

D11 1138 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
2.8740	2.6770	1-3-4-2	2.0600	1.732
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
B4ES	.028-.031	.018-.022	12 deg.BTDC/550	3.3 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	72-80		Oil pan drain plug	14-22
Rod brg. caps	24-25		Oil pump bolt	
Cyl. head bolts	51-54		Rocker arm nut	12-17
Cam sprocket bolt			Rckr.shaft brckt.bolt	16-17
Crank pulley bolt	51-54		Side cover bolt	
Flywheel bolt	29-30		Spark plug	11-14
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	8.7-11		Water pump bolt	
Oil pan bolt	3.6-4.3		Wtr.pmp.pulley bolt	
PISTON				
Diameter	2.8735-2.8755		Cyl.bore clearance	.0009-.0017
Pin diameter	.6869-.6871			
RINGS				
Ring gap-Top	.0079-.0130		Side clearance-Top	.0015-.0030
Ring gap-2nd			Side clearance-2nd	.0015-.0030
Ring gap-Oil			Side clearance-Oil	.0016-.0031
CRANKSHAFT				
Main journal dia.	2.059-2.060		Rod journal dia.	1.731-1.732
Main run clearance			Rod run clearance	
End play	.0031-.0067			
CAMSHAFT				
Front journal dia.	1.356-1.357		End play	.0004-.0020
Center journal dia.	1.728-1.729			
Rear journal dia.	1.356-1.357			
VALVES				
Intake length	4.03-4.04		Exhaust length	4.03-4.04
Intake stem dia.	.3138-.3144		Exhaust stem dia.	.3128-.3144
Intake head dia.	1.378-1.386		Exhaust head dia.	1.142-1.150
Intake face angle	45 deg. 30 sec.		Exhaust face angle	45 deg. 30 sec.
Intake clearance	.010 hot		Exhaust clearance	.010 hot

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BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
2.8740	2.7600	1-3-4-2	1.9675	1.7706
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
BP5ES	.031-.035	.018-.022	7 deg.BTDC/700	3.2 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	36-43		Oil pan drain plug	14-22
Rod brg. caps	24-26		Oil pump bolt	6.5-10
Cyl. head bolts	51-54		Rocker arm nut	12-17
Cam sprocket bolt	29-35		Rckr.shaft brckt.bolt	14-18
Crank pulley bolt	108-145		Side cover bolt	
Flywheel bolt	47-54		Spark plug	11-14
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	6.5-10		Water pump bolt	6.5-10
Oil pan bolt	2.9-5.1		Wtr.pmp.pulley bolt	
PISTON				
Diameter	2.8735-2.8755		Pin hole bore	.6871-.6874
Pin diameter	.6869-.6871			
RINGS				
Ring gap-Top	.0079-.0138		Side clearance-Top	.0016-.0028
Ring gap-2nd	.0079-.0138		Side clearance-2nd	.0016-.0028
Ring gap-Oil	.0118-.0354		Side clearance-Oil	.0016-.0032
CRANKSHAFT				
Main journal dia.	1.9666-1.9675		Rod journal dia.	1.7701-1.7706
Main run clearance	.0008-.0024		Rod run clearance	.0008-.0020
End play	.0020-.0059			
CAMSHAFT				
No.1 journal dia.	1.723-1.724		No.4 journal dia.	1.664-1.665
No.2 journal dia.	1.664-1.704		No.5 journal dia.	1.6224-1.6629
No.3 journal dia.	1.684-1.6849		End play	.0004-.0020
VALVES				
Intake length	4.03-4.04		Exhaust length	4.0748-4.0945
Intake stem dia.	.3138-.3144		Exhaust stem dia.	.3128-.3134
Intake head dia.	1.457-1.465		Exhaust head dia.	1.181-1.189
Intake face angle	45 deg. 30 sec.		Exhaust face angle	45 deg. 30 sec.
Intake clearance	.014 hot		Exhaust clearance	.014 hot

A15 1488 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
2.9920	3.2280	1-3-4-2	1.9675	1.7706
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
B4ES	.028-.031	.018-.022	7 deg.BTDC/650	3.3 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	36-43		Oil pan drain plug	14-29
Rod brg. caps	23-27		Oil pump bolt	
Cyl. head bolts	51-58		Rocker arm nut	12-16
Cam sprocket bolt	29-35		Rckr.shaft brckt.bolt	14-18
Crank pulley bolt	108-145		Side cover bolt	
Flywheel bolt	58-65		Spark plug	13-17
Flywheel housing	12-15		Water outlet bolt	
Manifold bolt & nut	10-13		Water pump bolt	6.5-10
Oil pan bolt	2.9-4.3		Wtr.pmp.pulley bolt	
PISTON				
Diameter	2.9908-2.9928		Cyl.bore clearance	.0010-.0018
Pin diameter	.7478-.7480			
RINGS				
Ring gap-Top	.0079-.0138		Side clearance-Top	.0016-.0029
Ring gap-2nd	.0059-.0118		Side clearance-2nd	.0012-.0025
Ring gap-Oil	.0118-.0354			
CRANKSHAFT				
Main journal dia.	1.9666-1.9675		Rod journal dia.	1.7701-1.7706
Main run clearance	.0010-.0035		Rod run clearance	.0012-.0031
End play	.0020-.0059			
CAMSHAFT				
No.1 journal dia.	1.723-1.724		No.4 journal dia.	1.664-1.665
No.2 journal dia.	1.664-1.704		No.5 journal dia.	1.6224-1.6629
No.3 journal dia.	1.684-1.6849		End play	.0004-.0020
VALVES				
Intake length	4.0748-4.0945		Exhaust length	4.0748-4.0945
Intake stem dia.	.3138-.3143		Exhaust stem dia.	.3128-.3134
Intake head dia.	1.457-1.465		Exhaust head dia.	1.181-1.189
Intake face angle	45 deg. 30 sec.		Exhaust face angle	45 deg. 30 sec.
Intake clearance	.014 hot		Exhaust clearance	.014 hot

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BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.0710	3.0550	1-3-4-2	2.0010	1.8759
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
B4ES	.028-.031	.018-.022	6 deg.BTDC/600	3.75 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	72-80		Oil pan drain plug	14 to 22
Rod brg. caps	20-27		Oil pump bolt	7 to 12
Cyl. head bolts	36-43		Rocker arm nut	12 to 17
Cam sprocket bolt	22 to 29		Rckr.shaft brckt.bolt	14 to 22
Crank pulley bolt	87 to 116		Side cover bolt	2.9 to 5.8
Flywheel bolt	36 to 43		Spark plug	11 to 14
Flywheel housing	22 to 29		Water outlet bolt	7 to 12
Manifold bolt & nut	12 to 17		Water pump bolt	9 to 13
Oil pan bolt	4.3 to 6.5		Wtr.pmp.pulley bolt	4.3 to 7.2
PISTON				
Diameter	3.0683-3.0703		Pin hole bore	.8268-.8271
Pin diameter	.8265-.8267			
RINGS				
Ring gap-Top	.0079-.0138		Side clearance-Top	.0014-.0029
Ring gap-2nd	.0055-.0114		Side clearance-2nd	.0014-.0025
Ring gap-Oil	.0118-.0354			
CRANKSHAFT				
Main journal dia.	2.0005-2.0010		Rod journal dia.	1.8754-1.8759
Main run clearance	.0012-.0031		Rod run clearance	.0012-.0028
End play	.0004-.0083			
CAMSHAFT				
Front journal dia.	1.7887-1.7892		Front brg. ID	1.7902-1.7907
Center journal dia.	1.7282-1.7287		Center brg. ID	1.7302-1.7307
Rear journal dia.	1.6242-1.6233		Rear brg. ID	1.6242-1.6248
End play	.0020-.0114			
VALVES				
Intake length	4.3051-4.3169		Exhaust length	4.3051-4.3169
Intake stem dia.	.3417-.3423		Exhaust stem dia.	.3417-.3423
Intake head dia.	1.488-1.496		Exhaust head dia.	1.256-1.264
Intake face angle	45 deg. 30 sec.		Exhaust face angle	45 deg. 30 sec.
Intake clearance	.010 hot		Exhaust clearance	.010 hot

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BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.4330	3.2680	1-3-4-2	2.4785	2.0462
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
B4ES	.028-.031	.018-.022	7 deg.BTDC/550	4.5 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	72-79		Oil pan drain plug	14-29
Rod brg. caps	35-44		Oil pump bolt	15-25
Cyl. head bolts	59-69		Rocker arm nut	12-17
Cam sprocket bolt	18-22		Rckr.shaft brckt.bolt	36-43
Crank pulley bolt	87-116		Side cover bolt	2.9-5.8
Flywheel bolt	43-54		Spark plug	11-14
Flywheel housing	22-29		Water outlet bolt	7-12
Manifold bolt & nut	10-13		Water pump bolt	14-18
Oil pan bolt	2.9-5.1		Wtr.pmp.pulley bolt	4.3-7.2
PISTON				
Diameter	3.4325-3.4344		Cyl.bore clearance	.0010-.0018
Pin diameter	.8656-.8661			
RINGS				
Ring gap-Top	.0098-.0157		Side clearance-Top	.0016-.0029
Ring gap-2nd	.0059-.0118		Side clearance-2nd	.0012-.0025
Ring gap-Oil	.0118-.0354			
CRANKSHAFT				
Main journal dia.	2.4780-2.4785		Rod journal dia.	2.0457-2.0462
Main run clearance	.0008-.0024		Rod run clearance	.0004-.0026
End play	.0020-.0071			
CAMSHAFT				
Front journal dia.	1.7887-1.7892		End play	.0020-.0110
Center journal dia.	1.7282-1.7287			
Rear journal dia.	1.6228-1.6233			
VALVES				
Intake length	4.33-4.35		Exhaust length	4.35-4.37
Intake stem dia.	.3408-.3413		Exhaust stem dia.	.3396-.3402
Intake head dia.	1.654		Exhaust head dia.	1.26
Intake face angle	45 deg. 30 sec.		Exhaust face angle	45 deg. 30 sec.
Intake clearance	.015 hot		Exhaust clearance	.015 hot

H20-II 1982 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.4330	3.2680	1-3-4-2	2.4785	1.7706
SPARK PLUG TYPE	SPARK PLUG GAP	AIR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
BP4ES	.031-.035	.0138-.0177	4 deg.BTDC/650	4 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	61-69		Oil pan drain plug	14-29
Rod brg. caps	23-27		Oil pump bolt	15-25
Cyl. head bolts	54-61		Rocker arm nut	
Cam sprocket bolt	22-29		Rckr.shaft brckt.bolt	36-43
Crank pulley bolt	105-112		Side cover bolt	
Flywheel bolt	98-105		Spark plug	13-17
Flywheel housing	32-43		Water outlet bolt	10-15
Manifold bolt & nut	12-14		Water pump bolt	14-18
Oil pan bolt	4.7-5.5		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.4317-3.4337		Cyl.bore clearance	.0010-.0018
Pin diameter	.7871-.7873			
RINGS				
Ring gap-Top	.0098-.0138			
Ring gap-2nd	.0059-.0098			
Ring gap-Oil	.012-.035			
CRANKSHAFT				
Main journal dia.	2.4780-2.4785		Rod journal dia.	1.7701-1.7706
Main run clearance	.0008-.0024		Rod run clearance	.0004-.0026
End play	.0020-.0071			
CAMSHAFT				
Front bushing ID	1.7902-1.7907		End play	.0020-.0091
Center bushing ID	1.7302-1.7307			
Rear bushing ID	1.7302-1.7307			
VALVES				
Intake length	4.2736-4.2854		Exhaust length	4.2539-4.2657
Intake stem dia.	.2744-.2750		Exhaust stem dia.	.2734-.2740
Intake head dia.	1.378-1.386		Exhaust head dia.	1.181-1.189
Intake face angle	45 deg. 30 sec.		Exhaust face angle	45 deg. 30 sec.
Intake clearance	.015 hot		Exhaust clearance	.015 hot

H25 2472 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.6220	3.6610	1-3-4-2	2.4785	1.9675
SPARK PLUG TYPE	SPARK PLUG GAP	AIR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
BP4ES	.031-.035	.0138-.0177	4 deg.BTDC/650	4 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	61-69		Oil pan drain plug	14-29
Rod brg. caps	23-27		Oil pump bolt	15-25
Cyl. head bolts	54-61		Rocker arm nut	
Cam sprocket bolt	22-29		Rckr.shaft brckt.bolt	36-43
Crank pulley bolt	105-112		Side cover bolt	
Flywheel bolt	98-105		Spark plug	13-17
Flywheel housing	32-43		Water outlet bolt	10-15
Manifold bolt & nut	12-14		Water pump bolt	14-18
Oil pan bolt	4.7-5.5		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.6207-3.6226		Cyl.bore clearance	.0010-.0018
Pin diameter	.8265-.8267			
RINGS				
Ring gap-Top	.0098-.0138			
Ring gap-2nd	.0059-.0098			
Ring gap-Oil	.012-.035			
CRANKSHAFT				
Main journal dia.	2.4780-2.4785		Rod journal dia.	1.9670-1.9675
Main run clearance	.0008-.0024		Rod run clearance	.0004-.0026
End play	.0020-.0071			
CAMSHAFT				
Front bushing ID	1.7902-1.7907		End play	.0020-.0091
Center bushing ID	1.7302-1.7307			
Rear bushing ID	1.7302-1.7307			
VALVES				
Intake length	4.2736-4.2854		Exhaust length	4.2539-4.2657
Intake stem dia.	.2744-.2750		Exhaust stem dia.	.2734-.2740
Intake head dia.	1.378-1.386		Exhaust head dia.	1.181-1.189
Intake face angle	45 deg. 30 sec.		Exhaust face angle	45 deg. 30 sec.
Intake clearance	.015 hot		Exhaust clearance	.015 hot

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BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.4330	3.2680	1-5-3-6-2-4	2.4785	2.0462
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
B4ES	.028-.031	.018-.022	5 deg.BTDC/600	5 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	72-79		Oil pan drain plug	14-29
Rod brg. caps	35-44		Oil pump bolt	15-25
Cyl. head bolts	59-69		Rocker arm nut	12-17
Cam sprocket bolt	18-22		Rckr.shaft brckt.bolt	36-43
Crank pulley bolt	87-116		Side cover bolt	2.9-5.8
Flywheel bolt	43-54		Spark plug	11-14
Flywheel housing	22-29		Water outlet bolt	7-12
Manifold bolt & nut	10-13		Water pump bolt	14-18
Oil pan bolt	2.9-5.1		Wtr.pmp.pulley bolt	4.3-7.2
PISTON				
Diameter	3.4325-3.4344		Cyl.bore clearance	.0010-.0018
Pin diameter	.8656-.8661			
RINGS				
Ring gap-Top	.0098-.0157		Side clearance-Top	.0016-.0029
Ring gap-2nd	.0059-.0118		Side clearance-2nd	.0012-.0025
Ring gap-Oil	.0118-.0354			
CRANKSHAFT				
Main journal dia.	2.4780-2.4785		Rod journal dia.	2.0457-2.0462
Main run clearance	.0008-.0024		Rod run clearance	.0004-.0026
End play	.0020-.0071			
CAMSHAFT				
No.1 journal dia.	1.7887-1.7892		No.4 journal dia.	1.6228-1.6233
No.2 journal dia.	1.7282-1.7287		End play	.0020-.0110
No.3 journal dia.	1.7282-1.7287			
VALVES				
Intake length	4.33-4.35		Exhaust length	4.35-4.37
Intake stem dia.	.3408-.3413		Exhaust stem dia.	.3396-.3402
Intake head dia.	1.654		Exhaust head dia.	1.26
Intake face angle	45 deg. 30 sec.		Exhaust face angle	45 deg. 30 sec.
Intake clearance	.015 hot		Exhaust clearance	.015 hot

Z24 2389 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.5040	3.7800	1-3-4-2	2.1636	1.9675
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
B4ES	.028-.031	.018-.022	12 deg.BTDC/650	3.2 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	33-40		Oil pan drain plug	14-29
Rod brg. caps	33-40		Oil pump bolt	8-11
Cyl. head bolts	54-61		Rocker arm nut	12-17
Cam sprocket bolt	87-116		Rckr.shaft brckt.bolt	11-18
Crank pulley bolt	87-116		Side cover bolt	
Flywheel bolt	65-80		Spark plug	13-17
Flywheel housing	65-80		Water outlet bolt	
Manifold bolt & nut	10-13		Water pump bolt	M6(3-7) M8(7-12)
Oil pan bolt	2.9-4.3		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.5026-3.5029		Cyl.bore clearance	.0010-.0018
Pin diameter	.8265-.8267			
RINGS				
Ring gap-Top	.0098-.0157		Side clearance-Top	.0016-.0029
Ring gap-2nd	.0059-.0118		Side clearance-2nd	.0012-.0025
Ring gap-Oil	.0118-.0354			
CRANKSHAFT				
Main journal dia.	2.1631-2.1636		Rod journal dia.	1.9670-1.9675
Main run clearance	.0008-.0024		Rod run clearance	.0005-.0021
End play	.0020-.0071			
CAMSHAFT				
Front journal dia.	1.2967-1.2974		End play	0.008
VALVES				
Intake length	4.8858-4.8976		Exhaust length	4.9252-4.9370
Intake stem dia.	.3136-.3142		Exhaust stem dia.	.3128-.3134
Intake head dia.	1.654		Exhaust head dia.	1.5
Intake face angle	45 deg. 30 sec.		Exhaust face angle	45 deg. 30 sec.
Intake clearance	.012 hot		Exhaust clearance	.012 hot

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BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.3750	4.5000	1-5-3-6-2-4	2.7283	2.25
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
B4ES	.028-.031	.018-.022	8 deg.BTDC/550	6 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	72-87		Oil pan drain plug	14-29
Rod brg. caps	33-43		Oil pump bolt	15-25
Cyl. head bolts	51-65		Rocker arm nut	
Cam sprocket bolt	22-30		Rckr.shaft brckt.bolt	25-35
Crank pulley bolt	110-120		Side cover bolt	
Flywheel bolt	58-72		Spark plug	13-17
Flywheel housing	38-54		Water outlet bolt	7-9
Manifold bolt & nut	18-25		Water pump bolt	18-25
Oil pan bolt	5.8-10.1		Wtr.pmp.pulley bolt	4.3-6.5
PISTON				
Diameter	3.3720-3.3740		Cyl.bore clearance	.0012-.0019
Pin diameter	.8129-.8131		Piston pin hole bore	.8131-.8133
RINGS				
Ring gap-Top	.0098-.0157		Side clearance-Top	.0012-.0031
Ring gap-2nd	.0059-.0118		Side clearance-2nd	.0012-.0031
Ring gap-Oil	.008-.035			
CRANKSHAFT				
Main journal dia.	2.7274-2.7283		Rod journal dia.	2.2492-2.2500
Main run clearance	.0012-.0042		Rod run clearance	.0006-.0027
End play	.0031-.0071			
CAMSHAFT				
No.1 journal dia.	1.9240-1.9350		No.4 journal dia.	1.9020-1.9030
No.2 journal dia.	1.9260-1.9270		End play	.0018-.0085
No.3 journal dia.	1.9140-1.9150			
VALVES				
Intake length	5.1201-5.1319		Exhaust length	5.1712-5.1831
Intake stem dia.	.3400-.3406		Exhaust stem dia.	.3396-.3402
Intake head dia.	1.693		Exhaust head dia.	1.425
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.015 hot		Exhaust clearance	.015 hot

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BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.3750	4.5000	1-5-3-6-2-4	2.6862	2.25
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
B4ES	.028-.031	.018-.022	8 deg.BTDC/550	6 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	72-87		Oil pan drain plug	14-29
Rod brg. caps	33-43		Oil pump bolt	15-25
Cyl. head bolts	51-65		Rocker arm nut	
Cam sprocket bolt	22-30		Rckr.shaft brckt.bolt	25-35
Crank pulley bolt	110-120		Side cover bolt	
Flywheel bolt	58-72		Spark plug	13-17
Flywheel housing	38-54		Water outlet bolt	7-9
Manifold bolt & nut	18-25		Water pump bolt	18-25
Oil pan bolt	5.8-10.1		Wtr.pmp.pulley bolt	4.3-6.5
PISTON				
Diameter	3.3720-3.3740		Cyl.bore clearance	.0012-.0019
Pin diameter	.8129-.8131		Piston pin hole bore	.8131-.8133
RINGS				
Ring gap-Top	.0098-.0157		Side clearance-Top	.0012-.0031
Ring gap-2nd	.0059-.0118		Side clearance-2nd	.0012-.0031
Ring gap-Oil	.008-.035			
CRANKSHAFT				
Main journal dia.	2.6862		Rod journal dia.	2.2492-2.2500
Main run clearance	.0012-.0042		Rod run clearance	.0006-.0027
End play	.0031-.0071			
CAMSHAFT				
No.1 journal dia.	1.9240-1.9350		No.4 journal dia.	1.9020-1.9030
No.2 journal dia.	1.9260-1.9270		End play	.0018-.0085
No.3 journal dia.	1.9140-1.9150			
VALVES				
Intake length	5.1201-5.1319		Exhaust length	5.1712-5.1831
Intake stem dia.	.3400-.3406		Exhaust stem dia.	.3396-.3402
Intake head dia.	1.693		Exhaust head dia.	1.425
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.015 hot		Exhaust clearance	.015 hot

SD22 2164 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.2680	3.9400	1-3-4-2	2.7968	2.0837
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
				6.87 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	108-116		Oil pan drain plug	
Rod brg. caps	38-41		Oil pump bolt	
Cyl. head bolts	Sub(36) Main(94)		Rocker arm nut	
Cam sprocket bolt	33-36		Rckr.shaft brckt.bolt	14-18
Crank pulley bolt	217-239		Side cover bolt	
Flywheel bolt	33-36		Spark plug	
Flywheel housing			Water outlet bolt	7-9
Manifold bolt & nut	11-13		Water pump bolt	8mm(8) 10mm(18)
Oil pan bolt	2.9-4.3		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.268		Sleeve clearance	.0047-.0076
Pin diameter	1.024			
RINGS				
Ring gap-Top	.0118-.0177		Ring gap-4th	.0059-.0118
Ring gap-2nd	.0079-.0138		Ring gap-5th	.0059-.0118
Ring gap-3rd	.0079-.0138			
CRANKSHAFT				
Main journal dia.	2.7963-2.7968		Rod journal dia.	2.0832-2.0837
Main run clearance	.0019-.0031		Rod run clearance	.0014-.0035
End play	.0024-.0095			
CAMSHAFT				
Front journal dia.	1.7887-1.7892		End play	.0032-.0102
Center journal dia.	1.7282-1.7287			
Rear journal dia.	1.6228-1.6233			
VALVES				
Intake length			Exhaust length	
Intake stem dia.	.3137-.3148		Exhaust stem dia.	.3127-.3133
Intake head dia.			Exhaust head dia.	
Intake face angle			Exhaust face angle	
Intake clearance	.014 hot		Exhaust clearance	.014 hot

SD25 2488 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.5040	3.9370	1-3-4-2	2.7921	2.0837
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
				6.87 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	108-116		Oil pan drain plug	
Rod brg. caps	38-41		Oil pump bolt	
Cyl. head bolts	Sub(36) Main(94)		Rocker arm nut	
Cam sprocket bolt	33-36		Rckr.shaft brckt.bolt	14-18
Crank pulley bolt	217-239		Side cover bolt	
Flywheel bolt	33-36		Spark plug	
Flywheel housing			Water outlet bolt	7-9
Manifold bolt & nut	11-13		Water pump bolt	8mm(8) 10mm(18)
Oil pan bolt	2.9-4.3		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.4998-3.5014		Sleeve clearance	.0035-.0045
Pin diameter	1.0233-1.0236			
RINGS				
Ring gap-Top	.0118-.0197		Side clearance Top	.0024-.0039
Ring gap-2nd	.0079-.0138		Side clearance 2nd	.0016-.0031
Ring gap-Oil	.0059-.0118		Side clearance Oil	.0008-.0024
CRANKSHAFT				
Main journal dia.	2.7916-2.7921		Rod journal dia.	2.0832-2.0837
Main run clearance	.0014-.0037		Rod run clearance	.0014-.0035
End play	.0024-.0055			
CAMSHAFT				
Front journal dia.	1.7887-1.7892		End play	.0032-.0102
Center journal dia.	1.7282-1.7287			
Rear journal dia.	1.6228-1.6233			
VALVES				
Intake length	4.61		Exhaust length	4.61
Intake stem dia.	.3138-.3144		Exhaust stem dia.	.3128-.3134
Intake head dia.	1.571-1.579		Exhaust head dia.	1.335-1.343
Intake face angle	45 deg. 30 sec.		Exhaust face angle	45 deg. 30 sec.
Intake clearance	.014 hot		Exhaust clearance	.014 hot

TB42 4169 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.7800	3.7800	1-5-3-6-2-4		
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps			Oil pan drain plug	
Rod brg. caps			Oil pump bolt	
Cyl. head bolts			Rocker arm nut	
Cam sprocket bolt			Rckr.shaft brckt.bolt	
Crank pulley bolt			Side cover bolt	
Flywheel bolt			Spark plug	
Flywheel housing			Water outlet bolt	
Manifold bolt & nut			Water pump bolt	
Oil pan bolt			Wtr.pmp.pulley bolt	
PISTON				
Diameter				
Pin diameter				
RINGS				
Ring gap-Top				
Ring gap-2nd				
Ring gap-3rd				
CRANKSHAFT				
Main journal dia.				
Main run clearance				
End play				
CAMSHAFT				
Front journal dia.				
Center journal dia.				
Rear journal dia.				
VALVES				
Intake length			Exhaust length	
Intake stem dia.			Exhaust stem dia.	
Intake head dia.			Exhaust head dia.	
Intake face angle			Exhaust face angle	
Intake clearance			Exhaust clearance	

TD42 4169 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.7800	3.7800	1-4-2-6-3-5		
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	INJ.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
			6 deg.BTDC/600	
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps			Oil pan drain plug	
Rod brg. caps			Oil pump bolt	
Cyl. head bolts			Rocker arm nut	
Cam sprocket bolt			Rckr.shaft brckt.bolt	
Crank pulley bolt			Side cover bolt	
Flywheel bolt			Spark plug	
Flywheel housing			Water outlet bolt	
Manifold bolt & nut			Water pump bolt	
Oil pan bolt			Wtr.pmp.pulley bolt	
PISTON				
Diameter				
Pin diameter				
RINGS				
Ring gap-Top				
Ring gap-2nd				
Ring gap-3rd				
CRANKSHAFT				
Main journal dia.				
Main run clearance				
End play				
CAMSHAFT				
Front journal dia.				
Center journal dia.				
Rear journal dia.				
VALVES				
Intake length			Exhaust length	
Intake stem dia.			Exhaust stem dia.	
Intake head dia.			Exhaust head dia.	
Intake face angle			Exhaust face angle	
Intake clearance			Exhaust clearance	

FD6

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	INJ.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	123-127		Oil pan drain plug	
Rod brg. caps	83-87		Oil pump bolt	13-14
Cyl. head bolts	43/72/108 3 times		Rocker arm nut	
Cam sprocket bolt	137-145		Rckr.shaft brckt.bolt	25-29
Crank pulley bolt	398-405		Side cover bolt	
Flywheel bolt	108-134		Spark plug	
Flywheel housing	M8:14 M12:54		Water outlet bolt	
Manifold bolt & nut	14-18		Water pump bolt	7-9
Oil pan bolt	7-9		Wtr.pmp.pulley bolt	
PISTON				
Diameter				
Pin diameter				
RINGS				
Ring gap-Top				
Ring gap-2nd				
Ring gap-3rd				
CRANKSHAFT				
Main journal dia.				
Main run clearance				
End play				
CAMSHAFT				
Front journal dia.				
Center journal dia.				
Rear journal dia.				
VALVES				
Intake length		Exhaust length		
Intake stem dia.		Exhaust stem dia.		
Intake head dia.		Exhaust head dia.		
Intake face angle		Exhaust face angle		
Intake clearance	.016 hot	Exhaust clearance	.016 hot	

3P 1345 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.0160				
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	71-79		Oil pan drain plug	
Rod brg. caps	30-34		Oil pump bolt	
Cyl. head bolts	74-84		Rocker arm nut	
Cam sprocket bolt			Rckr.shaft brckt.bolt	
Crank pulley bolt			Timing cover	
Flywheel bolt			Spark plug	
Flywheel housing			Water outlet bolt	
Manifold bolt & nut			Water pump bolt	
Oil pan bolt			Wtr.pmp.pulley bolt	
PISTON				
Diameter			Cyl.bore clearance	
Pin diameter				
RINGS				
Ring gap-Top			Side clearance-Top	
Ring gap-2nd			Side clearance-2nd	
Ring gap-Oil			Side clearance-Oil	
CRANKSHAFT				
Main journal dia.			Rod journal dia.	
Main run clearance			Rod run clearance	
End play			Thrust brg.thickness	
CAMSHAFT				
Front journal dia.			Cam lift-Intake	
Center journal dia.			Cam lift-Exhaust	
Rear journal dia.				
VALVES				
Intake length			Exhaust length	
Intake stem dia.			Exhaust stem dia.	
Intake head dia.			Exhaust head dia.	
Intake face angle			Exhaust face angle	
Intake clearance	.008 hot		Exhaust clearance	.014 hot

4P 1493 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.0160	3.1890	1-3-4-2	2.0473	1.8504
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
W9EP	.028-.031	.016-.020	8 deg.BTDC/550	4 U.S. qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	71-79		Oil pan drain plug	
Rod brg. caps	30-34		Oil pump bolt	12.2-16.6
Cyl. head bolts	74-84		Rocker arm nut	
Cam sprocket bolt			Rckr.shaft brckt.bolt	
Crank pulley bolt	30-39		Timing cover	10-14
Flywheel bolt	42-47		Spark plug	
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	20-25		Water pump bolt	
Oil pan bolt	2.9-5.1		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.0141-3.0169		Cyl.bore clearance	.0011-.0019
Pin diameter	.7874-.7878			
RINGS				
Ring gap-Top	.0059-.0137		Side clearance-Top	.0011-.0027
Ring gap-2nd	.0059-.0137		Side clearance-2nd	.0009-.0025
Ring gap-Oil	.0059-.0137		Side clearance-Oil	.0009-.0027
CRANKSHAFT				
Main journal dia.	2.0467-2.0473		Rod journal dia.	1.8498-1.8504
Main run clearance			Rod run clearance	
End play			Thrust brg.thickness	.0961-.0977
CAMSHAFT				
Front journal dia.	1.8488-1.8494		Cam lift-Intake	.2496-.2536
Center journal dia.	1.8409-1.8416		Cam lift-Exhaust	.2540-.2579
Rear journal dia.	1.8331-1.8337			
VALVES				
Intake length			Exhaust length	
Intake stem dia.	.3140-.3144		Exhaust stem dia.	.3134-.3140
Intake head dia.	1.4174		Exhaust head dia.	1.1693
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.008 hot		Exhaust clearance	.014 hot

5R 1994 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.4650	3.2290	1-3-4-2	2.3622	2.165
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
W9EP	.028-.031	.016-.020	10 deg.BTDC/550	1.27 U.S. gals.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	74-84		Oil pan drain plug	21-29
Rod brg. caps	43-50		Oil pump bolt	13-19
Cyl. head bolts	74-84		Rocker arm nut	10.8-15.8
Cam sprocket bolt	22-29		Rckr.shaft brckt.bolt	10.8-15.8
Crank pulley bolt	31-41		Timing cover	2.1-5.1
Flywheel bolt			Spark plug	
Flywheel housing	41.8-47.6		Water outlet bolt	
Manifold bolt & nut	10.8-15.8		Water pump bolt	
Oil pan bolt	2.1-5.1		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.4630-3.4643		Cyl.bore clearance	.0012-.0020
Pin diameter	.8660-.8665			
RINGS				
Ring gap-Top	.0071-.0130		Side clearance-Top	.0012-.0028
Ring gap-2nd	.0071-.0130		Side clearance-2nd	.0012-.0028
Ring gap-Oil	.008-.0280			
CRANKSHAFT				
Main journal dia.	2.3610-2.3622		Rod journal dia.	2.1638-2.1650
Main run clearance	.0008-.0020		Rod run clearance	.001-.002
End play				
CAMSHAFT				
1st journal dia.	1.8291-1.8297		4th journal dia.	1.7996-1.8002
2nd journal dia.	1.8193-1.8199		5th journal dia.	1.7897-1.7904
3rd journal dia.	1.8094-1.8100			
VALVES				
Intake length	4.311		Exhaust length	4.311
Intake stem dia.	.3335-.3341		Exhaust stem dia.	.3331-.3337
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.008 hot		Exhaust clearance	.014 hot

4Y 2237 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.5830	3.3860	1-3-4-2	2.2835	1.8898
SPARK PLUG TYPE	SPARK PLUG GAP	AIR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
WE9EX-U	.028-.031	.008-.016	7 deg.BTDC/550	1.1 U.S. gals.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	54-58		Oil pan drain plug	32
Rod brg. caps	34-36		Oil pump bolt	13
Cyl. head bolts	54-65		Rocker arm nut	16-17
Cam sprocket bolt	67		Rckr.shaft brckt.bolt	16-17
Crank pulley bolt	87-116		Timing cover	
Flywheel bolt			Spark plug	13-14
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	35-36		Water pump bolt	13-14
Oil pan bolt	8-9		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.5797-3.5809		Cyl.bore clearance	.0026-.0033
Pin diameter				
RINGS				
Ring gap-Top	.0091-.0189		Side clearance-Top	.0012-.0028
Ring gap-2nd	.0063-.0173		Side clearance-2nd	.0012-.0028
Ring gap-Oil	.0051-.0185			
CRANKSHAFT				
Main journal dia.	2.2829-2.2835		Rod journal dia.	1.8892-1.8898
Main run clearance	.0008-.0020		Rod run clearance	.0008-.0020
End play				
CAMSHAFT				
1st journal dia.	1.8291-1.8297		4th journal dia.	1.7996-1.8002
2nd journal dia.	1.8193-1.8199		5th journal dia.	1.7897-1.7904
3rd journal dia.	1.8094-1.8100			
VALVES				
Intake length	4.26		Exhaust length	4.272
Intake stem dia.	.3138-.3144		Exhaust stem dia.	.3136-.3142
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.008 hot		Exhaust clearance	.014 hot

2J 2481 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.4650	4.0157	1-2-4-3	2.7560	2.165
SPARK PLUG TYPE	SPARK PLUG GAP	AIR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
				1.85 U.S. gals.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	71-81		Inj.pump to drv.gr.	58-65
Rod brg. caps	47-54		I/pump to Inj. Pipe	17-26
Cyl. head bolts	80-86		Rocker arm nut	
Cam sprocket bolt	22-32		Rckr.shaft brckt.bolt	
Crank pulley bolt	80-108		Timing cover	10-14
Flywheel bolt	83-90		Glow plug	7-11
Flywheel housing			Intake manifold	11-15
Manifold bolt & nut			Exhaust manifold	13-17
Oil pan bolt	3.7-5.7		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.4598-3.4610		Sleeve clearance	.0044-.0051
Pin diameter	1.0630-1.0633			
RINGS				
Ring gap-Top	.0099-.0177		Ring gap-Oil	.0079-.0157
Ring gap-2nd	.0099-.0177			
Ring gap-3rd	.0079-.0157			
CRANKSHAFT				
Main journal dia.	2.755-2.756		Rod journal dia.	2.1645-2.165
Main run clearance	.0012-.0027		Rod run clearance	.0012-.0027
End play				
CAMSHAFT				
1st journal dia.	1.8567-1.8575		4th journal dia.	1.8331-1.8339
2nd journal dia.	1.8488-1.8496			
3rd journal dia.	1.8409-1.8417			
VALVES				
Intake length	4.748		Exhaust length	4.74
Intake stem dia.	.353-.354		Exhaust stem dia.	.352-.353
Intake head dia.	1.59		Exhaust head dia.	1.32
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.008 hot		Exhaust clearance	.014 hot

5P 2771 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.6600	4.0200	1-2-4-3	2.7560	2.165
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
W9EP	.028-.031	.016-.020	5 deg.BTDC/700	1.82 U.S. gals.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	71-81		Oil pan drain plug	10-16
Rod brg.caps	47-54		Oil pump bolt	
Cyl. head bolts	80-86		Rocker arm nut	
Cam sprocket bolt	22-32		Rckr.shaft brckt.bolt	10-16
Crank pulley bolt	80-108		Timing cover	
Flywheel bolt	83-90		Spark plug	10-16
Flywheel housing	36-50		Water outlet bolt	
Manifold bolt & nut	10-16		Water pump bolt	
Oil pan bolt	2.5-4.7		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.66-3.661		Cyl.bore clearance	.0012-.0020
Pin diameter	1.0630-1.0633			
RINGS				
Ring gap-Top	.012-.020		Side clearance Top	.0024-.004
Ring gap-2nd	.012-.020		Side clearance 2nd	.002-.0035
Ring gap-Oil	.012-.020		Side clearance Oil	.0012-.003
CRANKSHAFT				
Main journal dia.	2.755-2.756		Rod journal dia.	2.1645-2.165
Main run clearance	.0012-.003		Rod run clearance	.0012-.003
T/ brg thickness	.115-.117			
CAMSHAFT				
1st journal dia.	1.8567-1.8575		4th journal dia.	1.8331-1.8339
2nd journal dia.	1.8488-1.8496			
3rd journal dia.	1.8409-1.8417			
VALVES				
Intake length	4.748		Exhaust length	4.74
Intake stem dia.	.353-.354		Exhaust stem dia.	.352-.353
Intake head dia.	1.59		Exhaust head dia.	1.32
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.008 hot		Exhaust clearance	.014 hot

2F 4229 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.7010	4.0000	1-5-3-6-2-4	See Below	2.126
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
W14EX-U	.028-.031	0.012	7 deg.BTDC/750	8.2 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	#1-3(108) #4(94)		Oil pan drain plug	
Rod brg.caps	35-54		Oil pump bolt	
Cyl. head bolts	84-97		Rocker arm nut	
Cam sprocket bolt			Rckr.shaft brckt.bolt	10mm(32) 8mm(21)
Crank pulley bolt	116-144		Timing cover	
Flywheel bolt	58-79		Spark plug	
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	29-36		Water pump bolt	
Oil pan bolt	53-104 in.lbs.		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.6992-3.7012		Cyl.bore clearance	.0012-.0020
Pin fit @ 68 deg.F	.0003-.0005			
RINGS				
Ring gap-Top	.0079-.0157		Side clearance Top	.0012-.0028
Ring gap-2nd	.0079-.0157		Side clearance 2nd	.0008-.0024
CRANKSHAFT				
Main journal dia.	2.636/2.695/2.754/2.813		Rod journal dia.	2.1252-2.1260
Main run clearance	.0008-.0017		Rod run clearance	.0008-.0017
CAMSHAFT				
1st journal dia.	1.8880-1.8888		4th journal dia.	1.7108-1.7116
2nd journal dia.	1.8289-1.8297			
3rd journal dia.	1.7699-1.7707			
VALVES				
Intake length	4.913		Exhaust length	4.921
Intake stem dia.	.3138-.3144		Exhaust stem dia.	.3134-.3140
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.008 hot		Exhaust clearance	.014 hot

2H 3980 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.5827	4.0157	1-4-2-6-3-5	2.7559	2.1654
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
				12.3 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	82-92		Oil pan drain plug	
Rod brg.caps	62-68		Oil pump bolt	
Cyl. head bolts	73-80		Rocker arm nut	
Cam sprocket bolt	26-39		Rckr.shaft brckt.bolt	11-15
Crank pulley bolt	289-361		Timing cover	
Flywheel bolt	84-90		Spark plug	
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	Int:15 Exh:17		Water pump bolt	
Oil pan bolt	8-11		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.5799-3.5803		Sleeve clearance	.0028-.0035
Pin fit @ 68 deg.F				
RINGS				
Ring gap -Top	.0078-.0138		Side clearance Top	.0018-.0033
Ring gap -2nd	.0078-.0138		Side clearance 2nd	.0020-.0035
Ring gap -3rd	.0078-.0138		Side clearance 3rd	.0016-.0031
CRANKSHAFT				
Main journal dia.	2.7551-2.7559		Rod journal dia.	2.1646-2.1654
Main run clearance	.0012-.0028		Rod run clearance	.0012-.0028
CAMSHAFT				
1st journal dia.	2.0138-2.0146		4th journal dia.	1.9902-1.9909
2nd journal dia.	2.0059-2.0067			
3rd journal dia.	1.9980-1.9988			
VALVES				
Intake length	4.752		Exhaust length	4.748
Intake stem dia.	.3533-.3539		Exhaust stem dia.	.3525-.3531
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.008 hot		Exhaust clearance	.014 hot

UA 1484 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
2.9530	3.3071	1-3-4-2	2.4790	1.967
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	60-65		Oil pan drain plug	
Rod brg.caps	35-38		Oil pump bolt	
Cyl. head bolts	60-65		Rocker arm nut	
Cam sprocket bolt	95 (nut)		Rckr.shaft brckt.bolt	24-25
Crank pulley bolt	130		Timing cover	
Flywheel bolt	45		Spark plug	
Flywheel housing	20-30		Water outlet bolt	
Manifold bolt & nut			Water pump bolt	
Oil pan bolt			Wtr.pmp.pulley bolt	
PISTON				
Diameter			Sleeve clearance	.0016-.0031
Pin diameter				
RINGS				
Ring gap-Top			Side clearance Top	
Ring gap-2nd			Side clearance 2nd	
Ring gap-Oil			Side clearance Oil	
CRANKSHAFT				
Main journal dia.	2.478-2.479		Rod journal dia.	1.967
Main run clearance	.002-.003		Rod run clearance	.0012-.0031
End play	.001-.009			
CAMSHAFT				
1st journal dia.	1.965		End play	.001-.007
2nd journal dia.	1.926			
3rd journal dia.	1.769			
VALVES				
Intake length			Exhaust length	
Intake stem dia.			Exhaust stem dia.	
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.014 hot		Exhaust clearance	.014 hot

VA 1985 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.2280	3.7010	1-3-4-2	2.4790	2.085
SPARK PLUG TYPE	IGN.TIMING SN: A177 & A187	IGN.TIMING B177,187,C177Gas	IGN.TIMING B177,187,C177 LP	OIL CAPACITY WITH FILTER
W9EP	13 deg.BTDC/625	9 deg.BTDC/625	18 deg.BTDC/625	5.5 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	60-65		Oil pan drain plug	
Rod brg.caps	35-38		Oil pump bolt	
Cyl. head bolts	60-65		Rocker arm nut	
Cam sprocket bolt	95 (nut)		Rckr.shaft brckt.bolt	24-25
Crank pulley bolt	130		Timing cover	
Flywheel bolt	45		Spark plug	
Flywheel housing	20-30		Water outlet bolt	
Manifold bolt & nut			Water pump bolt	
Oil pan bolt			Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.226-3.227		Sleeve clearance	.0016-.0031
Pin diameter	.8654-.8657			
RINGS				
Ring gap -Top	.012-.020		Side clearance Top	.012-.020
Ring gap -2nd	.012-.020		Side clearance 2nd	.012-.020
Ring gap -Oil	.008-.047		Side clearance Oil	.008-.047
CRANKSHAFT				
Main journal dia.	2.478-2.479		Rod journal dia.	2.084-2.085
Main run clearance	.002-.003		Rod run clearance	.0012-.0031
End play	.001-.009			
CAMSHAFT				
1st journal dia.	1.965		End play	.001-.007
2nd journal dia.	1.926			
3rd journal dia.	1.769			
VALVES				
Intake length			Exhaust length	
Intake stem dia.	.316-.317		Exhaust stem dia.	.315-.316
Intake head dia.	1.55-1.56		Exhaust head dia.	1.18-1.19
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.012 hot		Exhaust clearance	.012 hot

FE 1998 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.3860	3.3858	1-3-4-2	2.3604	2.0061
SPARK PLUG TYPE	SPARK PLUG GAP	AIR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
W16EX-U	0.032	0.031	8 deg.BTDC/625	4.55 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	62-66		Oil pan drain plug	
Rod brg.caps	30-34		Oil pump bolt	M8:19 M10:38
Cyl. head bolts	66-70		Rocker arm nut	13-20
Cam sprocket bolt	35-48 (nut)		Rckr.shaft brckt.bolt	13-20
Crank pulley bolt	22-24		Timing cover	
Flywheel bolt			Spark plug	11-17
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	14-21		Water pump bolt	14-19
Oil pan bolt	5-9		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.3836-3.3844		Cyl.bore clearance	.0014-.0030
Pin diameter	.8651-.8654			
RINGS				
Ring gap-Top	.008-.014		Side clearance Top	.0012-.0028
Ring gap-2nd	.006-.012		Side clearance 2nd	.0012-.0028
Ring gap-Oil	.012-.035		Side clearance Oil	
CRANKSHAFT				
Main journal dia.	2.3597-2.3604		Rod journal dia.	2.0055-2.0061
Main run clearance	.012-.019		Rod run clearance	.0011-.0026
End play	.003-.007			
CAMSHAFT				
1st journal dia.	1.2575-1.2585		4th journal dia.	1.2563-1.2573
2nd journal dia.	1.2563-1.2573		5th journal dia.	1.2575-1.2585
3rd journal dia.	1.2563-1.2573		End play	.003-.006
VALVES				
Intake length			Exhaust length	
Intake stem dia.	.3161-.3167		Exhaust stem dia.	.3159-.3167
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.012 hot		Exhaust clearance	.012 hot

D5 1490 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.0300	3.1500	1-3-4-2	1.9667	1.5573
SPARK PLUG TYPE	SPARK PLUG GAP	IGN.TIMING GAS IDLE SPEED	IGN.TIMING LPG IDLE SPEED	OIL CAPACITY WITH FILTER
YT-5174508-00	0.032	7 deg.BTDC/600	10 deg.BTDC/600	4 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	48-51		Oil pan drain plug	
Rod brg.caps	22-25		Oil pump bolt	
Cyl. head bolts	63-67		Rocker arm nut	
Cam sprocket bolt	51-58		Rckr.shaft brckt.bolt	
Crank pulley bolt	116-123		Timing cover	
Flywheel bolt			Spark plug	
Flywheel housing			Water outlet bolt	
Manifold bolt & nut			Water pump bolt	14-19
Oil pan bolt	5-7		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.0289-3.0299		Cyl.bore clearance	
Pin diameter	.7865-.7869			
RINGS				
Ring gap -Top	.058-.059		Side clearance Top	.012-.026
Ring gap -2nd	.058-.059		Side clearance 2nd	.012-.026
Ring gap -Oil	.1582-.1587		Side clearance Oil	
CRANKSHAFT				
Main journal dia.	1.9661-1.9667		Rod journal dia.	1.5724-1.5573
Main run clearance	.0009-.0017		Rod run clearance	.0009-.0019
End play	.004-.006			
CAMSHAFT				
1st journal dia.	1.6515-1.6522			
2nd journal dia.	1.6504-1.6510			
3rd journal dia.	1.6515-1.6522		End play	.0008-.0029
VALVES				
Intake length			Exhaust length	
Intake stem dia.	.316-.317		Exhaust stem dia.	.316-.317
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.010 hot		Exhaust clearance	.012 hot

C240 2369 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.3858	4.0100	1-3-4-2	2.7553	2.0854
SPARK PLUG TYPE	SPARK PLUG GAP	AIR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
				1.6 U.S.gals.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	115-130		Oil pan drain plug	65 (O-ring:36)
Rod brg.caps	57-65		Oil pump bolt	10.1-17.3
Cyl. head bolts	New:83 Old:71		Rocker arm nut	
Cam sprocket bolt	72.3-86.7		Rckr.shaft brckt.bolt	10.1-17.3
Crank pulley bolt	122-151		Timing cover	10.1-17.3
Flywheel bolt	79-93		Spark plug	
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	10.1-17.3		Water pump bolt	25-33
Oil pan bolt	4.4-7.2		Wtr.pmp.pulley bolt	
PISTON				
Diameter	Varies with type		Sleeve clearance	.001-.007
Pin diameter	1.0638			
RINGS				
Ring gap-Top	.0079-.0158		Ring gap-Oil	.0039-.0118
Ring gap-2nd	.0079-.0158		Side clrc: 1,2,3	.0017-.0027
Ring gap-3rd	.0079-.0158		Side clearance Oil	.0008-.0021
CRANKSHAFT				
Main journal dia.	2.7548-2.7553		Rod journal dia.	2.0849-2.0854
Main run clearance	.0007-.0025		Rod run clearance	.0007-.0025
End play	0.004			
CAMSHAFT				
1st journal dia.	1.88-1.89		End play	.002-.0044
2nd journal dia.				
3rd journal dia.				
VALVES				
Intake length			Exhaust length	
Intake stem dia.	.3129-.3134		Exhaust stem dia.	.3118-.3124
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.017 cold		Exhaust clearance	.017 cold

4G33 1439 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
2.8740	3.3860	1-3-4-2	2.2441	1.7717
SPARK PLUG TYPE	SPARK PLUG GAP	AIR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
W14EX-U	.028-.031	0.031	5 deg.BTDC/650	1.19 U.S.gals.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	36-39		Oil pan drain plug	43-57
Rod brg.caps	23-25		Oil pump bolt	11-13
Cyl. head bolts	59		Rocker arm nut	
Cam sprocket bolt	36-43		Rckr.shaft brckt.bolt	
Crank pulley bolt	80-94		Timing cover	
Flywheel bolt	94-101 mounting		Spark plug	15-22
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	10-14		Water pump bolt	
Oil pan bolt	4.3-5.8		Wtr.pmp.pulley bolt	
PISTON				
Diameter	2.87		Cyl.bore clearance	.0008-.0016
Pin diameter	.7480-.7483			
RINGS				
Ring gap-Top	.0059-.0138		Side clearance Top	.0012-.0028
Ring gap-2nd	.0059-.0138		Side clearance 2nd	.0008-.0024
Ring gap-Oil	.008-.020			
CRANKSHAFT				
Main journal dia.	2.2441		Rod journal dia.	1.7717
Main run clearance	.0006-.0028		Rod run clearance	.0004-.0025
End play	.0020-.0068			
CAMSHAFT				
1st journal dia.	1.3386		End play	.003-.006
VALVES				
Intake length	4.169		Exhaust length	4.035
Intake stem dia.	0.3158		Exhaust stem dia.	0.3158
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.008 hot		Exhaust clearance	.010 hot

4G52 1995 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.3070	3.5433	1-3-4-2	2.362 or 2.598	2.086
SPARK PLUG TYPE	SPARK PLUG GAP	AIR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
W14EX-U	.028-.031	0.031	6 deg.BTDC/650	1.32 U.S.gals.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	54-61		Oil pan drain plug	43-57
Rod brg.caps	33-35		Oil pump bolt	5.8-7.2
Cyl. head bolts	65-72		Rocker arm nut	3.6-5.1
Cam sprocket bolt	36-43		Rckr.shaft brckt.bolt	
Crank pulley bolt	80-94		Timing cover	
Flywheel bolt	83-90		Spark plug	18-21
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	10-14		Water pump bolt	
Oil pan bolt	4.3-5.8		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.31		Cyl.bore clearance	.0008-.0016
Pin diameter	0.87			
RINGS				
Ring gap-Top	.0098-.0157		Side clearance Top	.0024-.0039
Ring gap-2nd	.0098-.0177		Side clearance 2nd	.0008-.0024
Ring gap-Oil	.008-.035		Side clearance Oil	
CRANKSHAFT				
Main journal dia.	2.362 or 2.598		Rod journal dia.	2.086
Main run clearance	.0007-.003		Rod run clearance	.0005-.0025
Center clearance	.001-.002			
CAMSHAFT				
1st journal dia.	1.3386		End play	.004-.008
2nd journal dia.				
3rd journal dia.				
VALVES				
Intake length	4.4394		Exhaust length	4.3961
Intake stem dia.	0.3158		Exhaust stem dia.	0.3158
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.006 hot		Exhaust clearance	.010 hot

4G54 2555 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.5870	3.8580	1-3-4-2	2.5985	2.086
SPARK PLUG TYPE	SPARK PLUG GAP	AIR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
W14EX-U	.028-.031	0.031	6 deg.BTDC/650	1.32 U.S.gals.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	54-61		Oil pan drain plug	43-57
Rod brg.caps	33-35		Oil pump bolt	5.8-7.2
Cyl. head bolts	65-72		Rocker arm nut	3.6-5.1
Cam sprocket bolt	36-43		Rckr.shaft brckt.bolt	
Crank pulley bolt	80-94		Timing cover	
Flywheel bolt	94-101		Spark plug	18-21
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	10-14		Water pump bolt	
Oil pan bolt	4.3-5.8		Wtr.pmp.pulley bolt	
PISTON				
Diameter	3.31		Cyl.bore clearance	.0008-.0016
Pin diameter	0.87			
RINGS				
Ring gap-Top	.0098-.0157		Side clearance Top	.0024-.0039
Ring gap-2nd	.0098-.0177		Side clearance 2nd	.0008-.0024
Ring gap-Oil	.008-.035		Side clearance Oil	
CRANKSHAFT				
Main journal dia.	2.5985		Rod journal dia.	2.086
Main run clearance	.0007-.003		Rod run clearance	.0005-.0025
Center clearance	.001-.002			
CAMSHAFT				
1st journal dia.	1.3386		End play	.004-.008
2nd journal dia.				
3rd journal dia.				
VALVES				
Intake length	4.3331		Exhaust length	4.2504
Intake stem dia.	0.3158		Exhaust stem dia.	0.3158
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.006 hot		Exhaust clearance	.010 hot

4G63 1997 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.3500	3.4600	1-3-4-2	2.2435-2.2832	1.7714
SPARK PLUG TYPE	SPARK PLUG GAP	IGN.TIMING Gas IDLE SPEED	IGN.TIMING LPG IDLE SPEED	OIL CAPACITY WITH FILTER
Gas:W14EX-U	.028-.031	4 deg.BTDC/740	9 deg.BTDC/740	1.27 U.S.gals.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	14.5 + 1/4 turn		Oil pan drain plug	28.9
Rod brg.caps	14.5 + 1/4 turn		Oil pump bolt	
Cyl. head bolts	14.5 + 1/4 + 1/4		Rocker arm nut	
Cam sprocket bolt	65.1		Rckr.shaft brckt.bolt	
Crank pulley bolt	18.1		Timing cover	
Flywheel bolt	97.6		Spark plug	18.1
Flywheel housing			Water outlet bolt	10.1
Manifold bolt & nut	Int:13 Ex:25.3		Water pump bolt	10.1
Oil pan bolt	5.1		Wtr.pmp.pulley bolt	6.5
PISTON				
Diameter			Cyl.bore clearance	
Pin diameter				
RINGS				
Ring gap-Top			Side clearance Top	
Ring gap-2nd			Side clearance 2nd	
Ring gap-Oil			Side clearance Oil	
CRANKSHAFT				
Main journal dia.	2.2435-2.2832		Rod journal dia.	1.77106-1.77145
Main run clearance	.0008-.0016		Rod run clearance	.0008-.0020
End play	.0020-.0071			
CAMSHAFT				
1st journal dia.	1.33602-1.33661		End play	
2nd journal dia.				
3rd journal dia.				
VALVES				
Intake length	4.3213		Exhaust length	4.1953
Intake stem dia.	.31339-.31398		Exhaust stem dia.	.31220-.31299
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance			Exhaust clearance	

4G64 2350 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.4100	3.9400	1-3-4-2	2.2435-2.2832	1.7714
SPARK PLUG TYPE	SPARK PLUG GAP	IGN.TIMING Gas IDLE SPEED	IGN.TIMING LPG IDLE SPEED	OIL CAPACITY WITH FILTER
Gas:W14EX-U	.028-.031	4 deg.BTDC/740	9 deg.BTDC/740	1.27 U.S.gals.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	14.5 + 1/4 turn		Oil pan drain plug	28.9
Rod brg.caps	14.5 + 1/4 turn		Oil pump bolt	
Cyl. head bolts	14.5 + 1/4 + 1/4		Rocker arm nut	
Cam sprocket bolt	65.1		Rckr.shaft brckt.bolt	
Crank pulley bolt	18.1		Timing cover	
Flywheel bolt	97.6		Spark plug	18.1
Flywheel housing			Water outlet bolt	10.1
Manifold bolt & nut	Int:13 Ex:25.3		Water pump bolt	10.1
Oil pan bolt	5.1		Wtr.pmp.pulley bolt	6.5
PISTON				
Diameter			Cyl.bore clearance	
Pin diameter				
RINGS				
Ring gap-Top			Side clearance Top	
Ring gap-2nd			Side clearance 2nd	
Ring gap-Oil			Side clearance Oil	
CRANKSHAFT				
Main journal dia.	2.2435-2.2832		Rod journal dia.	1.77106-1.77145
Main run clearance	.0008-.0016		Rod run clearance	.0008-.0020
End play	.0020-.0071			
CAMSHAFT				
1st journal dia.	1.33602-1.33661		End play	
2nd journal dia.				
3rd journal dia.				
VALVES				
Intake length	4.2779		Exhaust length	4.1401
Intake stem dia.	.31339-.31398		Exhaust stem dia.	.31220-.31299
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance			Exhaust clearance	

XN1P 1971 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.4650	3.1890	1-3-4-2	See Below	1.9685
SPARK PLUG TYPE	SPARK PLUG GAP Gas/Dual	SPARK PLUG GAP LPG	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
W16EX-U	0.024	.016-.020	8 deg.BTDC/850	
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	55		Oil pan drain plug	26-30
Rod brg.caps	29		Oil pump bolt	90 in,lbs.
Cyl. head bolts	60		Rocker arm nut	90 in,lbs.
Cam sprocket bolt	16.6		Rckr.shaft brckt.bolt	
Crank pulley bolt	125		Timing cover	90 in,lbs.
Flywheel bolt	50		Spark plug	16.5-18
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	15-18		Water pump bolt	
Oil pan bolt	90 in.lbs.		Wtr.pmp.pulley bolt	
PISTON				
Sleeve clearance	.0024-.0031			
RINGS				
Ring gap- Top	.0079-.0197		Side clearance Top	
Ring gap-2nd	.0157-.0217		Side clearance 2nd	
Ring gap-Oil	.0098-.0157		Side clearance Oil	
CRANKSHAFT				
Front M/journal	2.3386-2.3392		Rod journal dia.	1.9679-1.9685
Front Interior	2.3050-2.3060		Rod run clearance	.0007-.0020
Center	2.2509-2.2515		Main run clearance	.0010-.0030
Rear Interior	2.2102-2.2112		End play	.003-.008
Rear M/journal	2.1616-2.1622		T/washer thickness	.090 to .098
CAMSHAFT				
Front journal dia.	1.8864-1.8874		End play	.002-.0055
Center journal dia.	1.8077-1.8087			
Rear journal dia.	1.7289-1.7299			
VALVES				
Intake length	4.656		Exhaust length	4.409
Intake stem dia.	0.3158		Exhaust stem dia.	0.3157
Intake head dia.	1.6733		Exhaust head dia.	1.3977
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.004-.006 cold		Exhaust clearance	.010-.012 cold

XD3P 2498 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.7008	3.5433	1-3-4-2	2.3630	2.166
SPARK PLUG TYPE	SPARK PLUG GAP Gas/Dual	SPARK PLUG GAP LPG	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	75-90		Oil pan drain plug	18-26
Rod brg.caps	44		Oil pump bolt	
Cyl. head bolts			Rocker arm nut	13-27
Cam sprocket bolt	16.6		Rckr.shaft brckt.bolt	30-33
Crank pulley bolt	125		Timing cover	
Flywheel bolt	90-95		Spark plug	22-30
Flywheel housing			Water outlet bolt	
Manifold bolt & nut	15-18		Water pump bolt	
Oil pan bolt	5.3-9.3		Wtr.pmp.pulley bolt	
PISTON				
Pin diameter	1.1809-1.1811			
RINGS				
Ring gap -Top	.016-.026		Side clearance Top	
Ring gap -2nd	.014-.024		Side clearance 2nd	
Ring gap -Oil	.006-.012		Side clearance Oil	
CRANKSHAFT				
Main journal dia.	2.3620-2.3630		Rod journal dia.	2.165-2.166
Main run clearance	.0016-.0039		Rod run clearance	.0016-.0036
End play	.003-.011			
T/washer thickness	.0906-.0917			
CAMSHAFT				
Journal diameter	1.6502-1.6516		End play	.002-.006
VALVES				
Intake length	4.577		Exhaust length	4.577
Intake stem dia.	.3336-.3344		Exhaust stem dia.	.3328-.3337
Intake head dia.	1.673		Exhaust head dia.	1.398
Intake face angle	50 deg.		Exhaust face angle	50 deg.
Intake clearance	.012 cold		Exhaust clearance	.012 cold

Y112

112 Cu.In.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.1875	3.5000	1-3-4-2	1.7485	1.5
DISTRIBUTOR GAP	SPARK PLUG GAP	SPARK PLUG TYPE	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
0.0200	0.025	L14-U	TDC @ 600	4 U.S.qts.
TORQUE VALUES				
FT. LB.				
Flywheels: 5/16"(20-25), 3/8"(35-40), 7/16"(70-75), 1/2"(85-95), 9/16"(100-110), 5/8"(145-155)				
Cylinder heads: 3/8"(35-40), 7/16"(70-75), 1/2"(100-110), 9/16"(130-140), 5/8"(145-155)				
Manifolds: 5/16"(15-20), 3/8"(25-30), 7/16"(40-50), 1/2"(50-60), 9/16"(50-60), 5/8"(60-70)				
Covers,W/pumps,End plates: 5/16"(15-20), 3/8"(25-30), 7/16"(50-55), 1/2"(80-90)				
Oil pans: 5/16"(12-16), 3/8"(12-16)				
Flywheel Housings: 5/16"(15-20), 3/8"(25-30), 7/16"(50-55), 1/2"(80-90), 9/16"(115-125)				
Cam nuts, C.I. Shafts: 3/4"(65-70), 7/8"(70-80), 1"(95-100), 1 1/8"(125-130), 1 1/4"(145-150)				
Cam nuts, Forged steel shafts: 7/8"(120-125), 1"(175-180)				
Elastic stop nut with C.I. Or forged steel shafts: 7/8"(65-70)				
PISTON				
Pin diameter	.7083-.7085		Cyl.bore clearance	0.002
RINGS				
Ring gap-Top	.008-.013		Side clearance Top	.001-.003
Ring gap-2nd	.008-.013		Side clearance 2nd	.001-.003
Ring gap-Oil	.008-.016		Side clearance Oil	.001-.0025
CRANKSHAFT				
Main journal dia.	1.7475-1.7485		Rod journal dia.	1.499-1.500
Main run clearance	.0005-.0028		Rod run clearance	.0006-.0027
End play	.003-.008			
CAMSHAFT				
No.1 journal dia.	1.8085-1.8095		End play	.003-.007
No.2 journal dia.	1.7457-1.7465			
No.3 journal dia.	1.2465-1.2475			
VALVES				
Intake length			Exhaust length	
Intake stem dia.	.3141-.3149		Exhaust stem dia.	.3124-.3132
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.012 hot		Exhaust clearance	.020 hot

F163

162 Cu.In.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.4375	4.3750	1-3-4-2	2.3754	2.0627
DISTRIBUTOR GAP	SPARK PLUG GAP	SPARK PLUG TYPE	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
0.0200	0.025	L14-U	TDC @ 600	4.5 U.S.qts.
TORQUE VALUES FT. LB.				
Flywheels: 5/16"(20-25), 3/8"(35-40), 7/16"(70-75), 1/2"(85-95), 9/16"(100-110), 5/8"(145-155) Cylinder heads: 3/8"(35-40), 7/16"(70-75), 1/2"(100-110), 9/16"(130-140), 5/8"(145-155) Manifolds: 5/16"(15-20), 3/8"(25-30), 7/16"(40-50), 1/2"(50-60), 9/16"(50-60), 5/8"(60-70) Covers,W/pumps,End plates: 5/16"(15-20), 3/8"(25-30), 7/16"(50-55), 1/2"(80-90) Oil pans: 5/16"(12-16), 3/8"(12-16) Flywheel Housings: 5/16"(15-20), 3/8"(25-30), 7/16"(50-55), 1/2"(80-90), 9/16"(115-125) Cam nuts, C.I. Shafts: 3/4"(65-70), 7/8"(70-80), 1"(95-100), 1 1/8"(125-130), 1 1/4"(145-150) Cam nuts, Forged steel shafts: 7/8"(120-125), 1"(175-180) Elastic stop nut with C.I. Or forged steel shafts: 7/8"(65-70)				
PISTON				
Pin diameter	.8591-.8593		Cyl.bore clearance	0.003
RINGS				
Ring gap-Top	.008-.018		Side clearance Top	.002-.004
Ring gap-2nd	.008-.018		Side clearance 2nd	.0025-.004
Ring gap-Oil	.010-.030		Side clearance Oil	.0025-.0075
CRANKSHAFT				
Main journal dia.	2.3744-2.3754		Rod journal dia.	2.0619-2.0627
Main run clearance	.0007-.0028		Rod run clearance	.0006-.0022
End play	.002-.006			
CAMSHAFT				
No.1 journal dia.	1.8715-1.8725		End play	.005-.009
No.2 journal dia.	1.7455-1.7465			
No.3 journal dia.	1.2465-1.2475			
VALVES				
Intake length			Exhaust length	
Intake stem dia.	.3406-.3414		Exhaust stem dia.	.3377-.3385
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.012 hot		Exhaust clearance	.020 hot

F227

226 Cu.In.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.3130	3.3750	1-5-3-6-2-4	2.3754	2.0627
DISTRIBUTOR GAP	SPARK PLUG GAP	SPARK PLUG TYPE	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
0.0200	0.025	L14-U	TDC @ 600	5.5 U.S.qts.
TORQUE VALUES				
FT. LB.				
Flywheels: 5/16"(20-25), 3/8"(35-40), 7/16"(70-75), 1/2"(85-95), 9/16"(100-110), 5/8"(145-155)				
Cylinder heads: 3/8"(35-40), 7/16"(70-75), 1/2"(100-110), 9/16"(130-140), 5/8"(145-155)				
Manifolds: 5/16"(15-20), 3/8"(25-30), 7/16"(40-50), 1/2"(50-60), 9/16"(50-60), 5/8"(60-70)				
Covers,W/pumps,End plates: 5/16"(15-20), 3/8"(25-30), 7/16"(50-55), 1/2"(80-90)				
Oil pans: 5/16"(12-16), 3/8"(12-16)				
Flywheel Housings: 5/16"(15-20), 3/8"(25-30), 7/16"(50-55), 1/2"(80-90), 9/16"(115-125)				
Cam nuts, C.I. Shafts: 3/4"(65-70), 7/8"(70-80), 1"(95-100), 1 1/8"(125-130), 1 1/4"(145-150)				
Cam nuts, Forged steel shafts: 7/8"(120-125), 1"(175-180)				
Elastic stop nut with C.I. Or forged steel shafts: 7/8"(65-70)				
PISTON				
Pin diameter	.8591-.8593		Cyl.bore clearance	0.003
RINGS				
Ring gap-Top	.008-.018		Side clearance Top	.002-.004
Ring gap-2nd	.008-.015		Side clearance 2nd	.0025-.004
Ring gap-Oil	.010-.030		Side clearance Oil	.0025-.0075
CRANKSHAFT				
Main journal dia.	2.3744-2.3754		Rod journal dia.	2.0619-2.0627
Main run clearance	.0007-.0028		Rod run clearance	.0006-.0022
End play	.002-.006			
CAMSHAFT				
No.1 journal dia.	1.8715-1.8725		No.4 journal dia.	1.2495-1.2505
No.2 journal dia.	1.8085-1.8095		End play	.005-.009
No.3 journal dia.	1.7455-1.7465			
VALVES				
Intake length			Exhaust length	
Intake stem dia.	.3406-.3414		Exhaust stem dia.	.3377-.3385
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.012 hot		Exhaust clearance	.020 hot

F245 244 Cu.In.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.4375	4.3750	1-5-3-6-2-4	2.2500	2.0627
DISTRIBUTOR GAP	SPARK PLUG GAP	SPARK PLUG TYPE	IGN.TIMING IDLE SPEED	OIL CAPACITY WITH FILTER
0.0200	0.025	L14-U	TDC @ 600	5.5 U.S.qts.
TORQUE VALUES FT. LB.				
Flywheels: 5/16"(20-25), 3/8"(35-40), 7/16"(70-75), 1/2"(85-95), 9/16"(100-110), 5/8"(145-155) Cylinder heads: 3/8"(35-40), 7/16"(70-75), 1/2"(100-110), 9/16"(130-140), 5/8"(145-155) Manifolds: 5/16"(15-20), 3/8"(25-30), 7/16"(40-50), 1/2"(50-60), 9/16"(50-60), 5/8"(60-70) Covers,W/pumps,End plates: 5/16"(15-20), 3/8"(25-30), 7/16"(50-55), 1/2"(80-90) Oil pans: 5/16"(12-16), 3/8"(12-16) Flywheel Housings: 5/16"(15-20), 3/8"(25-30), 7/16"(50-55), 1/2"(80-90), 9/16"(115-125) Cam nuts, C.I. Shafts: 3/4"(65-70), 7/8"(70-80), 1"(95-100), 1 1/8"(125-130), 1 1/4"(145-150) Cam nuts, Forged steel shafts: 7/8"(120-125), 1"(175-180) Elastic stop nut with C.I. Or forged steel shafts: 7/8"(65-70)				
PISTON				
Pin diameter	.8591-.8593		Cyl.bore clearance	0.003
RINGS				
Ring gap-Top	.008-.018		Side clearance Top	.002-.004
Ring gap-2nd	.008-.018		Side clearance 2nd	.0025-.004
Ring gap-Oil	.010-.030		Side clearance Oil	.0025-.0075
CRANKSHAFT				
Main journal dia.	2.3744-2.3754		Rod journal dia.	2.0619-2.0627
Main run clearance	.0007-.0028		Rod run clearance	.0006-.0022
End play	.002-.006			
CAMSHAFT				
No.1 journal dia.	1.8715-1.8725		No.4 journal dia.	1.2465-1.2475
No.2 journal dia.	1.8085-1.8095		End play	.005-.009
No.3 journal dia.	1.7455-1.7465			
VALVES				
Intake length			Exhaust length	
Intake stem dia.	.3406-.3414		Exhaust stem dia.	.3377-.3385
Intake head dia.			Exhaust head dia.	
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.012 hot		Exhaust clearance	.020 hot

D155G 155 Cu.In.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.6250	3.7500	1-2-4-3	2.2500	1.75/2.00/2.25
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY PLUS FILTER
	0.025		5 deg.BTDC/500	4 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	88-92		Oil pan drain plug	
Rod brg.caps	ESNA:35 MARSDEN:46		Oil pump bolt	
Cyl. head bolts	89.5-91.6		Water outlet bolt	
B/shft.gr.retainer	33-38		Water pump bolt	
Idler gear retainer	34-35		Wtr.pmp.pulley bolt	
Flywheel bolt	67-69			
Flywheel housing	24			
Rocker arm bolt	19-20			
Spark plug	24-28			
PISTON				
Piston diameter	3.6229-3.6245		Sleeve clearance	.0008-.0028
Pin diameter	1.2494-1.2496			
RINGS				
Ring gap-Top	.010-.020		Side clearance Top	.0025-.004
Ring gap-2nd	.010-.020		Side clearance 2nd	.002-.004
Ring gap-Oil	.015-.055		Side clearance Oil	.0065 max
CRANKSHAFT				
Main journal dia.	2.249-2.250		Rod journal dia.	1.75/2.00/2.25
Main run clearance	.005-.081		Rod run clearance	.0127-.0635
End play	.045-.0105			
CAMSHAFT				
No.1 journal dia.	1.749-1.750		No.4 journal dia.	1.7485-1.7495
No.2 journal dia.	1.7485-1.7495		End play	Thrust button
No.3 journal dia.	1.7485-1.7495			
VALVES				
Intake length	4.974-4.994		Exhaust length	4.8655-4.8835
Intake stem dia.	.372-.373		Exhaust stem dia.	.371-.372
Intake head dia.	1.449-1.459		Exhaust head dia.	1.390-1.397
Intake face angle	44 deg. 30 sec.		Exhaust face angle	44 deg. 30 sec.
Intake clearance	.007-.013 cold		Exhaust clearance	.017-.023 cold

D176G 176 Cu.In.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.6250	4.2500	1-2-4-3	2.2500	1.75/2.00/2.25
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY PLUS FILTER
	0.025		5 deg.BTDC/500	4 U.S.qts.
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	88-92		Oil pan drain plug	
Rod brg.caps	ESNA:35 MARSDEN:46		Oil pump bolt	
Cyl. head bolts	89.5-91.6		Water outlet bolt	
B/shft.gr.retainer	33-38		Water pump bolt	
Idler gear retainer	34-35		Wtr.pmp.pulley bolt	
Flywheel bolt	67-69			
Flywheel housing	24			
Rocker arm bolt	19-20			
Spark plug	24-28			
PISTON				
Piston diameter	3.6235-3.6245		Sleeve clearance	.001-.003
Pin diameter	.8741-.8743			
RINGS				
Ring gap-Top	.010-.020		Side clearance Top	.002-.0035
Ring gap-2nd	.010-.020		Side clearance 2nd	.002-.004
Ring gap-Oil	.015-.055		Side clearance Oil	.0065 max
CRANKSHAFT				
Main journal dia.	2.249-2.250		Rod journal dia.	1.75/2.00/2.25
Main run clearance	.005-.081		Rod run clearance	.0127-.0635
End play	.045-.0105			
CAMSHAFT				
No.1 journal dia.	1.749-1.750		No.4 journal dia.	1.7485-1.7495
No.2 journal dia.	1.7485-1.7495		End play	Thrust button
No.3 journal dia.	1.7485-1.7495			
VALVES				
Intake length	4.974-4.994		Exhaust length	4.8655-4.8835
Intake stem dia.	.372-.373		Exhaust stem dia.	.371-.372
Intake head dia.	1.449-1.459		Exhaust head dia.	1.390-1.397
Intake face angle	44 deg. 30 sec.		Exhaust face angle	44 deg. 30 sec.
Intake clearance	.007-.013 cold		Exhaust clearance	.017-.013 cold

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
4.0000		1-3-4-2	2.2485	1.9987
DISTRIBUTOR GAP	SPARK PLUG GAP	IGN.TIMING Gas IDLE SPEED	IGN.TIMING LPG IDLE SPEED	OIL CAPACITY WITH FILTER
0.0080	0.035	6 deg.BTDC/625	14 deg.BTDC/625	
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	60		Oil pan drain plug	32
Rod brg.caps	33		Oil pump bolt	
Cyl. head bolts	65		Rocker arm nut	35-40
Cam sprocket bolt	53		Rckr.shaft brckt.bolt	
Crank pulley bolt	140		Timing cover	3.5-4
Flywheel bolt	80		Spark plug	26
Flywheel housing	40-45		Water outlet bolt	
Manifold bolt & nut			Water pump bolt	
Oil pan bolt	6(9-12) 12(3-4)		Wtr.pmp.pulley bolt	
PISTON				
Pin diameter	.9750-.9752			
RINGS				
Ring gap-Top	.010-.020		Side clearance Top	.0025-.003
Ring gap-2nd	.010-.020		Side clearance 2nd	0.003
Ring gap-Oil	.015-.055		Side clearance Oil	0.005
CRANKSHAFT				
Main journal dia.	2.2477-2.2485		Rod journal dia.	1.9979-1.9987
Main run clearance	.0009-.0035		Rod run clearance	.001-.003
End play	.004-.009			
CAMSHAFT				
Journal diameter	2.009-2.010		End play	.003-.007
VALVES				
Intake length	4.400		Exhaust length	4.400
Intake stem dia.	0.3102		Exhaust stem dia.	0.3093
Intake head dia.	1.81		Exhaust head dia.	1.55
Intake face angle	30 deg.		Exhaust face angle	30 deg.
Intake clearance	.015 hot		Exhaust clearance	.025 hot

4.236 3860 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.8770	5.0000	1-3-4-2	2.9992	2.4996
SPARK PLUG TYPE	INJ.TIMING LETTER #1 CYL.	INJ.TIMING LETTER MCH.	INJ.TIMING LETTER HYD.	SUMP CAPACITY WITH FILTER
	"W"	"C"	"A"	14 U.S.pints
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	140-150		Fuel pipe nut	15
Rod brg.caps	65-70		Bal.retaining screw	36
Cyl. head bolts	100		Idler gr.setscrew	29-30
Cam sprocket bolt	50			
Crank pulley bolt	1.5:240 1.67:300			
Flywheel bolt	90			
Atomiser nut	12			
PISTON				
Piston diameter			Sleeve clearance	
Pin diameter				
RINGS				
Ring gap- Top			Side clearance Top	
Ring gap-2nd			Side clearance 2nd	
Ring gap-Oil			Side clearance Oil	
CRANKSHAFT				
Main journal dia.	2.9984-2.9992		Rod journal dia.	2.4988-2.4996
Main run clearance	.0023-.0046		Rod run clearance	.0015-.0035
T/washer thickness	.089-.092			
CAMSHAFT				
No.1 journal dia.	1.9965-1.9975		No.4 journal dia.	1.9665-1.9675
No.2 journal dia.	1.9865-1.9875			
No.3 journal dia.	1.9665-1.9675			
VALVES				
Intake length	4.831-4.847		Exhaust length	4.847-4.863
Intake stem dia.	.372-.373		Exhaust stem dia.	.372-.3728
Intake head dia.	1.736-1.746		Exhaust head dia.	1.435-1.445
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.012 hot		Exhaust clearance	.012 hot

G4.236 3860 C.C.

BORE	STROKE	FIRING ORDER	MAIN JOURNAL	ROD JOURNAL
3.8770	5.0000	1-3-4-2	2.9990	2.4995
SPARK PLUG TYPE	SPARK PLUG GAP	DISTRIBUTOR GAP	IGN.TIMING IDLE SPEED	OIL CAPACITY PLUS FILTER
TORQUE VALUES				
LOCATION	FT. LB.		LOCATION	FT. LB.
Main brg.caps	145		Oil pan drain plug	
Rod brg.caps	80		Oil pump bolt	
Cyl. head bolts	96		Water outlet bolt	
Cam sprocket bolt	48		Water pump bolt	
Governor drv. gear	24		Wtr.pmp.pulley bolt	
Rocker stud	77			
Idler gr.hub screw	30			
PISTON				
Piston diameter			Sleeve clearance	.0044-.0062
Pin diameter	.9998-1.0000			
RINGS				
Ring gap-Top	.016-.021		Side clearance Top	
Ring gap-2nd	.012-.017		Side clearance 2nd	
Ring gap-Oil	.012-.017		Side clearance Oil	
CRANKSHAFT				
Main journal dia.	2.9985-2.9990		Rod journal dia.	2.4990-2.4995
Main run clearance	.0024-.0049		Rod run clearance	.0015-.0035
End play	.020-.0150			
CAMSHAFT				
Journal diameter	1.9965-1.9975		End play	.0040-.0160
VALVES				
Intake length			Exhaust length	
Intake stem dia.	.372-.373		Exhaust stem dia.	.372-.3728
Intake head dia.	1.742-1.746		Exhaust head dia.	1.438-1.442
Intake face angle	45 deg.		Exhaust face angle	45 deg.
Intake clearance	.012 hot		Exhaust clearance	.015 hot