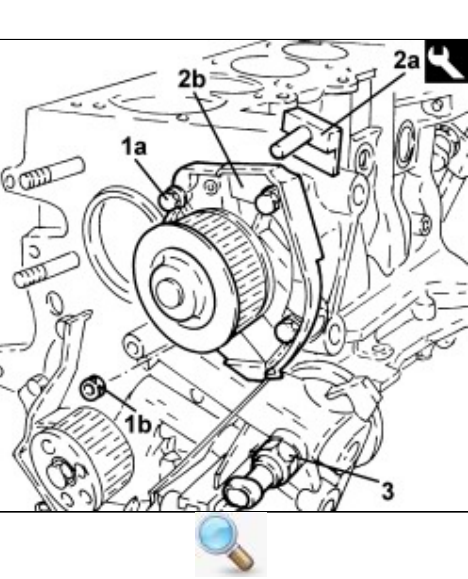


191 - Giulietta 1.4 Turbo Benzina ENGINE - DISMANTLING AND REASSEMBLY FOLLOWING OP.1004E10 - WASH AND CHECK DISMANTLED COMPONENTS - REFITTING CYLINDER HEAD AND OIL SUMP - DOES NOT INCLUDE OPERATIONS ON CYLINDER HEAD AND AUXILIARY UNITS 1004E20



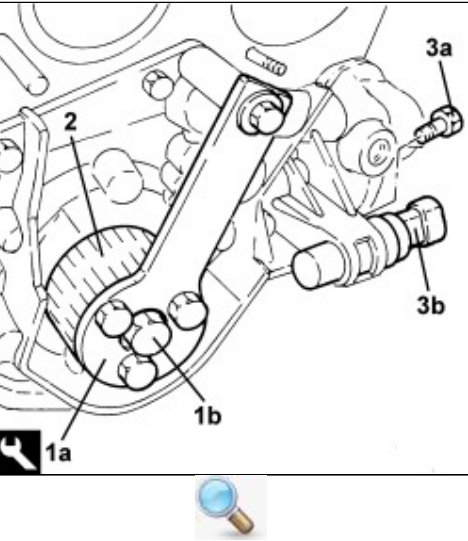
Removing ([Refitting](#))

1. Undo bolts (1a) and nut (1b) securing the water pump to the crankcase.
2. Remove the sealant using the tool (2a) and remove the water pump (2b).

Tool	Description	Function	Validity
1870718000	Blade	Cut sealant	1.4 Turbo Petrol

- Clean thoroughly between the engine block and water pump mating surfaces.

3. Remove the engine oil minimum pressure switch.



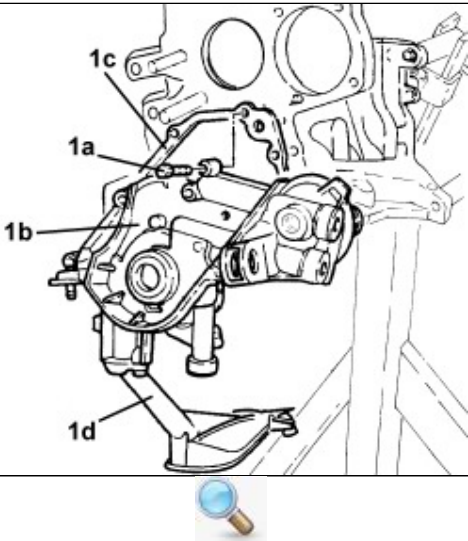
1. Fit the tool (1a) and undo the screw (1b) securing the crankshaft gear.

Tool	Description	Function	Validity
2000004500	Template	Crankshaft timing	1.4 Turbo Petrol

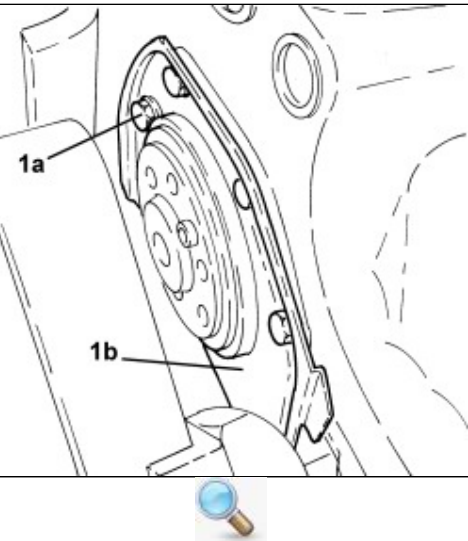
- Remove the template fitted previously.

2. Remove the crankshaft gear.

3. Undo the bolt (3a) and remove the rpm sensor (3b).

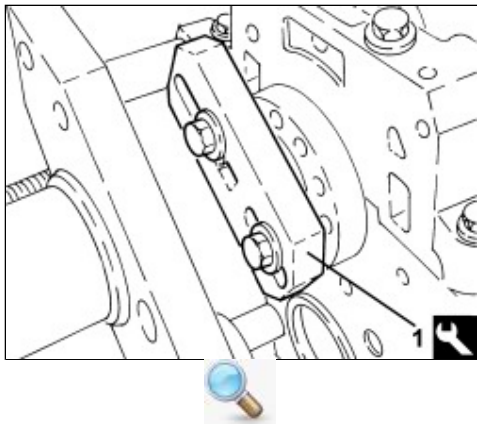


1. Undo the bolts (1a) and remove the crankcase front cover (1b) with the oil pump incorporated, complete with gasket (1c) and intake duct (1d).



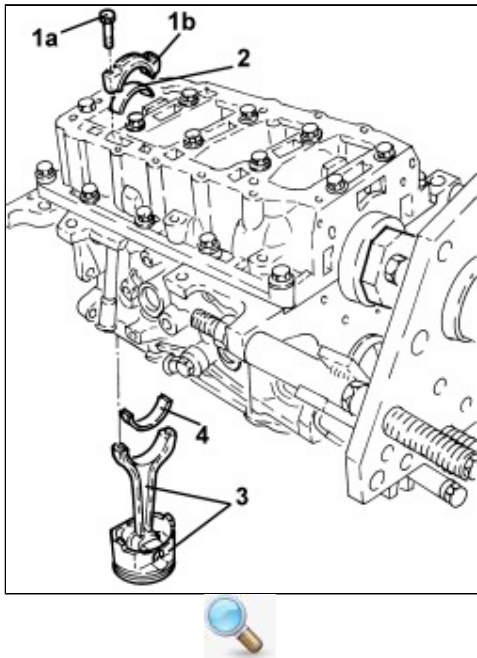
1. Undo the screws (1a) and remove the crankshaft rear cover (1b) with built-in oil seal ring.

- Rotate the engine block through 180°.



1. Fit the tool for rotating the crankshaft.

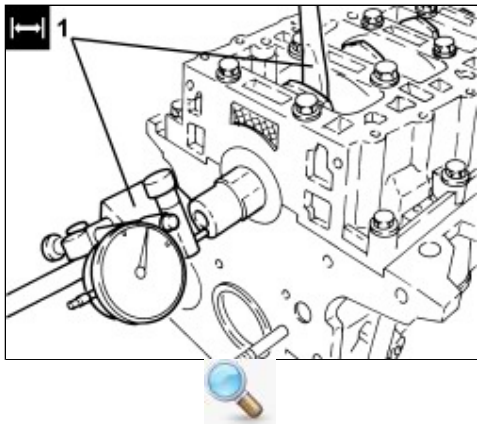
Tool	Description	Function	Validity
1860815000	Flange	Crankshaft rotation	1.4 Turbo Petrol



1. Undo the bolts (1a) and remove the connecting rod caps (1b).
2. Remove the lower connecting rod half-bearings.
3. Remove the connecting rod - piston assemblies.
4. Remove the upper connecting rod half-bearings.

The arrow on the piston crown facing the timing side indicates the fitting direction.

 The matching of the connecting rod-cap is "BREAKING" type therefore the position is compulsory and the number corresponding to the position of the cylinder must be present.



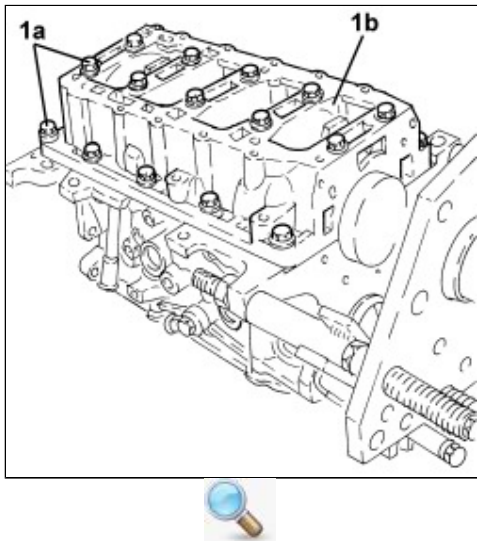
- Remove the flange for rotating the crankshaft fitted previously.

1. Using a dial gauge, check that the crankshaft end float is within specified limits.

Size	Value	Validity
Crankshaft end float (mm)	0.155 ÷ 0.355	1.4 Turbo Petrol

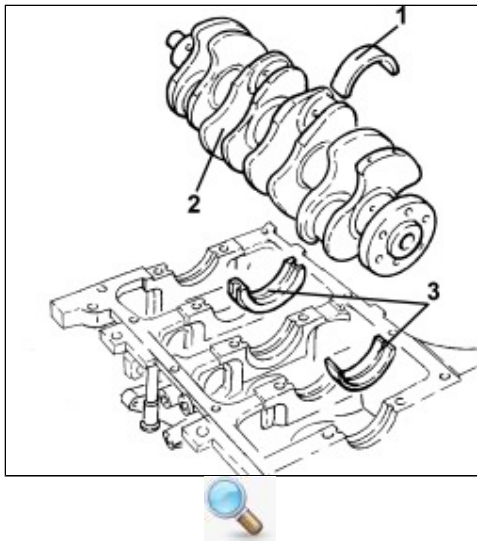
- Remove the dial gauge.

 If the value for the crankshaft end float does not correspond to the prescribed figures, when refitting, regrind the engine block seat and use the central main bearing half incorporating appropriately oversized crankshaft thrust half-washers.

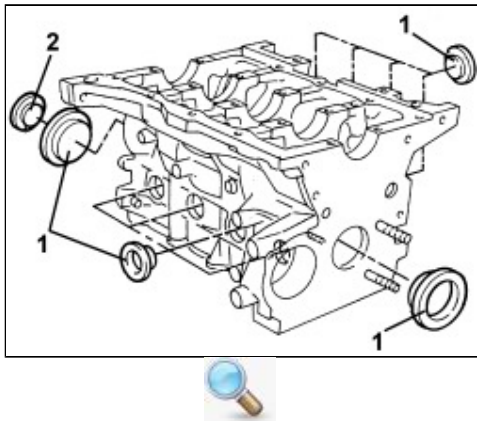
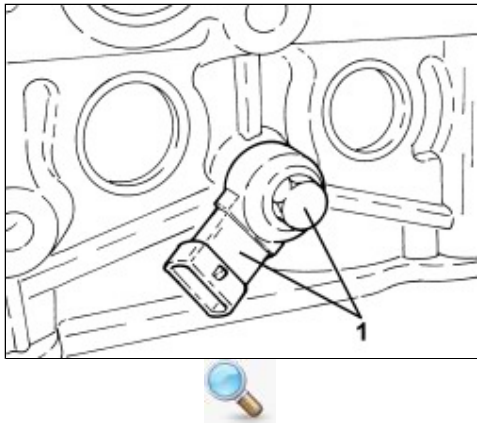


1. Undo the bolts (1a) and remove the lower crankcase (1b), complete with lower half-bearings, from the engine block.

1. Remove the lower main half bearings from the engine block.
2. Remove the crankshaft.
3. Remove the upper main half-bearings.



1. Undo the bolt and remove the knock sensor.

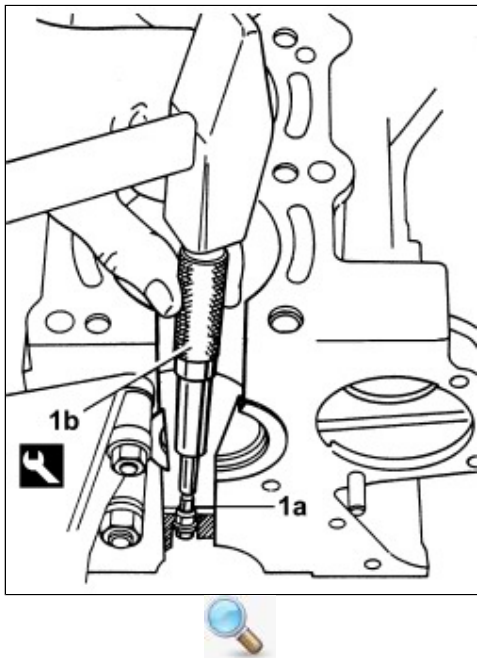


- Remove the lower crankcase locating bushes with the engine block.
- Raise the engine block using a hydraulic lift and place it on a suitable workbench.

[Op. 1028H60 SET OF PISTONS, GUDGEON PINS AND RINGS - REPLACE PISTONS AND CONNECTING RODS AT THE BENCH - INCLUDES ALIGNMENT AND BALANCING](#)

[Op. 1084B18 ENGINE OIL PUMP, REMOVED - CHECK AT THE BENCH](#)

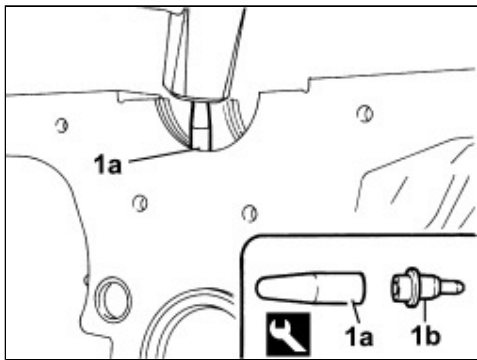
1. Remove the coolant chamber plugs from the crankcase using an appropriate steel striker.
2. Remove the lubrication duct plug from the engine block using a steel striker.



1. Remove the oil jets (1a) using the tool (1b).

Tool	Description	Function	Validity
1860395000	Drift	Engine oil jet removal	1.4 Turbo Petrol

-  Insert the striker guide hole on the nozzle surface to prevent the striker from slipping and damaging the cylinder liner during the removal operation.
-  Use new oil jets when refitting.



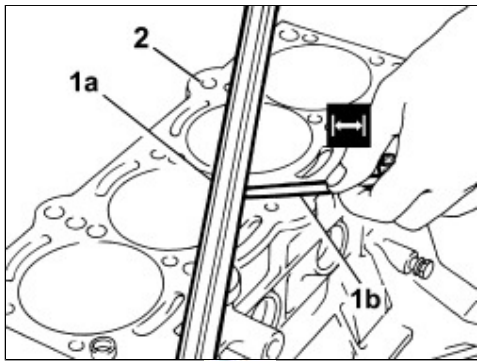
 Refitting ([Removing](#) )

- Wash and check the appearance of all components removed.
- Place the engine block on the overhaul stand.
- Fit the water/oil sealing plugs in the engine block using suitable fitting tools and sealant.
- Fit the locating bushes for the engine block.

1. Use the tool (1a) and a plastic mallet to fit the new oil jets (1b).



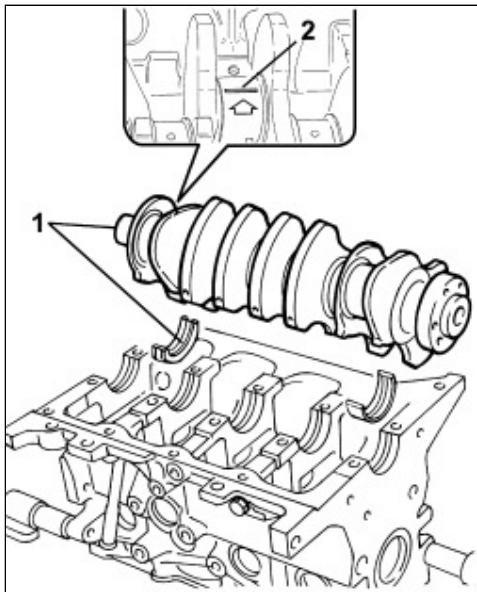
Tool	Description	Function	Validity
1860313000	Fitting tool	Engine oil jet fitting	1.4 Turbo Petrol



1. Using a calibrated metal rule (1a) and a feeler gauge (1b), check the flatness of the cylinder head - engine block support surface.

2. If the measurement does not correspond to the prescribed values, regrind the cylinder head support surface.

Size	Value	Validity
Engine cylinder head lower surface flatness (mm)	< 0.1	1.4 Turbo Petrol



- Measure the diameter of the cylinder liners and check that they correspond to the prescribed figures.

Size	Value	Validity
Cylinder liner inner diameter - Grade A (mm)	72.000 ÷ 72.010	1.4 Turbo Petrol
Size	Value	Validity
Cylinder liner inner diameter - Grade B (mm)	72.010 ÷ 72.020	1.4 Turbo Petrol
Size	Value	Validity
Cylinder liner inner diameter - Grade C (mm)	72.020 ÷ 72.030	1.4 Turbo Petrol

- Check that the ovality of the cylinder liners is within the prescribed limits.

Size	Value	Validity
Cylinder liner ovality (mm)	+/- 0.05	1.4 Turbo Petrol

- Check that the taper of the cylinder liners is within the prescribed limits.

Size	Value	Validity
Cylinder liner taper (mm)	+/- 0.005	1.4 Turbo Petrol

- If the cylinder bore, taper or ovality measurements are not within the prescribed limits, ream the cylinder bores following the prescribed oversizes.



In the case of reaming, all the liners must have the same oversize.

Size	Value	Validity
Cylinder liner inner diameter oversize (mm)	0.1	1.4 Turbo Petrol

- Check that the diameter of the main journals is within the prescribed limits.

Size	Value	Validity
Main journal diameter - Grade A (mm)	47.994 ÷ 48.000	1.4 Turbo Petrol
Size	Value	Validity
Main journal diameter - Grade B (mm)	47.988 ÷ 47.994	1.4 Turbo Petrol
Size	Value	Validity
Main journal diameter - Grade C (mm)	47.982 ÷ 47.988	1.4 Turbo Petrol

- If the diameter of the main journals does not fall within the prescribed values, they should be reground to the prescribed undersize.

 Because the crankshaft has undergone nitriding, this treatment should be repeated and the size re-checked if it is ground.

Size	Value	Validity
Main journal diameter undersize (mm)	0.127	1.4 Turbo Petrol

- Check that the diameter of the crankpins is within the prescribed limits.

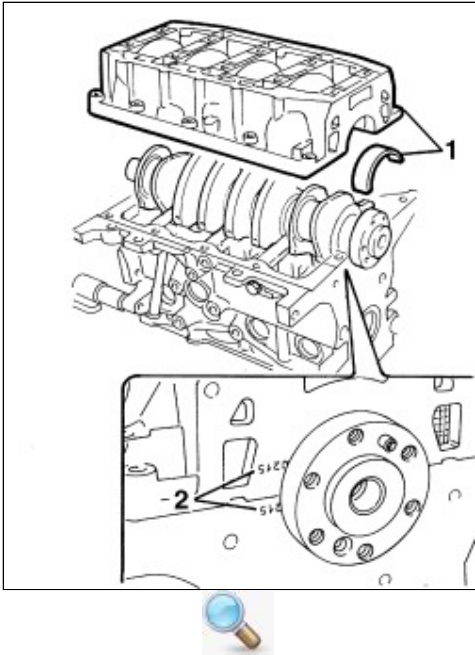
Size	Value	Validity
Crankpin diameter (mm)	41.990 ÷ 42.008	1.4 Turbo Petrol

- If the diameter of the crankpins is not correct, they should be reground to the prescribed undersize.

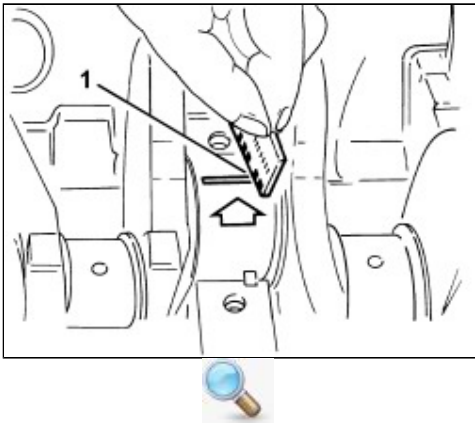
 Because the crankshaft has undergone nitriding, this treatment should be repeated and the size re-checked if it is ground.

Size	Value	Validity
Crankpin diameter undersize (mm)	0.127	1.4 Turbo Petrol

- Check the main bearings, noting that the half-bearings should not be adapted. Replace them if scoring or signs of binding are found.
 - Fit the main bearing halves in their seats on the upper crankcase, aligning the lubrication ports and ensuring scrupulous cleanliness. The centre main bearing half incorporates the thrust half-washers because it performs a load-bearing function and also acts as a thrust bearing.
 - If the crankshaft has been ground, fit new oversize half-bearings to restore the initial tolerance conditions.
- Fit the crankshaft in the special housing in the engine block with the upper half-bearings.
 - Fit the calibrated wire (Plastigage) for measuring the main journal clearance.
- Fit the main half-bearings in the lower crankcase.
 - Fit the lower crankcase on the engine block, checking that the codes stamped on both parts of the engine block correspond, because the engine block components are not interchangeable.



- The size of the main half-bearings is given.



Size	Value	Validity
Main half-bearings - Category 1 (Red) (mm)	1.836 ÷ 1.840	1.4 Turbo Petrol
Size	Value	Validity
Main half-bearings - Grade 2 (Blue) (mm)	1.843 ÷ 1.847	1.4 Turbo Petrol
Size	Value	Validity
Main half-bearings - Grade 3 (Yellow) (mm)	1.848 ÷ 1.852	1.4 Turbo Petrol
Size	Value	Validity
Main bearing half undersize (mm)	0.127	1.4 Turbo Petrol

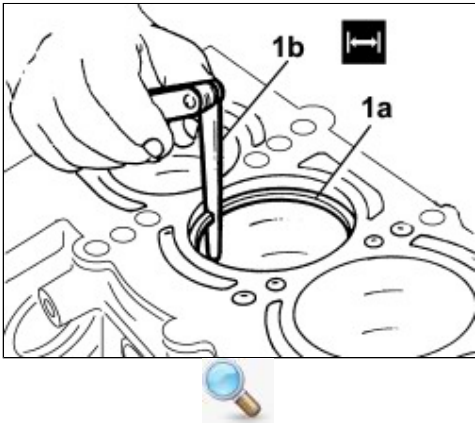
- Tighten the screws securing the lower crankcase to the engine block to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Engine block	Central screw	M10	1.9 ÷ 2.1 + 80°	1.4 Turbo Petrol
Component	Fastening	Ø	Value (daNm)	Validity
Engine block	Side screw	M8	2.9 ÷ 3.2	1.4 Turbo Petrol

1. Remove the lower crankcase and check the main journal clearance. Use an appropriate measuring device to measure the width of the calibrated wire.

 Check one journal at a time, without rotating the crankshaft.

Size	Value	Validity
Clearance between main bearings - crankshaft main journals (mm)	0.025 ÷ 0.040	1.4 Turbo Petrol



- After checking all the main journals, apply sealant to the contact surfaces between the lower crankcase and upper crankcase. Then fit the lower crankcase permanently by tightening the screws to torque in the order described previously.

 Apply a 2-mm thick continuous sealant strip to the lower crankcase surface.

- Check that the outer diameter of the pistons corresponds to the recommended figures; if not, replace the pistons complete with sealing rings and piston pins.

Size	Value	Validity
Piston outer diameter -Grade A (mm)	71.960 ÷ 71.970	1.4 Turbo Petrol
Size	Value	Validity
Piston outer diameter - Grade B (mm)	71.970 ÷ 71.980	1.4 Turbo Petrol
Size	Value	Validity
Piston outer diameter - Grade C (mm)	71.980 ÷ 71.990	1.4 Turbo Petrol

 Measure perpendicular to the gudgeon pin axis, 9 mm from the lower edge of the skirt.

- Position the pistons in the cylinder liners and use a feeler gauge to measure the specified clearance.

Size	Value	Validity
Clearance between piston - cylinder liner (mm)	0.030 ÷ 0.050	1.4 Turbo Petrol

- Check that the inner bore of the piston pin housings is within the prescribed limits; if not, replace the pistons.

Size	Value	Validity
Gudgeon pin outer diameter (mm)	17.978 ÷ 17.982	1.4 Turbo Petrol

- Check that the outer diameter of the piston pins is within the recommended limits; if not, replace the worn parts.

Size	Value	Validity
Gudgeon pin outer diameter (mm)	17.970 ÷ 17.974	1.4 Turbo Petrol

- Use a micrometer gauge to measure the thickness of the piston sealing rings.

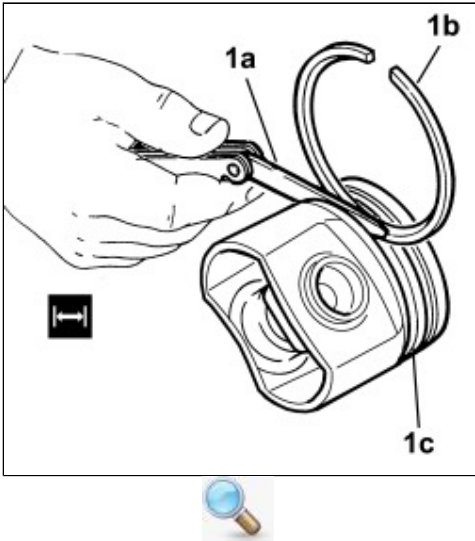
Size	Value	Validity
Cylinder compression 1st sealing ring thickness (mm)	1.170 ÷ 1.195	1.4 Turbo Petrol
Size	Value	Validity
Cylinder compression 2nd sealing ring thickness (mm)	1.170 ÷ 1.190	1.4 Turbo Petrol
Size	Value	Validity

Cylinder compression 3rd sealing ring thickness (mm)	1.970 ÷ 1.990	1.4 Turbo Petrol
Size	Value	Validity
Sealing ring oversize (mm)	0.1	1.4 Turbo Petrol

1. Fit the sealing rings (1a) in the cylinder liners/bores and use a feeler gauge (1b) to check the gap between the seal ends is within specified limits. Otherwise replace the sealing rings.

Size	Value	Validity
Cylinder compression 1st sealing ring gap (mm)	0.20 ÷ 0.35	1.4 Turbo Petrol
Size	Value	Validity
Cylinder compression 2nd sealing ring gap (mm)	0.40 ÷ 0.60	1.4 Turbo Petrol
Size	Value	Validity
Cylinder compression 3rd sealing ring gap (mm)	0.20 ÷ 0.40	1.4 Turbo Petrol

- Check that the piston ring seats are within the prescribed values.



Size	Value	Validity
Sealing ring seat in piston - 1st groove (mm)	1.220 ÷ 1.240	1.4 Turbo Petrol
Size	Value	Validity
Sealing ring seat in piston - 2nd groove (mm)	1.210 ÷ 1.230	1.4 Turbo Petrol
Size	Value	Validity
Sealing ring seat in piston - 3rd groove (mm)	2.010 ÷ 2.030	1.4 Turbo Petrol

1. Use a feeler gauge (1a) to check the mating clearance between the retaining rings (1b) and the grooves on pistons (1c).

Size	Value	Validity
Cylinder compression 1st sealing ring end float (mm)	0.025 ÷ 0.070	1.4 Turbo Petrol
Size	Value	Validity
Cylinder compression 2nd sealing ring end float (mm)	0.020 ÷ 0.060	1.4 Turbo Petrol

Size	Value	Validity
Cylinder compression 3rd sealing ring end float (mm)	0.020 ÷ 0.060	1.4 Turbo Petrol

- Check that the diameters of the big ends and the small ends are within the prescribed values.

Size	Value	Validity
Big end diameter (mm)	45.138 ÷ 45.148	1.4 Turbo Petrol
Size	Value	Validity
Small end diameter with bush (mm)	17.993 ÷ 18.000	1.4 Turbo Petrol

The small end bush cannot be separated from the actual connecting rod.



The bush is therefore handled by the Parts Dept. together with the connecting rod.

[Op. 1028H60 SET OF PISTONS, GUDGEON PINS AND RINGS - REPLACE PISTONS AND CONNECTING RODS AT THE BENCH - INCLUDES ALIGNMENT AND BALANCING](#)

[Op. 1084B18 ENGINE OIL PUMP, REMOVED - CHECK AT THE BENCH](#)

- Fit the tool for rotating the crankshaft.

Tool	Description	Function	Validity
1860815000	Flange	Crankshaft rotation	1.4 Turbo Petrol

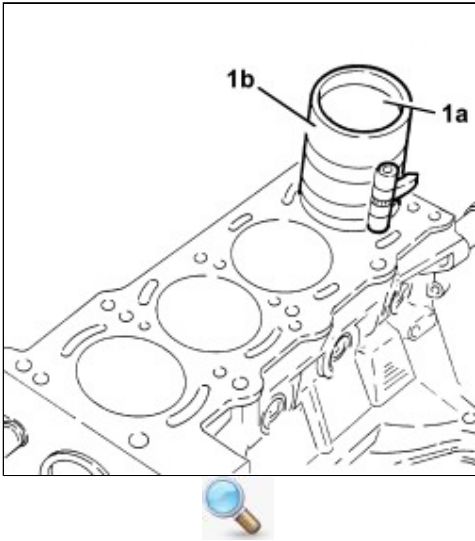
- Fit the connecting rod-piston assemblies and align in accordance with the following references.

1. Piston class and arrow indicating timing side.
2. Area on the inlet side where the number indicating the cylinder to which the connecting rod belongs is stamped.
3. Gudgeon pin offset

 The matching of the connecting rod-cap is "BREAKING" type therefore the position is compulsory and the number corresponding to the position of the cylinder must be present.

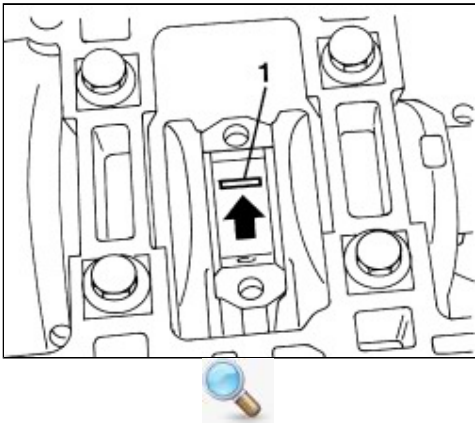
 Letters identifying the cylinder liner classes are shown on the engine block.

1. Fit connecting rod/piston assemblies (1a) with half-bearings, using tool (1b) to compress retaining rings and then fit the piston into the liner.



- Rotate the engine on the overhaul stand.

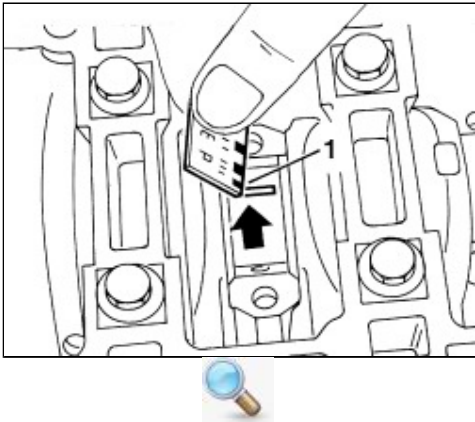
1. Apply the calibrated wire (Plastigage) for measuring the crankpin clearance.



- The size of the connecting rod half-bearings is given.

Size	Value	Validity
Connecting rod half-bearing thickness (mm)	1.544 ÷ 1.548	1.4 Turbo Petrol
Size	Value	Validity
Connecting rod half-bearing 1 oversize (mm)	0.127	1.4 Turbo Petrol
Size	Value	Validity
Connecting rod half-bearing 2 oversize (mm)	0.254	1.4 Turbo Petrol
Size	Value	Validity
Connecting rod half-bearing 3 oversize (mm)	0.508	1.4 Turbo Petrol

- Refit the connecting rod caps complete with half-bearings and secure them by tightening the screws to the prescribed torque.



The connecting rod caps are fracture type. If replaced, they are supplied pre-fractured by the manufacturer. Check that the parts are free of burrs, blisters, scratches or any other surface defect. Before installation, parts must be thoroughly washed, cleaned and dried. Fit the connecting rod caps so that the number stamped on each cap faces towards the same side as the number stamped on the big end.

Each connecting rod must be paired with its cap, respecting the numerical references stamped on the parts. Connecting rods and connecting rod caps are not interchangeable.

Component	Fastening	Ø	Value (daNm)	Validity
Connecting rod caps	Screw	M8	1.9 ÷ 2.1 + 40° +/- 2°	1.4 Turbo Petrol

1. Remove the connecting rod caps and check the crankpin clearance. Use an appropriate gauge to measure the width of the calibrated wire.

Check one crankpin at a time, without rotating the crankshaft.

Size	Value	Validity
Clearance between connecting rod bearings - crankpin bearings (mm)	0.024 ÷ 0.060	1.4 Turbo Petrol

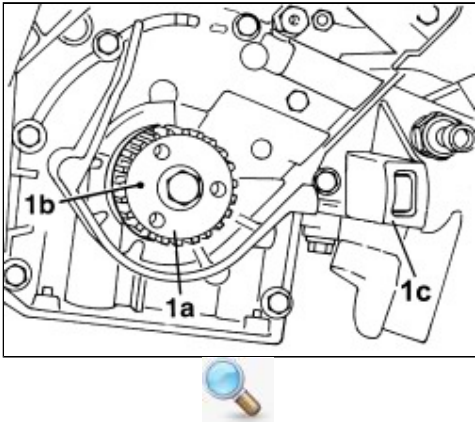
- If the value measured is not within the prescribed figures, replace the connecting rod bearings.

- Refit the connecting rod caps complete with half-bearings and secure them by tightening the screws to the torque given previously.

- Rotate the engine on the overhaul stand.

- Position a new oil pump gasket.

- Fit the front engine block cover with built-in oil pump complete with intake chamber and secure by tightening the screws to the prescribed torque.



Component	Fastening	Ø	Value (daNm)	Validity

Engine oil pump	Screw	M6	0.9 ÷ 1.1	1.4 Turbo Petrol
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- Place the minimum engine oil pressure switch in position and tighten it to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Engine oil pressure warning light switch	-	M14	2.9 ÷ 3.5	1.4 Turbo Petrol

- Fit the oil seal on the crankshaft front cover using the tool.

Tool	Description	Function	Validity
1860990000	Fitting tool	Fitting camshaft oil seal	1.4 Turbo Petrol

- Remove the flange for rotating the crankshaft fitted previously.

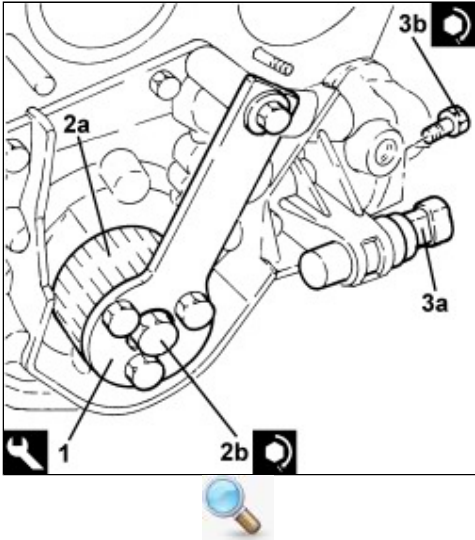
- Place a new engine block rear cover with integrated oil seal ring in position and secure it by tightening the screws to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Crankshaft rear cover to engine block	Screw	M6	0.8 ÷ 1.0	1.4 Turbo Petrol

- Place the crankshaft gear in its housing.

1. Because the timing is adjusted with the four pistons in line, i.e. half-way along their effective strokes, it is essential to position the crankshaft timed with the camshafts. They can be approximately positioned by turning the crankshaft gear (1a) until the locating dowel (1b) is positioned opposite to the rpm sensor seat (1c) with the first cylinder piston in descending phase, i.e. intake.

1. Position the counter-torque tool.



Tool	Description	Function	Validity
2000004500	Template	Crankshaft timing	1.4 Turbo Petrol

2. Secure the crankshaft gear (2a) by tightening the screw (2b) to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Crankshaft gear	Screw	M12	1.9 ÷ 2.1 + 110°	1.4 Turbo Petrol

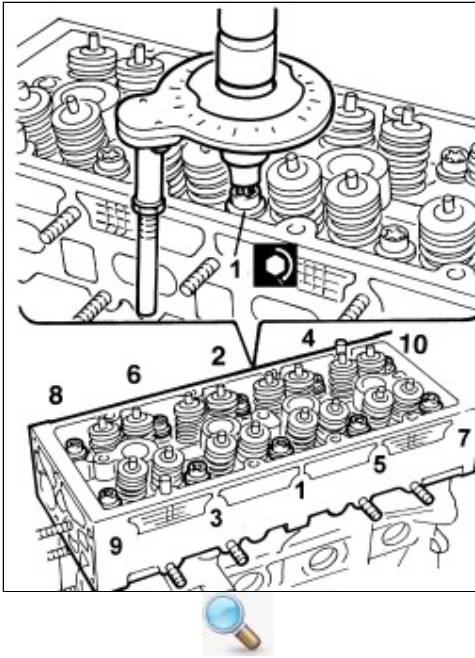
3. Position the rpm sensor (3a) in its housing and secure it by tightening the bolt (3b) to the recommended torque.

Component	Fastening	Ø	Value (daNm)	Validity
Rpm sensor	-	M6	0.8 ÷ 1.0	1.4 Turbo Petrol

- Apply silicone sealant to the splining on the flange securing the water pump to the engine block.

- Position the water pump in its housing and secure it, tightening the screws and the nut to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Water pump	Screw	M6	0.9 ÷ 1.1	1.4 Turbo Petrol



Component	Fastening	Ø	Value (daNm)	Validity
Water pump	Nut	M6	0.9 ÷ 1.1	1.4 Turbo Petrol

- Rotate the engine through 180° on the overhaul stand.
- Clean the lower crankcase and oil sump contact surfaces, removing the silicone sealant residues.
- Apply the sealant without a break to the entire perimeter of the oil sump.
- Position the oil sump in its housing and secure it, tightening the screws and the nuts to the prescribed torque.

 When positioning the oil sump, avoid significant sideways movements that could remove the sealant.

Component	Fastening	Ø	Value (daNm)	Validity
Engine oil sump	Screw	M6	0.8 ÷ 1.0	1.4 Turbo Petrol
Component	Fastening	Ø	Value (daNm)	Validity
Engine oil sump	Nut	M6	0.8 ÷ 1.0	1.4 Turbo Petrol

- Rotate the engine through 180° on the overhaul stand.
- Fit the locating bushes for the engine block.
- Fit a new cylinder head gasket on the cylinder block.
- Position the cylinder head on the engine block, aligning the locating dowels.

1. Tighten the screws securing the cylinder head to the prescribed torque.

 Follow the order shown in the figure for each tightening sequence.

Component	Fastening	Ø	Value (daNm)	Validity
Cylinder head	Screw	M9	3.0 + 90° + 90°	1.4 Turbo Petrol

- Fit the locating bushes and position the camshaft housing seal on the cylinder head support plane.
- Position the tappet retaining tools beneath the camshaft housing, then place the camshaft housing on the cylinder head and withdraw the tools.
- Use the tool to tighten the camshaft housing screws to the prescribed torque.

Tool		Description		Function		Validity			
1860834000		Key		Loosen/tighten upper cylinder head screws Loosen/tighten crankcase sump side screws		1.4 Turbo Petrol			
Component		Fastening		Ø		Value (daNm)		Validity	
Camshaft housing		Screw		M8		1.3 ÷ 1.6		1.4 Turbo Petrol	

- Refit the plugs complete with new O-rings and tighten them to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity

Upper cylinder head plugs	Plugs	M16	1.3 ÷ 1.6	1.4 Turbo Petrol
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- Place the camshaft driven pulley in its housing without tightening the screw.
- Fit the camshaft driven pulley locking tool.

Tool	Description	Function	Validity
2000015800	Counter-torque	Locking driven pulley	1.4 Turbo Petrol

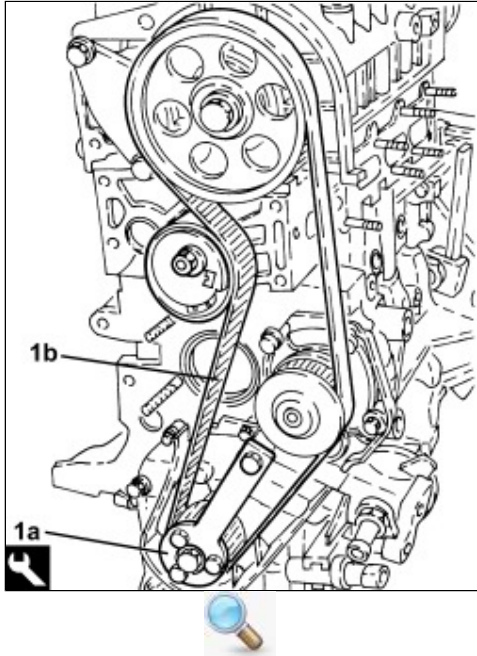
- Tighten the camshaft driven pulley screw to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Driven timing pulley	Screw	M12	10.8 ÷ 13.2	1.4 Turbo Petrol

- Tighten the retaining screws for the camshaft idler gears to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Ingranaggi alberi distribuzione	Vite	M12	12.0	1.4 Turbo Benzina

- Loosen the screw securing the camshaft driven pulley and remove the locking tool.
1. After fitting the tool (1a), proceed with fitting the timing drive belt (1b), fitting it at first on the crankshaft gear, on the water pump pulley, on the camshaft driven pulley and lastly on the mobile tensioner.



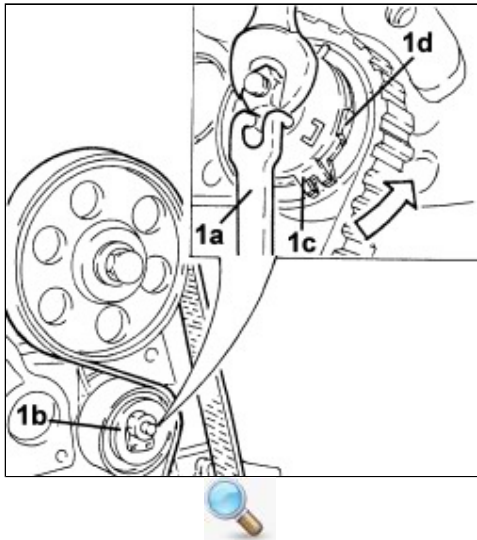
Tool	Description	Function	Validity
2000004500	Template	Crankshaft timing	1.4 Turbo Petrol

- 🛠️ Ensure that this operation is performed with the camshaft driven pulley slack.

- Camshaft timing was adjusted previously by applying special tools.

Tool	Description	Function	Validity
1860985000	Locating pins	Camshaft timing	1.4 Turbo Petrol

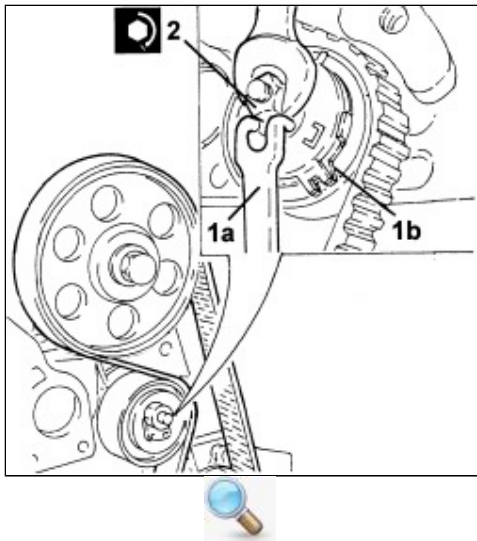
1. Tension the timing belt by turning it anticlockwise with the tool (1a) and the moving tensioner (1b) and then secure it when the reference fork (1c) touches the striker (1d).



Tool	Description	Function	Validity
1860987000	Key	Tensioning toothed timing drive belt	1.4 Turbo Petrol

- Fit the camshaft driven pulley locking tool.

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Tool	Description	Function	Validity
2000015800	Counter-torque	Locking driven pulley	1.4 Turbo Petrol

- Tighten the camshaft driven pulley screw to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Driven timing pulley	Screw	M12	10.8 ÷ 13.2	1.4 Turbo Petrol

- Remove the tools previously fitted for timing and make the crankshaft turn for two revolutions.

1. Loosen the moving tensioner nut and adjust the front fork using tool (1a) until it is aligned with rear fork (1b).

2. Tighten the nut securing the moving tensioner to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Timing control moving tensioner	Nut	M8	2.2 ÷ 2.7	1.4 Turbo Petrol

- Turn the crankshaft through two revolutions in its normal rotation direction, then reposition the tools used to adjust timing and check the engine is timed.

- Remove the tools used for timing the engine.

- Place the side plugs in their seats in the camshaft housing and tighten them to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Upper cylinder head plugs	Plugs	M16	1.3 ÷ 1.6	1.4 Turbo Petrol

- Place the flywheel side camshaft seal rear cover in its housing and secure it using the nuts.

- Place the water pump inlet pipe, complete with a new gasket, in position and secure it by tightening the screws to the engine block and to the cylinder head to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Water pump rigid inlet pipe	Screw	M6	0.9 ÷ 1.1	1.4 Turbo Petrol

- Fit the ignition coils and tighten them to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Ignition coils	Screw	M6	0.9	

- Position the timing sensor in its housing and secure it using the screw.

- Place the timing side engine support in position and secure it by tightening the screws to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Timing side power unit rigid support	Screw	M10	5.4 ÷ 6.6	1.4 Turbo Petrol

- Fit the upper and lower timing belt covers and secure them using the screws.

- Position the crankshaft pulley in its housing and secure it by tightening the screws to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Service pulley on crankshaft	Screw	M8	2.3 ÷ 2.8	1.4 Turbo Petrol

- Place the oil filter mounting and engine oil heat exchanger in position and tighten the connector, crankshaft oil seal front cover side, to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Heat exchanger and oil filter mounting - oil pump side	Screw	M20	4.1 ÷ 4.5	1.4 Turbo Petrol

- Tighten the screw securing the engine oil heat exchanger and oil filter mounting assembly, engine block side, to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Heat exchanger and oil filter mounting - crankcase side	Screw	M10	4.5 ÷ 5.5	1.4 Turbo Petrol

- Place the exhaust manifold-turbocharger assembly, complete with new gasket, back in its housing and secure it by tightening the new nuts to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Exhaust manifold	Nut	M8	1.4 ÷ 1.6 + 30° +/- 3°	1.4 Turbo Petrol

- Place the exhaust manifold heat shield in its housing and tighten the nuts to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Exhaust manifold heat shield	Nut	M6	0.8 ÷ 1.0	1.4 Turbo Petrol

- Place the turbocharger coolant return pipe, complete with new gaskets, in position and tighten the connectors.

 The connectors should be tightened keeping the pipe still. Any movement of the pipe of more than 3° will adversely affect the seal of the connectors.

- Place the turbocharger lubrication oil supply pipe, complete with new gasket, back in its housing and tighten the connectors to the prescribed torque.

 The connectors should be tightened keeping the pipe still. Any movement of the pipe of more than 3° will adversely affect the seal of the connectors.

Component	Fastening	Ø	Value (daNm)	Validity
Engine oil supply pipe to turbocharger - heat exchanger side	Connector	M6	0.8 ÷ 1.0	1.4 Turbo Petrol
Component	Fastening	Ø	Value (daNm)	Validity

Engine oil supply pipe to turbocharger - turbocharger side	Connector	M12	1.8 ÷ 2.2	1.4 Turbo Petrol
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- Tighten the screw securing the turbocharger lubrication oil supply pipe intermediate mounting bracket.

- Place the engine oil heat exchanger coolant return pipe, complete with new gaskets, in position and tighten the connectors.

 The connectors should be tightened keeping the pipe still. Any movement of the pipe of more than 3° will adversely affect the seal of the connectors.

- Place the engine oil heat exchanger coolant delivery pipe, complete with new gaskets, in position and tighten the connectors to the prescribed torque.

 The connectors should be tightened keeping the pipe still. Any movement of the pipe of more than 3° will adversely affect the seal of the connectors.

Component	Fastening	Ø	Value (daNm)	Validity
Coolant supply pipe to engine oil heat exchanger	Screw	M16	3.0 ÷ 3.6	1.4 Turbo Petrol

- Tighten the screws securing the coolant delivery pipe to the engine oil heat exchanger, engine block side and heat exchanger side.

- Place the turbocharger lubrication oil return pipe, complete with new gaskets, back in its housing and tighten the screws to the prescribed torque.

 Tighten the "slotted screw" first when connecting the pipe to the turbocharger.

 The connectors should be tightened keeping the pipe still. Any movement of the pipe of more than 3° will adversely affect the seal of the connectors.

Component	Fastening	Ø	Value (daNm)	Validity
Engine oil supply pipe to turbocharger	Screw	M6	0.8 ÷ 1.0	1.4 Turbo Petrol

- Tighten the intermediate connector securing the turbocharger lubrication oil return pipe to the engine block, engine oil heat exchanger side, to the prescribed torque.

 The connector should be tightened keeping the pipe still. Any movement of the pipe of more than 3° will adversely affect the seal of the connector.

Component	Fastening	Ø	Value (daNm)	Validity
Engine oil return pipe from turbocharger - oil filter mounting side	Connector	M16	3.0 ÷ 3.6	1.4 Turbo Petrol

- Place the water-engine oil heat exchanger heat shield in its housing and tighten the screws to the prescribed torque.

- Place the engine oil filter heat shield in its housing and tighten the screws to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Engine oil filter heat shield	Screw	M6	0.8 ÷ 1.0	1.4 Turbo Petrol

- Refit the bracket complete with pressurized air by-pass solenoid and tighten the fastenings.

- Refit the oil vapour separator and tighten the screws.

- Refit the air chamber in its seat and tighten the new screws to the prescribed torque.

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Component	Fastening	Ø	Value (daNm)	Validity
Air chamber	Screw (to be replaced)	M7	1.3 ÷ 1.6	1.4 Turbo Petrol

- Connect the oil vapour supply pipe to the air chamber and tighten the band.
- Place the air chamber mounting bracket in position and tighten the screws.
- Place the engine oil dipstick pipe back in its housing and secure it with the bolt.
- Place the intermediate shaft bearing support in position and secure it by tightening the screws to the prescribed torque.

Component	Fastening	Ø	Value (daNm)	Validity
Intermediate driveshaft bearing support	Screw	M8	2.3 ÷ 2.8	1.4 Turbo Petrol

- Fit the alternator and air conditioning compressor mounting in position and tighten the fastenings to the prescribed torque.
- Place the alternator in position and tighten the relevant screws.
- Place the air conditioning compressor in position and tighten the screws.
- Fit the auxiliary drive belt, adjust the moving tensioner and then remove the locking pin.
- Place the engine wiring back in position and tighten the screw securing the ignition coil wiring duct.
- Connect the electrical connections for the ignition coils.
- Secure the electrical connection for the timing sensor.
- Connect the earth lead and tighten the screw.
- Connect the electrical connection for the engine coolant temperature sensor.
- Connect the electrical connection for the pressurized air by-pass solenoid valve.
- Connect the electrical connection for the throttle body.
- Connect the wiring duct to the air chamber using the retaining clips.
- Connect the electrical connection for the fuel vapour solenoid valve.
- Connect the electrical connection for the knock sensor.
- Connect the injector wiring junction.
- Connect the electrical connection for the air conditioning compressor.
- Connect the alternator earth lead and tighten the nut.
- Place the timing belt inner guard in its housing and secure it using the screws.
- Connect the earth lead to the auxiliary support and tighten the screw.
- Connect the electrical connection for the air temperature and pressure sensor.
- Connect the electrical connection for the exhaust gas temperature sensor.
- Connect the electrical connection for the minimum engine oil pressure switch.
- Connect the electrical connection for the engine rpm sensor.