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VULCAN IRON WORKS INC.

EXECUTIVE AND SALES OFFICES

2725 N. AUSTRALIAN AVE.

Phone: 305 842-1515

WEST PALM BEACH, FLORIDA 33407

TWX 510 952-6668



PROTOTYPE
IPH-16 HAMMER
SPECIFICATIONS
MODEL #685016JRM
SERIAL NO. FH6000

PERFORMANCE DATA

Rated Striking Energy - Max. - Ft. Lbs.	50,000
Blows Per Minute - Max. Rated	60
Steam Pressure - PSIG @ Hammer	135
Air Pressure - PSIG @ Hammer	135
Steam Consumption - Lbs./Hr. From & @ 212° F.	6,465
Air Consumption - CFM - Adiabatic Compression	1,250
Maximum Stroke - Ft.	3
Boiler H.P. - ASME Rating	200
√EW Rating	28,867

DIMENSIONAL DATA

Diameter of Piston - Inches	17
Area of Piston - Square Inches	226.98
Length of Hammer - W/Stabber	18' - 1 3/4"
Length of Hammer - W/O Stabber	14' - 1 3/4"
Width of Hammer - Max. - Inches	70
Depth of Hammer - Max. - Inches	79 1/4
Pile Sizes - OD - Inches	30, 36, 42, 48
Size of Hose - Inches	3

WEIGHT DATA

Weight of Striking Parts - Lbs.	16,666
Net Weight - Lbs.	44,000

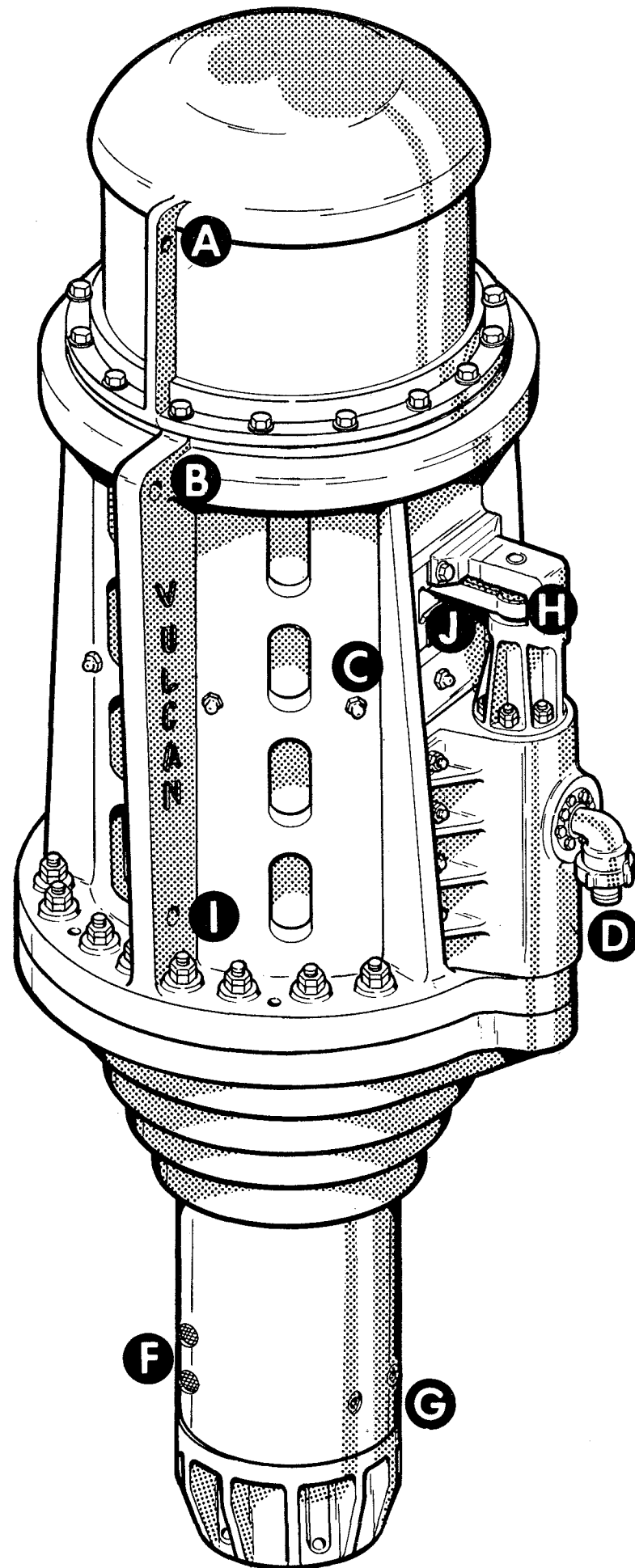
SHIPPING DATA

Shipping Weight - Lbs.	48,000
Shipping Dimensions - Inches	240 X 98 X 89
Shipping Cube - Cu. Ft.	1212

**LUBRICATION
AND
GENERAL
INSTRUCTIONS**

IPH-16

INSTRUCTIONS



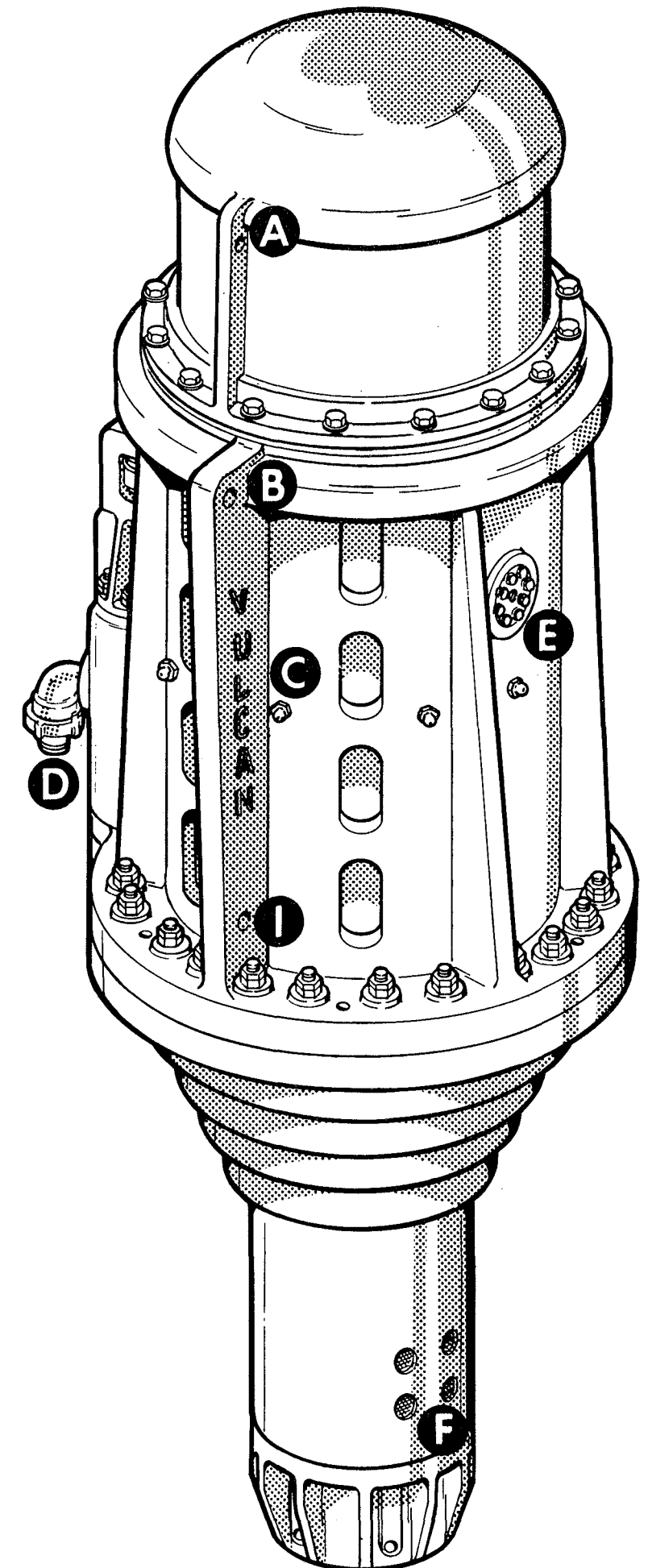
- A** DO NOT attempt to lift the hammer by the lugs indicated at these locations. These lugs are for the purpose of lifting and handling the Cover Head.
- B** The lugs provided at these locations are for the purpose of handling and lifting the hammer. Holes are provided in the lugs for either shackle or rope sling. DO NOT lift or handle the hammer at any other point.
- C** Around the upper Cylinder Housing there are eight Grease Fittings for ram lubrication. Grease should be applied at these points every two hours of operation.
- D** Steam cylinder oil should be introduced into the hammer at this point through the hose along with the steam or air. The swivel joint should be grease lubricated at least once per shift.
- E** Before placing hammer in operation, remove the Ram Retaining and Transit Pin and install Guide Pin. The Guide Pin should be thoroughly grease lubricated at the time of installation.
- F** There are six Cylinder Housing relief port plugs at the lower end of the Cylinder. These plugs have stainless steel screens to prevent ingress of foreign matter. These screens should be checked frequently to make sure that they are free and clean.
- G** There are two Cylinder Housing Drain Plugs for condensate blow out and inspection. They should be checked for tightness once a day.
- H** Lubricate outer end of Valve Lever as well as Valve Lever Spacers with specified lubricant with either a rose gun or brush. This should be done once every two hours of operation.
- I** Located on opposite sides of the Upper Cylinder Housing are two holes through the vertical lifting rib. These holes are for the attachment of tugger or guide lines.
- J** Lubricate the valve lever where it passes through the Valve Lever Bushing in the Upper Cylinder Housing with either a rose gun or brush. This should be done once every two hours of operation.

LUBRICANT SPECIFICATIONS

At "C" "E" "D" use Cascade No. 102-2 Moly-No-Temp grease.

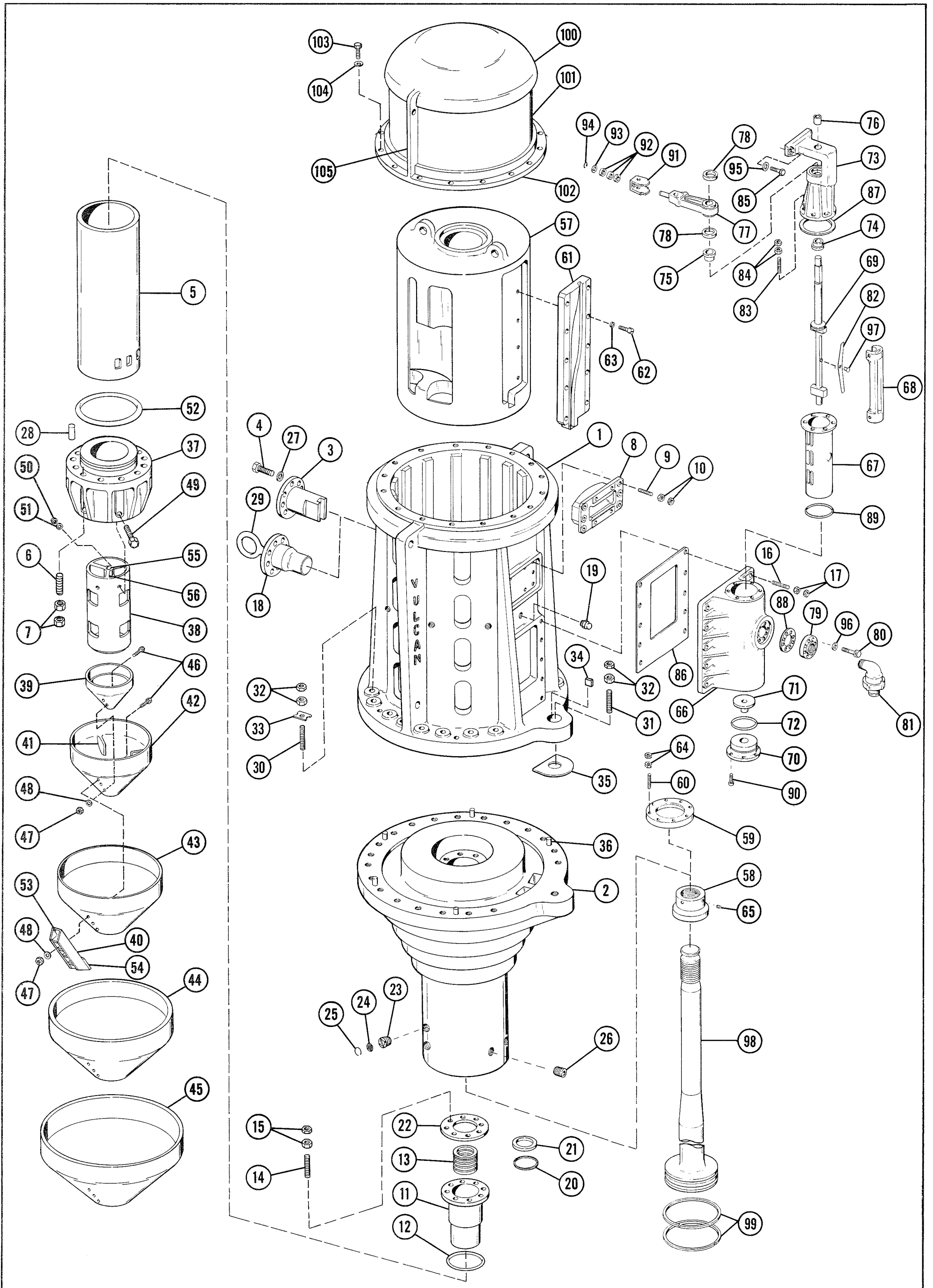
At "D" for cylinder lubrication use Texaco Pinnacle Mineral Steam Oil.

At "H" "J" use Lubriplate APG 90 oil.



EXPLODED PARTS DRAWING

IPH-16





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IPH-16 HAMMER

SUBASSEMBLIES

- SA100U Upper Cylinder Housing Group - Including 100U-1, 101-1, 102-8, 107-1, 108-8, 109-8, 110-8, 117-10, 118-10, 119-10, 120-1, 121-8, 129-8, 131-1.
- SA100L Lower Cylinder Housing Group - Including 100L-1, 103-1, 104-12, 105-12, 106-12, 111-1, 112-1, 113-4, 114-8, 115-8, 116-8, 122-4, 123-5, 124-1, 125-6, 126-6, 127-6, 128-2, 130-2, 132-20, 133-1, 134-21, 135-21, 136-20, 137-1, 138-2, 139-5.
- SA200H Cylinder Head Group - Including 200-1, 212-6, 213-6, 214-6, 215-1.
- SA200S Pile Stabbing Guide Group - Including 201-1, *202-1, *203-24, *204-4, *205-1, 206-1, 207-1, 208-1, 209-16, 210-16, 211-16, *216-48, *217-12, *218-1, *219-3.
- SA300 Ram Group - Including 300-1, 303-8, 304-1, 305-10, 306-10.
- SA400 Valve Gear Group - Including 400-1, 401-1, 402-1, 403-1, 404-1, 405-1, 406-1, 407-1, 408-1, 409-1, 410-1, 411-1, 412-2, 413-1, 414-8, 415-1, 416-1, 417-6, 418-6, 419-6, 420-2, 421-1, 422-1, 423-1, 424-1, 425-6, 426-1, 427-3, 428-1, 429-1, 430-2, 431-8, 432-1.
- SA500 Piston Rod Group - Including 500-1, 501-2, 301-1, 302-1, 307-8, 308-8, 309-4.
- SA600 Cover Head Group - Including *600-1, *601-1, *602-1, 603-16, 604-16, *605-2.

NOTES:

1. Any part indicated by an asterisk (*) is a welded component and cannot be mechanically disassembled.



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IPH-16 HAMMER

REPLACEMENT PARTS

<u>KEY NO.</u>	<u>PART NO.</u>	<u>NAME</u>
1	JM-100U-1	Upper Cylinder Housing
2	JM-100L-1	Lower Cylinder Housing
3	JM-101-1	Guide Pin
4	JM-102-8	Guide Pin Cap Screw
5	JM-103-1	Cylinder Sleeve
6	JM-104-12	Cylinder Head Stud
7	JM-105-12	Cylinder Head Stud Nut - Full
7	JM-106-12	Cylinder Head Stud Nut - Jam
8	JM-107-1	Valve Lever Bushing
9	JM-108-8	Valve Lever Bushing Stud
10	JM-109-8	Valve Lever Bushing Stud Nut - Full
10	JM-110-8	Valve Lever Bushing Stud Nut - Jam
11	JM-111-1	Cylinder Housing Bushing
12	JM-112-1	Cylinder Housing Bushing "O" Ring
13	JM-113-4	Cylinder Housing Bushing Contracting Ring
14	JM-114-8	Cylinder Housing Bushing Stud
15	JM-115-8	Cylinder Housing Bushing Stud Nut - Full
15	JM-116-8	Cylinder Housing Bushing Stud Nut - Jam
16	JM-117-10	Valve Chest Stud
17	JM-118-10	Valve Chest Stud Nut - Full
17	JM-119-10	Valve Chest Stud Nut - Jam
18	JM-120-1	Ram Retaining Pin
19	JM-121-8	Cylinder Housing Grease Fitting
20	JM-122-4	Cylinder Housing Bushing Groove Ring
21	JM-123-5	Cylinder Housing Bushing Spacer Ring
22	JM-124-1	Cylinder Housing Bushing Cover
23	JM-125-6	Cylinder Housing Relief Port Plug
24	JM-126-6	Cylinder Housing Relief Port Plug Screen
25	JM-127-6	Cylinder Housing Relief Port Plug Ring
26	JM-128-2	Cylinder Housing Drain Plug
27	JM-129-8	Guide Pin Cap Screw Washer
28	JM-130-2	Cylinder Sleeve Dowel Pin
29	JM-131-1	Ram Retaining Pin Eye Bolt
30	JM-132-20	Cylinder Housing Stud
31	JM-133-1	Cylinder Housing Stud
32	JM-134-21	Cylinder Housing Stud Nut - Full

IPH-16 HAMMER

REPLACEMENT PARTS (CONT'D)

<u>KEY NO.</u>	<u>PART NO.</u>	<u>NAME</u>
32	JM-135-21	Cylinder Housing Stud Nut - Jam
33	JM-136-20	Cylinder Housing Stud Nut Lock
34	JM-137-1	Cylinder Housing Stud Nut Wedge
35	JM-138-2	Cylinder Housing Shim
36	JM-139-5	Cylinder Housing Dowel Pin
37	JM-200-1	Cylinder Head
38	JM-201-1	Pile Guide Sleeve
39	JM-202-1	Pile Guide Sleeve Point
40	JM-203-24	Pile Guide Bolt Guard
41	JM-204-4	Pile Guide Cone Gusset
42	JM-205-1	Pile Guide Cone w/Skirt for 30" Pipe
43	JM-206-1	Pile Guide Cone w/Skirt for 36" Pipe
44	JM-207-1	Pile Guide Cone w/Skirt for 42" Pipe
45	JM-208-1	Pile Guide Cone w/Skirt for 48" Pipe
46	JM-209-16	Pile Guide Bolt
47	JM-210-16	Pile Guide Bolt Nut
48	JM-211-16	Pile Guide Bolt Lock Washer
49	JM-212-6	Pile Guide Sleeve Bolt
50	JM-213-6	Pile Guide Sleeve Bolt Nut
51	JM-214-6	Pile Guide Sleeve Bolt Washer
52	JM-215-1	Cylinder Head "O" Ring
53	JM-216-48	Pile Guide Bolt Guard Gusset
54	JM-217-12	Pile Guide Bolt Guard Plate
55	JM-218-1	Pile Guide Sleeve Pipe
56	JM-219-3	Pile Guide Sleeve Gusset
57	JM-300-1	Ram
58	JM-301-1	Piston Rod Nut
59	JM-302-1	Piston Rod Nut Ring
60	JM-303-8	Piston Rod Nut Ring Stud
61	JM-304-1	Cam Insert
62	JM-305-10	Cam Insert Screw
63	JM-306-10	Cam Insert Screw Washer
64	JM-307-8	Piston Rod Nut Ring Stud Nut - Full
64	JM-308-8	Piston Rod Nut Ring Stud Nut - Jam
65	JM-309-4	Piston Rod Nut Screw
66	JM-400-1	Valve Chest
67	JM-401-1	Valve Chest Liner
68	JM-402-1	Valve
69	JM-403-1	Valve Stem
70	JM-404-1	Blind Valve Chest Head
71	JM-405-1	Blind Valve Chest Head Bushing
72	JM-406-1	Blind Valve Chest Head "O" Ring

IPH-16 HAMMER

REPLACEMENT PARTS (CONT'D)

<u>KEY NO.</u>	<u>PART NO.</u>	<u>NAME</u>
73	JM-407-1	Open Valve Chest Head
74	JM-408-1	Open Valve Chest Head Lower Bushing
75	JM-409-1	Open Valve Chest Head Int. Bushing
76	JM-410-1	Open Valve Chest Head Upper Bushing
77	JM-411-1	Valve Lever
78	JM-412-2	Valve Lever Spacer
79	JM-413-1	Inlet Flange
80	JM-414-8	Inlet Flange Cap Screw
81	JM-415-1	Inlet Fitting
82	JM-416-1	Valve Spring
83	JM-417-6	Open Valve Chest Head Stud
84	JM-418-6	Open Valve Chest Head Stud Nut - Full
84	JM-419-6	Open Valve Chest Head Stud Nut
85	JM-420-2	Open Valve Chest Head Cap Screw - Jam
86	JM-421-1	Valve Chest Gasket
87	JM-422-1	Open Valve Chest Head Gasket
88	JM-423-1	Inlet Flange Gasket
89	JM-424-1	Valve Chest Liner "O" Ring
90	JM-425-6	Blind Valve Chest Head Screw
91	JM-426-1	Valve Lever Wear Sleeve
92	JM-427-3	Valve Lever Roller
93	JM-428-1	Valve Lever Roller Washer
94	JM-429-1	Valve Lever Roller Retainer
95	JM-430-2	Open Valve Chest Head Cap Screw Washer
96	JM-431-8	Inlet Flange Cap Screw Washer
97	JM-432-1	Valve Spring Rivet
98	JM-500-1	Piston and Rod
99	JM-501-2	Piston Ring
100	JM-600-1	Cover Head
101	JM-601-1	Cover Head Skirt
102	JM-602-1	Cover Head Skirt Flange
103	JM-603-16	Cover Head Skirt Flange Screw
104	JM-604-16	Cover Head Skirt Flange Screw Washer
105	JM-605-2	Cover Head Lifting Lug



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IPH-16 HAMMER

PROTOTYPE SPARE PARTS BACK-UP

A supply of spare parts for the Prototype Hammer is provided to support the Hammer testing period. The parts so supplied are listed below.

<u>KEY NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>KIT QTY.</u>
3	JM-101-1	Guide Pin	1
4	JM-102-8	Guide Pin Cap Screw	8
6	JM-104-12	Cylinder Head Stud	12
7	JM-105-12	Cylinder Head Stud Nut - Full	12
7	JM-106-12	Cylinder Head Stud Nut - Jam	12
8	JM-107-1	Valve Lever Bushing	1
9	JM-108-8	Valve Lever Bushing Stud	8
10	JM-109-8	Valve Lever Bushing Stud Nut - Full	8
10	JM-110-8	Valve Lever Bushing Stud Nut - Jam	8
11	JM-111-1	Cylinder Housing Bushing	1
12	JM-112-1	Cylinder Housing Bushing "O" Ring	1
13	JM-113-4	Cylinder Housing Bushing Contracting Ring	4
14	JM-114-8	Cylinder Housing Bushing Stud	8
15	JM-115-8	Cylinder Housing Bushing Stud Nut - Full	8
15	JM-116-8	Cylinder Housing Bushing Stud Nut - Jam	8
16	JM-117-10	Valve Chest Stud	10
17	JM-118-10	Valve Chest Stud Nut - Full	10
17	JM-119-10	Valve Chest Stud Nut - Jam	10
23	JM-125-6	Cylinder Housing Relief Port Plug	6
24	JM-126-6	Cylinder Housing Relief Port Plug Screen	6
25	JM-127-6	Cylinder Housing Relief Port Plug Ring	6
26	JM-128-2	Cylinder Housing Drain Plug	2
27	JM-129-8	Guide Pin Cap Screw Washer	8
30	JM-132-20	Cylinder Housing Stud	20
31	JM-133-1	Cylinder Housing Stud	1

IPH-16 HAMMER

PROTOTYPE SPARE PARTS BACK-UP (CONT'D)

<u>KEY NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>KIT QTY.</u>
32	JM-134-21	Cylinder Housing Stud Nut - Full	21
32	JM-135-21	Cylinder Housing Stud Nut - Jam	21
33	JM-136-20	Cylinder Housing Stud Nut Lock	20
37	JM-200-1	Cylinder Head	1
38	JM-201-1	Pile Guide Sleeve	1
39	JM-202-1	Pile Guide Sleeve Point	1
42	JM-205-1	Pile Guide Cone w/Skirt for 30" Pipe	1
46	JM-209-16	Pile Guide Bolt	16
47	JM-210-16	Pile Guide Bolt Nut	16
48	JM-211-16	Pile Guide Bolt Lock Washer	16
49	JM-212-6	Pile Guide Sleeve Bolt	6
50	JM-213-6	Pile Guide Sleeve Bolt Nut	6
52	JM-215-1	Cylinder Head "O" Ring	1
58	JM-301-1	Piston Rod Nut	1
59	JM-302-1	Piston Rod Nut Ring	1
60	JM-303-8	Piston Rod Nut Ring Stud	8
61	JM-304-1	Cam Insert	1
62	JM-305-10	Cam Insert Screw	10
63	JM-306-10	Cam Insert Screw Washer	10
64	JM-307-8	Piston Rod Nut Ring Stud Nut - Full	8
64	JM-308-8	Piston Rod Nut Ring Stud Nut - Jam	8
65	JM-309-4	Piston Rod Nut Screw	4
69	JM-403-1	Valve Stem	1
71	JM-405-1	Blind Valve Chest Head Bushing	1
72	JM-406-1	Blind Valve Chest Head "O" Ring	1
74	JM-408-1	Open Valve Chest Head Lower Bushing	1
75	JM-409-1	Open Valve Chest Head Int. Bushing	1
76	JM-410-1	Open Valve Chest Head Upper Bushing	1
77	JM-411-1	Valve Lever	1
78	JM-412-2	Valve Lever Spacer	2
79	JM-413-1	Inlet Flange	1
80	JM-414-8	Inlet Flange Cap Screw	8
81	JM-415-1	Inlet Fitting	1
82	JM-416-1	Valve Spring	1
83	JM-417-6	Open Valve Chest Head Stud	6
84	JM-418-6	Open Valve Chest Head Stud Nut - Full	6
84	JM-419-6	Open Valve Chest Head Stud Nut - Jam	6
85	JM-420-2	Open Valve Chest Head Cap Screw	2
86	JM-421-1	Valve Chest Gasket	1
87	JM-422-1	Open Valve Chest Head Gasket	1
88	JM-423-1	Inlet Flange Gasket	1
89	JM-424-1	Valve Chest Liner "O" Ring	1
90	JM-425-6	Blind Valve Chest Head Screw	6

IPH-16 HAMMER

PROTOTYPE SPARE PARTS BACK-UP (CONT'D)

<u>KEY NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>KIT QTY.</u>
91	JM-426-1	Valve Lever Wear Sleeve	2
92	JM-427-3	Valve Lever Roller	3
93	JM-428-1	Valve Lever Roller Washer	1
94	JM-429-1	Valve Lever Roller Retainer	1
95	JM-430-2	Open Valve Chest Head Cap Screw Washer	2
96	JM-431-8	Inlet Flange Cap Screw Washer	8
98	JM-500-1	Piston and Rod	1
99	JM-501-2	Piston Ring	2
103	JM-603-16	Cover Head Skirt Flange Screw	16
104	JM-604-16	Cover Head Skirt Flange Screw Washer	16



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IPH-16 HAMMER

DISASSEMBLY PROCEDURE

A. Complete Hammer Disassembly:

With the Hammer in a horizontal position, remove the following subassemblies in the order specified:

1. SA600
2. SA200S
3. SA400
4. SA200H
5. SA500

At this point, the Hammer should be placed in the vertical position in the tub. Remove the following subassemblies in the order specified.

1. SA300 (Refer to detail subassembly information)
2. SA100U (Refer to detail subassembly information)

B. Subassembly Disassembly:

To disassemble the various subassemblies, the parts specified should be removed in the order specified:

1. SA500 (Piston Rod Group)
 - a. Remove 307-8 & 308-8.
 - b. Remove 302-1.
 - c. Remove 309-4.
 - d. Remove 301-1 with spanner wrench provided.
When driving the Piston Rod out of the Ram
DO NOT use a steel drift. Use timber drift
or bronze rod. Be careful not to damage the
threads on the upper end of the Piston Rod.
2. SA400 (Valve Gear Group)
 - a. Remove 425-6.
 - b. Remove 404-1.
 - c. Remove 402-1 & 403-1 together.
 - d. Remove 418-6 & 419-6.

IPH-16 HAMMER

DISASSEMBLY PROCEDURE (CONT'D)

- e. Remove 422-1.
- f. Remove 429-1 from Valve Lever.
- g. Remove 428-1 from Valve Lever.
- h. Remove 427-3 from Valve Lever.
- i. Remove 426-1 from Valve Lever.
- j. Unscrew 415-1.
- k. Remove 414-8.
- l. Remove 431-8.
- m. Remove 413-1.
- n. Remove 423-1.

At Step "c." above, when the Valve and Valve Stem are removed, the Valve Lever and Valve Lever Spacers are released from the assembly. It is easy to damage gaskets in the disassembly process. It is therefore recommended that new gaskets be used when re-assembly takes place.

3. SA100U (Upper Cylinder Housing Group)

- a. Remove 102-8.
- b. Remove 129-8.
- c. Remove 101-1.

Removal of these Guide Pin Components is necessary prior to the removal of the Ram.

4. SA100L (Lower Cylinder Housing Group)

- a. Remove 115-8 & 116-8.
- b. Remove 124-1.
- c. Remove 111-1.
- d. Remove 123-5.
- e. Remove 113-4.
- f. Remove 122-4.
- g. Remove 112-1.

Extreme care must be observed in the disassembly of the Cylinder Housing Bushing parts.

C. General Information:

- 1. Reassembly of the above subassemblies and Hammer should be done in the reverse order of disassembly.
- 2. After disassembly, all parts should be checked for burrs and de-burred if necessary.

IPH-16 HAMMER

DISASSEMBLY PROCEDURE (CONT'D)

3. During reassembly all parts should be lubricated where necessary. The recommended assembly lubricant is Lubriplate grease, #630AA.
4. All parts excessively worn should be replaced and not re-used.



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IPH-16 HAMMER

PROBLEMS & REMEDIES

A. Hammer will not function:

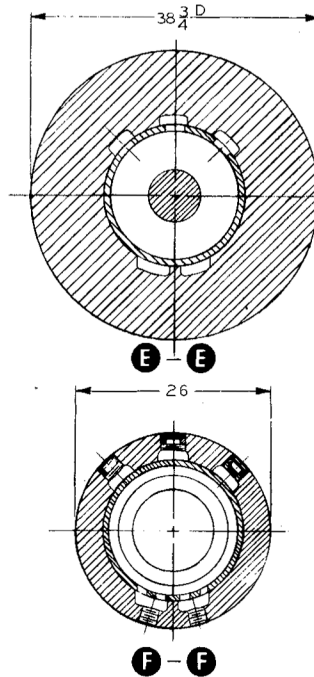
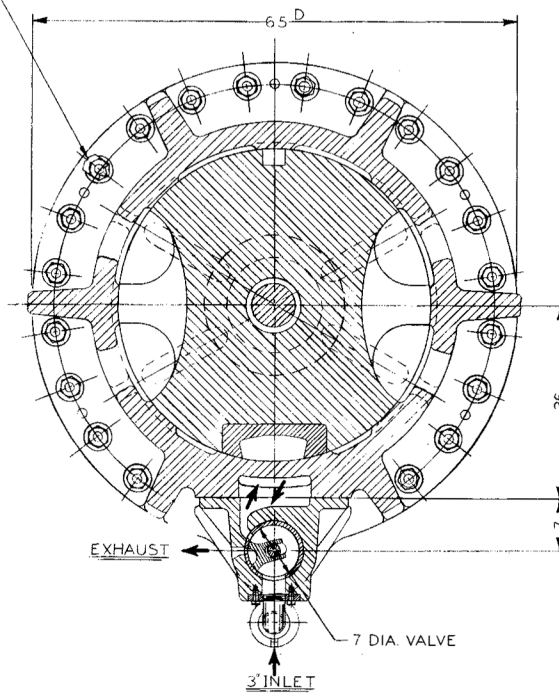
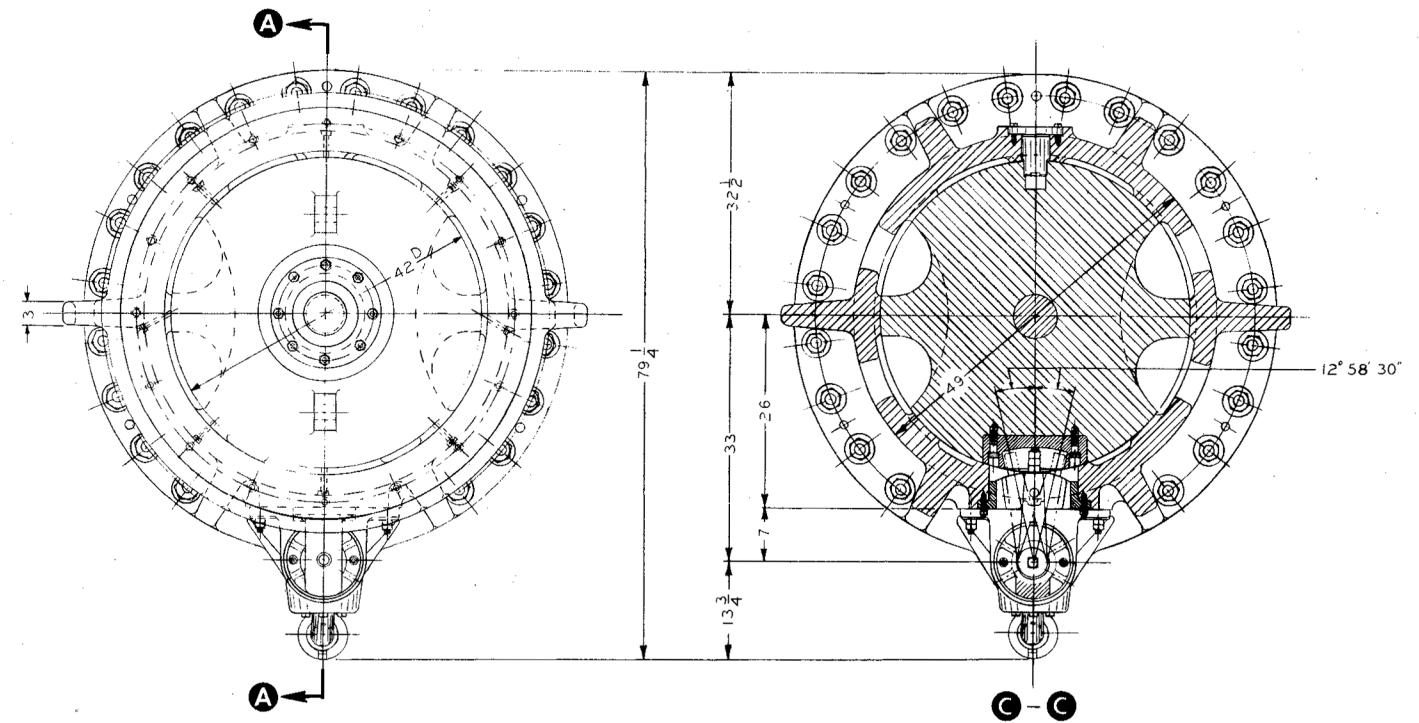
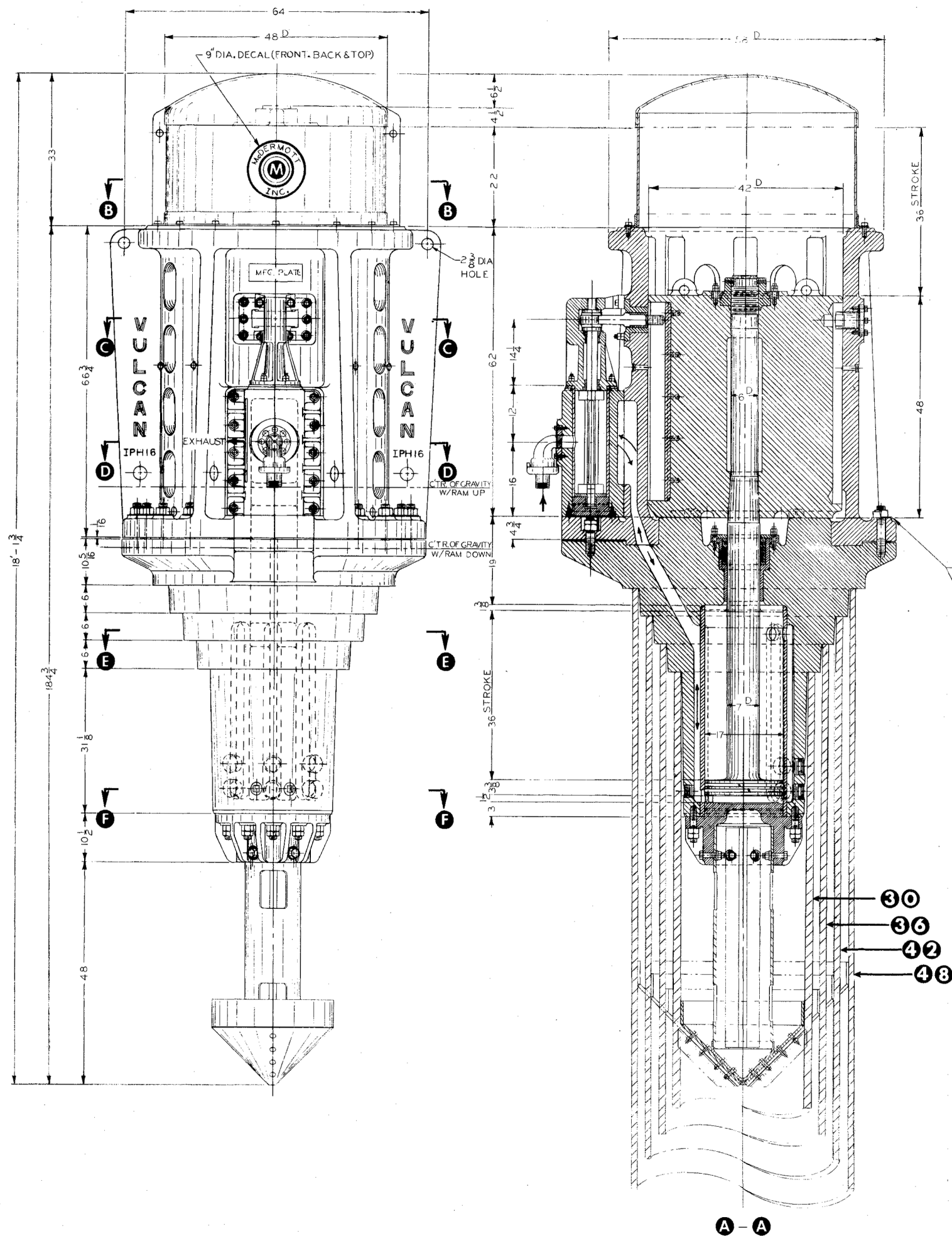
<u>Possible Cause</u>	<u>Remedy</u>
1. Ram Retaining Pin (JM-120-1) left in Hammer.	1. Remove Ram Retaining Pin (JM-120-1) and replace with Guide Pin (JM-101-1) Refer to SA100U Procedure.
2. Missing Cylinder Housing Drain Plugs (JM-128-2).	2. Replace Plugs. Be sure to use thread sealant.
3. Valve (JM-402-1) and Valve Lever (JM-411-1) in "Dead Center" position.	3. Facing Hammer, move Valve Lever (JM-411-1) all the way to the left.
4. Valve Lever (JM-411-1) jammed.	4. Remove Valve Lever (JM-411-1). Refer to SA400 Procedure. De-burr if necessary. Replace if necessary.
5. Guide Pin (JM-101-1) jammed.	5. Remove Guide Pin (JM-101-1). Refer to SA100U Procedure. De-burr if necessary. Replace if necessary.
6. Broken Valve Lever (JM-411-1).	6. Remove Valve Gear. Refer to SA400 Procedure. Replace Valve Lever (JM-411-1) and reinstall Valve Gear.
7. Loose Cylinder Head Studs. (JM-104-12)	7. Tighten Cylinder Head Studs (JM-104-12) and Cylinder Head Stud Nuts (JM-105-12 & JM-106-12).

IPH-16 HAMMER

PROBLEMS & REMEDIES (CONT'D)

B. Hammer Runs Erratically:

<u>Possible Cause</u>	<u>Remedy</u>
1. Steam/Air Leakage.	1. Check for loose Cylinder Head Stud Nuts (JM-105-12 & JM-106-12). Check for loose Valve Chest Stud Nuts (JM-118-10 & JM-119-10). Check for loose Cylinder Housing Stud Nuts (JM-134-21 & JM-135-21). Check for seal between the Upper Cylinder Housing (JM-100U-1) & Lower Cylinder Housing (JM-100L-1). Check for blown Cylinder Head "O" Ring (JM-215-1). Check for blown Valve Chest Gasket (JM-421-1). Tighten loose nuts, replace "O" Rings and Gaskets as required.
2. Loose Piston Rod (JM-500-1).	2. Tighten Piston Rod Nut (JM-301-1). Refer to SA500 Procedure.
3. Bent Valve Lever (JM-411-1).	3. Replace Valve Lever (JM-411-1). Refer to SA400 Procedure.
4. Worn Cam Groove.	4. Remove Ram (JM-300-1) and replace Cam Insert (JM-304-1). Refer to SA300 Procedure.
5. Worn Valve Lever Rollers (JM-427-3).	5. Remove Valve Gear (SA400). Do not disassemble further. Replace Valve Lever Rollers (JM-427-3) as per steps "f." through "i.", SA400 Procedure.
6. Broken Piston Ring (JM-501-2).	6. Remove Piston Rod (JM-500-1). Refer to Hammer Disassembly Procedure. Replace Piston Rings (JM-501-2) and re-install.
7. Plugged steam/air passages and Ports.	7. Check ports and passages for obstruction and clear if necessary.
8. Worn Valve Lever Sleeve (JM-426-1).	8. Follow the same Procedure as in #5 above.



USE PRIMER NO. 86 THEN PAINT HAMMER FROM TOP TO FIRST STEP - McDERMOTT MEDIUM GREEN. "AMERCOAT" NO. 35. PAINT STEPS, LOWER END OF HAMMER, STABBING GUIDE, & VULCAN IPH 16" LETTERING - "CODIT" 3M CO. NO. 7216 (WHITE COAT)

J. RAY McDERMOTT & CO., INC.

NOTICE

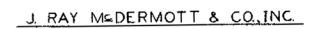
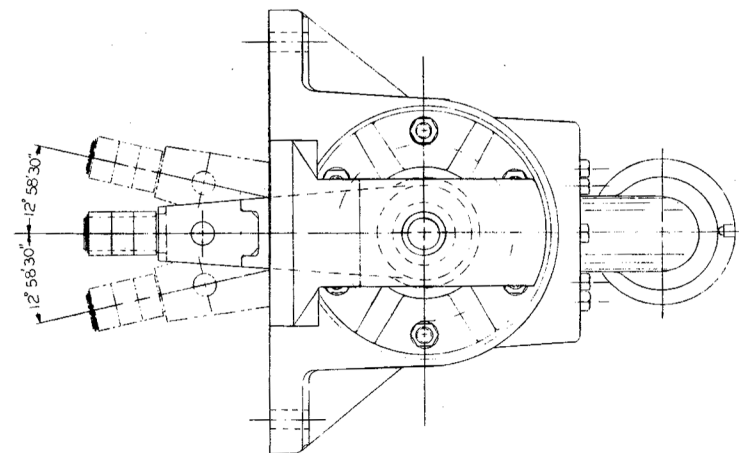
These drawings disclose confidential ideas and information that are the property of VULCAN IRON WORKS INC. and a special confidential disclosure is made hereon under an implied and continuing pledge of good faith and secrecy that disclosure and use of the trade secrets shall not be made without the prior written authorization of VULCAN IRON WORKS INC.

CHANGE RECORD				VULCAN IRON WORKS INC. CHATTANOOGA, TENNESSEE, U.S.A.	
NO.	DESCRIPTION	DATE	CHK'D BY	BY	
NAME				GENERAL ASSEMBLY MODEL NO. 685016 JRM	
NAME				INTERNAL PILE HAMMER SIZE IPH 16	
DATE				9-6-68	SCALE 1 1/2" = 1'-0"
DRAWN				HARMON	CHECKED
REF. DWG.					APPROVED
					DWPB-1550

APPROVED BY: VULCAN IRON WORKS, INC. DATE:

APPROVED BY: J. RAY McDERMOTT & CO., INC. DATE:

U.S. PATENT OFFICE SERIAL NO. 735691

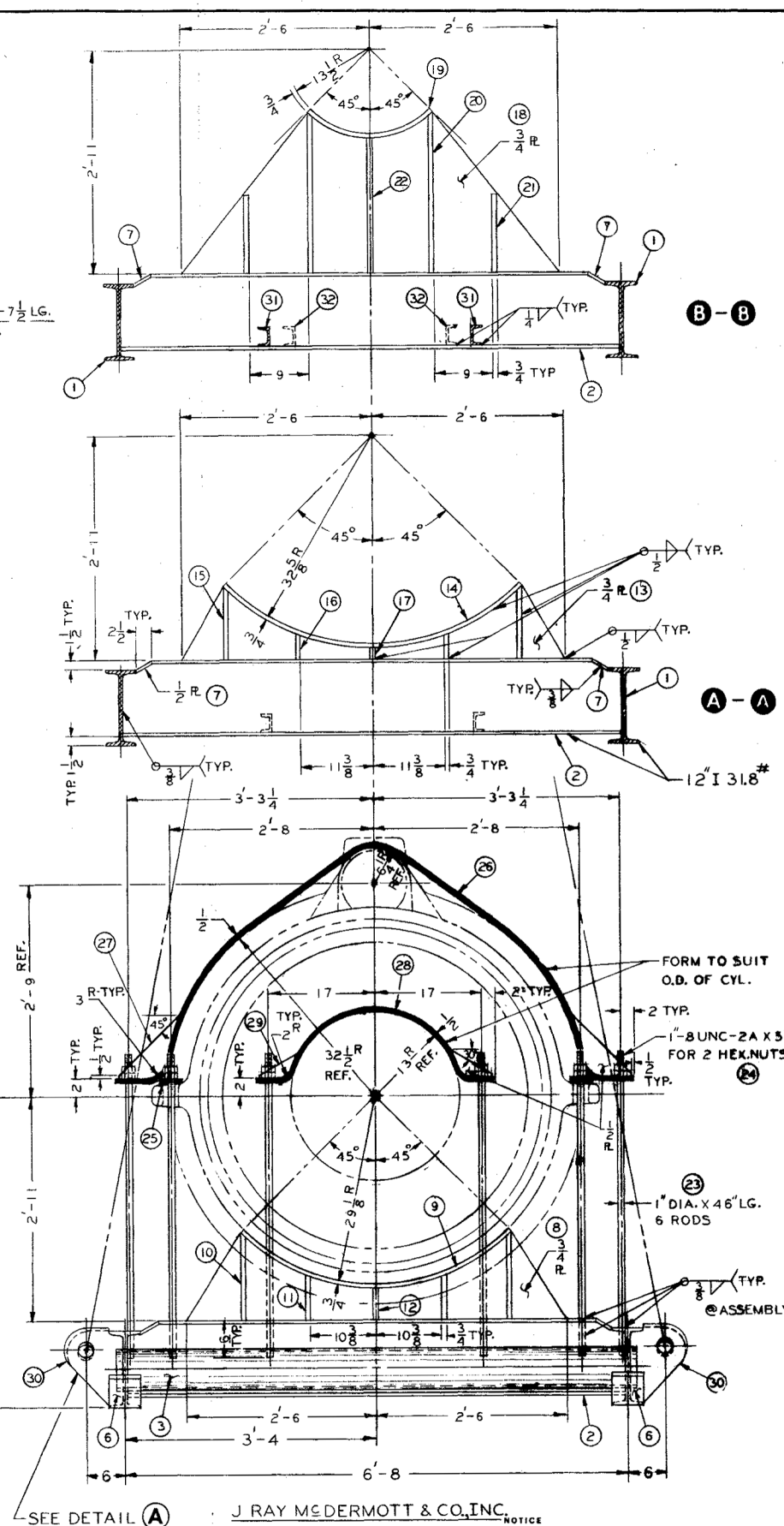
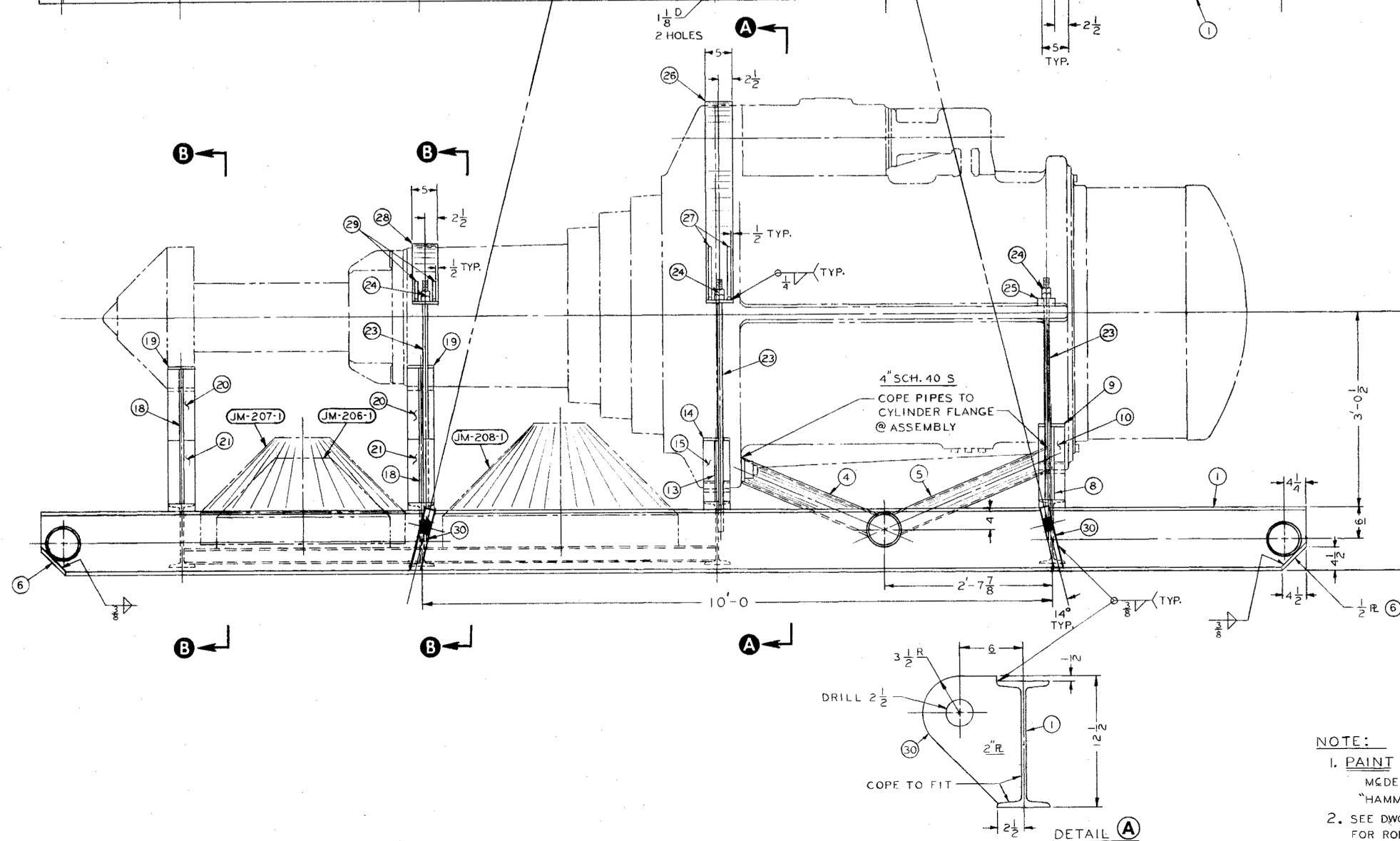
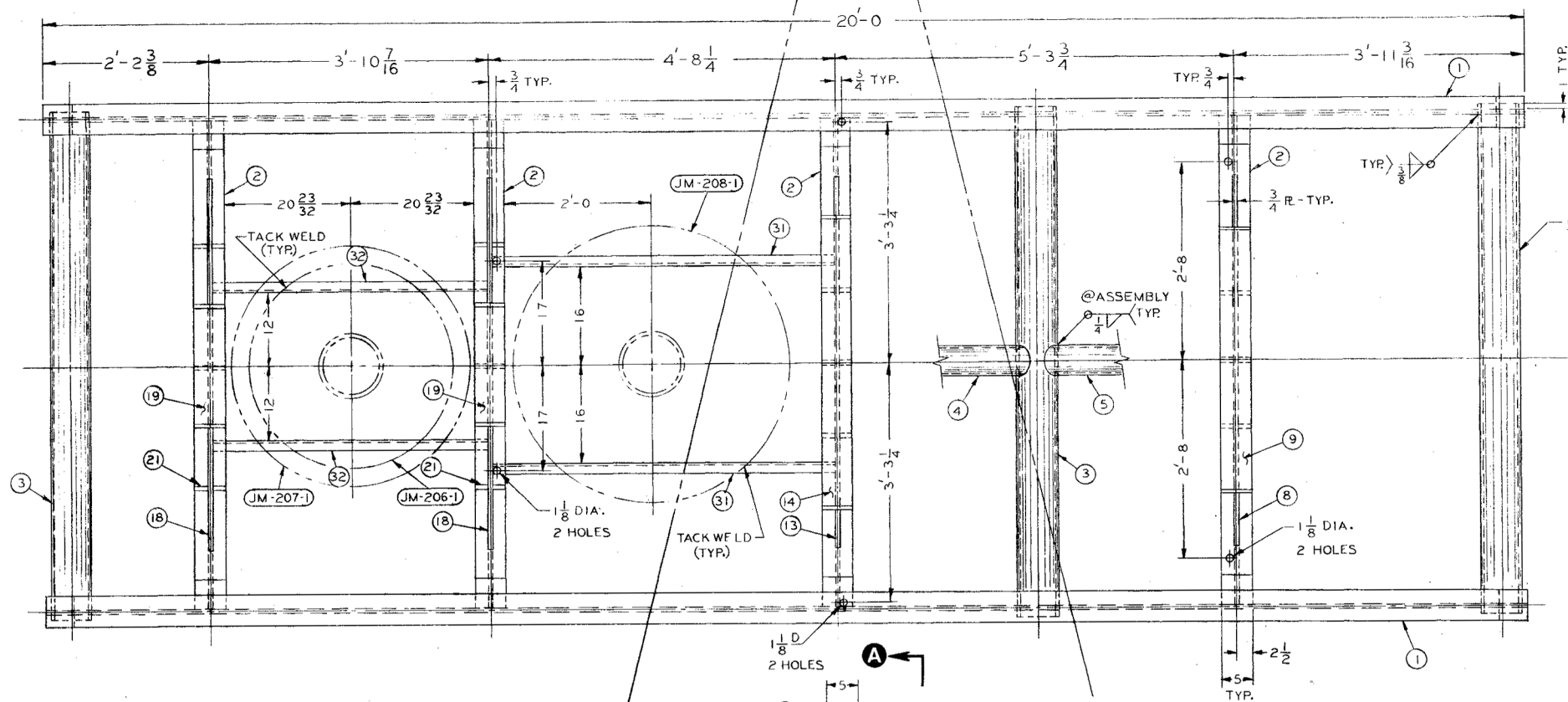


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ALL SURFACES TO BE SQUARE, PARALLEL, CONCENTRIC AND STRAIGHT WITHIN .005" PER FOOT.
ALL FRACTIONAL MACHINE DIMENSIONS TO BE HELD WITHIN $\pm 1/64"$; DECIMAL DIMENSIONS WITHIN $\pm .005"$
AND ANGLES TO BE $\pm 0^\circ-30'$ UNLESS OTHERWISE STATED. BREAK ALL SHARP CORNERS.

CHANGE RECORD				 VULCAN IRON WORKS INC. WEST PALM BEACH, FLORIDA U.S.A.			
NO.	DESCRIPTION	DATE	CHK'D.	PATT. NO.	PART NO.		
		BY	BY				
				NAME VALVE GEAR ASSEMBLY			
				FOR INTERNAL PILE HAMMER IPH 16			
		DATE 7-1-68		SCALE 3"=1'-0"		MAT'L.	
		DRAWN E DUMAS		CHECKED		APPROVED	
		REF. DWG.					DWPB-1560 SA



NOTE:

1. PAINT
McDERMOTT MEDIUM GREEN
"HAMMERCOAT" NO. 35
2. SEE DWG. NO. D-10228
FOR ROPE SLING DETAILS.

J RAY McDERMOTT & CO., INC. NOTICE

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ALL SURFACES TO BE SQUARE, PARALLEL, CONCENTRIC AND STRAIGHT WITHIN .005" PER FOOT.
ALL FRACTIONAL MACHINE DIMENSIONS TO BE HELD WITHIN ± 1/64"; DECIMAL DIMENSIONS WITHIN ± .005"
AND ANGLES TO BE ± 0°-30' UNLESS OTHERWISE STATED. BREAK ALL SHARP CORNERS.

CHANGE RECORD				PATT. NO.	
NO.	DESCRIPTION	DATE	BY	CHK'D.	BY
1	STRUCTURAL STEEL SKID	9-27-68	HARMON		

VULCAN IRON WORKS INC.
WEST PALM BEACH, FLORIDA, U.S.A.

STRUCTURAL STEEL SKID
FOR INTERNAL PILE HAMMER SIZE IPH16

DATE 9-27-68 SCALE 1/4"=1'-0" MAT. SSS ASTM A36

DRAWN HARMON CHECKED APPROVED

REF. DWG. DWPB-1532