



Foreword

Engine service manual of Chery Oriental Son is provided to maintenance operators of Chery Automobile special maintenance station. Engine maintenance manual consists of mechanics section and electronic section, which introduce basic parameters of Oriental Son engine, brief introduction, fitting, assembling and adjustment tips of assembly components and general troubleshooting. It is convenient for maintenance staff to refer to related document.

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Service Department
Chery Automobile International Co. Ltd.
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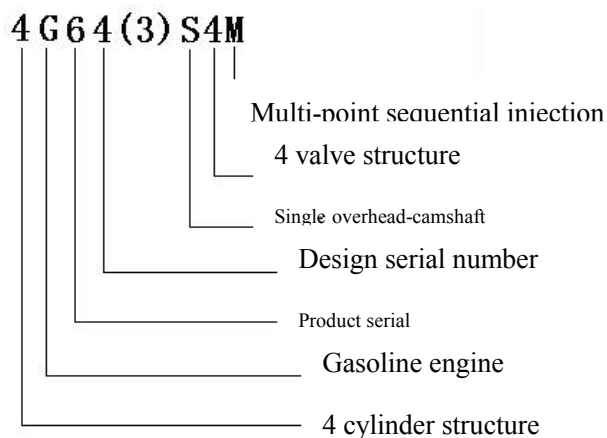


Chapter 1 Overview

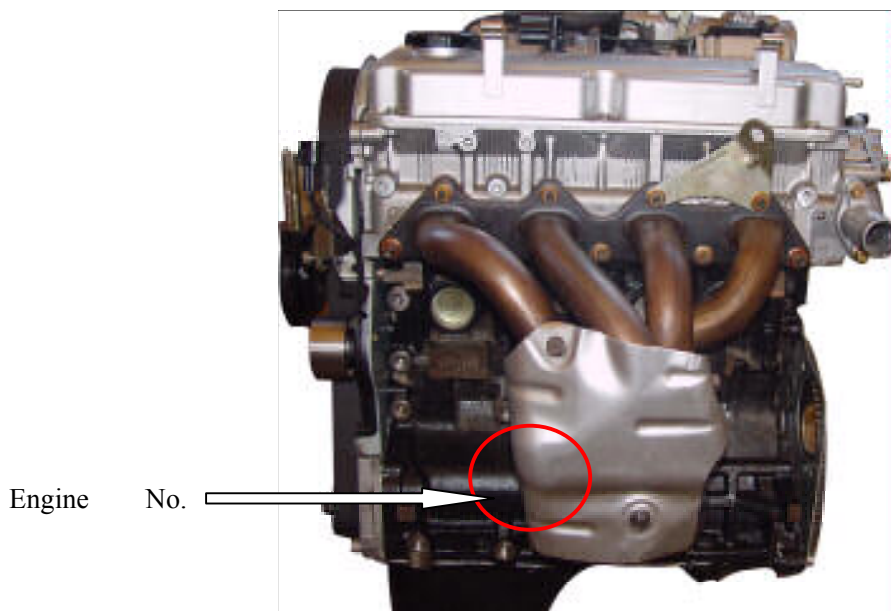
Engine used in Chery Oriental Son car is MITSUBISHI 4G64 (2.4L) and 4G63 (2.0L) model engine, which adapt single-overhead-camshaft, 4-cylinder 16-valve and multi-point sequential injection.

I. Technical Data

1. Engine Mode Number Indication



2. Engine Number Position





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Engine Section

3. Related Engine Data

Item	Specification	
	4G63 S4 MPI	4G64 S4 MPI
Engine type	Four cylinder in-line, 4 stroke, water-cooled, single-overhead-camshaft, 16 valve multi-point sequential injection	
Cylinder number	4	4
Combustion chamber	Ridge chamber	Ridge chamber
Total displacement ml	1,997	2,351
Cylinder diameter mm	85.0	86.5
Stroke mm	88.0	100.0
Output power kw	92 (6000r/min)	95 (5500r/min)
Max torque N.m	167.7	198.1
Compression ratio	10	9
Lubrication system	Pressure supply, full filter	Pressure supply, full filter
Fuel pump type	Gear type	Gear type
Water pump type	Centrifugal impeller	Centrifugal impeller

4. Maintenance Standard

UOM: mm

Item				Standard Value	Usage Limit Value
Engine gear belt	Tensioner arm protrusion			12	—
	Tensioner arm depression (98~196N)			≤1	—
Camshaft	Cam height	Air-in	4G63	37.50	37.00
		Air-out	4G63	36.99	36.49
	Shaft diameter			45.0	
Cylinder cover	Lower surface flatness			0.03	0.2
	Surface grinding limit* total grinding of cylinder body and cylinder cover			—	* 0.2
	Full height			119.9—120.1	
				97.4	≤99.4
Valve	Edge thickness	Air-in		1.0	0.5
		Air-out		1.2	0.7
	Valve rod diameter			6.0	—
		Air-in		0.02—0.05	0.10



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Item			Standard Value	Usage Limit Value
	Crest clearance between valve rod and duct	Air-out	0.03—0.07	0.15
	Inclination angle		45°—45.5°	—
	Height	Air-in	112.30	111.80
		Air-out	114.11	113.61
Valve spring	Free height		51.0	50.0
	Pre-loading force/Operation height	Km/mm	27.2/44.2	—
	Verticality		≤2°	≤4°
Valve duct	Contact bandwidth		0.9—1.3	—
	Internal diameter		6.0	—
	External diameter		11.0	—
	Depression depth		14.0	—
	Valve rod protrusion height		49.3	49.8
Engine oil pump	Side clearance	Driving gear	0.08—0.14	—
		Driven gear	0.06—0.12	—
Piston	Piston clearance		0.02—0.04	—
Piston ring	Lateral clearance	No.1 ring	0.02—0.06	0.1
		No.2 ring	0.02—0.06	0.1
	End clearance	No.1 ring	0.25—0.35	0.8
		No.2 ring	0.40—0.55	0.8
		Oil ring	0.10—0.40	1.0
Piston pin	External diameter		22.0	—
	Depressing force (Kg)		755—1750	—
	Depressing temperature		Room temperature	—
Crank	Crank pin clearance		0.02—0.05	0.1
Connecting rod	Bigger end clearance		0.10—0.25	0.4
Crank	Axial clearance		0.05—0.18	0.25
	Main axle diameter		57	—
	Connecting axle diameter		45	—
	Main axle diametral clearance		0.02—0.04	0.1
Cylinder body	Upper surface flatness		0.05	0.1
	Upper surface grinding limit*Total grinding of cylinder body and cylinder cover		—	* 0.2
	Full height 4G63		284±0.1	—
	Internal diameter of cylinder hole 4G63		85.00—85.03	—
Cylinder body	Cylinder hole cylindricity		0. 01	—
Motor	Rotor coil resistance		3—5	—



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Item			Standard Value	Usage Limit Value
Cylinder Cover	Secondary processing size of valve conduit installation hole (air-in and air-out valve) enlargement	0.05 O.S.	11.05—11.07	
		0.25 O.S.	11.25—11.27	
		0.50 O.S.	11.50—11.52	
	Secondary processing size of air-in valve seating hole enlargement	0.30 O.S.	34.435—34.455	
		0.60 O.S.	34.735—34.755	
	Secondary processing size of air-out valve seating hole enlargement	0.30 O.S.	31.935—31.955	
		0.60 O.S.	32.235—32.255	

Remarks:

O.S.: Enlarged diameter

5. Tightening torque

Tightened Part	Torque (kgM)
Alternator, Ignition system	
Water pump belt gear	0.9
Adjusting bolt	1.0
Locking bolt	2.2
Alternator bracket screw bolt	2.4
Alternator center axle nut	4.5
Crank belt gear	2.5
Ignition coil	1.0
Spark piston	2.5
Camshaft position sensor cylinder	2.2
Camshaft position sensor bracket	1.4
Camshaft position sensor	1.0
Timing Belt	
Protruded screw bolt on timing belt cover	1.1
Tensioner wheel screw bolt	4.9
Tensioner arm screw bolt	2.2
Automatic tensioner screw bolt	2.4
Central belt wheel screw bolt	3.6
Tensioner bracket	4.9
Timing belt rear cover	1.1
Timing belt indicator	0.9
Engine oil pump belt gear	5.5
Screw bolt of crank belt gear	12.0
Tensioner “B”	1.9
Belt gear of balance axle	4.6



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Screw bolt of camshaft belt gear	9.0
Belt gear of balance axle	4.6
Fuel System	
Throttle	1.9
EGR valve	2.2
Injector and distribution pipe	1.2
Fuel oil return pipe	0.9
Fuel pressure regulator	0.9
Intake Manifold	
Screw bolt of engine flying rings	1.9
Engine coolant temperature sensor	3.0
Connecting bolt of outflow pipe	2.0
Manifold bolt	2.0
Coolant temperature sensor	1.1
Manifold bracket	1.4
Exhaust Manifold	
Screw bolt of emission manifold cover	1.4
Screw bolt of inflow duct joint	2.4
Exhaust manifold nut (M8)	3.0
Exhaust manifold nut (M10)	5.0
Screw bolt of coolant bypass duct joint	2.4
Screw bolt of coolant duct component	1.3
Thermostat housing bolt	2.4
Water pump screw bolt	1.4
Rocker and Camshaft	
Rocker cover screw bolt	0.4
Screw bolt of rocker and camshaft assembly	3.2
Trust bearing cover bolt	1.9
Cylinder Cover and Valve	
Cylinder cover bolt	2.0+90°+90°
Front cover & Engine oil pump	
Drain plug	4.5
Oil pan	0.7
Screw bolt and nut of oil strainer	1.9

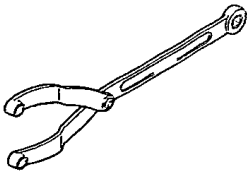
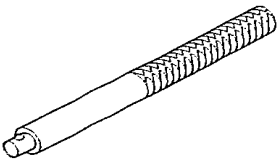
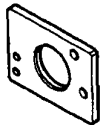
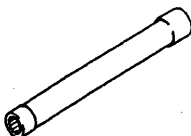


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Oil pressure switch	1.0
Pressure relief plug	4.5
Screw bolt of oil cleaner bracket	1.9
Front cover bolt	2.4
Plug	2.4
Flange bolt	3.7
Engine oil pump cover bolt	1.6
Engine oil pump cover screw	1.0
Piston and Connecting Rod Assembly	
Connecting rod nut	2.0+90°~100°
Crank, Cylinder Body, Flywheel	
Flywheel screw bolt	13.5
Installation screw bolt of rear cover	1.1
Installation screw bolt of bell jar	0.9
Installation screw bolt of oil seal cover	1.1
Screw bolt of main bearing cover	2.5+90°~100°
Throttle Body	
Bracket screw bolt	0.5
Throttle Position Sensor	0.35
Screw bolt of idle speed air valve	0.35
Idle speed adjustment bolt and installation nut	0.3

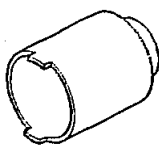
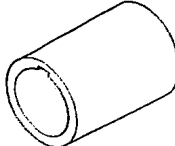
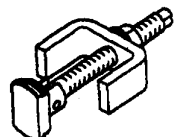
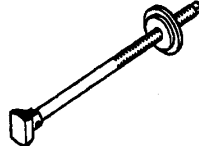
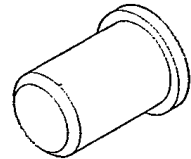
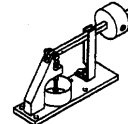
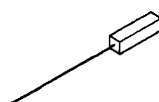
II. Special Tools

Tool	Number	Name	Purpose
	MB990767	Spanner for crankshaft belt gear	Use MD998719 when fixing camshaft belt gear
	MB990938	Handle	Use it together with MD998776 to install crankshaft rear oil seal.
	MB991603	Balance axle bearing puller limiter	Use it with MD998372 together to disassemble reverse balance axle rear bearing and install guiding limiter.
	MB991654	Cylinder cover bolt spanner (12)	Disassemble and assemble cylinder cover bolt.



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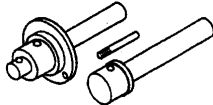
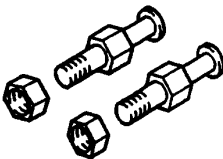
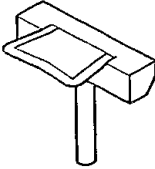
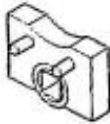
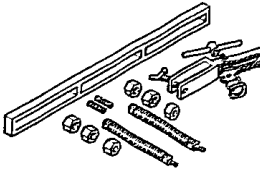
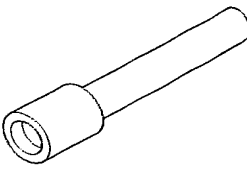
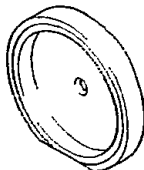
Engine Section

Tool	Number	Name	Purpose
	MD998162	Plug spanner	Disassemble and assemble front cover plug cock.
	MD998285	Crankshaft front oil seal duct	MD998375 Use MD998375 to install crankshaft front oil seal
	MD998371	Balance axle bearing puller	Disassemble reverse balance axle front bearing
	MD998372	Balance axle bearing puller	Disassemble reverse balance axle rear bearing
	MD998375	Crank shaft front oil seal installer	Install crankshaft front oil seal
	MD998440	Leakage check tester	Leakage test for hydraulic post.
	MD998441	Hydraulic post keeper	Exhaust air from hydraulic post
	MD998442	hydraulic post wiring	Exhaust air from hydraulic post
	MD998443	hydraulic post keeper	Use it when disassembling or assembling rocker shaft component



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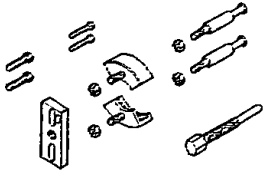
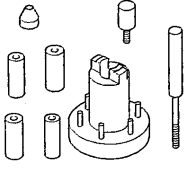
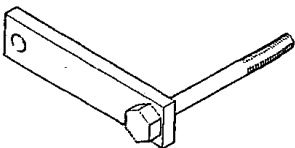
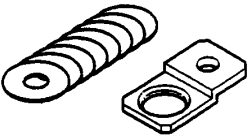
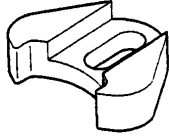
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Tool	Number	Name	Purpose
	MD998705	Balance axle bearing installer	Install balance axle front and rear bearing.
	MD998713	Camshaft oil seal installer	Install camshaft oil seal
	MD998719	Fixing pin for belt gear	Use MB990767 to fix camshaft belt gear.
	MD998727	Oil pan remover	Disassemble oil pan
	MD998735	Valve spring compressor	Disassemble and assemble valve and related parts
	MD998767	Tensioner puller sleeve	Timing belt tension adjustment
	MD998772	Valve spring compressor	Disassemble and assemble valve and related parts
	MD998774	Valve oil seal installer	Install valve oil seal
	MD998776	Crankshaft rear oil seal installer	MB990938 Use MB990938 to install crankshaft rear oil seal.



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Tool	Number	Name	Purpose
	MD998778	Crankshaft belt gear puller	Disassemble crankshaft belt gear
	MD998780	Piston disassembling and assembling tool	Disassemble and assemble piston pin.
	MD998781	Flywheel stopper	Fix flywheel and driving disk
	MD998783	Plug spanner fixer	Disassemble and assemble front cover plug
	MD998785	Timing belt gear stopper	Keep balance axle belt gear.