

General Specifications

General		
Engine management		EEC V
Emission standard		96 EC
Engine code		Y5A
Firing order		1-3-4-2
Bore	mm	89,6
Stroke	mm	91
Cubic capacity	cc	2295
Compression ratio		10,0:1
Compression pressure at starter motor speed	bar	
Engine power (EC rating)	kW	108
Engine power (EC rating)	PS	147
Engine power (EC rating), at	rev/min	5600
Torque (EC rating)	Nm	202
Torque (EC rating), at	rev/min	4500
Idle speed	rev/min	875
Engine speed, max. continuous	rev/min	6150
Engine speed, max. intermittent	rev/min	6375
Spark plugs		AGPR22P1
Spark plug gap	mm	1,0

Dimensions

Cylinder block		
Cast mark		2,3
Cylinder bore diameter, standard class 1	mm	89,60 – 89,61
Cylinder bore diameter, standard class 2	mm	89,61 – 89,62
Number of main bearings		5
Thrust bearing width (without thrust half washers) standard	mm	21,17 – 21,23
Fitted main bearing shells		
Vertical inner diameter, standard	mm	55,003 – 55,030
Vertical inner diameter, 1st undersize 0,05	mm	54,953 – 54,980
Vertical inner diameter, 2nd undersize 0,25	mm	54,753 – 54,780
Vertical inner diameter, 3rd undersize 0,50	mm	54,503 – 54,530
Vertical inner diameter, 4th undersize 0,75	mm	54,253 – 54,280
Main bearing parent bore diameter, standard	mm	59,287 – 59,300
Main bearing parent bore diameter, oversize 0,40	mm	59,687 – 59,700
Crankshaft		
End float	mm	0,093 – 0,303
Main bearing journal diameter, standard	mm	54,98 – 55,00
Main bearing journal diameter, undersize (green)	mm	54,73 – 54,75
Bearing shell to main bearing journal clearance	mm	0,020 – 0,039
Big end journal diameter, standard	mm	50,89 – 50,91
Big end journal diameter, undersize 0,25 (green)	mm	50,64 – 50,66

Thrust half washer thickness, standard	mm	2,494 – 2,544
Thrust half washer thickness, oversize 0,38 mm (yellow)	mm	2,301 – 2,351
Thrust bearing journal width, standard	mm	26,025 – 26,075
Thrust bearing journal width, oversize 0,38 (yellow)	mm	26,405 – 26,455
Connecting rod		
Bore diameter, big end	mm	53,89 – 53,91
Bore diameter, small end	mm	20,599
Fitted big-end bearing shells		
Vertical inner diameter, standard	mm	50,916 – 50,950
Vertical inner diameter, 1st undersize 0,025	mm	50,892 – 50,926
Vertical inner diameter, 2nd undersize 0,25	mm	50,666 – 50,700
Vertical inner diameter, 3rd undersize 0,50	mm	50,416 – 50,450
Vertical inner diameter, 4th undersize 0,75	mm	50,166 – 50,200
Vertical inner diameter, 5th undersize 1,00	mm	49,916 – 49,950
Big-end bearing journal to shell clearance	mm	0,006 – 0,060
Big-end bearing end float	mm	0,090 – 0,3610
Pistons		
Piston diameter, standard 1	mm	89,580 – 89,610
Piston diameter, standard 2	mm	89,590 – 89,620
Piston pin length	mm	63,0 – 63,8
Interference fit in small-end bore	mm	0,016 – 0,042
Piston ring gap (installed), top	mm	0,3 – 0,46
Piston ring gap (installed), middle	mm	0,5 – 0,76
Piston ring gap (installed), bottom	mm	0,15 – 0,71
Ring gap positions	Set the ring gaps at 90° to each other around the piston circumference; this also applies to each part of the oil scraper ring.	
Cylinder head with valve seat inserts*		
Cast mark		2,3
Upper correction angle, inlet valve (production)	°	30
Upper correction angle, exhaust valve (production)	°	30
Valve seat angle	°	44,5 – 45,5
Valve seat width, inlet	mm	1,18 – 2,02
Valve seat width, exhaust	mm	1,35 – 2,19
Lower correction angle, inlet (production)	°	75
Lower correction angle, exhaust (production)	°	75
Valve stem guide diameter, inlet	mm	7,063 – 7,094
Valve stem guide diameter, exhaust	mm	7,063 – 7,094
Camshaft bearing parent bore diameter	mm	26,00 – 26,03
Camshafts		
Number of camshaft bearings, each camshaft		5
Drive	Single roller chain	
Camshaft end float	mm	0,02 – 0,26
Cam lift, inlet	mm	9,4
Cam lift, exhaust	mm	8,75

Valve timing, inlet opens BTDC	°CS	9
Valve timing, inlet closes ABDC	°CS	51
Valve timing, exhaust opens BBDC	°CS	48
Valve timing, exhaust closes ATDC	°CS	12
Camshaft bearing journal diameter	mm	25,96 – 25,98
Valves		
Valve timing		DOHC
Valve clearance adjustment		Hydraulic tappets
Hydraulic tappet diameter	mm	30
Hydraulic tappet clearance in housing	mm	0,025 – 0,071
Inlet valve length	mm	111,67 – 112,13
Exhaust valve length	mm	111,37 – 111,83
Valve head diameter, inlet	mm	33,5
Valve head diameter, exhaust	mm	30,0
Valve stem diameter, standard inlet	mm	7,025 – 7,043
Valve stem diameter, standard exhaust	mm	6,999 – 7,017
Valve stem diameter, oversize 0,2 inlet	mm	7,225 – 7,243
Valve stem diameter, oversize 0,2 exhaust	mm	7,399 – 7,417
Valve stem diameter, oversize 0,4 inlet	mm	7,425 – 7,443
Valve stem diameter, oversize 0,4 exhaust	mm	7,199 – 7,217
Inlet valve stem guide clearance	mm	0,020 – 0,069
Exhaust valve stem guide clearance	mm	0,046 – 0,095
Free valve spring height	mm	43,6
Spring height (compressed)	mm	max. 26,5
Valve spring inner diameter	mm	17,2
Valve spring coil diameter	mm	3,7
Number of turns		7,4
Lubrication		
Oil pressure at 800 rev/min (with SAE 10W/30 and 80°C oil temperature)	bar	1,60
Oil pressure at 2000 rev/min (with SAE 10W/30 and 80°C oil temperature)	bar	3,10
Pressure relief valve opens at	bar	3,70 – 4,60
Oil control light comes on at	bar	0,30 – 0,50
Oil pump rotor/housing clearance	mm	0,154 – 0,304
Inner/outer rotor clearance	mm	0,05 – 0,20
Rotor end float at mating face	mm	0,039 – 0,104
Balancer shaft housing		
Balancer shaft end float	mm	0,050 – 0,100
Balancer shaft radial clearance	mm	0,022 – 0,074

Distance plate for balancer shaft housing

Range of adjustment	Available shims	Colour coding
0,26 – 0,29 mm	0,15 mm	Silver
0,30 – 0,44 mm	0,30 mm	Pale blue
0,45 – 0,59 mm	0,45 mm	Red

0,60 – 0,75 mm	0,60 mm	Black
0,76 – 0,90 mm	0,75 mm	Green

Lubricants, Adhesives and Sealers

Description	Ford Specification
Coolant	ESD-M97B49-A
Sealer, coolant temperature sensor, coolant pump angle connector, oil pressure switch (Loctite 243)	WSK-M2G349-A7
Sealer for rear oil seal carrier to balancer shaft housing	WSE-M4G323-A6
Lubricant for O-ring of crankshaft position/speed sensor (CPS)	WSD-M1C226-A
Power steering fluid	SQM-2C-9010-A
Lubricant for spark plug threads, HO2S sensor ('Never Seez')	ESE-M1244-A
High-temperature grease	ESDM-1C220-A

Capacity

Description	Litres
Engine oil, initial fill, with filter	4,6
Engine oil, oil change incl. filter (every 15,000 km)	4,25
Engine oil, oil change excl. filter	3,75

Engine oil

Ambient temperature	Designation	Specification
-10 to over 40°C	Ford Super Multigrade Engine Oil	SAE 20W50 API/SG/CD
-15 to over 40°C	Ford Super Multigrade Engine Oil	SAE 15W40 API/SH/CD
-20 to over 40°C	Ford Super Multigrade Engine Oil	SAE 10W30 API/SH/CD EC
-20 to over 40°C	Ford XR+ High-performance High-lubricity Engine Oil	SAE 10W40 API/SH/CD EC
-30 to over 40°C	Ford Formula S Synthetic Engine Oil	SAE 5W50 API/SG/CD
-30 to over 40°C	Synthetic/Semi-synthetic Engine Oil	SAE 5W40 API/SH/CD EC
+40 degrees to under -30°C	Ford Super Multigrade Engine Oil	SAE 5W30 API/SG/CD
The engine oil to specification SAE 5W30 API/SG/CD has only been approved for use in northern European territories		
If engine oils of other brands are used, it is imperative to ensure that these conform to API SG/CD or better in the particular viscosity class.		

Torques

General	Nm	lbf.ft
Front axle reinforcing bar	80	59
Air conditioning compressor	47	35
Air baffle - fan motors	11	8
Hood hinges	23	17
EGR valve to bracket	24	18
EGR tube to exhaust manifold	75	56
EGR tube bracket to exhaust manifold	23	17
Transmission crossmember to body	36	27

Torques

Transmission crossmember to automatic transmission	62	46
Driveshaft to rear axle	65	48
Driveshaft centre bearing	21	16
Starter motor to automatic transmission	44	33
Automatic transmission to engine (flange bolts)	44	33
Starter motor bracket to cylinder block	44	33
Torque converter to engine drive plate	44	33
Earth lead to automatic transmission	44	33
Oil dipstick tube bracket to automatic transmission	24	18
Oil pipes to automatic transmission	25	19
Oil pipe bracket to automatic transmission	44	33
Engine mounting bracket to cylinder block	47	35
Engine mounting nuts	50	37

Torques

Steering	Nm	lbf.ft
Intermediate shaft to steering shaft	18	13
Steering gear, 1st stage	15	11
Steering gear - 2nd stage	90°	90°
Power steering pump to bracket	25	19
Power steering pump pulley	25	19

Torques

Exhaust system	Nm	lbf.ft
Front to rear exhaust pipe	47	35
Front exhaust pipe bracket to transmission crossmember	47	35
Catalytic converter to exhaust manifold	47	35
Catalytic converter bracket to automatic transmission	44	33
Catalytic converter bracket to body	47	35
Front catalytic converter bracket	24	18

Torques

Cylinder block	Nm	lbf.ft
Main bearing	97	72
Big end bearing, 1st stage	7	5
Big end bearing, 2nd stage	16	12
Big end bearing, 3rd stage	90°	90°
Balancer shaft housing to cylinder block, 1st stage	5	4
Balancer shaft housing to cylinder block, 2nd stage	17	13
Crankshaft rear oil seal carrier	15	11
Crankshaft pulley/vibration damper, 1st stage	52	38
Crankshaft pulley/vibration damper, 2nd stage	85°	85°
Clutch Disk and Pressure Plate	29	21
Flywheel	87	64

Torques

Lower timing chain cover.	11	9
Crankshaft position/speed sensor	4	3

Torques

Cylinder Head	Nm	lbf.ft
Cylinder head bolts, 1st stage	40	30
Cylinder head bolts, 2nd stage	55	41
Cylinder head bolts, 3rd stage	90°	90°
Cylinder head bolts, 4th stage	90°	90°
Auxiliary cylinder head bolts	38	28
Camshaft bearing caps	24	18
Timing chain top guide	12	9
Timing chain bottom guide	26	19
Camshaft sprockets	59	44
Timing chain upper cover	10	8
Cylinder head cover, 1st stage	3	2
Cylinder head cover, 2nd stage	9	7
Camshaft position sensor (CMP sensor)	5	4
Spark plugs	18	13
DIS ignition coils	10	8
Ignition coil cover	5	4
Studs for exhaust manifold	14	11
Engine oil dipstick tube bracket	24	18
Engine lifting eye	25	19
Inlet manifold	22	16
Fuel rail	23	17
Throttle housing	10	8
Idle speed control valve	10	8
Engine coolant temperature sensor (ECT sensor)	27	20

Torques

Oil circuit	Nm	lbf.ft
Oil intake tube to balancer shaft housing	12	9
Sump to balancer shaft housing		
Oil drain plug	24	18
Oil pressure switch	27	20
Oil filter connector	57	42
Oil pump	12	9
Oil pump sprocket	21	15
Oil pump drive chain upper guide	26	19
Oil pump drive chain lower guide	12	9
Oil pump drive chain tensioner	12	9

Torques

Balancer shaft housing	Nm	lbf.ft
Balancer shaft bearing caps to housing	12	9
Sprockets to shaft stub	19	14

Torques

Coolant circuit	Nm	lbf.ft
Coolant pump	23	17