422/M2
422T/M2
Engines

Service Manual

Bur 6-79550NA

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ENGINE SERVICE SPECIFICATIONS

SERVICE STANDARDS

Inspection	Standard Dimension	Standard Value	To Be Repaired	Allowable Limit	Remarks
CYLINDER HEAD					
Compression pressure of cylinder		More than 30 kg/cm² (426.6 PSI)	Less than 25 kg/cm² (355.5 PSI)		
Tightening torque of cylinder head		98 - 103 Nm (72.3 - 75.9 lb ft)			
Distortion of face of cylinder head		0.05 mm (0.0002 inch max.)	0.12 mm (0.0047 inch)		
Valve seat depth (Both intake and exhaust) Width Recess Valve Seat		0.65 - 0.95 mm (0.026 - 0.037 inch)	1.6 mm (0.063 inch)		Valve seat angle 45°
Valve seat width (intake)		1.5 - 2.0 mm (0.06 inch - 0.08 inch)	2.5 mm (0.1 inch)		
Valve seat width (exhaust)		1.94 - 2.16 mm (0.076 - 0.085 inch)	2.5 mm (0.1 inch)		
CYLINDER BLOCK					
Type			Dry type (Unit type)		
Bore	84 mm (3.307 inch)	84 - 84.019 mm (3.307 - 3.308 inch)	84.2 mm (3.315 inch)	85.2 mm (3.354 inch)	Oversize 0.5, 1.0 mm (0.02/.04 inch)
Cylinder block type surface warpage		0.05 mm (0.002 inch max.)	0.12 mm (0.0047 inch)		
PISTON					
Skirt long-diameter size	84 mm (3.307 inch)	83.948 - 83.963 mm (3.3050 - 3.3056 inch)		83.7 mm (3.295 inch)	Oversize 0.5,1.0 mm (0.02/.04 inch)
Clearance with cylinder		0.038 - 0.072 mm (0.0015 - 0.0028 inch)		0.25 mm (0.01 inch)	20° C (68° F)
Piston pin hole inside diameter	28 mm (1.1024 inch)	27.999 - 28.003 mm (1.1023 - 1.1025 inch)			
Piston pin hole to pin clearance		0.01 ± 0.007 mm (-0.00004 ± 00028 inch)		0.02 mm (0.0008 inch)	
PISTON PIN					
Pin outside diameter	28 mm (1.1024 inch)	27.996 - 28.0 mm (1.1022 - 1.1024 inch)		27.98 mm (1.1016 inch)	
Rod small end bushing to pin clearance		0.010-0.025 mm (0.0004 - 0.00098 inch)		0.1 mm (0.004 inch)	Oil clearance

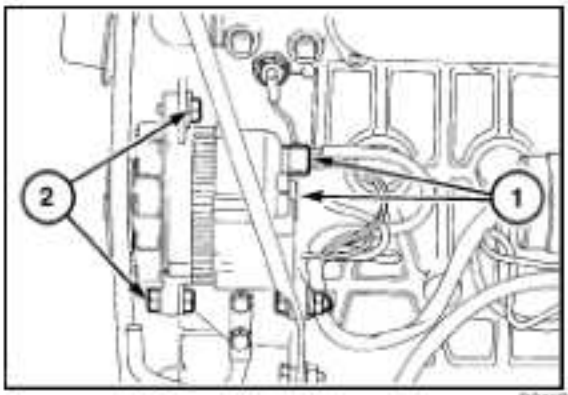
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ENGINE DISASSEMBLY

Alternator

Disconnect the alternator wire harness and wires, 1.

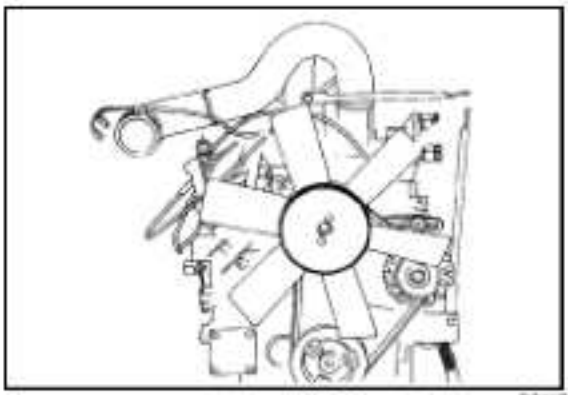
Remove the alternator pivot and adjusting bracket, hardware 2.



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Remove Cooling Fan and Pulley

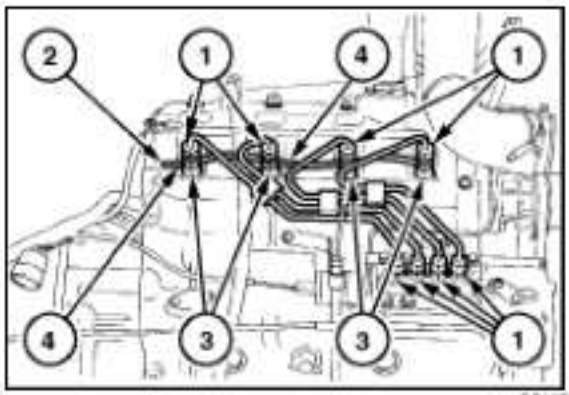
Remove the fan retaining hardware and spacers.



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Fuel Injection Pipe

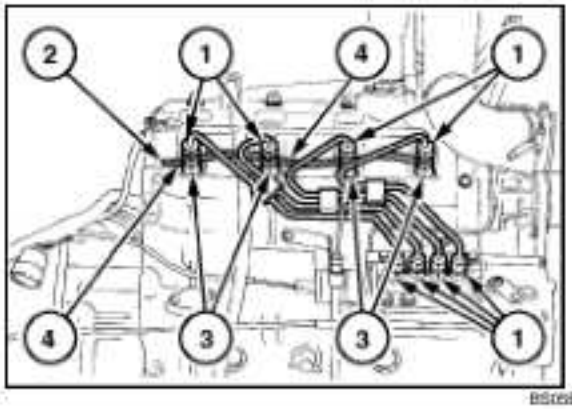
1. Loosen the fuel pipe nuts from the fuel injection pump and injectors, 1. Remove the pipes as an assembly.
2. Remove the spring clamp and fuel return hose, 2.



BS058264

Injector Assembly

Loosen and remove the securing nuts, 3. Remove the leak-off rail, 4. Remove the aluminum washers and discard. Remove the injectors tagging or marking with the cylinder they were removed from.



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TURBOCHARGER - 422T/M2 ENGINE

Specifications

ITEM	DESCRIPTION	SPECIFICATIONS
Turbocharger	Lubrication	Pressure-fed from external source
Turbine	Axial-flow turbine maximum continuous permissible speed (RPM)	180000
Blower	Centrifugal blower dry weight lbs. (kg)	3.2 kg (7.0 lbs)

Turbocharger Troubleshooting

TURBOCHARGER IS SLUGGISH IN PICKING UP SPEED

POSSIBLE CAUSE	CORRECTION
The sealed part of turbine wheel is heavily carboned, causing the rotor to offer much resistance to turning	Change Oil (engine oil) Disassemble and clean
Incomplete fuel combustion in the engine, due to a faulty condition in the fuel injection system	Disassemble and clean Check the injection system for cause, and repair
Lack of lubrication during cold weather startup	Warm up below 1500 RPM for three minutes on startup and allow to run at low idle for one minute before shutdown

EXCESSIVE OR ABNORMAL VIBRATION

POSSIBLE CAUSE	CORRECTION
A loose pipe connection at the turbine or blower side or at the bearing	Tighten and repair
Bearing failure causing the rotor to run rough	Replace Turbocharger
Turbine wheel or blower wheel has broken vanes caused by entry of metal or solid objects	Replace Turbocharger
Loss of dynamic balance in the rotor	Replace Turbocharger

DIRTY EXHAUST SMOKE

POSSIBLE CAUSE	CORRECTION
Not enough intake air	A clogged element in the air cleaner, clean or replace element
	Closed air intake inlet, open inlet
	Air leakage from a connection, check and repair

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