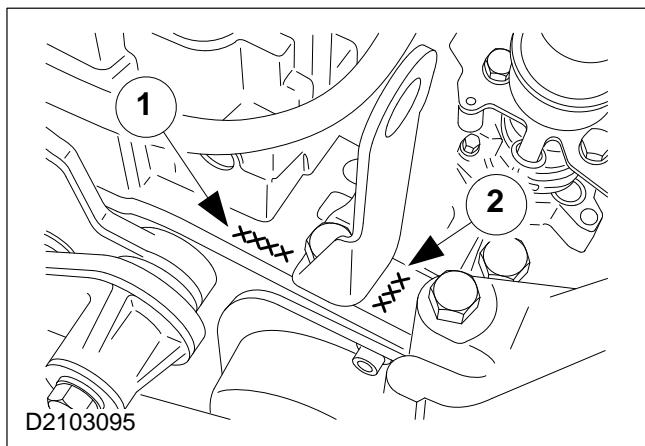


General Specifications

Engine Data

		2,5 TCI Diesel Engine
Engine management		EDC
Emission standard		94 EEC/12
Fuel		Diesel
Engine code		SCD
Injection sequence		1-3-4-2
Bore	mm	92
Stroke	mm	94
Cubic capacity effective	cc	2498
Compression ratio		20,2 – 21,7 : 1
Compression pressure at starter motor speed	bar	24 – 26
Power output (EEC) at	kW	92
	rev/min	4200
Power output (DIN) PS	kW	85
	PS	115
at	rev/min	4200
Torque (EEC/DIN) at		293
	rev/min	2000
Idle speed	rev/min	875 ± 25



Location of engine code/serial number

1. Serial number
2. Engine code

Dimensions

	mm
Cylinder block and main bearing housings	
Number of main bearings	5
Main bearing inside Ø, front	
Standard	63,043 – 63,088
1st undersize 0,25	62,793 – 62,838
2nd undersize 0,50	62,543 – 62,588
Main bearing shell width, front	31,750 – 32,250
Main bearing clearance (radial), front	0,043 – 0,103

Dimensions

	mm
Front main bearing, depth from front face	6
Main bearing inside \varnothing - main bearing housing	
Standard	63,050 – 63,093
1st undersize 0,25	62,800 – 62,843
2nd undersize 0,50	62,550 – 62,593
Main bearing shell width - main bearing housing	29,750 – 30,000
Main bearing clearance (radial) - main bearing housing	0,030 – 0,073
Main bearing inside \varnothing , rear	
Standard	70,050 – 70,065
1st undersize 0,25	69,800 – 69,815
2nd undersize 0,50	69,550 – 69,565
Main bearing shell width, rear	31,750 – 32,250
Main bearing clearance (radial), rear	0,050 – 0,085
Camshaft bearing inside \varnothing ,	
Windscreen	53,540 – 53,590
Middle	53,540 – 53,590
Rear	53,540 – 53,590
Camshaft bearing clearance (radial)	0,030 – 0,095
Cylinder liners	
Cylinder liner \varnothing	
Class A	92,000 – 92,010
Class B	92,010 – 92,020
Cylinder liner protrusion	0,00 – 0,05
Thickness of shims	0,15 / 0,17 / 0,20 / 0,23 / 0,25
Crankshaft	
Main bearing journal \varnothing , front	
Standard	62,985 – 63,000
1st undersize 0,25	62,735 – 62,750
2nd undersize 0,50	62,485 – 62,500
Main bearing journal \varnothing – main bearing housing	
Standard	63,005 – 63,020
1st undersize 0,25	62,755 – 62,770
2nd undersize 0,50	62,505 – 62,520
Main bearing journal \varnothing , rear	
Standard	79,980 – 80,000
1st undersize 0,25	79,730 – 79,750
2nd undersize 0,50	79,480 – 79,500
Big-end bearing journal \varnothing	
Standard	53,940 – 53,955
1st undersize 0,25	53,690 – 53,705
2nd undersize 0,50	53,440 – 53,440
Crankshaft end float	0,153 – 0,304
Thickness of thrust washers	

Dimensions

	mm
Standard	2,311 – 2,362
1st oversize	2,411 – 2,462
2nd oversize	2,511 – 2,562
Connecting Rods	
Bearing inner \varnothing , big-end	
Standard	53,977 – 54,016
1st undersize 0,25	53,727 – 53,766
2nd undersize 0,25	53,477 – 53,516
Bearing shell width	22,750 – 23,250
Connecting rod bearing clearance (radial), big-end	0,022 – 0,076
Bearing inner \varnothing , small end	30,035 – 30,050
Pistons	
Piston \varnothing (measured at right-angles to the piston pin bore)	
Class A	91,935 – 91,945
Class B	91,945 – 91,955
Piston clearance (when first fitted) class A – B	0,055 – 0,075
Piston protrusion at TDC	0,530 – 0,820
Piston ring gaps (fitted)	
Upper compression ring	0,25 – 0,50
Lower compression ring	0,20 – 0,35
Oil control ring	0,25 – 0,58
Piston ring clearance in piston groove	
upper compression ring	0,080 – 0,130
lower compression ring	0,070 – 0,102
Oil control ring	0,040 – 0,072
Ring gap positions	The piston ring gaps must be spread evenly around the circumference of the piston. This also applies to the elements of the oil control ring. Stagger the ring gaps at intervals of 120°.
Piston pins	
Piston pin type	“Floating” in piston and connecting rod
Piston pin retention	Circlips
Piston pin \varnothing	
Class A	29,990 – 29,993
Class B	29,993 – 29,996
Piston pin clearance (radial)	
Class A	0,039 – 0,042
Class B	0,057 – 0,060
Cylinder heads	
Number of cylinder heads	4
Height of cylinder heads	89,950 – 90,050
Height of end spacers	89,295 – 90,050

Dimensions

	mm
Thickness of cylinder head gasket with piston protrusion of	(Number of notch marks)
0,53 – 0,62	1,42 (1)
0.63 – 0.72 mm	1,52 (2)
0.73 – 0.82 mm	1,62 (0)
Camshaft	
Valve timings	
Inlet opens BTDC	26 °C/S
Exhaust closes ATDC	36 °C/S
Cam lift (camshaft)	
Inlet	7,019
Exhaust	7,303
Thickness of thrust plate, (S)	3,950 – 4,050
Camshaft end float	0,050 – 0,200
Bearing journal Ø	
	53,495 – 53,510
1st undersize 0,25	53,245 – 53,260
Fuel injection pump	
Manufacturer	Bosch
Type	VP36–VE4/10E2100 L688
Setting – plunger stroke after BDC	0,53 – 0,57

Engine Oil

Ambient Temperature		Specification
–15 to above +40 °C	Ford Super Engine Oil	SAE 15W40 – API SH/CD
–10 to above +40 °C	Ford Super Engine Oil	SAE 20W50 API SG/CD
–25 to above +40 °C	Ford XR+ High-performance High-lubricity Engine Oil	SAE 15W40 – API SH/CD
–25 to above +40 °C	Ford Formula S Synthetic Engine Oil	SAE 5W50 API SG/CD

Engine Lubrication

	bar
Oil pressure (minimum) , at idle speed (Oil temperature approx. 100 °C) at 4000 rev/min	1,5
	4
Pressure relief valve opening pressure	6,38

Lubricants, Fluids and Sealers

Description	Ford Specification
Coolant	ESD-M97B-49-A
Transmission fluid (MT 75)	ESD-M2C186-A
Lubricant – cylinder liner (bottom), connecting rod bolts, crankshaft rear oil seal, hydraulic tappets	SAE 15W40 API SG/CD (engine oil)

Lubricants, Fluids and Sealers

Lubricant for main and camshaft bearings, big-end bearings, oil pump pivot pins, vacuum pump pivot pins, timing gears	SQM-2C-9002-AA Hypoid oil SAE90
Lubricant for M12 cylinder head bolts	SAE 15W40 – API SG/CD (engine oil)
Lubricant for M14 cylinder head bolts	SQM-2C-9002-AA Hypoid oil SAE90
Lubricant for O-rings, crankshaft thrust washers	ESD-M1C220-A
Cylinder liner adhesive Loctite 222	WSK-M2G351-A4
Adhesive for oil dipstick tube, fuel injection pump studs, oilway blanking plugs, piston cooling nozzles	WSK-M2G349-A1
Adhesive for coolant temperature sensors, crankshaft pulley/vibration damper nut (Loctite 510)	WSK-M2G349-A7
Adhesive for pressure relief valve, cylinder block plugs	WSK-M2G348-A5
Sealer for sump	SLM-4G9111-A
Sealer for injectors	ESEAM-1C1014
Sealer – timing cover to engine block	SPM-2G9121-A

Capacities

Description	Litres
Engine oil, first fill with filter	7,3
incl. filter change	6,6
excl. filter change	6,0
Coolant	7,0
Transmission fluid (MT 75)	1,2

Timing Belt Tension

Description	
Belt tension, new (N)	332 – 375
Setting of automatic belt tensioner (X)	85
	Follow the instructions to adjust the belt tension.

Torques

General	Nm	lbf.ft
Hood hinge bolts	23	17
Front axle transverse brace to side members	80	59
Front axle/engine crossmember to side members	80	59
Starter motor		
Positive lead to starter motor		
Starter motor to transmission intermediate flange	35	26
Heat shield bracket to starter motor	12	9
Inlet manifold		
Inlet manifold to cylinder heads	32	24
Exhaust manifold		
Exhaust manifold to cylinder heads	32	24

Torques

Exhaust manifold to catalytic converter	47	35
Exhaust pipe to turbocharger	45	33
Exhaust pipe to catalytic converter	45	33
Fuel injection pump		
Gear to fuel injection pump	88	65
Blanking plug in fuel injection pump timing opening		
Fuel injection pipes to injectors and fuel injection pump	17	13
Fuel return pipe to fuel injection pump	27	20
Alternator		
Alternator bracket to cylinder block (M10)	47	35
Alternator to bracket – lower position	28	21
Alternator to bracket – upper position	47	35
Transmission		
Transmission intermediate flange to engine (M8)	27	20
M10	47	35
Transmission intermediate flange to sump	37	27
Transmission housing to sump	38	28
Transmission housing to transmission intermediate flange	44	32
Transmission mounting bracket	44	32
Starter motor to transmission intermediate flange	35	26
Crankshaft position (CKP) sensor to transmission intermediate flange	12	9
Coolant circuit		
Radiator and intercooler to crossmember	23	17
Coolant collecting pipe to cylinder heads	12	9
Coolant pump to cylinder block	25	18
Coolant pipe bracket to cylinder block	27	20
Coolant expansion tank to engine	5	4
Steering		
Steering intermediate shaft to steering shaft	24	18
Power steering pump pulley	31	23
Power steering pump with bracket to cylinder block	132	97
Power steering pump to bracket	21	16
Oil circuit		
Oil intake pipe bracket to cylinder block	27	20
Oil feed pipe to turbocharger	27	20
Sump blanking plug	35	26
Oil pipes to oil filter intermediate housing	60	44
Sump to cylinder block	12	9
Oil pump to cylinder block	27	20
Rocker arm oil feed pipe to cylinder heads	13	10
Oil feed pipe extension to cylinder block	25	18
Rocker arm oil feed pipe to connector	23	17
Oil feed pipe to hollow retaining screw in main bearing housing	33	24
Oil feed pipes to extension	25	18

Torques

Oil feed pipe to vacuum pump	27	20
Oil filter intermediate housing to cylinder block	60	44
Turbocharger		
Front exhaust pipe to turbocharger	45	33
Oil feed pipe to turbocharger	27	20
Heat shield to turbocharger, nuts	10	7
Heat shield to turbocharger, bolts	12	9
Vacuum pump		
Oil feed pipe to vacuum pump	27	20
Vacuum pump to cylinder block	21	15
Vacuum pump connector to cylinder block	54	40
Vacuum pump oil feed pipe to cylinder block	13	10
Vacuum pump oil feed pipe bracket to cylinder block	27	20
Engine mounting		
Engine mounting to front axle/engine support bar	50	37
Right-hand engine mounting bracket to cylinder block	47	35
Left-hand engine mounting bracket to cylinder block	47	35
Cylinder block		
Pipe flange to EGR valve	27	20
Fix cylinder liners with clamps	50	37
Main bearing housings	42	31
Hollow locating screws - main bearing housings to engine block	47	35
Big-end bearing caps, 1st stage	29	21
Big-end bearing caps, 2nd stage	60°	60°
Oil seal housing and main bearing housing to transmission flange	12	9
Sump to cylinder block	12	9
Oil pump to cylinder block	27	20
Oil intake pipe bracket to cylinder block	27	20
Camshaft thrust plate to cylinder block	29	21
Vacuum pump to cylinder block	21	15
Vacuum pump connector to cylinder block	54	40
Timing pulley to fuel injection pump	88	65
Timing cover to cylinder block	12	9
Crankshaft pulley/vibration damper to crankshaft	196	145
Flywheel to crankshaft, 1st stage	20	15
Flywheel to crankshaft, 2nd stage	75°	75°
Clutch to flywheel	27	20
Fuel injection pump to cylinder block	30	22
Oil feed pipe extension to cylinder block	25	18
Oil feed pipe to hollow retaining screw in main bearing housing	33	24
Vacuum pump oil feed pipe to cylinder block	13	10
Vacuum pump oil feed pipe bracket to cylinder block	27	20
Fuel filter retaining plate to cylinder block, M8	27	20
Fuel filter retaining plate to cylinder block, M10	47	35

Torques

Automatic belt tensioner clamp bolt	47	35
Automatic belt tensioner bracket to cylinder block	69	51
Alternator bracket to cylinder block	47	35
Air conditioning compressor	25	18
Engine lifting eye to cylinder block	47	35
Right-hand engine mounting bracket to cylinder block	47	35
Oil filter intermediate housing to engine block	60	44
Left-hand engine mounting bracket to cylinder block	47	35
Alternator upper bracket to cylinder block, M10	47	35
Alternator upper bracket to cylinder block, M12	69	51
Cylinder heads		
Exhaust manifold to cylinder heads	32	24
Glow plugs in cylinder heads	24	18
Cylinder head bolts M14, inner, 1st stage	30	22
Cylinder head bolts M14, inner, 2nd stage	70°	70°
Cylinder head bolts M14, inner, 3rd stage	70°	70°
Cylinder head bolts M12, outer, 1st stage	30	22
Cylinder head bolts M12, outer, 2nd stage	85°	85°
Inlet manifold to cylinder heads	32	24
Rocker shaft to cylinder heads	27	20
Injectors	69	51
Cylinder head cover to cylinder heads	16	12
Rocker arm oil feed pipe to cylinder heads	13	10
Coolant collecting pipe to cylinder heads	12	9
Retorque cylinder head bolts		
Cylinder head bolts M14, inner, 1st stage	-180° (undo)	-180° (undo)
Cylinder head bolts M14, inner, 2nd stage	30	22
Cylinder head bolts M14, inner, 3rd stage	130°	130°
Cylinder head bolts M12, outer, 1st stage	90	66