Perkins 400 Series
Models 403C-11, 403C-15, 404C-22 and 404C-22T

WORKSHOP MANUAL

403C-11 Three cylinder naturally aspirated diesel engine

403C-15 Three cylinder naturally aspirated diesel engine

404C-22 Four cylinder naturally aspirated diesel engine

404C-22T Four cylinder turbo charged diesel engine

Perkins Confidential: Green
Chapters

1. General information
2. Specifications
3. Cylinder head assembly
4. Piston and connecting rod assemblies
5. Crankshaft assembly
6. Timing case and drive assembly
7. Cylinder block assembly
8. Engine timing
9. Aspiration system
10. Lubrication system
11. Fuel system
12. Cooling system
13. Flywheel and housing
14. Electrical equipment
15. Auxiliary equipment
16. Special tools

The following pages contain a detailed table of contents
Contents

1 General information
Introduction ......................................................................................................................... 1
Safety precautions .................................................................................................................. 2
POWERPART recommended consumable products ............................................................. 4
Engine views ........................................................................................................................ 6
Engine identification ............................................................................................................. 7
Engine lift equipment .......................................................................................................... 8

2 Specifications
Basic engine data .................................................................................................................. 9
Standard torques .................................................................................................................. 10
Special torques ..................................................................................................................... 11
Compression test data ......................................................................................................... 12

3 Cylinder head assembly
Rocker cover and inlet manifold
Operation 3-1 To remove and to fit ..................................................................................... 13
Rocker assembly
Operation 3-2 To remove and to fit ..................................................................................... 14
400 Series

Operation 3-3 To dismantle and to assemble .......................... 15
Operation 3-4 To inspect .................................................. 16

Exhaust manifold and gasket
Operation 3-5 To remove and to fit ..................................... 17

Fuel injection pipes / fuel return pipes
Operation 3-6 To remove and to fit ..................................... 18

Cylinder head setscrews
Operation 3-7 To remove and to fit ..................................... 19

Cylinder head
Operation 3-8 Tightening sequence 403C-11 and 403C-15 ......... 20
Operation 3-9 Tightening sequence 404C-22 and 404C-22T ........ 21

Cylinder head gasket
Operation 3-10 To remove and to fit ................................ 22
Operation 3-11 To select the correct thickness of cylinder head gasket .................................................. 23

Valve and valve spring
Operation 3-12 To remove and to fit ................................ 24
Operation 3-13 To inspect valve spring ................................ 25
Operation 3-14 To inspect valve stem and thickness of valve head .................................................. 26

Cylinder head to valve stem clearance
Operation 3-15 To inspect ................................................ 27

Cylinder head
Operation 3-16 To inspect ................................................ 28

Valve seat width
Operation 3-17 To inspect and to correct ................................ 29

Valve depth
Operation 3-18 To check .................................................... 30
Operation 3-19 To lap the contact face of the valve seat ........ 31

Valve tip clearance
Operation 3-20 To check and to adjust ................................ 32
400 Series

4 Piston and connecting rod assemblies

Big end bearing and cap
Operation 4-1 To remove and to fit ......................................................... 33

Piston and connecting rod
Operation 4-2 To remove and to fit .......................................................... 34
Operation 4-3 To dismantle and to assemble ............................................ 35

Piston rings
Operation 4-4 To fit ............................................................................. 36
Operation 4-5 To measure the piston ring clearance ............................... 37
Operation 4-6 To measure the piston ring gap ....................................... 38

Piston and connecting rod assemblies
Operation 4-7 To dismantle and to assemble ......................................... 39

Piston and piston ring
Operation 4-8 To inspect ...................................................................... 40

Connecting rod
Operation 4-9 To inspect ...................................................................... 41

Connecting rod bearing clearance
Operation 4-10 To check ...................................................................... 42

Small end bush
Operation 4-11 To remove and to fit ...................................................... 43

5 Crankshaft assembly

Crankshaft pulley
Operation 5-1 To remove and to fit ......................................................... 45

Crankshaft retaining bolts and crankshaft
Operation 5-2 To remove and to fit ......................................................... 46

Crankshaft
Operation 5-3 To inspect for deflection .................................................. 47