

Fluid Power Products, Including Aerospace: 2004

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SUMMARY OF FINDINGS

In 2004, fluid power product manufacturers, including aerospace, had shipments of \$11,669.2 million, an increase of 11.8 percent, from \$10,442.1 million reported in 2003.

Hydraulic and pneumatic valves increased 9.4 percent to \$2,934.9 million in 2004, from \$2,683.4 million in 2003. Fittings and assemblies for tubing and hose, excluding plumbers' brass goods, increased 14.0 percent to \$2,568.8 million in 2004, from \$2,253.2 million in 2003. Hydraulic and pneumatic cylinder, actuators, accumulators, cushions, and nonvehicular shock absorbers increased by 11.6 percent to \$3,058.7 million in 2004, from \$2,741.3 million in 2003. Compressed air and gas dryers and lubricators increased 6.0 percent to \$79.4 million in 2004, from \$74.9 million in 2003. Filters of hydraulic and pneumatic systems increased 7.6 percent to \$555.4 million in 2004, from \$516.2 million in 2003. Hydraulic and pneumatic pumps, motors, and hydrostatic transmission components increased 13.8 percent to \$2,472.0 million in 2004, from \$2,173.2 million in 2003.

For general CIR information, explanation of general terms and historical note, see the appendix.

Address inquiries concerning these data to Investment Goods Industries Branch, Manufacturing and Construction Division (MCD), Washington, DC 20233-6900, or call Paul Corey, 301-763-4787.

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U S C E N S U S B U R E A U

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Table 1. Value of Shipments of Fluid Power Products, Including Aerospace: 2004 and 2003
 [Value in thousands of dollars]

Product code	Product description	2004		2003
	Fluid power products, including aerospace.....	11,669,191		10,442,129
3329125	Nonaerospace type hydraulic directional control valves.....	412,968		385,875
3329127	Nonaerospace type hydraulic valves (except directional control).....	820,658		690,981
3329129	Nonaerospace type pneumatic directional control valves.....	542,538		488,433
332912B	Nonaerospace type pneumatic valves (except directional control).....	220,602		193,304
3329121	Aerospace type hydraulic fluid power valves.....	397,107		406,959
3329123	Aerospace type pneumatic fluid power valves.....	324,432		310,580
332912D	Parts for fluid power valves.....	216,589	r/	207,282
332912H	Nonaerospace type flared (metal) fittings and couplings for, and assemblies of, tubing used in fluid power transfer systems.....	366,963		322,123
332912J	Nonaerospace type flareless fittings and couplings, including nonmetal fittings, used in fluid power transfer systems.....	437,211	r/	385,946
332912L	Nonaerospace type hydraulic and pneumatic fittings and couplings for hose, and manifolds.....	839,041	r/	725,931
332912N	Nonaerospace type hydraulic and pneumatic assemblies of hose.....	357,081		292,803
332912F	Aerospace type hydraulic and pneumatic hose or tube end fittings and assemblies and manifolds.....	568,497		526,359
3339993	Nonaerospace type filters for hydraulic fluid power systems.....	313,442		294,202
3339994	Nonaerospace type filters for pneumatic fluid power systems.....	135,789		127,081
3339996	Aerospace type hydraulic and pneumatic filters.....	106,150		94,926
3339998 pt.	Compressed air and gas dryers, and lubricators.....	79,415	r/	74,889
3339951	Nonaerospace type hydraulic fluid power cylinders and actuators, linear and rotary.....	1,059,690		881,599
3339953	Nonaerospace type pneumatic fluid power cylinders and actuators, linear and rotary.....	406,803		392,948
3339955	Parts for nonaerospace type hydraulic and pneumatic fluid power cylinders, actuators, and related items, n.e.c.	450,696		369,237
3339957	Aerospace type fluid power cylinders and actuators, hydraulic and pneumatic.....	1,141,542		1,097,468
3339961	Nonaerospace type reciprocating pumps.....	735,474	r/	646,915
3339963	Nonaerospace type rotary and other fluid power pumps.....	539,088		452,711
3339965	Nonaerospace type fluid power motors.....	562,657	r/	452,766
3339967	Aerospace type fluid power pumps and motors.....	249,064		240,606
3339969	Parts for fluid power pumps, motors, and hydrostatic transmissions.....	385,694	r/	380,205

n.e.c. Not elsewhere classified. pt. Part. r/Revised by 5 percent or more from previously published data.

Table 2. Manufacturer's Shipments of Fluid Power Products by Type, Including Aerospace: 2004 and 2003
 [Quantity in units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2004		No. of cos.	2003	
			Quantity	Value		Quantity	Value
3329125	Fluid power products, including aerospace.....	(X)	(X)	11,669,191	(X)	(X)	10,442,129
	Nonaerospace type hydraulic directional control valves.....	(X)	7,668,423	412,968	(X)	r/ 6,977,375	385,875
	Manual:						
3329125110	3- and 4-way monoblock.....	24	(D)	a/ 65,685	26	(D)	a/ 57,885
3329125120	3- and 4-way sectional.....	16		1,859,029	18	2,016,660	a/ 154,147
3329125130	Other manual.....	8	b/	39,118	b/ 8	39,681	b/ 4,012
	Solenoid:						
3329125140	2-way types.....	11	(D)	a/ 24,521	12	(D)	b/ 25,252
3329125150	3- and 4-way types.....	21		1,091,627	21	896,362	86,170
3329125160	Other directional control.....	29		2,529,225	a/ 31	r/ 2,162,714	b/ 58,409
3329127	Nonaerospace type hydraulic valves (except directional control).....	(X)	19,951,327	820,658	(X)	r/ 16,963,472	690,981
	Pressure control:						
3329127110	Relief valves.....	24	a/	542,389	25	a/r/ 528,304	a/ 26,953
3329127120	Other, including load sensing and manual types.....	10	(D)	25,796	12	(D)	20,285
	Flow control:						
3329127130	Manual types.....	16	a/	1,880,363	a/ 17	a/ 1,916,357	b/ 26,703
3329127140	Other flow control valves.....	18	a/	1,174,624	a/ 18	1,031,145	38,411
3329127150	Cartridge valves (all types).....	22		12,485,420	22	a/ 10,467,384	a/ 241,349
	Electrohydraulic valves:						
3329127160	Pilot-operated, torque motor servovalves.....	6	(D)	b/ 92,772	7	(D)	76,314
3329127170	Other types, including proportional.....	10		264,293	11	238,549	71,329
3329127180	Other nonaerospace type hydraulic valves, including stack and logic.....	16		2,556,862	17	1,750,427	189,637
3329129	Nonaerospace type pneumatic directional control valves.....	(X)	19,536,996	542,538	(X)	17,561,127	488,433
3329129110	Manual.....	31	b/	4,534,136	a/ 30	c/ 4,152,473	b/r/ 75,102
	Solenoid:						
3329129120	Under 1/8 inch port diameter.....	11	c/	5,023,559	b/ 10	a/ 4,626,643	b/ 97,149
	1/8 inch up to and including 1/4 inch port diameter:						
3329129130	3-way types.....	16	c/	2,473,536	17	a/ 2,144,332	51,228
3329129140	4-way types.....	18	c/	3,752,768	a/ 18	c/r/ 3,329,561	b/ 112,932
	Over 1/4 inch port diameter:						
3329129150	3-way types.....	16	(D)	41,105	16	a/ 488,192	37,834
3329129160	4-way types.....	15	c/	1,404,992	b/ 15	c/r/ 1,197,497	b/ 72,709
3329129170	All other types.....	4	(D)	10,215	4	c/r/ 195,969	r/ 9,223
3329129180	Mechanical, remote pilot, and all other types.....	21	b/	1,613,136	21	a/r/ 1,426,460	a/r/ 32,256
332912B	Nonaerospace type pneumatic directional control valves.....	(X)	10,767,457	220,602	(X)	9,151,722	193,304
332912B110	Filter-regulator combination units, integral types.....	10		1,008,860	9	b/ 891,331	c/ 19,947
332912B120	Other FRs and filter-regulator-lubricator combo units.....	10		201,632	10	b/ 165,570	b/ 9,184
332912B130	Regulators, sold separately.....	15		3,006,840	13	c/ 2,533,779	c/ 55,587
332912B140	Flow control valves.....	21		3,763,803	21	a/ 3,167,714	64,125
332912B150	Check, shuttle, exhaust, needle, and all other types.....	27		2,786,322	a/ 27	a/ 2,393,328	b/ 44,461
3329121	Aerospace type hydraulic fluid power valves.....	(X)	1,681,949	397,107	(X)	1,582,241	406,959
	2-, 3-, and 4-way directional control valves:						
3329121110	Manually or mechanically operated.....	16	(D)	85,820	17	(D)	84,865
3329121120	Solenoid operated.....	21	c/	95,185	b/ 21	c/r/ 110,769	b/r/ 76,008
3329121130	Motor operated.....	9	(D)	16,315	9	b/ 18,606	b/ 14,536
3329121140	Electrohydraulic servovalves.....	10	c/	72,228	9	(D)	b/ 111,520
3329121150	Flow, pressure, and other types of hydraulic valves.....	22	c/	395,141	b/ 23	371,674	120,030
3329123	Aerospace type pneumatic fluid power valves.....	(X)	332,632	324,432	(X)	319,066	310,580
3329123110	Pneumatic valves (all types).....	22	b/	332,632	a/ 25	b/ 319,066	310,580
332912D	Parts for fluid power valves.....	(X)	(X)	216,589	(X)	(X)	207,282
332912D110	Parts for nonaerospace type hydraulic and pneumatic valves, sold separately.....	51	(X)	b/ 170,411	55	(X)	b/r/ 155,968
332912D120	Parts for aerospace type hydraulic and pneumatic valves, sold separately.....	19	(X)	b/ 46,178	20	(X)	a/ 51,314
332912H	Nonaerospace type flared (metal) fittings and couplings for, and assemblies of, tubing used in fluid power transfer systems.....	(X)	(X)	366,963	(X)	(X)	322,123
	Flared fittings:						
332912H110	Brass and bronze (SAE 45 degrees and 37 degrees).....	14	(X)	c/ 155,142	14	(X)	c/ 134,096

Table 2. Manufacturer's Shipments of Fluid Power Products by Type, Including Aerospace: 2004 and 2003
 [Quantity in units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2004		No. of cos.	2003					
			Quantity	Value		Quantity	Value				
332912H120	Carbon steel (JIC 37 degrees).....	11	(X)		12	(X)					
332912H130	Other, including alloy steel.....	13	(X)	c/	14	(X)	c/r/				
332912H140	Assemblies of tubing.....	11	(X)		11	(X)					
332912H150	Assemblies of tubing and hose.....	7	(X)		7	(X)					
332912J	Nonaerospace type flareless fittings and couplings, including nonmetal fittings, used in fluid power transfer systems.....	(X)	(X)		(X)	(X)	r/				
	Metal types:										
332912J110	Brass and bronze.....	21	(X)		20	(X)					
332912J120	Carbon steel.....	11	(X)		12	(X)	(D)				
332912J130	Stainless steel.....	13	(X)		13	(X)	(D)				
332912J140	Other, including alloy steel.....	6	(X)	a/	6	(X)	a/r/				
332912J150	Nonmetal fittings, including plastic.....	9	(X)		9	(X)					
332912L	Nonaerospace type hydraulic and pneumatic fittings and couplings for hose, and manifolds.....	(X)	(X)		(X)	(X)					
332912L110	Permanent hose end fittings (crimped and swaged).....	20	(X)		21	(X)	r/				
332912L120	Hydraulic and pneumatic reusable end fittings....	24	(X)		25	(X)					
332912L130	Hydraulic quick connect and disconnect couplings.....	19	(X)		19	(X)					
332912L140	Pneumatic quick connect and disconnect couplings.....	22	(X)		21	(X)					
332912L150	Manifolds and manifold assemblies for fluid power systems.....	21	(X)		23	(X)	r/				
332912L160	All other, including steel adaptor, swivel, rotating, and extension fittings.....	18	(X)	a/	19	(X)	a/				
332912N	Nonaerospace type hydraulic and pneumatic assemblies of hose.....	(X)	(X)		(X)	(X)					
332912N110	Assemblies with permanent end fittings.....	21	(X)		21	(X)					
332912N120	Assemblies with reusable end fittings.....	9	(X)	a/	9	(X)	a/				
332912F	Aerospace type hydraulic and pneumatic hose or tube end fittings and assemblies and manifolds.....	(X)	(X)		(X)	(X)					
332912F110	Assemblies of hose and/or tubing.....	15	(X)	a/	15	(X)	(D)				
332912F120	Quick connect, rotating, swivel, and extension fittings.....	11	(X)	a/	11	(X)					
332912F130	Manifolds for aerospace hydraulic systems.....	4	(X)		4	(X)	(D)				
332912F140	Aerospace hose and tube fittings, n.e.c.	13	(X)		14	(X)					
3339993	Nonaerospace type filters for hydraulic fluid power systems.....	(X)	(X)		(X)	(X)					
	Hydraulic fluid filter assemblies, with or without filter element installed:										
3339993010	Low pressure (below 301 psi).....	18	c/	708,948	b/	26,360	18	c/	673,345	a/	22,168
3339993020	Medium pressure (301 to 2,999 psi).....	13	c/	498,606	c/	27,226	14	a/	470,423	a/	26,479
3339993030	High pressure (3,000 psi and above).....	13	a/	129,543	b/	12,477	12		115,658	b/	11,132
	Filter replacement elements:										
3339993040	Reusable (cleanable) type.....	11	b/	624,015	b/	13,617	12	b/	554,203	c/	15,858
3339993050	Nonreusable type.....	21	c/	15,762,104	b/	191,812	22		15,430,136		182,539
3339993060	Strainers and separators, filter parts, and accessories.....	16		(X)	b/	41,950	16		(X)	a/	36,026
3339994	Nonaerospace type filters for pneumatic fluid power systems.....	(X)	(X)		(X)	(X)			(X)		127,081
	Air supply filter assemblies and filter replacement elements, excluding those shipped as part of a FR or FRL combo unit:										
3339994010	Coalescing types, including elements sold separately.....	17	(X)	c/	64,660	17		(X)	c/	63,264	
3339994020	Other types, including elements sold separately.....	10	(X)		23,195	9		(X)	c/	20,743	
3339994030	Air exhaust mufflers, diffusers, filter parts, and air preparation accessories.....	15	(X)	a/	47,934	14		(X)		43,074	
3339996	Aerospace type hydraulic and pneumatic filters.....	(X)	(X)		(X)	(X)			(X)		94,926
3339996010	Hydraulic.....	7	(X)	b/	81,688	7		(X)	a/	68,203	
3339996020	Pneumatic.....	7	(X)		24,462	7		(X)		26,723	
3339998 pt.	Compressed air and gas dryers, and lubricators.....	(X)		277,432		79,415	(X)		270,388	r/	74,889
	Compressed air and gas dryers:										
3339998872	Refrigerated dryers.....	4		(D)	c/	26,949	4		(D)		(D)
3339998874	Desiccant dryers.....	6	b/	9,640	a/	35,670	6	b/r/	9,555	c/r/	31,403

Table 2. Manufacturer's Shipments of Fluid Power Products by Type, Including Aerospace: 2004 and 2003
 [Quantity in units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2004		No. of cos.	2003		
			Quantity	Value		Quantity	Value	
333998879	Other compressed air and gas dryers.....	4	(D)	c/	1,595	4	(D)	(D)
333998880	Lubricators for pneumatic systems, sold separately.....	8	230,394		15,201	8	c/	222,650 c/r/ 12,327
3339951	Nonaerospace type hydraulic fluid power cylinders and actuators, linear and rotary.....	(X)	4,083,644		1,059,690	(X)		3,436,568 r/ 881,599
	Hydraulic cylinders, excluding electrohydraulic:							
	Tie-rod types:							
	Standard NFPA and JIC tie-rod types:							
3339951110	Less than 1,500 psi.....	18	a/ 185,003		59,979	18		172,699 52,584
3339951120	1,500 to 3,000 psi.....	16	b/ 176,028	b/	70,326	17	b/	175,466 b/ 68,205
3339951130	Greater than 3,000 psi.....	5	(D)		(D)	6	(D)	(D)
3339951140	Other tie-rod types.....	15	a/ 254,579	a/	26,083	15	a/	215,806 a/ 24,190
3339951150	Threaded/weld fused combination.....	45	b/ 2,878,430	a/	585,011	44	a/	2,384,945 a/ 475,067
3339951160	Telescoping.....	20	126,756		118,885	20		108,576 93,752
3339951170	Mill type.....	11	(D)		(D)	11	(D)	(D)
3339951180	Other, including those threaded at both ends....	14	342,262		91,104	14		267,623 a/ 65,873
3339951190	Electrohydraulic types.....	8	2,801		7,353	7	a/	2,932 7,243
33399511A0	Hydraulic rotary actuators.....	12	53,608		61,243	12		53,159 59,305
3339953	Nonaerospace type pneumatic fluid power cylinders and actuators, linear and rotary.....	(X)	5,637,017		406,803	(X)		5,334,483 392,948
	NFPA interchangeable cylinders:							
3339953110	Steel.....	16	248,292		61,767	16	a/	238,838 a/ 58,051
	Aluminum:							
3339953120	Less than 1-1/2 inch bore size.....	6	a/ 36,590	b/	2,310	6	a/r/	26,263 b/ 2,289
3339953130	1-1/2 inch bore size and over.....	15	263,103		39,807	15	a/	247,673 36,744
3339953140	Rodless cylinders.....	10	97,239		33,202	9		93,995 31,118
	Other pneumatic cylinders:							
3339953150	Less than 1-1/2 inch bore size.....	21	3,569,893		153,302	20	a/	3,465,899 156,586
3339953160	1-1/2 inch bore size and over.....	28	a/ 1,344,681		98,648	29	a/	1,186,595 a/ 88,329
3339953170	Pneumatic rotary actuators.....	12	77,219		17,767	12		75,220 19,831
3339955	Parts for nonaerospace type hydraulic and pneumatic fluid power cylinders, actuators, and related items, n.e.c.	(X)	(X)		450,696	(X)		(X) 369,237
3339955110	Accumulators (bladder, piston, and other types)...	16	a/ 232,291	b/	64,210	18	a/	187,931 a/ 54,938
3339955120	Shock absorbers, not for vehicle suspension, and cushions (hydraulic and pneumatic).....	14	1,820,707		79,041	14	b/	1,460,372 c/ 70,267
3339955130	Reservoirs, intensifiers, and other devices for fluid energy absorption and/or storage.....	12	(D)	c/	5,987	11	(D)	c/ 4,590
3339955140	Parts for nonaerospace type hydraulic and pneumatic cylinders, actuators, accumulators, cushions, and nonvehicular shock absorbers, sold separately.....	48	(X)		301,458	49	(X)	r/ 239,442
3339957	Aerospace type fluid power cylinders and actuators, hydraulic and pneumatic.....	(X)	(X)		1,141,542	(X)		(X) 1,097,468
	Hydraulic servo-actuator assemblies (linear and rotary):							
3339957110	Mechanical input.....	10	a/ 50,864		361,105	12	r/	33,357 361,655
3339957120	Electrical input.....	7	a/ 22,227		349,245	9	r/	21,839 317,955
3339957130	Combination input.....	4	(D)		(D)	4	(D)	(D)
	Hydraulic utility actuators:							
3339957140	Linear actuators (cylinders).....	11	36,687	a/	82,520	12	a/r/	31,786 a/ 85,721
3339957150	Rotary actuators (limited rotation).....	2	(D)		(D)	2	(D)	(D)
3339957160	Shock absorbers, snubbers, and cushions, all types, excluding oleo strut assemblies.....	6	(D)	b/	30,798	7	(D)	(D)
3339957170	Pneumatic actuators (linear and rotary).....	8	57,213		93,689	8	a/r/	53,590 71,185
3339957180	Accumulators (bladder, piston, and other types).....	11	10,326		22,979	10		11,270 22,069
3339957190	Reservoirs, intensifiers, and other devices for fluid energy absorption and/or storage.....	6	1,376		18,293	7		1,816 17,505
33399571A0	Other aerospace-type fluid power cylinders, rotary actuators, cushions, and related items, n.e.c.	4	(X)		2,164	4	(X)	(X) 2,298
3339955150	Parts for aerospace type hydraulic and pneumatic cylinders, actuators, accumulators, cushions, and related items, sold separately.....	13	(X) E199	a/	56,360	14	(X)	c/r/ 70,099
3339961	Nonaerospace type reciprocating pumps.....	(X)	4,396,231		735,474	(X)	r/	3,521,400 646,915
	Axial piston:							
	Variable displacement types:							
3339961110	Closed loop.....	13	3,889,393	a/	503,819	14	r/	2,844,300 r/ 410,176
3339961120	Open loop.....	12	306,175		175,080	12	(D)	(D) r/ 154,336
3339961130	Fixed displacement types.....	8	(D)		(D)	10	(D)	(D)
3339961140	Radial piston types.....	3	(D)		(D)	4	(D)	(D)

Table 2. Manufacturer's Shipments of Fluid Power Products by Type, Including Aerospace: 2004 and 2003
 [Quantity in units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2004		No. of cos.	2003		
			Quantity	Value		Quantity	Value	
3339963	Nonaerospace type rotary and other fluid power pumps.....	(X)	5,275,107	539,088	(X)	r/	4,302,781	452,711
	Gear type:							
3339963110	Internal gear type, including gerotors.....	20	b/ 1,748,811	b/ 191,854	20	b/r/	1,471,567	b/r/ 162,655
3339963120	External gear type.....	14	2,079,493	265,379	14	r/	1,611,366	r/ 202,260
	Vane type:							
3339963130	Fixed displacement.....	4	(D)	(D)	4		(D)	(D)
3339963140	Variable displacement.....	3	(D)	(D)	3		(D)	(D)
3339965	Nonaerospace type fluid power motors.....	(X)	(X)	562,657	(X)		(X)	r/ 452,766
3339965110	Pneumatic (air) motors.....	2	(D)	(D)	2		(D)	(D)
	Hydraulic motors:							
	Gear type:							
3339965120	Internal types, excluding gerotors.....	12	(D)	90,970	12		773,017	a/ 71,003
3339965130	Gerotor types.....	5	2,247,748	251,990	5		1,550,288	203,522
3339965140	External.....	6	113,114	13,868	5	r/	86,895	r/ 10,447
3339965150	Vane types, fixed and variable.....	6	8,390	8,016	6		(D)	(D)
3339965160	Radial piston types, fixed and variable.....	5	114,963	87,592	5		80,655	56,822
	Axial piston types:							
3339965170	Fixed displacement.....	9	b/ 104,089	a/ 48,374	8	r/	77,315	r/ 34,811
3339965180	Variable displacement.....	8	b/ 109,909	c/ 32,889	8	r/	66,796	r/ 38,458
3339965190	Prime movers shipped with pumps or sold separately.....	4	(X)	(D)	4		(X)	(D)
3339967	Aerospace type fluid power pumps and motors.....	(X)	104,316	249,064	(X)		97,145	240,606
	Hydraulic pumps:							
3339967110	Fixed and variable displacement types.....	9	29,513	118,071	10		27,368	r/ 119,393
3339967120	Pump/electric motor assemblies, fixed and variable displacement types.....	9	41,117	94,194	8	r/	34,669	85,656
3339967130	Other pump packages, n.e.c.	7	c/ 31,062	c/ 18,456	8		31,037	b/ 16,620
	Motors:							
3339967140	Pneumatic (air) motors and motor packages.....	1	(D)	(D)	1		(D)	(D)
3339967150	Hydraulic motors, fixed and variable displacement types.....	3	(D)	(D)	3		(D)	(D)
3339967160	Hydraulic motor packages, including motor/gearbox, motor/valve, motor/generator, and similar combination units.....	2	(D)	(D)	2		(D)	(D)
3339969	Parts for fluid power pumps, motors, and hydrostatic transmissions.....	(X)	(X)	385,694	(X)		(X)	r/ 380,205
	Hydraulic:							
3339969110	Nonaerospace.....	34	(X)	b/ 317,079	38		(X)	r/ 307,668
3339969120	Aerospace.....	5	(X)	(D)	7		(X)	b/r/ 54,670
	Pneumatic:							
3339969130	Nonaerospace.....	4	(X)	a/ 8,342	4		(X)	(D)
3339969140	Aerospace.....	3	(X)	(D)	2		(X)	(D)

D Withheld to avoid disclosing data for individual companies. n.e.c. Not elsewhere classified. pt. Part. r/Revised by 5 percent or more from previously published data. X Not applicable.

Note: Percent of estimation for each item is indicated as follows: a/10 to 25 percent of this item is estimated. b/26 to 50 percent of this item is estimated. c/Over 50 percent of this item is estimated.

Table 3a. Manufacturers' Shipments of Fluid Power Products, Including Aerospace by Use: 2004
 [Quantity in units. Value in thousands of dollars]

Product code	Product description	No. of cos.	Mobile shipments				Industrial shipments			
			Quantity	Percent	Value	Percent	Quantity	Percent	Value	Percent
3329125	Fluid power products, including aerospace.....	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
	Nonaerospace type hydraulic directional control valves.....	(X)	5,071,626	65	315,598	76	2,596,797	35	97,370	24
	Manual:									
3329125110	3- and 4-way monoblock.....	24	(D)	(D)	a/ 61,472	94	(D)	(D)	b/ 4,213	6
3329125120	3- and 4-way sectional.....	16	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3329125130	Other manual.....	8	b/ 24,177	62	a/ 2,628	55	b/ 14,941	38	c/ 2,152	45
	Solenoid:									
3329125140	2-way types.....	11	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3329125150	3- and 4-way types.....	21	587,475	54	c/ 58,140	56	504,152	46	45,721	44
3329125160	Other directional control.....	28	(D)	(D)	c/ 35,190	55	(D)	(D)	b/ 29,287	45
3329127	Nonaerospace type hydraulic valves (except directional control).....	(X)	14,809,235	75	618,933	75	5,142,092	25	201,725	25
	Pressure control:									
3329127110	Relief valves.....	24	a/ 223,275	41	14,496	48	319,114	59	15,899	52
3329127120	Other, including load sensing and manual types.....	10	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Flow control:									
3329127130	Manual types.....	16	a/ 1,097,907	58	a/ 18,598	58	a/ 782,456	42	a/ 13,729	42
3329127140	Other flow control valves.....	18	a/ 431,477	37	a/ 18,534	45	743,147	63	22,337	55
3329127150	Cartridge valves (all types).....	22	10,114,061	81	a/ 219,516	74	2,371,359	19	76,755	26
	Electrohydraulic valves:									
3329127160	Pilot-operated, torque motor servovalves.....	6	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3329127170	Other types, including proportional.....	10	242,638	92	76,737	90	21,655	8	b/ 8,628	10
3329127180	Other nonaerospace type hydraulic valves, including stack and logic.....	15	(D)	(D)	209,491	97	(D)	(D)	a/ 7,370	3
3339993	Nonaerospace type filters for hydraulic fluid power systems.....	(X)	(X)	(X)	157,218	50	(X)	(X)	156,224	50
	Hydraulic fluid filter assemblies, with or without filter element installed:									
3339993010	Low pressure (below 301 psi).....	18	c/ 401,100	57	b/ 10,890	41	b/ 307,848	43	a/ 15,470	59
3339993020	Medium pressure (301 to 2,999 psi).....	14	(D)	(D)	c/ 8,655	32	(D)	(D)	c/ 18,571	68
3339993030	High pressure (3,000 psi and above).....	13	a/ 17,580	14	a/ 3,556	29	c/ 111,963	86	b/ 8,921	71
	Filter replacement elements:									
3339993040	Reusable (cleanable) type.....	11	b/ 208,875	33	c/ 3,802	28	c/ 415,140	67	c/ 9,815	72
3339993050	Nonreusable type.....	21	c/ 8,804,584	56	b/ 115,167	60	c/ 6,957,520	44	c/ 76,645	40
3339993060	Strainers and separators, filter parts, and accessories.....	16	(X)	(X)	c/ 15,148	36	(X)	(X)	b/ 26,802	64
3339951	Nonaerospace type hydraulic fluid power cylinders and actuators, linear and rotary.....	(X)	3,305,000	81	801,978	76	778,644	19	257,712	24
	Hydraulic cylinders, excluding electrohydraulic:									
	Tie-rod types:									
	Standard NFPA and JIC tie-rod types:									
3339951110	Less than 1,500 psi.....	18	a/ 11,712	6	c/ 1,655	3	a/ 173,291	94	58,324	97
3339951120	1,500 to 3,000 psi.....	16	(D)	(D)	c/ 3,296	5	(D)	(D)	b/ 67,030	95
3339951130	Greater than 3,000 psi.....	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339951140	Other tie-rod types.....	15	a/ 246,333	97	a/ 22,298	85	b/ 8,246	3	b/ 3,785	15
3339951150	Threaded/weld fused combination.....	45	b/ 2,516,595	87	a/ 508,668	87	a/ 361,835	13	b/ 76,343	13
3339951160	Telescoping.....	20	125,900	99	117,535	99	c/ 856	1	b/ 1,350	1
3339951170	Mill type.....	11	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339951180	Other, including those threaded at both ends.....	14	305,706	89	79,812	88	a/ 36,556	11	b/ 11,292	12
3339951190	Electrohydraulic types.....	8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
33399511A0	Hydraulic rotary actuators.....	12	43,058	80	b/ 36,520	60	10,550	20	a/ 24,723	40
3339961	Nonaerospace type reciprocating pumps.....	(X)	2,169,417	49	559,107	76	2,226,814	51	176,367	24
	Axial piston:									
	Variable displacement types:									
3339961110	Closed loop.....	13	(D)	(D)	b/ 377,775	75	(D)	(D)	c/ 126,044	25
3339961120	Open loop.....	12	241,353	79	a/ 135,548	77	64,822	21	39,532	23
3339961130	Fixed displacement types.....	8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339961140	Radial piston types.....	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339963	Nonaerospace type rotary and other fluid power pumps.....	(X)	3,191,015	60	371,896	69	2,084,092	40	167,192	31
	Gear type:									
3339963110	Internal gear type, including gerotors.....	20	(D)	(D)	b/ 89,293	47	(D)	(D)	b/ 102,561	53
3339963120	External gear type.....	14	1,861,287	90	241,023	91	a/ 218,206	10	24,356	9
	Vane type:									
3339963130	Fixed displacement.....	4	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339963140	Variable displacement.....	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339965 pt.	Nonaerospace type fluid power motors.....	(X)	(X)	(X)	498,993	1	(X)	(X)	34,706	7
	Hydraulic motors:									
	Gear type:									
3339965120	Internal types, excluding gerotors.....	12	(D)	(D)	(D)	(D)	(D)	(D)	(D)	9
3339965130	Gerotor types.....	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339965140	External.....	6	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339965150	Vane types, fixed and variable.....	6	4,225	50	c/ 3,402	42	b/ 4,165	50	c/ 4,614	58
3339965160	Radial piston types, fixed and variable.....	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Axial piston types:									
3339965170	Fixed displacement.....	9	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339965180	Variable displacement.....	8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

D Withheld to avoid disclosing data for individual companies. pt. Part. X Not applicable.

Note: Percent of estimation for each item is indicated as follows: a/10 to 25 percent of this item is estimated. b/26 to 50 percent of this item is estimated. c/Over 50 percent of this item is estimated.

Table 3b. Manufacturers' Shipments of Fluid Power Products, Including Aerospace by Use: 2003
 [Quantity in units. Value in thousands of dollars]

Product code	Product description	No. of cos.	Mobile shipments				Industrial shipments			
			Quantity	Percent	Value	Percent	Quantity	Percent	Value	Percent
3329125	Fluid power products, including aerospace.....	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
	Nonaerospace type hydraulic directional control valves.....	115	4,532,431	65	298,804	77	2,445,144	35	87,071	23
	Manual:									
3329125110	3- and 4-way monoblock.....	26	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3329125120	3- and 4-way sectional.....	18	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3329125130	Other manual.....	8	b/ 24,150	61	b/ 2,020	50	b/ 15,531	39	c/ 1,992	50
	Solenoid:									
3329125140	2-way types.....	12	(D)	(D)	c/ 20,891	83	(D)	(D)	4,361	17
3329125150	3- and 4-way types.....	21	435,374	49	46,439	54	460,988	51	39,731	46
3329125160	Other directional control.....	30	(D)	(D)	b/ 32,452	56	(D)	(D)	a/ 25,957	44
3329127	Nonaerospace type hydraulic valves (except directional control).....	127	12,423,747	73	517,500	75	4,539,725	27	173,481	25
	Pressure control:									
3329127110	Relief valves.....	24	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3329127120	Other, including load sensing and manual types.....	12	(D)	(D)	4,945	24	(D)	(D)	15,340	76
	Flow control:									
3329127130	Manual types.....	17	a/ 1,102,108	58	14,811	55	b/ 814,249	42	c/ 11,892	45
3329127140	Other flow control valves.....	18	366,677	36	17,543	46	664,468	64	20,868	54
3329127150	Cartridge valves (all types).....	22	a/ 8,501,320	81	177,262	73	b/ 1,966,064	19	b/ 64,087	27
	Electrohydraulic valves:									
3329127160	Pilot-operated, torque motor servovalves.....	7	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3329127170	Other types, including proportional.....	11	220,993	93	66,092	93	17,556	7	5,237	7
3329127180	Other nonaerospace type hydraulic valves, including stack and logic.....	16	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339993	Nonaerospace type filters for hydraulic fluid power systems.....	93	(X)	(X)	150,168	51	(X)	(X)	144,034	49
	Hydraulic fluid filter assemblies, with or without filter element installed:									
3339993010	Low pressure (below 301 psi).....	18	c/ 387,960	58	b/ 10,268	46	b/ 285,385	42	a/ 11,900	54
3339993020	Medium pressure (301 to 2,999 psi).....	14	(D)	(D)	c/ 8,414	32	(D)	(D)	b/ 18,065	68
3339993030	High pressure (3,000 psi and above).....	12	15,428	13	a/ 3,007	27	a/ 100,230	87	b/ 8,125	73
	Filter replacement elements:									
3339993040	Reusable (cleanable) type.....	11	b/ 162,606	29	c/ 3,953	25	b/ 391,597	71	c/ 11,905	75
3339993050	Nonreusable type.....	22	a/ 8,459,358	54	b/ 107,708	59	b/ 6,970,778	46	b/ 74,831	41
3339993060	Strainers and separators, filter parts, and accessories.....	16	(X)	(X)	b/ 16,818	47	(X)	(X)	b/ 19,208	53
3339951	Nonaerospace type hydraulic fluid power cylinders and actuators, linear and rotary.....	164	2,690,077	78	633,776	72	746,491	22	247,823	28
	Hydraulic cylinders, excluding electrohydraulic:									
	Tie-rod types:									
	Standard NFPA and JIC tie-rod types:									
3339951110	Less than 1,500 psi.....	18	11,364	7	c/ 1,787	3	161,335	93	50,797	97
3339951120	1,500 to 3,000 psi.....	17	(D)	(D)	c/ 3,067	4	(D)	(D)	b/ 65,138	96
3339951130	Greater than 3,000 psi.....	6	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339951140	Other tie-rod types.....	15	a/ 207,823	96	a/ 18,153	75	a/ 7,983	4	6,037	25
3339951150	Threaded/weld fused combination.....	44	a/ 2,046,040	86	a/ 404,449	85	a/ 338,905	14	a/ 70,618	15
3339951160	Telescoping.....	20	(D)	(D)	87,536	93	(D)	(D)	6,216	7
3339951170	Mill type.....	11	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339951180	Other, including those threaded at both ends.....	14	233,409	87	55,702	85	a/ 34,214	13	b/ 10,171	15
3339951190	Electrohydraulic types.....	7	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
33399511A0	Hydraulic rotary actuators.....	12	42,595	80	35,882	61	10,564	20	23,423	39
3339961	Nonaerospace type reciprocating pumps.....	37	2,014,122	56	498,937	73	1,507,278	44	147,978	27
	Axial piston:									
	Variable displacement types:									
3339961110	Closed loop.....	13	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339961120	Open loop.....	12	(D)	(D)	116,246	75	(D)	(D)	38,090	25
3339961130	Fixed displacement types.....	9	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339961140	Radial piston types.....	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339963	Nonaerospace type rotary and other fluid power pumps.....	41	2,580,517	71	308,844	76	1,722,264	29	143,867	24
	Gear type:									
3339963110	Internal gear type, including gerotors.....	20	b/ 576,930	39	b/ 75,325	46	a/ 894,637	61	b/ 87,330	54
3339963120	External gear type.....	14	1,444,416	90	182,985	90	a/ 166,950	10	19,275	10
	Vane type:									
3339963130	Fixed displacement.....	4	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339963140	Variable displacement.....	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339965 pt.	Nonaerospace type fluid power motors.....	49	(X)	(X)	371,187	88	(X)	(X)	51,438	12
	Hydraulic motors:									
	Gear type:									
3339965120	Internal types, excluding gerotors.....	12	(D)	(D)	63,474	89	(D)	(D)	b/ 7,529	11
3339965130	Gerotor types.....	5	(D)	(D)	167,565	82	(D)	(D)	35,957	18
3339965140	External.....	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339965150	Vane types, fixed and variable.....	6	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339965160	Radial piston types, fixed and variable.....	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
	Axial piston types:									
3339965170	Fixed displacement.....	8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3339965180	Variable displacement.....	8	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

D Withheld to avoid disclosing data for individual companies. pt. Part. X Not applicable.

Note: Percent of estimation for each item is indicated as follows: a/10 to 25 percent of this item is estimated. b/26 to 50 percent of this item is estimated. c/Over 50 percent of this item is estimated.

Table 4. Shipments, Exports, and Imports of Fluid Power Products: 2004
 [Quantity in units. Value in thousands of dollars]

Product code	Product description	Manufacturers' shipments		Export shipments 1/		Import shipments 2/	
		Quantity	Value	Quantity	Value	Quantity	Value
3329121, 125, 127	Hydraulic fluid power valves.....	29,301,699	1,630,733	4,648,962	269,742	34,860,684	334,424
3329123, 129, 12B	Pneumatic fluid power valves.....	30,637,085	1,087,572	3,472,724	129,984	36,223,914	330,715
332912D	Parts for fluid power valves: hydraulic, pneumatic, all types.....	(X)	216,589	(X)	111,049	(X)	235,995
3339951 pt., 957 pt.	Hydraulic cylinders and hydraulic actuators (except electrohydraulic types).....	4,198,952	1,969,596	585,557	127,094	3,566,874	370,762
3339953 pt.	Pneumatic cylinders (tie-rod types).....	547,985	103,884	2,236	2,940	73,946	8,831
3339953 pt., 957 pt.	Pneumatic cylinders (except tie-rod types).....	5,146,245	396,608	715,939	40,039	1,084,527	56,940
3339951 pt., 957 pt.	Fluid power accumulators, hydraulic and pneumatic, and other hydraulic, pneumatic or combination devices for fluid energy absorption and/or storage, all types.....	(X)	145,779	373,892	113,764	842,507	131,686
3339965 pt., 967 pt.	Pneumatic (air) motors and motor packages, all types.....	137,195	16,162	14,659	5,363	11,345	1,482
3339965 pt., 967 pt.	Hydraulic motors, all types.....	3,652,427	549,716	208,830	112,037	358,830	205,013
3339961, 963, 967 pt.	Hydraulic pumps, all types.....	9,773,030	1,505,283	4,751,286	479,706	4,839,614	514,683
3339969	Parts for fluid power pumps and motors.....	(X)	385,694	(X)	221,934	(X)	441,527
pt. Part.	X Not applicable.						

1/Source: Census Bureau report, EM 545, U.S. Exports.
 2/Source: Census Bureau report, IM 145, U.S. Imports for Consumption.

Note: For comparison of North American Industry Classification System (NAICS)-based product codes, Schedule B export codes, and HTSUSA import codes, see Table 5.

Table 5. Comparison of North American Industry Classification System (NAICS)-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2004

Product code	Product description	Export code 1/	Import code 2/
3329121, 125, 127	Hydraulic fluid power valves.....	8481.10.0020 8481.20.0010 8481.20.0020 8481.20.0030 8481.20.0040 8481.20.0050	8481.10.0020 8481.20.0010 8481.20.0020 8481.20.0030 8481.20.0040 8481.20.0050
3329123, 129, 12B	Pneumatic fluid power valves.....	8481.10.0040 8481.10.0060 8481.20.0060 8481.20.0070 8481.20.0080	8481.10.0040 8481.10.0060 8481.20.0060 8481.20.0070 8481.20.0080
332912D	Parts for fluid power valves: hydraulic, pneumatic, all types.....	8481.90.9010	8481.90.9020 8481.90.9040
3339951 pt., 957 pt.	Hydraulic cylinders and hydraulic actuators (except electrohydraulic types).....	8412.21.0015 8412.21.0030 8412.21.0045 8412.21.0060 8412.21.0075	8412.21.0015 8412.21.0030 8412.21.0045 8412.21.0060 8412.21.0075
3339953 pt.	Pneumatic cylinders (tie-rod types).....	8412.31.0040	8412.31.0040
3339953 pt., 957 pt.	Pneumatic cylinders (except tie-rod types).....	8412.31.0080	8412.31.0080
3339955 pt., 957 pt.	Fluid power accumulators, hydraulic and pneumatic, and other hydraulic, pneumatic or combination devices for fluid energy absorption and/or storage, all types.....	8412.29.8075 8412.39.0080 8479.89.9865	8412.29.8075 8412.39.0080 8479.89.9865
3339965 pt., 967 pt.	Pneumatic (air) motors and motor packages, all types....	8412.39.0040	8412.39.0040
3339965 pt., 967 pt.	Hydraulic motors, all types.....	8412.29.8015 8412.29.8030 8412.29.8045 8412.29.8060	8412.29.8015 8412.29.8030 8412.29.8045 8412.29.8060
3339961, 963, 967 pt.	Hydraulic pumps, all types.....	8413.50.0070 8413.50.0080 8413.60.0020 8413.60.0030 8413.60.0040	8413.50.0070 8413.50.0080 8413.60.0020 8413.60.0030 8413.60.0040
3339969	Parts for fluid power pumps and motors.....	8412.90.9005 8412.90.9015 8412.90.9025 8412.90.9035 8413.91.9050	8412.90.9005 8412.90.9015 8412.90.9025 8412.90.9035 8413.91.9050

pt. Part.

1/Source: 2004 edition, Harmonized System-based Schedule B, Statistical Classification of Domestic and Foreign Commodities Exported from the United States.

2/Source: Harmonized Tariff Schedule of the United States, Annotated (2004).

Appendix.

General CIR Survey Information, Explanation of General Terms and Historical Note

GENERAL

The CIR program has been providing monthly, quarterly, and annual measures of industrial activity for many years. Since 1904, with its cotton and fats and oils surveys, the CIR program has formed an essential part of an integrated statistical system involving the quinquennial economic census, manufacturing sector, and the annual survey of manufactures. The CIR surveys, however, provide current statistics at a more detailed product level than either of the other two statistical programs.

The primary objective of the CIR program is to produce timely, accurate data on production and shipments of selected products. The data are used to satisfy economic policy needs and for market analysis, forecasting, and decision making in the private sector. The product-level data generated by these surveys are used extensively by individual firms, trade associations, and market analysts in planning or recommending marketing and legislative strategies, particularly if their industry is significantly affected by foreign trade. Although production and shipments information are the two most common data items collected, the CIR program collects other measures also such as inventories, orders, and consumption. These surveys measure manufacturing activity in important commodity areas such as textiles and apparel, chemicals, primary metals, computer and electronic components, industrial equipment, aerospace equipment, and consumer goods.

The CIR program uses a unified data collection, processing, and publication system. The U.S. Census Bureau updates the survey panels for most reports annually and reconciles the estimates to the results of the broader-based annual survey of manufactures and the economic census, manufacturing sector. The manufacturing sector provides a complete list of all producers of the products covered by the CIR program and serves as the primary source for CIR sampling. Where a small number of producers exist, CIR surveys cover all known producers of a product. However, when the number of producers is too large, cutoff and random sampling techniques are used. Surveys are continually reviewed and modified to provide the most up-to-date information on products produced. The CIR program includes a group of mandatory and voluntary surveys. Typically the monthly and quarterly surveys are conducted on a voluntary basis. Those companies that choose not to respond to the voluntary surveys are required to submit a mandatory annual counterpart corresponding to the more frequent survey.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS), 1997

The adoption of the North American Industry Classification System (NAICS) in the 1997 Economic Census has had a major impact on the comparability of current and historic data. Approximately half of the industries in the manufacturing sector of NAICS do not have comparable industries in the Standard Industrial Classification (SIC) system that was used in the past.

While most of the change affecting the manufacturing sector was change within the sector, some industries left manufacturing and others came into manufacturing. Prominent among those that left manufacturing are logging and portions of publishing. Prominent among the industries that came into the manufacturing sector are bakeries, candy stores where candy is made on the premises, custom tailors, makers of custom draperies, and tire retreading. The net effect of the classification changes are such that if the 1997 value of shipments data for all manufacturers were tabulated on an SIC basis, it would be approximately 3 percent higher.

Listed below are the NAICS sectors:

- 21 Mining
- 22 Utilities
- 23 Construction
- 31-33 Manufacturing
- 42 Wholesale Trade
- 44-45 Retail Trade
- 48-49 Transportation and Warehousing
- 51 Information
- 52 Finance and Insurance
- 53 Real Estate and Rental and Leasing
- 54 Professional, Scientific, and Technical Services
- 55 Management of Companies and Enterprises
- 56 Administrative and Support and Waste Management and Remediation Services
- 61 Educational Services
- 62 Health Care and Social Assistance
- 71 Arts, Entertainment, and Recreation
- 72 Accommodation and Food Services
- 81 Other Services (except Public Administration)

(Not listed above are the Agriculture, Forestry, Fishing, and Hunting sector (NAICS 11), partially covered by the census of agriculture conducted by the U.S. Department of Agriculture, and the Public Administration sector (NAICS 92), covered by the census of governments conducted by the Census Bureau.)

The 20 NAICS sectors are subdivided into 96 subsectors (three-digit codes), 313 industry groups (four-digit codes), and, as implemented in the United States, 1170 industries (five- and six-digit codes).

FUNDING

The Census Bureau funds most of the surveys. However, a number of surveys are paid for either fully or partially by other Federal Government agencies or private trade associations. A few surveys are mandated, but all are authorized by Title 13 of the United States Code.

RELIABILITY OF DATA

Survey error may result from several sources including the inability to obtain information about all cases in the survey, response errors, definitional difficulties, differences in the interpretation of questions, mistakes in recording or coding the reported data, and other errors of collection, response, coverage, and estimation. These nonsampling errors also occur in complete censuses. Although no direct measurement of the biases due to these nonsampling errors has been obtained, precautionary steps were taken in all phases of the collection, processing, and tabulation of the data in an effort to minimize their influence.

A major source of bias in the published estimates is the imputing of data for nonrespondents, for late reporters, and for data that fail logic edits. Missing figures are imputed based on period-to-period movements shown by reporting firms. A figure is considered to be an impute if the value was not directly reported on the questionnaire, directly derived from other reported items, directly available from supplemental sources, or obtained from the respondent during the analytical review phase. Imputation generally is limited to a maximum of 10 percent for any one data cell. Figures with imputation rates greater than 10 percent are suppressed or footnoted. The imputation rate is not an explicit indicator of the potential error in published figures due to nonresponse, because the actual yearly movements for nonrespondents may or may not closely agree with the imputed movements. The range of difference between the actual and imputed figures is assumed to be small. The degree of uncertainty regarding the accuracy of the published data increases as the percentage of imputation increases. Figures with imputation rates above 10 percent should be used with caution.

DATA REVISIONS

Statistics for previous years may be revised as the result of corrected figures from respondents, late reports for which imputations were originally made, or other corrections. Data that have been revised by more than 5 percent from previously published data are indicated by footnotes.

DISCLOSURE

The Census Bureau collects the CIR data under the authority of Title 13, United States Code, which specifies that the information can only be used for statistical purposes and cannot be published or released in any manner that would identify a person, household, or establishment. "D" indicates that data in the cell have been suppressed to avoid disclosure of information pertaining to individual companies.

EXPLANATION OF GENERAL TERMS

Capacity. The maximum quantity of a product that can be produced in a plant in 1 day if operating for 24 hours. Includes the capacity of idle plants until the plant is reported to be destroyed, dismantled, or abandoned.

Consumption. Materials used in producing or processing a product or otherwise removing the product from the inventory.

Exports. Includes all types of products shipped to foreign countries, or to agents or exporters for reshipment to foreign countries.

Gross shipments. The quantity or value of physical shipments from domestic establishments of all products sold, transferred to other establishments of the same company, or shipped on consignment, whether for domestic or export sale or use. Shipments of products purchased for resale are omitted. Shipments of products made under toll arrangements are included.

Interplant transfers. Shipments to other domestic plants within a company for further assembly, fabrication, or manufacture.

Inventories. The quantity or value of finished goods, work in progress, and materials on hand.

Machinery in place. The number of machines of a particular type in place as of a particular date whether the machinery was used for production, prototype, or sampling, or was idle. Machinery in place includes all machinery set up in operating positions.

Net receipts. Derived by subtracting the materials held at the end of the previous month from the sum of materials used during the current month.

Production. The total volume of products produced, including: products sold; products transferred or added to inventory after adjustments for breakage, shrinkage, and obsolescence, plus any other inventory adjustment; and products that undergo further manufacture at the same establishment.

Quantities produced and consumed. Quantities of each type of product produced by a company for internal consumption within that same company.

Quantity and value of new orders. The sales value of orders received during the current reporting period for products and services to be delivered immediately or at some future date. Also represents the net sales value of contract change documents that increase or decrease the sales value of the orders to which they are related, when the parties concerned are in substantial agreement as to the amount involved. Included as orders are only those that are supported by binding legal documents such as signed contracts or letter contracts.

Quantity and value of shipments. The figures on quantity and value of shipments represent physical shipments of all products sold, transferred to other establishments of the same company, or shipped on consignment, whether for domestic or export sale. The value represents the net sales price, f.o.b. plant, to the customer or branch to which the products are shipped, net of discounts, allowances, freight charges, and

returns. Shipments to a company's own branches are assigned the same value as comparable appropriate allocation of company overhead and profit. Products bought and resold without further manufacture are excluded.

Stocks. Total quantity of ending finished inventory.

Unfilled orders (backlog). Calculated by adding net new orders and subtracting net sales from the backlog at the end of the preceding year.

HISTORICAL NOTE

Data on fluid power products have been collected by the Census Bureau since 1981. Historical data may be obtained from Current Industrial Reports available at your local Federal Depository Library.