

Fluid Power Products for Motion Control, Including Aerospace: 2006

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SUMMARY OF FINDINGS

In 2006, fluid power product manufacturers, including aerospace, had shipments of \$13,627.8 million, an increase of 4.9 percent, from \$12,994.4 million reported in 2005.

Hydraulic and pneumatic valves increased 3.9 percent to \$3,256.2 million in 2006, from \$3,132.7 million in 2005. Fittings and assemblies for tubing and hose, excluding plumbers' brass goods, decreased 0.1 percent to \$3,007.3 million in 2006, from \$3,010.6 million in 2005. Hydraulic and pneumatic cylinders, actuators, accumulators, cushions, and nonvehicular shock absorbers increased by 12.0 percent to \$3,964.0 million in 2006, from \$3,538.0 million in 2005. Compressed air and gas dryers and lubricators decreased 6.4 percent to \$65.9 million in 2006, from \$70.4 million in 2005. Filters of hydraulic and pneumatic systems increased 11.5 percent to \$608.1 million in 2006, from \$545.3 million in 2005. Hydraulic and pneumatic pumps, motors, and hydrostatic transmission components increased 1.1 percent to \$2,726.3 million in 2006, from \$2,697.4 million in 2005.

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.

For mail or fax copies of this publication, please contact the Information Services Center, MCD, Washington, DC 20233-6900, or call 301-763-4673.

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 for Motion Control, Including Aerospace: 2006 and 2005
 [Value in thousands of dollars]

Product code	Product description	2006		2005
	Fluid power products, including aerospace.....	13,627,810		12,994,389
3329125	Nonaerospace type hydraulic directional control valves.....	531,491		496,295
3329127	Nonaerospace type hydraulic valves (except directional control.....	908,519		886,084
3329129	Nonaerospace type pneumatic directional control valves.....	589,853		561,514
332912B	Nonaerospace type pneumatic valves (except directional control.....	215,707		196,851
3329121	Aerospace type hydraulic fluid power valves.....	500,236		426,091
3329123	Aerospace type pneumatic fluid power valves.....	325,618		361,590
332912D	Parts for fluid power valves.....	184,802		204,255
332912H	Nonaerospace type flared (metal) fittings and couplings for, and assemblies of, tubing used in fluid power transfer systems.....	466,690		414,790
332912J	Nonaerospace type flareless fittings and couplings, including nonmetal fittings, used in fluid power transfer systems.....	536,046		493,404
332912L	Nonaerospace type hydraulic and pneumatic fittings and couplings for hose, and manifolds.....	849,402		834,786
332912N	Nonaerospace type hydraulic and pneumatic assemblies of hose.....	409,377		390,852
332912F	Aerospace type hydraulic and pneumatic hose or tube end fittings and assemblies and manifolds.....	745,817	r/	876,761
3339993	Nonaerospace type filters for hydraulic fluid power systems.....	396,131		334,952
3339994	Nonaerospace type filters for pneumatic fluid power systems.....	99,409	r/	112,074
3339996	Aerospace type hydraulic and pneumatic filters.....	112,519		98,314
3339998 pt.	Compressed air and gas dryers, and lubricators.....	65,862		70,441
3339951	Nonaerospace type hydraulic fluid power cylinders and actuators, linear and rotary.....	1,534,949		1,346,918
3339953	Nonaerospace type pneumatic fluid power cylinders and actuators, linear and rotary.....	455,351		449,505
3339955	Parts for nonaerospace type hydraulic and pneumatic fluid power cylinders, actuators, and related items, n.e.c.	570,095		495,123
3339957	Aerospace type fluid power cylinders and actuators, hydraulic and pneumatic.....	1,403,599		1,246,400
3339961	Nonaerospace type reciprocating pumps.....	796,763		853,220
3339963	Nonaerospace type rotary and other fluid power pumps.....	700,780	r/	642,871
3339965	Nonaerospace type fluid power motors.....	615,985		634,195
3339967	Aerospace type fluid power pumps and motors.....	279,968		276,251
3339969	Parts for fluid power pumps, motors, and hydrostatic transmissions.....	332,841	r/	290,852

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

Table 2. Manufacturers' Shipments of Fluid Power Products for Motion Control by Type, Including Aerospace: 2006 and 2005
 [Quantity in units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2006			2005		
			Quantity		Value	No. of cos.	Quantity	Value
	Fluid power products, including aerospace.....	(X)	(X)		13,627,810	(X)	(X)	12,994,389
3329125	Nonaerospace type hydraulic directional control valves.....	(X)	8,604,047		531,491	(X)	8,038,806	496,295
	Manual:							
3329125110	3- and 4-way monoblock.....	24	(D)	a/	117,952	24	(D)	b/ 93,219
3329125120	3- and 4-way sectional.....	16	1,192,823	a/	164,974	17	1,372,333	a/ 180,436
3329125130	Other manual.....	9	b/ 43,027	b/	5,233	9	b/ 39,154	b/ 4,748
	Solenoid:							
3329125140	2-way types.....	12	(D)	a/	26,925	12	(D)	a/ 27,300
3329125150	3- and 4-way types.....	21	a/ 1,644,185	b/	140,377	22	b/ 1,324,401	b/ 117,384
3329125160	Other directional control.....	27	c/ 2,639,881	b/	76,030	29	2,375,792	b/ 73,208
3329127	Nonaerospace type hydraulic valves (except directional control).....	(X)	21,487,024		908,519	(X)	21,294,255	886,084
	Pressure control:							
3329127110	Relief valves.....	24	b/ 696,532	b/	35,472	24	a/ 642,555	b/ 34,197
3329127120	Other, including load sensing and manual types.....	11	(D)	b/	31,203	10	(D)	b/ 30,090
	Flow control:							
3329127130	Manual types.....	14	a/ 1,518,026	a/	26,157	15	a/ 1,500,527	a/ 24,964
3329127140	Other flow control valves.....	17	a/ 1,324,701	b/	45,249	17	a/ 1,260,596	a/ 50,045
3329127155	Cartridge valves (except directional control).....	17	a/ 13,681,616	b/	303,579	(NA)	(NA)	(NA)
3329127150	Cartridge valves (all types).....	(NA)	(NA)		(NA)	17	a/ 13,760,473	a/r/ 309,401
	Electrohydraulic valves:							
3329127160	Pilot-operated, torque motor servovalves.....	6	(D)	a/	85,396	7	(D)	a/r/ 89,213
3329127170	Other types, including proportional.....	11	a/ 265,924	a/	73,096	11	b/ 284,670	a/ 77,136
3329127180	Other nonaerospace-type hydraulic valves, including stack and logic.....	18	2,954,062		308,367	17	2,815,536	271,038
3329129	Nonaerospace type pneumatic directional control valves.....	(X)	20,170,314		589,853	(X)	19,095,229	561,514
3329129110	Manual.....	28	c/ 4,847,453	b/	77,349	29	c/ 4,428,278	b/ 82,642
	Solenoid:							
3329129120	Under 1/8 inch port diameter.....	12	a/ 5,787,704	b/	124,759	12	b/ 4,901,633	b/ 108,862
	1/8 inch up to and including 1/4 inch port diameter:							
3329129130	3-way types.....	16	b/ 1,842,436		58,520	16	b/ 2,134,851	a/ 57,406
3329129140	4-way types.....	17	c/ 3,773,926	a/	130,707	17	c/ 3,649,742	b/ 127,305
	Over 1/4 inch port diameter:							
3329129150	3-way types.....	16	(D)		(D)	16	a/ 553,106	a/ 47,729
3329129160	4-way types.....	16	c/ 1,515,102	b/	99,341	15	c/ 1,586,742	b/ 92,327
3329129170	All other types.....	3	(D)		(D)	4	27,504	a/ 3,739
3329129180	Mechanical, remote pilot, and all other types.....	21	c/ 1,824,856	b/	44,680	20	b/ 1,813,373	b/ 41,504
332912B	Nonaerospace type pneumatic valves (except directional control) 1/.....	(X)	8,983,635		215,707	(X)	9,840,432	196,851
332912B110	Filter-regulator combination units, integral types.....	8	643,477		17,210	8	667,326	13,320
332912B120	Other FRs and filter-regulator-lubricator combo units.....	11	b/ 162,364	a/	9,203	10	151,539	a/ 8,026
332912B130	Regulators, sold separately.....	11	a/ 664,806	a/	18,515	13	1,538,335	30,897
332912B140	Flow control valves.....	24	a/ 4,361,515	c/	98,129	23	4,472,474	89,178
332912C000	Nonaerospace-type pneumatic valves for nonmotion control applications.....	(S)	(S)		(S)	(NA)	(NA)	(NA)
332912B150	Check, shuttle, exhaust, needle, and all other types.....	24	b/ 3,151,473	b/	72,650	25	a/ 3,010,758	b/ 55,430
3329121	Aerospace type hydraulic fluid power valves.....	(X)	1,939,782		500,236	(X)	1,834,193	426,091
	2-, 3-, and 4-way directional control valves:							
3329121110	Manually or mechanically operated.....	16	(D)	c/	96,420	15	(D)	c/ 94,654
3329121120	Solenoid operated.....	20	(D)	b/	76,851	20	(D)	c/ 72,889
3329121130	Motor operated.....	7	(D)	a/	12,538	7	(D)	a/ 11,103
3329121140	Electrohydraulic servovalves.....	9	c/ 83,962		161,268	9	c/ 73,875	125,695
3329121150	Flow, pressure, and other types of hydraulic valves.....	23	c/ 498,057	b/	153,159	23	c/ 474,306	b/ 121,750
3329123	Aerospace type pneumatic fluid power valves.....	(X)	303,084		325,618	(X)	279,400	361,590
3329123110	Pneumatic valves (all types).....	22	a/ 303,084		325,618	21	a/ 279,400	361,590
332912D	Parts for fluid power valves.....	(X)	(X)		184,802	(X)	(X)	204,255
332912D110	Parts for nonaerospace type hydraulic and pneumatic valves, sold separately.....	47	(X)	a/	132,644	46	(X)	(D)
332912D120	Parts for aerospace type hydraulic and pneumatic valves, sold separately.....	17	(X)	a/	52,158	18	(X)	(D)
332912H	Nonaerospace type flared (metal) fittings and couplings for, and assemblies of tubing used in, fluid power transfer systems.....	(X)	(X)		466,690	(X)	(X)	414,790
	Flared fittings:							
332912H110	Brass and bronze (SAE 45 degrees and 37 degrees).....	12	(X)	b/	104,956	12	(X)	a/ 91,504
332912H120	Carbon steel (JIC 37 degrees).....	12	(X)		215,464	11	(X)	194,591
332912H130	Other, including alloy steel.....	12	(X)		57,540	12	(X)	c/ 52,172
332912H140	Assemblies of tubing.....	11	(X)		47,294	11	(X)	46,627
332912H150	Assemblies of tubing and hose.....	7	(X)		41,436	7	(X)	29,896

Table 2. Manufacturers' Shipments of Fluid Power Products for Motion Control by Type, Including Aerospace: 2006 and 2005
 [Quantity in units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2006			2005			
			Quantity		Value	No. of cos.	Quantity	Value	
332912J	Nonaerospace type flareless fittings and couplings, including nonmetal fittings, used in fluid power transfer systems.....	(X)	(X)		536,046	(X)	(X)	493,404	
	Metal types:								
332912J110	Brass and bronze.....	19	(X)	a/	132,176	19	(X)	a/ 116,920	
332912J120	Carbon steel.....	11	(X)		(D)	11	(X)	98,828	
332912J130	Stainless steel.....	13	(X)		(D)	13	(X)	(D)	
332912J140	Other, including alloy steel.....	8	(X)		(D)	4	(X)	(D)	
332912J150	Nonmetal fittings, including plastic.....	9	(X)		4,756	9	(X)	(D)	
332912L	Nonaerospace type hydraulic and pneumatic fittings and couplings for hose, and manifolds.....	(X)	(X)		849,402	(X)	(X)	834,786	
332912L110	Permanent hose end fittings (crimped and swaged).....	21	(X)		268,489	20	(X)	293,458	
332912L120	Hydraulic and pneumatic reusable end fittings.....	19	(X)		95,992	22	(X)	96,156	
332912L130	Hydraulic quick connect and disconnect couplings.....	19	(X)		159,040	19	(X)	147,188	
332912L140	Pneumatic quick connect and disconnect couplings.....	20	(X)	a/	123,626	21	(X)	a/ 107,485	
332912L150	Manifolds and manifold assemblies for fluid power systems.....	17	(X)	b/	111,325	18	(X)	b/ 108,499	
332912L160	All other, including steel adaptor, swivel, rotating, and extension fittings.....	17	(X)	a/	90,930	18	(X)	82,000	
332912N	Nonaerospace type hydraulic and pneumatic assemblies of hose 1/.....	(X)	(X)		409,377	(X)	(X)	390,852	
332912N110	Assemblies with permanent end fittings.....	23	(X)		329,630	22	(X)	329,514	
332912N120	Assemblies with reusable end fittings.....	9	(X)		79,747	9	(X)	61,338	
332912N130	Nonaerospace-type hydraulic and pneumatic bulk hose.....	(S)	(S)		(S)	(NA)	(NA)	(NA)	
332912F	Aerospace-type hydraulic and pneumatic hose or tube end fittings and assemblies and manifolds.....	(X)	(X)		745,817	(X)	(X)	r/ 876,761	
332912F110	Assemblies of hose and/or tubing.....	13	(X)		(D)	14	(X)	(D)	
332912F120	Quick connect, rotating, swivel, and extension fittings....	(NA)	(NA)		(NA)	11	(X)	235,045	
332912F125	Hose and/or tube fittings, all types.....	18	(X)		451,616	(NA)	(NA)	(NA)	
332912F130	Manifolds for aerospace hydraulic systems.....	3	(X)		(D)	4	(X)	(D)	
332912F140	Aerospace hose and tube fittings, n.e.c.	(NA)	(NA)		(NA)	13	(X)	(D)	
3339993	Nonaerospace type filters for hydraulic fluid power systems.....	(X)	(X)		396,131	(X)	(X)	334,952	
	Hydraulic fluid filter assemblies, with or without filter element installed:								
3339993010	Low pressure (below 301 psi).....	17	a/	949,668	a/	28,980	17	a/r/ 969,740	a/r/ 25,139
3339993020	Medium pressure (301 to 2,999 psi).....	10	c/	380,074	c/	32,026	11	c/ 356,263	c/ 25,261
3339993030	High pressure (3,000 psi and above).....	11	b/	172,816	a/	14,329	12	a/r/ 143,423	a/r/ 10,825
	Filter replacement elements:								
3339993040	Reusable (cleanable) type.....	10	b/	821,125	b/	11,820	10	b/ 795,121	b/r/ 11,769
3339993050	Nonreusable type.....	18	b/	17,390,667	b/	268,779	19	b/ 16,828,118	b/ 215,391
3339993060	Strainers and separators, filter parts, and accessories....	13	(X)	a/	40,197	13	(X)	a/ 46,567	
3339994	Nonaerospace type filters for pneumatic fluid power systems.....	(X)	(X)		99,409	(X)	(X)	r/ 112,074	
	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..	14	(X)	c/	56,509	15	(X)	r/ 66,401	
3339994020	Other types, including elements sold separately.....	9	(X)		(D)	11	(X)	b/r/ 17,768	
3339994030	Air exhaust mufflers, diffusers, filter parts, and air preparation accessories.....	9	(X)		(D)	10	(X)	r/ 27,905	
3339996	Aerospace type hydraulic and pneumatic filters.....	(X)	(X)		112,519	(X)	(X)	98,314	
3339996010	Hydraulic.....	5	(X)		(D)	5	(X)	a/ 78,271	
3339996020	Pneumatic.....	4	(X)		(D)	5	(X)	20,043	
3339998 pt.	Compressed air and gas dryers, and lubricators.....	(X)	112,360		65,862	(X)	178,860	r/ 70,441	
	Compressed air and gas dryers:								
3339998A00	Compressed air and gas dryers.....	6	(D)	c/	63,790	(NA)	(NA)	(NA)	
3339998872	Refrigerated dryers.....	(NA)	(NA)		(NA)	4	(D)	b/ 33,013	
3339998874	Desiccant dryers.....	(NA)	(NA)		(NA)	7	(D)	a/ 33,073	
3339998879	Other compressed air and gas dryers.....	(NA)	(NA)		(NA)	4	(D)	1,377	
3339998880	Lubricators for pneumatic systems, sold separately.....	5	(D)		2,072	6	104,851	2,978	
3339951	Nonaerospace type hydraulic fluid power cylinders and actuators, linear and rotary.....	(X)	4,815,722		1,534,949	(X)	4,707,736	1,346,918	
	Hydraulic cylinders, excluding electrohydraulic:								
	Tie-rod types:								
3339951110	Standard NFPA and JIC tie-rod types: Less than 1,500 psi.....	21	199,078		71,405	22	a/ 192,261	62,209	

Table 2. Manufacturers' Shipments of Fluid Power Products for Motion Control by Type, Including Aerospace: 2006 and 2005
 [Quantity in units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2006			2005					
			Quantity		Value	No. of cos.	Quantity	Value			
3339951120	1,500 to 3,000 psi.....	18	b/	163,188	b/	106,090	18	b/	179,525	b/	94,791
3339951130	Greater than 3,000 psi.....	6		(D)	c/	5,901	6		(D)	b/	7,411
3339951140	Other tie-rod types.....	15		195,761		26,508	15		230,215		25,958
3339951150	Threaded/weld fused combination.....	50	b/	3,430,942	a/	870,274	49	a/	3,358,128		785,940
3339951160	Telescoping.....	22		123,993		170,520	24	b/	151,027		155,871
3339951170	Mill type.....	12		(D)		44,949	12		(D)		33,905
3339951180	Other, including those threaded at both ends.....	16		573,236		149,466	18		483,131		102,948
3339951190	Electrohydraulic types.....	9	b/	2,461		6,872	9	b/	3,233		10,139
33399511A0	Hydraulic rotary actuators.....	12		66,782		82,964	12		56,057		67,746
3339953	Nonaerospace type pneumatic fluid power cylinders and actuators, linear and rotary.....	(X)		5,685,743		455,351	(X)		5,981,641		449,505
	NFPA interchangeable cylinders:										
3339953110	Steel.....	15	a/	244,124	a/	70,828	16	a/	271,677	a/	69,267
	Aluminum:										
3339953120	Less than 1-1/2 inch bore size.....	8	b/	27,021	b/	2,043	7	a/	43,949	a/	2,678
3339953130	1-1/2 inch bore size and over.....	16		268,341		45,393	15		293,186		43,947
3339953140	Rodless cylinders.....	10		107,881	a/	36,968	10		116,523		36,478
	Other pneumatic cylinders:										
3339953150	Less than 1-1/2 inch bore size.....	20	a/	3,572,945		163,175	21		3,764,855		163,491
3339953160	1-1/2 inch bore size and over.....	30	a/	1,368,826	a/	113,655	30	a/	1,411,757		115,309
3339953170	Pneumatic rotary actuators.....	12	a/	96,605	a/	23,289	13		79,694		18,335
3339955	Parts for nonaerospace type hydraulic and pneumatic fluid power cylinders, actuators, and related items, n.e.c.	(X)		(X)		570,095	(X)		(X)		495,123
3339955110	Accumulators (bladder, piston, and other types).....	16	a/	291,654	a/	102,648	17	a/r/	278,613	a/r/	76,293
3339955120	Shock absorbers, not for vehicle suspension, and cushions (hydraulic and pneumatic).....	12		2,261,778	a/	98,015	13		1,944,956	b/	86,560
3339955130	Reservoirs, intensifiers, and other devices for fluid energy absorption and/or storage.....	12		(D)	c/	6,217	12		(D)	c/	5,499
3339955140	Parts for nonaerospace type hydraulic and pneumatic cylinders, actuators, accumulators, cushions, and nonvehicular shock absorbers, sold separately.....	53		(X)		363,215	54		(X)	c/	326,771
3339957	Aerospace type fluid power cylinders and actuators, hydraulic and pneumatic.....	(X)		(X)		1,403,599	(X)		(X)		1,246,400
	Hydraulic servo-actuator assemblies (linear and rotary):										
3339957110	Mechanical input.....	10	a/	72,489		521,644	10		35,774	r/	449,550
3339957120	Electrical input.....	6	a/	24,776		388,351	7		22,187		360,081
3339957130	Combination input.....	4		(D)		(D)	4		(D)		(D)
	Hydraulic utility actuators:										
3339957140	Linear actuators (cylinders).....	11	a/	48,062	b/	70,830	11	a/	45,089	b/	92,240
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)		(D)	6		(D)		(D)
3339957170	Pneumatic actuators (linear and rotary).....	8	b/	75,675	a/	92,903	8	a/	55,123	a/	75,306
3339957180	Accumulators (bladder, piston, and other types).....	11	b/	14,298	a/	29,363	11		10,504	a/	25,555
3339957190	Reservoirs, intensifiers, and other devices for fluid energy absorption and/or storage.....	6		1,577		21,371	6	a/	1,572		21,559
33399571A0	Other aerospace type fluid power cylinders, rotary actuators, cushions, and related items, n.e.c.	4		(X)	c/	1,829	4		(X)	a/	2,314
3339955150	Parts for aerospace type hydraulic and pneumatic cylinders, actuators, accumulators, cushions, and related items, sold separately.....	11		(X)	a/	69,019	11		(X)	a/	48,311
3339961	Nonaerospace type reciprocating pumps.....	(X)		4,928,946		796,763	(X)		4,308,053		853,220
	Axial piston:										
	Variable displacement types:										
3339961110	Closed loop.....	13		4,566,772		561,894	13		3,857,321		588,799
3339961120	Open loop.....	13	b/	323,983	a/	218,045	13	a/	336,920		225,334
3339961130	Fixed displacement types.....	9		(D)		(D)	9		(D)		(D)
3339961140	Radial piston types.....	2		(D)		(D)	3		(D)		(D)
3339963	Nonaerospace type rotary and other fluid power pumps.....	(X)		5,189,317		700,780	(X)		5,218,335		642,871
	Gear type:										
3339963110	Internal gear type, including gerotors.....	17	b/	(D)	c/	282,315	17	b/r/	1,802,336	b/r/	271,215
3339963120	External gear type.....	12	a/	2,033,402	a/	323,261	13		2,217,401		290,331
	Vane type:										
3339963150	Fixed and variable displacement.....	7		(D)		95,204	(NA)		(NA)		(NA)
3339963130	Fixed displacement.....	(NA)		(NA)		(NA)	5		(D)		(D)
3339963140	Variable displacement.....	(NA)		(NA)		(NA)	4		(D)		(D)
3339965	Nonaerospace type fluid power motors.....	(X)		(X)		615,985	(X)		(X)		634,195
3339965110	Pneumatic (air) motors.....	4		(D)		(D)	4		(D)		(D)
	Hydraulic motors:										
	Gear type:										
3339965120	Internal types, excluding gerotors.....	9		(D)		107,203	11		(D)		99,107

Table 2. Manufacturers' Shipments of Fluid Power Products for Motion Control by Type, Including Aerospace: 2006 and 2005
 [Quantity in units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2006		No. of cos.	2005	
			Quantity	Value		Quantity	Value
3339965130	Gerotor types.....	6	952,752	241,701	5	b/ 2,194,294	259,895
3339965140	External.....	6	127,133	a/ 15,798	7	132,664	a/r/ 16,017
3339965150	Vane types, fixed and variable.....	6	b/ 14,600	a/ 15,682	6	9,727	11,492
3339965160	Radial piston types, fixed and variable.....	5	b/ 83,853	73,798	5	b/ 97,982	88,083
	Axial piston types:						
3339965170	Fixed displacement.....	9	b/ 141,521	a/ 64,417	10	b/ 134,217	61,606
3339965180	Variable displacement.....	10	b/ 191,128	69,033	10	171,626	69,717
3339965190	Prime movers shipped with pumps or sold separately.....	4	(X)	(D)	4	(X)	(D)
3339967	Aerospace type fluid power pumps and motors.....	(X)	85,493	279,968	(X)	r/ 87,254	276,251
	Hydraulic pumps:						
3339967110	Fixed and variable displacement types.....	8	28,308	137,678	8	r/ 26,496	128,129
3339967120	Pump/electric motor assemblies, fixed and variable displacement types.....	9	(D)	a/ 105,641	9	49,869	100,414
3339967130	Other pump packages, n.e.c.	5	(D)	(D)	5	b/r/ 9,835	13,528
	Motors:						
3339967170	Aerospace-type fluid power motors, all kinds.....	5	(D)	(D) (NA)	(NA)	(NA)	(NA)
3339967140	Pneumatic (air) motors and motor packages.....	(NA)	(NA)	(NA)	1	(D)	(D)
3339967150	Hydraulic motors, fixed and variable displacement types.....	(NA)	(NA)	(NA)	4	(D)	(D)
3339967160	Hydraulic motor packages, including motor/gearbox, motor/valve, motor/generator, and similar combination units.....	(NA)	(NA)	(NA)	2	(D)	(D)
3339969	Parts for fluid power pumps, motors, and hydrostatic transmissions.....	(X)	(X)	332,841	(X)	(X) r/ 290,852	
	Hydraulic:						
3339969110	Nonaerospace.....	33	(X)	a/ 255,382	36	(X) a/r/ 223,535	
3339969120	Aerospace.....	5	(X)	(D)	5	(X)	(D)
	Pneumatic:						
3339969130	Nonaerospace.....	3	(X)	c/ 9,818	4	(X) a/ 9,782	
3339969140	Aerospace.....	2	(X)	(D)	2	(X)	(D)
333996A000	Nonaerospace hydrostatic transmissions.....	(S)	(S)	(S) (NA)	(NA)	(NA)	(NA)
333996B000	Nonaerospace hydraulic power units.....	(S)	(S)	(S) (NA)	(NA)	(NA)	(NA)

D Withheld to avoid disclosing data for individual companies. NA Not available. n.e.c. Not elsewhere classified. r/Revised by 5 percent or more from previously published data. S Does not meet publication standards. X Not applicable.

1/Product category total does not include data suppressed by a S.

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 3. Shipments, Exports, and Imports of Fluid Power Products: 2006
 [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.....	32,030,853	1,940,246	4,070,623	362,192	48,874,906	475,453
3329123, 129, 12B	Pneumatic fluid power valves.....	29,457,033	1,131,178	3,048,312	179,205	36,491,055	410,818
332912D	Parts for fluid power valves: hydraulic, pneumatic, all types.....	(X)	184,802	(X)	152,961	(X)	378,031
3339951 pt., 957 pt.	Hydraulic cylinders and hydraulic actuators (except electrohydraulic types).....	4,973,562	2,664,048	452,357	163,953	5,235,215	523,805
3339953 pt.	Pneumatic cylinders (tie-rod types).....	539,486	118,264	2,779	5,224	79,623	12,976
3339953 pt., 957 pt.	Pneumatic cylinders (except tie-rod types).....	5,221,932	429,990	632,864	48,699	2,519,926	92,473
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)	201,539	235,157	177,431	700,524	172,655
3339965 pt., 967 pt.	Hydraulic motors, all types.....	1,915,080	499,164	251,763	120,175	489,549	354,231
3339961, 963, 967 pt.	Hydraulic pumps, all types.....	(D)	(D)	4,901,062	656,990	5,324,958	664,786
3339969	Parts for fluid power pumps and motors.....	(X)	332,841	(X)	352,009	(X)	602,772

1/Source: Census Bureau report, EM 545, U.S. Exports.

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

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

Table 4. Comparison of North American Industry Classification System (NAICS)-Based Product Codes with Schedule B Export Codes and HTSUSA Import Codes: 2006

Product code	Product description	Export code 1/	Import code 2/
3329121, 125, 127	Hydraulic fluid power valves.....	8481.10.0020	8481.10.0020
		8481.20.0010	8481.20.0010
		8481.20.0020	8481.20.0020
		8481.20.0030	8481.20.0030
		8481.20.0040	8481.20.0040
		8481.20.0050	8481.20.0050
3329123, 129, 12B	Pneumatic fluid power valves.....	8481.10.0040	8481.10.0040
		8481.10.0060	8481.10.0060
		8481.20.0060	8481.20.0060
		8481.20.0070	8481.20.0070
		8481.20.0080	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	8412.21.0015
		8412.21.0030	8412.21.0030
		8412.21.0045	8412.21.0045
		8412.21.0060	8412.21.0060
		8412.21.0075	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
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.....	8412.29.8075	8412.29.8075
		8412.39.0080	8412.39.0080
		8479.89.9865	8479.89.9865
3339965 pt., 967 pt.	Hydraulic motors, all types.....	8412.29.8015	8412.29.8015
		8412.29.8030	8412.29.8030
		8412.29.8045	8412.29.8045
		8412.29.8060	8412.29.8060
3339961, 963, 967 pt.	Hydraulic pumps, all types.....	8413.50.0070	8413.50.0070
		8413.50.0080	8413.50.0080
		8413.60.0020	8413.60.0020
		8413.60.0030	8413.60.0030
		8413.60.0040	8413.60.0040
3339969	Parts for fluid power pumps and motors.....	8412.90.9005	8412.90.9005
		8412.90.9015	8412.90.9015
		8412.90.9025	8412.90.9025
		8412.90.9035	8412.90.9035
		8413.91.9050	8413.91.9050

pt. Part.

1/Source: 2006 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 (2006).

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.