

<b>NATEF</b>	<b>Priority</b>	<b>Task</b>	<b>Completed</b>	<b>Notes</b>
<b>Engine identification</b>				
A3	P1	Check for bulletins and service records		
A4	P1	ID components using casting numbers		
A1	P1	Complete repair order		
<b>Diagnosis</b>				
A2	P1	Interpret engine concern		
A9	P2	Power balance test		
A11	P1	Cylinder leakage test		
A10	P1	Compression test (cranking and running)		
D3	P1	Block check		
A6	P2	Check noises and vibrations		
A8	P1	Check engine vacuum		
1		Test exhaust-back pressure		
A5	P1	Check engine for fluid leaks		
A7	P2	Diagnose oil and coolant consumption		
D1	P1	Check oil pressure		
D14	P1	Identify causes of engine overheating		
<b>Disassembly and Cleaning</b>				
C1	P1	Blocks		
2		Cylinder head assm.		
C7	P2	Inspect main and rod bearings		
<b>Crack Detection and Repair</b>				
3		Magnaflux: Cylinder head, dry		
4		Cylinder head, dye penetrant		
5		Crankshaft		
6		Connecting rods		
7		Flywheel		
C2	P2	Block, dry		
		Pressure test:		
8		Cylinder head		
9		Block		
		Ceramic seal:		
10		Cylinder head		
11		Block		
		Crack repair		
12		Pin		
13		Spray weld		
<b>Cylinder Head Reconditioning</b>				
B6	P3	Inspect valves & seats		
B3	P3	Inspect springs & retainers		
B5	P3	Inspect guides & concentricity		
B12	P2	Inspect camshaft journals and lobes		
B13	P2	Inspect cam bearings		
B8	P2	Inspect rocker, pushrods, pivots		
B9	P2	Inspect lifters		
B7	P3	Check spring and stem heights		
14		Grind valves		
14s	P3	Grind valve seats & check concentricity		
15		Cut valve seats		
		Valve guide repairs:		
16		Hone to fit		
17		Ream for oversize stems		
18		Knurl/roller knurl & ream		
19		R & R, cast iron head		
20		R & R, aluminum head		

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21		B & I guide bushings		
22		B & I thin-wall bronze liners		
		Seat repairs:		
23		R & R seat		
24		B & I seat		
25		Machine insert to fit		
26		Rocker stud R & R		
27		Rocker arms; reface		
28		Seals; machining for positive type		
29		Straighten head		
30		Line Bore, OHC		
31		Welding: Arc, Mig, Tig		
<b>Resurfacing</b>				
32		Deck side of head		
33		Cam side of head		
34		Intake side of head		
35		Exhaust side of head		
36		Diesel head		
37		In-line block		
38		V-Block		
39		With liners, flanged sleeves		
40		With timing cover; OHC		
		Manifolds:		
41		Intake, V-block		
42		Intake, In-line		
43		Exhaust		
		Flywheels		
44		Flat		
45		Stepped		
46		R & R Ring gear		
<b>Cylinders</b>				
C3	P2	Inspect cylinder walls and measure		
C4	P2	Deglaze cylinder walls		
C5	P3	Inspect cam bearings and determine action		
C11	P2	Determine piston to cylinder clearance		
C13	P2	Inspect aux/balance shaft		
47		Knurl and fit pistons		
48		Bore		
49		Hone oversize		
50		Torque-plate hone		
51		B & I sleeve		
<b>Line Honing Blocks</b>				
		Gauge main bores		
52		Grind main caps		
53		Refit cap to registers		
54		Line hone mains		
<b>Crankshaft Services</b>				
C6	P1	Inspect & measure crankshaft		
55		Chamfer oil holes		
56		Clean and polish		
57		Straighten		
58		R & R oil plugs		
59		Grind		
60		Weld/grind		
61		Repair keyway		

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62		Knurl snout, regrind		
63		Grind flange square		
64		Stress-relieve		
65		Dowel pin repairs		
<b>Connecting Rod &amp; Piston</b>				
C8	P3	Check condition of rod by piston & brg wear		
C9	P2	Inspect skirts and ring lands		
66		Gauge rod bores		
67		R&R rod bolts		
68		Grind parting lines		
69		Resize housing bores		
C10	P3	Assemble rods and pistons		
70		Align		
		Pin fitting:		
71		Oversize pins in rods		
72		Oversize pins in pistons		
73		Full floating pin bushings		
74		Knurl pistons		
<b>Balancing</b>				
75		Rods		
76		Pistons and pins		
77		Crankshaft, V-type		
78		Crankshaft, in-line		
79		Flywheel or flexplate		
80		Clutch		
81		Torque converter		
<b>Thread Repair</b>				
A14	P1	Remove broken fastener		
A14	P1	Remove broken drill, easy-out		
A14	P1	Install Heli-Coil		
A14	P1	Install Time-Sert threaded bushing		
<b>Blueprinting Extras</b>				
83		Correct lifter bores		
84		Correct main seal location		
85		Correct rocker geometry		
86		CC combustion chambers, surface		
87		Cross-drill crankshaft oil holes		
88		Degree camshaft		
89		Drill water passages		
90		Drill oil passages		
91		Fit steel main caps		
92		Flow test heads		
93		Install larger valves		
94		Lighten flywheel		
95		Machine valve bowls w/ bowl hogs		
96		Machine valve covers surfaces		
97		Machine for screw-in studs		
98		Measure casting thickness		
99		Plug block deck, drill water holes		
100		Port cylinder heads		
101		Port manifold		
102		Rods; correct length		
103		Spot face head bolt holes		
104		Index, surface V-block		

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<b>Assembly</b>				
105		Straighten camshaft		
106		Fit cam bearings		
107		Fit auxiliary shaft bearings		
D2	P2	Overhaul oil pump		
C12	P2	Inspect, measure, & install piston rings		
		Assemble cylinder heads:		
108		OHV		
109		OHC, 2 valve		
110		OHC, 4 valve		
111		Vacuum test valve sealing		
112		Assemble short block:		
C15	P1	OHV		
C15	P1	OHC		
		Test in Dynamaster:		
113		Short block only		
114		Long block		
<b>In-Chassis:</b>				
A13	P1	Install engine covers using gaskets, etc.		
		Engine installation:		
A12	P2	FWD		
A12	P2	RWD		
		R & R cylinder heads:		
B1	P1	OHV In-line		
B1	P1	OHC In-line		
B1	P1	V-block		
B2	P1	Inspect cylinder head for cracks and warpage		
B4	P3	R & R valve seals and inspect valve train		
115		R & R timing sets:		
B11	P1	OHV		
B11	P1	OHC, belt		
A15	P2	R & R engine mounts (116)		
C14	P2	Replace vibration damper		
117		Cooling system repairs:		
D6	P1	Inspect & replace thermostat		
D8	P2	R & R water pump		
D4	P1	R & R belts		
D5	P1	R & R hoses		
D9	P2	R & R radiator		
D10	P1	Inspect cooling fan		
118		R & R core plugs		
		Oil leak repair:		
119		Main seal		
120		Valve cover gasket		
121		Oil pan gasket		
122		Replace pressure switch		
D11	P3	Inspect auxilliary coolers		
123		Service PCV system		
		Exhaust system repairs:		
124		Repair or replace manifolds		
125		Install headers		
126		Re-torque cyl head		
127		30, 60K services		
B10	P1	Valve adjustment		
D13	P1	Change oil & filter		