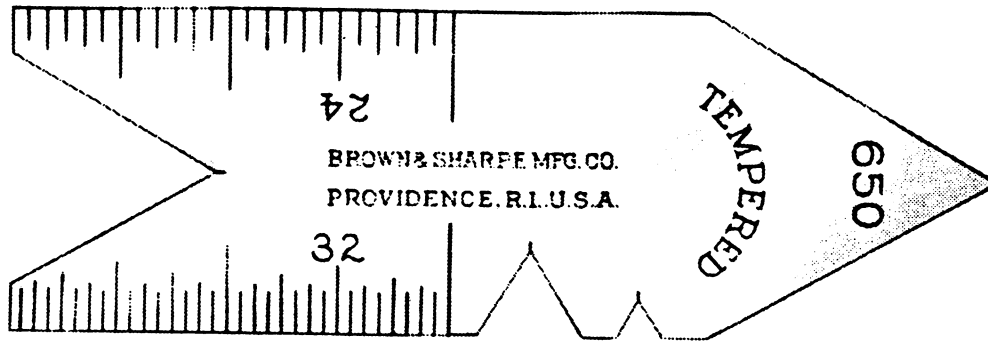


GS-0071

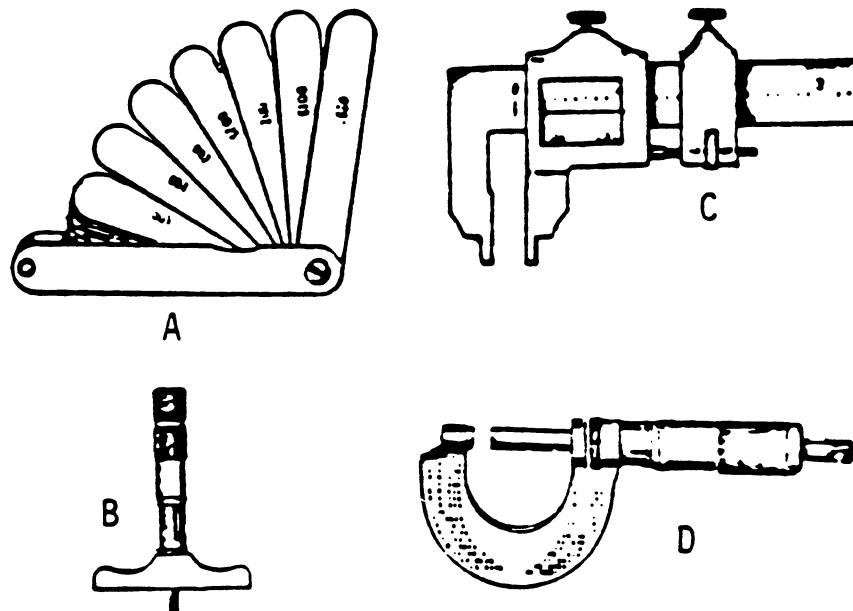


(COURTESY OF CORNELL MARITIME PRESS)

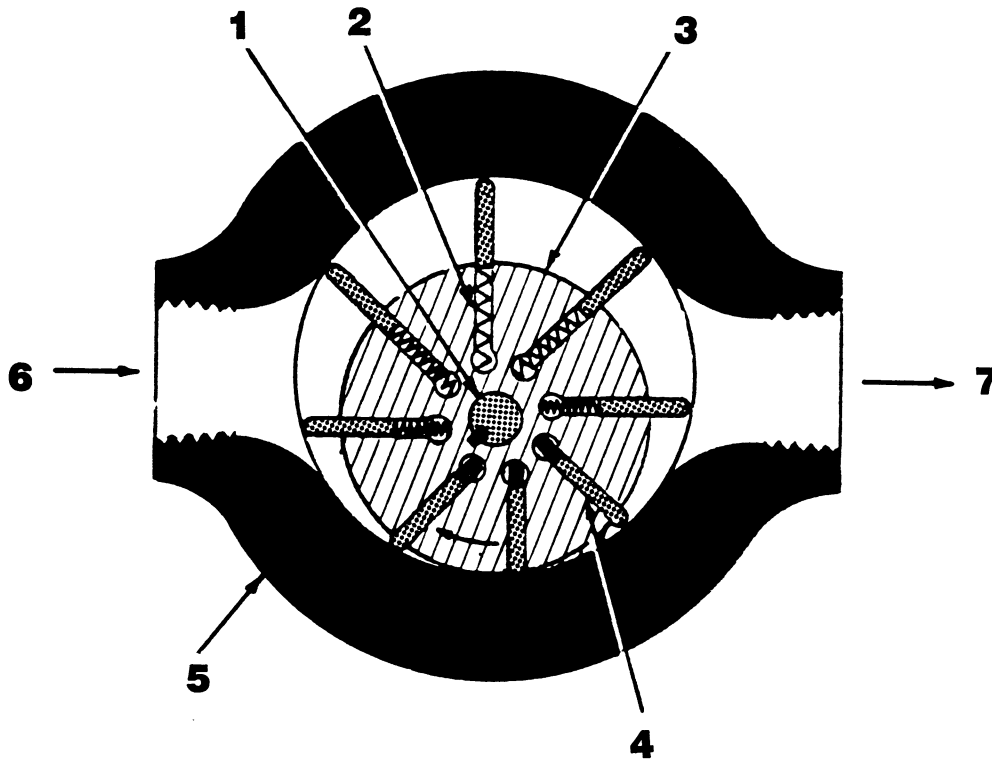
GS-0072



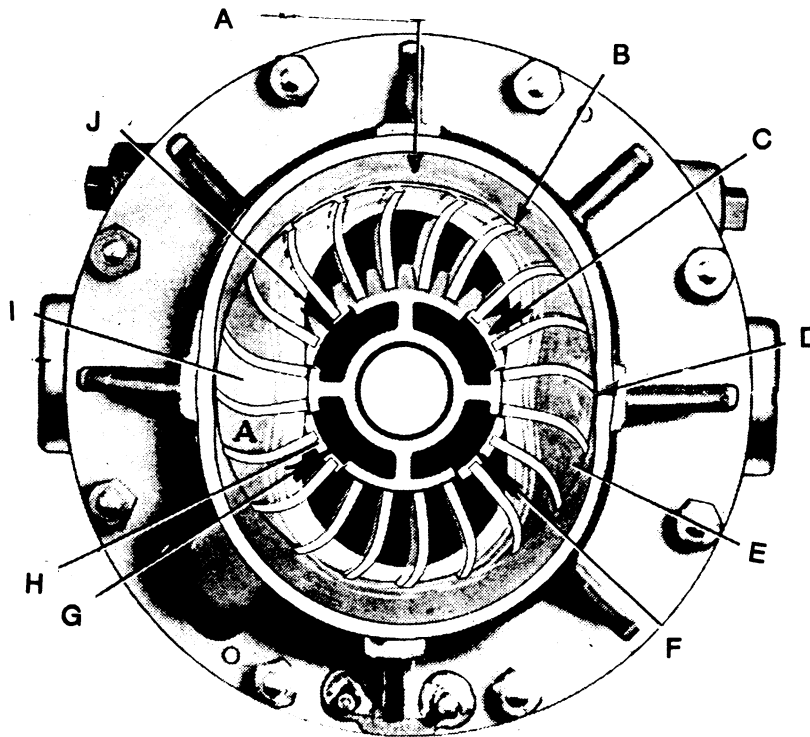
GS-0073



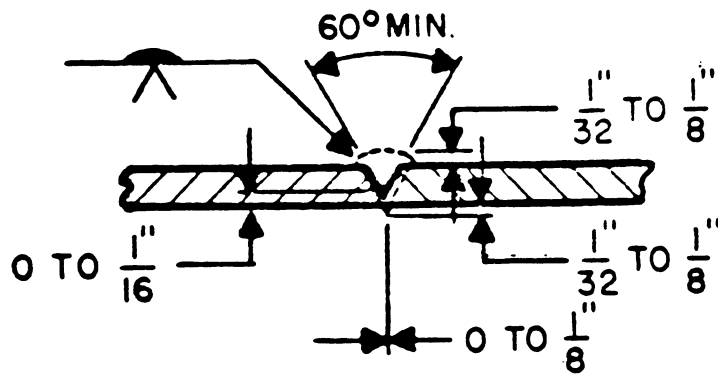
GS-0074



GS-0075



GS-0076

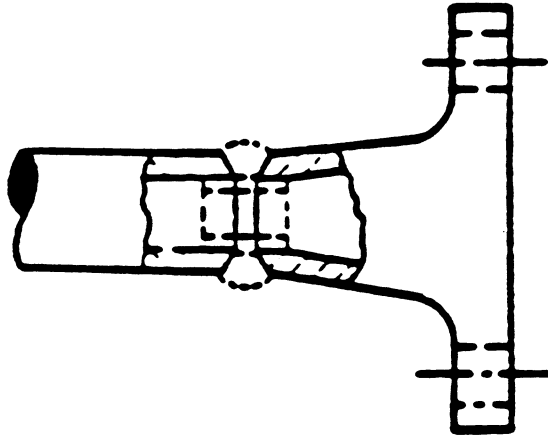


GS-0077

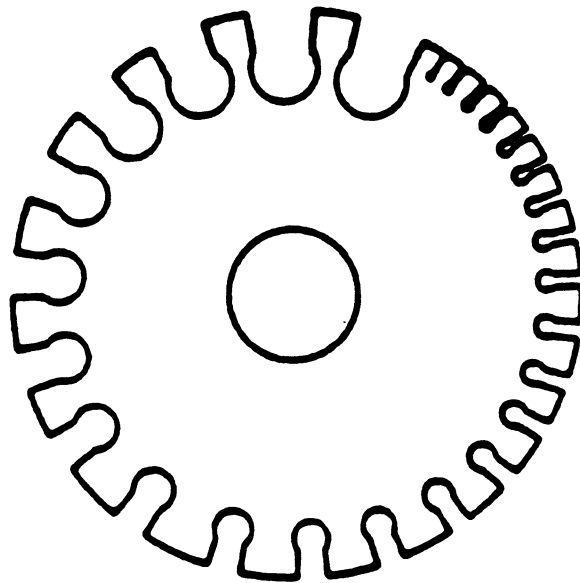
TYPES of WELDS

	A	B
1		
2		
3		
4		
5		
6		

GS-0078

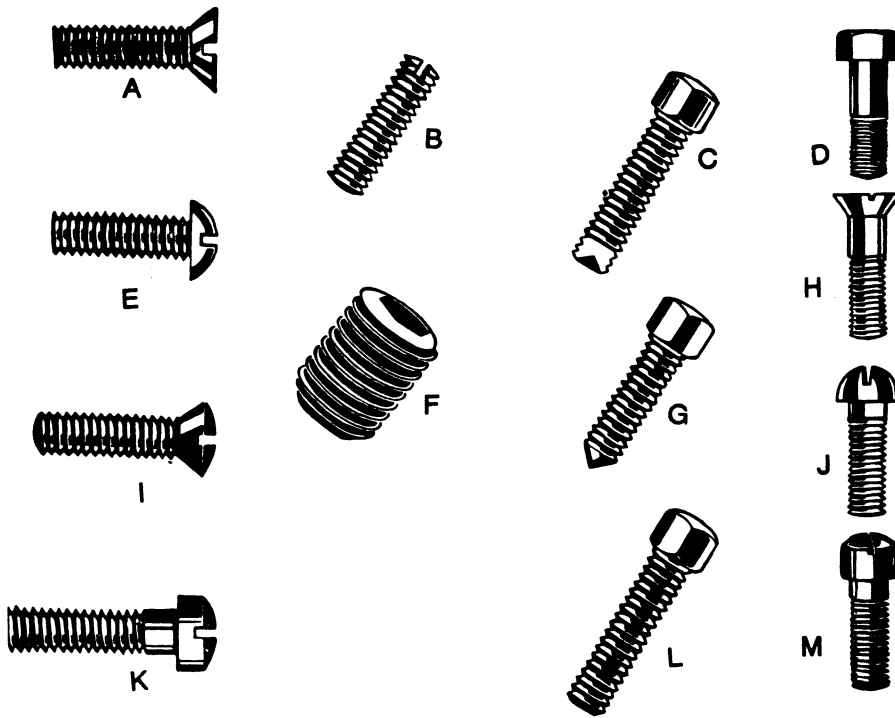


GS-0079

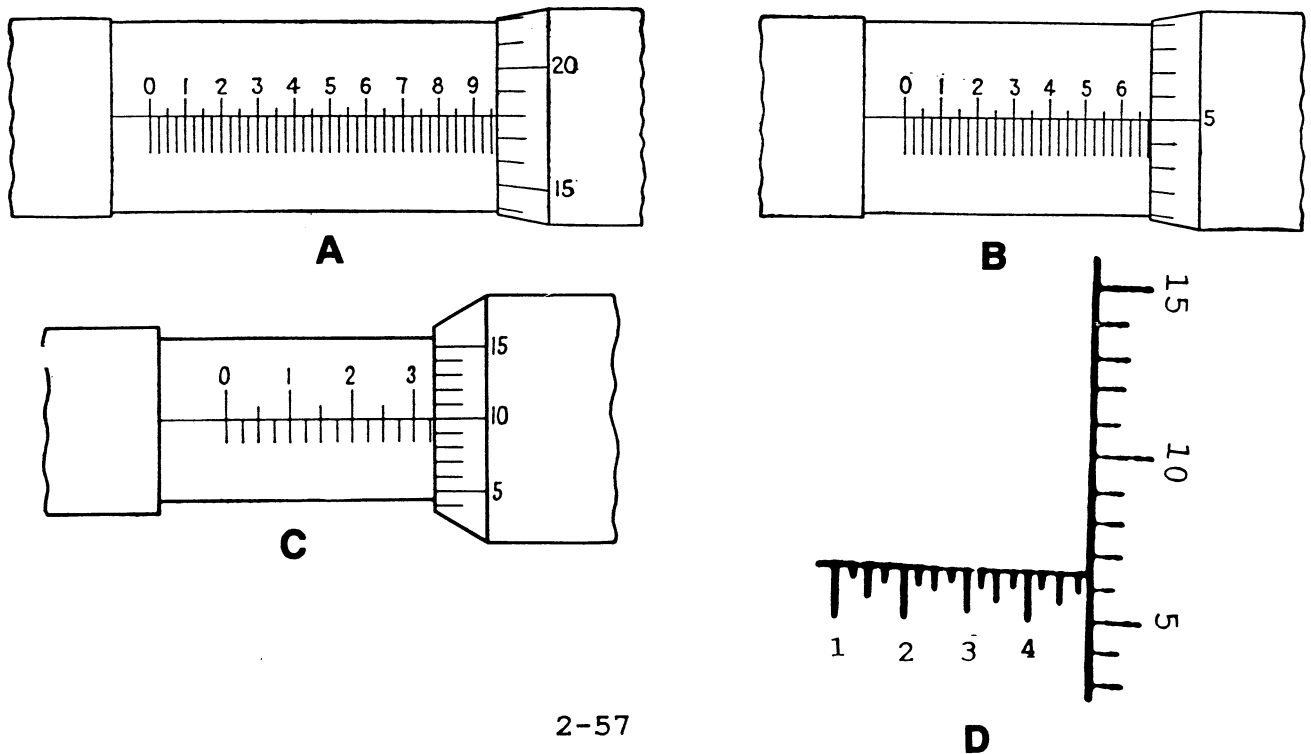


2-56

GS-0080

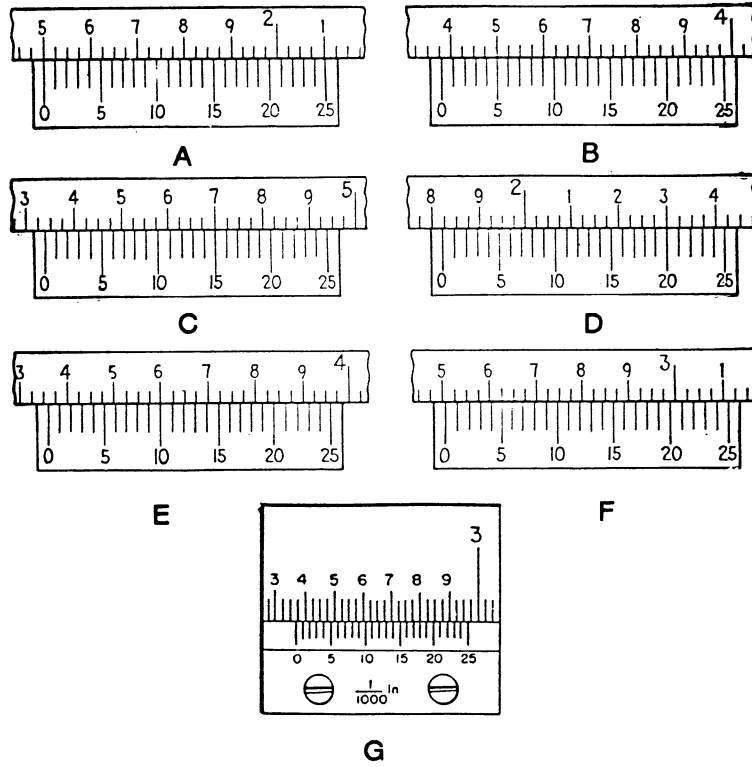


GS-0081

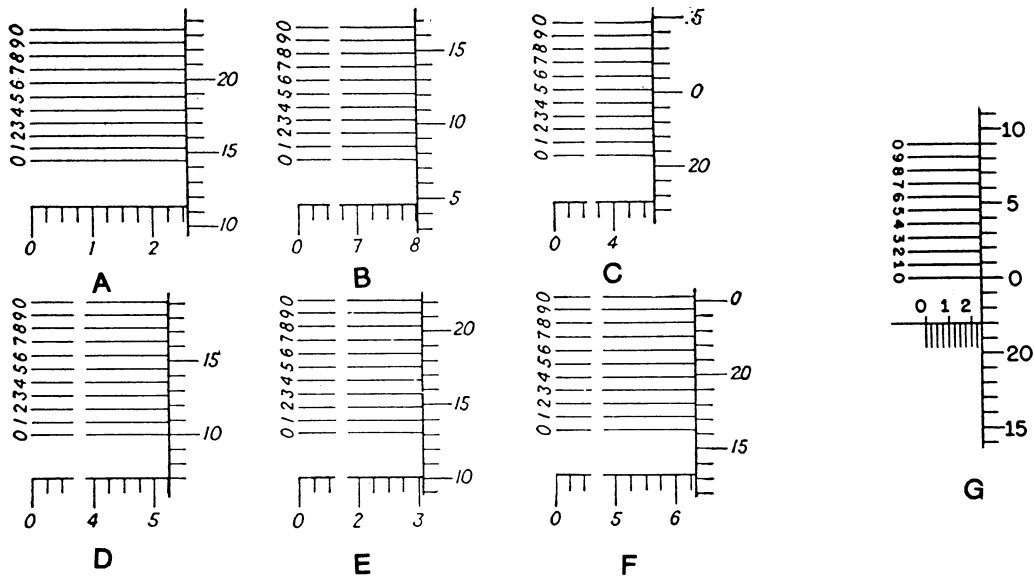


2-57

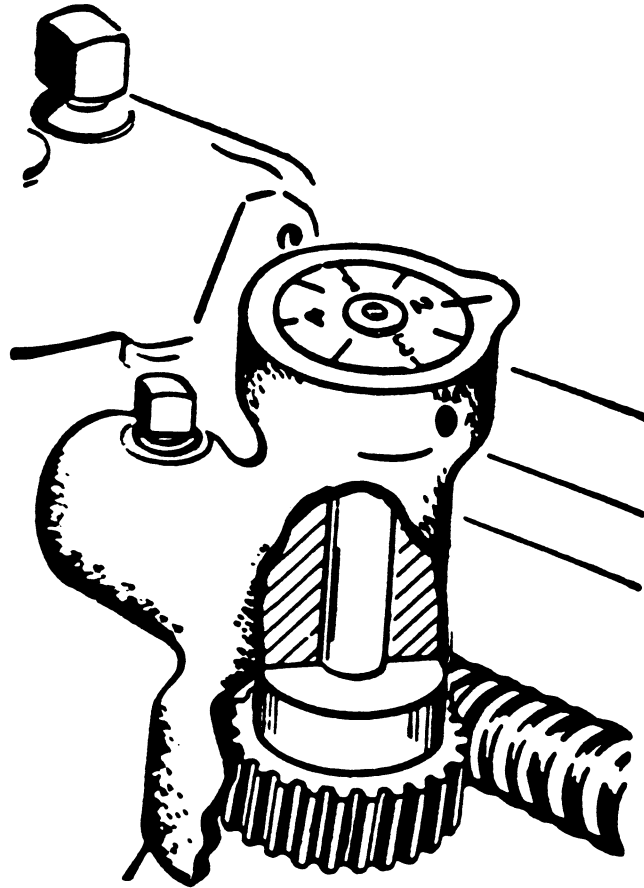
GS-0082



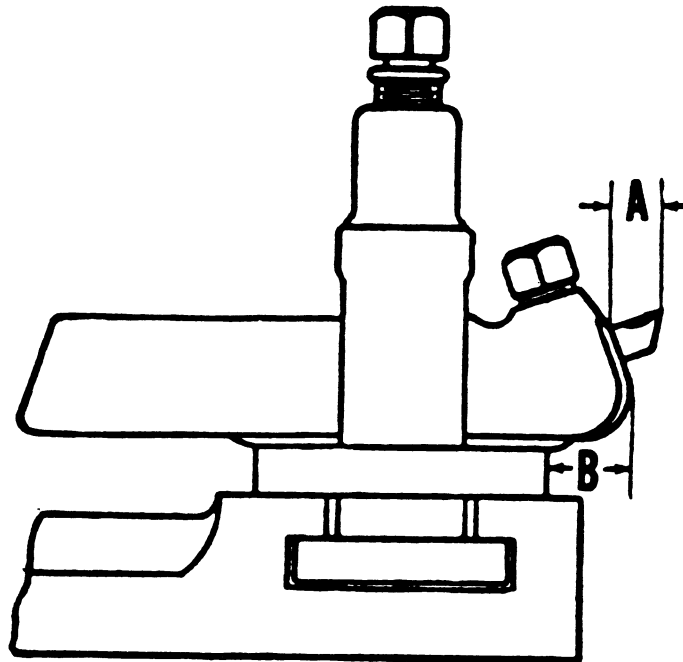
GS-0083



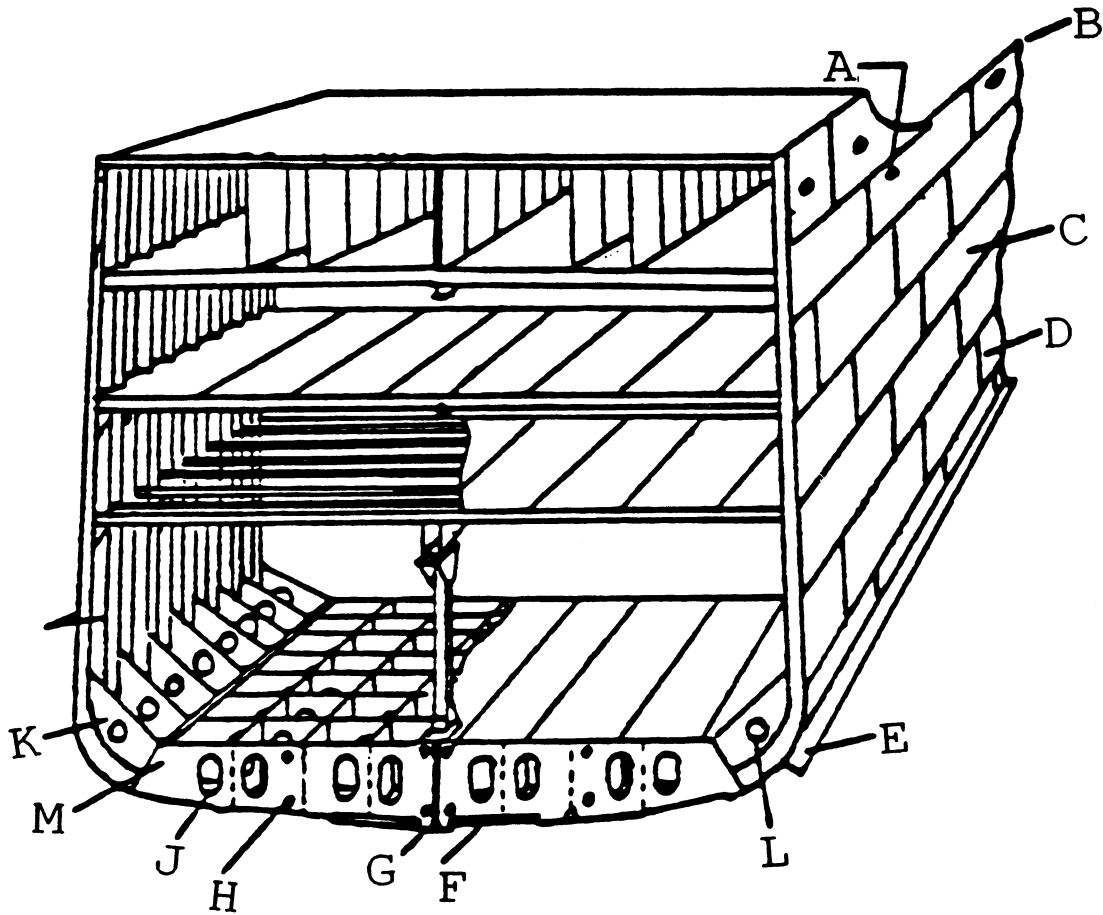
GS-0084



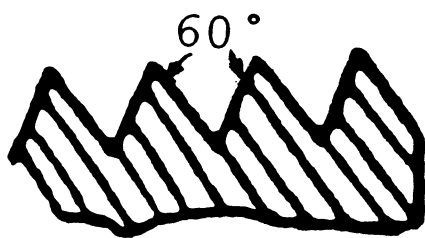
GS-0085



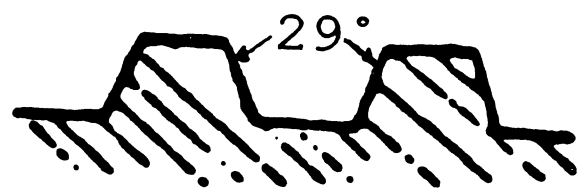
GS-0086



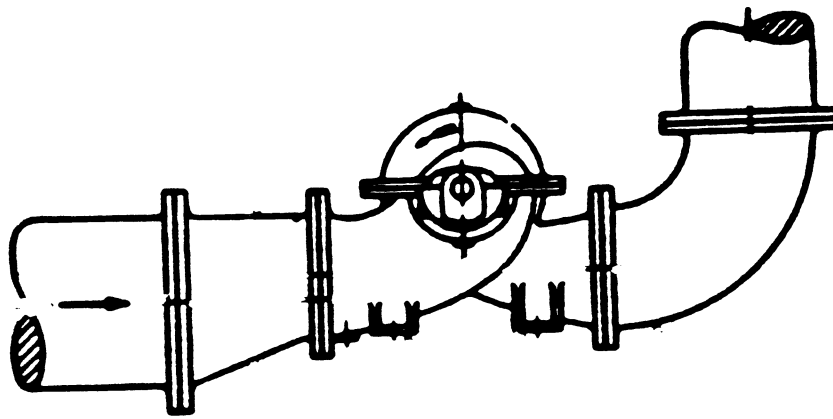
GS-0087



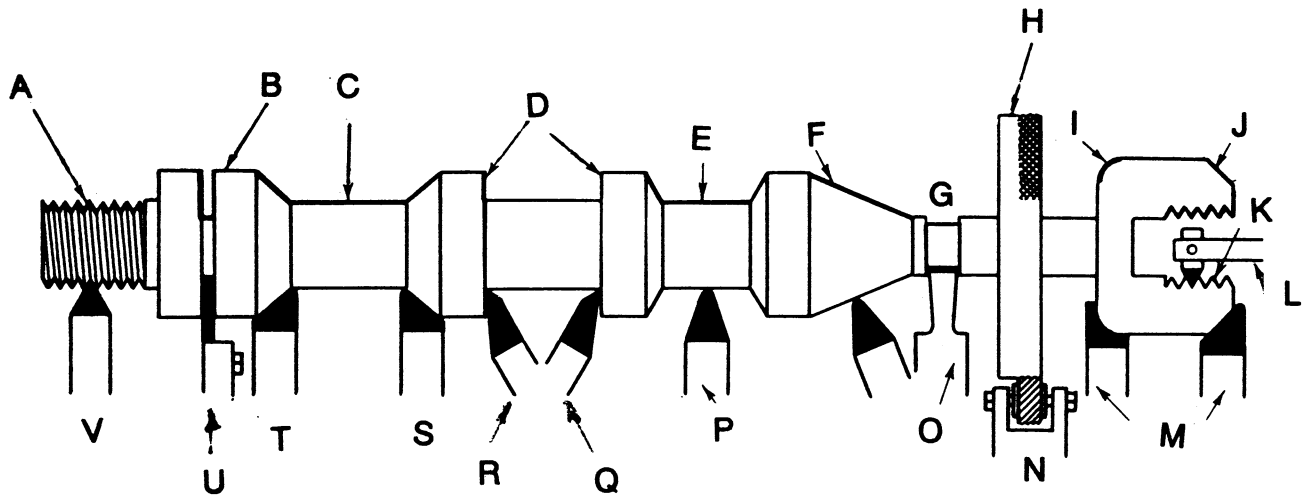
GS-0088



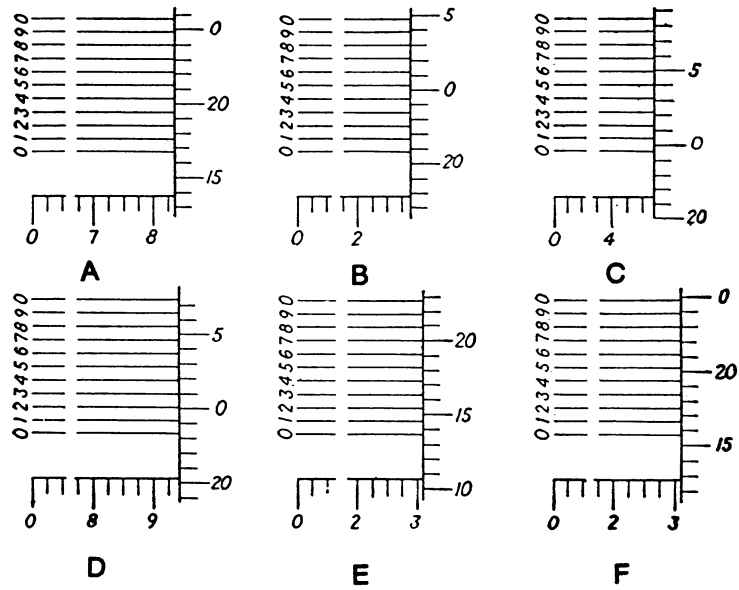
GS-0089



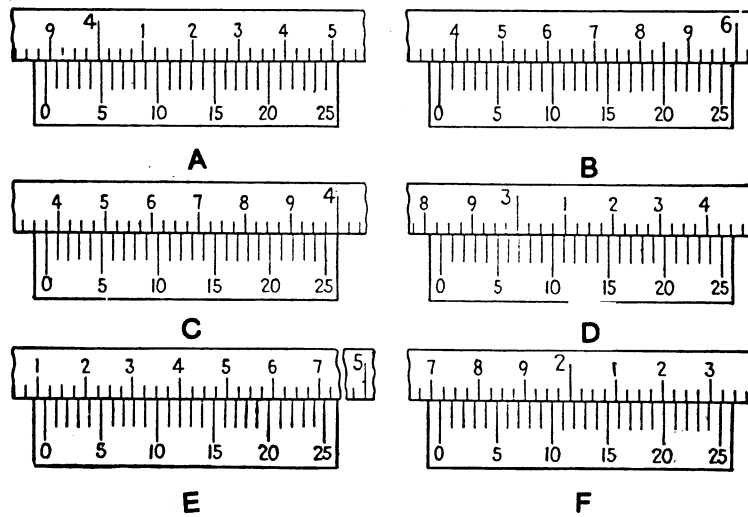
GS-0090



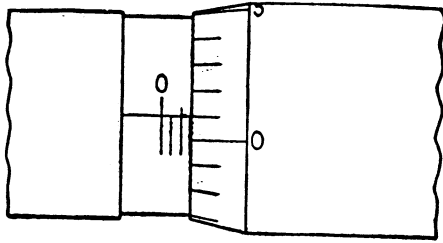
GS-0091



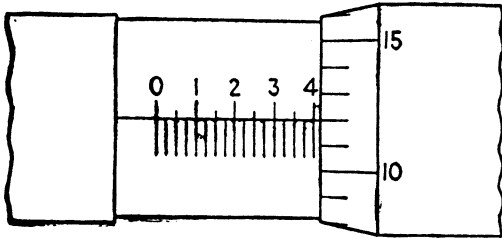
GS-0092



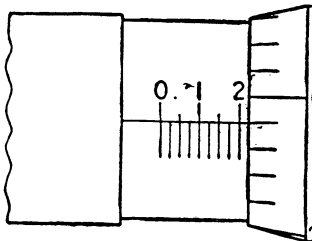
GS-0093



A

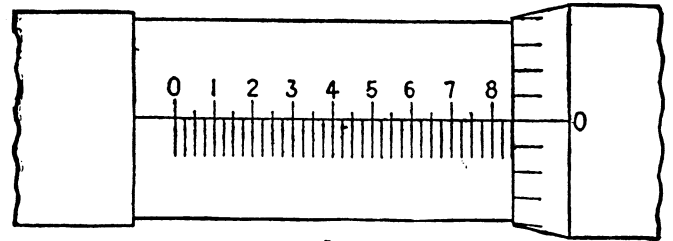


B

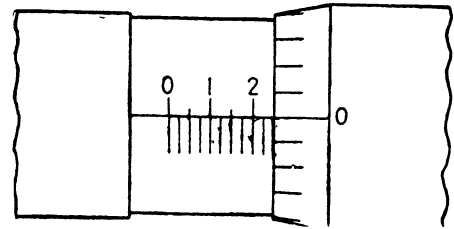


C

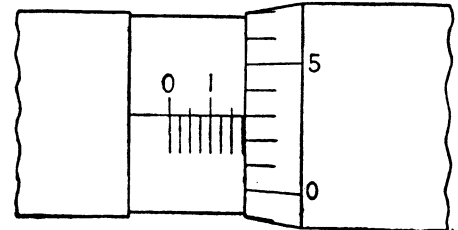
GS-0094



1

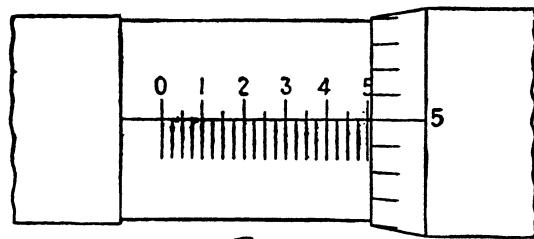


2

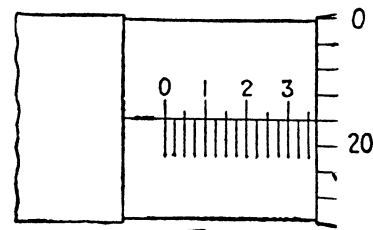


3

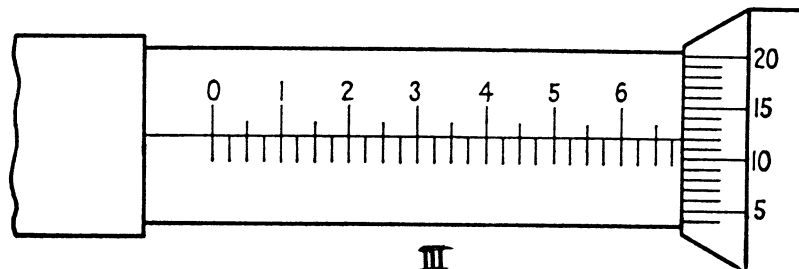
GS-0095



I

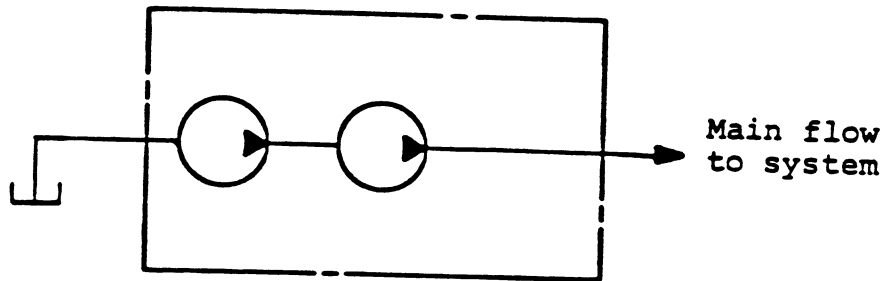


II



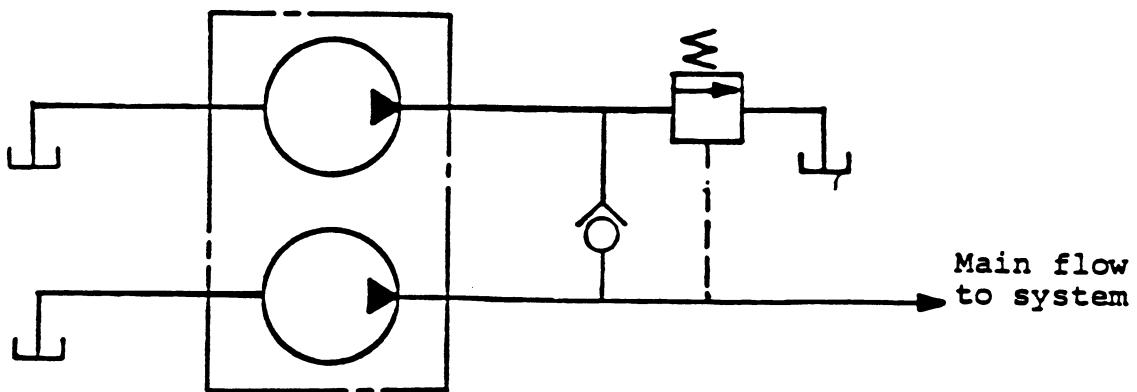
III

GS-0096



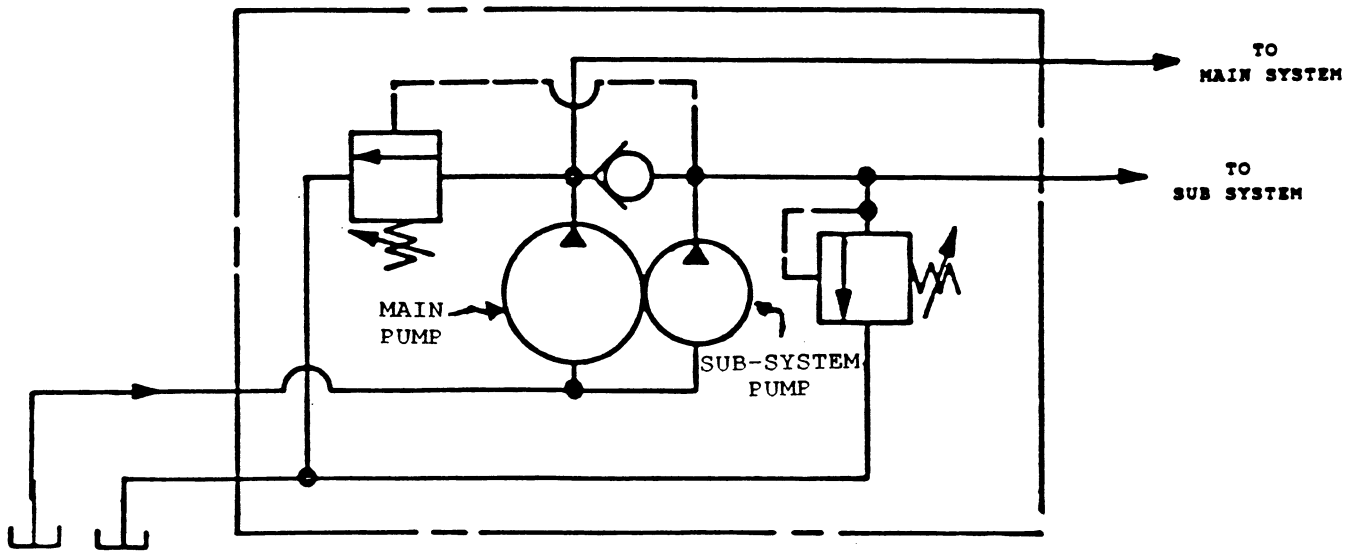
(COURTESY OF CORNELL MARITIME PRESS)

GS-0097



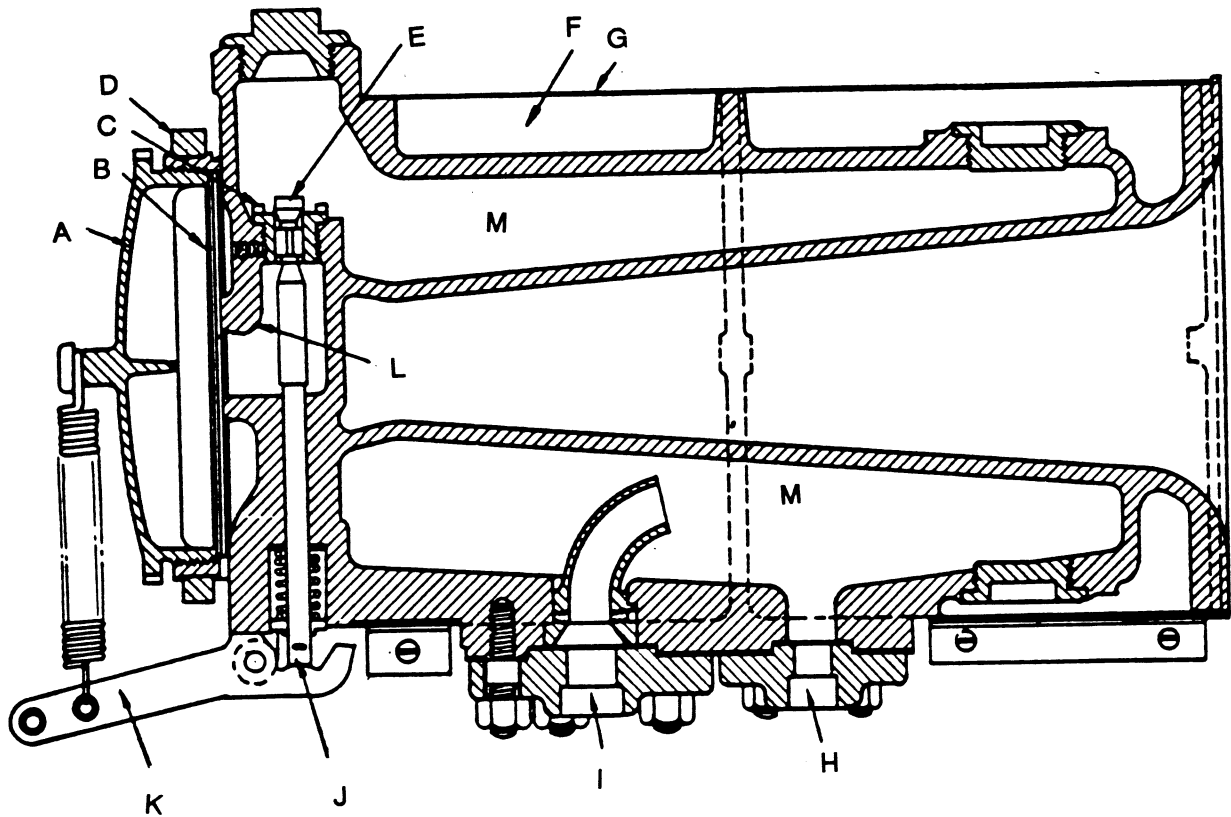
(COURTESY OF CORNELL MARITIME PRESS)

GS-0098

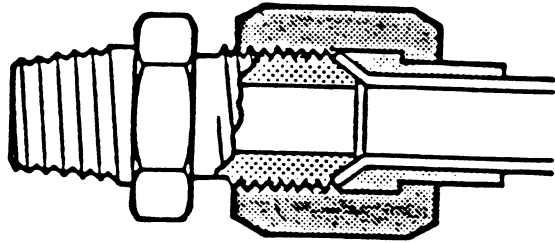


(COURTESY OF CORNELL MARITIME PRESS)

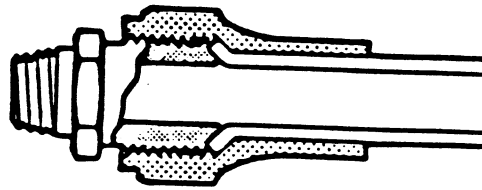
GS-0099



GS-0100

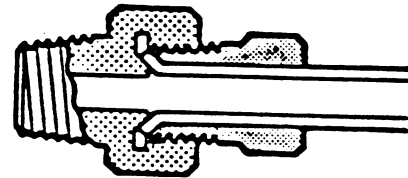


A

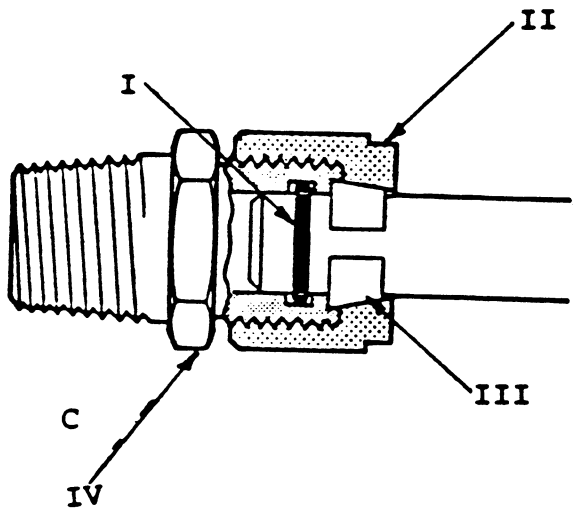


STANDARD

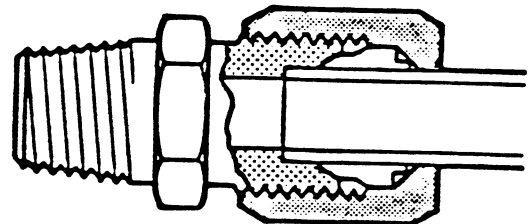
INVERTED



B



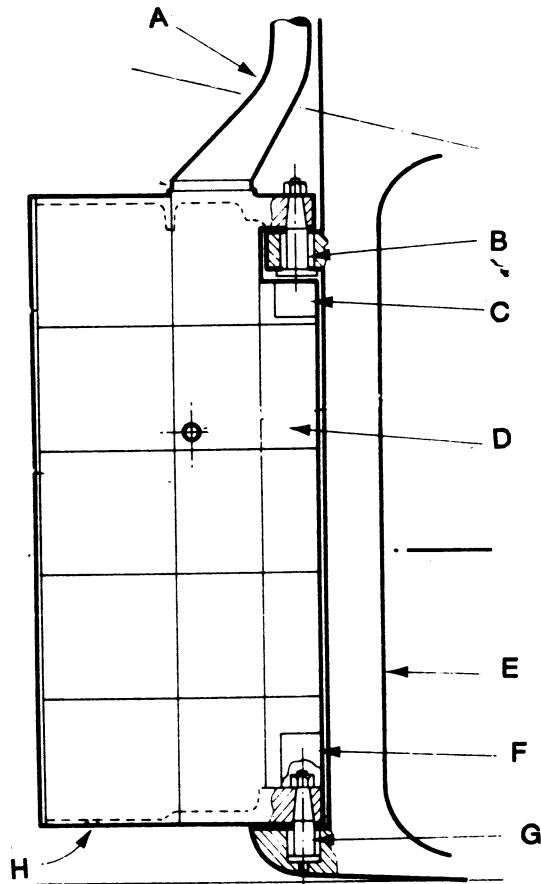
C



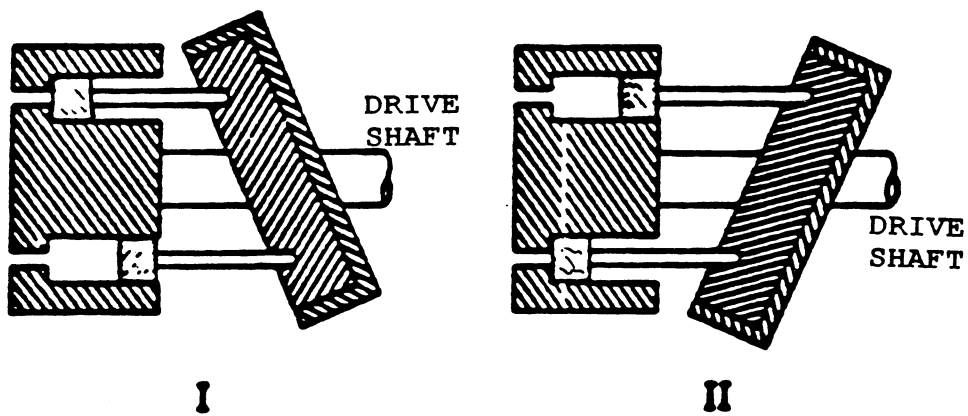
D

(COURTESY OF CORNELL MARITIME PRESS)

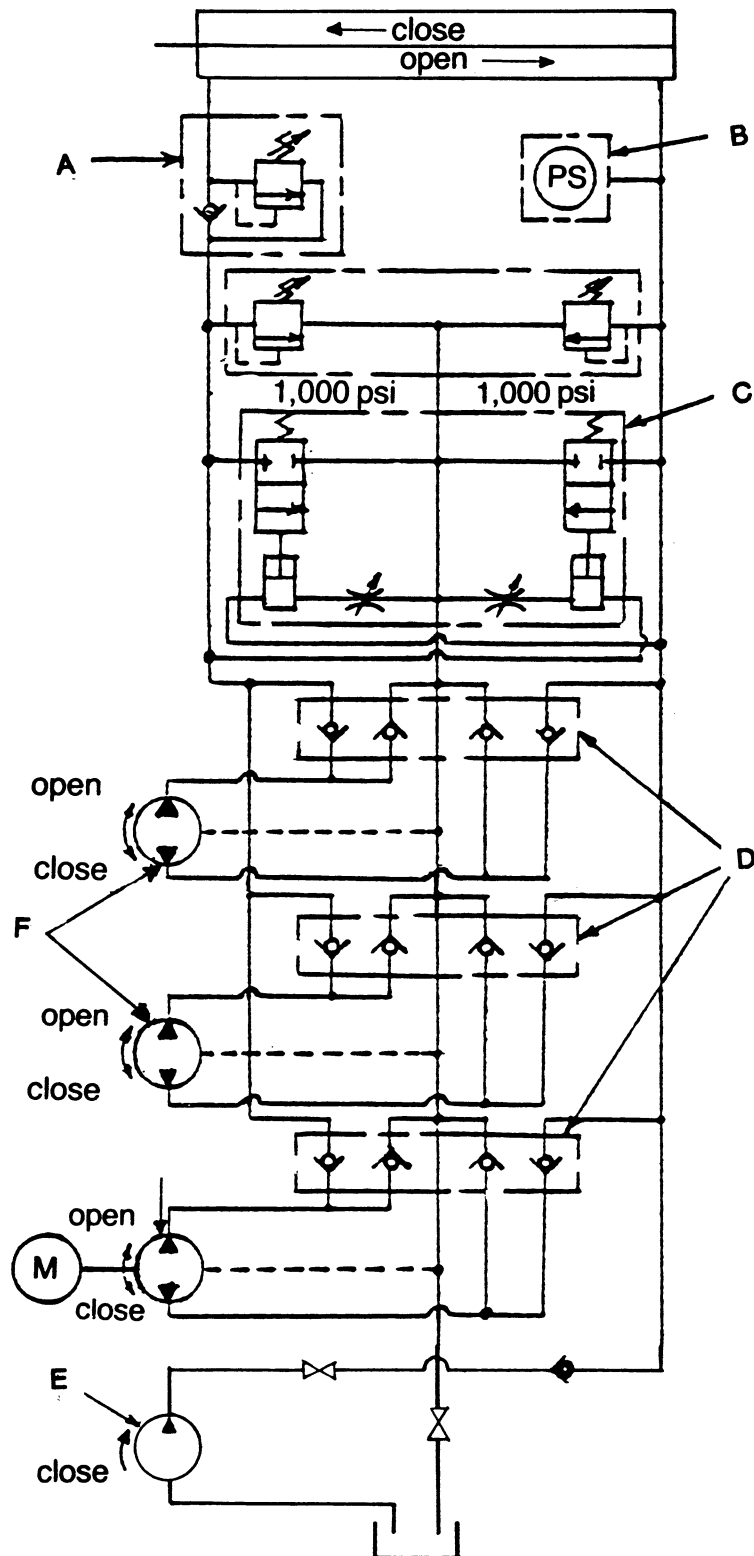
GS-0101



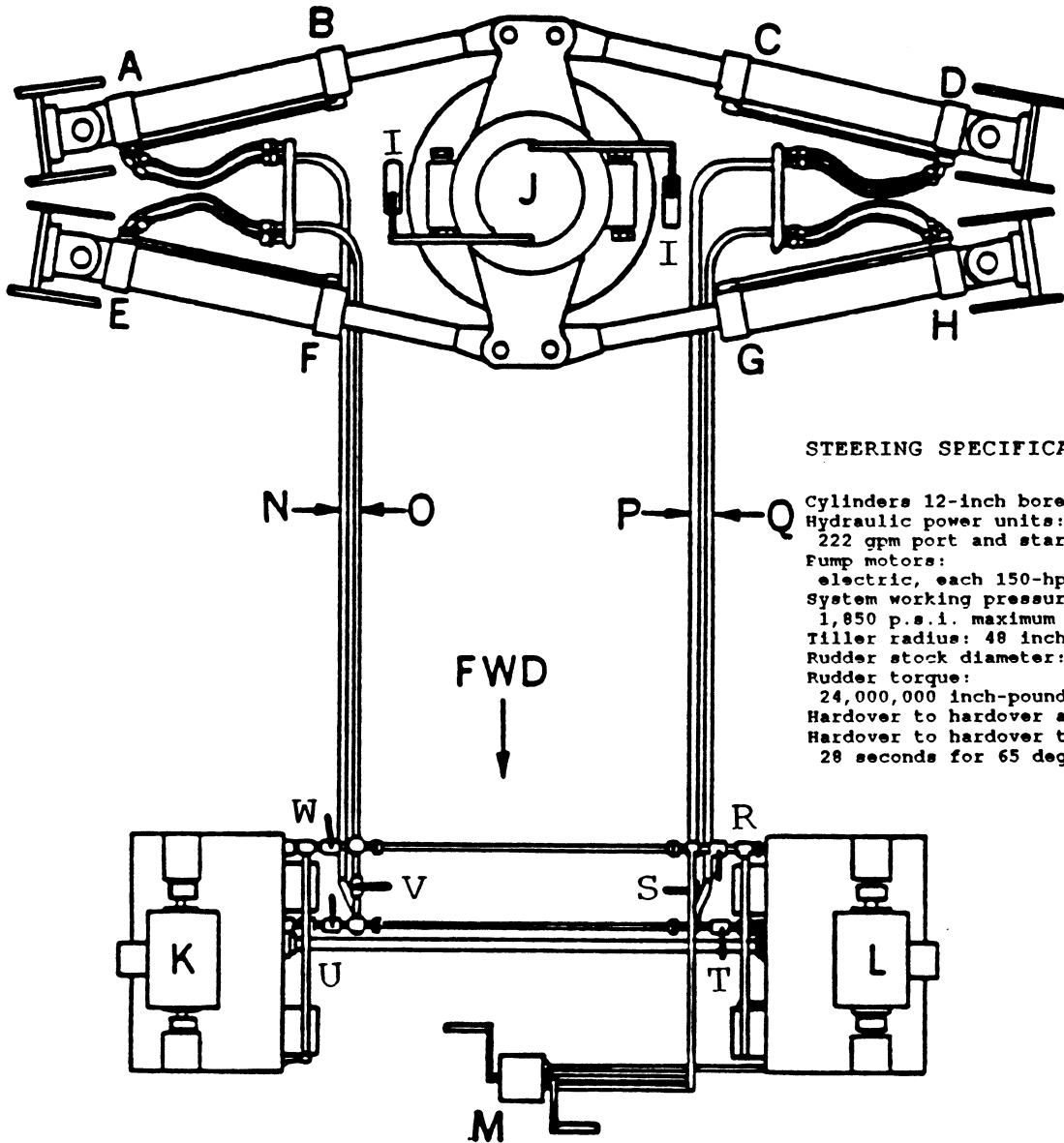
GS-0102



GS-0103



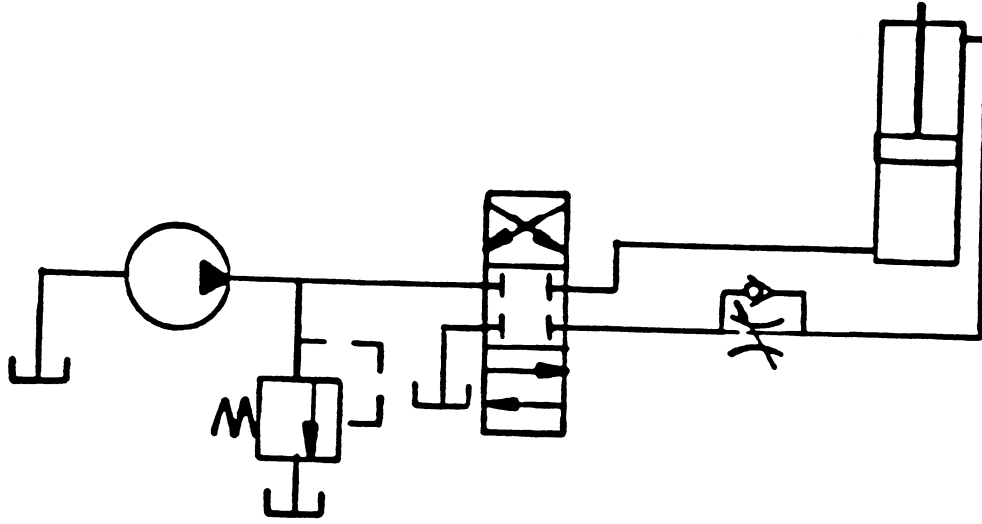
GS-0104



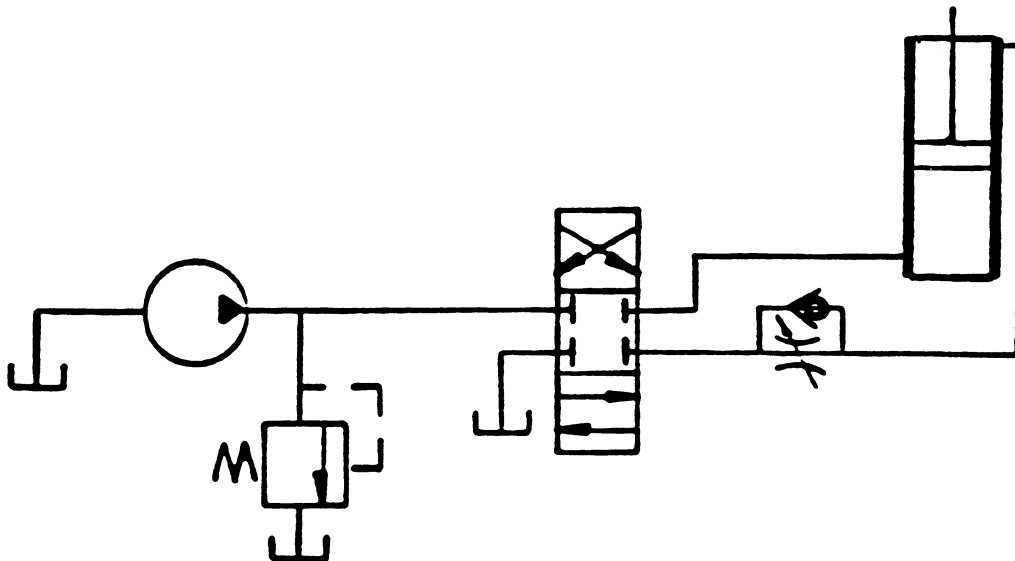
STEERING SPECIFICATION

Cylinders 12-inch bore, 65-inch stroke
 Hydraulic power units:
 222 gpm port and starboard units
 Pump motors:
 electric, each 150-hp., 1,800 r.p.m.
 System working pressure:
 1,850 p.s.i. maximum
 Tiller radius: 48 inches
 Rudder stock diameter: 30.2 inches
 Rudder torque:
 24,000,000 inch-pounds maximum
 Hardover to hardover angle: 70 degrees
 Hardover to hardover time:
 28 seconds for 65 degrees

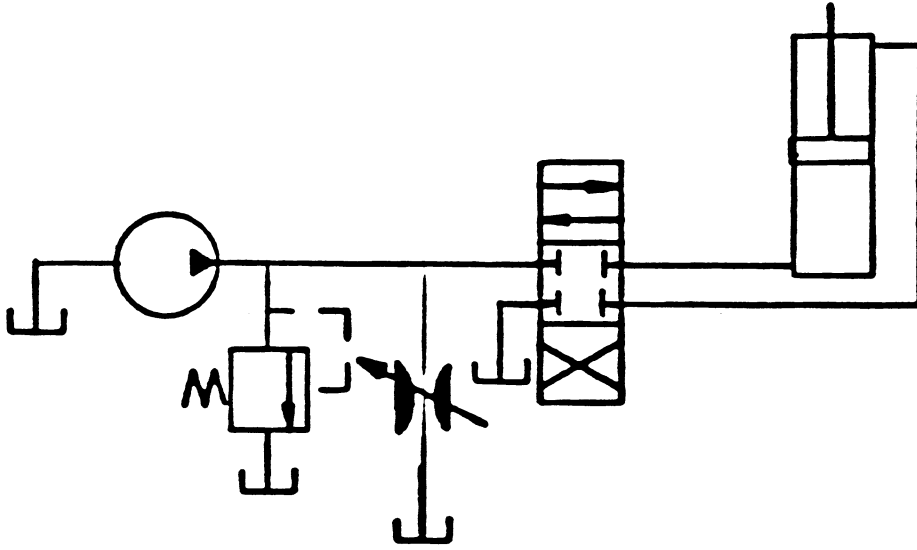
GS-0105



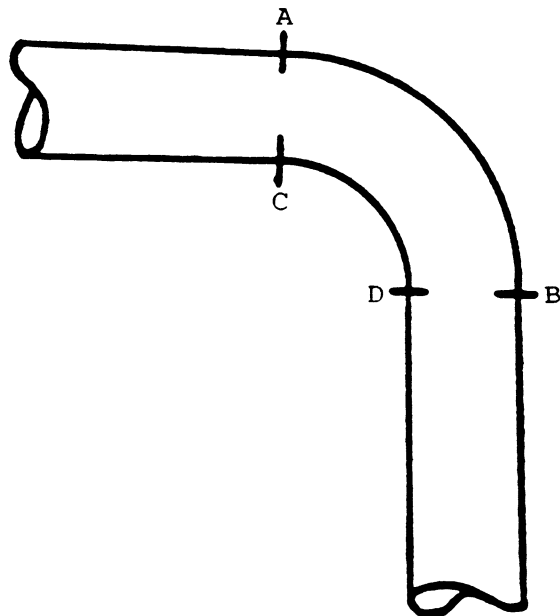
GS-0106



GS-0107



GS-0108



GS-0109

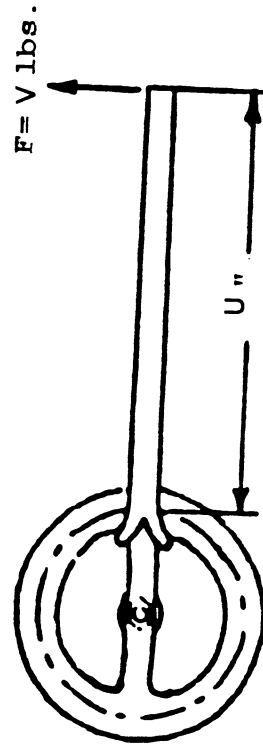


Figure II

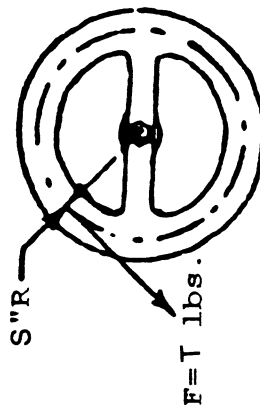
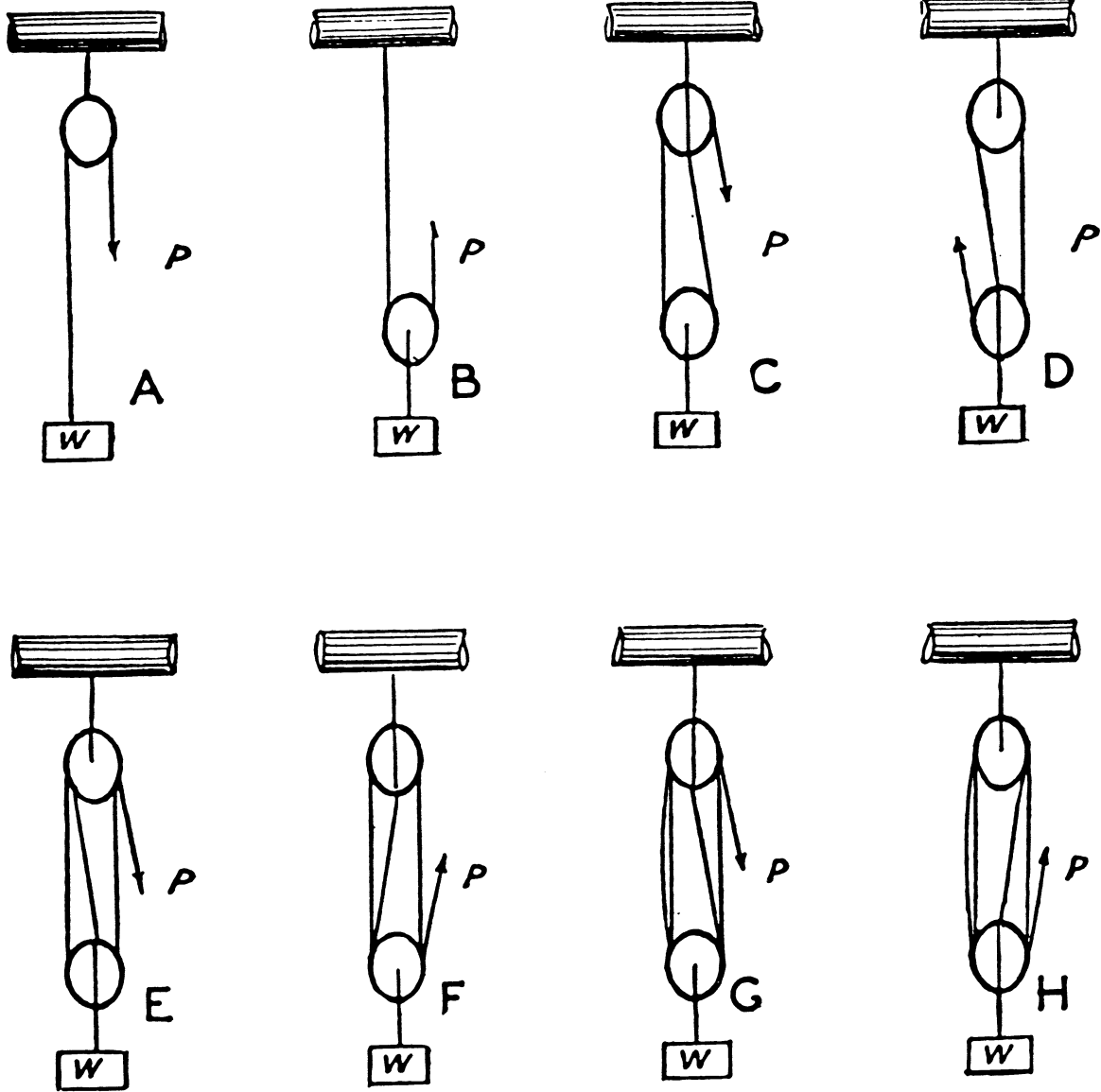
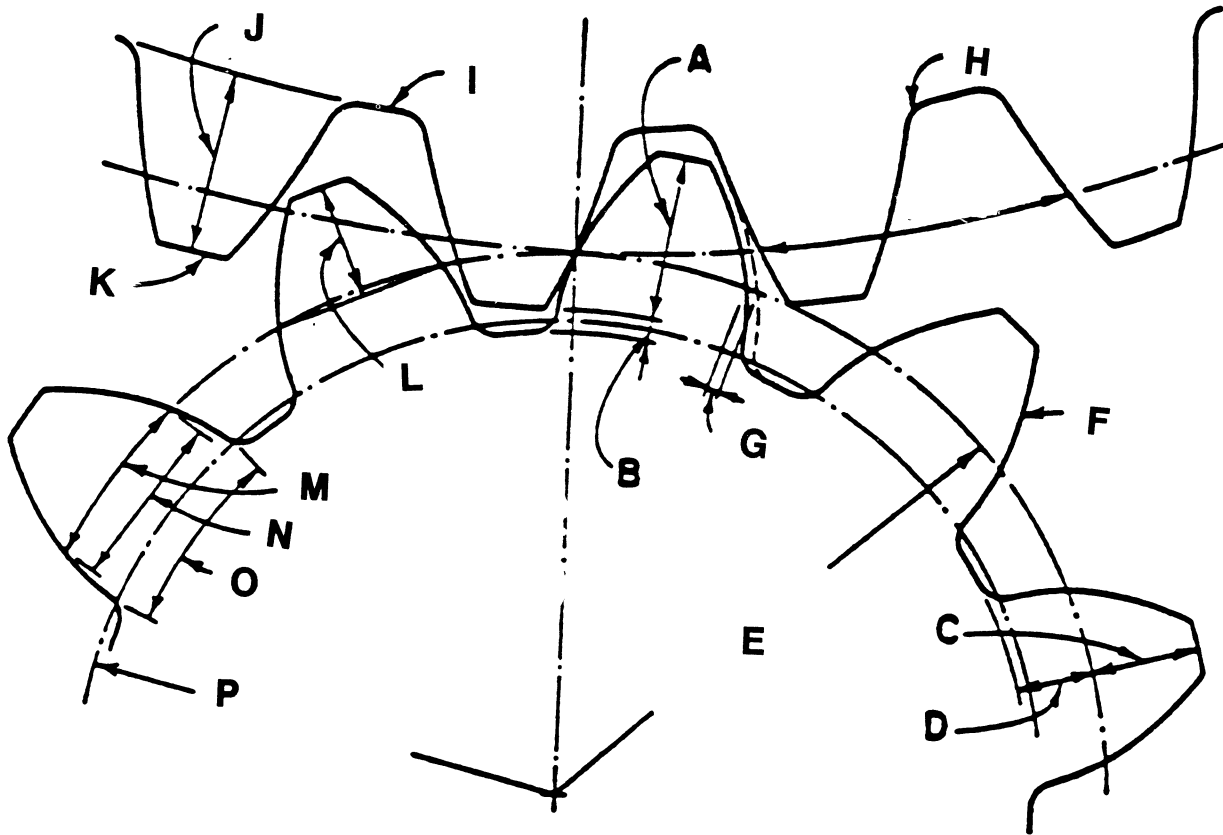


Figure I

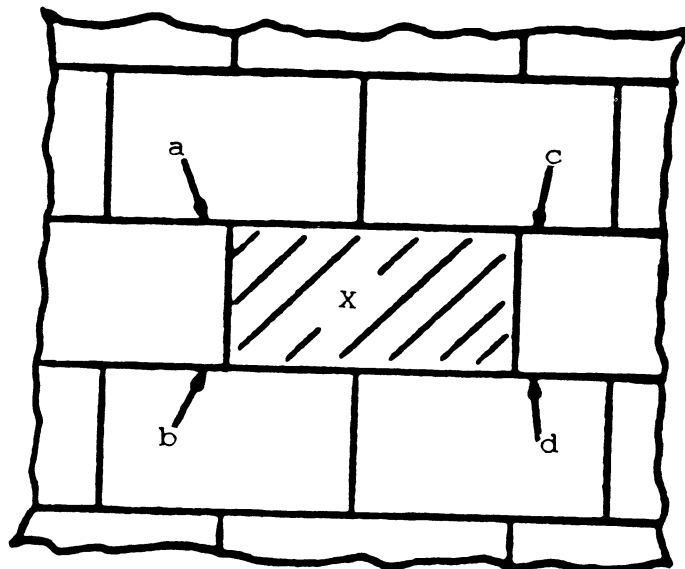
GS-0110



GS-0111



GS-0112



GS-0113

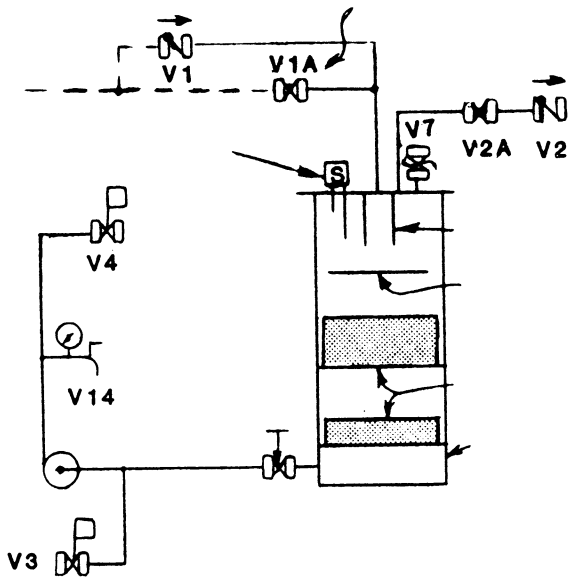


FIG. A

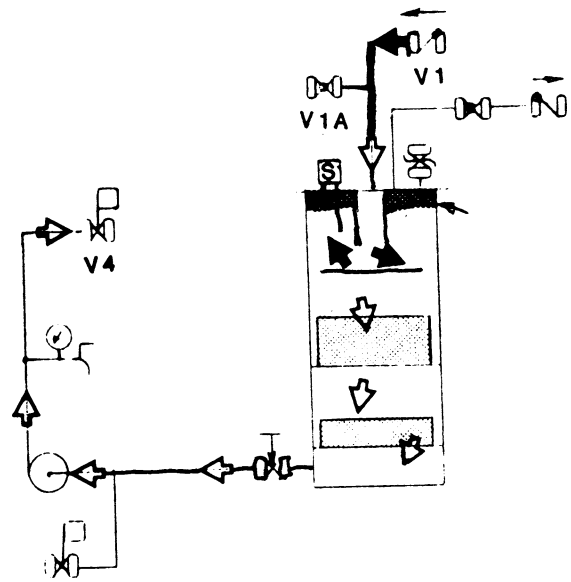


FIG. B

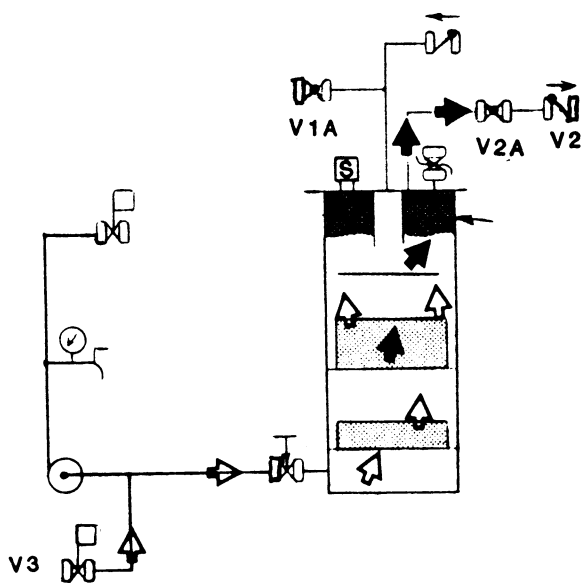


FIG. C

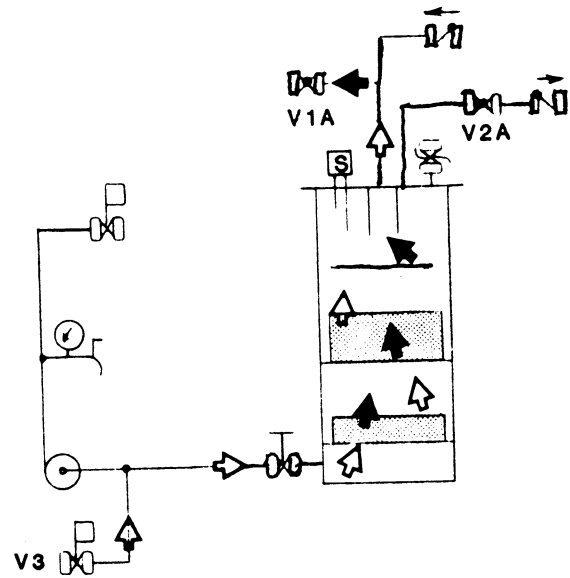
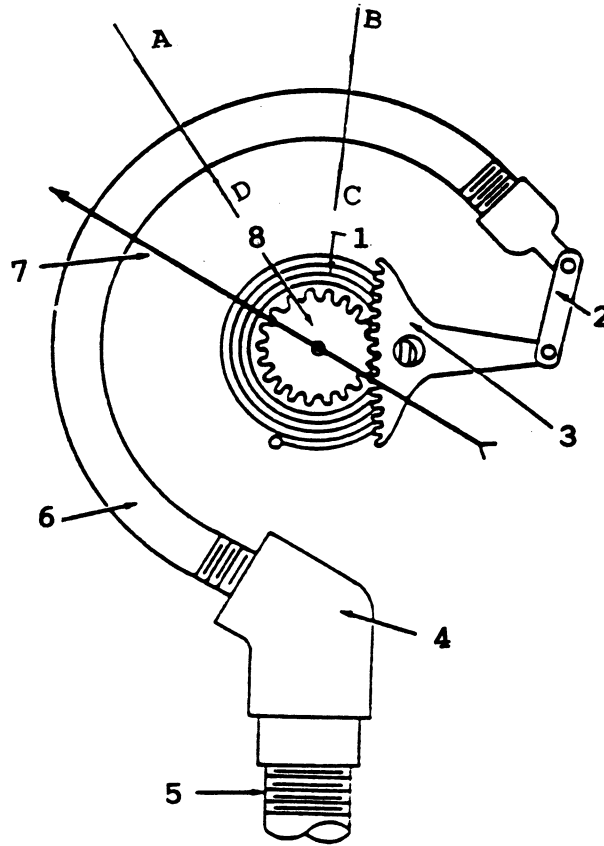


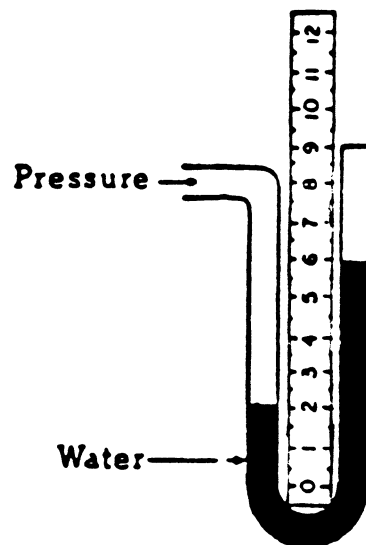
FIG. D

➡ OIL
➡ WATER

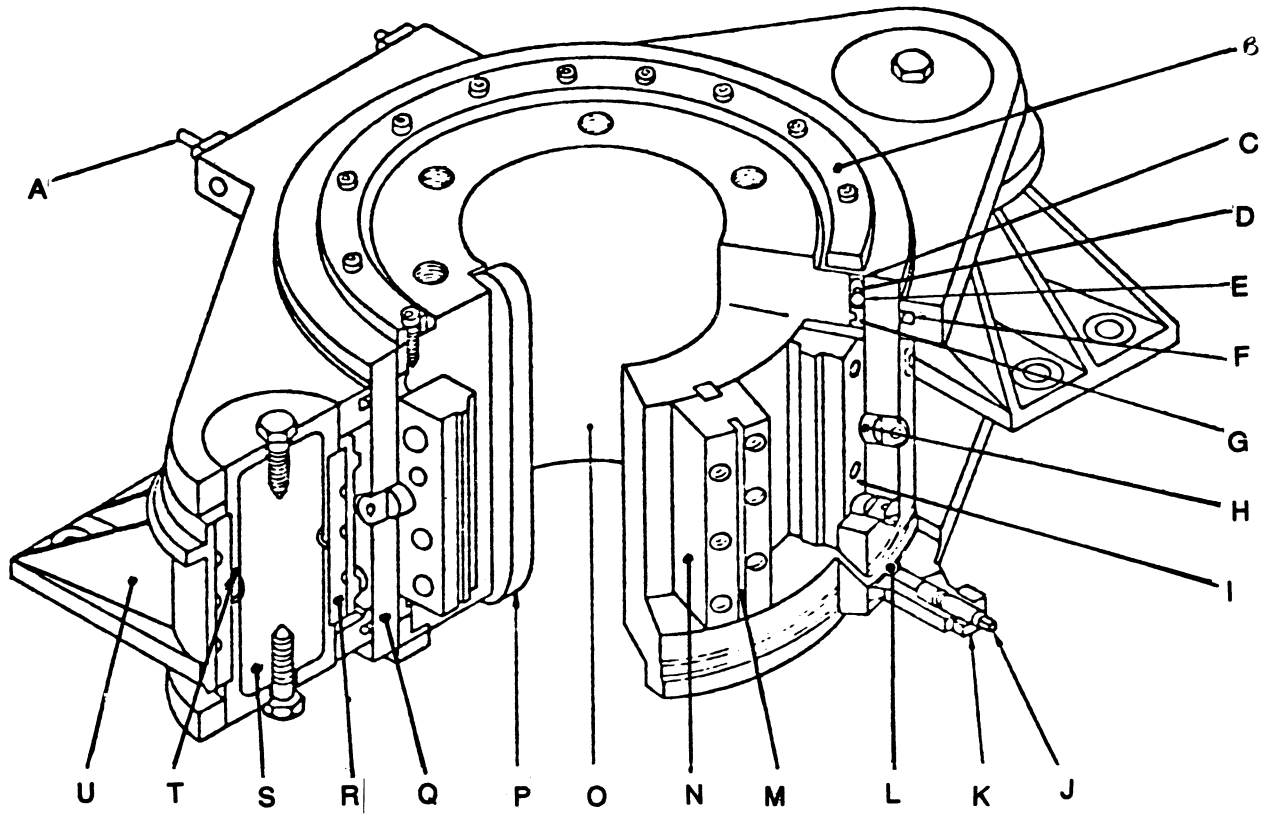
GS-0114



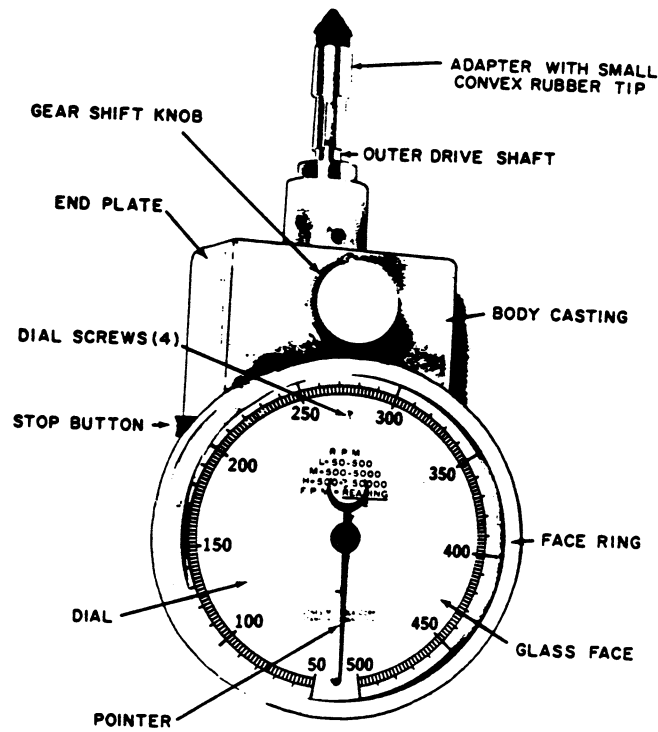
GS-0115



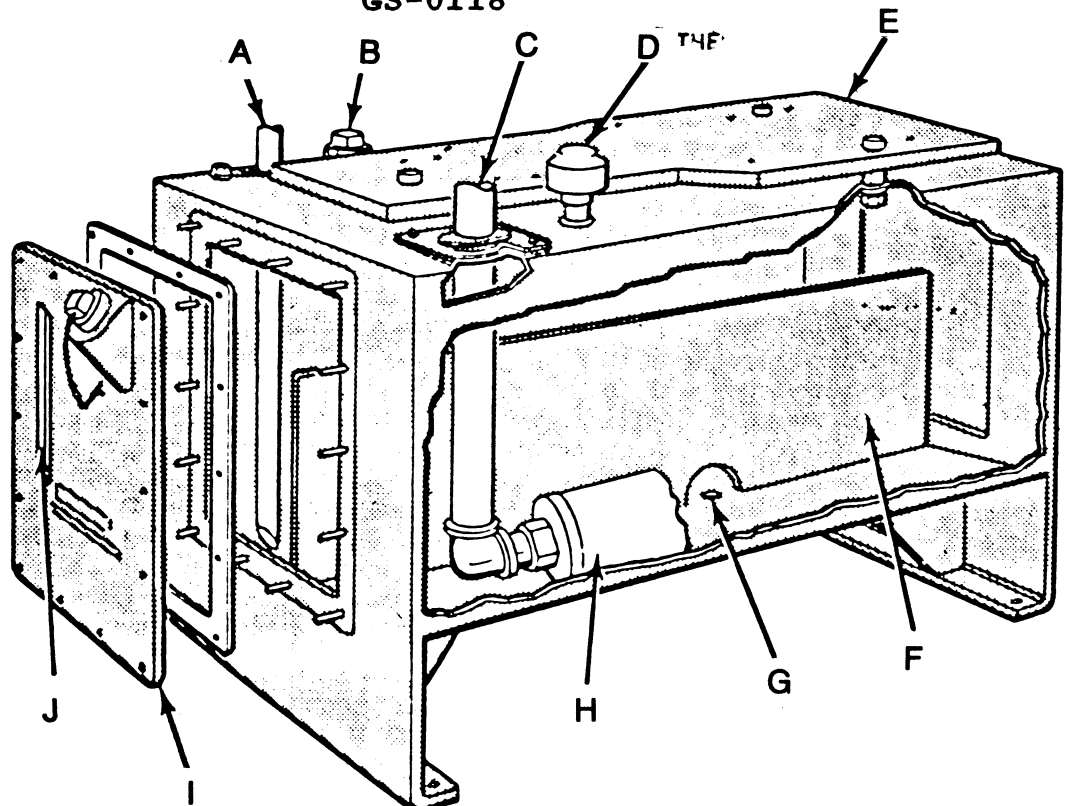
GS-0116



GS-0117

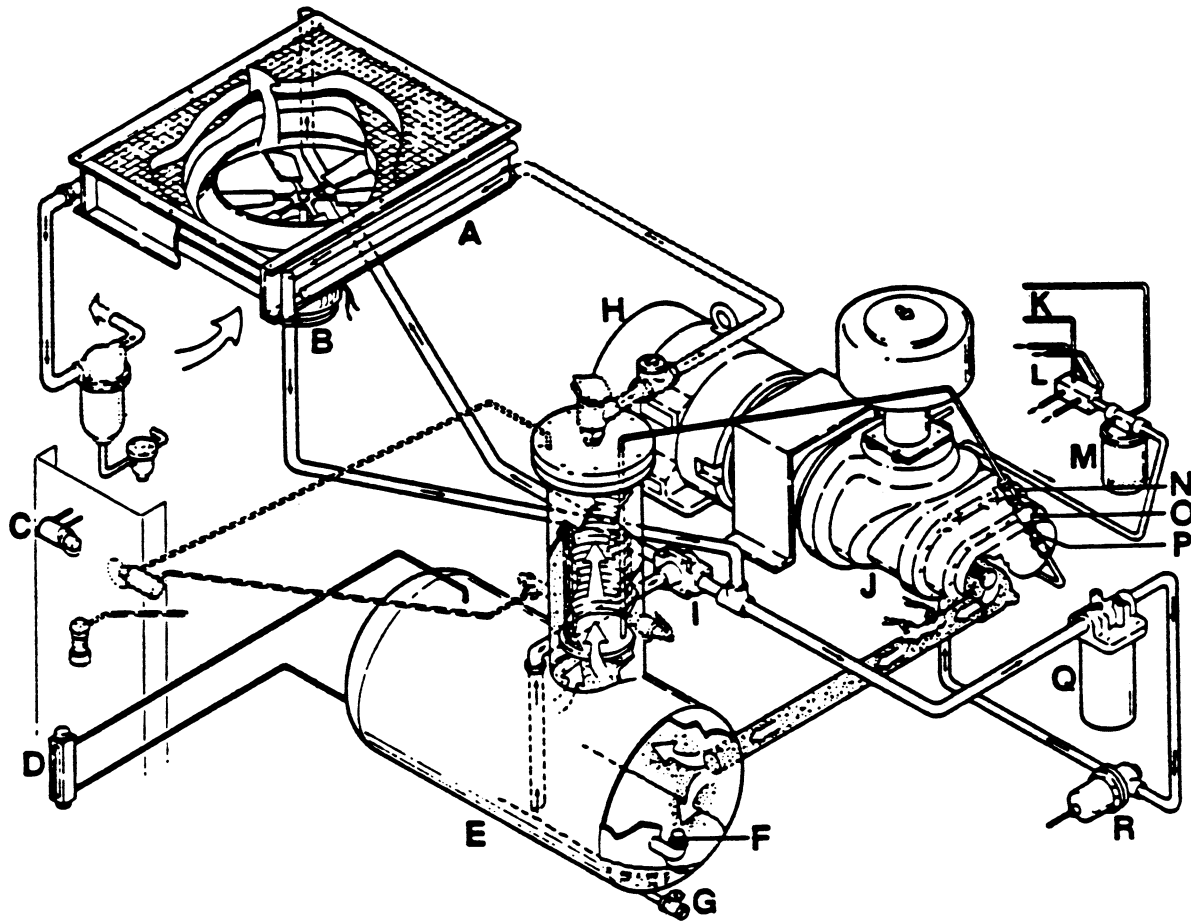


GS-0118



2-78

GS-0119

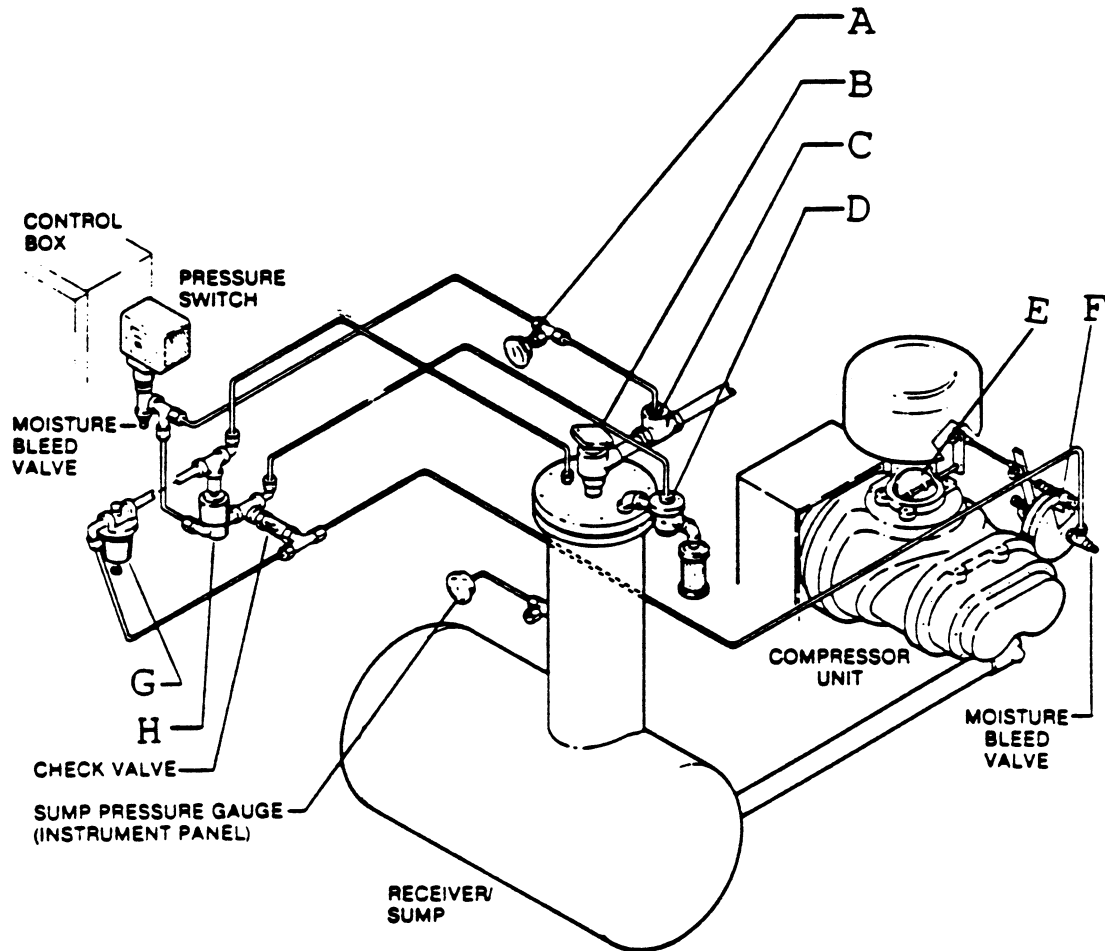


A - FLUID COOLER (TOP)
B - FAN MOTOR
C - BEARING FILTER MAINTENANCE INDICATOR
D - FLUID LEVEL SIGHT GLASS
E - RECEIVER SUMP
F - FLUID FILL CAP
G - FLUID DRAIN
H - MOTOR
I - THERMAL VALVE

J - COMPRESSOR UNIT
K - TO BEARING FILTER MAINTENANCE INDICATOR
L - FLUID MANIFOLD TO COMPRESSOR BEARINGS
M - BEARING FLUID FILTER
N - FLUID RETURN LINE SIGHT GLASS
O - RETURN LINE STRAINER
P - ORIFICE
Q - MAIN FLUID FILTER
R - FLUID STOP VALVE

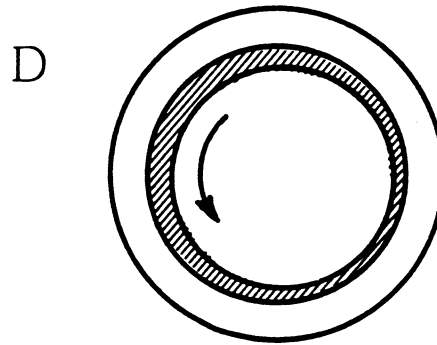
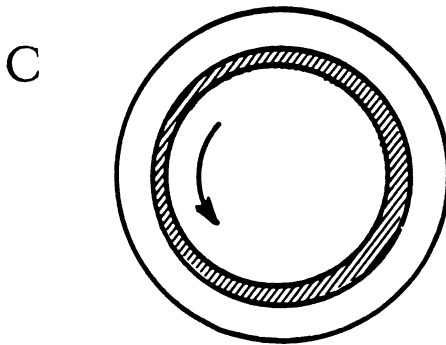
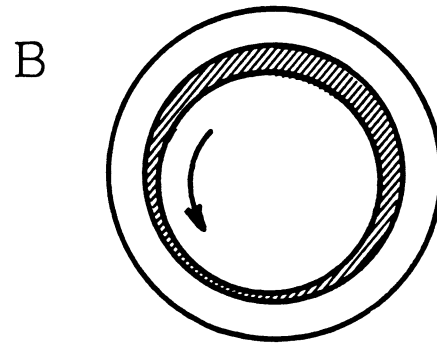
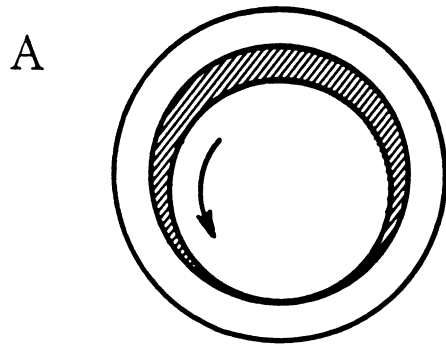
(COURTESY OF SULLAIR CORPORATION)

GS-0120

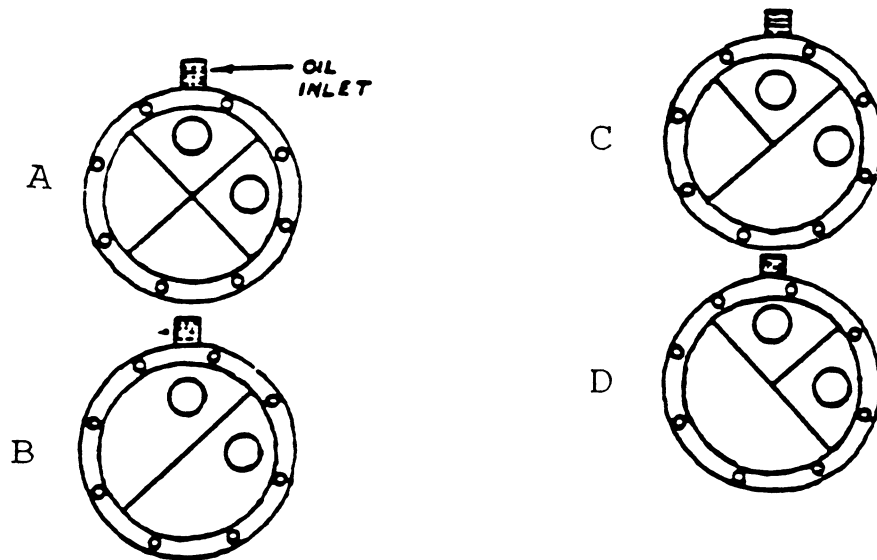
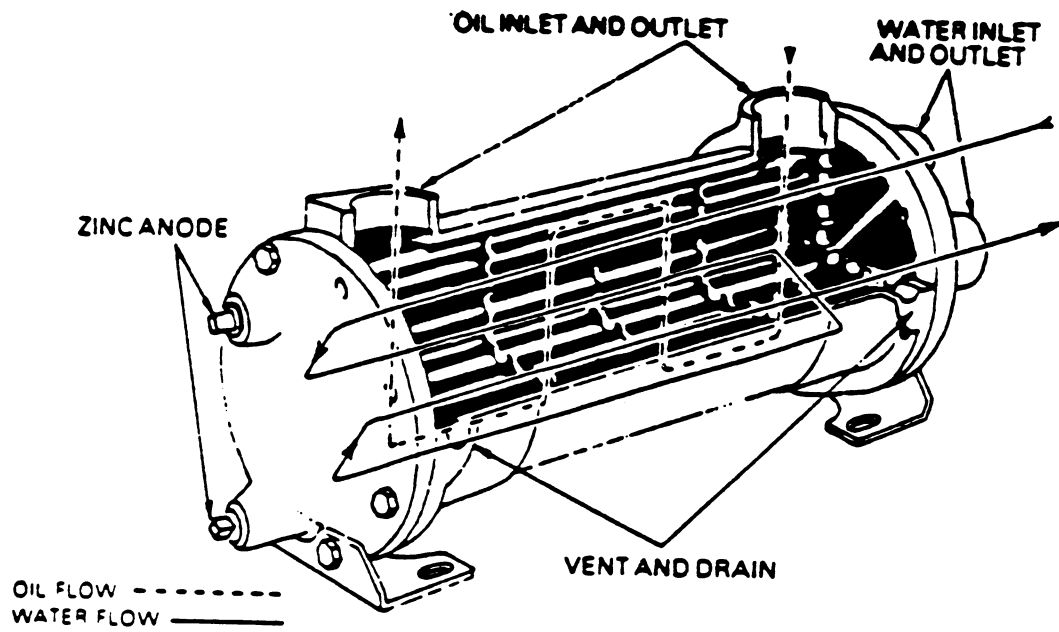


(COURTESY OF SULLAIR CORP.)

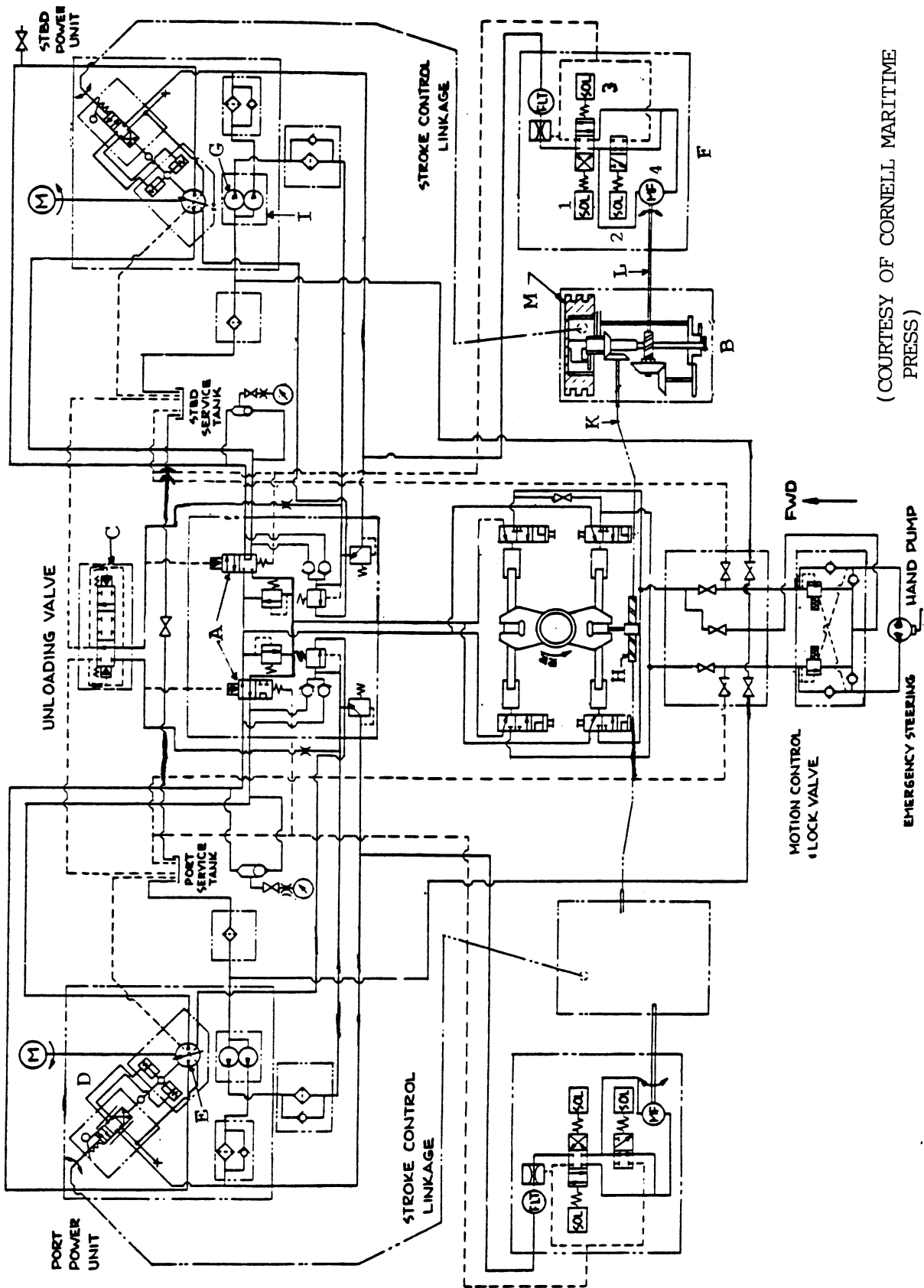
GS-0121



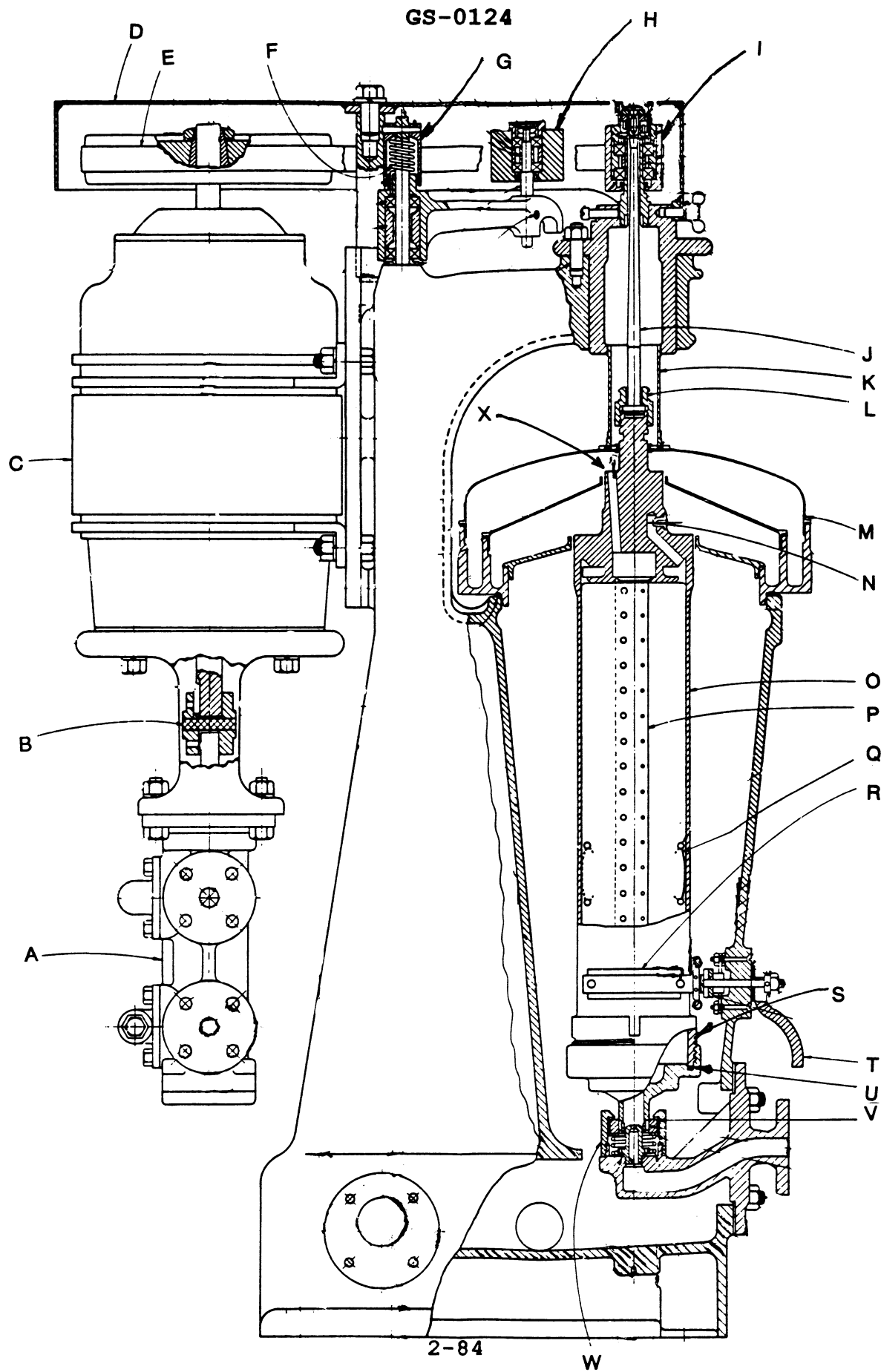
GS-0122



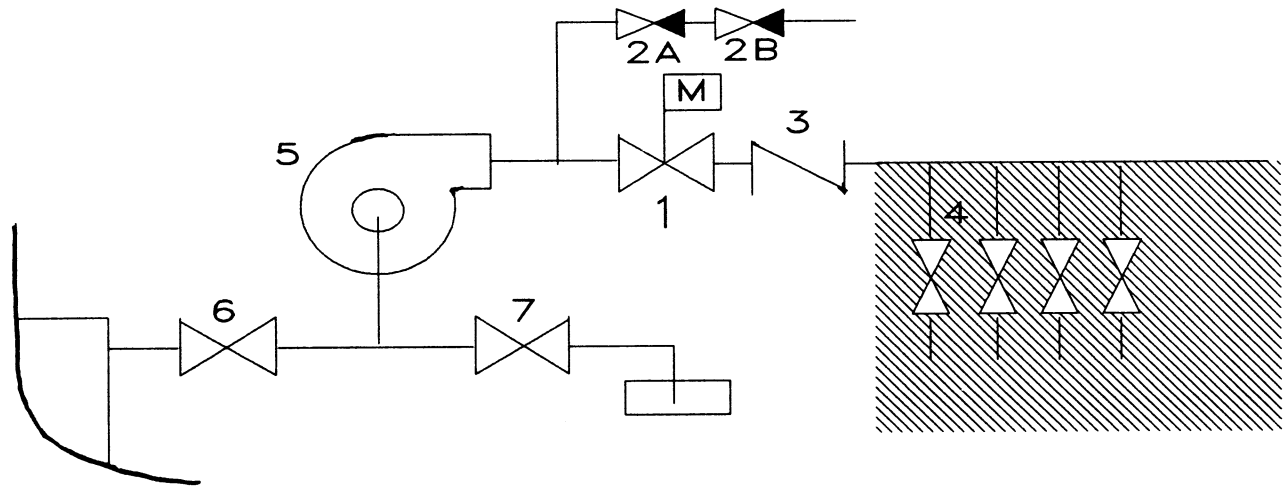
GS-0123



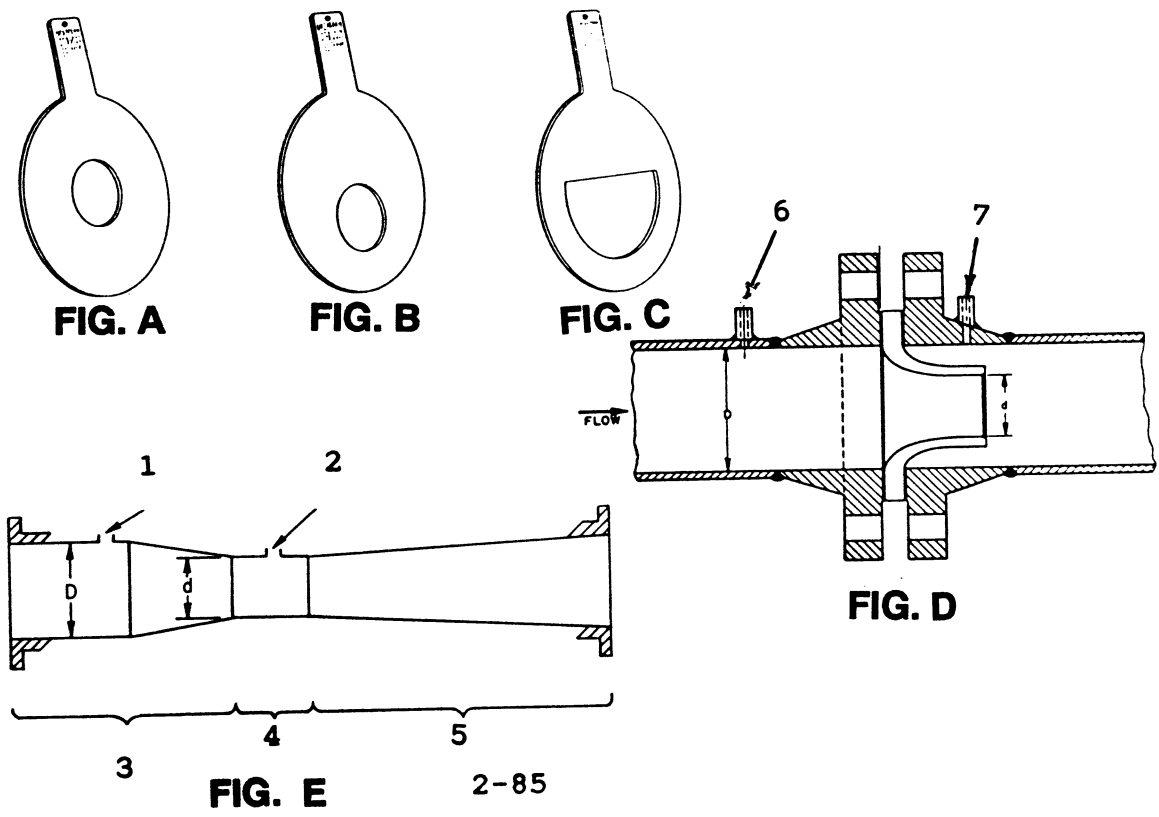
(COURTESY OF CORNELL MARITIME PRESS)



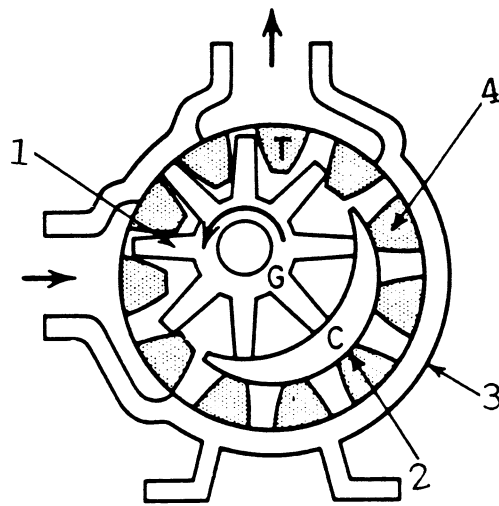
GS-0125



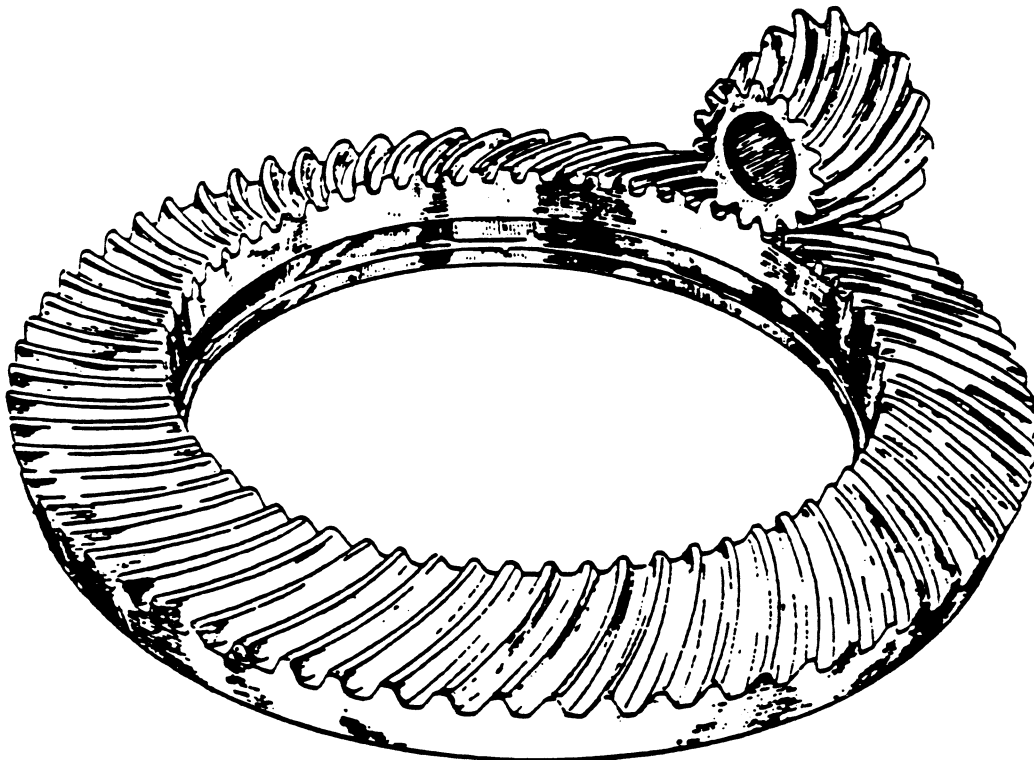
GS-0126



GS-0127

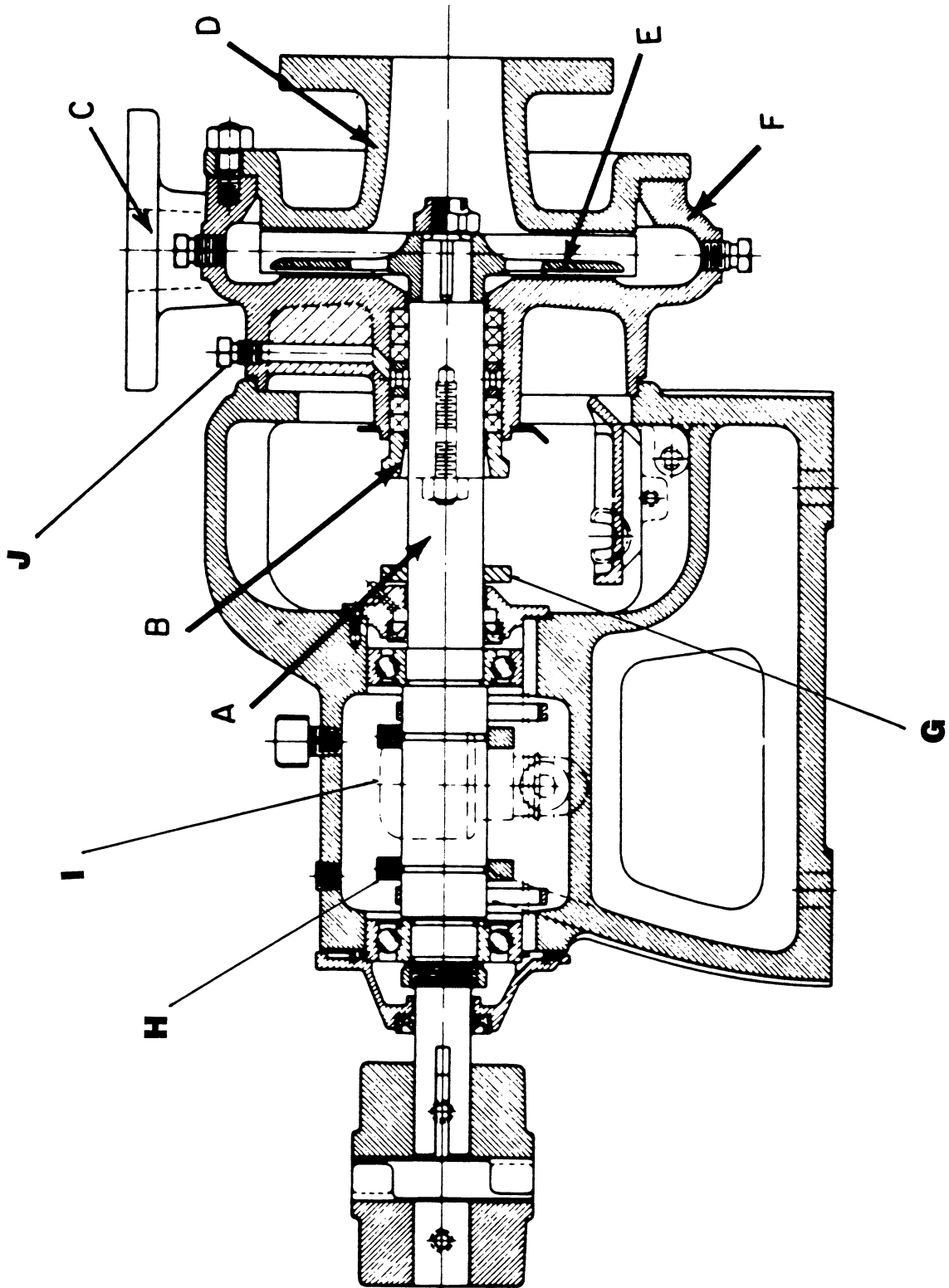


GS-0128

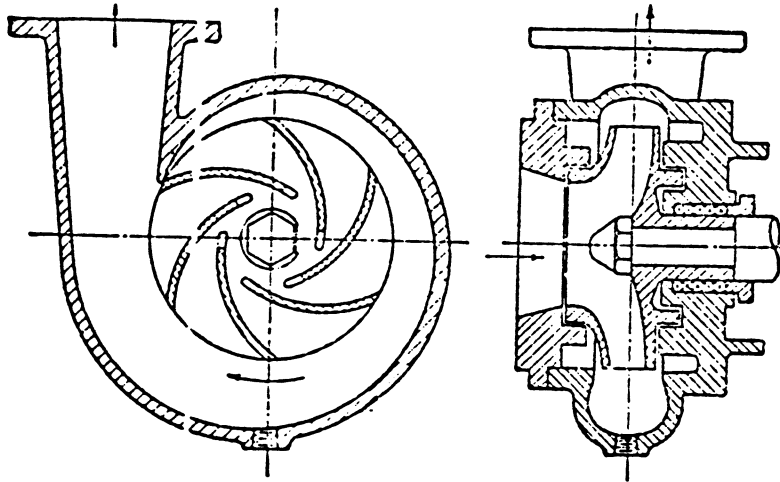


2-86

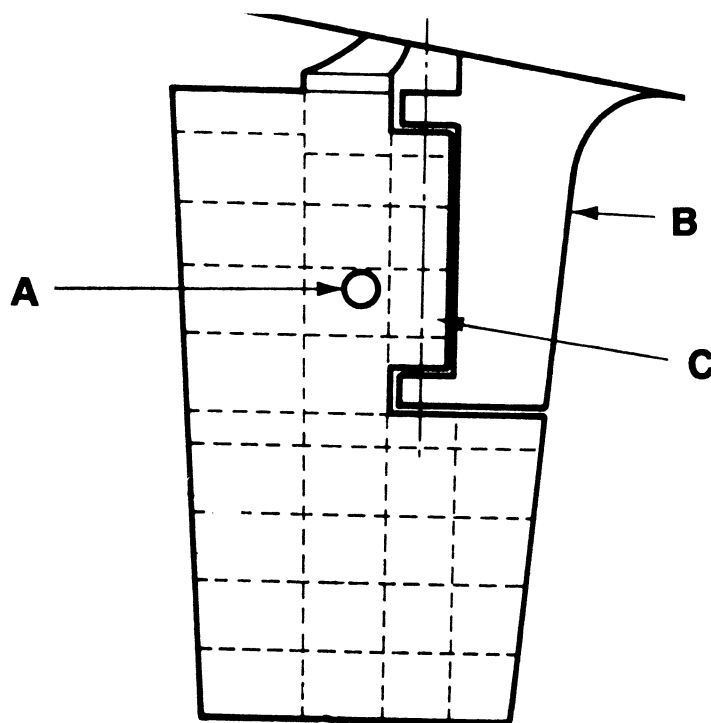
GS-0129



GS-0130

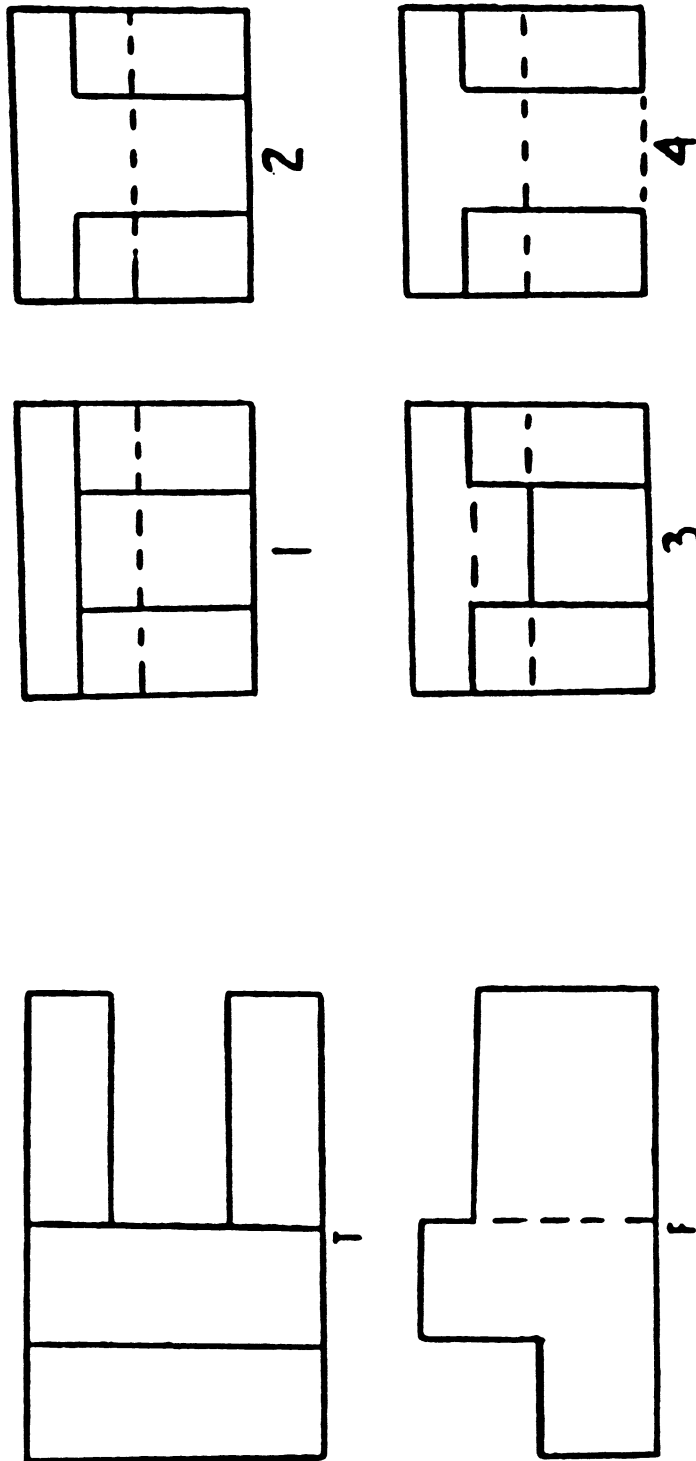


GS-0131

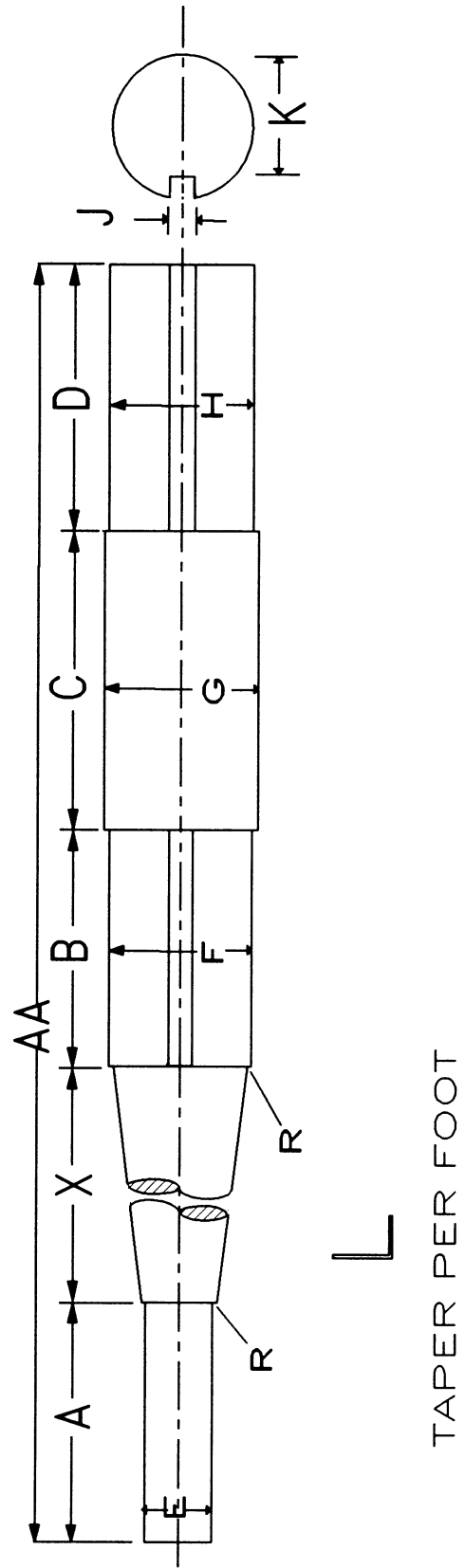


2-88

GS-0132

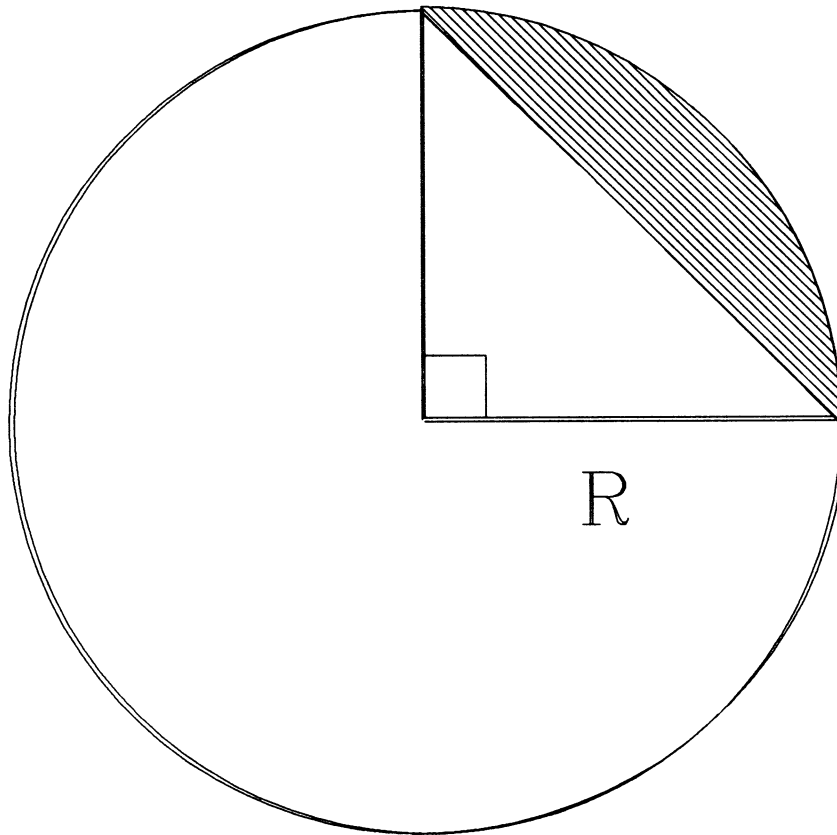


GS-0133

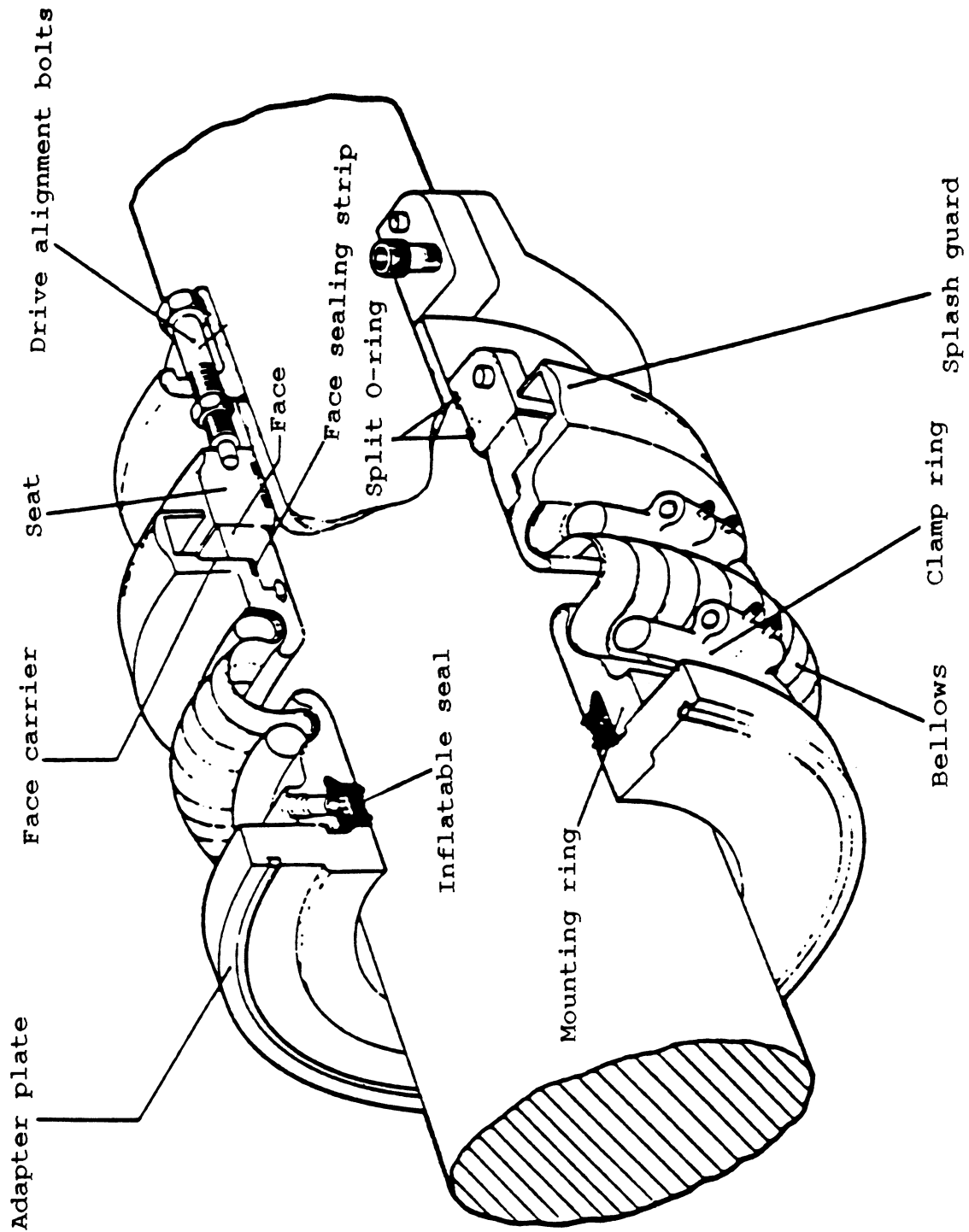


2-90

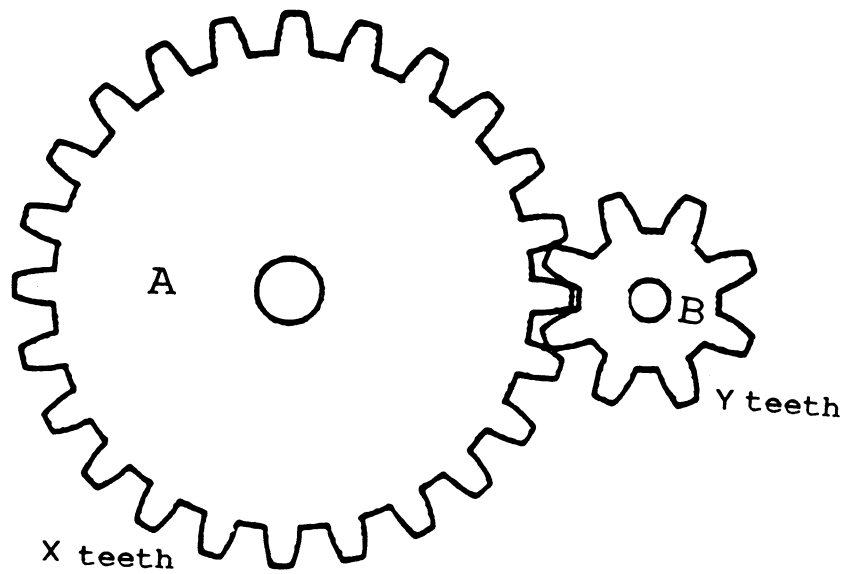
GS-0134



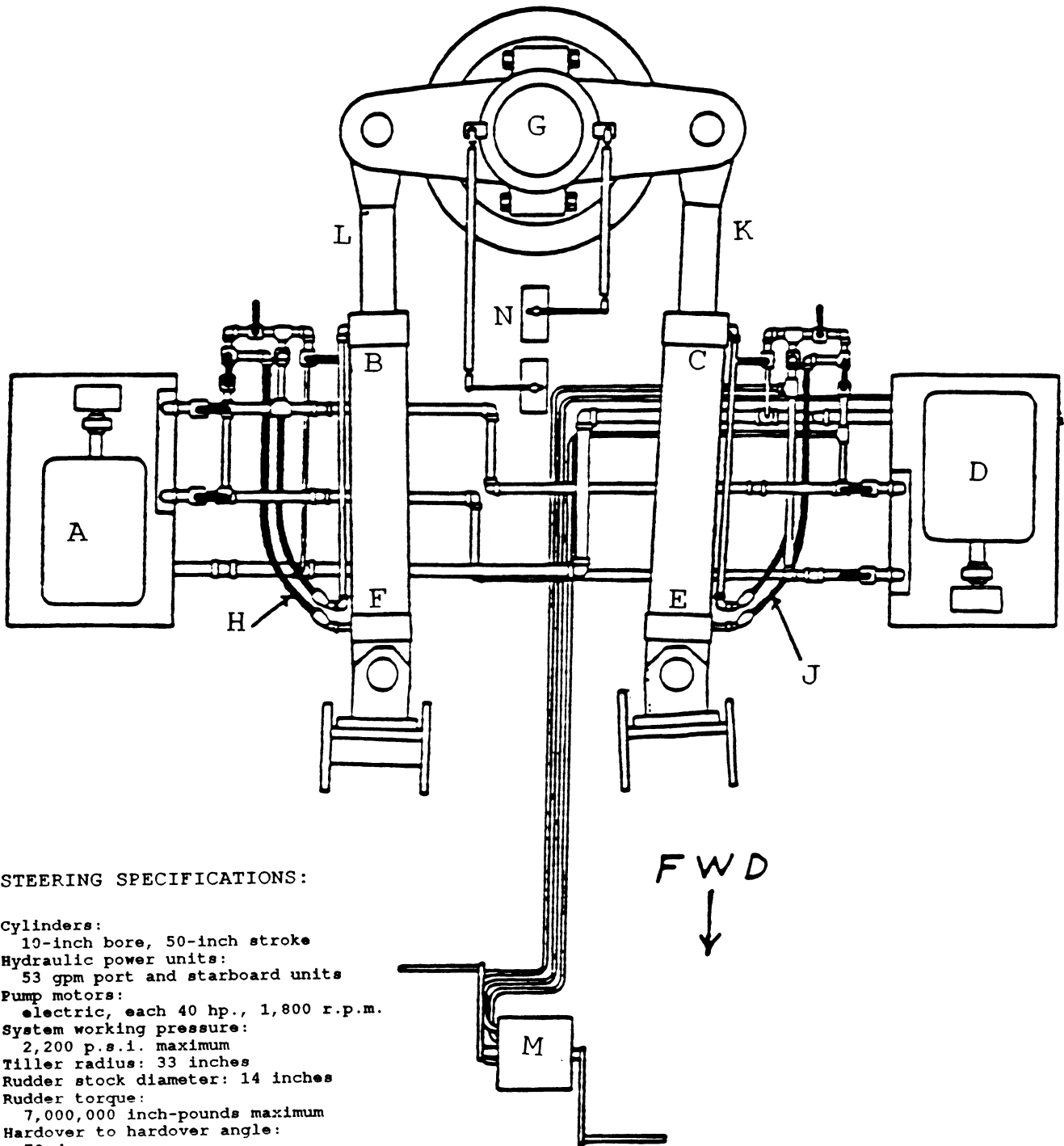
GS-0135



GS-0136



GS-0137

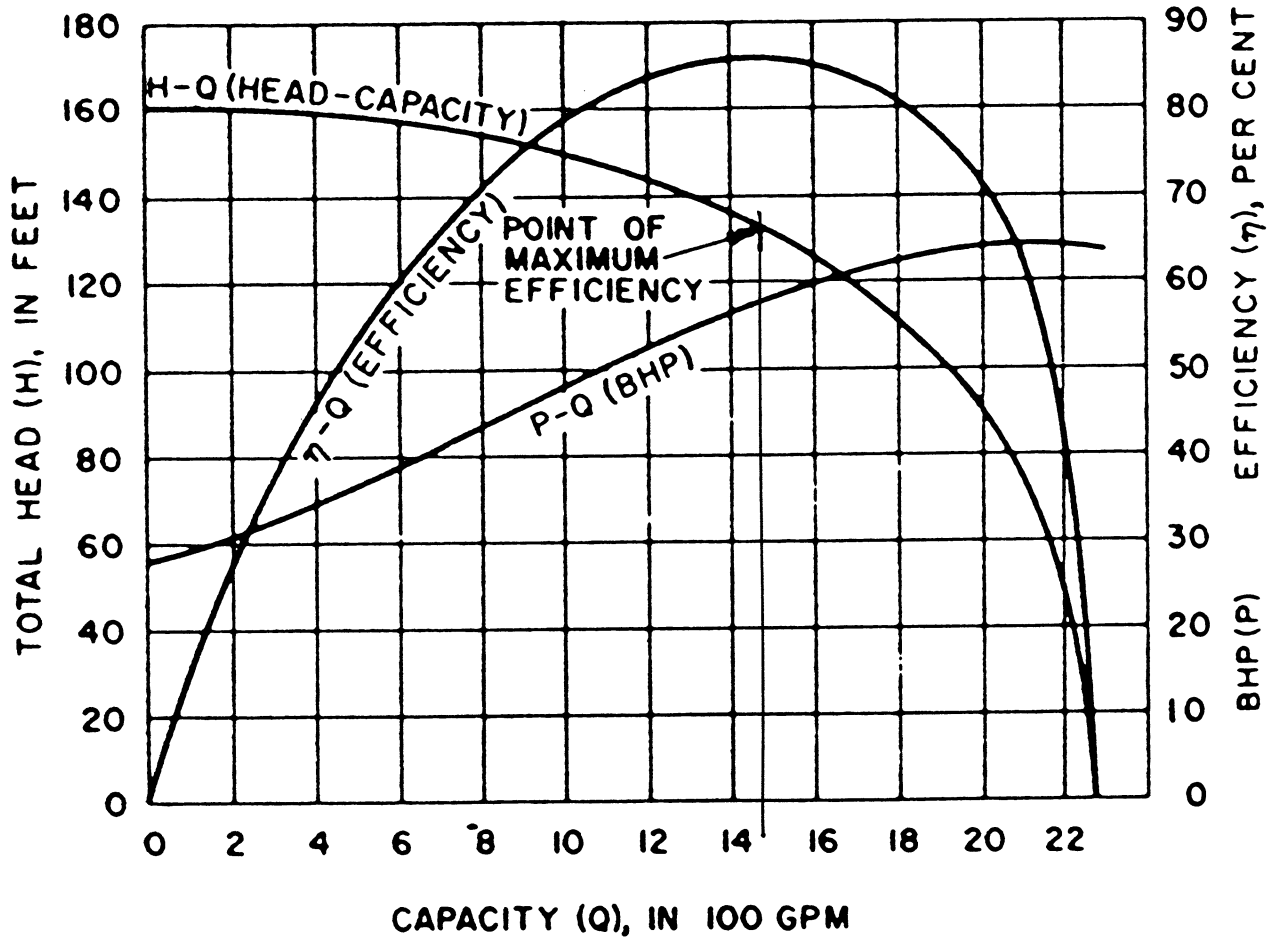


STEERING SPECIFICATIONS:

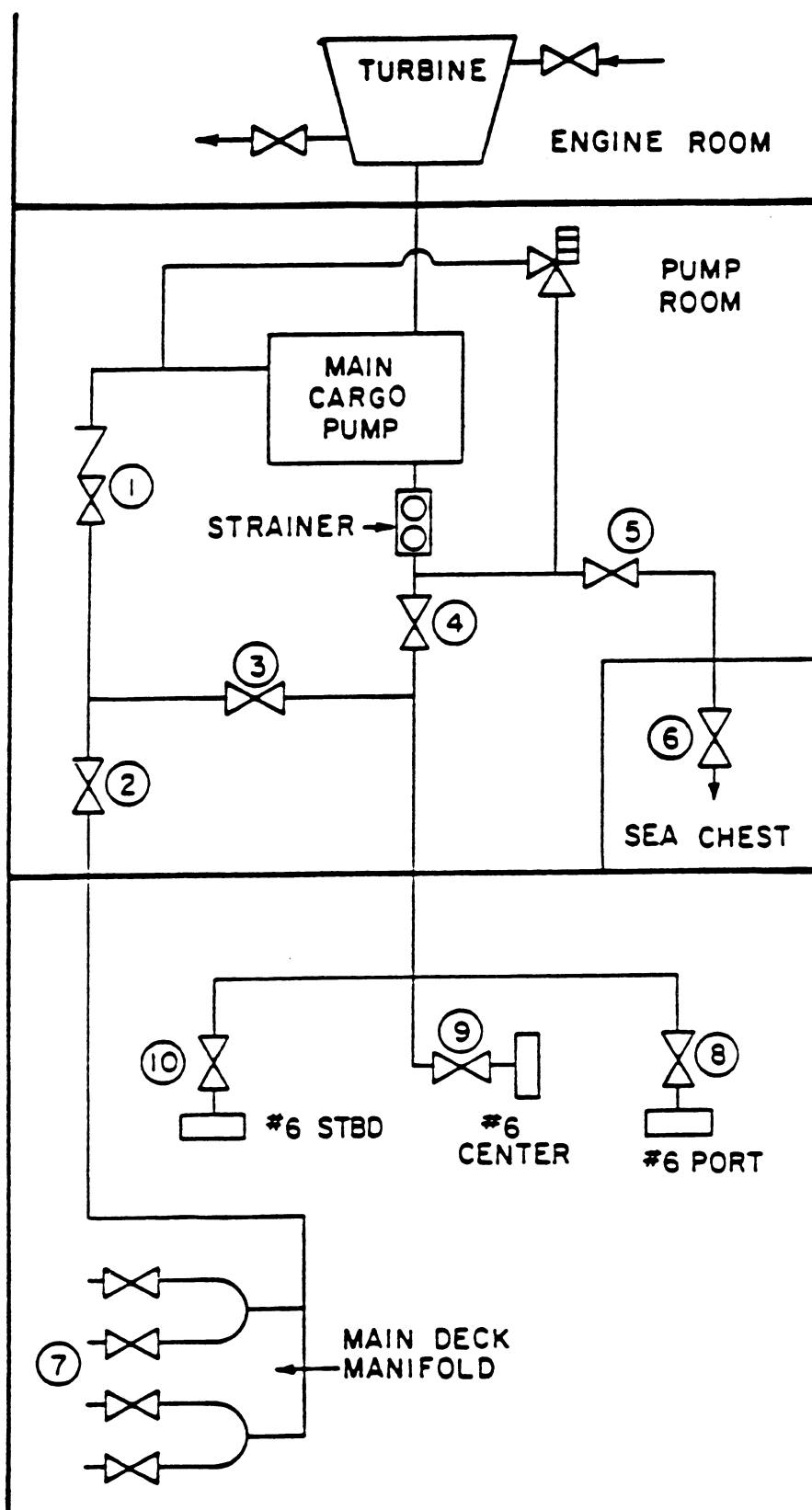
- Cylinders:
10-inch bore, 50-inch stroke
- Hydraulic power units:
53 gpm port and starboard units
- Pump motors:
electric, each 40 hp., 1,800 r.p.m.
- System working pressure:
2,200 p.s.i. maximum
- Tiller radius: 33 inches
- Rudder stock diameter: 14 inches
- Rudder torque:
7,000,000 inch-pounds maximum
- Hardover to hardover angle:
70 degrees
- Hardover to hardover time:
28 seconds for 65 degrees

GS-0138

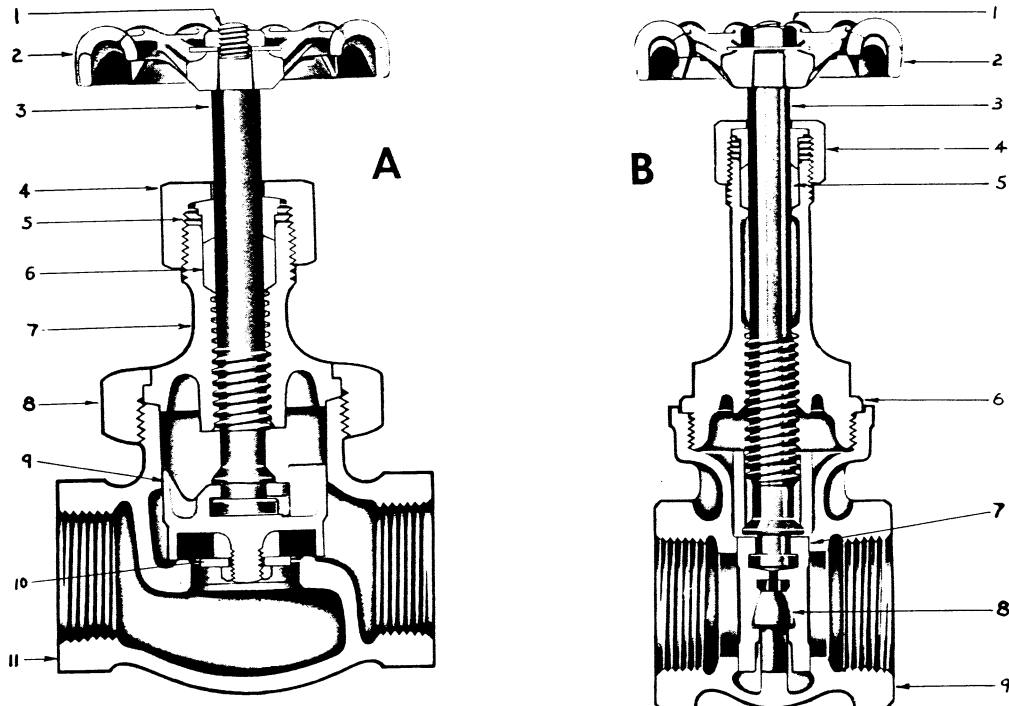
Typical constant-speed characteristic curves for a high-specific-speed pump



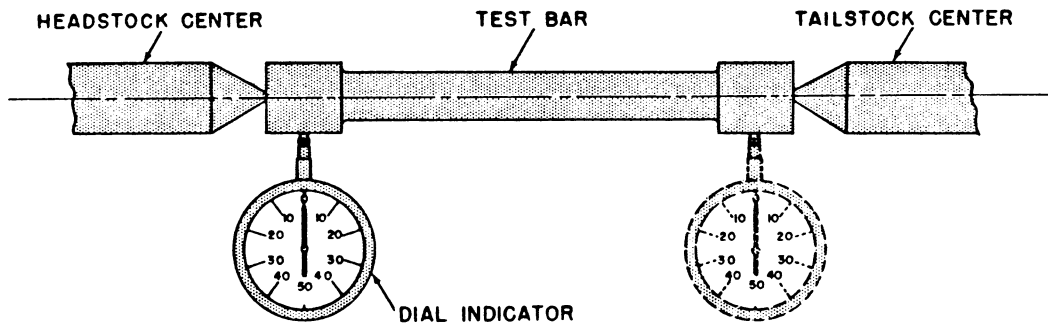
GS-0139



GS-0140

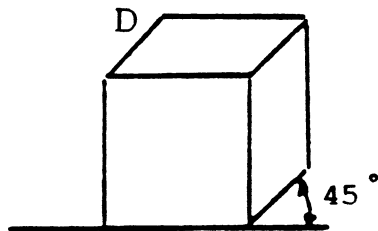
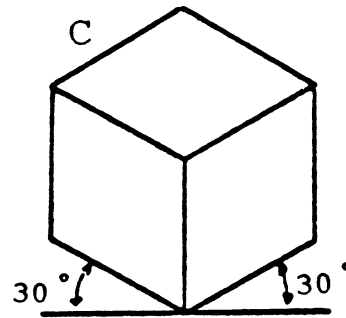
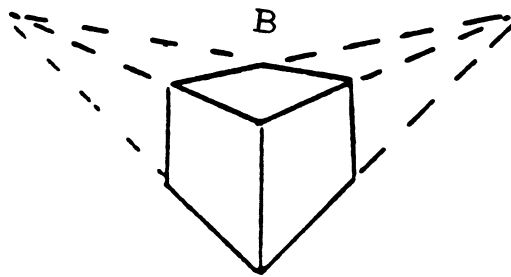
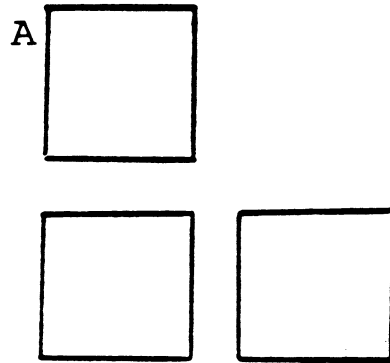


GS-0141

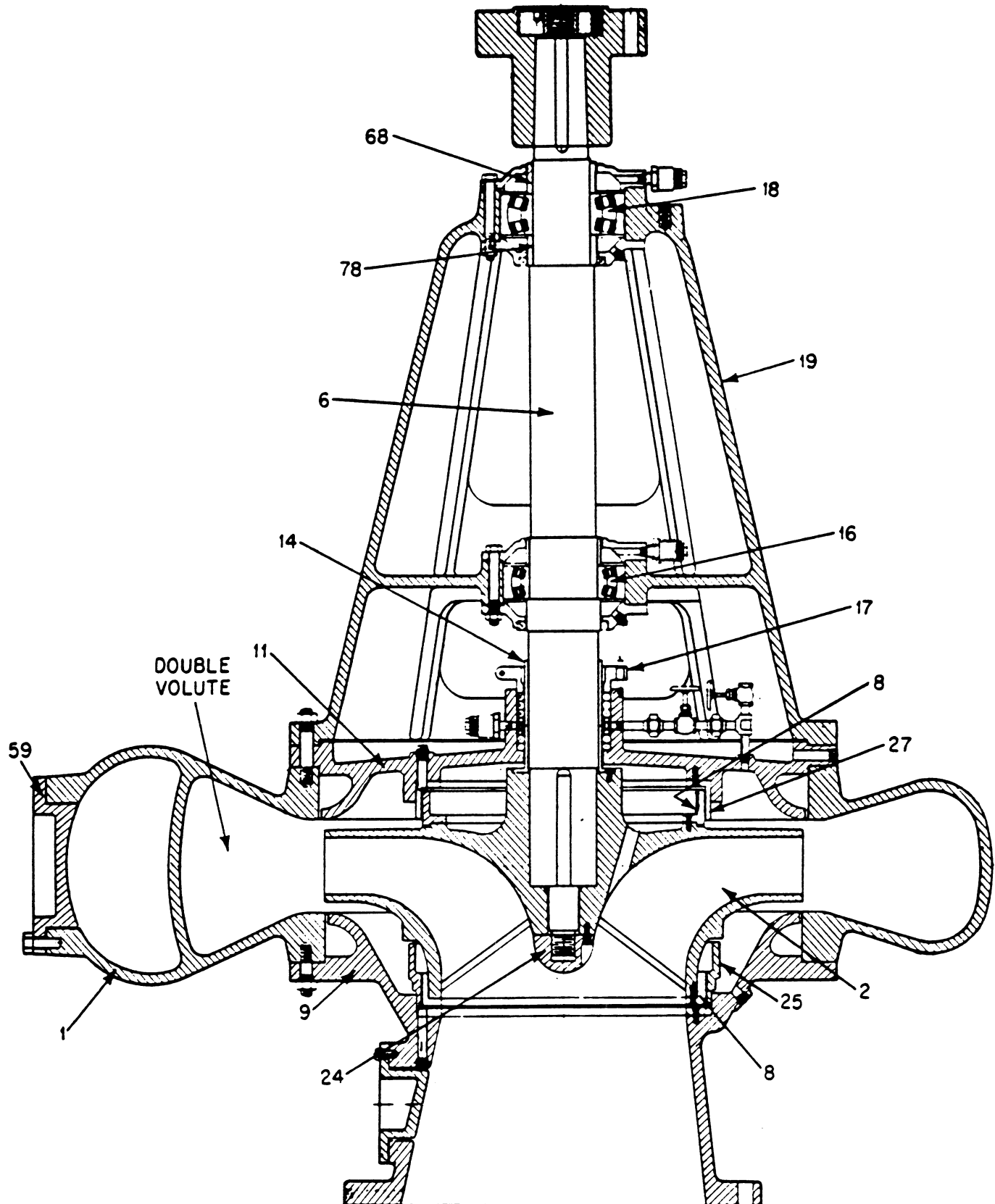


Alignment of lathe centers with a dial indicator.

GS-0142



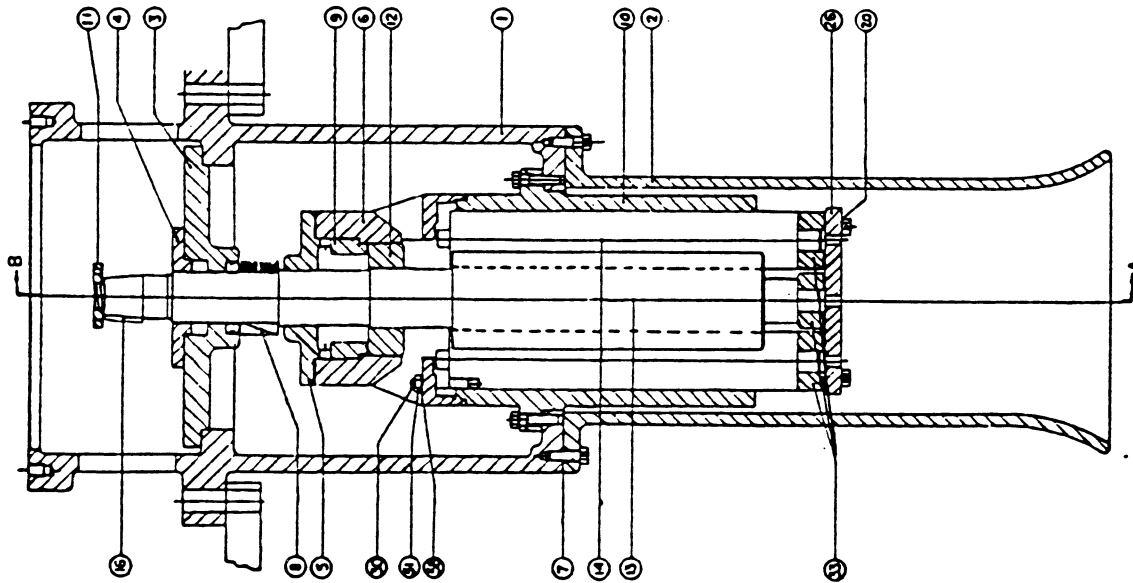
GS-0143



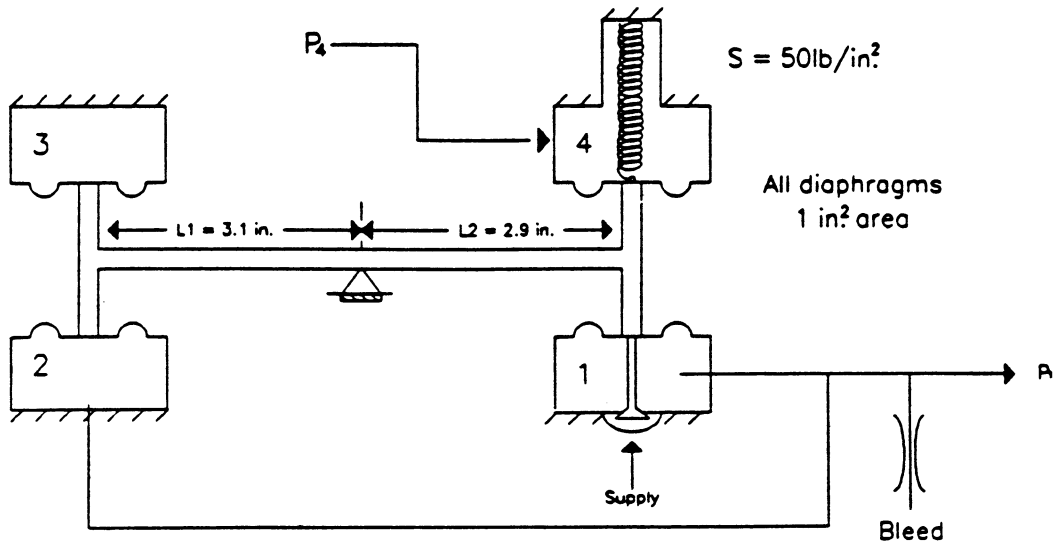
GS-0144

LIST OF MATERIAL FOR ONE UNIT

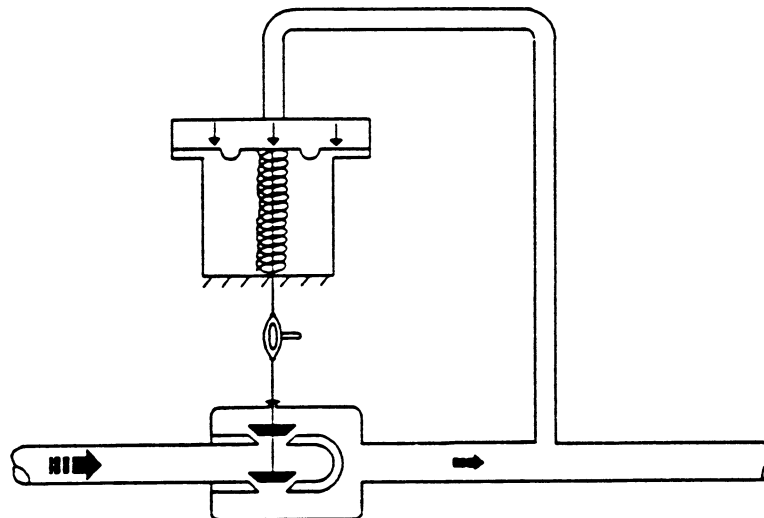
PC NO	NAME	MATERIAL
1	PUMP CASE	CAST STEEL
2	INLET BELL	CAST STEEL
3	SEAL HOUSING	CAST STEEL
4	PACKING GLAND	GUN METAL
5	BEARING RETAINER	BEARING BRONZE
6	BALANCE ROTOR HOUSING	BEARING BRONZE
7	GASKET	PLANT FIBRE
8	MECHANICAL SEAL FOR 2, 3, 8" DIA SHAFT	STEEL & SYN RUBBER
9	SPACER	BEARING BRONZE
10	ROTOR HOUSING	BEARING BRONZE
11	CHECK NUT	STEEL
12	BALANCE PISTON	STEEL
13	POWER ROTOR	STEEL
14	CLER ROTOR	STEEL
15	SOC HD SET SCREW 1/4 - 20 x 7/16" LONG	STEEL
16	KEY	STEEL
17	BOLT 3/8" - 16 x 1" LONG	STEEL
18	BOLT 3/8" - 16 x 1 1/4" LONG	STEEL
19	EXTERNAL TOOTH LOCKWASHER	STEEL
20	EXTERNAL TOOTH LOCKWASHER	STEEL
21	BOLT 1/4" - 13 x 1 1/4" LONG	STEEL
22	SOC. HD PIPE PLUG - 1/8" SIZE	BRASS
23	INLET BELL	CAST STEEL
24	BOLT 1/4" - 13 x 1 1/4" LONG	STEEL
25	SPACER	STEEL PIPE
26	THRUST PLATE	STEEL
27	GASKET	PLANT FIBRE
28	OIL BALANCE TUBE	STEEL
29	O RING	SYNTHETIC RUBBER
30	STUD 5/8" - 11 x 3 1/4" LONG	STEEL
31	NUT 5/8" - 11" THDS.	STEEL
32	BOLT 1/4" - 13 x 4 1/4" LONG	STEEL
33	THRUST SHOE	BEARING BRONZE
34	LACING WIRE 1/16" DIA. x 16 FT. LG. (CUT TO SUIT)	MONEL
35	PKG RING FOR 2 3/8" DIA SHAFT 1/4" SQ	SYMBOL 430
36	BOLT 3/8" - 16" x 1 3/4" LONG	STEEL
37	STUD 3/4" - 10 x 3" LONG	STEEL
38	EXTERNAL TOOTH LOCKWASHER	STEEL
39	SPRING PIN 3/32" x 3/8" LONG	STEEL
40	NAME PLATE (SERIAL)	BRASS SHEET
41	NAME PLATE (CAUTION)	BRASS SHEET
42	NAME PLATE (ROTATION)	BRASS SHEET



GS-0145

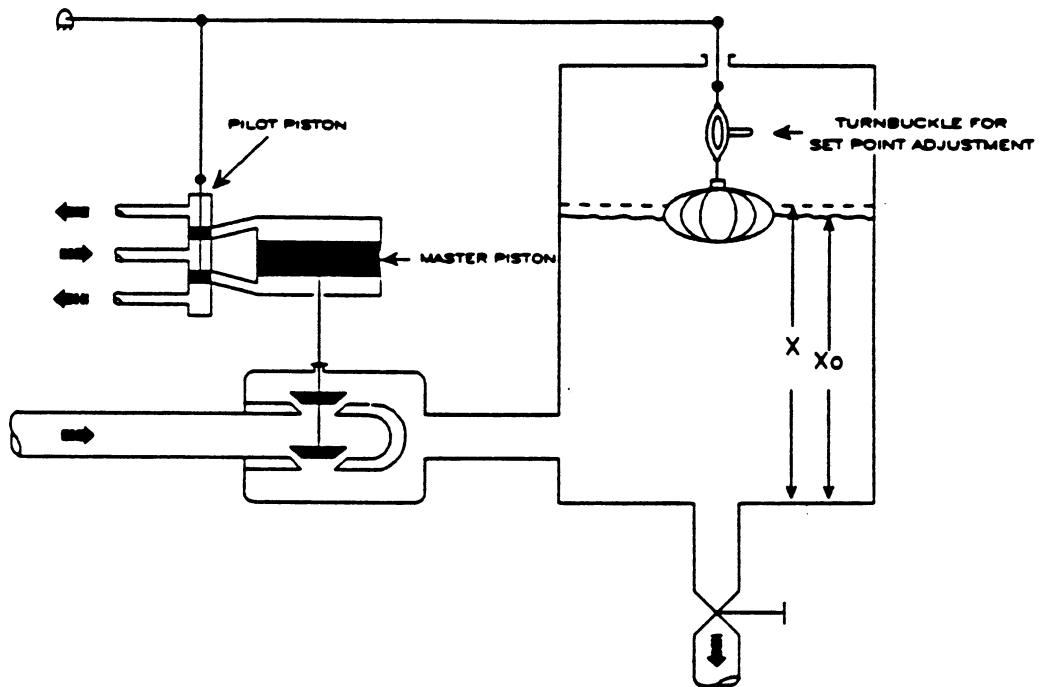


GS-0146

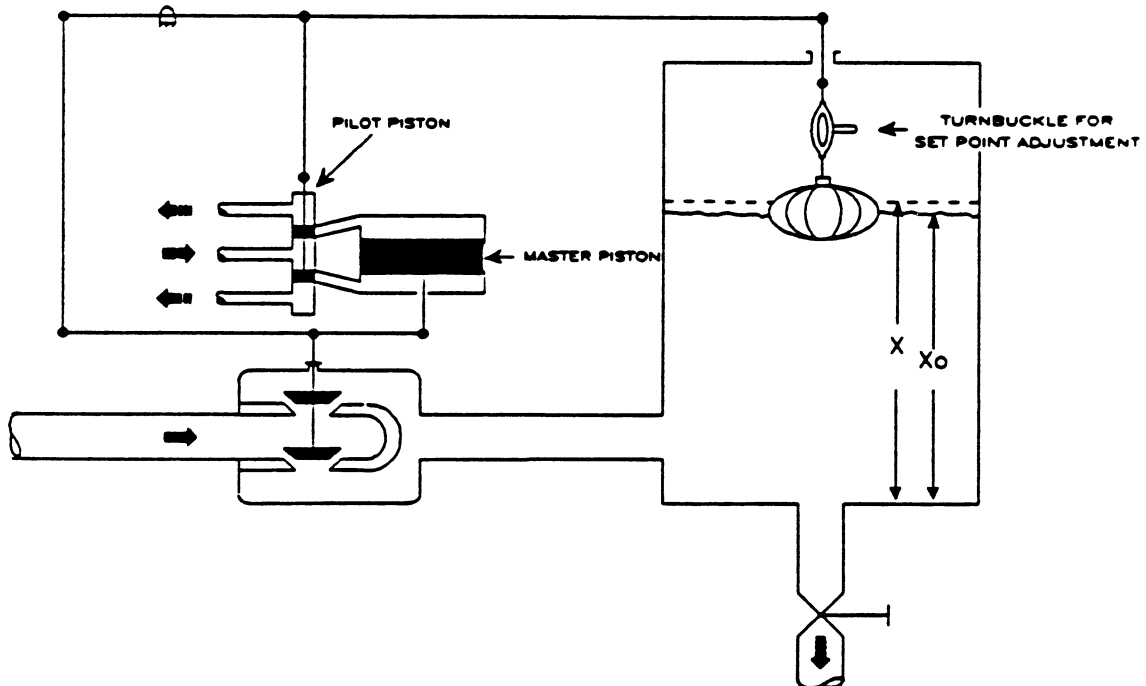


2-101

GS-0147



GS-0148



GS-0149

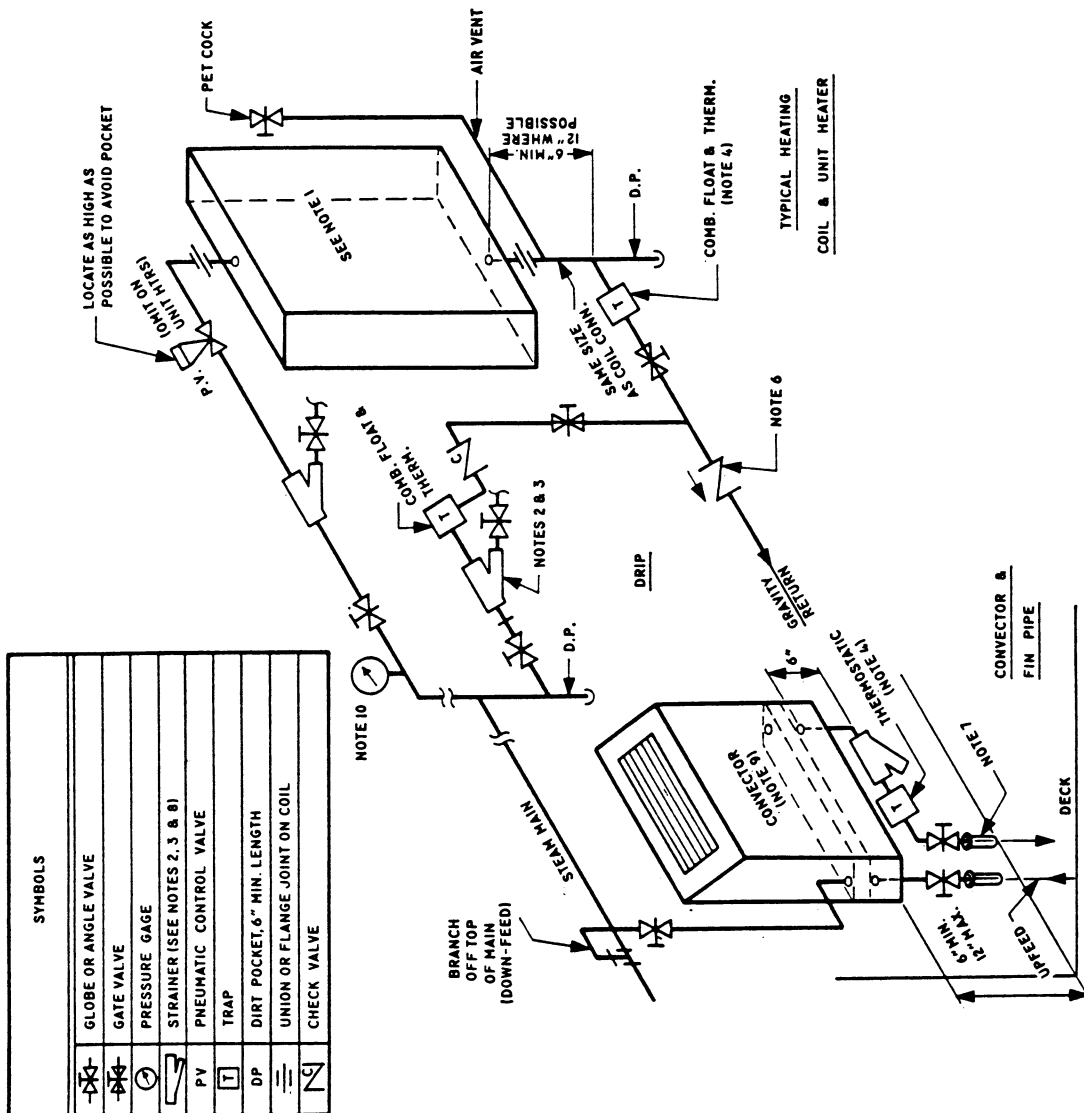
Table 8
Pounds per U.S. Gallon
and U.S. Gallons per Pound

ASTM-IP				30-45° API				
API Gravity 60° F.	Pounds per U.S. Gallon at 60° F.	U.S. Gallons at 60° F. per Pound	API Gravity 60° F.	Pounds per U.S. Gallon at 60° F.	U.S. Gallons at 60° F. per Pound	API Gravity 60° F.	Pounds Per U.S. Gallon at 60° F.	U.S. Gallons per Pound at 60° F.
30.0	7.296	0.13707	35.0	7.076	0.14132	40.0	6.870	0.14557
30.1	7.291	0.13715	35.1	7.072	0.14140	40.1	6.866	0.14565
30.2	7.287	0.13724	35.2	7.068	0.14149	40.2	6.862	0.14574
30.3	7.282	0.13732	35.3	7.064	0.14157	40.3	6.858	0.14582
30.4	7.278	0.13741	35.4	7.059	0.14166	40.4	6.854	0.14591
30.5	7.273	0.13749	35.5	7.055	0.14174	40.5	6.850	0.14599
30.6	7.269	0.13758	35.6	7.051	0.14183	40.6	6.846	0.14608
30.7	7.264	0.13768	35.7	7.047	0.14191	40.7	6.842	0.14616
30.8	7.260	0.13775	35.8	7.042	0.14200	40.8	6.838	0.14625
30.9	7.255	0.13783	35.9	7.038	0.14208	40.9	6.834	0.14633
31.0	7.251	0.13792	36.0	7.034	0.14217	41.0	6.830	0.14642
31.1	7.246	0.13800	36.1	7.030	0.14225	41.1	6.826	0.14650
2	7.242	0.13809	36.2	7.026	0.14234	41.2	6.822	0.14659
	7.237	0.13817	36.3	7.021	0.14242	41.3	6.818	0.14667
		0.13826	36.4	7		41.4	6.814	0.1467
							6.810	

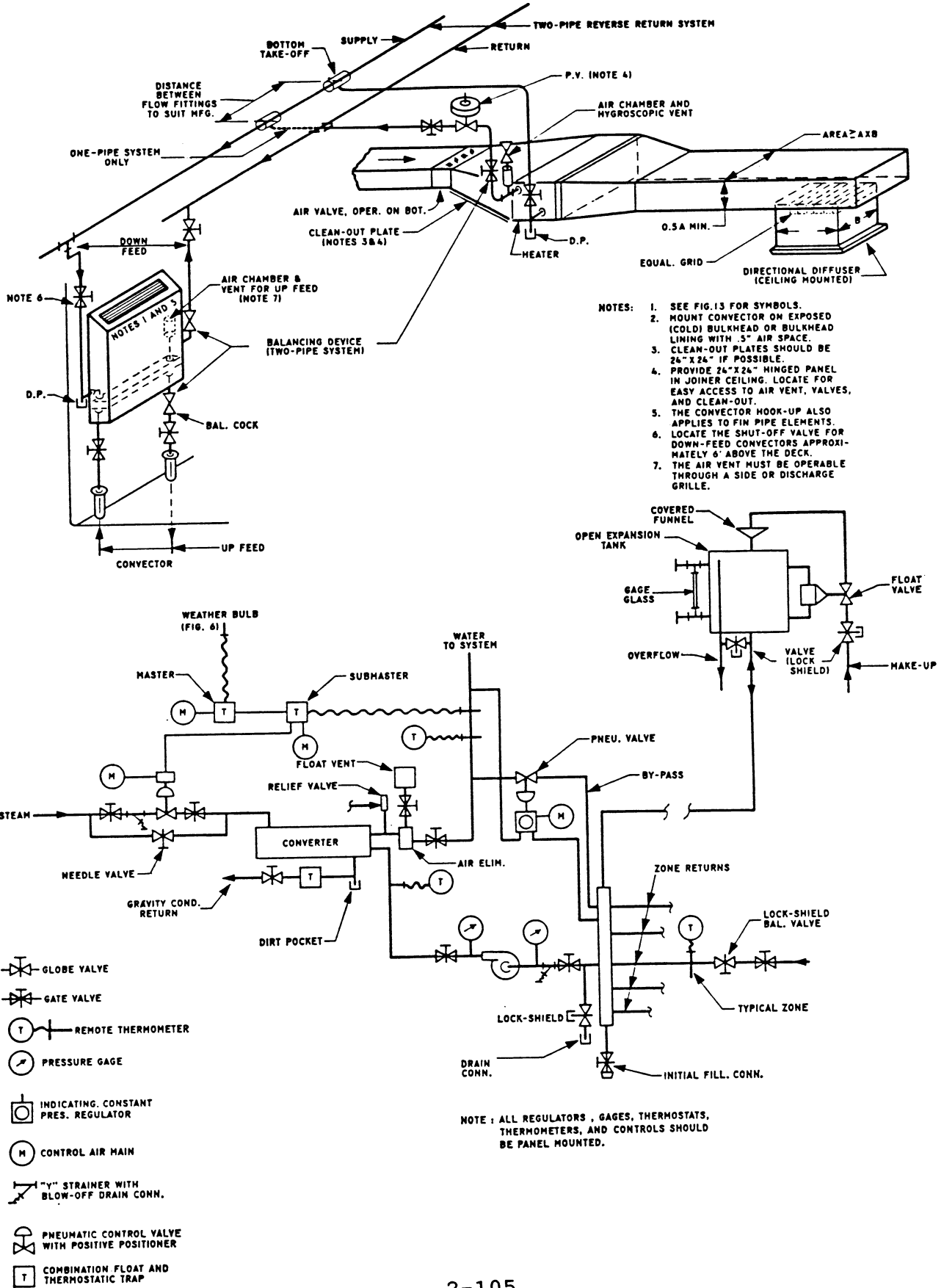
GS-0150

NOTES

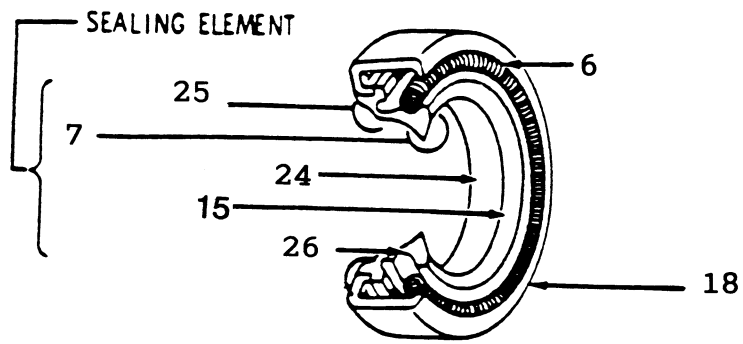
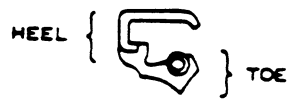
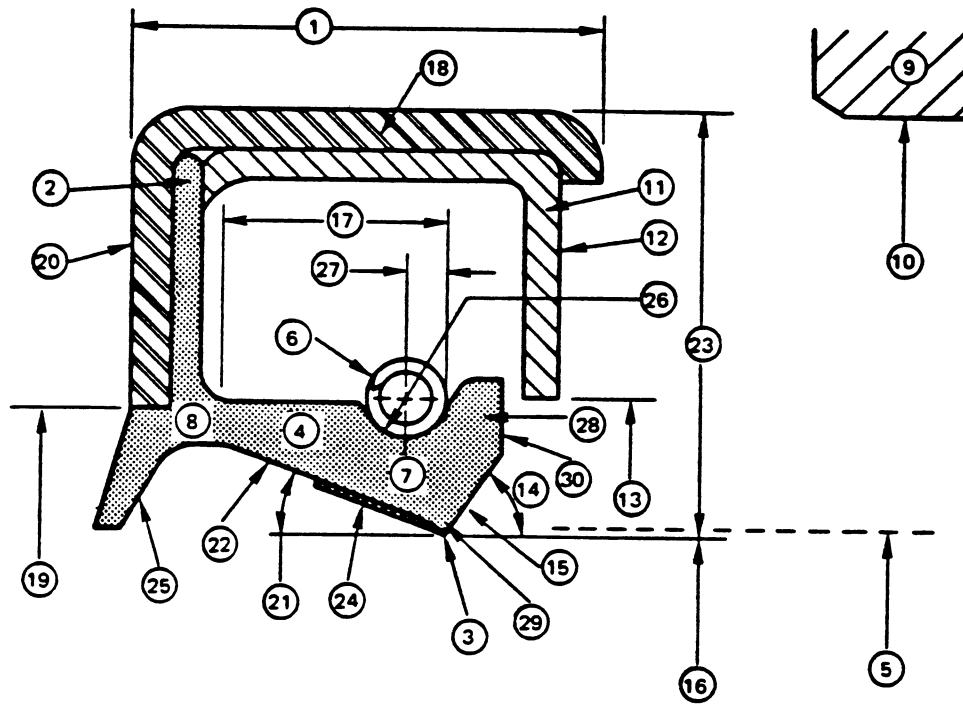
1. WHEN TWO OR MORE HEATING COILS ARE REQUIRED, PROVIDE DRAINS FOR EACH COIL AS INDICATED.
2. PIPE STRAINER TO OPEN DRAIN WITHIN SIGHT OF THE VALVE.
3. PROVIDE BLOWOFF COCKS IN EQUIPMENT SPACES ONLY.
4. PROVIDE BARE PIPE COOLING LEG BETWEEN COIL AND TRAP AT LEAST 24" LONG.
5. PROVIDE STRAINER AHEAD OF TRAP ON UNIT HEATERS.
6. PROVIDE CHECK VALVE IN RETURN ONLY WHERE CONDENSATE MUST BE LIFTED.
7. PROVIDE STUFFING TUBES IN WET SPACES ONLY, DESIGNED TO THERMALLY ISOLATE PIPE FROM STRUCTURE. AT ALL OTHER PENETRATIONS, PROVIDE OVERSIZED CUTS WITH SUITABLE SLEEVES LARGE ENOUGH TO PASS THE FULL THICKNESS OF STANDARD PIPE INSULATION.
8. ALL STRAINERS SHALL BE OF THE SELF-CLEANING TYPE.
9. MOUNT THE CONVECTOR ON THE EXPOSED (COLD) BULKHEAD OR BULKHEAD LINING, WITH A 0.5-IN. AIR SPACE.
10. PROVIDE ONE PRESSURE GAGE IN EACH FAN EQUIPMENT ROOM.



GS-0151

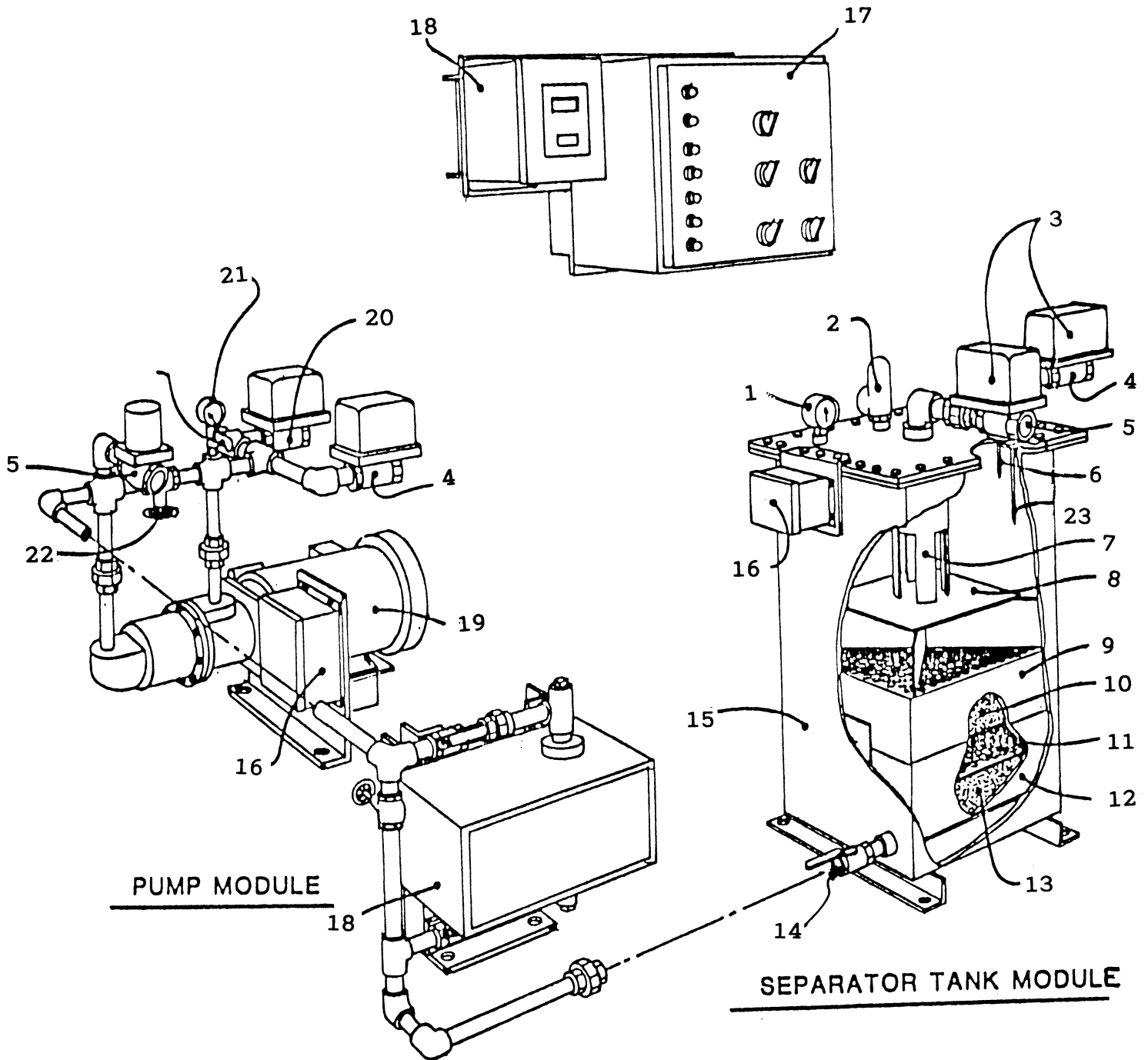


GS-0152



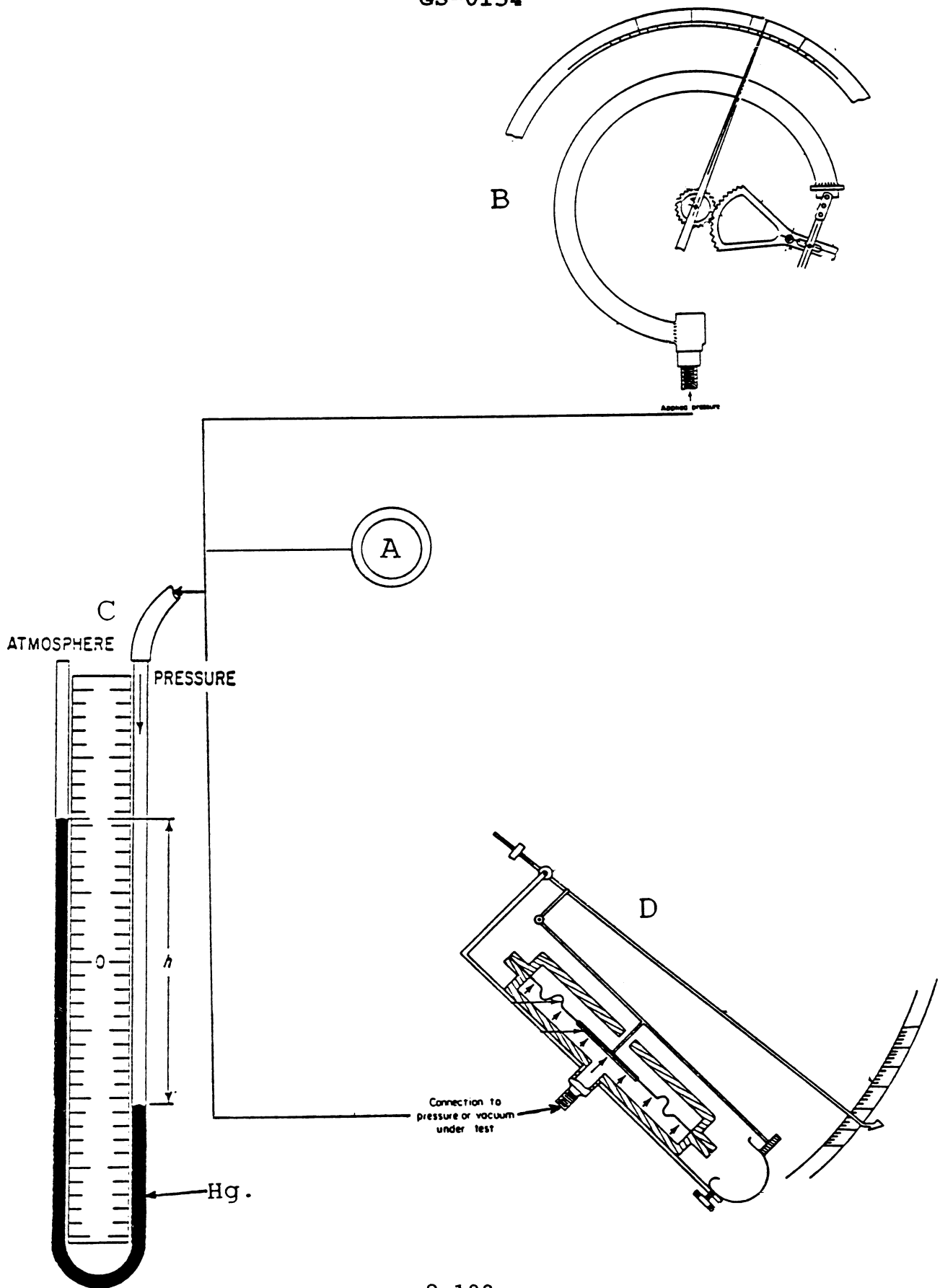
GS-0153

CONTROL PANEL ASSY.

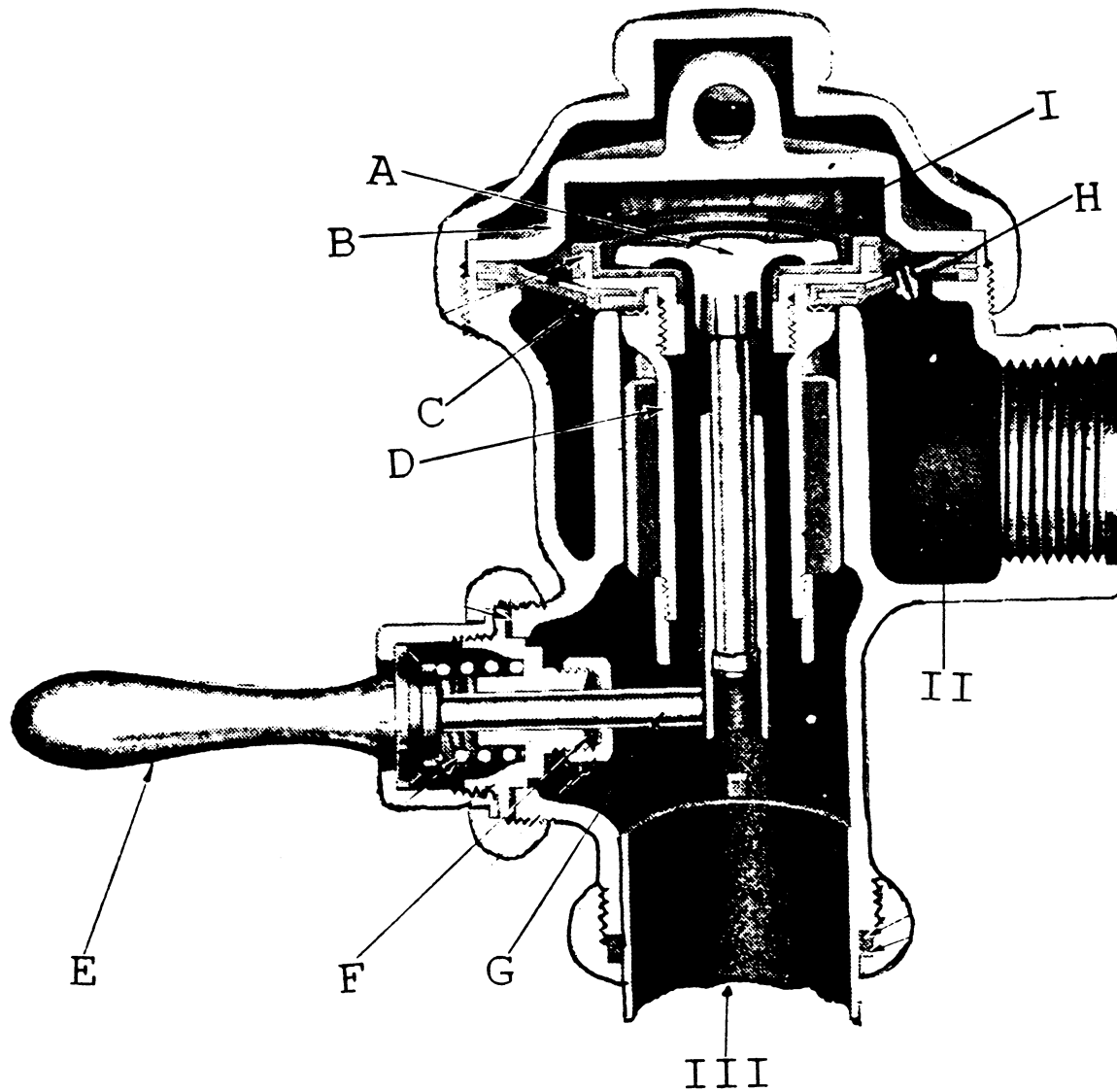


(COURTESY OF PARMATIC POLLUTION CONTROL CORP.)

GS-0154

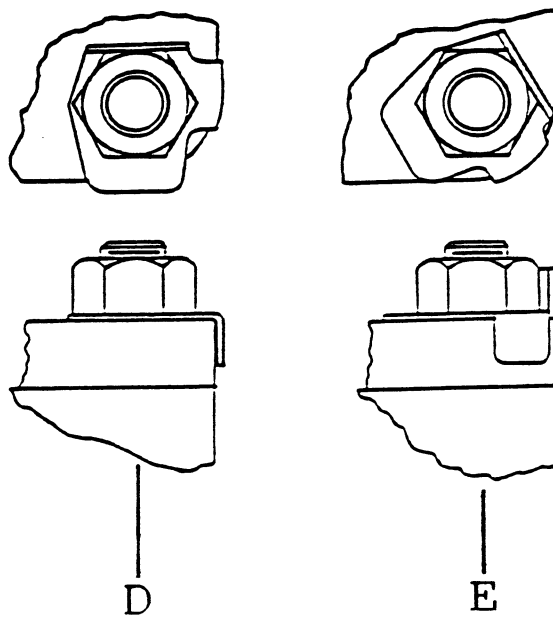
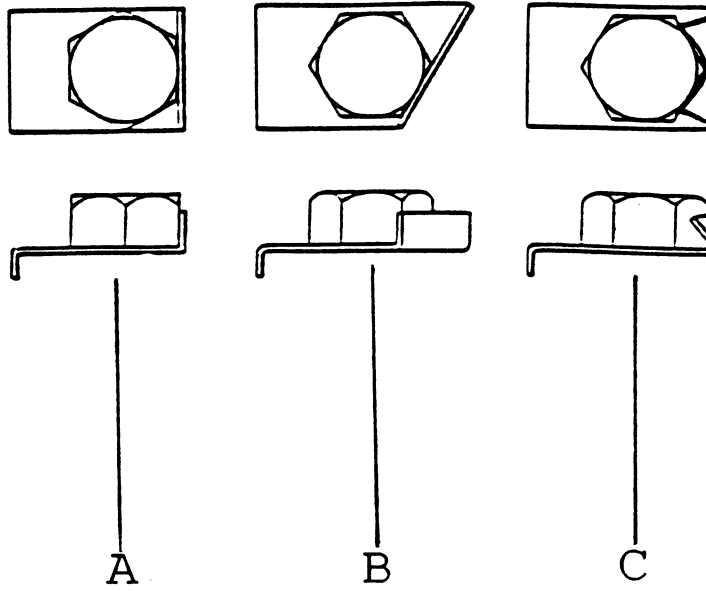


GS-0155



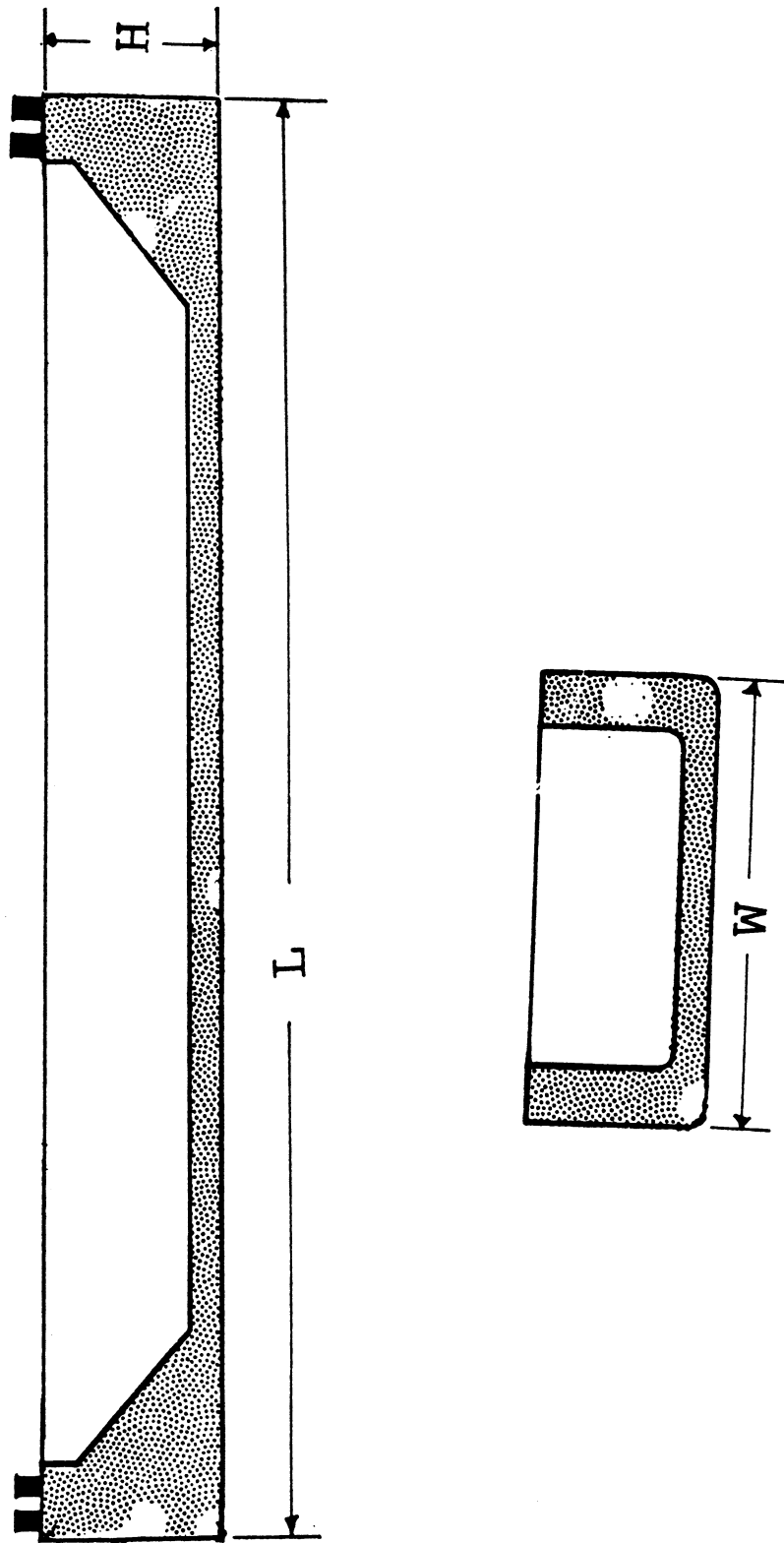
(COURTESY OF SLOAN VALVE COMPANY)

GS-0156



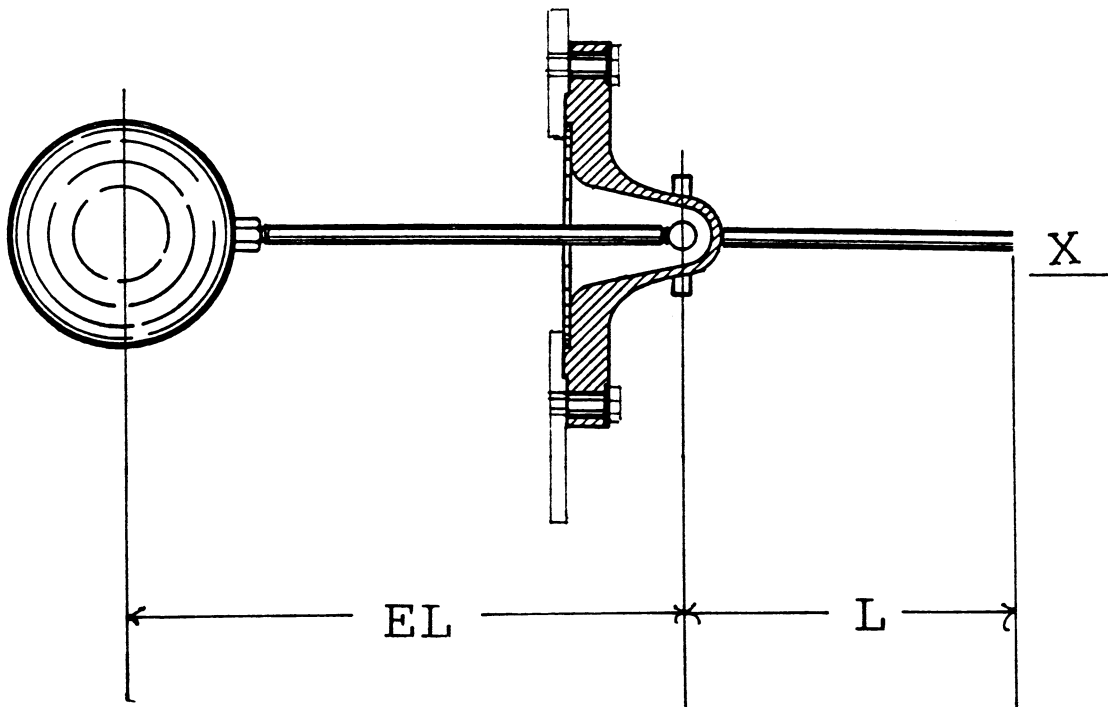
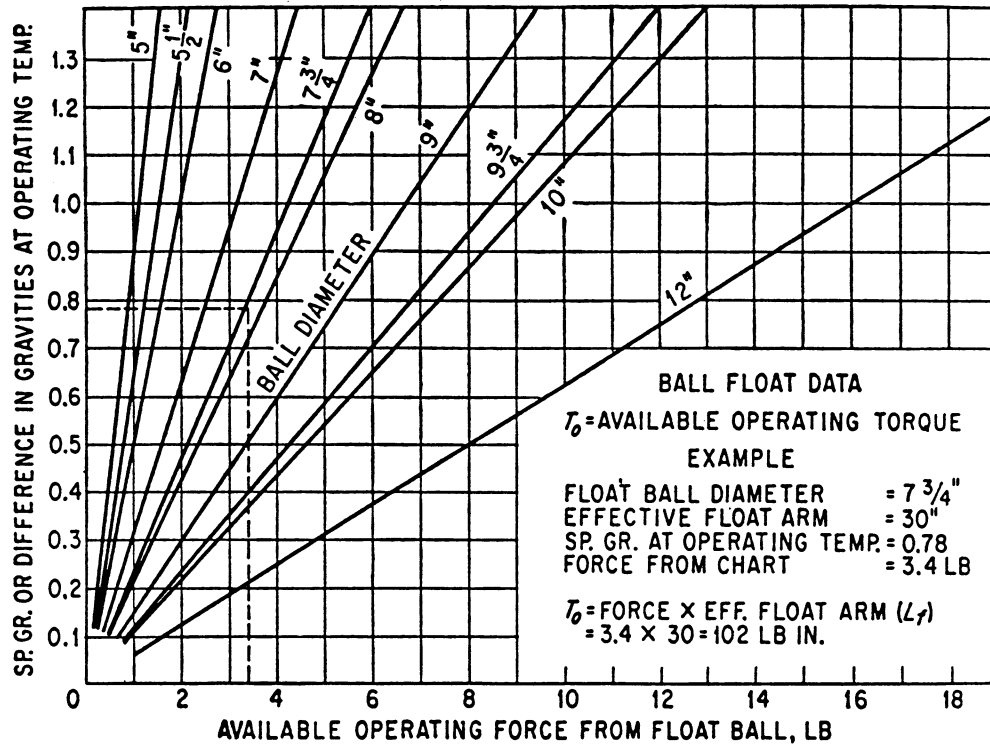
GS-0157

COMMON BARGE



2-111

GS-0158



GS-0159

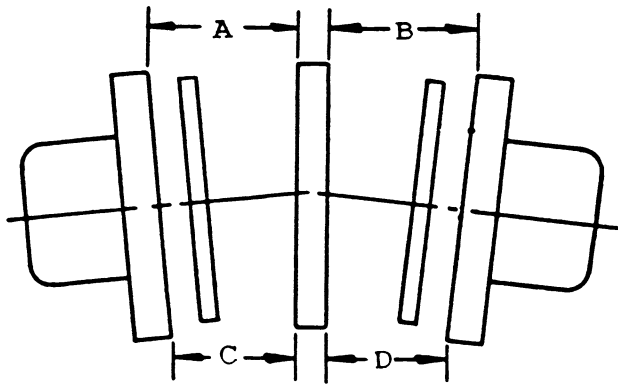


Figure 1

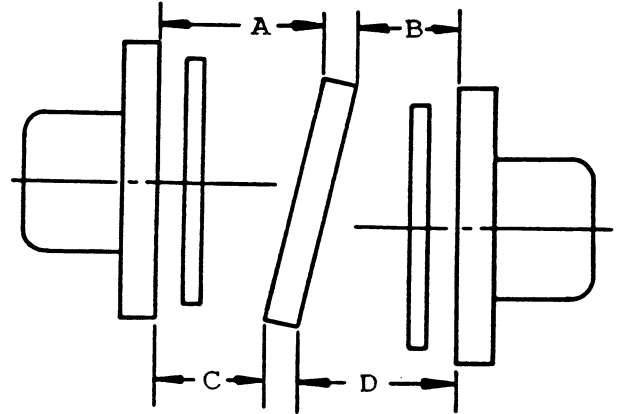


Figure 2

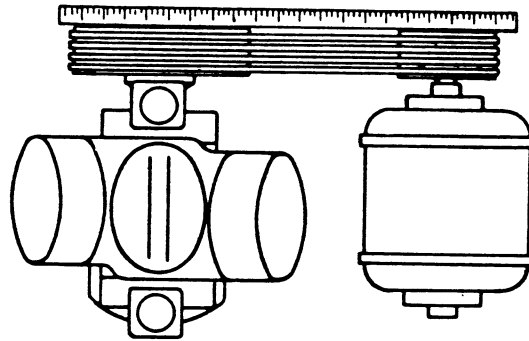


Figure 3

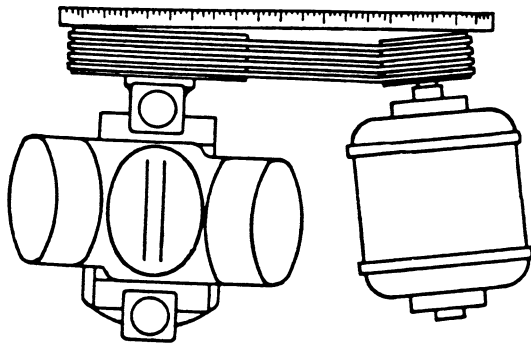


Figure 4

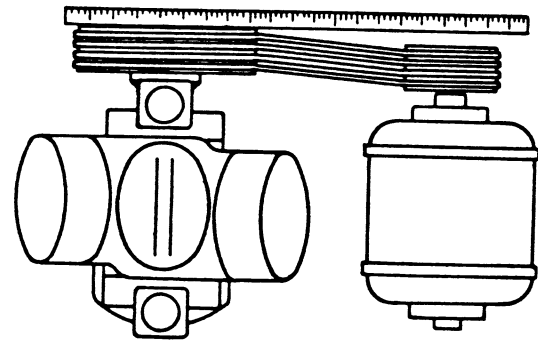
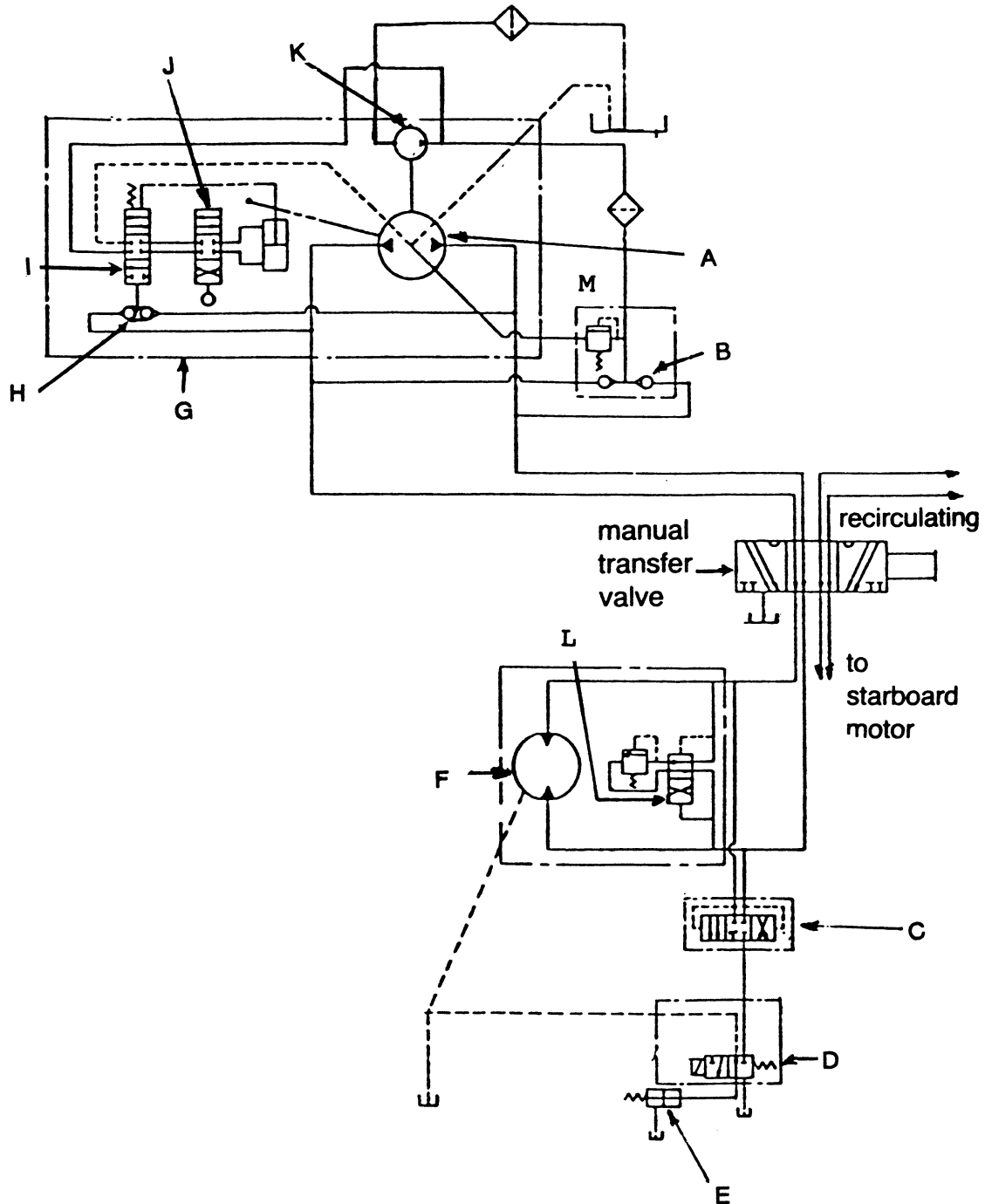
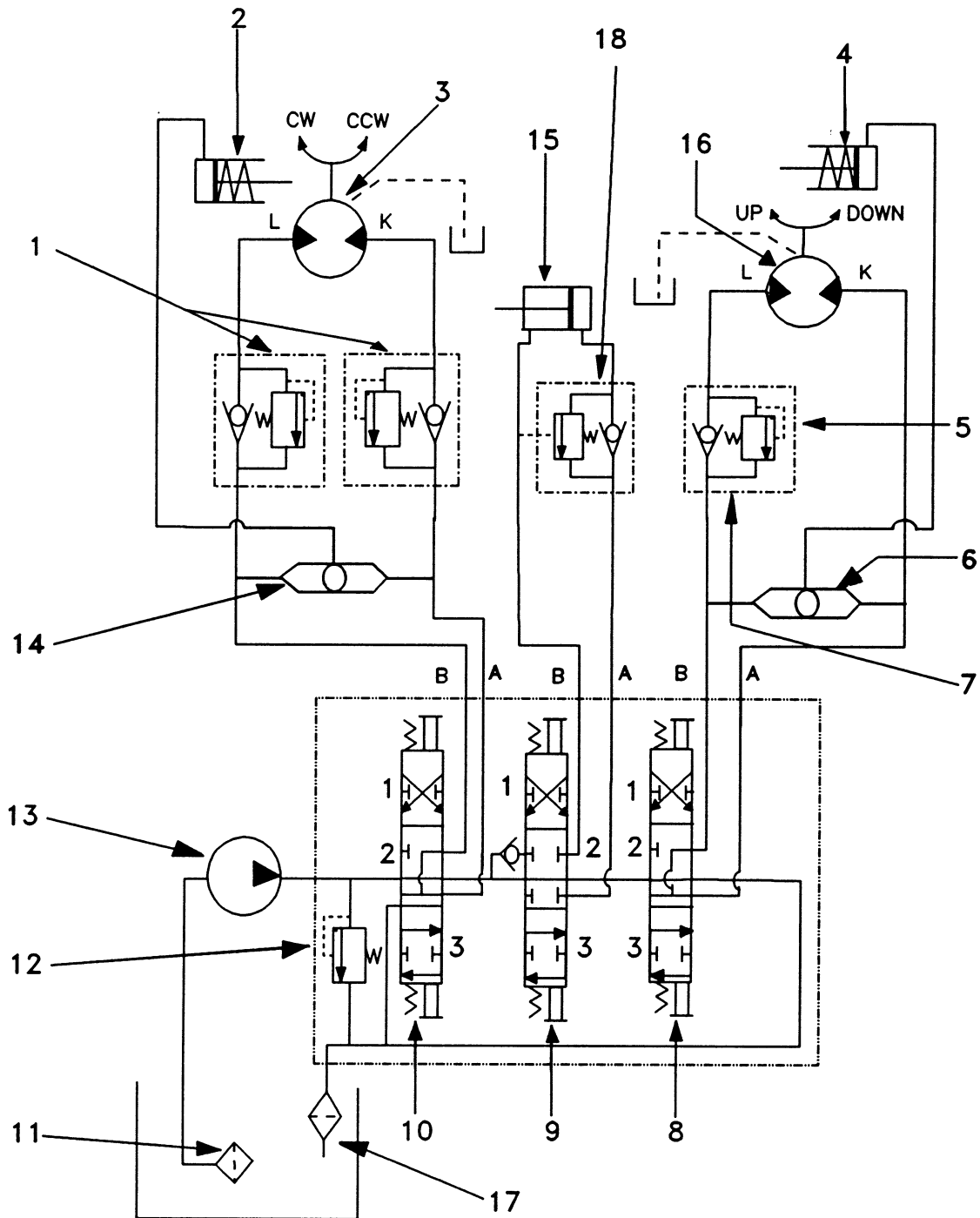


Figure 5

GS-0160



GS-0161



GS-0162

