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Overview Created: Aug 15, 2018 Edited: Aug 15, 2018

VEHICLE TYPE Industrial	FUEL TYPE Diesel	ENGINE CODE 1104C
MAKE PERKINS	MODEL 1104	YEAR 2001-2007
BORE/STROKE 4.1338-4.1348" (104.998-105.024 MM)	VIN	LITER 4.4
COMPRESSION RATIO NA: 19.3:1 TURBO: 18.2:1 or 17.2:1		CID 268
COMMENT TURBO RG, RH, RK & NATURALLY ASPIRATED RE, RF		CYL L 4
		FIRING ORDER 1-3-4-2
		INTFR Unkown

Cylinder Head

Casting

Head Information	Specifications
New Thickness/Measured At	4.643-4.647" (117.932-118.034 MM)
Minimum Thickness	4.614" (117.196 MM)
Warp Spec.	.0020" (.051 MM)
Chamber Volume (cc)	
Surface Finish	
OHC Camshaft Bore Diameter	
Injector Tip Protrusion	
Lifter Bore Diameter	
Comments	

Valve

Valve Information	Intake	Exhaust
Installed Stem Height		
Stem Diameter	.3525-.3533" (8.954-8.974 MM)	.3519-.3528" (8.938-8.963 MM)
Total Length	5.075-5.093" (128.905-129.362 MM)	5.075-5.093" (128.905-129.362 MM)
Head Diameter	1.818-1.828" (46.177-46.431 MM)	1.634-1.643" (41.504-41.732 MM)
Angle	30°	30°
Margin		
Recession	N/A: .023-.033" TURBO: .062-.072"	N/A: .021-.032" TURBO: .060-.071"
Valve Guide Information	Intake	Exhaust
Guide Height	.486-.498" (12.350-12.360 MM)	.486-.498" (12.350-12.360 MM)
Guide Clearance	.0010-.0027" (.025-.069 MM)	.0016-.0033" (.040-.840 MM)
Guide OD		
Valve seal Type		
Valve Seat Information	Intake	Exhaust
Seat Width		
Seat Angle	30°	30°
Seat Outside Diameter		
Seat Inside Diameter		

Seat Insert Height		
Seat Insert Bore Diameter	1.6701-1.6711" (42.420-42.445 MM)	1.8827-1.8837" (47.820-47.845 MM)
Seat Insert Bore Depth	.3902-.3953", TURBO .4295-.4346"	.3902-.3953", TURBO .4295-.4346"

Valve Spring

Outer or Single Spring	Intake	Exhaust
Free Length	NATURALLY ASPIRATED	NATURALLY ASPIRATED
Installed Height	1.319" (33.500 MM)	1.319" (33.500 MM)
Open Test Pressure		
Close Test Pressure	57 LBS @ 1.319"	57 LBS @ 1.319"
Inner Spring	Intake	Exhaust
Free Length	TURBOCHARGED	TURBOCHARGED
Installed Height	1.358" (34.500 MM)	1.358" (34.500 MM)
Open Test Pressure		
Close Test Pressure	51 LBS @ 1.358"	51 LBS @ 1.358"

Roker shaft

Description	Specification
Shaft Diameter	.9828-.9837" (24.962-24.987 MM)
Bore Diameter	.9848-.9863" (25.013-25.051 MM)
Oil Clearance	.0010-.0035" (.026-.089 MM)
Rock Arm Ratio	

Installation

Description	Intake
Intake Valve Lash	.008" COLD
Exhaust Valve Lash	.018" COLD (.450 MM)
Lash Adjustment Method	
Precup Torque Spec.	
Cylinder Head Torque	37, 74 FT/LBS + 225° SHORT BOLTS & 270° LONG BOLTS
Camshaft Cap Torque	



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Cylinder Block

Cylinder Block

Description	Specifications
Cylinder Bore Diameter	4.1338-4.1348" (104.998-105.024 MM)
Torque Plate	
Cylinder Bore Finish	
Deck Height	17.3689-17.3729" (441.173-441.274 MM)
Measured At	DECK TO PAN SURFACE
Surface Finish	
Main to Cam Bore Distance	
Main to Pan Rail Distance	
Bore Center to Center	
Lifter Bore Diameter	.7500-.7513" (19.050-19.082 MM), .0015-.0037" CLR
Main Saddle Width	
Comments	

Piston

Description	Specifications
Compression Height	
Piston Protrusion	.008-.014" (.210-.350 MM)
Skirt Oil Clearance	NOT SUPPLIED BY OEM
Piston to Rod Assembly Orientation	
Piston Pin Diameter	1.5628-1.5630" (39.694-39.700 MM)
Piston Pin Type	FLOAT
Piston Pin Bore Diameter	1.5631-1.5633" (39.703-39.709 MM), .0001-.0006" CLR
Piston Ring Gap	TOP .012-.022", 2ND .028-.037", OIL .012-.022"

Housing Bore

Description	Specifications
Main Bore Diameter	3.1660-3.1670" (80.416-80.442 MM)
Seal Bore Diameter	
Main Cap Torque	180 FT/LBS
Additional Main Cap Bolts	

Camshaft Bore Diameter	- 2.1875-2.1887" (55.563-55.593 MM) - - 1.9900-1.9920" (50.546-50.597 MM) - - 1.9700-1.9720" (50.038-50.088 MM) - - -
Auxiliary Shaft Bore Diameter	- - - -
Balance Shaft Bore Diameter	- - - -

Cylinder Sleeve

Description	Specifications
Sleeve Protrusion	.004" ABOVE - .004" BELOW
Sleeve Flange Outside Diameter	
Sleeve Fit	.001-.003" (.030-.080 MM) PRESS FIT
Sleeve Flange Height	.150-.152" (3.810-3.860 MM)
Sleeve Upper Fit Diameter	
Sleeve Bottom Fit Diameter	

Cylinder Block Lower Bore	Specifications
Depth	
Inside Diameter	4.245-4.250" (107.820-107.950 MM)
Fit	

Cylinder Block Counter/Upper Bore	Specifications
Depth	.150-.154" (3.810-3.910 MM)
Lower Bore Depth Diameter	
Spacer/Deck Plate Thickness	
Outside Diameter	

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BORE/STROKE	4.1338-4.1348" (104.998-105.024 MM) 5.000" (127.000 MM)				
COMPRESSION RATIO	NA: 19.3:1 TURBO: 18.2:1 or 17.2:1			FIRING ORDER 1-3-4-2	
COMMENT	TURBO RG, RH, RK & NATURALLY ASPIRATED RE, RF				INTFR Unkown

Crankshaft

Crankshaft

Description	Specifications
Stroke	5.000" (127.000 MM)
Cylinder Bore	4.1338-4.1348" (104.998-105.024 MM)
Comments	THRUST WASHERS: .089-.091" (2.261-2.311 MM) OVERSIZE THICKNESS: .096-.098" (2.438-2.489 MM). CRANKSHAFT MUST BE REHARDEND AFTER MACHINING PROCESS. 20 HOURS OF NITRIDIIING

Rod Journal

Description	Specifications
Rod Journal Diameter	2.4986-2.4994" (63.466-63.486 MM)
Journal Width	1.5890-1.5910" (40.350-40.420 MM)
Fillet Radius	.145-.156" (3.683-3.962 MM)
Oil Clearance	.0012-.0032" (.030-.081 MM)

Main Journal

Description	Specifications
Pos. 1	- 2.9982-2.9990" (76.155-76.176 MM) -
Pos. 2	- -
Pos. 3	- -
Pos. 4	- -
Pos. 5	- -
Pos. 6	- -
Oil Clearance	.0019-.0046" (.047-.117 MM)
End Play	.002-.015" (.050-.380 MM) .0201" (.510 MM) MAX
Fillet Radius	.145-.156" (3.683-3.962 MM)
Thrust Width	1.7380-1.7410" (44.150-44.220 MM)
Rear Seal Diameter	5.2429" (133.170 MM)
Front Seal Diameter	
Pulley Diameter	
Gear Diameter	1.8750-1.8758" (47.625-47.645 MM)
Hardness	

Journal Finish	
Balance	



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Connecting Rod

Connecting Rod

Description	Specifications
Big End Housing Bore	2.6460-2.6465" (67.210-67.220 MM)
Beam Length	
Big End Width	
Big End Side Clearance	
Connecting Rod Torque	92 FT/LBS
Bolt Diameter	
Small End Bore For Bushing	1.6933-1.6941" (43.010-43.030 MM)
Small End Bore Finished ID	1.5639-1.5645" (39.723-39.738 MM)
Small End Oil Clearance	.0009-.0017" (.023-.044 MM)
Center To Center Distance	8.624-8.626" (219.050-219.100 MM)
Twist/Bend	
Comment	



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COMMENT TURBO RG, RH, RK & NATURALLY ASPIRATED RE, RF							INTFR Unkown			

Camshaft

Camshaft

Description	Specifications
Camshaft Journal Diameters	- 1.9965-1.9975" (50.711-50.736 MM) - - 1.9865-1.9875" (50.457-50.482 MM) - - 1.9665-1.9675" (49.949-49.975 MM) - - - - - - - - - - -
Total Length	
Journal Oil Clearance	
Cam End Play	.004-.022" (.101-.058 MM) T/W THICKNESS: .216-.218"
Lifter Type	
Lifter Diameter	.7480-.7485" (18.987-19.012 MM)
Camshaft Gear Bolt Torque	70 FT/LBS
Comments	

Camshaft Journal Specifications

Auxiliary Journal	Specifications
Auxiliary Journal Oil Clearance	
Auxiliary Journal Diameters	- - - - - - - -
Timing Gear Lash	

Lobe Configuration

Lobe Configuration Information	Intake	Exhaust
Lobe lift	NA: .2906-.2948"	NA: .2914-.2954"
Duration at 0.050"	TURBO: .2768-.2807"	TURBO: .3135-.3174"
Center Line		
Valve Event Timing Marks at .050"		
Description	Intake/Exhaust	
Lobe Separation		
Base Circle New		

Base Circle Min



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Torque/Tune-Up

Torque Specifications

Description	Specifications
Intake Manifold	16 FT/LBS
Exhaust Manifold	24 FT/LBS
Flywheel	RE, RF, RG, RH RJ=77 FT/LBS, RK=85 FT/LBS
Flywheel Bolt Sealer	* SEE COMMENTS BELOW
Flywheel Surfacing	
Damper	
Damper Bolt Sealer	
Main Bearing Cap	180 FT/LBS
Additional Main Cap Bolts	
Connecting Rod	92 FT/LBS
Cylinder Head	37, 74 FT/LBS + 225° SHORT BOLTS & 270° LONG BOLTS
Camshaft Cap Torque	
Camshaft Gear Bolt	70 FT/LBS
Comments	* CAST IRON FLY HOUSING M10=32#, HEAD STAMPED 8.8 M12=55#, HEAD STAMPED 10.9 M10=46#, HEAD STAMPED 10.9 M12=85#

Additional Torque Specifications

Tune-Up Specifications

Description	Specifications
Idle Speed (rpm)	
Compression Ratio	NA: 19.3:1 TURBO: 18.2:1 or 17.2:1
Firing Order	1-3-4-2
Spark Plug Gap	
Ignition Timing	
Oil Pressure At Idle	28 psi
Oil Pressure	40 psi
Intake Valve Lash	.008" COLD
Exhaust Valve Lash	.018" COLD (.450 MM)
Lash Adjustment Method	
Comments	

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MAKE PERKINS MODEL 1104	YEAR 2001-2007 VIN	LITER 4.4 CID 268 CYL L 4

CYLINDER HEAD TORQUE SEQUENCE

