



Venturi Jet Junk Basket

2.625 inch

MAN-TTT-320-2625 (R01)

Thru-Tubing Technology

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2.625 Venturi Jet Junk Basket

Description

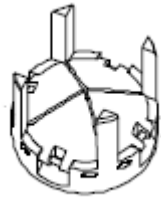
The Venturi Jet Junk Basket is used to retrieve junk from the wellbore. When fluid is pumped through the coil tubing to the Venturi, nozzles direct the flow to the OD of the tool toward the bottom, a vacuum is created in the Venturi chamber and fluid and debris is drawn into the bottom of the tool. A debris screen is located between the Venturi chamber and the cages that will hold the debris inside the tool. The cages are used to trap the debris from falling out, and the screen prevents it from recirculating around the ports. The volume of the debris chamber may be enlarged by the addition of extensions between the cage housing and the screen housing. The nozzles are replaceable to achieve any possible ratio of flow rate and psi combination. The Cage Housing on the bottom of the tool can also be dressed with carbide for milling or washing over a fish. The housings are also available with CS threads. An important feature of the Venturi is that it is not dependant on the hole size to work. The rate of the Venturi action is much higher than the pump rate, no matter the hole size and nitrogen can be used without damaging the tool. The Venturi can be run with or without a mud motor.



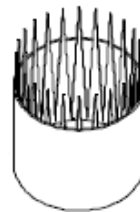
Note: Unless otherwise indicated, all the strength figures given in this manual, are the result of calculations based on the yield strength of the material used in the manufacture of this product. These strength calculations are considered accurate within plus or minus 20% and are to be used only as a guide. They do not constitute a guarantee, actual or implied. In use, appropriate allowance should be made as a safety factor.

Finger and Flutter cages - open and closed.

Finger Cage size 1-17/32 in. and Flutter Cage size 1-15/16 in.



Finger Cages



Flutter Cages

2.625 Venturi Jet Junk Basket

Nozzle Flow Chart - Water

Jets Used	500 psi	600 psi	700 psi	800 psi	1,000 psi	1,500 psi	2,000 psi
25-30	23	25.2	27.2	29	32.5	39.8	46
25-35	24	26.5	28.6	30.5	34.2	41.8	48
25-40 30-35	26	28.5	30.8	33	36.5	45	52
30-40	28	30.5	33	35.5	39	48	56
25-50 35-40	29	32	34.5	37	41	50.5	58
30-50	31	34	37	39.5	44	54	62
35-50	32	35	38	40.5	45.5	56	64
25-60	33	36	39	41.5	46.5	58.5	66
40-50	34	37	40	43	48	59	68
25-70 30-60	35	38	41	44	49	60.5	70
35-60	36	39	42.5	45.5	50.5	62	72
25-80 30-70	37	40	43	46.5	52	63.5	74
35-70 40-60	38	41.5	44.5	48	53.5	65.5	76
30-80	39	42.5	45.5	49	54.5	67	78
35-80 40-70	40	43.5	47	50.5	56	69	80
25-90 50-60	41	44.5	48	51.5	57.5	70.5	82
40-80	42	45.5	49	52.5	59	72	84
30-90 50-70	43	46.5	50.5	54	60.5	74	86
35-90	44	48	52	55.5	62	76	88
25-100 50-80	45	49	53	57	63.5	78	90
40-90	46	50	54	58	64.5	79.5	92
30-100 60-70	47	51	55	59.5	66	81	94
25-110 60-80	48	52.5	56.5	61	68	83	96
35-100 50-90	49	53.5	58	62	69	85	98

Nozzle Flow Chart - Water, cont.

Jets Used	500 psi	600 psi	700 psi	800 psi	1,000 psi	1,500 psi	2,000 psi
25-120 30-110 40-100 70-80	50.0	55.0	59.5	63.5	71.0	87.0	100.0
35-100	51.0	55.5	60.0	64.0	72.0	88.0	102.0
30-120	52.0	57.0	62.0	66.0	74.0	90.0	104.0
35-120 40-110 60-90	53.0	58.0	63.0	67.0	75.0	91.5	105.5
50-100	54.0	25.5	63.5	67.5	75.5	92.5	107.0
40-120 70-90	55.0	60.0	65.0	69.0	77.5	95.0	110.0
50-110	56.0	61.0	66.0	70.5	79.0	96.5	111.5
25-130 60-100	57.0	62.5	67.5	72.5	80.5	99.0	114.0
50-120	58.0	64.0	69.0	73.5	82.5	101.0	117.0
30-130 60-110 70-100	59.0	65.0	70.0	75.0	84.0	103.0	119.0
25-140 35-130 80-100	61.0	66.5	71.5	76.5	85.5	105.0	121.0
40-130 60-120 70-110	62.0	68.0	73.0	78.5	87.5	107.0	124.0
30-140 80-110	63.0	69.0	74.5	79.5	89.0	109.0	126.0
35-140 70-120	64.0	70.0	75.5	80.5	90.5	110.5	128.0
90-100	65.0	71.0	77.0	82.0	92.0	112.5	130.0
25-150 40-140 50-130 80-120	66.0	72.0	78.0	83.0	93.0	114.0	132.0
90-110	67.0	73.0	79.8	85.0	95.0	116.0	134.0
25-160 30-150	68.0	74.5	80.5	86.5	96.5	118.0	136.0
50-140 60-130	69.0	75.5	81.5	87.0	97.5	119.0	138.0

2.625 Venturi Jet Junk Basket

Nozzle Flow Chart - Water, cont.

Jets Used	500 psi	600 psi	700 psi	800 psi	1,000 psi	1,500 psi	2,000 psi
30-160 35-150 90-120	70.0	76.5	82.5	88.5	99.0	121.0	140.0
35-160 40-150 70-130	71.0	77.5	84.0	90.0	100.5	123.0	142.0
25-170 60-140 100-110	72.0	79.0	85.0	91.5	102.0	125.0	144.0
40-160 80-130	73.0	80.0	86.5	92.5	103.5	126.5	146.0
25-180 30-170 70-140 100-120	74.0	81.0	87.5	93.5	105.0	128.5	148.0
50-150	75.0	82.0	88.5	94.5	106.0	129.5	1,850.0
30-180 35-170 80-140	76.0	83.0	89.5	95.5	107.0	131.0	152.0
35-180 40-170 50-160 90-130 110-120	77.0	84.0	91.0	97.0	108.5	132.5	154.0
60-150	78.0	85.0	92.0	98.5	110.0	135.0	156.0
40-180	79.0	86.0	93.0	99.5	111.5	136.5	158.0
60-160 70-150 90-140	80.0	87.0	94.5	101.0	113.0	138.0	160.0
50-170	81.0	88.0	95.0	102.0	114.0	138.5	162.0
50-180 70-160 80-150	82.0	89.5	96.5	103.5	115.5	142.0	164.0
60-170 80-160 110-130	84.0	92.0	99.0	106.0	118.5	145.5	168.0
100-140	85.0	93.0	100.5	107.5	120.0	147.0	170.0
60-180 70-180 90-150	86.0	94.0	102.0	109.0	121.5	148.5	172.0
110-140 120-130	87.0	95.0	103.0	110.0	122.0	150.0	174.0

Nozzle Flow Chart - Water, cont.

Jets Used	500 psi	600 psi	700 psi	800 psi	1,000 psi	1,500 psi	2,000 psi
70-180							
80-170	88.0	96.0	104.0	111.5	124.0	152.0	176.0
90-160							
80-180	89.0	97.0	105.0	112.5	125.5	154.0	178.0
120-140	90.0	98.0	106.0	113.5	127.0	155.5	180.0
100-150	91.0	99.0	107.0	114.5	128.5	157.0	182.0
90-170	92.0	100.0	108.0	115.5	129.5	158.5	184.0
100-160							
110-150	93.0	101.0	109.0	118.0	131.0	160.0	186.0
90-180	94.0	102.0	110.0	119.0	132.5	162.0	188.0
110-160	95.0	103.5	111.5	120.0	134.0	164.0	190.0
120-150	96.0	104.5	112.5	121.0	135.5	166.0	192.0
100-170							
120-160	97.0	106.0	115.0	122.5	137.0	168.0	194.0
130-140							
100-180	98.0	107.0	116.0	124.0	138.5	170.0	196.0
110-170	99.0	108.5	117.0	125.0	140.0	172.0	198.0
110-180	100.0	110.0	118.5	126.5	142.0	174.0	200.0
120-170	102.0	111.0	120.0	128.0	143.5	176.0	204.0
120-180							
130-150	103.0	112.5	121.5	130.0	145.0	178.0	206.0
130-160	105.0	114.5	124.0	132.5	148.0	181.0	210.0
140-150	106.0	116.0	125.0	134.0	150.0	183.5	212.0
140-160	108.0	118.0	127.5	136.5	152.5	186.5	216.0
130-170	109.0	119.0	128.5	137.5	154.0	188.0	218.0
130-180	110.0	120.5	130.0	139.0	156.0	191.0	220.0
140-170	112.0	122.5	132.5	141.5	158.0	193.5	224.0
140-180	113.0	123.5	133.5	142.5	159.5	195.0	226.0
150-160	114.0	124.5	134.5	144.0	161.0	196.5	228.0
150-170	118.0	129.0	139.5	148.5	166.0	203.5	236.0
150-180	119.0	130.0	141.0	150.5	167.5	205.5	238.0
160-170	120.0	131.0	142.0	151.5	169.0	208.0	240.0
160-180	121.0	132.5	143.5	153.0	171.5	210.0	242.0
170-180	125.0	137.0	148.0	158.0	177.0	217.0	250.0

2.625 Venturi Jet Junk Basket

Understanding the Four Preceding Flow Charts

The first column of numbers under the heading (Jets (nozzles) Used) would be the different combinations of Nozzles that could be used in the 2.625 in. Venturi Jet Junk Basket. The seven numbers to the right of each Nozzle combination are the flow rates, in gallons per minute (gpm), through that particular pair of nozzles. The pressure at the tool is given, in pounds per square inch (psi), above each different flow rate. For example, the first numbers under the (Jets Used) column are 25-30, this means that if a number 25 and a number 30 nozzle are placed in the venturi basket, and fresh water is pumped through the tool, a 23 gpm pump rate will show a pressure of 500 (psi) at the tool. Likewise with a 25-30 set of Nozzles at 40 gpm the pressure at the tool will be 1,500 psi.

To Calculate Flow Rates in GPM for Fluids other than Fresh Water

Find the conversion factor from the table below and multiply the conversion factor by the tabulated gallons per minute (gpm) flow rates taken from the previous four pages, the product is the gpm for the desired fluid though the two Nozzles at the given pressure.

Weight of Solution	Specific Gravity	Conversion Factor
7.0 Lbs. per Gallon	0.84	1.09
8.0 Lbs. per Gallon	0.96	1.026
8.34 Lbs. per Gallon	1.00	1.00
9.0 Lbs. per Gallon	1.08	0.96
10.0 Lbs. per Gallon	1.20	0.91
11.0 Lbs. per Gallon	1.32	0.87
12.0 Lbs. per Gallon	1.44	0.83
14.0 Lbs. per Gallon	1.68	0.77

To Find Nozzle Capacities at Different GPM and Pressures than Listed on the Preceding Four Pages

The Nozzle capacities, in gallons per minute (gpm), vary with different pressures across the Nozzles. As a rule of thumb, to the relationship between gpm and corresponding pressure drop across the Nozzles is as follows:

$$\frac{G.P.M._1}{G.P.M._2} = \frac{G.P.M._1}{G.P.M._2}$$

Nozzle Flow Chart - Gas

Flow Chart for Gas with 0.967 Specific Gravity in Cubic Feet per Minute

Jets Used	200 psi	400 psi	500 psi	600 psi	700 psi	800 psi	900 psi	1,000 psi	1,200 psi	1,400 psi	1,500 psi
25-30	103	200	248	295	343	391	437	488	584	679	727
25-35	109	210	260	310	361	411	462	512	614	714	764
25-40 30-35	116	225	279	322	386	441	495	549	657	765	819
30-40	118	228	282	337	392	446	501	556	665	775	829
25-50 35-40	131	253	314	375	436	497	558	619	741	862	924
30-50	140	271	336	402	467	532	597	663	793	923	989
35-50	146	281	348	417	485	552	620	687	823	958	1,026
25-60	147	284	353	420	489	557	626	694	831	968	1,036
40-50	153	296	367	439	510	582	643	724	866	1,009	1,081
25-70 30-60	156	302	375	447	520	592	665	738	884	1,029	1,101
35-60	162	312	387	462	538	612	688	762	913	1,064	1,138
25-80 30-70	164	318	394	470	546	623	700	776	929	1,082	1,158
35-70 40-60	171	330	408	489	569	647	727	806	966	1,125	1,203
30-80	173	336	416	497	577	658	739	820	981	1,143	1,223
35-80 40-70	179	346	428	512	595	678	762	844	1,011	1,178	1,260
25-90 50-60	183	354	439	523	609	694	779	865	1,035	1,205	1,290
40-80	186	361	447	534	620	740	795	881	1,054	1,229	1,315
30-90 50-70	192	372	461	550	640	747	818	909	1,087	1,266	1,355
35-90	198	382	473	565	658	749	841	933	1,117	1,301	1,392
25-100 50-80	203	393	488	581	676	771	865	960	1,150	1,338	1,433
40-90	205	397	492	587	683	779	874	970	1,160	1,352	1,447
30-100 60-70	212	411	510	608	707	806	904	1,004	1,202	1,399	1,498
25-110 60-80	214	413	512	611	710	810	909	1,009	1,028	1,406	1,505
35-100 50-90	218	421	522	623	725	826	927	1,028	1,232	1,434	1,535

2.625 Venturi Jet Junk Basket

Nozzle Flow Chart - Gas, cont.

Flow Chart for Gas with 0.967 Specific Gravity in Cubic Feet per Minute

Jets Used	200 psi	400 psi	500 psi	600 psi	700 psi	800 psi	900 psi	1,000 psi	1,200 psi	1,400 psi	1,500 psi
25-120 30-110 40-100 70-80	225	434	539	643	748	852	957	1,062	1,271	1,480	1,584
35-110	229	441	546	653	759	865	971	1,077	1,290	1,502	1,607
30-120	234	452	561	670	779	887	996	1,106	1,323	1,541	1,649
35-120 40-110 60-90	240	462	573	685	797	907	1,019	1,130	1,353	1,576	1,686
50-100	241	464	576	688	800	912	1,023	1,135	1,359	1,582	1,695
40-120 70-90	247	477	592	707	822	937	1,052	1,167	1,396	1,627	1,741
25-130 60-100	258	497	617	736	856	976	1,096	1,216	1,456	1,695	1,815
50-120	262	505	627	750	872	993	1,115	1,237	1,480	1,724	1,846
30-130 60-110 70-100	267	515	639	763	887	1,011	1,135	1,260	1,508	1,756	1,880
25-140 35-130 80-100	272	525	651	777	903	1,030	1,156	1,283	1,536	1,788	1,915
40-130 60-120 70-110	280	540	670	800	930	1,061	1,191	1,321	1,581	1,842	1,972
30-140 80-110	281	543	673	804	934	1,065	1,195	1,327	1,588	1,849	1,980
35-140 70-120	287	553	685	819	952	1,085	1,218	1,351	1,618	1,884	2,017
90-100	288	565	701	836	973	1,109	1,244	1,381	1,653	1,925	2,061
25-150 40-140 50-130 80-120	289	576	714	852	991	1,130	1,268	1,407	1,685	1,961	2,100
90-110	303	585	725	866	1,007	1,148	1,288	1,430	1,711	1,993	2,133
25-160 30-150	307	592	735	876	1,019	1,162	1,305	1,447	1,733	2,017	2,160
50-140 60-130	309	596	739	884	1,027	1,171	1,314	1,458	1,745	2,032	2,177

Nozzle Flow Chart - Gas, cont.

Flow Chart for Gas with 0.967 Specific Gravity in Cubic Feet per Minute

Jets Used	200 psi	400 psi	500 psi	600 psi	700 psi	800 psi	900 psi	1,000 psi	1,200 psi	1,400 psi	1,500 psi
30-160 35-150 90-120	316	610	757	903	1,050	1,197	1,344	1,491	1,787	2,078	2,225
35-160 40-150 70-130	322	620	769	918	1,068	1,217	1,367	1,515	1,815	2,113	2,262
25-170 60-140 100-110	325	627	778	929	1,080	1,232	1,383	1,534	1,837	2,138	2,289
40-160 80-130 25-180 30-170 70-140 100-120	329	635	788	940	1,093	1,246	1,400	1,553	1,859	2,164	2,317
50-150	335	647	802	959	1,115	1,271	1,426	1,582	1,894	2,205	2,362
30-180 35-170 80-140	338	653	810	967	1,124	1,281	1,439	1,597	1,911	2,225	2,382
35-180 40-170 50-160 90-130 110-120	344	663	822	982	1,142	1,301	1,462	1,621	1,941	2,260	2,419
60-150 40-180	351	678	841	1,004	1,168	1,331	1,494	1,657	1,984	2,311	2,474
60-160 70-150 90-140	360	694	862	1,028	1,196	1,363	1,531	1,697	2,032	2,367	2,534
50-170	362	698	866	1,036	1,204	1,373	1,541	1,709	2,046	2,372	2,551
50-180 70-160 80-150	366	706	875	1,047	1,217	1,387	1,558	1,728	2,068	2,408	2,579
60-170 80-160 110-130	378	729	905	1,081	1,257	1,433	1,609	1,784	2,136	2,488	2,663
100-140	381	736	913	1,090	1,267	1,445	1,621	1,799	2,154	2,508	2,686
60-180 70-180 90-150	382	737	915	1,092	1,270	1,447	1,626	1,803	2,158	25,174	2,691
110-140 120-130	392	756	937	1,120	1,301	1,484	1,665	1,848	2,212	2,576	2,758

2.625 Venturi Jet Junk Basket

Nozzle Flow Chart - Gas, cont.

Flow Chart for Gas with 0.967 Specific Gravity in Cubic Feet per Minute

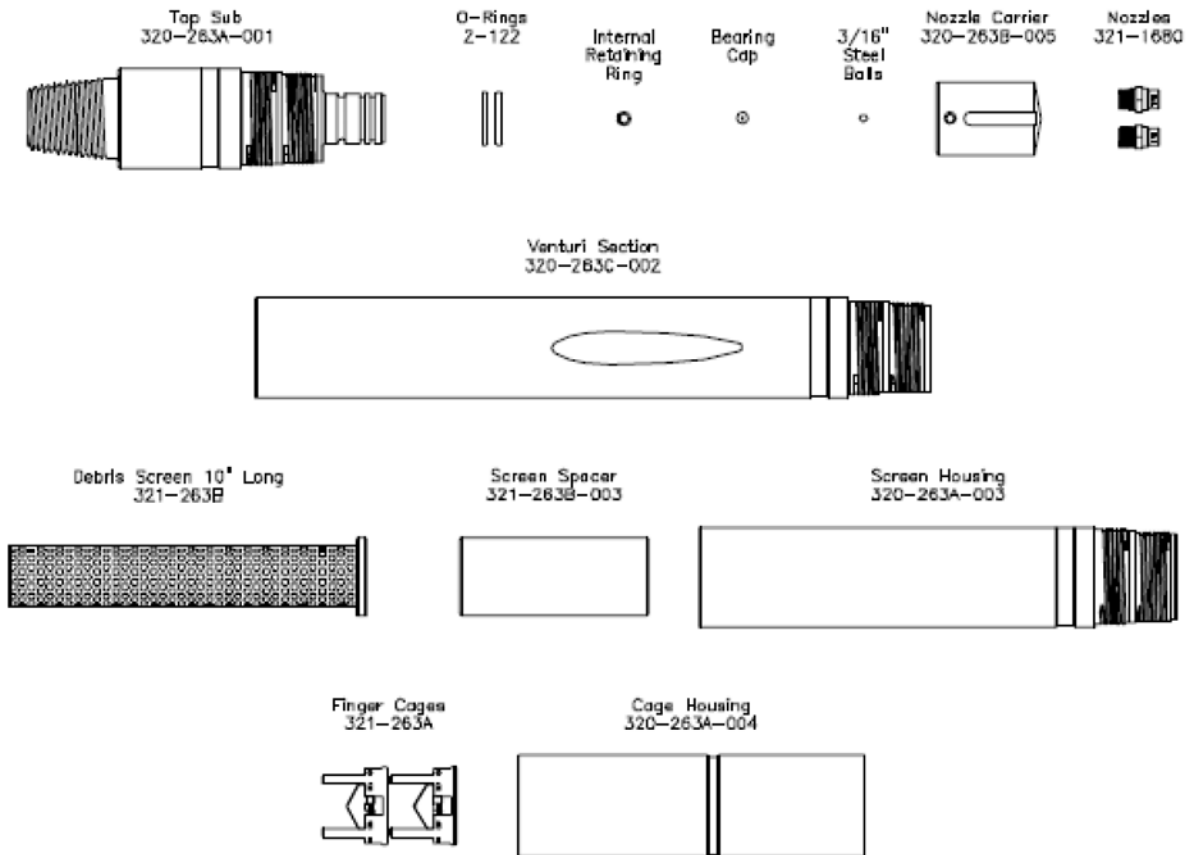
Jets Used	200 psi	400 psi	500 psi	600 psi	700 psi	800 psi	900 psi	1,000 psi	1,200 psi	1,400 psi	1,500 psi
70-180 80-170 90-160	391	756	937	1,120	1,301	1,484	1,665	1,848	2,212	2,576	2,758
80-180	399	771	956	1,142	1,327	1,513	1,700	1,885	2,256	2,628	2,813
120-140	403	777	964	1,152	1,339	1,526	1,713	1,901	2,275	2,650	2,837
100-150	407	787	977	1,165	1,355	1,545	1,733	1,923	2,303	2,681	2,871
90-170	414	799	991	1,184	1,377	1,570	1,762	1,955	2,340	2,725	2,917
100-160 110-150	416	803	997	1,189	1,383	1,577	1,770	1,963	2,351	2,737	2,931
90-180	418	807	1,000	1,195	1,389	1,584	1,777	1,972	2,361	2,749	2,943
110-160	427	823	1,021	1,219	1,417	1,616	1,814	2,012	2,409	2,805	3,003
120-150	429	828	1,027	1,227	1,427	1,626	1,825	2,025	2,424	2,823	3,022
100-170 120-160 130-140	434	838	1,040	1,242	1,444	1,647	1,848	2,050	2,455	2,858	3,060
100-180	438	846	1,050	1,253	1,457	1,661	1,865	2,069	2,477	2,884	3,088
110-170	445	858	1,064	1,272	1,478	1,686	1,892	2,099	2,513	2,926	3,132
110-180	449	866	1,074	1,283	1,491	1,700	1,909	2,128	2,545	2,952	3,160
120-170	456	879	1,091	1,304	1,516	1,728	1,940	2,152	2,576	3,000	3,211
120-180 130-150	460	887	1,101	1,315	1,529	1,742	1,957	2,171	2,598	3,026	3,239
130-160	471	907	1,126	1,344	1,563	1,782	2,001	2,219	2,657	3,094	3,313
140-150	476	919	1,139	1,361	1,582	1,804	2,024	2,246	2,689	3,131	3,353
140-160	485	935	1,160	1,385	1,610	1,836	2,061	2,286	2,737	3,187	3,413
130-170	489	942	1,169	1,397	1,624	1,852	2,079	2,306	2,761	3,205	3,442
130-180	493	950	1,179	1,408	1,637	1,866	2,096	2,325	2,783	3,241	3,470
140-170	503	970	1,203	1,438	1,671	1,906	2,139	2,373	2,841	3,298	3,532
140-180	507	978	1,213	1,449	1,684	1,920	2,156	2,392	2,863	3,334	3,570
150-160	511	986	1,223	1,460	1,698	1,936	2,173	2,410	2,876	3,360	3,598
150-170	529	1,021	1,266	1,513	1,759	2,006	2,251	2,497	2,980	3,471	3,727
150-180	533	1,029	1,276	1,524	1,772	2,020	2,268	2,516	3,012	3,507	3,755
160-170	538	1,037	1,287	1,537	1,787	2,038	2,288	2,537	3,038	3,537	3,787
160-180	542	1,045	1,297	1,548	1,800	2,052	2,305	2,556	3,060	3,563	3,815
170-180	560	1,080	1,340	1,601	1,861	2,122	2,382	2,643	3,164	3,674	3,944

Nozzle Size Chart

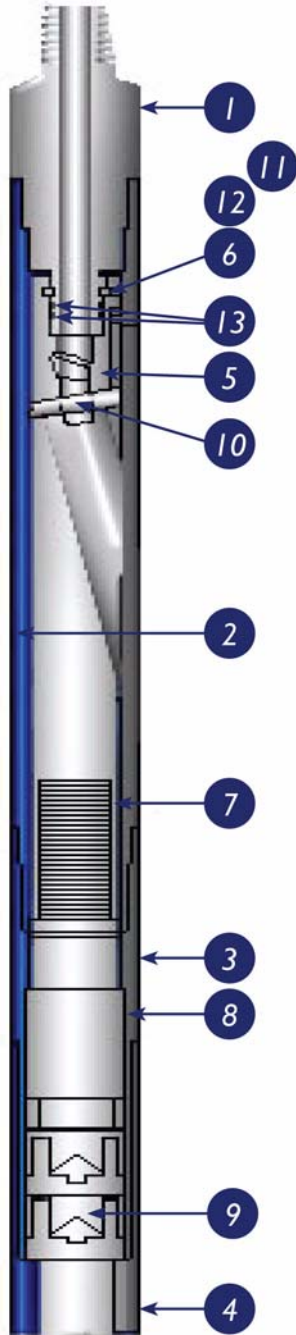
Nozzle Number	Nozzle ID	
	(inches)	(mm)
10	0.086	2.184
15	0.107	2.718
25	0.129	3.277
30	0.141	3.581
35	0.147	3.734
40	0.156	3.962
50	0.172	4.369
60	0.188	4.775
70	0.196	4.978
80	0.203	5.156
90	0.219	5.563
100	0.234	5.944
110	0.242	6.147
120	0.250	6.350
130	0.272	6.909
140	0.281	7.137
150	0.297	7.544
160	0.302	7.671
170	0.313	7.950
180	0.316	8.026

2.625 Venturi Jet Junk Basket

Part Identification Chart



TT0320-263A BOM, Schematic and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0320-263A-001
2	1	Venturi Section	TT0320-263C-002
3	1	Screen Housing	TT0320-263A-003
4	1	Cage Housing	TT0320-263A-004
5	1	Nozzle Carrier	TT0320-263B-005
6	1	Bearing Retainer Cap	TT0320-263A-010
7	1	Debris Screen	TT0321-263B
8	1	Screen Spacer Sleeve	TT0321-263B-003
9	2	Finger Style Cages	TT0321-263A
10	1	Nozzle Kit (not shown)	TT0321-1680
11	2	Internal Retainer Snap Rings 5/16" Bore	PUR-TSRI020-000
12	22	Steel Ball Bearings 3/16"	PUR-TSBC000-012
13	2	O-Rings 1 5/16" x 1 1/8" x 3/32" 2-122	PUR-TORV000-122

Tool Name: 2.625 in. OD Venturi Jet Junk Basket

Product Code: TT0320-263A **Tool OD:** 2.625 in. **Tool ID:** 1.56 in.

Material: AISI 4140 HT 285-341 Bhn **Tool Length:** 45 in.

Minimum Yield: 100,000 psi

Strength Properties of Tool:

Minimum Yield Point and Load to Yield: Pin Connection on CWP Wash Pipe Connection 116,000 lbs (top connection on tool is not taken into account since the top connection varies per customer request).

Burst Point and Burst Pressure: Top Sub and Nozzle Carrier Rotational Connection - 11,770 psi, CWP Box Connection - 6,090 psi.

Torsional Weak Point and Ft-Lbs to Yield: CWP Connections 1,788 ft-lbs.

Recommended Make Up Torque:

1st Connection: Top Sub and Venturi Section CWP Connection - 450 ft-lbs.

2nd Connection: Venturi Section and Screen Housing CWP Connection - 450 ft-lbs.

3rd Connection: Screen Housing and Cage Housing CWP Connection - 450 ft-lbs.

2.625 Venturi Jet Junk Basket

1.0 Pre-Assembly



Warning: *Make sure all tool parts and components have been thoroughly cleaned or serious damage and/or injury could occur!*



Note: *Verify that the correct O-ring redress kit and quantities are used as specified on the Bill Of Materials (for example, 5 each etc....). Lay out all redress kit components on a clean surface.*



Note: *Make sure to lubricate all O-rings and threaded surfaces.*



Note: *Visually inspect all parts for damage or wear. Thread parts together without the O-rings to check fit. Repair or replace damaged parts.*



Caution: *Always file wrench marks or burrs and clean off debris!*



Caution: *This tool should always be disassembled, cleaned thoroughly, inspected and reassembled after each job!*

1.1 Install the 2 O-rings (item #13), onto the Top Sub (item#1). Grease the O-rings, the pin threads near the O-rings, the entire ID of the Top Sub, and then place in a vise.

1.2 Grease the entire ID of the Nozzle Carrier (item #5) and then install it onto the Top Sub until the carrier holes line up with the groove on the Top Sub.



Note: *You may need to tap the carrier over the O-rings with a rubber mallet.*

1.3 Place a Bearing Cap (item #6) into one of the Nozzle Carrier holes, then install the Snap Ring (item #11).

1.4 Turn the carrier 180°, then insert 22 Steel Ball Bearings (item #12). Complete by repeating step 2.3.

1.5 Move the tool down in the vise to the Nozzle Carrier.

2.625 Venturi Junk Basket



Caution: Do not vise on the Nozzle Carrier slot, as it could damage the tool!

1.6 Put the required 2 Nozzles (item #10), as per the flow chart, into the holes in the bottom of the Nozzle Carrier and make wrench tight.



Note: It is recommended to use Teflon tape on the NPT thread.

1.7 Move the tool back in the vise to Top Sub (item #1).

1.8 Grease the entire ID of the Venturi Section (item #2). Look in the box end of the Venturi Section and find the alignment lug. Now match it with the slot on the Nozzle Carrier and screw the section onto the Top Sub, making it wrench tight.

1.9 Grease the entire ID of the Screen Housing (item #3). Insert the Screen Spacer Sleeve (item #8), then the Debris Screen, ring end first, into the Screen Housing.



Note: If you are using the optional Hollow Magnetic Insert, it will replace the Screen Spacer Sleeve in this step.

1.10 Screw the Screen Housing onto the Venturi Section wrench tight.

1.11 If needed, grease and make up the required length of Debris Catchers/Extensions. Standard lengths come in 1-6 ft sections.

1.12 Grease the entire ID of the Cage Housing (item #4) and then insert the 2 Finger Cages/Flutter Cages (item #9), fingers up, into the housing.



Note: Finger Cages come standard with the tool, however, Flutter Style Cages can be used and are optional.

1.13 Move the tool in the vise to the Screen Housing/Venturi Section connection.

1.14 Screw on the Cage Housing and make wrench tight.

2.0 Disassembly

2.1 Place the tool in a vise on the either the Debris Catcher/Extension or Screen Housing (item #3) and remove the Cage Housing (item #4). Unscrew the Cage Housing and drop it, box end first, on a wood block to remove the 2 Finger Cages/Flutter Cages (item #9).

2.2 Remove any installed Debris Catchers/ Extensions.

2.3 Move the tool down in the vise to the Venturi Section and vise near the Screen Housing (item #3).



Caution: Do not vise on the Venturi nozzle slot, as it could damage the tool!

2.4 Remove the Screen Housing, then remove the Screen (item #7). Drop the housing, box end first, on a wood block to remove either the Screen Spacer Sleeve (item #8) or Hollow Magnetic Insert.

2.5 Move the tool down in the vise to the Top Sub (item #1). Now unscrew the Venturi Section (item #2) from the Top Sub.

2.6 Move the tool down in the vise to the Nozzle Carrier (item #5).



Caution: Do not vise on the Nozzle Carrier slot, as it could damage the tool!

2.7 Remove the 2 Nozzles (item #10) from the carrier.

2.8 Move the assembly in the vise to the Top Sub.

2.9 Remove and discard a Snap Ring (item #11) from one of the Nozzle Carrier (item #5) holes, then remove the Bearing Cap (item #6) and put to the side for later cleaning.

2.10 Rotate the carrier 180° and repeat step 2.9.

2.625 Venturi Junk Basket

2.11 To remove the Steel Ball Bearings, hold your hand underneath the carrier and rotate it back and forth until all 22 balls have been removed.



Note: You may have to use de-greaser, a small length of plastic cord or a magnet to remove all of the ball bearings.

2.12 Remove the Nozzle Carrier from the Top Sub.

2.13 Finally, remove the Top Sub from the vise.



Note: Remove and discard all O-rings. Replace O-rings after each use. Thoroughly clean tool parts in a cleaner approved by state and/or local laws.



Note: Visually inspect tool for swelling after each use. Damaged or swelled components must be replaced.



Note: It is recommended that a Magnetic Particle Inspection (MPI) be completed on all components after each job.