



Contents

| | |
|---|-----------|
| 00 - Technical data | 1 |
| 1 Technical data | 1 |
| 1.1 Technical data | 1 |
| 1.2 Engine number | 1 |
| 1.3 Engine data | 1 |
| 10 - Removing and installing engine | 3 |
| 1 Removing and installing engine | 3 |
| 1.1 Removing and installing engine | 3 |
| 1.2 Notes on removing | 4 |
| 1.3 Securing engine to assembly stand | 7 |
| 1.4 Notes on installing | 7 |
| 1.5 Tightening torques | 8 |
| 1.6 Assembly mountings | 9 |
| 1.7 Additional information and removal instructions for vehicles with air conditioner | 10 |
| 13 - Crankshaft group | 11 |
| 1 Dismantling and assembling engine | 11 |
| 1.1 Dismantling and assembling engine | 11 |
| 1.2 Removing and installing ribbed belt | 21 |
| 2 Dismantling and assembling cylinder block, crankshaft and flywheel | 23 |
| 2.1 Dismantling and assembling cylinder block, crankshaft and flywheel | 23 |
| 2.2 Crankshaft dimensions | 26 |
| 2.3 Renewing crankshaft oil seal -belt pulley end- | 26 |
| 2.4 Renewing crankshaft sealing flange -flywheel end- | 28 |
| 3 Dismantling and assembling pistons and conrods | 37 |
| 3.1 Dismantling and assembling pistons and conrods | 37 |
| 3.2 Piston and cylinder dimensions | 43 |
| 15 - Cylinder head, Valve gear | 44 |
| 1 Removing and installing cylinder head | 44 |
| 1.1 Removing and installing cylinder head | 44 |
| 1.2 Checking valve timing | 49 |
| 1.3 Checking semi-automatic toothed belt tensioning roller | 52 |
| 1.4 Removing, installing and tensioning toothed belts | 56 |
| 1.5 Removing and installing camshaft housing | 63 |
| 1.6 Removing and installing cylinder head | 66 |
| 1.7 Checking compression pressures | 69 |
| 2 Servicing valve gear | 71 |
| 2.1 Servicing valve gear | 71 |
| 2.2 Reworking valve seats | 80 |
| 2.3 Removing and installing camshaft adjuster and exhaust camshaft sprocket | 82 |
| 2.4 Renewing camshaft oil seals | 90 |
| 2.5 Checking valve guides | 93 |
| 2.6 Renewing valve guides | 94 |
| 2.7 Renewing valve stem seals | 95 |
| 17 - Lubrication | 98 |
| 1 Removing and installing parts of the lubrication system | 98 |
| 1.1 Removing and installing parts of the lubrication system | 98 |
| 1.2 Removing and installing oil sump | 105 |
| 1.3 Removing and installing oil pump | 107 |
| 1.4 Checking oil pressure and oil pressure switch | 110 |



| | |
|--|------------|
| 19 - Cooling system | 112 |
| 1 Removing and installing parts of cooling system | 112 |
| 1.1 Removing and installing parts of cooling system | 112 |
| 1.2 Parts of cooling system body side | 113 |
| 1.3 Parts of cooling system engine side | 116 |
| 1.4 Coolant hose connection diagram | 121 |
| 1.5 Draining and filling cooling system | 122 |
| 1.6 Removing and installing radiator | 124 |
| 1.7 Removing and installing coolant pump | 126 |
| 20 - Fuel supply system | 128 |
| 1 Removing and installing parts of fuel supply system | 128 |
| 1.1 Removing and installing parts of fuel supply system | 128 |
| 1.2 Removing and installing fuel tank with its attachments and fuel filter | 129 |
| 1.3 Safety precautions when working on the fuel supply system | 133 |
| 1.4 Rules for cleanliness | 134 |
| 1.5 Removing and installing fuel delivery unit | 134 |
| 1.6 Removing and installing fuel tank | 135 |
| 1.7 Crash fuel shut-off | 137 |
| 1.8 Checking fuel pump | 138 |
| 2 Electronic power control (EPC) | 144 |
| 2.1 Electronic power control (EPC) | 144 |
| 2.2 Servicing parts of electronic power control (EPC) | 144 |
| 3 Activated charcoal filter system | 145 |
| 3.1 Activated charcoal filter system | 145 |
| 3.2 Servicing parts of the activated charcoal filter system | 145 |
| 3.3 Checking fuel tank breather | 147 |
| 24 - Mixture preparation, Injection | 149 |
| 1 Servicing injection system | 149 |
| 1.1 Servicing injection system | 149 |
| 1.2 Fitting locations overview | 149 |
| 1.3 General notes on injection | 155 |
| 1.4 Removing and installing parts of the injection system | 156 |
| 1.5 Dismantling and assembling intake manifold | 164 |
| 1.6 Dismantling and assembling fuel rail with injectors | 167 |
| 1.7 Dismantling and assembling air cleaner | 170 |
| 1.8 Safety precautions | 173 |
| 1.9 Rules for cleanliness | 174 |
| 1.10 Technical data | 174 |
| 2 Checking components | 175 |
| 2.1 Checking components | 175 |
| 2.2 Checking injectors | 175 |
| 2.3 Checking fuel pressure regulator and holding pressure | 178 |
| 2.4 Adapting components | 182 |
| 26 - Exhaust system | 183 |
| 1 Removing and installing parts of exhaust system | 183 |
| 1.1 Removing and installing parts of exhaust system | 183 |
| 1.2 Exhaust manifold, front exhaust pipe and catalyst with attachments | 183 |
| 28 - Ignition system | 190 |
| 1 Servicing ignition system | 190 |
| 1.1 Servicing ignition system | 190 |
| 1.2 General notes on ignition system | 190 |



4-Cyl. injection engine (1.6 ltr., 4 valve) - Edition 04.2001

| | | |
|-----|--|-----|
| 1.3 | Removing and installing parts of the ignition system | 191 |
| 1.4 | Safety precautions | 193 |
| 1.5 | Test data, spark plugs | 194 |