

Air Velocity Chart per 1000 CFM

		Bore Hole Dia.																
		6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	30"	36"				
Square Inch Area		28.3	50.3	78.5	113.1	154	201	254.4	314	380	452	531	707	1018				
DRILL PIPE																		
Dia.	Area																	
3-1/2	9.6	18.7	40.7	68.9	103.5	114.4	191.4											
Velocity		7700	3508	2090	1391	997	752											
4	12.5	15.8	37.8	66	100.6	141.5	188.5											
Velocity		9114	3809	2182	1431	1017	764											
4-1/2	15.9	12.4	34.4	62.6	97.2	138.1	185	238										
Velocity		11613	4186	2300	1481	1043	778	605										
5	19.6	8.7	30.7	58.9	93.5	134.4	181.4	235										
Velocity		16551	4690	2449	1540	1071	794	613										
5-1/5	23.8	4.5	26.5	54.7	89.3	130.2	177	231										
Velocity		32000	5434	2633	1613	1106	814	623										
6	28.3		22	50.2	48.8	125.7	173	226										
Velocity			6545	2868	1698	1146	832	637										
7	38.5		11.8	40	74.6	115.5	162.5	216										
Velocity			12203	3600	1930	1247	886	666										
8-5/8	58.4			20.1	54.7	95.6	143	196										
Velocity				7164	2633	1506	1007	735										
9-5/8	72.8			5.7	40.3	81.2	128	182										
Velocity				25263	3573	1773	1125	791										
10	78.5				43.6	75.5	122.5	176	235									
Velocity					4162	1907	1176	818	613									
10-3/4	90.8				22.3	63.2	110	164	289									
Velocity					6457	2278	1309	878	498									
11-3/4	108.4				4.7	45.6	92.5	146										
Velocity					10638	3158	1557	986										
16	201.1						53.4	113	179	251	330							
Velocity							2696	1274	804	574	436							
18	254.5							59	125	198	277							
Velocity								2440	1152	727	520							
20	314.2								66.5	138	217	393						
Velocity									2165	1043	664	366						
24	452.4										78	255						
Velocity											1846	565						
30	707															311		
Velocity																46.3		

KEY Top line= difference in area
Bottom line= velocity

COLORS Red= to much velocity
Green= adequate depending on cuttings
White= adequate with water and foam
Orange= not enough velocity

Although other standards are often used, the following general rules should be considered in order to realize optimum bit life and penetration rates.

Air Circulation - UP- Hole Velocity

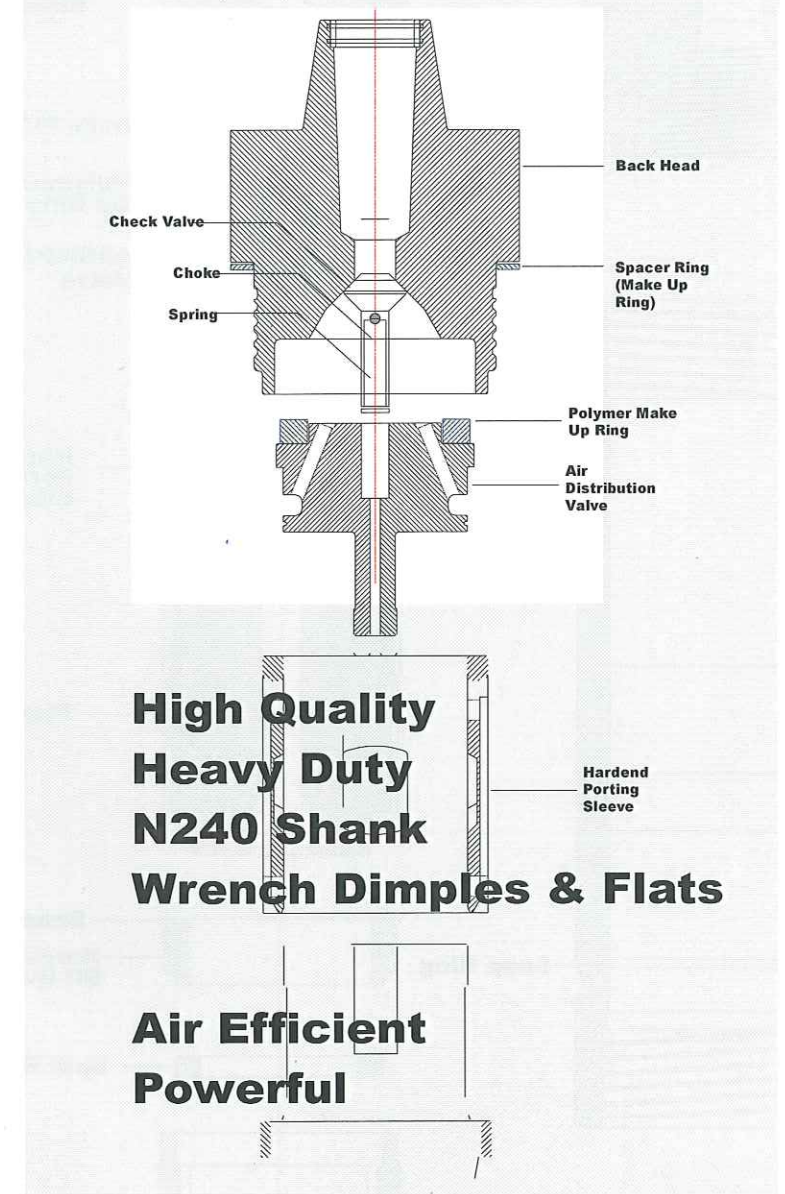
From a minimum of 3,000 FPM, up-hole velocity should be increased as material density increases.

Material	Chip Weight	Annular Velocity
Soft Shales	Light	3000 FPM
Medium Limestone	Heavy/ medium size	4500 FPM
Hard Granite	Very hard/ large size	5000 - 6500 FPM

Model HD 2400-1 Hammer



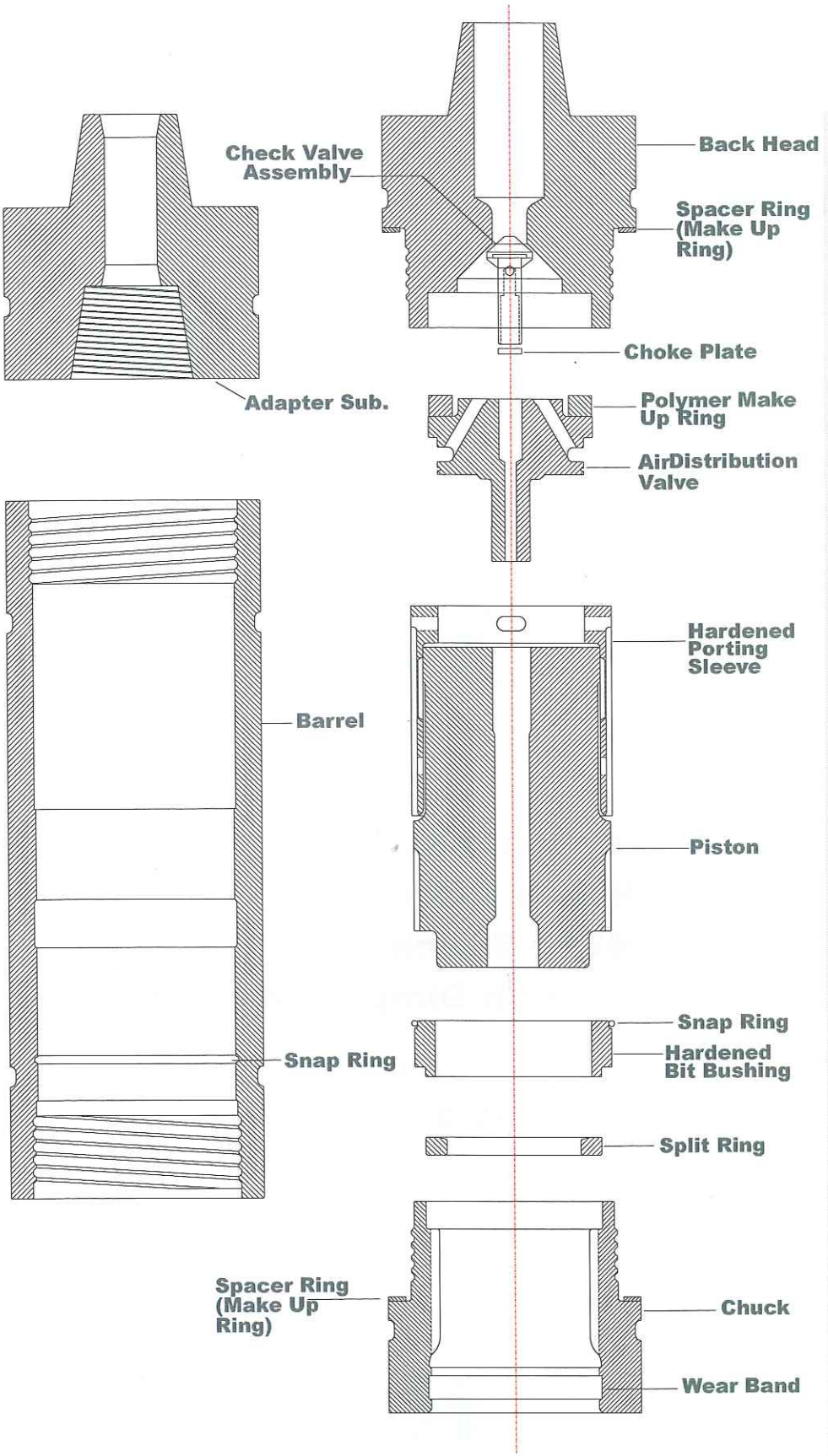
Designed to operate in all directions



HOLTE

MANUFACTURING

Model H D2400-1 Specifications



Exploded Cross Section

Bits Available For HD 2400

- Bit sizes available for the HD2400 are,
- URG Underreamer Style**
24in. to 36in.
- Down Hole Bit Style**
24in. to 36in.

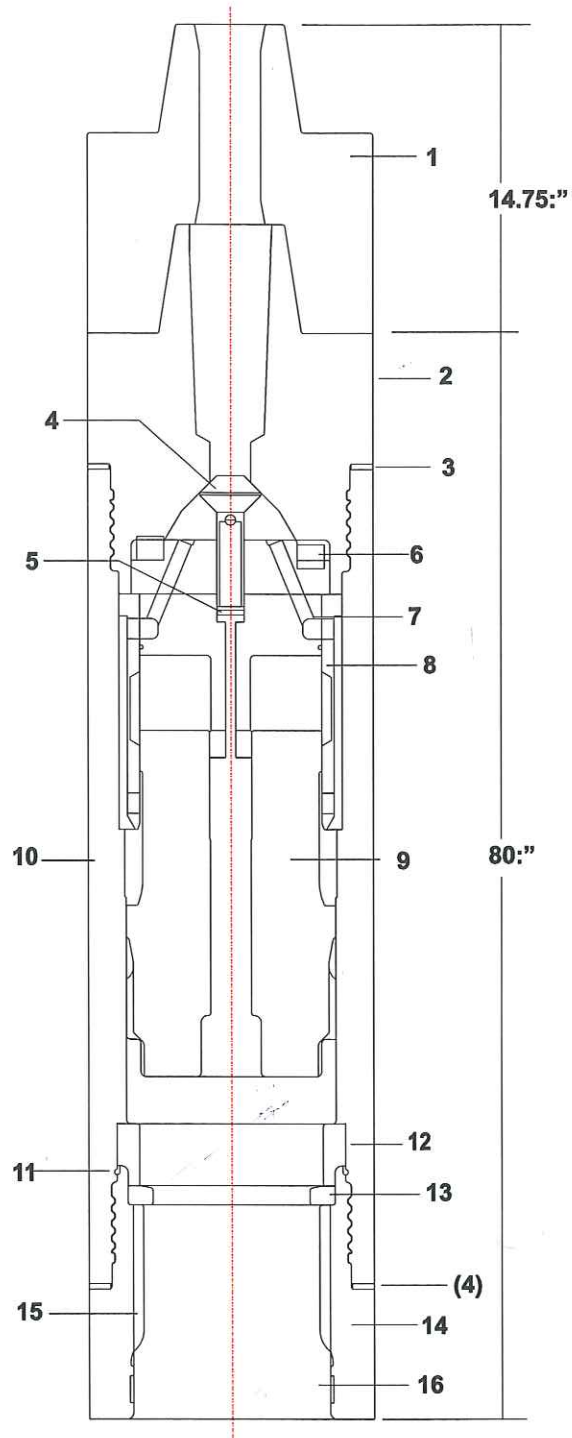
Inside The HD 2400

The patented split bit bushing, acts as a bit bearing and guide. This unique design requires no elastic band to hold it together during assembly. Most importantly, when revers rotation is required, the split bit bushing does not fall off if the chuck is accidentally unscrewed from the hammer.

The HD 2400 is designed with air porting that allows the hammer to operate efficiently in all directions.

Call Holte Mfg. today for more information
(541)343-3399
 or e-mail us at drilling@drilling.com
 or visit our web site at <http://www.drilling.com>

Assembled Cross Section



Model 2400 Specification

Outside Diameter	20"
Tool Length w/Sub.	94-3/4"
Total weight w/Sub.	6100
Piston Weight	1390
Standard Shank	HD 2400 / N240
Standard Top Sub.	10-1/2" H90
Maximum Piston Travel	8.63"
Stroke from Bottom to Top Feed Port	5"

Air Consumption

C.F.M.	2400	3600	4800
P.S.I.	200	245	285
Cycle Rate	400	600	788

Parts List

No.	Qty.	PN#	Description
1	1	DHH2405	Adapter Sub
2	1	DHH2410	Back Head
3	2	DHH2415	Spacer Ring (make-up ring)
4	1	DHH2416	Check Valve Assembly
5	1	DHH2417	Choke Plate
6	1	DHH2418	Polymer Make-Up Ring
7	1	DHH2420	Air Distribution Valve
8	1	DHH2430	Hardened Porting Sleeve
9	1	DHH2440	Piston
10	1	DHH2450	Barrel
11	1	DHH2455	Snap Ring
12	1	DHH2460	Bit Bushing
13	1	DHH2465	Split Ring (2 halves)
14	1	DHH2470	Chuck
15	12	Dp24	Delron Drive Plates
16	1	DHH2480	Wear Band