

Mercedes-Benz Engines

4-CYLINDER DIESEL & 5-CYLINDER TURBO DIESEL

ENGINE CODING

ENGINE IDENTIFICATION

Engine identification number is stamped on left side of cylinder block. First 6 digits of this number are used for engine identification purposes.

ENGINE IDENTIFICATION

Application	Chassis Type	Engine Code
240D (4-Cyl.)	123.123	616.912
300D (5-Cyl. Turbo)	123.130	617.912
300CD (5-Cyl. Turbo)	123.150	617.912
300SD (5-Cyl. Turbo)	126.120	617.951
300TD (5-Cyl. Turbo)	123.193	617.952

ENGINE, MANIFOLDS & CYLINDER HEAD

ENGINE

Removal

1) Drain cooling system from plug on side of cylinder block. Remove engine hood, radiator and fan shroud. (On some models, hood may be raised 90° to allow for engine removal.) Remove air filter with intake duct.

2) Draw oil from power steering pump reservoir and disconnect hoses. If equipped with air conditioning, dismount and set compressor aside, do not disconnect refrigerant hoses.

3) Remove control linkage with shaft and set aside. Disconnect all coolant, vacuum, oil, fuel, electrical lines and hoses which lead to engine. On turbocharged models, loosen oil filter cover and raise slightly. Disconnect exhaust system at turbocharger.

4) On all other models, disconnect exhaust pipe at exhaust manifold. On all models, remove lateral support for exhaust pipe at transmission. If equipped with level control, remove pump and set aside, leaving lines connected.

5) Remove engine mount bolts at chassis. Remove drive shaft shield and disconnect drive shaft at transmission. Disconnect engine shock absorbers at chassis. Disconnect shift lever and all electrical connections at transmission.

6) Remove transmission cross-member retaining bolts, and remove cross-member. Attach sling to lifting eyes and hoist engine/transmission assembly out at an angle of approximately 45°. Separate engine/transmission assembly.

Installation

Lower engine/transmission assembly into position, and reverse removal procedure to complete installation.

NOTE: Ensure that oil cooler, lines and filter housing have been flushed if installing new engine as a result of bearing failure.

TURBOCHARGER

Removal (Turbo Diesel Only)

1) Remove air filter assembly and all ducting. Disconnect wire from temperature switch. Remove vacu-

um line and crankcase breather pipe. Disconnect engine oil supply line to turbocharger.

2) Remove air filter mounting bracket. Disconnect exhaust flange at exhaust manifold. Remove exhaust pipe bracket on automatic transmission and move exhaust pipe to rear.

3) Remove intermediate flange mounting bracket. Remove 4 mounting nuts holding turbocharger to manifold and remove turbocharger. Cover oil return pipe.

Installation

1) Install new flange gasket so that reinforcing bead is towards exhaust manifold. Ensure that center housing is filled with approximately 1/4 pint of oil.

2) Install intermediate flange and oil return pipe and install turbocharger. To complete installation, reverse removal procedure.

INTAKE & EXHAUST MANIFOLDS

Removal

Remove air cleaner assembly. Remove all vacuum lines and electrical connections that would interfere with manifold removal. Remove manifold retaining bolts, and remove manifold.

Installation

Clean gasket mating surfaces. Install manifold, using new gasket. Reverse removal procedure to complete installation.

CYLINDER HEAD

Removal

NOTE: Ensure engine has cooled down before removing cylinder head.

1) Drain cooling system and disconnect all water hoses attached to cylinder head. Remove air cleaner and ducting. If equipped with level control, remove pump and set aside, leaving lines connected.

2) If equipped with power steering, remove pump with bracket and fuel filter and set aside. On turbocharged models, loosen and pull up oil filter cover slightly, and remove turbocharger.

3) Detach all remaining electrical connections, water, fuel and vacuum lines from cylinder head and intake manifold. Unbolt dipstick guide tube of automatic transmission from intake manifold.

4) Disconnect exhaust pipe from manifold or turbocharger and at transmission support. Remove throttle control linkage and set aside. Remove injection lines, and cover all connections.

5) Remove exhaust manifold support at manifold. Remove camshaft cover. Loosen, but do not remove camshaft sprocket bolt. Rotate crankshaft by using socket tool on crankshaft pulley so that No. 1 cylinder is at TDC on compression stroke.

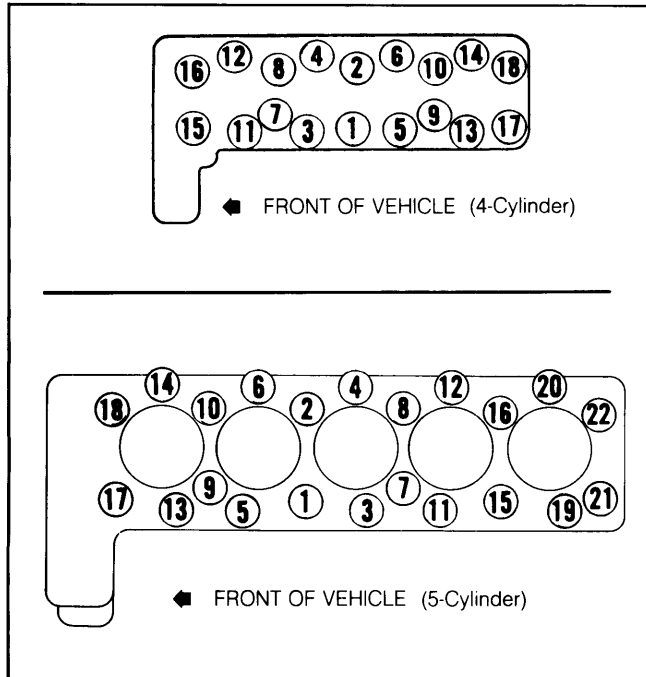
6) Loosen, and remove rocker arm assembly bracket bolts evenly. Remove rocker arm assemblies. Mark camshaft sprocket and timing chain for proper assembly. Remove chain tensioner plug, and remove tensioner spring.

7) Remove timing chain guide rail from cylinder head. Remove camshaft sprocket. Loosen and remove head bolts in reverse order of tightening sequence. See Fig. 1. Attach sling to lifting eyes on head and lift head from engine. Thoroughly clean all mating surfaces of head and cylinder block.

4-CYLINDER DIESEL & 5-CYLINDER TURBO DIESEL (Cont.)

NOTE: Injection nozzles must be removed prior to removing the 5 head bolts next to nozzles.

Fig. 1: Cylinder Head Tightening Sequence



When removing cylinder head, loosen bolts in reverse order.

Installation

1) Ensure that No. 1 piston is still at TDC. Place new head gasket into position, ensuring that locating dowels are in correct position. Install cylinder head on block. Install cylinder head bolts, ensuring there of proper length. Tighten cylinder head bolts.

2) To complete installation, reverse removal procedure, and note the following. Adjust valve clearance. Use new seals and gaskets when installing all components. Run engine until warm, then loosen each head bolt 1/4 turn and tighten in sequence. See Fig. 1.

CAMSHAFT

TIMING CHAIN

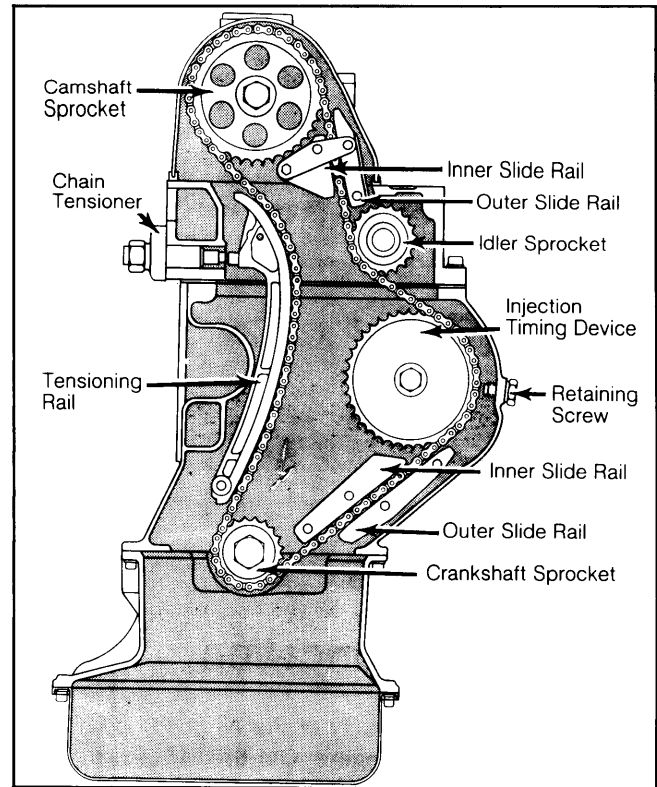
Removal & Installation

1) A split link timing chain is available for repairs without dismantling engine. Remove glow plugs, and camshaft cover. Remove air cleaner adapter. Cover chain guard with cloth and grind open both pins of a link in the timing chain.

2) Remove old link and insert new split link with new chain attached. Turn crankshaft slowly in normal direction while feeding new chain in, and old chain out. Ensure that chain does not slip on sprockets and install master (split) link from rear so that retainer will be at front of engine.

3) Install link spring lock with closed end facing direction of rotation. Rotate crankshaft through one complete revolution and check that all timing marks still agree. To complete installation, reverse removal procedure.

Fig. 2: Timing Chain and Related Components



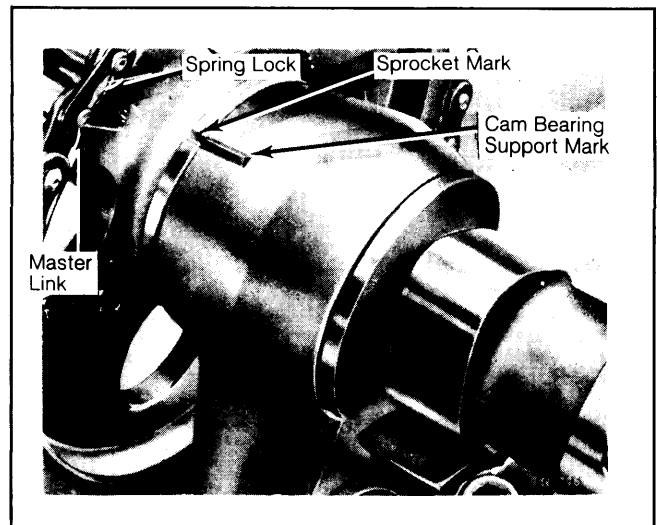
Timing chain can be replaced without major dismantling of engine.

VALVE TIMING

1) Rotate No. 1 piston to TDC of compression stroke. Align camshaft timing mark with mark on No. 1 camshaft bearing support bracket. Install camshaft sprocket.

2) If correct valve timing is not achieved when camshaft sprocket is installed, offset Woodruff keys are available to make timing corrections, see following table:

Fig. 3: Camshaft Timing Mark Locations



Ensure timing marks are correctly aligned.

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4-CYLINDER DIESEL & 5-CYLINDER TURBO DIESEL (Cont.)

OFFSET WOODRUFF KEYS

Offset	Crankshaft Correction
.0275" (.7 mm)	4°
.0354" (.9 mm)	6 1/2°
.0433" (1.1 mm)	8°
.0511" (1.3 mm)	10°

INJECTION PUMP TIMING

1) To check injection pump timing (start of fuel delivery), turn crankshaft in normal direction until 24° BTDC mark is at pointer with No. 1 piston on compression stroke. Remove first pumping element pipe connection and valve ports and install overflow pipe in their place.

2) Set control lever to full throttle position. Attach auxiliary fuel container to pump inlet fitting. Rotate engine until fuel stream stops from overflow pipe and drips are at least 10-15 seconds apart. Delivery should occur when pipe stops dripping and crankshaft is on 24° BTDC mark.

3) Turn crankshaft 2 more full turns and check that fuel stops dripping at end of second full turn if pump timing is correct. If adjustment is required, loosen pump mounting nuts and turn pump toward engine to advance delivery and away from engine to retard start of delivery.

4) When timing is correct, tighten mounting nuts and recheck start of delivery. Disconnect auxiliary fuel container and overflow pipe. Connect normal fuel line and install first pumping element with fittings.

CAMSHAFT

Removal

Remove camshaft cover and camshaft sprocket. See Cylinder Head in this article. Remove shim from camshaft together with bearings and oil pipe. To install apply engine oil to camshaft bearings, camshaft journals and cams. Place camshaft into bearings from rear.

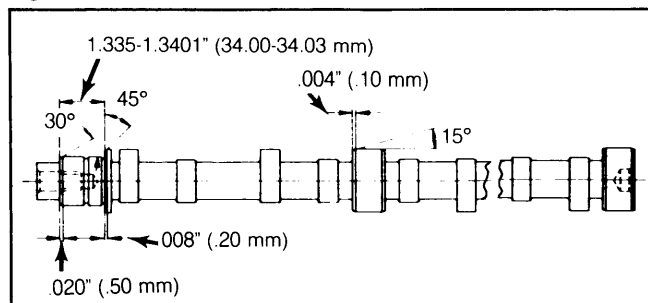
Installation

Reverse removal procedure, ensuring that camshaft supports and dowel pins are aligned.

CAMSHAFT BEARING REPLACEMENT

1) Inspect camshaft bearings for wear. If worn, grind bearing journals and fit undersize bearings.

Fig. 4: Detailed View of Camshaft



Install camshaft into bearings from rear.

2) Bearing on No. 1 journal controls camshaft end play. Width of journal is 1.3385-1.3401" (34.0-34.03 mm). Place bearing on camshaft and install retaining ring.

3) Using a feeler gauge, measure clearance between camshaft flange and bearing. Lap bearing to

proper fit. The following table lists camshaft bearing journal diameters for standard and undersize bearings:

CAMSHAFT JOURNAL DIAMETERS

Application	Bearing No. 1 In. (mm)	No. 2 & 3 In. (mm)	¹ No. 4 In. (mm)
Standard	1.375 (34.94)	1.831 (46.51)	1.926 (48.94)
Intermediate (Grey)	1.371 (34.84)	1.824 (46.34)	1.923 (48.84)
1st Undersize (Red)	1.365 (34.69)	1.818 (46.19)	1.916 (48.69)

¹ — Only applies to 5-cylinder engine.

VALVES

VALVE ARRANGEMENT

4-Cylinder

E-I-I-E-E-I-I-E (Front-to-rear).

5-Cylinder

E-I-I-E-E-I-I-E-E-I (Front-to-rear).

ROCKER ARM ASSEMBLIES

Removal

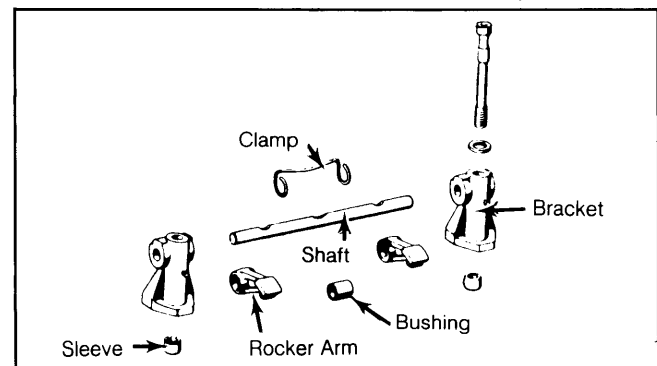
1) Remove air cleaner, and camshaft cover. Loosen rocker arm bracket bolts and rotate camshaft so there is no load on rocker arms being removed.

2) Remove front assembly (serving 2 front cylinders), then rotate camshaft so that rear assembly can be removed without tension. Disassemble and replace parts as required.

Installation

To install, reverse removal procedure. Adjust valve clearance.

Fig. 5: Detailed View of Rocker Arm Assembly



Loosen and/or tighten bolts evenly.

VALVE SPRINGS & OIL SEALS

Removal

With rocker arms and brackets removed from head, install spring compressor and remove adjusting cap and lock nut from valve stem. Remove collar and valve spring. Old seal may be pried off with screwdriver or pulled off with pliers.

4-CYLINDER DIESEL & 5-CYLINDER TURBO DIESEL (Cont.)

Installation

Note that intake seals are color coded Black and exhaust seals are Green. Position assembly sleeve over valve stem and press new seal onto guide with tool (617 589 00 43 00). Replace valve spring, collar, lock nut and adjusting cap.

VALVE GUIDE SERVICING

Checking Valve Guides

After removal of valve spring and valve stem seal, the wear on valve guide can be determined by moving valve stem crosswise in relation to engine. Maximum movement of .004" (.12 mm) is allowed.

Removing & Inserting Guides

1) Drive out valve guide with knock-out mandrel from direction of combustion chamber or press out. Insert valve guide into liquid oxygen for approximately 3-4 minutes. Insert immediately into respective bore, and drive in with a hammer.

2) If no liquid oxygen is available, heat head in a water bath, or heat in an oven to a maximum of 176°F (80°C). Coat valve guide with lubricant, and drive in with knock-in mandrel until circlip or knock-in mandrel rests against cylinder head. Guides are pressed in from rocker side. Check guide bores and ream for proper clearance as required.

3) Valve guides are available in standard and 1 oversize (color Red). An interference fit of .0004-.0015" (.010-.040 mm) is used. If guide does not meet specifications, replace. Note that intake guides are 2.362" (60 mm) long and exhaust guides are 1.909" (48.5 mm) long.

VALVE GUIDES SPECIFICATIONS

Application	Guide O.D. In. (mm)	Cyl. Head Bore In. (mm)
Standard .....	.5522-.5527 (14.03-14.04)	.5511-.5518 (14.00-14.02)
Oversize (Red) .....	.5601-.5605 (14.23-14.24)	.5590-.5597 (14.20-14.22)

VALVE CLEARANCE ADJUSTMENT

NOTE: Valves should be adjusted with engine at normal operating temperature. Cold specifications are provided for initial settings after assembly of engine.

1) Adjust valves according to firing sequence (1-3-4-2 on 4 cylinder engine and 1-2-4-5-3 on 5 cylinder engine). Rotate crankshaft so piston of valves to be

VALVE CLEARANCE SPECIFICATIONS

Valve	In. (mm)
Intake	
Cold .....	.004 (.10)
Warm .....	.006 (.15)
Exhaust	
Cold	¹ .012 (.30)
Warm	¹ .014 (.35)

¹ — Clearances for Turbo Diesel are .04" (.10 mm) for intake, and .016" (.40 mm) for exhaust.

adjusted is at TDC on compression stroke. Measure clearance between surface of camshaft and rocker arm.

2) To adjust, fit holding wrench on valve retainer. Loosen cap nut while holding hex nut and adjust clearance by turning cap nut. After adjustment, lock cap nut by tightening hex nut and recheck valve clearance.

PISTONS, RINGS & PINS

OIL PAN

Removal

1) Drain engine oil and remove or raise engine hood to 90° position. Disconnect air cleaner corrugated duct and remove throttle control shaft. Remove fan shroud, and place over fan. Remove oil dipstick tube bracket at power steering pump bracket.

2) Remove A/C compressor, and loosen clamp for air/oil cooler lines. Disconnect engine shock absorbers at chassis. Loosen exhaust system lateral support at transmission. Remove engine mounting bolts from chassis. Remove oil cooler lines for automatic transmission at transmission, between intermediate flange and upper section of pan.

3) Remove 4 lower bolts on intermediate flange and remove intermediate flange shield. Remove lower oil pan retaining bolts, and remove pan. Use drift and drive oil dipstick guide tube out as far as it will go. Remove strainer extension with strainer from oil pump. Remove upper oil pan bolts.

4) Attach engine sling and hoist to front of engine, and raise enough to remove oil pan upper section. Pull out oil dipstick guide tube. Turn crankshaft until counterweights and connecting rods clear pan, and lower and remove pan from block.

Installation

1) Install new radial seal in groove at rear of pan. Ensure that mating surfaces are clean. Coat upper pan section with gasket compound. Place upper pan in position and insert dipstick guide tube. On turbocharged engine, insert oil return line from turbocharger.

2) Bolt upper section of pan to engine. Mount strainer extension and strainer to oil pump. Use new gasket and bolt lower pan to upper pan. To complete installation, reverse removal procedure.

PISTON & ROD ASSEMBLY

Removal

1) Place piston on connecting rod with arrow on piston crown facing forward. Circlip grooves in connecting rods face to left side of engine (intake manifold side). Coat piston pin with engine oil and press in by hand. Insert piston pin circlips in grooves.

2) Lubricate cylinder bores, rod bearing journals, rod bearing shells and pistons. Arrange gaps of piston rings around piston circumference evenly. Install piston ring compressor, and guide in piston with arrow facing forward.

3) Place connecting rod bearing caps on connecting rods, with cap code numbers aligning with connecting rod code numbers. Tighten rod cap nuts. Measure piston protrusion above top of cylinder block with piston at TDC. Piston should project at least .020" (.50 mm), but not more than .035" (.90 mm) above block.

Mercedes-Benz Engines

4-CYLINDER DIESEL & 5-CYLINDER TURBO DIESEL (Cont.)

FITTING PISTONS & RINGS

1) Measure piston and cylinder diameters to determine running clearance. Piston diameter is measured at 90° to piston pin bore near bottom of piston skirt.

2) There are 2 compression rings, and 1 oil ring. Install compression rings with markings "top" or "F" and oil ring with marking "GOE" or "F" facing upward.

CRANKSHAFT MAIN & CONNECTING ROD BEARINGS

MAIN BEARING SERVICE

Measure main bearing and connecting rod journals for out-of-round and taper. Out-of-round must not exceed .0002-.0004" (.005-.010 mm) and taper must not exceed .0004-.0006" (.010-.015 mm). Select proper under-size (if required), and grind crankshaft to diameters shown in Crankshaft Journal Diameters table.

CRANKSHAFT JOURNAL DIAMETERS

Application	Main In. (mm)	Con. Rod In. (mm)
Standard	2.7541-2.7545 (69.95-69.96)	2.0454-2.0458 (51.95-51.96)
1st Undersize	2.7442-2.7446 (69.70-69.71)	2.0356-2.0360 (51.70-51.71)
2nd Undersize	2.7344-2.7348 (69.45-69.46)	2.0257-2.0261 (51.45-51.46)
3rd Undersize	2.7246-2.7249 (69.20-69.21)	2.0159-2.0163 (51.20-51.21)
4th Undersize	2.7147-2.7151 (68.95-68.96)	2.0060-2.0064 (50.95-50.96)

THRUST BEARING ALIGNMENT

1) Third main bearing is equipped with separate shells and thrust washers in place of 2 one piece bearing inserts. Two identical thrust washers are inserted in cylinder block, and 2 remaining halves are fitted in bearing cap.

2) Bottom halves have 2 tabs to prevent turning and avoid incorrect installation. Following size thrust washers are available to adjust crankshaft end play: .085" (2.15 mm), .087" (2.20 mm), .089" (2.25 mm), .092" (2.35 mm) and .094" (2.40 mm).

REAR MAIN BEARING OIL SEAL

Removal

With oil pan and crankshaft removed, pull old seal from groove in crankcase and oil pan.

Installation

Insert new radial seal in groove and press into place using an oiled hammer handle. To provide overlap, cut seal off .040" (1 mm) above separation surface. Coat seal halves with engine oil.

FRONT OIL SEAL

Removal

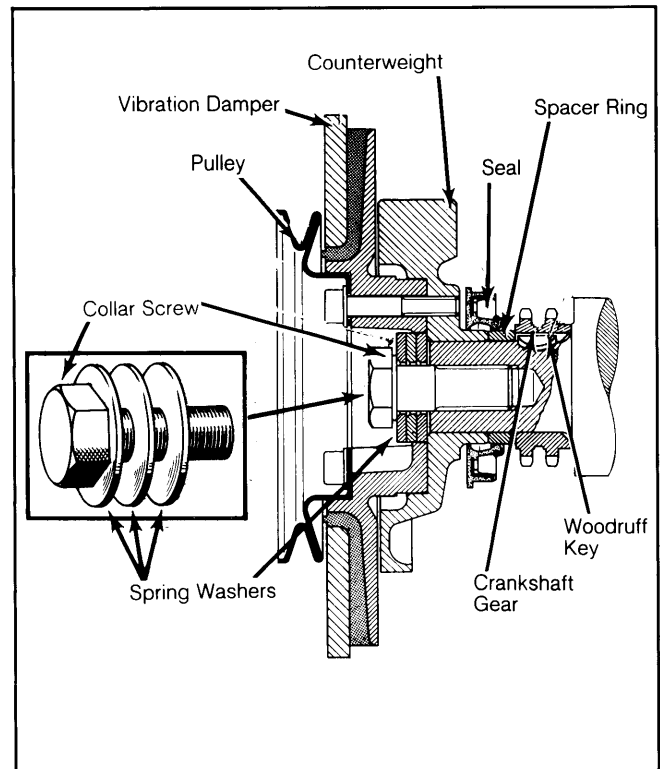
Remove radiator and fan shroud. Remove front pulley and vibration dampener. Pry old oil seal from front cover, using a screwdriver. If fitted with original seal, remove spacer washer with puller (616 589 00 33 00).

NOTE: On some engines, chrome plated spacer ring will not be required. Replacement seals for Turbo Diesel are of Green Viton inside and Black acrylic outside. Other seals are Black outside and White inside.

Installation

Install new spacer ring (if required) and lubricate seal lips with engine oil. Ensure that seal cavity is clean and free of nicks and scratches. Place seal squarely into recess, and use seal installation tool to press seal into proper position.

Fig. 6: Sectional View of Crankshaft Front Oil Seal



Lubricate oil seal lips with engine oil.

ENGINE OILING

CRANKCASE CAPACITIES

4 & 5-Cylinder — 7.0 qts. (6.6L).
5-Cylinder Turbo — 7.9 qts. (7.5L).

NORMAL OIL PRESSURE

7.1 psi. (.5 kg/cm²) at 700-780 RPM idle speed;
42 psi. (3 kg/cm²) at 3000 RPM.

OIL FILTER

Oil filter is vertically mounted and contains a single cartridge composed of a main and by-pass section.

PRESSURE REGULATOR VALVE

Non-adjustable.

ENGINE OILING SYSTEM

Engine lubrication is provided by a gear type oil pump, which force feeds oil through an oil filter to oil

4-CYLINDER DIESEL & 5-CYLINDER TURBO DIESEL (Cont.)

gallery. From oil gallery, oil flows to main and connecting rod bearings. Pistons, wrist pins and connecting rod bushings are splash lubricated.

A vertical oil passage from oil gallery has a transverse passage which supplies oil to intermediate sprocket shaft and bearings. Another oil passage supplies oil to oil pump drive shaft and helical gear.

Vertical passage also supplies oil to No. 1 camshaft bearing. An external oil tube attached to No. 1 camshaft bearing support, lubricates other camshaft bearings and rocker arms.

NOTE: Turbo Diesel models have an external line feeding oil to the turbocharger with a gravity feed back to the crankcase. Additionally, the main oil gallery feeds spray nozzles, for cooling the pistons.

OIL PUMP

Removal (240D)

With engine oil pan removed, remove oil pump mounting screw on crankcase and remove oil pump.

Installation

Install oil pump and tighten mounting screw on crankcase and bearing cap. Install oil pan, using new gasket.

Removal (All Other Models)

Remove oil pan. Oil pump is chain driven and must have sprocket and chain removed prior to pump removal. Remove 5 oil pump mounting bolts. Remove connecting pipe from engine block, and remove pump.

Installation

Use new "O" ring and insert connecting pipe. Ensure that sprocket and chain are properly mounted and install oil pump. Mount sprocket on pump drive shaft and install tensioning rail and spring.

ENGINE COOLING

THERMOSTAT

Opens at 172-180°F (78-82°C).

ENGINE SPECIFICATIONS

GENERAL SPECIFICATIONS

Year	Displacement		Fuel System	HP@RPM	Torque Ft. Lbs.@RPM	Compr. Ratio	Bore		Stroke	
	Cu. In.	cc					In.	mm	In.	mm
1982										
4-Cyl.	146.4	2399	Fuel Inj.	67@4000	97@2400	21.0:1	3.57	90.9	3.64	92.4
5-Cyl.	183.0	2998	Fuel Inj.	120@4350	170@2400	21.5:1	3.57	90.9	3.64	92.4

VALVES

Engine Size & Valve	Head Diam. In. (mm)	Face Angle	Seat Angle	Seat Width In. (mm)	Stem Diameter In. (mm)	Stem Clearance In. (mm)	Valve Lift In. (mm)
All Intake	1.563-1.571 (39.70-39.90)	30°	30°	.051-.063 (1.3-1.6)	.3906-.3913 (9.92-9.94)	.0030 (.075)	.....
Exhaust	1.343-1.350 (34.10-34.30)	30°	30°	.098-.114 (2.5-2.9)	.3906-.3913 (9.92-9.94)	.0030 (.075)	.....

COOLING SYSTEM CAPACITY

4-Cylinder 10.6 qts. (10.3L).

5-Cylinder 11.6 qts. (11.0L).

5-Cylinder Turbo 12.7 qts. (12.0L).

WATER PUMP

Removal

Drain cooling system and loosen "V" belts. Remove fan and drive pulley. Disconnect hoses from pump. Remove mounting bolts, and remove pump.

Installation

Coat new gasket with sealer, and mount pump on engine. Install fan and hub, and adjust belts. Fill radiator and expansion tank to mark and run engine. After temperature reaches approximately 140°F (60°C), install radiator cap and check for leaks.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Cylinder Head (Hex Head Bolts) ¹	
Step 1	51 (70)
Step 2	66 (90)
Step 3	73 (100)
Cylinder Head (12-Point Head Bolts)	
Step 1	30 (40)
Step 2	² 51 (70)
Rocker Arm Support Bolts	29 (39)
Prechamber in Cyl. Head	108-130 (157-177)
Nozzle Holder in Prechamber	51-58 (69-79)
Glow Plugs	36 (49)
Connecting Rod Caps	36 (49)
Main Bearing Caps	65 (88)
Crankshaft Front Hex Bolt	195-239 (265-325)
Camshaft Sprocket Bolt	58 (79)

¹ — Setting time between steps 2 & 3 is 10 minutes.

² — Loosen head bolts 1/4 turn, and retighten in sequence to final torque after engine is warm.

Mercedes-Benz Engines

4-CYLINDER DIESEL & 5-CYLINDER TURBO DIESEL (Cont.)

ENGINE SPECIFICATIONS (Cont.)

PISTONS, PINS, RINGS

Engine	PISTONS	PINS		RINGS		
	Clearance In. (mm)	Piston Fit In. (mm)	Rod Fit In. (mm)	Ring No.	End Gap In. (mm)	Side Clearance In. (mm)
All	.0007-.0015 (.018-.0138)	1	Push Fit	No. 1	.0079-.0138 (.20-.35)	.004-.005 (.100-.132)
				No. 2	.0079-.0138 (.20-.35)	.003-.004 (.070-.102)
				No. 3	.0098-.0157 (.25-.40)	.001-.002 (.030-.062)

¹ — Interference fit. See Piston & Rod Assembly in this article.

CRANKSHAFT MAIN & CONNECTING ROD BEARINGS

Engine	MAIN BEARINGS				CONNECTING ROD BEARINGS		
	Journal Diam. In. (mm)	Clearance In. (mm)	Thrust Bearing	Crankshaft End Play In. (mm)	Journal Diam. In. (mm)	Clearance In. (mm)	Side Play In. (mm)
All	2.7541-2.7545 (69.95-69.96)	.0012-.0027 (.031-.068)	Center	.0039-.0090 (.10-.22)	2.0454-2.0458 (51.95-51.96)	.0012-.0027 (.031-.068)	.005-.010 (.12-.26)

VALVE SPRINGS

Engine	Free Length In. (mm)	PRESSURE Lbs. @ In. (Kg @ mm)	
		Valve Closed	Valve Open
All	2.015 (51.2)	.....	130.1@1.102 (59.0@28.0)

CAMSHAFT

Engine	Journal Diam. In. (mm)	Clearance In. (mm)	Lobe Lift In. (mm)
All No. 1	1.375 (34.94)	.0010-.0026 (.025-.066)	.003-.006 (.070-.149)
No. 2, 3 & 4	1.926 (48.94)	.0010-.0026 (.025-.066)	.....

VALVE TIMING

Engine	INTAKE		EXHAUST	
	Open (BTDC)	Close (ABDC)	Open (BBDC)	Close (ATDC)
All	13.5°	15.5°	19°	17°