2009

Light Vehicle Engines

North American Availability & Specifications

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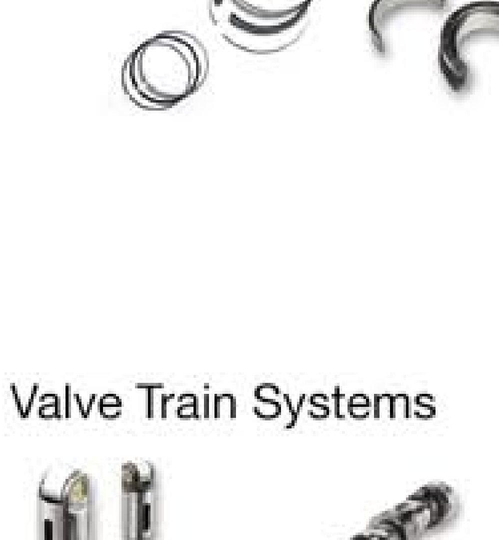
WARD'S & WARD'S Engine & Vehicle Technology Update

MAHLE Components Help Power Nine of *Ward's* Top Ten Engines

Piston Systems

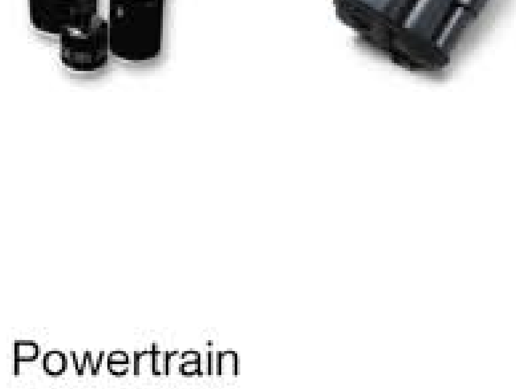
Cylinder Components



Valve Train Systems

Air Management Systems

Liquid Management Systems



Powertrain

MAHLE

Driven by performance

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Disp. (L)	Disp. (cc)	Code	Maker	Plant	2008 Engine Volume (1)	Blk./Head/ Cyl. Liner Mat.	Layout (vee°)	Bore x Stroke (mm)	Comp. Ratio	Performance Hp/ RPM	Torque Lb.-Ft. (Nm)/RPM	Fuel system/Valving/ Valve Actuation	2009 Models Installed	Con Rod	Camshaft Type	Intake Manifold Material
GENERAL MOTORS																2008 CY TOTAL ENGINE VOLUME 3,403,500
1.6	1598	LXV	GMDAT	Bupyung, S. Korea	60,500	CI/AL	I-4	79x81.5	10.8:1	106/ 6400	105 (142)/ 3800	SFI/ETC/DOHC/4vpc/VVT	Aveo, G3, Wave (Canada)	FS	CI	plastic
1.8	1798	1ZZ-FED	Toyota	Buffalo, WV; Cambridge, ON, Canada	52,000	AL/AL/CIL	I-4	80.5x88.3	10.0:1	132/ 6000	128 (174)/ 4400	SFI/DOHC.4vpc/VVT-i	Vibe	FPMFS	1-pc. Cast	CA
1.8	1796	2H0	GM	Szentgotthard, Hungary	15,000	CI/AL	I-4	80.5x88.2	10.5:1	138/ 6300	125 (170)/ 3800	SFI/ETC/DOHC/4vpc/VI/ VVT	Astra	FS	CNI	composite
2.0	1998	LK9	GME	KaiserSlauten, Germany	11,500	AL/AL/CIL	I-4	86x86	9.5:1	207/ 5300	221(300)/ 2500	SFI/DOHC/4vpc/TRBO/int/RFF	Saab 9-3	FSFS	1-pc. Cast	CA
2.0	1998	LNF	GM	Spring Hill, TN	12,300	AL/AL/CIL	I-4	86x86	9.2:1	250/ 5900-260/ 5300	222 (301)/ 1650-260 (235)/ 2500	DI/DOHC/4vpc/TRBO/Int/VVT/RFF	HHR SS, Cobalt SS, Solstice GXP, Sky Redline	FSFS	1-pc. CNI	CA
2.2	2189	LAP	GM	Tonawanda, NY	199,200	AL/AL/CIL	I-4	86x94.6	10.0:1	155/ 6100	150 (203)/ 4900	SFI/DOHC/4vpc/RFF	Cobalt, G5	FPMFS	1-pc. CNI	composite
2.2	2189	LAP	GM	Tonawanda, NY	40,500	AL/AL/CIL	I-4	86x94.6	10.0:1	155/ 6100	150 (203)/ 4900	SFI/DOHC/4vpc/RFF/E85	Cobalt, G5	FPMFS	1-pc. CNI	composite
2.3	2295	LJ3	GME	Sodertalje, Sweden	3,000	CI/AL	I-4	90x90	9.3:1	260/ 5300	258 (350)/ 1900	SFI/DOHC/4vpc/TRBO/int	Saab 9-5	FSFS	Chill Cast	CA
2.4	2362	2AZ-FE	Toyota	Buffalo, WV; Cambridge, ON, Canada	5,500	AL/AL/CIL	I-4	80.5x96	9.8:1	158/ 6000	162 (220)/ 4000	SFI/DOHC.4vpc/VVT-i	Vibe	FPMFS	1-pc. Cast	CA
2.4	2384	LAT	GM	Spring Hill, TN	5,000	AL/AL/CIL	I-4	88x98	10.4:1	164/ 6400-172/ 6500	159 (210)/ 5000-167 (226)/ 4500	SFI/DOHC4vpc/RFF/ETC/VVT	Aura Hybrid, Malibu Hybrid	Plus 4kW (5-hp) electric synchronous motor/generator developing 60 Nm (44 lb.ft.) of torque coupled with a 10-kW, 36-volt NiMH battery pack		
2.4	2384	LE5	GM	Spring Hill, TN	225,500	AL/AL/CIL	I-4	88x98	10.4:1	164/ 6400-173/ 5800	156 (212)/ 5000-167 (226)/ 4500	SFI/ECT/DOHC4vpc/RFF/VVT	Aura, G6, HHR, Malibu, Sky, Solstice, VUE	FPMFS	CNI	composite
2.4	2384	LE9	GM	Spring Hill, TN	22,000	AL/AL/CIL	I-4	88x98	10.4:1	172/ 5800	167 (226)/ 4500	SFI/ETC/DOHC4vpc/RFF/VVT/E85	HHR	FPMFS	CNI	composite
2.8	2792	LP9	GM-Holden	Melbourne, Australia	5,200	AL/AL/CIL	V-6 (60º)	89x74.8	9.5:1	280/5500	273 (370)-295(400)/ 2000	SFI/DOHC/4vpc/TRBO/VVT/RF	Saab 9-3	FPMFS	CNI	CA
2.9	2921	LLV	GM	Tonawanda, N.Y.	41,000	AL/AL/CIL	I-4	95.5x102	10.0:1	185/ 5600	190 (258)/ 2800	SFI/ETC/DOHC/4vpc/VVT/RF	Colorado, Canyon	FPMFS	1-pc. CNI	composite
3.4	3350	LNJ	GM-China	Shangai, China	130,300	CI/AL	V-6 (60º)	92x84.1	9.5:1	185/ 5200	210 (285)/ 3800	SFI/ETC/OHV/PRR	Equinox, Torrent	FPMFS	AS	CA
3.5	3510	LZ4	GM	Tonawanda, NY; Ramos Arizpe, Mexico	205,000	CI/AL	V-6 (60º)	99x76	9.8:1	207/ 5800-222/ 5900	214 (290)/ 4000-221 (300)/ 4000	SFI/ETC/OHV,VVT/PRR	G6, Impala, Malibu, VUE	FPMFS	AS	CA
3.5	3510	LZE	GM	Tonawanda, NY	200,000	CI/AL	V-6 (60º)	99x76	9.8:1	207-221/ 5800	214 (290)-221 (300)/ 4000	SFI/ETC/OHV,VVT/PRR/ETC/E85	G6, Impala, Malibu	FPMFS	AS	CA
3.6	3564	LCS	GM	Ramos Arizpe, Mexico	12,000	AL/AL/CIL	V-6 (60º)	94x85.6	11.3:1	262/ 6100	250 (339)/ 4800	DI/DOHC/4vpc/VI/VVT/RF	Vue Hybrid	Plus 2 transmission-intigrated 55-KW (74-hp) electric motors powered by 300-volt NiMH battery pack.		
3.6	3564	LY7	GM/GM-Holden	Flint, MI; St. Catharines, ON, Canada; Ramos Arizpe, Mexico; Melbourne, Australia	290,500	AL/AL/CIL	V-6 (60º)	94x85.6	10.2:1	252/ 6300-264/ 6500	248 (336)/2100-254 (344)/ 2800	SFI/DOHC/4vpc/VI/VVT/RF	Acadia, Aura XR, CTS, SRX, Enclave, Equinox, G6, G8, Malibu, Outlook, Torrent, VUE	FPMFS	FS	CA
3.6	3564	LLT	GM	Flint, MI; St. Catharines, ON, Canada; Ramos Arizpe, Mexico; Melbourne, Australia	44,000	AL/AL/CIL	V-6 (60º)	94x85.6	11.3:1	281/ 6300-304/ 6400	266 (361)/ 3400-273 (370)/ 5200	DI/DOHC/4vpc/VI/VVT/RF	Acadia, CTS, STS, Enclave, Outlook, Traverse	SFS	CNI	CA
3.7	3651	LLR	GM	Flint, MI	88,000	AL/AL/CIL	I-5	95.5x102	10.0:1	239/ 5800-242/ 5600	241 (327)-242 (328)/ 4600	SFI/ETC/DOHC/4vpc/VVT/RF	Colorado, Canyon, Hummer H3	FPMFS	1-pc. CNI	composite
3.8	3791	L26	GM	Flint, MI	72,200	CI/CI	V-6 (90º)	96.5x86.4	9.4:1	200/ 5200	230 (311)/ 4000	SFI/OHV/PRR	LaCrosse (Allure)	FPMFS	FS	CA
3.9	3880	LGD	GM	Ramos Arizpe, Mexico	45,000	CI/AL	V-6 (60º)	99x84	9.8:1	224/ 5700-233/ 5600	235 (319)/ 3200-240 (325)/ 4000	SFI/ETC/OHV/VVT/PRR/E85	Impala, Lucerne	FPMFS	AS	CA
3.9	3880	LZ9	GM	Tonawanda, NY; Ramos Arizpe, Mexico	53,500	CI/AL	V-6 (60º)	99x84	9.8:1	219/ 5700-222/ 5600	234/ 3200-238 (323)/ 4000	SFI/ETC/OHV/VVT/PRR	Lucerne, G6	FPMFS	AS	CA
4.2	4195	LL8	GM	Flint, MI	166,600	AL/AL/CIL	I-6	93x102	10.3:1	285/ 6000	276 (374)/ 4600	SFI/DOHC/4vpc/VVT/RF/ETC	Envoy, TrailBlazer; Saab 9-7X	FPMFS	CNI	composite
4.3	4300	LU3	GM	Romulus, MI	88,500	CI/CI	V-6 (90º)	101.6x88.4	9.2:1	195/ 4600	260 (353)/ 2800	SFI/ETC/OHV/PRR	Express, Savana, Silverado, Sierra	FPMFS	steel	CA-lower; compoaite-upper
4.4	4371	LC3	GM-PBC*	Wixon, MI	1,000	AL/AL/CIL	V-8 (90º)	91x84	9.0:1	443-469/ 6400	414 (561)-439 (595)/ 3900	SFI/DOHC/4vpc/RF/SPR	STS-V & XLR-V	FPMFS	CNI	CA
4.6	4565	LD8	GM	Livonia, MI	9,200	AL/AL/CIL	V-8 (90º)	93x84	10.0:1	275/ 6000	295 (400)/ 4400	SFI/ETC/DOHC/4vpc/RF	DTS & Limousine; Lucerne	FPMFS	CNI	composite
4.6	4565	L37	GM	Livonia, MI	39,000	AL/AL/CIL	V-8 (90º)	93x84	10.0:1	292/ 6300	288 (390)/ 4500	SFI/ETC/DOHC/4vpc/RF	DTS & Limousine; Lucerne Super	FPMFS	CNI	composite
4.6	4565	LH2	GM	Livonia, MI	9,000	AL/AL/CIL	V-8 (90º)	93x84	10.5:1	320/ 6400	310 (420)-315 (427)/ 4400	SFI/ETC/DOHC/4vpc/RF/VVT	SLS, SRX, STS, XLR	FPMFS	CNI	composite
4.8	4807	LY2	GM	Romulus, MI; St. Catharines, ON, Canada	170,600	CI/AL	V-8 (90º)	96x83	9.1:1	258/ 4600-295/ 5600	294 (399)/ 4500-305 (414)/ 5600	SFI/ETC/OHV/PRR	Express, Express HD, Savana, Savana HD, Silverado, Sierra, Tahoe, Yukon	FPMFS	HS	composite
5.3	5328	LS4	GM	St. Catharines, ON, Canada	25,000	AL/AL/CIL	V-8 (90º)	96x92	10.0:1	310-320/ 5200	335 (454)/ 4000-340 (461)/ 4200	SFI/ETC/OHV/PRR/CD/E85	Avalanche, Sierra, Silverado, Suburban, Tahoe, Yukon, Yukon XL	FPMFS	HS	composite
5.3	5328	LC9	GM	Romulus, MI; St. Catharines, ON, Canada	272,000	AL/AL/CIL	V-8 (90º)	96x92	9.9:1	310-320/ 5200	335 (454)/ 4400-340 (461)/ 4200	SFI/ETC/OHV/PRR/CD/E85	Avalanche, Silverado, Suburban, Sierra, Tahoe, Yukon, Yukon XL	FPMFS	HS	composite
5.3	5328	LH6	GM	Romulus, MI	177,000	AL/AL/CIL	V-8 (90º)	96x92	9.9:1	300/ 5300-315/ 5200	321 (435)/ 4000-338 (458)/ 4400	SFI/ETC/OHV/PRR/CD	Envoy Denali, TrailBlazer, Saab 9-7X, Sierra, Silverado	FPMFS	HS	composite
5.3	5328	LH8	GM	Romulus, MI	8,500	AL/AL/CIL	V-8 (90º)	96x92	9.9:1	300/ 5200	320 (434)/ 4000	SFI/ETC/OHV/PRR	Colorado, Canyon, Hummer H3 Alpha	FPMFS	HS	composite
5.3	5328	LMF	GM	Romulus, MI; St. Catharines, ON, Canada	6,500	CI/AL	V-8 (90º)	96x92	9.9:1	301/ 5200	325 (441)/ 4500	SFI/ETC/OHV/PRR/E85	Express, Savana	FPMFS	steel	composite
5.3	5328	LMG	GM	Romulus, MI; St. Catharines, ON, Canada	110,500	CI/AL	V-8 (90º)	96x92	9.9:1	310-320/ 5200	335 (454)/ 4400-340 (461)/ 4200	SFI/ETC/OHV/PRR/CD/E85	Avalanche, Silverado, Sierra, Suburban, Tahoe, Yukon, Yukon XL	FPMFS	HS	composite
5.3	5328	LY5	GM	Romulus, MI; St. Catharines, ON, Canada	63,500	CI/AL	V-8 (90º)	96x92	9.9:1	310-320/ 5200	335 (454)/ 4400-340 (461)/ 4200	SFI/ETC/OHV/PRR/CD	Avalanche, Silverado, Sierra, Suburban, Tahoe, Yukon, Yukon XL	FPMFS	steel	composite
6.0	5970	LS2	GM	St. Catharines, ON, Canada	9,500	AL/AL/CIL	V-8 (90º)	101.6x92	10.9:1	390/ 6000	400 (542)/ 4000	SFI/ETC/OHV/PRR	TrailBlazer SS; Saab 9-7X Aero	FPMFS	HS	composite
6.0	5967	L76 (Truck)	GM	Romulus, MI	115,000	AL/AL/CIL	V-8 (90º)	101.6x92	9.6:1	366/ 5800-367/ 5600	375 (508)/ 4300-376 (510)/4400	SFI/ETC/OHV/PRR	Avalanche, Sierra, Silverado, Suburban, Yukon XL	FPMFS	HS	composite
6.0	5967	L76 (Car)	GM	Silao, Mexico	10,000	AL/AL/CIL	V-8 (90º)	101.6x92	10.4:1	355/ 5300	384 (521)/ 4400	SFI/ETC/OHV/PRR/CD	G8	FPMFS	HS	composite
6.0	5967	LFA	GM	Silao, Mexico	12,000	AL/AL/CIL	V-8 (90º)	101.6x92	10.78:1	332/ 5100	367 (498)/ 4100	SFI/ETC/OHV/PRR/VVT/CD/ESI	Escalade Hybrid, Silverado Hybrid, Sierra Hybrid, Tahoe Hybrid, Yukon Hybrid	Plus 2 transmission-intigrated 60-KW (81-hp) perm. electric motors powered by 300-volt NiMH battery pack.		
6.0	5967	LY6	GM	Romulus, MI	20,000	CI/AL	V-8 (90º)	101.6x92	9.6:1	312/ 4400-360/ 5400	358 (485)/ 4400-382 (518)/ 4200	SFI/ETC/OHV/PRR	Express, Savana, Suburban HD, Yukon XL HD	FPMFS	HS	composite
6.2	6162	L9H	GM	Romulus, MI	75,000	AL/AL/CIL	V-8 (90º)	103.3x92	10.5:1	393-403/ 5700	415 (563)-417 (565)/ 4300	SFI/ETC/OHV/RRA/E85	Escalade, Escalade EXT, Escalade ESV, Silverado LTZ, Sierra Denali, Yukon Denali, Yukon XL Denali	FPMFS	HS	composite
6.2	6162	LS3	GM	St. Catharines, ON, Canada	30,000	AL/AL/CIL	V-8 (90º)	103.3x92	10.7:1	430- 436/ 5900	415 (563)-428 (580)/ 4600	SFI/ETC/OHV/RRA	Corvette, G8 GXP	FPMFS	HS	composite
6.2	6162	LSA	GM	Silao, Mexico	8,800	AL/AL/CIL	V-8 (90º)	103.3x92	9.1:1	556/ 6100	551 (747)/ 3800	SFI/ETC/SPR/Int/OHV/RFF	CTS	FSFS	CNI	composite
6.2	6162	LS9	GM-PBC*	Wixom, MI	100	AL/AL/CIL	V-8 (90º)	103.3x92	9.1:1	638 / 6500	604 (819) / 3800	SFI/ETC/SPR/Int/OHV/PRR	Corvette ZR-1	FT	steel	CA
6.6	6599	LMM	DMAX	Moraine, OH	130,000	CI/AL	V-8 (90º)	103x99	16.8:1	250-365/ 3200	460 (624)-660 (895)/ 1600	DI/OHV/TRBO/PRR	Express HD, Savana HD, Silverado HD, Sierra HD	FSFS	steel	CA
7.0	7008	LS7	GM-PBC*	Wixom, MI	7,500	AL/AL/CIL	V-8 (90º)	104.8x101.6	11.0:1	505/ 6300	470 (637)/ 4800	SFI/ETC/OHV/PRR	Corvette Z06	FT	HS	composite
FORD																2008 CY TOTAL ENGINE VOLUME 2,278,400
2.0	1999	99N	Ford	Dearborn, MI	200,500	AL/AL/CIL	I-4	87.4x83.1	10.0:1	140-143/ 6000	136 (184)/ 4250	SFI/DOHC/4vpc/BT	Focus	FPMFS	1-pc. Cast	CA
2.3	2261	99Z	Ford	Chihuahua, Mexico	110,000	AL/AL/CIL	I-4	87.5x94	9.7:1	160/ 6250	156 (212)/ 4250	SFI/DOHC/4vpc/BT	Fusion; Mercury Milan	FPMFS	1-pc. Cast	composite
2.3	2261	99D	Ford	Dearborn, MI	65,000	AL/AL/CIL	I-4	87.5x94	9.7:1	143/ 5250	154 (209)/ 3750	SFI/DOHC/4vpc/VCT/BT	Ranger	FPMFS	1-pc. Cast	composite
2.4	2401	NA	Volvo	Skovde, Sweden	5,400	AL/AL	I-5	81x93.2	8.5:1	257/ 5500	258 (350)/ 2100	SFI/DOHC/4vpc/VVT/TRBO/Int	Volvo S60 T5	FSFS		
2.4	2435	B5244S4/ B5244S7	Volvo	Skovde, Sweden	8,000	AL/AL	I-5	83.3x90	10.3:1	168/ 6000	166 (225)/ 4500-170 (230)/ 4400	SFI/DOHC/4vpc	Volvo S40, V50	FSFS		
2.5	2488	NA	Ford	Chihuahua, Mexico	35,000	AL/AL/CIL	I-4	89x100.1	9.7:1	171/ 4500	171 (232)/ 4500	SFI/DOHC/4vpc/BT	Escape; Mercury Mariner	FPMFS	1-pc. Cast	composite
2.5	2488	NA	Ford	Chihuahua, Mexico	32,000	AL/AL/CIL	I-4	89x100.1	12.3:1	153/ 6000	136 (184)/ 4500	SFI/DOHC/4vpc/BT/AC	Escape Hybrid; Mercury Mariner Hybrid	Plus 70 KW (94 hp) perm. magnet electric motor with 330-volt NiMH battery pack.		
2.5	2521	B5254T3	Volvo	Skovde, Sweden	98,500	AL/AL	I-5	83x93.2	9.0:1	227/ 5000	236 (320)/ 1500	SFI/DOHC/4vpc/VVT/TRBO/Int	Volvo C30, C70 T5, S40 T5, V50 T5	FSFS	assembled	CA
2.5	2521	B524T2	Volvo	Skovde, Sweden	4,000	AL/AL	I-5	83x93.2	9.0:1	208/ 5000	236 (320)/ 1500	SFI/DOHC/4vpc/VVT/TRBO/Int	Volvo S60 2.5T,	FSFS	assembled	CA
3.0	2953	NA	Ford	Skovde, Sweden	5,000	AL/AL	I-6	84x96	9.3:1	281/ 5600	295 (400)/ 1500	SFI/DOHC/4vpc/VVT/TRBO/Int	Volvo S80 T6, XC70 T6	FPMFS	1-pc. Cast	
3.0	2967	992	Ford	Cleveland #2, OH	100,000	AL/AL/CIL	V-6 (60º)	88.9x79.5	10.0:1	221/ 6250	205 (278)/ 4500	SFI/DOHC/4vpc/RF	Fusion; Mercury Milan	FPMFS	assembled	CA
3.0	2967	99S	Ford	Cleveland #2, OH	200,500	AL/AL/CIL	V-6 (60º)	88.9x79.5	10.0:1	240/ 6550	233 (316)/ 4300	SFI/DOHC/4vpc/RF	Escape; Mercury Mariner	FPMFS	assembled	CA
3.2	3192	NA	Volvo	Skovde, Sweden	34,000	AL/AL	I-6	84x96	10.8:1	235/ 6200	236 (320)/ 3200	SFI/DOHC/4vpc/VVT	Volvo S80, V70, XC70, XC90	FSFS	assembled	CA
3.5	3496	U38x	Ford	Lima, OH	290,000	AL/AL/CIL	V-6 (60º)	92.5x88.7	10.3:1	263-265/ 6250	248 (336)-250 (339)/ 4500	SFI/DOHC/4vpc/VCT/PRR	Edge, Flex, Taurus, Taurus X; Lincoln MKX, MKZ; Mercury Sable	FPMFS	1-pc. Cast	composite
3.7	3726	U38x	Ford	Lima, OH	25,000	AL/AL/CIL	V-6 (60º)	92.5x88.7	10.3:1	263/ 6250	249 (338)/ 4500	SFI/DOHC/4vpc/VCT/VI/PRR	Lincoln MKS	FPMFS	1-pc. Cast	composite
4.0	4009	99E/99K	Ford	Cologne, Germany	173,500	CI/AL	V-6 (60º)	100.4x84.4	9.7:1	207/ 5250-210/ 5300	238 (323)/ 4700-254 (344)/ 3700	SFI/SOHC/RF	Mustang, Explorer, Ranger; Mercury Mountaineer	FS	1-pc. Cast	composite
4.4	4414	B8444S	Yamaha	Iwata, Japan	14,000	AL/AL	V-8 (90º)	94x79.5	10.4:1	311/ 5850-311/ 5959	325 (441)/ 3900-325 (441)/ 3950	SFI/DOHC/4vpc	Volvo S80, XC90			
4.6	4605	99W	Ford	Romeo #2, MI	60,000	CI/AL	V-8 (90º)	90.2x89.9	9.3:1	225/ 4800-248/ 5750	286 (388)/ 3500-294 (399)/ 4000	SFI/SOHC/RRA	F-150, Econoline	FPMFS	assembled	RP
4.6	4605	99W	Ford	Romeo #2, MI	115,200	CI/AL	V-8 (90º)	90.2x89.9	9.4:1	224/ 4800-239/ 4900	272 (369)/ 4000-287 (389)/ 4100	SFI/SOHC/RRA/E85	Crown Victoria; Mercury Gr. Marquis; Lincoln Town Car	FPMFS	assembled	RP
4.6	4605	99W	Ford	Romeo #2, MI	64,000	CI/AL	V-8 (90º)	90.2x89.9	9.4:1	224/ 4800-239/ 4900	272 (369)/ 4000-287 (389)/ 4100	SFI/SOHC/RRA	Crown Victoria; Mercury Gr. Marquis; Lincoln Town Car	FPMFS	assembled	RP
4.6	4605	99W	Ford	Romeo #2, MI	5,000	AL/AL/CIL	V-8 (90º)	90.2x89.9	9.8:1	300-319/ 5750	320 (434)-325 (441)/ 4500	SFI/SOHC/3vpc/VCT	Mustang Bullitt, GT	FPMFS	assembled	composite
4.6	4605	99H	Ford	Romeo #2, MI	55,000	AL/AL/CIL	V-8 (90º)	90.2x89.9	9.8:1	292/ 5750	315 (427)/ 4000	SFI/SOHC/RRA/3vpc	Explorer, Sport Trac; Mercury Mountaineer	FPMFS	assembled	RP
5.4	5409	99L	Ford	Windsor #2, ON, Canada	268,400	CI/AL	V-8 (90º)	90.2x105.8	9.0:1	255/ 4500	350 (474)/ 2500	SFI/SOHC/RRA	Econoline	FPMFS	assembled	RP
5.4	5409	995-3	Ford	Windsor #2, ON, Canada	30,000	CI/AL	V-8 (90º)	90.2x105.8	9.8:1	310/ 5000	365 (495)/ 3750	SFI/SOHC/3vpc/VCT/RFF/E85	Expedition, F-150; Lincoln Navigator	FPMFS	assembled	composite
5.4	5409	995-3	Ford	Windsor #2, ON, Canada	42,000	CI/AL	V-8 (90º)	90.2x105.8	9.8:1	300/ 5000	365 (495)/ 3750	SFI/SOHC/3vpc/VCT/RFF	F-Super Duty	FPMFS	assembled	composite
5.4	5409	NA	Ford	Romeo #2, MI	8,200	CI/AL	V-8 (90º)	90.2x105.8	8.4:1	500/ 6000	480 (651)/ 4500	SFI/DOHC/4vpc/SPR/Int	Mustang Shelby GT500	FSFS	composite	CA
5.4	5409	NA	Ford	Romeo #2, MI	1,200	CI/AL	V-8 (90º)	90.2x105.8	8.4:1	540/ 6250	510 (691)/ 4500	SFI/DOHC/4vpc/SPR/Int	Mustang Shelby GT500 KR	FSFS	composite	CA
6.0	5954	NA	Navistar	Navistar-Indianapolis, IN	155,000	CI/CI	V-8 (90º)	95x104.9	18.0:1	235/ 3150	440 (597)/ 1600	DI/OHV4vpc/TRBO/RFA	Econoline	FPMFS	1-pc. forged	CA
6.4	6400	NA	Navistar	Navistar-Indianapolis, IN	50,000	CI/CI	V-8 (90º)	98x1.04.9	17.1:1	350/ 3000	650 (881)/ 2000	DI/OHV4vpc/TRBO/RFA	F-Super Duty	FPMFS	1-pc. forged	CA
6.8	6802	99S	Ford	Windsor Annex, ON, Canada	16,000	CI/AL	V-10 (90º)	90.2x105.8	9.0:1	305/ 4250	420 (569)/ 3250	SFI/SOHC/RF	Econoline	FPMFS	assembled	RP
6.8	6802	99Y	Ford	Windsor Annex, ON, Canada	8,000	CI/AL	V-10 (90º)	90.2x105.8	9.2:1	362/ 4750	457 (620)/ 3250	SFI/SOHC/3vpc/RF	F-Super Duty	FPMFS	assembled	RP
CHRYSLER																2008 CY TOTAL ENGINE VOLUME 1,854,800
1.8	1798	NA	Chry-GEMA	Dundee, MI	4,800	AL/AL/CIL	I-4	86x77.4	10.5:1	148/ 6500	125 (169)/ 5200	SFI/DOHC/4vpc/VVT	Dodge Caliber	FPMFS	1-pc. Cast	RP
2.0	1998	NA	Chry-GEMA	Dundee, MI	96,000	AL/AL/CIL	I-4	86x86	10.5:1	158/ 6400	141 (191)/ 5000	SFI/DOHC/4vpc/VVT	Dodge Caliber; Jeep Compass, Patroit	FPMFS	1-pc. Cast	RP
2.4	2360	NA	Chry-GEMA	Dundee, MI	200,000	AL/AL/CIL	I-4	88x97	10.5:1	172-173/ 6000	165 (223)-166 (225)/ 4400	SFI/DOHC/4vpc/VVT	Chrysler Sebring; Dodge Avenger, Caliber, Journey; Jeep Patriot, Compass	FPMFS	1-pc. Cast	RP
2.4	2360	NA	Chry-GEMA	Dundee, MI	3,700	AL/AL/CIL	I-4	88x97	8.6:1	285/ 5700	265 (352)/ 2000	SFI/DOHC/4vpc/VVT/TRBO	Dodge Caliber SRT4	FPMFS	1-pc. Cast	RP
2.4	2429	EDZ	Chrysler	Saltillo, Mexico	67,000	CI/AL	I-4	87.5x101	9.5:1	150/ 5100	165 (224)/ 4000	SFI/DOHC/4vpc/RF	PT Cruiser	FPMFS	1-pc. Cast	RP
2.4	2429	EDV	Chrysler	Saltillo, Mexico	3,200	CI/AL	I-4	87.5x101	8.1:1	180/ 5200	210 (285)/ 4000	SFI/DOHC/4vpc/RF/TRBO/Int	PT Cruiser	FSFS	1-pc. Cast	RP
2.7	2736	EER	Chrysler	Kenosha, WI	94,500	AL/AL/CIL	V-6 (60º)	86x78.5	9.9:1	186/ 5500	191 (259)/ 4000	SFI/DOHC/4vpc/RF/E85	Dodge Avenger; Chrysler Sebring	FPMFS	assembled	RP
2.7	2736	EER	Chrysler	Kenosha, WI	36,000	AL/AL/CIL	V-6 (60º)	86x78.5	9.9:1	178/ 5500	190 (258)/ 4000	SFI/DOHC/4vpc/RF	Chrysler 300; Dodge Charger	FPMFS	assembled	RP
3.0	2987	NA	Daimler	Marienfelde, Germany	53,000	AL/AL/CIL	V-6 (72º)	83x92	18.1:1	215/ 3800	375 (508)/1600	DI/DOHC/4vpc/TRBO	Dodge Sprinter	FS	1-pc. Cast	CA
3.3	3301	EGV	Chrysler	Trenton, MI	108,000	CI/AL	V-6 (60º)	93x81	9.4:1	175/ 5000	205 (278)/ 4000	SFI/OHV/PRA/RT/E85	Chrysler Town & Country; Dodge Grand Caravan	FSFS	1-pc. Cast	CA/RP
3.5	3518	EGF	Chrysler	Kenosha, WI	70,000	AL/AL/CIL	V-6 (60º)	96x81	9.8:1	235/ 6400	232 (315)/ 4000	SFI/SOHC/4vpc/RRA	Sebring; Dodge Avenger, Journey	FSFS	1-pc. Cast	CA/RP
3.5	3518	EGG	Chrysler	Kenosha, WI	31,000	AL/AL/CIL	V-6 (60º)	96x81	9.8:1	250/ 6400	250 (340)/ 3800	SFI/SOHC/4vpc/RRA	Chrysler 300; Dodge Challenger, Charger	FSFS	assembled	CA/RP
3.7	3701	EKG	Chrysler	Detroit, MI	288,000	CI/AL	V-6 (90º)	93x90.8	9.7:1	210-215/ 5200	235 (319)/ 4000	SFI/SOHC/RF	Dodge Dakota, Durango, Nitro, Ram Pickup; Jeep Commander, Gr. Cherokee, Liberty	FPMFS	assembled	RP
3.8	3778	EGL	Chrysler	Trenton, MI	178,000	CI/AL	V-6 (60º)	96x87	9.7:1	197/ 5200	230 (312)/ 4000	SFI/OHV/PRA/RT	Chrysler Town & Country; Dodge Grand caravan	FSFS	1-pc. Cast	CA/RP
3.8	3778	EGT	Chrysler	Trenton, MI	128,000	CI/AL	V-6 (60º)	96x87	9.7:1	202/ 5200	237 (321)/ 4000	SFI/OHV/PRA/RT	Jeep Wrangler, Wrangler Unlimited	FSFS	1-pc. Cast	CA/RP
4.0	3952	EGQ	Chrysler	Trenton, MI	34,000	AL/AL/CIL	V-6 (60º)	96x91	10.3:1	251/ 6000	259 (350)/ 4200	SFI/SOHC/4vpc/RRA	Chrysler Town & Country; Dodge Grand Caravan	FSFS	1-pc. Cast	CA/RP
4.0	3952	EGS	Chrysler	Trenton, MI	20,000	AL/AL/CIL	V-6 (60º)	96x91	10.3:1	260/ 6000	265 (359)/ 4200	SFI/SOHC/4vpc/RRA	Nitro R/T	FSFS	1-pc. Cast	CA/RP
4.7	4701	EVA	Chrysler	Detroit, MI	30,000	CI/AL	V-8 (90º)	93x86.5	**9.7:1	303-310/ 5650	330 (447)/ 3950	SFI/ETC/SOHC/RRA	Chrysler Aspen; Dodge Dakota, Durango, Ram Pickup; Jeep Commander, Grand Cherokee	FSFS	assembled	RP
4.7	4701	EVA	Chrysler	Detroit, MI	107,000	CI/AL	V-8 (90º)	93x86.5	**9.7:1	302/ 5650-305/ 5650	329 (446)-334 (453)/ 3950	SFI/ETC/SOHC/RRA/E85	Chrysler Aspen; Dodge Dakota, Durango; Jeep Commander, Gr. Cherokee	FSFS	assembled	RP
5.7	5654	EZB	Chrysler	Satillo, Mexico	188,600	CI/AL	V-8 (90º)	99.5x90.9	10.5:1	359/ 5150-390/ 5600	389 (527)/ 4350-410 (556)/ 4300	SFI/ETC/OHV/VCT/PRA/RT/CD	Chrysler Aspen, Chrysler 300, Durango, Dodge Challenger, Charger; Jeep Grand Cherokee, Jeep Commander, Dodge Ram Pickup	FPMFS	assembled	RP
5.7	5654	EZA	Chrysler	Satillo, Mexico	21,000	CI/AL	V-8 (90º)	99.5x90.9	10.5:1	383/ 5600	400 (542)/ 4000	SFI/ETC/OHV/VCT/PRA/RT	Ram HD Pickup	FPMFS	assembled	RP
6.1	6059	NA	Chrysler	Satillo, Mexico	7,000	CI/AL	V-8 (90º)	103.0x90.9	10.3:1	420-425/ 6000	420 (569)/ 4800	SFI/ETC/OHV/4vpc/PRA/RT	Chrysler 300 SRT8; Dodge Challenger SRT8, Charger SRT8	FPMFS	assembled	CA
6.7	6690	NA	Cummins	Columbus, IN	84,000	CI/CI	I-6	107X124	17.3:1	305/ 2900-350/ 3000	610 (827)/ 1600-650 (881)/ 1500	DI/OHV/TRBO/RFA	Ram HD Pickup	FSFS	assembled	CA
8.4	8437	EWC	Chrysler	Detroit, MI	2,000	AL/AL/CIL	V-10 (90º)	103x100.6	10.2:1	600/ 6000	560 (760)/ 5100	SFI/OHV/PRR	Viper	FPMFS	1-pc. Cast	CA
BMW																2008 CY TOTAL ENGINE VOLUME 427,000
1.6	1598	NA	BMW	N. Warwickshire, England	28,000	AL/AL	I-4	77x85.8	11.0:1	118/ 6000	114 (155)/ 4250	SFI/DOHC/4vpv/VVTL	Mini Cooper			
1.6	1598	NA	BMW	N. Warwickshire, England	26,000	AL/AL	I-4	77x85.8	10.5:1	172/ 5500	177 (240)/ 1600	DI/SOHC/4vpc/TRBO/VVTL	Mini Cooper S			
3.0	2996	N52	BMW	Steyr, Austria	270,000	MAL/AL/CIL	I-6	85x88	10.7:1	230/ 6500-260/ 6600	200 (271)-225 (305)/ 2750	SFI/DOHC/4vpc/VVT	128i, 328i, 528i, Z4, X3, X5	FSFS	1-pc. Cast	RP
3.0	2979	M54B30	BMW	Steyr, Austria	17,000	AL/AL/CIL	I-6	84x89.6	10.2:1	300/ 5800	300 (407)/ 1400	SFI/DOHC/4vpc/VVT/2TRBO/Int	135i, 335i, 535i	FSFS	1-pc. Cast	RP
3.0	2993	NA	BMW	Steyr, Austria	5,000	CI/AL	I-6	84x90	16.5:1	265/ 4200	425 (580)/ 1750	DII/DOHC/4vpc/TRBO/Int	335d, X535d	FSFS		
4.0	3999	NA	BMW	Munich, Germany	3,500	AL/AL/CIL	V-8 (90º)	92x75.2	12.0:1	414/ 8300	295 (400)/ 3900	SFI/DOHC/4vpc/VVT	M3	FPMFS		
4.4	4395	NA	BMW	Munich, Germany	1,000	AL/AL/CIL	V-8 (90º)	89x88.3	10.0:1	400/ 5500	450 (610)/ 1800	DI/DOHC/4vpc/VVT/2TRBO/Int	750i	FPMFS		
4.8	4799	NA	BMW	Munich, Germany	70,800	AL/AL/CIL	V-8 (90º)	93x88.3	10.5:1	350-360/ 6300	350 (474)-360 (488)/ 3400	SFI/DOHC/4vpc/VVT	550i, 650i, X5	FPMFS		
5.0	4999	NA	BMW	Munich, Germany	4,200	AL/AL/CIL	V-10 (60º)	90x75.2	11.3:1	500/ 7750	383 (500)/ 6100	SFI/DOHC/4vpc/VVTL	M5, M6	FSFS		
6.8	6750	NA	BMW	Munich, Germany	1,500	AL/AL/CIL	V-12 (60º)	91.9x84.6	11.0:1	453/ 5350	531 (720)/ 3500	DI/DOHC/4vpc/VVTL	Rolls-Royce Phantom	FSFS		
DAIMLER																2008 CY TOTAL ENGINE VOLUME 255,500
1.0	999	NA	MB/Mitsubishi	Japan	25,000	AL/AL	I-3	72x81.8	9.8:1	70/ 5800	68 (92)/ 4500	SFI/DOHC/4vpc	Smart Fortwo			
3.0	2996	NA	MB	Bad Cannstatt, Germany	48,000	AL/AL/SAL	V-6 (90º)	88x82.1	11.1:1	228/ 6000	221 (300)/ 2700	SFI/ETC/SOHC/4vpc/VI	Mercedes C300, SLK280	FS	FS	magnesium
3.0	2987	NA	MB	Bad Cannstatt, Germany	20,000	AL/AL/CIL	V-6 (90º)	83x92	16.5:1	210/ 3800	398 (540)/ 1400-400 (542)/ 1600	DI/DOHC/4vpc/TRBO/Int	Mercedes E320 BTC, ML320 BTC; GL320 BTC, R320 BTC	FS	1-pc. Cast	CA
3.5	3498	M112 E35D	MB	Bad Cannstatt, Germany	89,000	AL/AL/SAL	V-6 (90º)	92.9x86	10.7:1	268/ 6000	258 (350)/ 2400	SFI/DOHC/4vpc/VI	Mercedes C350, CLK350, E350, ML350, R350	FSFS	FS	magnesium
3.5	3498	M112 E35D	MB	Bad Cannstatt, Germany	1,600	AL/AL/SAL	V-6 (90º)	92.9x86	11.7:1	300/ 6500	265 (359)/4900	SFI/DOHC/4vpc	Mercedes SLK350	FSFS	FS	magnesium
4.7	4663	NA	MB	Bad Cannstatt, Germany	2,500	AL/AL/SAL	V-8 (90º)	92.9x86	10.7:1	335/ 6000	339 (460)/ 2700	SFI/ETC/SOHC/4vpc/VI	GL450	FSFS	FS	magnesium
5.4	5439	M113 E55 AMG	AMG	Affalterbach, Germany	500	AL/AL/SAL	V-8 (90º)	97x92	9.0:1	500/ 6100	516 (700)/ 2750	SFI/ETC/SOHC/3vpc/SPR/2int	Mercedes G55 AMG	FSFS	FS	magnesium
5.4	5439	M155	AMG	Affalterbach, Germany	200	AL/AL/SAL	V-8 (90º)	97x92	8.8:1	617/ 6500	575 (780)/ 3250	SFI/SOHC/3vpc/SPR/2Int	Mercedes SLR McLaren	FS	FS	
5.5	5461	NA	MB	Bad Cannstatt, Germany	56,000	AL/AL/SAL	V-8 (90º)	98x90.5	10.7:1	382/ 6000	391 (530)/ 2800	SFI/ETC/SOHC/4vpc/VI	Mercedes CL550, CLK550, CLS550, E550, G550, ML550, GL550, S550, SL550	FS	FS	
5.5	5513	M285	MB	Berlin, Germany	5,000	AL/AL/SAL	V-12 (60º)	82x87	9.0:1	510/ 5000-550/ 5250	612 (830)/ 1900-664 (900)/ 2300	SFI/SOHC/2spark/3vpc/2TRBO/2Int	Maybach 57, Maybach 62; Mercedes CL600, S600, SL600	FSFS	FS	
6.0	5980	M275 AMG	AMG	Affalterbach, Germany	1,500	AL/AL/SAL	V-12 (60º)	82.6x93	9.0:1	604/ 5500-612/ 4800	738 (1000)/ 2000	SFI/SOHC/3vpc/2TRBO/2Int	Maybach 57 S, Mercedes CL65 AMG, S65 AMG, SL65 AMG	FS	FS	
6.2	6208	NA	AMG	Affalterbach, Germany	6,200	AL/AL/SAL	V-8 (90º)	102.2x94.6	11.3:1	475-518/ 6800	465 (630)/ 5000	SFI/ETC/DOHC/4vpc/VI	Mercedes CL63 AMG, CLS63 AMG, E63 AMG, ML63 AMG, S63 AMG, SL63 AMG	FS	FS	
FUJI HEAVY INDUSTRIES																2008 CY TOTAL ENGINE VOLUME 216,600
2.5	2457	EJ25	Subaru	Gumma, Japan; Lafayette, IN	142,600	AL/AL/CIL	Bxr-4	99.5x79	10.0:1	170/ 6000	170 (230)/ 4400	SFI/ETC/SOHC/4vpc/VVL	Subaru Forester, Impreza, Legacy, Outback, Outback Sport	FS	assembled	CA
2.5	2457	EJ25	Subaru	Gumma, Japan; Lafayette, IN	38,800	AL/AL/CIL	Bxr-4	99.5x79	8.2:1	224/ 5200-305/ 6000	226 (306)/ 2800-290 (393)/ 4400	SFI/ETC/DOHC/4vpc/VVT/TRBO/Int	Subaru Forester, Impreza, Legacy, Outback	FS	assembled	CA
3.0	2999	EJ30	Subaru	Gumma, Japan	9,200	AL/AL/CIL	Bxr-6	89.2x80	10.7:1	245/ 6600-256/ 6600	215 (292)/ 4200-247 (335)/ 4400	SFI/ETC/DOHC/4vpc/VVTL	Subaru Legacy, Outback	FSFS	assembled	CA
3.6	3630	EJ36	Subaru	Gumma, Japan	26,000	AL/AL/CIL	Bxr-6	92x91	10.5:1	256/ 6000	247 (335)/ 4400	SFI/ETC/DOHC/4vpc/VVTL	Tribeca	FSFS	assembled	CA
HONDA																2008 CY TOTAL ENGINE VOLUME 1,796,200
NA	NA	NA	Honda	Japan	100	Perm. Magnet AC Motor	NA	NA	NA	134/ NA	189 (256)/ 0-3056	PEM fuel cell	FCX Clarity	With 288-volt Li-On battery pack		
1.3	1339	NA	Honda	Suzuka, Japan	31,500	AL/AL/CIL	I-4	73x80	10.8:1	110/ 6000	123 (167)/ 1000	SFI/SOHC/2vpc/i-VTEC	Civic Hybrid	Plus 20 hp, 76 lb.-ft., (103 Nm) torque perm. magnet motor with 144-Volt NiMH battery		
1.5	1497	L15A	Honda	Suzuka, Japan	80,000	AL/AL/CIL	I-4	73x 89.4	10.4:1	116/ 6600	106 (143)/ 4800	SFI/ETC/SOHC/4vpc/i-VTEC/RRA	Fit	FS	1-pc. Cast	CA
1.8	1799	R18A	Honda	Anna, OH; Suzuka, Japan; Alliston, ON	370,000	AL/AL/CIL	I-4	81x87.3	10.5:1	140/ 6300	128 (174)/ 4300	SFI/ETC/SOHC/4vpc/i-VTEC/RRA	Civic	FS	1-pc. Cast	CA
1.8	1799	NA	Honda	Anna, OH; Suzuka, Japan	2,500	AL/AL/CIL	I-4	81x87.3	12.5:1	113/ 6300	109 (148)/ 4300	SFI/ETC/SOHC/4vpc/i-VTEC/RRA/ Nat. Gas	Civic GX	FS	1-pc. Cast	CA
2.0	1998	K20Z3	Honda	Anna, OH; Suzuka, Japan	36,600	AL/AL/CIL	I-4	86x86	11.1:1	197/ 7800	139 (188)/ 6200	SFI/ETC/DOHC/4vpc/i-VTEC	Civic Si	FS		
2.2	2157	F22C1	Honda	Suzuka, Japan	2,500	AL/AL/FRM	I-4	87x90.7	11.1:1	237/ 7800	162 (220)/ 6800	SFI/ETC/DOHC/4vpc/VTEC/RF	S2000	FS	1-pc. Cast	CA
2.3	2300	NA	Honda	Anna, OH	30,000	AL/AL/FRM	I-4	86x99	8.8:1	240/ 6000	260 (353)/ 4500	DI/ETC/DOHC/4vpc/i-VTEC/TRBO/Int	Acura RDX	FS	1-pc. Cast	CA
2.4	2354	K24A	Honda	Sayama, Japan	258,000	AL/AL/CIL	I-4	87x99	9.7:1	166/ 5800	161 (218)/ 4200	SFI/ETC/DOHC/4vpc/i-VTEC	CR-V, Element	FS	1-pc. Cast	CA
2.4	2354	K24A	Honda	Sayama, Japan	343,000	AL/AL/CIL	I-4	87x99	10.5:1	177/ 6500-190/ 7000	161 (219)/ 4300-162 (220)/ 4400	SFI/ETC/DOHC/4vpc/i-VTEC	Accord	FS	1-pc. Cast	CA
2.4	2354	K24A	Honda	Sayama, Japan	32,000	AL/AL/CIL	I-4	87x99	11.0:1	201/ 7000	170 (230)/ 4300-172 (233)/ 4400	SFI/DOHC/4vpc/i-VTEC	Acura TSX	FS	1-pc. Cast	CA
3.5	3471	J35A6	Honda	Anna, OH; Lincoln, AL	351,000	AL/AL/CIL	V-6 (60º)	89x93	10.0:1	244/ 5750-250/ 5700	240 (319/ 5000-247 (327)/ 4300	SFI/ETC/SOHC/4vpc/VTEC	Odyssey, Ridgeline	FPMFS	1-pc. Cast	CA
3.5	3471	J35A7	Honda	Anna, OH; Lincoln, AL	74,000	AL/AL/CIL	V-6 (60º)	89x93	10.0:1	244-250/ 5700	245 (331)/ 4900-253 (343)/ 4800	SFI/ETC/SOHC/4vpc/i-VTEC/CD	Odyssey EX-L & Touring, Pilot	FPMFS	1-pc. Cast	CA
3.5	3471	J35A7	Honda	Anna, OH; Lincoln, AL	115,000	AL/AL/CIL	V-6 (60º)	89x93	10.5:1	271/ 6200	251 (340)-254 (344)/ 5000	SFI/ETC/SOHC/4vpc/i-VTEC/CD	Accord	FPMFS	1-pc. Cast	CA
3.5	3471	J35A	Honda	Sayama, Japan; Anna, Ohio	40,000	AL/AL/CIL	V-6 (60º)	89x93	11.2:1	280/ 6200	254 (344)/ 5000	SFI/SOHC/4vpc/VTEC	Acura TL	FSFS	1-pc. Cast	CA
3.7	3664	NA	Honda	Anna, OH	30,000	AL/AL/CIL	V-6 (60º)	86x99	11.2:1	300/ 6000-305/ 6200	271 (305)/ 4500-273 (370)/ 5000	SFI/SOHC/4vpc/VTEC	Acua MDX, RL, TL SH-AWD	FSFS	1-pc. Cast	CA
HYUNDAI																2008 CY TOTAL ENGINE VOLUME 432,600
1.6	1595	Alfa II	Hyundai	Ulsan, S. Korea	50,500	CI/AL	I-4	76.5x87	10.0:1	110/ 6000	106 (144)/ 3000	SFI/DOHC/4vpc/VVT	Accent	FS		
2.0	1975	Beta	Hyundai	Ulsan, S. Korea	104,000	CI/AL	I-4	82x93.5	10.3:1	140-141/ 6000	136 (184)/ 4500-137 (185)/ 4600	SFI/DOHC/4vpc/VVT	Elantra, Tucson	FS		
2.4	2359	Theta II	Hyundai	Ulsan, S. Korea; Montgomery, AL (Late '08)	50,000	AL/AL/CIL	I-4	88x97	10.5:1	175/ 6000	168 (228)/ 4000	SFI/DOHC/4vpc/VVT	Sonata	FS		
2.7	2656	Delta	Hyundai	Asan, S. Korea	51,700	AL/AL/CIL	V-6 (60º)	86.7x75	10.0:1	173-185/ 6000	178 (241)/ 4000-183 (248)/ 4000	SFI/DOHC/4vpc	Santa Fe, Tucson	FS		
3.3	3342	Lambda	Hyundai	Asan, S. Korea; Montgomery, AL	126,400	AL/AL/CIL	V-6 (60º)	92x83.8	10.0:1	234-249/ 6000	226 (306)-229 (310)/ 3500	SFI/DOHC/4vpc/VVT	Azera, Sonata, Santa Fe	FPMFS	1-pc. Cast	CA
3.8	3778	Lambda	Hyundai	Ulsan, S. Korea	43,000	AL/AL/CIL	V-6 (60º)	96x87	10.4:1	250-290/ 6000	253 (343)/ 3500-264 (358)/ 4500	SFI/DOHC/4vpc/VVT	Azera, Entourage, Genesis, Veracruz	FPMFS		
4.6	4627	NA	Hyundai	Ulsan, S. Korea	7,000	AL/AL/CIL	V-8 (60º)	92x87	10.4:1	368-375/ 6500	324 (439)-333 (452)/ 3500	SFI/DOHC/4vpc/VVT	Genesis	FPMFS		
JAGUAR																2008 CY TOTAL ENGINE VOLUME 13,600
4.2	4196	AJ34	Jaguar	Ford-Bridgend, Wales	12,800	AL/AL/CIL	V-8 (90º)	86x90.3	11.0:1	300/ 6000	310 (420)/ 4100	SFI/ETC/DOHC/4vpc/VCT	Jaguar XK-F, XK-8, XJ8	FPMFS	1-pc. Cast	RP
4.2	4196	AJ34S	Jaguar	Ford-Bridgend, Wales	800	AL/AL/CIL	V-8 (90º)	86x90.3	9.1:1	420/ 6000	413 (560)/ 4000	SFI/ETC/DOHC/4vpc/VCT/SPR/int	Jaguar XF S/C, XJR, XJ Super V-8, XKR	FPMFS	1-pc. Cast	RP
KIA																2008 CY TOTAL ENGINE VOLUME 273,000
1.6	1595	Alfa II	Hyundai	Ulsan, S. Korea	36,500	CI/AL	I-4	76.5x87	10.0:1	110/ 6000	107 (145)/ 4500	SFI/DOHC/4vpc/VVT	Rio, Rio5	FS		
2.0	1975	Beta	Hyundai	Ulsan, S. Korea	69,000	CI/AL	I-4	82x93.5	10.1:1	138/ 6000	136 (184)/ 4500	SFI/DOHC/4vpc/VVT	Spectra, Spectra5	FS		
2.0	1975	Beta	Hyundai	Ulsan, S. Korea	19,700	CI/AL	I-4	82x93.5	10.0:1	140/ 6000	136 (184)/ 4500	SFI/DOHC/4vpc	Sportage	FS		
2.4	2359	Theta	Hyundai	Ulsan, S. Korea	47,000	AL/AL/CIL	I-4	86.5x100	10.5:1	175/6000	168 (228)-169 (229)/ 4000	SFI/DOHC/4vpc	Optima, Rondo	FS		
2.7	2656	Delta	Hyundai	Asan, S. Korea	40,000	AL/AL/CIL	V-6 (60º)	86.7x75	10.0:1	173-192/ 6000	178 (241)-184 (249)/ 4000	SFI/DOHC/4vpc	Optima, Rondo, Sportage	FS		
3.3	3342	Lambda	Hyundai	Asan, S. Korea	9,800	AL/AL/CIL	V-6 (60º)	92x83.8	10.0:1	242/ 6000	228 (310)/ 4500	SFI/DOHC/4vpc/VVT	Sorrento	FPMFS		CA
3.8	3778	Lambda	Hyundai	Ulsan, S. Korea	51,000	AL/AL/CIL	V-6 (60º)	96x87	10.4:1	250-276/ 6000	253 (343)/ 3500-267 (362)/ 4500	SFI/DOHC/4vpc	Amanti, Borrego, Sedona, Sorento	FPMFS		
4.6	4627	NA	Hyundai	Ulsan, S. Korea	2,000	AL/AL/CIL	V-8 (60º)	92x87	10.4:1	337/ 6000	324 (439)/ 3500	SFI/DOHC/4vpc/VVT	Borrego	FPMFS		
LAND ROVER																2008 CY TOTAL ENGINE VOLUME 29,000
3.2	3192	NA	Volvo	Skovde, Sweden	5,500	AL/AL	I-6	84x96	10.8:1		234 (320)/ 3200	SFI/DOHC/4vpc/VVT	Land Rover LR2	FSFS	assembled	CA
4.2	4196	AJ34S	Jaguar	Ford-Bridgend, Wales	2,500	AL/AL/CIL	V-8 (90º)	86x90.3	9.1:1	390-400/ 5750	410 (556)-420 (659)/ 3500	SFI/DOHC/4vpc/VVT/SPR/int	Range Rover S/C, Range Rover Sport S/C	FPMFS	1-pc. Cast	RP
4.4	4398	NA	Jaguar	Ford-Bridgend, Wales	21,000	AL/AL/CIL	V-8 (90º)	88.1x90.4	10.75:1	300/ 5500-305/ 5750	315 (427)-325 (441)/ 4000	SFI/DOHC/4vpc/VVT/ETC	Land Rover LR3, Range Rover HSE; Range Rover Sport HSE	FPMFS	1-pc. Cast	RP
MAZDA																2008 CY TOTAL ENGINE VOLUME 282,700
1.3	1308	RENESIS	Mazda	Japan	3,400	AL/NA	Rotary	NA	10.0:1	212/ 7500-232/ 8500	159 (216)/ 5500	SFI/2-rotor	RX-8	--	--	--
2.0	1999	LFX	Mazda	Japan	77,000	AL/AL/CIL	I-4	87.5x83.1	10.0:1	148/ 6500-166/ 6700	135 (183)/ 4500-140 (192)/ 5000	SFI/DOHC/4vpc/VVT	Mazda3, MX-5???	FPMFS	1-pc. Cast	CA
2.3	2261	L3X	Mazda/Ford	Chihuahua, Mexico; Japan	65,500	AL/AL/CIL	I-4	87.5x94	9.7:1	153-156/ 6500	148 (201)/ 4500-150 (203)/ 4000	SFI/DOHC/4vpc/VVT	Mazda3, Mazda5	FPMFS	1-pc. Cast	
2.3	2261	L3-VDT	Mazda/Ford	Japan	28,000	AL/AL/CIL	I-4	87.5x94	9.5:1	244/ 5000-263/ 5500	258 (350)/ 2500-280 (380)/ 3000	DI/DOHC/4vpc/TRBO/Int/VVT	CX-7, MazdaSpeed3	FS	1-pc. Cast	
2.3	2261	99D	Ford	Dearborn, MI	1,000	AL/AL/CIL	I-4	87.5x94	9.7:1	143/ 5250	154 (209)/ 3750	SFI/DOHC/4vpc/VCT/BT	Mazda B-Series	FPMFS	1-pc. Cast	composite
2.5	2488	NA	Ford	Chihuahua, Mexico	42,000	AL/AL/CIL	I-4	89x100.1	9.7:1	170/ 6000-171/ 4500	167/ 4000-171 (232)/ 4500	SFI/DOHC/4vpc/BT	Mazda6, Tribute	FPMFS	1-pc. Cast	composite
2.5	2488	NA	Ford	Chihuahua, Mexico	2,000	AL/AL/CIL	I-4	89x100.1	12.3:1	153/ 6000	136 (184)/ 4500	SFI/DOHC/4vpc/BT/AC	Tribute Hybrid	Plus 70 KW (94 hp) perm. magnet electric motor with 330-volt NiMH battery pack.		
3.0	2967	99S	Ford	Cleveland #2, OH	16,600	AL/AL/CIL	V-6 (60º)	88.9x79.5	10.0:1	240/ 6550	233 (316)/ 4300	SFI/DOHC/4vpc/RF	Tibute	FPMFS	assembled	CA
3.7	3726	NA	Mazda	Japan	46,700	AL/AL/CIL	V-6 (60º)	95.5x86.7	10.3:1	272-273/ 6250	269 (365)/ 4250-270 (366)/ 4500	SFI/DOHC/4vpc/VVT	CX-9, Mazda6	FPMFS	1-pc. Cast	CA
4.0	4025	99E	Ford	Cologne, Germany	500	CI/AL	V-6 (60º)	100.3x84.3	9.0:1	207/ 5250	238 (323)/ 3000	SFI/SOHC/RF	B4000 pickup	FPMFS	1-pc. Cast	RP
MITSUBISHI																2008 CY TOTAL ENGINE VOLUME 113,000
2.0	1998	4B11	Mitsubishi	Shiga, Japan	17,000	AL/AL/CIL	I-4	86x86	10.0:1	152/ 6000	146 (198) 4250	SFI/SOHC/4vpc/VVT/RF	Lancer	FS	1-pc. Cast	CA
2.0	1998	4B11	Mitsubishi	Shiga, Japan	7,000	AL/AL/CIL	I-4	86x86	8.5:1	237/ 6000	253 (343)/ 3000	SFI/SOHC/4vpc/VVT/TRBO/Int	Lancer Ralliart	FS	1-pc. Cast	CA
2.0	1998	4B12	Mitsubishi	Shiga, Japan	3,000	AL/AL/CIL	I-4	86x86	10.5:1	168/ 6000	167 (226)/ 4100	SFI/SOHC/4vpc/VVT/RF	Lancer GT	FS	1-pc. Cast	CA
2.0	1998	4B11 T/C	Mitsubishi	Shiga, Japan	1,000	AL/AL/CIL	I-4	86x86	9.0:1	291/ 6500	300 (407)/ 4400	SFI/SOHC/4vpc/RF/TRBO/Int	Lancer Evolution	FS	1-pc. Cast	CA
2.4	2378	4G69	Mitsubishi	Shiga, Japan	52,000	CI/AL	I-4	87x100	9.5:1	160/ 5500-162/ 6000	157 (213)-162 (220)/ 4000	SFI/SOHC/4vpc/VVT/RF	Galant, Eclipse	FS	1-pc. Cast	CA
2.4	2360	4B12	Mitsubishi	Shiga, Japan	5,500	AL/AL/CIL	I-4	88x97	10.5:1	168/ 6000	167 (226)/ 4100	SFI/SOHC/4vpc/VVT/RF	Outlander	FS	1-pc. Cast	CA
3.0	2998	6B31	Mitsubishi	Japan	8,000	AL/AL	V-6 (60º)	87.6x82.9	9.5:1	220/ 6250	204 (277)/ 4000	SFI/SOHC/4vpc/VVT/RF	Outlander	FS	1-pc. Cast	CA
3.7	3701	EKG	Chrysler	Detroit, MI	3,600	CI/AL	V-6 (90º)	93x90.8	9.7:1	210/ 5200	235 (319)/ 4000	SFI/SOHC/RF	Raider	FPMFS	assembled	RP
3.8	3828	6G75	Mitsubishi	Japan	15,800	CI/AL	V-6 (60º)	95x90	10.5:1	230/ 5250-260/ 5750	250 (339)/ 4000-258 (350)/ 4500	SFI/SOHC/4vpc	Eclipse, Galant	FS	1-pc. Cast	CA
4.7	4701	EVA	Chrysler	Detroit, MI	100	CI/AL	V-8 (90º)	93x86.5	9.0:1	302/ 5650	329 (446)/ 3950	SFI/SOHC/RRA/E85	Raider	FPMFS	assembled	RP
NISSAN																2008 CY TOTAL ENGINE VOLUME 1,257,000
1.8	1798	MR18DE	Nissan	Aguascalientes, Mexico	190,000	AL/AL/CIL	I-4	84x81.1	9.9:1	122/ 5200	125 (172)/ 4800	SFI/DOHC/4vpc/VVT	Versa	FS	1-pc. Cast	CA
2.0	1995	MR20DE	Nissan	Aguascalientes, Mexico	142,000	AL/AL/CIL	I-4	84x90.1	10.0:1	140/ 5100	147 (199)/ 4800	SFI/DOHC/4vpc/VVT	Sentra	FS	1-pc. Cast	Plastic Nylon
2.5	2488	QR25DE	Nissan	Decherd, TN	11,000	AL/AL/CIL	I-4	89x100	9.6:1	158/ 5200	162 (220)/ 2800	SFI/DOHC/4vpc/VVT	Altima Hybrid	Plus 40 hp, perm. magnet motor with 245-Volt NiMH battery pack.		
2.5	2488	QR25DE	Nissan	Decherd, TN	322,000	AL/AL/CIL	I-4	89x100	***9.5:1	152/ 5200-177/ 6000	171 (233)/ 4400-180 (244)/ 3900	SFI/DOHC/4vpc/VVT	Altima, Frontier, Rogue	FS	1-pc. Cast	Plastic Nylon
2.5	2488	QR25DE	Nissan	Aguascalientes, Mexico	5,000	AL/AL/CIL	I-4	89x100	10.5:1	200/ 6600	180 (244)/ 5200	SFI/DOHC/4vpc/VVT	Sentra SE-R Spec V	FS	1-pc. Cast	Plastic Nylon
3.5	3498	VQ35DE	Nissan	Iwaki, Japan, Decherd, TN	222,000	AL/AL/CIL	V-6 (60º)	95.5x81.4	10.3:1	230/ 5800-303/ 6800	236 (320)/ 4400-270 (366)/ 4800	SFI/DOHC/4vpc/VVT	Altima, Quest, Murano; Infiniti M35, FX35	FS	1-pc. Cast	Plastic Nylon
3.5	3498	VQ35	Nissan	Iwaki, Japan	52,500	AL/AL/CIL	V-6 (60º)	95.5x81.4	10.6:1	290/ 6400	261 (354)/ 4400	SFI/DOHC/4vpc/VVT	Maxima	FS	1-pc. Cast	Plastic Nylon
3.5	3498	VQ35HR	Nissan	Iwaki, Japan	11,000	AL/AL/CIL	V-6 (60º)	95.5x81.4	10.6:1	306/ 6800	268 (363)/ 4800	SFI/DOHC/4vpc/VVT	350-Z	FS	1-pc. Cast	Plastic Nylon
3.7	3696	VQ37VHR	Nissan	Iwaki, Japan	35,000	AL/AL/CIL	V-6 (60º)	95.5x86	11.0:1	328-330/ 7000	269 (365)-270 (366)/ 5200	SFI/DOHC/4vpc/VVT	Infiniti G37	FS	1-pc. Cast	Plastic Nylon
3.8	3799	VR38DETT	Nissan	Yokohama, Japan	1,800	AL/AL/CIL	V-6 (60º)	95.5x88.4	NA	480/ 6400	434 (588)/ 3200	SFI/DOHC/4vpc/VVT	GT-R	FS	1-pc. Cast	CA
4.0	3954	VQ40DE	Nissan	Decherd, TN	148,700	AL/AL/CIL	V-6 (60º)	95.5x92	9.7:1	261-266/ 5600	281 (385)-288 (390)/ 4000	SFI/DOHC/4vpc/VVT	Frontier, Pathfinder, Xterra	FS	1-pc. Cast	Plastic Nylon
4.5	4494	VK45DE	Nissan	Yokahama, Japan	5,000	AL/AL/CIL	V-8 (90º)	93x82.7	10.5:1	325/ 6400	336 (456)/ 4000	SFI/DOHC/4vpc/VVT	Infiniti M45	FS	1-pc. Cast	Plastic Nylon
5.0	5026	VK50VE	Nissan	Yokahama, Japan	6,000	AL/AL/CIL	V-8 (90º)	95.5x87.7	10.9:1	390/ 6500	369 (500)/ 4400	SFI/DOHC/4vpc/VVT	Infiniti FX50	FS	1-pc. Cast	Plastic Nylon
5.6	5552	VK56DE	Nissan	Decherd, TN	98,000	AL/AL/CIL	V-8 (90º)	98x92	9.8:1	310/ 5200-320/ 4900	385 (522)-393 (533)/ 3600	SFI/DOHC/4vpc/VVT	Armada, Pathfinder, Titan; Infiniti QX56	FS	1-pc. Cast	
5.6	5552	VK56DE	Nissan	Decherd, TN	7,000	AL/AL/CIL	V-8 (90º)	98x92	9.8:1	317/ 5200	385 (522)/ 3400	SFI/DOHC/4vpc/VVT/E85	Titan	FS	1-pc. Cast	
PORSCHE																2008 CY TOTAL ENGINE VOLUME 25,900
2.9	2893	NA	Porsche	Zuffenhausen, Germany	4,000	AL/AL/SAL	Bxr-6	88.9x78.7	11.5:1	255 /6400-265/ 7200	214 (290)-221 (300)/ 4400	SFI/DOHC/4vpc/VVT	Boxster, Cayman	FSFS	assembled	RP
3.4	3436	NA	Porsche	Zuffenhausen, Germany	2,500	AL/AL/SAL	Bxr-6	96.5x78.7	12.5:1	310/ 6400-320/ 7200	266 (361)/ 4400-273 (370)/ 4750	SFI/DOHC/4vpc/VVT	Boxster S, Cayman S	FSFS	assembled	RP
3.6	3598	NA	Porsche	Zuffenhausen, Germany	5,000	CI/AL	DOHCV-6	89x96.4	12.3:1	290/ 6200	273 (370)/ 3000	DI/ETC/DOHC/4vpc/EVVTL/VI	Cayenne			
3.6	3614	NA	Porsche	Zuffenhausen, Germany	4,800	AL/AL/SAL	Bxr-6	97x81.5	12.5:1	345/ 6500	288 (390)/ 4400	DI/DOHC/4vpc/VVT/VI	911 Carrera, Carrera 4, Targa 4	FSFS	assembled	CA
3.6	3600	NA	Porsche	Zuffenhausen, Germany	1,600	AL/AL/SAL	Bxr-6	100x76.4	9.0:1	480/ 6800	460 (624)/ 1950	DI/DOHC/4vpc/2TRBO/Int/VI	911 Turbo	FSFS	assembled	CA
3.8	3800	NA	Porsche	Zuffenhausen, Germany	1,500	AL/AL/SAL	Bxr-6	102x77.5	12.5:1	385/ 6500	310 (420)/ 4400	DI/DOHC/4vpc/VVT	911 Carrera S, Carrera 4S, Targa 4S	FS	assembled	CA
4.8	3598	NA	Porsche	Zuffenhausen, Germany	6,500	AL/AL	DOHCV-8	96x83	12.5:1	385/ 6200	369 (500)/ 3500	DI/DOHC/4vpc/VVTL/ETC/VI	Cayenne S			
SUZUKI																2008 CY TOTAL ENGINE VOLUME 64,000
2.0	1995	J20A	Suzuki	Sagara, Japan	30,000	AL/AL/CIL	I-4	84x90	10.5:1	143/ 5800	136 (184)/ 3500	SFI/DOHC/4vpc	SX4, SX4 Crossover	FS		
2.4	2393	J24B	Suzuki	Sagara, Japan	5,000	AL/AL/CIL	I-4	92x90	10.0:1	166/ 6000	162 (220)/ 4000	SFI/DOHC/4vpc	Grand Vitara	FS		
3.2	3195	N32A	Suzuki	Sagara, Japan	7,500	AL/AL/CIL	V-6	89x85.6	10.0:1	230/ 6200	213 (289)/ 3500	SFI/DOHC/4vpc/RF	Grand Vitara	FS		
3.6	3564	N36A	Suzuki	Sagara, Japan	21,500	AL/AL/CIL	V-6	94x85.6	10.2:1	252/ 6500	243 (330)/ 2300	SFI/DOHC/4vpc/VVT	XL-7	FS		
TOYOTA																2008 CY TOTAL ENGINE VOLUME 2,353,000
1.5	1497	1NZ-FXE	Toyota	Japan	160,000	AL/AL/CIL	I-4	75x84.7	13.0:1	76/ 5000	82 (111)/ 4200	SFI/DOHC/4vpc/VVT-i	Prius	Plus 67-hp, 295 -b.-ft.(400-Nm) perm. magnet electric motor with 201.6-volt NiMH battery pack.		
1.5	1497	1NZ-FE	Toyota	Japan	103,000	AL/AL/CIL	I-4	75x84.7	10.5:1	106/ 6000	103 (140)/ 4200	SFI/DOHC/4vpc/VVT-i	Yaris	FS	PC	
1.8	1794	1ZZ-FED	Toyota	Buffalo, WV; Cambridge, ONT; Shimoyama, Japan	432,000	AL/AL/CIL	I-4	79x91.5	10.0:1	132/ 6000	128 (174)/ 4400	SFI/DOHC/4vpc/VVT-i	Corolla, Matrix	FS	1-pc. Cast	CA
1.8	1797	2ZR-FE	Toyota	Japan	28,500	AL/AL/CIL	I-4	80.5x88.3	10.0:1	128/ 5000	125 (170)/ 4400	SFI/DOHC/4vpc/VVT-i	Scion xD	FS	1-pc. Cast	CA
2.4	2362	2AZ-FE	Toyota	Georgetown, KY; Japan	455,000	AL/AL/CIL	I-4	88.4x96	9.8:1	158-161/ 6000	161 (218)-162 (220)/ 4000	SFI/DOHC/4vpc/VVT-i	Camry, Camry Solara, Corolla, Matrix; Scion tC, xB	FS	1-pc. Cast	CA
2.4	2362	2AZ-FXE	Toyota	Georgetown, KY; Japan	56,500	AL/AL/CIL	I-4	88.4x96	12.5:1	147/ 6000	138 (187)/ 6000	SFI/DOHC/4vpc/VVT-i	Camry Hybrid	Plus 141-hp, 199-lb.-ft.(270-Nm) perm. magnet electric motor with 244.8-volt NiMH battery pack.		
2.5	2494	NA	Toyota	Japan	45,000	AL/AL/CIL	V-6	89.9x78.7	10.4:1	179/ 6000	172 (233)/ 4000	DI/DOHC/4vpc/VVT-i	Rav4	FPMSC		
2.5	2499	4GR-FSE	Toyota	Japan	24,500	AL/AL/CIL	V-6	83x77	12.0:1	204/ 6400	185 (251)/ 4800	DI/DOHC/4vpc/VVT-i	Lexus IS 250	FPMSC		
2.7	2672	NA	Toyota	Japan	92,000	AL/AL/CIL	I-4	89.9x104.9	10.0:1	182/ 5800	182 (247)/ 4200	SFI/DOHC/4vpc/VVT-i	Highlander, Venza	FS		
2.7	2693	3RZ-FE	Toyota	Japan	13,600	CI/AL	I-4	95X95	9.6:1	159/ 5200	180 (244)/ 3800	SFI/DOHC/4vpc/VVT-i	Tacoma	FS		
3.3	3310	3MZ-FE	Toyota	Kamigo, Japan	21,000	AL/AL/CIL	V-6 (60º)	92x83	10.8:1	210-225/ 5600	220-240 (298-325)/ 3600	SFI/DOHC/4vpc/VVT-i	Camry Solara	FS	1-pc. Cast	CA
3.3	3310	3MZ-FE	Toyota	Kamigo, Japan	37,300	AL/AL/CIL	V-6 (60º)	92x83	10.8:1	209/ 5600	212 (287)/ 3600	SFI/DOHC/4vpc/VVT-i	Highlander Hybrid; Lexus RX 400H	Plus two AC 650V perm. magnet electric motors. Front-167 hp, 247 lb.-ft. (335 Nm)/ 1500 rpm torque. Rear- (AWD only) 68 hp, 96 lb.-ft. (130 Nm)/ 610 rpm torque.		
3.5	3456	2GR-FE	Toyota	Georgetown, KY; Buffalo, WV	392,000	AL/AL/CIL	V-6 (60º)	94x83.1	10.8:1	265-272/ 6200	245 (332)-254 (344)/ 4700	SFI/DOHC/4vpc/VVT-i/RRA	Avalon, Camry, Highlander, RAV4, Sienna, Venza; Lexus ES 350, RX 350	FPMSC	1-pc. Cast	CA
3.5	3456	2GR-FSE	Toyota	Japan	14,500	AL/AL/CIL	V-6 (60º)	94x83.1	11.5:1	303/ 6200	274 (371)/ 4800	SFI/ETC/DOHC/4vpc/VVT-i	Lexus GS 350	FPMSC	1-pc. Cast	CA
3.5	3456	2GR-FSE	Toyota	Japan	26,000	AL/AL/CIL	V-6 (60º)	94x83.1	11.8:1	306/ 6400	277 (376)/ 4800	DI-SFI/DOHC/4vpc/VVT-i	Lexus IS 350	FPMSC	1-pc. Cast	CA
3.5	3456	2GR-FSE	Toyota	Japan	1,000	AL/AL/CIL	V-6 (60º)	94x83.1	11.8:1	292/ 6400	267 (362)/ 4800	DI-SFI/DOHC/4vpc/VVT-i	Lexus GS 450h	Plus 167-hp, AC 650-volt perm. magnet electric motor with 288-volt NiMH battery pack.		
4.0	3955	1GR-FE	Toyota	Tahara, Japan; Huntsville, AL	136,000	AL/AL/CIL	V-6 (60º)	94x95	10.0:1	236-239/ 5200	266 (361)/ 3800- 278 (377)/ 3700	SFI/DOHC/4vpc/BT	4Runner, FJ Cruiser, Tacoma, Tundra	FPMSC	1-pc. Cast	CA
4.3	4292	3UZ-FE	Toyota	Japan	2,200	AL/AL/CIL	V-8 (90º)	91x82.5	10.5:1	288/ 5600	317 (430)/ 3400	SFI/ETC/DOHC/4vpc/VVT-i	Lexus SC 430	FPMSC	1-pc. Cast	
4.6	4608	1UR-FSE	Toyota	Huntsville, AL; Tahara, Japan	21,000	AL/AL/CIL	V-8 (90º)	94x83.1	(tt)11.8:1	342/ 6200-380/ 6400	339 (460)/ 3600-367 (498)/ 4100	SFI/ETC/DOHC/4vpc/VVT-i	Sequoia, Tundra; Lexus GS 460, LS 460	FPMSC	1-pc. Cast	CA
4.7	4663	2UZ-FE	Toyota	Huntsville, AL; Tahara, Japan	56,000	CI/AL	V-8 (90º)	94x84	(tt)9.6:1	260-276/ 5400	306 (404)-332 (450)/ 3400	SFI/DOHC/4vpc/VVT-i	4Runner, Sequoia, Tundra, Lexus GX 470	FPMSC	1-pc. Cast	CA
5.0	4969	2UR-FSE	Toyota	Tahara, Japan	1,200	AL/AL/CIL	V-8 (90º)	94x89.5	11.8:1	389/ 6400	385 (522)/ 4100	DI-SFI/ETC/DOHC/4vpc/VVT-i/VI	Lexus LS 600h	Plus 221-hp, AC 650-volt perm. magnet electric motor with 288-volt NiMH battery pack.		
5.0	4969	2UR-GSE	Toyota	Tahara, Japan	1,200	AL/AL/CIL	V-8 (90º)	94x89.5	11.8:1	416/ 6600	371 (500)/ 5200	DI-SFI/DOHC/4vpc/VVT-i/ ETC	Lexus LS IS-F	FPMSC	1-pc. Cast	CA
5.7	5663	3UR-FE	Toyota	Huntsville, AL; Tahara, Japan	233,500	AL/AL/CIL	V8	94x102	10.5:1	381-383/ 5600	401 (544)/ 3200-403 (546)/ 3600	SFI/DOHC/4vpc/VVT-i/ETC	Land Cruiser, Sequoia, Tundra; Lexus LX570	FPMSC	1-pc. Cast	
VOLKSWAGEN																2008 CY TOTAL ENGINE VOLUME 637,000
2.0	1984	NA	VW	Puebla, Mexico	70,500	CI/AL	I-4	82.5x92.8	10.3:1	200/ 5100	207 (280)/1800	DI/SOHC/4vpc/TRBO/int/BT	CC, Eos, GTI, Jetta, Passat, Tiguan; Audi A3, TT	FS	1-pc. Cast	CA
2.0	1984	NA	VW	Germany	36,500	CI/AL	I-4	82.5x92.8	10.3:1	211/ 5300-265/ 6000	258 (350)/ 1500-258 (350)/ 2\500	DI/ETC/SOHC/4vpc/TRBO/int/BT	Audi A4, TTS	FS	1-pc. Cast	CA
2.0	1968	NA	VW	Puebla, Mexico	6,000	CI/AL	I-4	81x95.5	16.5:1	140/ 4000	236 (320)/ 1750	DI/SOHC/4vpc/TRBO/int	Jetta TDI	FS	1-pc. Cast	CA
2.5	2480	NA	VW	Puebla, Mexico	444,000	CI/AL	I-5	82.5x92.8	9.5:1	150/ 5000-170/ 5700	170 (228)/ 3750-177 (240)/ 4250	SFI/SOHC/4vpc/BT	Beetle, Jetta, Rabbit	FS	1-pc. Cast	CA
3.2	3123	NA	VW	Salzgitter, Germany	45,000	CI/AL	V-6 (90º)	84.5x92.8	12.5:1	250/ 6300-270/ 6500	236 (320)/ 2800-243 (330)/ 3250	SFI/DOHC/5vpc/VVT/BT	Audi A3 3.2 Quattro, A4, A5, A6, Q5	FSFS	1-pc. Cast	CA
3.2	3189	NA	VW	Salzgitter, Germany	2,600	CI/AL	V-6 (90º)	84x95,9	10.85:1	250/ 6300	236 (320)/ 2500	SFI/DOHC/5vpc/VVT/BT	Auti TT	FSFS	1-pc. Cast	CA
3.6	3597	NA	VW	NA	7,000	CI/AL	V-6 (90º)	89x96.4	12.0:1	276-280/ 6200	265 (360)-266 (360)/ 2750	DI/ETC/DOHC/4vpc/EVVTL/VI	CC, Touareg; Audi Q7	FSFS	assembled	RP
3.8	3778	EGH	Chrysler	Trenton, MI	2,000	CI/AL	V-6 (60º)	96x87	9.6:1	197/ 5200	230 (312)/ 4000	SFI/OHV/PRA/RF	Routan	FSFS	1-pc. Cast	CA/RP
4.0	3952	NA	Chrysler	Trenton, MI	4,500	AL/AL/CIL	V-6 (60º)	96x91	10.2:1	253/ 6000	262 (355)/ 4100	SFI/SOHC/4vpc/RRA	Routan	FSFS	1-pc. Cast	CA/RP
4.2	4172	NA	Audi	Gyor, Hungary	1,700	AL/AL/CIL	V-8 (90º)	84.5x93	11.0:1	340/ 7000	302 (410)/ 3500	DI/ETC/DOHC/5vpc/BT	S4	FSFS		
4.2	4172	NA	Audi	Gyor, Hungary	4,700	AL/AL/CIL	V-8 (90º)	84.5x93	11.0:1	350/ 6800	324 (440)/ 3500	DI/ETC/DOHC/5vpc/VVT/BT	Touareg	FSFS		
4.2	4172	NA	Audi	Gyor, Hungary	4,000	AL/AL/CIL	V-8 (90º)	84.5x93	12.5:1	350/ 6800	325 (339)/ 3500	DI/ETC/DOHC/5vpc/VVT/BT	Audi A6, A8	FSFS		
4.2	4172	NA	Audi	Gyor, Hungary	1,000	AL/AL/CIL	V-8 (90º)	84.5x93	12.5:1	420/ 7800	317 (430)/ 6000	DI/ETC/DOHC/5vpc/VVT/BT	Audi R8	FSFS		
5.2	5204	NA	Audi	Gyor, Hungary	2,000	AL/AL/CIL	V-10 (90º)	84.5x92.8	12.5:1	435/ 6800-450/ 7000	398 (540)/ 3500	DI/ETC/DOHC/5vpc/VVT/BT	Audi S6, S8	FSFS		
6.0	5998	NA	VW	Salzgitter, Germany	2,500	CI/AL	W-12 (72º)	84x90.2	11.0:1	450/ 6200	428 (580)/ 4000	SFI/ETC/DOHC/4vpc/VVT/BT/VI	Audi A8	FSFS		composite
6.0	5998	NA	VW/Bentley	Crewe, England	1,500	CI/AL	W-12 (72º)	84x90.2	9.0:1	552/ 6100-600/ 6000	479 (650)/ 1600-553 (750)/ 1700	SFI/ETC/DOHC/4vpc/VVT/2TRBO/ BT/VI	Bentley Continental GT, GTC, Flying Spur, Flying Spur Speed	FSFS		composite
6.8	6752	NA	Bentley	Crewe, England	1,000	CI/AL	V-8	104x99	7.8:1	450/ 4100-530/ 4000	645 (875)/ 1800-774 (1050)/ 3250	SFI/OHV/2vpc/2TRBO/int	Bentley Arnage R, Arnage RL, Azure, Brooklands	FSFS		
6.8	6752	NA	Bentley	Crewe, England	500	CI/AL	V-8	104x99	7.8:1	500/ 4200	739 (1000)/ 3200	SFI/OHV/2vpc/2TRBO/int	Bentley Arnage Final Series, Arnage T	FSFS		

LEGEND FOR NORTH AMERICAN ENGINES 2009

AC: Atkinson cycle
AL: aluminum
AS: assembled steel
BT: bucket tappets
CA: cast aluminum
CI: cast iron
CD: cylinder deactivation
CIFS: cast iron, fracture split
CIL: cast iron liners
CNI: cast nodular iron
COMP: composite
CPM: cast powder metal
CS: cast steel
DDV: direct drive valvetrain
DI: direct injection
DOHC: double-overhead-cam
EFI: electronic fuel injection
ETC: electronic throttle control
ESI: engine stop at idle
FPMFS: forged powdered metal fracture split
FPMSC: forged powdered metal Saw Cut
FRM: fiber-reinforced metal
FS: forged steel
FSFS: forged steel fracture split
FT: forged titanium
HS: hollow steel
IDI: indirect injection
INT: intercooler
MAL: magnesium-aluminum composite
NA: information not available at press time
OHV: overhead-valve
PC: plastic composite
PEM: proton exchange membrane
PRA: push rods, rocker arms
PRR: push rods, roller rockers
RF: roller followers
RFF: roller finger followers
RP: reinforced plastic
RRA: roller rocker arms
RT: roller tappets
SAL: silicon aluminum alloy liners
SFS: sinter fordged steel
SFI: sequential fuel injection
SOHC: single-overhead-cam
SPR: supercharger
TRBO: turbocharger
VI: variable intake
VTEC: variable valve timing and lift electronic control
i-VTEC: intelligent variable valve timing and lift electronic control.
VCT: variable cam timing
VVL: variable valve lift
VVT: variable valve timing
VVTL: variable valve timing and lift control.

PBC: Performance Build Center. ** 9.8:1 in Ram Pickup, Commander and Grand Cherokee applications. * 9.6:1 in Altima. (tt 10.5 in GS460. (tt) 10.0:1 in GX 470. (1) Engine volumes are estimates for the calendar year based on vehicles built in North America and imports sold in North America. Estimates for North American-built vehicles are based on calendar year 2008 production, including export output; imports are based on 2008 North American sales. Volumes for discontinued engines excluded.*

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