Section 2 B200/230, B204/234 Engines

Group 20 General

Performance, compression, octane requirements

Engine variant	Comp. ratio	Rec. octane ratio	Power		Max. torque	
			kW at r/s	hp* (bhp) at rpm	Nm at r/s	kpm (ft.lbf) at rpm
B 200 E	10.0:1	95 [1]	89/95	121/5700	158/80	16.1/4800
B 200 F	10.0:1	95 [2]	82/95	111/5700	158/47	16.1/2800
B 200 G	10.0:1	95 [1]	82/95	111/5700	155/47	16.1/2800
B 200 FT	8.5:1	95 [2]	114/93	155/5600 (153/5600)	230/60	23.4/3600 (170/3600)
B 230 E	10.3:1	95 [2]	96/92	131/5500	190/55	19.4/3300
B 230 F (Bosch 2.4)	9.8:1	95 [2]	85/90	116/5400 (114/5400)	183/42	18.7/2500 (135/2500)
B 230 F (Bendix)	9.8:1	95 [2]	85/90	116/5400 (114/5400)	182/42	18.6/2500 (134/2500)
B 230 FB	9.3:1	95 [2]	96/92	130/5500	185/49	18.9/2950
B 230 FD	9.8:1	95 [2]	85/90	116/5400 (114/5400)	183/42	18.7/2500 (135/2500)
B 230 FT	8.7:1	95 [2]	121/80	165/4800 (162/4800)	264/57	26.9/3450 (195/3450)
B 230 G	9.3:1	95 [1]	96/92	130/5500	185/49	18.9/2950
B 230 GT	8.7:1	95 [1]	125/80	170/4800	265/57	27.0/3450
B 204 E	9.7:1	95 [1]	102/100	139/6000	181/80	18.4/4800
B 204 FT	8.2:1	95 [2]	140/88	190/5300	280/49	28.5/2950
B 234 F	10.0:1	95 [2]	114/93	155/5600 (153/5600)	204/80	20.8/4800 (150/4800)
B 234 G	10.0:1	95 [1]	114/93	155/5600 (153/5600)	204/80	20.8/4800 (150/4800)

* metric horsepower

[1] Unleaded fuel can be used.

[2] Unleaded fuel **must** be used. Can be run on 91 octane unleaded.

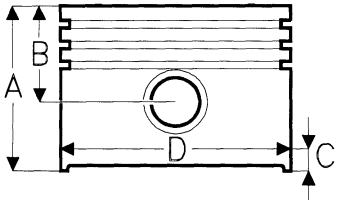
Other general data

	B 200/204	B 230/234
No. of cylinders	4	4
Cylinder bore ..... mm	88.9	96.0
Stroke ..... mm	80	80
Displacement ..... dm^3 (litres)	1.99	2.32
Firing order	1-3-4-2	1-3-4-2
Compression ..... MPa (kp/cm^2)	0.9 (9)	0.9 (9)
max. deviation between cylinders ..... MPa (kp/cm^2)	0.2 (2)	0.2 (2)
Weight, without turbocharger (TC) ..... kg	140-150	140-150
with turbocharger (TC) ..... kg	165	160-165

Group 21 Engine block

Cylinder head	B 200/230	B 204/234
Height, new ..... mm	146.1	103.5 ± 0.5
Max. machining ..... mm		0.3
min. after machining ..... mm	145.6	102.7
Max. warp		
along ..... mm	0.50	0.50
across ..... mm	0.25	0.25

Cylinder block	B 200/204	B 230/234
Cylinder bore		
Standard (C-marked) ..... mm	88.90 - 88.91	96.00 - 96.01
(D-marked) ..... mm	88.91 - 88.92	96.01 - 96.02
(E-marked) ..... mm	88.92 - 88.93	96.02 - 96.03
(G-marked) ..... mm	88.94 - 88.95	96.04 - 96.05
Oversize 1 ..... mm	89.29 - 89.30	96.30 - 96.31
2 ..... mm	89.67 - 89.68	96.60 - 96.61



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Engine type	Dimensions in mm		
	A	B	C
B 200 E/F	69.9	41.9	13.4
B 200 FT	67.7	39.7	13.4
B 230	64.7	39.7	13.5
B 204 E	67.1	39.1	13.4
B 204 FT	67.7	39.7	14.6
B 234 F/G	68.7	39.9	13.4

Pistons	B 200/204	B 230/234	
Piston diameter (D) (measured at right angles to gudgeon (piston) pin hole, dim. C from lower edge)			
• Standard (C-marked) .....mm	88.88 - 88.89	95.98 - 95.99	
(D-marked) .....mm	88.89 - 88.90	95.99 - 96.00	
(E-marked).....mm	88.90 - 88.91	96.00 - 96.01	
(G-marked) .....mm	88.92 - 88.93	96.02 - 96.03	
• Oversize 1.....mm	89.27 - 89.28	96.28 - 96.29	
2 .....mm	89.65 - 89.66	96.58 - 96.59	
Piston clearance, new piston .....mm	0.010 - 0.030	0.010 - 0.030	
used piston.....mm	0.08	0.08	
Piston weight	**B 200/230**	**B 204/234**	
• Max. weight diff. between pistons in same engine .....g	16	14	
Piston rings, axial clearance (measured with ring on piston)	**B 200**	**B 204**	**B 230/234**
• upper comp. ring.....mm	0.060 - 0.092	0.040 - 0.072	0.060 - 0.092
• lower comp. ring .....mm	0.030 - 0.062	0.030 - 0.062	0.040 - 0.072
• oil scraper ring .....mm	0.020 - 0.055	0.020 - 0.050	0.030 - 0.065
Piston rings, gap (measured in cylinder)	**B 200/204**	**B 230/234**	
• upper comp. ring.....mm	0.30 - 0.50	0.30 - 0.55	
• lower comp. ring .....mm	0.30 - 0.50	0.30 - 0.55	
• oil ring.....mm	0.20 - 0.50	0.30 - 0.65	
Gudgeon (piston) pin			
• Diameter .....mm	23.00 $^{+0}_{-0.004}$	23.00 $^{+0}_{-0.004}$	

- fit in connecting rod ..... Light thumb pressure (close running fit)
- fit in piston ..... Thumb pressure (push fit)

Valve system		
Valve clearance, checking (adjustment)	**B 200/230**	
• cold engine ..... mm	0.30 - 0.40(0.40)	
• warm engine ..... mm	0.35 - 0.45(0.45)	
Valve tappets	**B 200/230**	**B 204/234**
• diameter (A) ..... mm	36.975 - 36.995	$35.000\ ^{+0.025}_{-0.041}$
• height (B) ..... mm	30 - 31	26.0 ± 0.5
• dim. (C) unloaded ..... mm		18.40
• dim. (C) compressed ..... mm		16.15
(Measurement points, see diagram in service manual)		

Valve springs											
B 200/230 E			**B 200/230 F, B 200/230 FT**			**B 204 E, B 234 F/G**			**B 204 FT/GT**		
Ø mm	Length mm	Load N(kp)	Ø mm	Length mm	Load N (kp)	Ø mm	Length mm	Load N (kp)	Ø mm	Length mm	Load N (kp)
32.5	45.0	0	25.9	45.5	0	26.2	43.0	0	26.5	46.6	0
	38.0	280-320 (28-32)		38.0	280-320 (28-32)		37.0	212-252 (21-25)		37.0	330-370 (33-37)
	27.0	710-790 (71-79)		27.5	702-782 (70-78)		26.5	600-680 (60-68)		29.5	665-735 (66-73)

Valve guide	Intake valve	Exhaust valve
Inner diameter ..... mm	8.000 - 8.022	8.000 - 8.022
Height above face of cyl. head, 200/230 .... mm	15.4 - 15.6	17.9 - 18.1
204/234 .... mm	14.8 - 15.2	14.8 - 15.2
Play, valve spindle guide (measured with new valve)		
new, B 200/230 ..... mm	0.03 - 0.06	0.06 - 0.09
B 204/234 ..... mm	0.03 - 0.06	0.04 - 0.07
max ..... mm	0.15	0.15

Valve guides available in 3 oversizes (B204/234 one oversize) and are marked with grooves. * B 204/234: Reamer 5373	**Size**	**Marking**	**Reamer**
	Standard	No groove	–
	O/s 1	1 groove	5161*
	O/s 2	2 grooves	5162
	O/s 3	3 grooves	5163

Valve seat	**B 200/230**		**B 204/234**	
	Intake	**Exhaust**	**Intake**	**Exhaust**
• diameter, standard.....mm	46.00	38.00	34.14/ 36.14	31.14/ 33.14
oversize 1.....mm	46.25	38.25	34.64/ 36.64	31.64/ 33.64
oversize 2.....mm	46.50	38.50		
• matching surface width.mm	1.3 - 1.9	1.7 - 2.3	1.3 - 1.9	1.7 - 2.3
• matching surface angle .....°	45	45	45	45
• reduction angle,				
upper.....°	15	15	15	15
lower.....°	70	70	70	70
• seat pos. in cyl. head				
diameter, standard.....mm	45.83	37.83	34.00/36.00	31.00/33.00
oversize 1 .....mm	46.08	38.08	34.50/36.50	31.50/33.50
oversize 2 .....mm	46.33	38.33		
interference.....mm	0.17	0.17	0.10 - 0.14	0.10 - 0.14
Valves				
(stellite-flashed may not be machine-ground)				
• diameter, disc .....mm	44.00	35.00	32.50 ± 0.15	29.50 ± 0.15
stem.....mm	7.935	7.925	6.95	6.94
• total length .....mm			122.45	122.25
• max. machining				
valve stem.....mm	0.4	0.4	0.4	0.4
• height, valve stem .....mm			49.0 - 49.8	49.0 - 49.8
• height, disc edge, new..mm	1.5	1.5	1.5	1.5
min. after machining.....mm	1.2	1.2	1.2	1.2
• matching surface angle .....°	44.5	44.5	44.5	44.5

Timing gears

Engine type	Camshaft			Checking of camshaft adjustment (cold engine)		
	marking	max. lift height in mm		Valve clearance in mm, check	Valves to open at	
	intake exhaust	intake	exhaust		intake	exhaust
B 200 E	V	11.37		0.7	11° *	
B 200 F/G	M	9.5	10.5	0.7	6° **	44° ***
B 200 FT	T	9.93		0.7	4° *	
B 230 E	V	11.37		0.7	11° *	
B 230 F	M	9.5	10.5	0.7	6° **	44° ***
B 230 FB/G	VX3	11.37	10.65	0.7	7.7° *	50.1° ***
B 230 FD	M	9.5	10.5	0.7	6° **	44° ***
B 230 FT	T	9.93		0.7	4° *	
B 230 GT	T	9.93		0.7	4° *	
B 204 E	U I U A	9.38		0.7	5.1° *	37.1° ***
B 204 FT	F I F A	6.81	7.45	0.7	12.9° **	31.2° ***
B 234 F/G	U I U A	9.38		0.7	5.1° *	37.1° ***

* before top dead centre, ** after top dead centre, *** before bottom dead centre

Camshaft

Radial play, new, ...mm 0.030 - 0.071
max, ...mm 0.15
Axial play, B 200/230 .....mm 0.1 - 0.4
B 204/234.....mm 0.05 - 0.40

Balance shaft, 204/234

Axial play .....mm 0.06 - 0.19

Belt tension table, B 204/234		
Balance shaft belt		
Coolant temperature	Used belt	New belt
20° C (68° F)	3.4 ± 0.2	3.8 ± 0.2
40° C (104° F)	4.0 ± 0.2	4.3 ± 0.2
87° C (188 ° F)	4.7 ± 0.2	4.9 ± 0.2

Crank mechanism

Crankshaft

Out-of-true, max.	mm	0.04
Crankshaft, axial play	mm	0.080 - 0.270
Main bearing, radial play	mm	0.024 - 0.064
Crankshaft bearing, radial play	mm	0.023 - 0.067

Main bearing journals

Diameter, standard	mm	63.00
undersize 1	mm	62.75
undersize 2	mm	62.50
Out-of-roundness, max	mm	0.006
Taper, max.	mm	0.006
Axial bearing width	mm	35.40 $^{+0}_{-0.17}$

Crankshaft bearing journals

Diameter, standard	mm	49.00
undersize 1	mm	48.75
undersize 2	mm	48.50
Out-of-roundness, max	mm	0.01
Taper, max.	mm	0.01

Connecting rod

Play at piston	mm	0.15 - 0.45
Max. weight diff. between connecting rods in same engine	g	20

Flywheel

Axial runout, max.	mm	0.02 /100 mm Ø

Carrier plate(automatic)

Axial plate, max.	mm	0.40

Tightening torque	Nm		ft. lb	
Applies to oiled nuts and bolts.	B 200 B 230	B 204 B 234	B 200 B 230	B 204 B 234
Cylinder head (stage 1)	20	20	15	15
(stage 2)	60	40	43	29
(stage 3) ..... angle-tighten	90°	115°	90°	115°
Bolts should be tightened in sequence from the middle outwards.				
Cam-carrier(central fastener)		20		15
Main bearing cap	110	110	80	80
Connecting rod cap (stage 1)	20	20	15	15
(stage 2) .... angle-tighten	90°	90°	90°	90°
Camshaft cap	20	20	15	15
Camshaft pulley	50	50	37	37
Camshaft idler pulleys		25		18
Camshaft tensioner pulley		50		37
Cross stay		25		18
Balance shaft housing, separate unit		5		3.5
Balance axle housing,				
attachment, stage 1		20		15
stage 2 ..... **undo the bolts**				
stage 3		10		7
stage 4 ..... angle-tighten		90°		90°
Balance axle housing, fitted unit		8		5.9
Balance axle pulley		50		37
Balance axle belt-tension pulley		40		29
Crankshaft, centre bolt				
(vibration damper, pulley), stage 1	60	60	43	43
stage 2	60°	60°	60°	60°
Flywheel/carrier plate				
(use new bolts)	70	70	51	51
Oil pump		11		8
Oil pump-suction pipe		11		8
Oil pump-gear, stage 1		20		15
stage 2 ..... angle-tighten		50°		50°
Spark plugs	25	25	18	18

Group 22 Lubrication system

General	
Oil capacity and quality, see page 14	
Oil pressure with warm engine and new oil filter:	
engine speed r/s (rpm)	**oil pressure MPa**
15 (900)	0.10
33 (2000)	0.25
50 (3000)	0.30
max	0.80

Oil pump	B 200/230	B 204/234
Axial play .....mm	0.02 - 0.12	0.05 - 0.10
Radial play (excl. bearing play) .....mm	0.02 - 0.09	
Gear flank play (excl. bearing play) .....mm	0.15 - 0.35	
Bearing play, drive spindle .....mm	0.032 - 0.070	
trailing spindle.....mm	0.014 - 0.043	
	B 200/230/234 B 204 F	**B 204 FT/GT**
Length, reduction valve spring at different loads .....mm/N	47.6 / 0	37.8 / 0
	32.0 / 40 - 48	30.3 / 61 - 67
	26.0 / 56 - 67	26.0 / 96 - 108

Group 23 Fuel system

CO-content, idling speed

Engine variant	Fuel system	CO-content %		Idling speed r/s (rpm)
		Adjustment	Check	
B 200 E	CI	1.0	0.5 - 2.0	15.0 (900)
B 200 F	LH 2.4	*	0.4 - 0.8 [1)]	12.9 (775)
B 200 G	LH 2.4	1.0	0.5 - 2.0	12.9 (775)
B 200 FT	LH 2.4	*	0.2 - 1.0 [1)]	12.9 (775)
B 230 E	CI	1.0	0.5 - 2.0	15.0 (900)
B 230 F	LH 2.4	*	0.4 - 0.8 [1)]	12.9 (775)
	Regina	*	0.4 - 0.8 [1)]	12.9 (775)
B 230 FB	LH 2.4	*	0.4 - 0.8 [1)]	12.9 (775)
B 230 FD	LH 2.4	*	0.4 - 0.8 [1)]	12.9 (775)
B 230 FT	LH 2.4	*	0.4 - 0.8 [1)]	12.5 (750)
B 230 G	LH 2.4	1.0	0.5 - 2.0	12.9 (775)
B 230 GT	LH 2.4	1.0	0.5 - 2.0	12.5 (750)
B 204 E	LH 2.4	0.8	0.6 - 1.0	15.0 (900)
B 204 FT	LH 2.4	*	0.4 - 0.8 [1)]	13.3 (800)
B 234 F	LH 2.4	*	0.4 - 0.8 [1)]	14.2 (850)
B 234 G	LH 2.4	0.8	0.5 - 1.1	14.2 (850)

* Cannot be adjusted

[1)] Heated oxygen sensor (HO2S) connected. Measured upstream of three-way catalytic converter (TWC).

Components LH 2.4 MFI system

CONTROL MODULES

Engine type	Volvo P/N	Bosch P/N
B 200 F 91	35 31 831-0	0 280 000 **594**
92	35 47 779-3	**936**
92-	68 42 289-8	**949**
B 200 G 92-	35 07 258-6	0 280 000 **926**
B 200 FT -91	35 31 721-3	0 280 000 **596**
92-	35 47 772-8	**932**
B 230 F 91	35 17 407-7	0 280 000 **561**
91-92	35 01 687-2	0 280 000 **556**
92-	35 47 773-6	**933**
B 230 FB -91	35 31 657-9	0 280 000 **595**
92-	35 47 777-7	**935**
92-	68 42 288-0	**934**
B 230 FD 93	35 07 179-4	0 280 000 **946**
94	91 46 221-8	**946**
B 230 FT 91	35 17 368-1	0 280 000 **560**
91-92	35 17 370-7	**563**
92	35 47 781-0	**937**
92	35 47 783-5	0 280 000 **939**
92-93	91 35 138-7	**939**
94	68 42 448-0	0 280 000 **954**
94	91 35 591-7	**962**
94	91 46 220-0	

Engine type	Volvo P/N	Bosch P/N
B 230 G 92-	35 07 259-4	0 280 000 **900**
B 230 GT 91	35 47 400-6	0 280 000 **927**
92-	35 47 782-7	**938**
B 204 E 91	13 67 066-6	0 280 000 **559**
B 204 FT -92	35 31 519-1	0 280 000 **597**
93-	35 47 059-0	0 280 000 **950**
B 234 F 91	35 07 605-8	0 280 000 **562**
91	35 07 604-1	**571**
91	35 17 372-3	**562**
91	35 17 608-0	**571**
92-	35 47 788-4	**928**
B 234 G 91	35 47 262-0	0 280 000 **911**
92-	35 47 790-0	**930**

MASS AIR FLOW (MAF) SENSOR	B 200/230 F/FB/FD/FT B 234 F	B 200 G, B 230 G/GT B 234 G
Bosch	0 280 212 **016**	0 280 212 **021**
Volvo	35 17 020-8	35 47 266-1
Resistance between connectors 2 and 3 ....Ω	2.5 - 4.0	2.5 - 4.0
MASS AIR FLOW (MAF) SENSOR	**204 E**	**204 FT**
Bosch	0 280 212 **007**	0 280 213 **012**
Volvo	13 46 645-3	35 17 569-4
Resistance between connectors 2 and 3 ....Ω	3.5 - 4.0	2.5 - 4.0

Engine type	Volvo P/N	Manuf. P/N	Resistance of preheating resistor		Tighte-ning torque
			cold + 20° C	hot + 350° C	Nm (ft lb)
B 200 F	35 01 753-2	0 258 003 **034**	2 - 3	7 - 14	55 (40)
B 200 FT, -93	35 31 400-4	0 258 003 **090**	2 - 3	7 - 14	55 (40)
94	91 35 794-7				55 (40)
B 230 F/FB, - 93	35 01 753-2	0 258 003 **034**	2 - 3	7 - 14	55 (40)
94	35 47 445-1				55 (40)
B 230 FD, -93	68 42 910-9	0 258 003 **308**			55 (40)
94	91 35 795-4	0 258 003			55 (40)
B 230 FT, -93	35 31 400-4	0 258 003 **090**	2 - 3	7 - 14	55 (40)
94	91 35 794-7	0 258 003			55 (40)
el EGR 94	91 35 621-2	0 258 003 **034**	2 - 3	7 - 14	55 (40)
B 204 FT -93	35 31 400-4	0 258 003 **090**	2 - 3	7 - 14	55 (40)
94	91 35 794-7				55 (40)
B 204 GT -92	35 17 778-1	0 258 003 **085**			55 (40)
B 234 F	35 01 400-4	0 258 003 **090**	2 - 3	7 - 14	55 (40)

PRESSURE REGULATOR	**B 200/230/234 B 204 E**	**B 204 FT**	
Bosch	0 280 160 **294**	0 280 160 **730**	
Volvo	35 17 064-6	35 47 368-5	
System pressure* ....kPa	300	300	
Shut-off pressure ....kPa	200 - 300	200 - 300	
* fuel pressure above pressure in inlet manifold.			
INJECTORS	**B 200/230 F/FB/FD/G B 204 E**	**B 200/204 FT B 230 FT/GT**	**B 234 F/G**
Bosch	0 280 150 **762**	0 280 150 **804**	0 280 150 **749**
Volvo	35 17 572-8	35 17 283-2	35 01 986-8
Injection volume ....cm^3/min at system pressure ....kPa	185 300	300 300	214 300
SERIES RESISTANCE	**B 204 FT**		
Bosch	0 280 159 **014**		
Volvo	35 31 339-4		
Resistance ....Ω	5.5 - 6.6		
START INJECTOR	**B 200**	**B 230**	
Bosch	0 280 170 **455**	0 280 170 **446**	
Volvo	35 31 228-9	35 17 130-5	
Injection volume ....cm^3/min	123	160	
IDLE AIR CONTROL (IAC) VALVE	**B 200/230 B 204/234**		
Bosch	0 280 140 **516**		
Volvo	13 89 618-8		

THROTTLE POSITION (TP) SWITCH	B 200/230 B 204/234	
Bosch	0 280 120 **325**	
Volvo	35 17 068-7	
THROTTLE POSITION (TP) SENSOR	**B 204 FT**	
Bosch	0 280 150 **400**	
Volvo	35 17 772-4	
Resistance between connector		
1 and 3, idle ....Ω	2500 - 5000	
full load ....Ω	300 - 500	
ENGINE COOLANT TEMPERATURE (ETC) SENSOR	**B 200/230 B 204/234**	**B 204 FT (EGTC)**
Bosch (Luxor)	0 280 130 **032**	220 4079-01L(Luxor)
Volvo	13 46 030-8	35 14 565-5
Resistance at:		
– 10°C (14°F) ....Ω	8 260 - 10 560	12 400
+ 20°C (68°F) ....Ω	2 280 - 2 720	2 800
+ 80°C (176°F) ....Ω	290 - 364	280
Tightening torque ....Nm(ft lb)		40 (30)
FUEL PUMP – 1993	**B 200/230 F/FB/FD/G B 204 E, B 234 F**	**B 230 FT/GT B 200/204 FT**
Bosch	0 580 464 **039**	0 580 464 **025**
Volvo	13 89 449-8	13 36 679-4
Pump capacity at system pressure 300 kPa and +20°C (68°F)		
12V ....l/h	130	130
11V ....l/h	108	108
10V ....l/h	85	85
Current consumption at system pressure 300 kPa, +20°C (68°F), 12V:		
maximum ....A	6.5	6.5

FUEL PUMP 1993 –	B 200/230 F/FB/FD/G B 204 E, B 234 F	B 230 FT/GT B 200/204 FT
Bosch	0 580 464 **068**	0 580 464 **025**
Volvo	91 42 044-8	91 42 045-5
Pump capacity at system pressure 300 kPa and +20°C (68°F)		
12V l/h	130	130
11V l/h	108	108
10V l/h	85	85
Current consumption at system pressure 300 kPa, +20°C (68°F), 12V:		
maximum A	6.5	6.5

PREPUMP	B 200/230 F/FB/FD/G B 204 E, B 234 F	B 230 FT/GT B 200/204 FT
Volvo, 91	35 07 436-8	35 17 845-8 *
92–94 (excl. 960 93–94)	13 89 721-0	35 17 845-8 *
93–94		91 42 049-7
Current consumption A	3 - 4	5.5
Volvo (only 740 with extra tank)	35 01 928-0	
Current consumption A	1.4	
* for Thailand applies to P/N 35 07 436-8)		

FUEL FILTER	B 200/230 -91 B 204/234 -91	B 200/230 92- B 204/234 92-
Bosch	0 450 905 **601**	0 450 905 **200**
Volvo	13 89 450-6	68 42 033-0
Filters particles down to mm	0.002	0.002
Tightening torque Nm(ft lb)	20 - 35 (15 - 26)	20 - 35 (15 - 26)

RELAY, FUEL INJECTION	740/940	960
Volvo, E-engines	35 23 639-7	
Volvo, F-engines –93	35 23 608-2	13 62 914-2
Volvo, F-engines 94 (excl. Turbo)	91 30 270-3	91 30 270-3
Turbo engines	35 23 608-2	91 30 270-3

Regina, components

CONTROL MODULE	Volvo	Bendix
P/N – 1992	35 31 658-7	S 101 560 102 B
1992 – 1993, manual	68 42 882-0	S 101 560 202 B
1994, manual	91 46 261-4	S 101 590 202 C
1992 – , automatic	68 42 981-0	S 101 560 102 E

PRESSURE REGULATOR	Volvo	Bendix
P/N – 1993	13 89 564-4	4088942-0001
1993 –	68 42 410-0	7056689-0501
System pressure ..... kPa	300	
Shut-off pressure ..... kPa	200 - 300	

INJECTORS	Volvo	Bendix
P/N	13 89 563-6	4088914-0001
Injection volume ..... cm^3/min	170	
at system pressure ..... kPa	300	
Resistance ..... Ω	16 ± 1	

START INJECTOR	Volvo	Bosch
P/N	35 17 130-5	0 280 170 **446**
Injection volume ..... cm^3/min	165	
Resistance ..... Ω	10 ± 1	

IDLE AIR CONTROL (IAC) VALVE	Volvo	VDO
P/N	13 89 557-8	Kx 220 75 777
Resistance OF coil ..... Ω	4	

THROTTLE POSITION (TP) SWITCH	Volvo	VDO
P/N – 1993	13 89 558-6	K 243.003001004
1993 –	91 35 839-0	Kx19.120.602

PRESSURE SENSOR	Volvo	Delco
P/N	13 78 162-0	16018622
Signal approx. 4.4 volts at ..... kPa	100	
3.2 volts at ..... kPa	80	
2.1 volts at ..... kPa	60	
1.1 volts at ..... kPa	40	
0.5 volts at ..... kPa	20	

ENGINE COOLANT TEMPERATURE SENSOR (ECT) , (double)	Volvo	Bosch
P/N	13 46 030-8	0 280 130 **032**
Resistance at:		
– 10°C (14°F) ..... Ω	8200 - 10600	
+ 20°C (68°F) ..... Ω	2200 - 2800	
+ 80°C (176°F) ..... Ω	250 - 400	

TEMPERATURE SENSOR FOR INTAKE AIR	Volvo	Bendix
P/N	13 89 556-0	X 102 152
Approximate resistance at:		
– 40°C (-40°F) ..... Ω	45 000	
– 20°C (- 4°F) ..... Ω	15 000	
0°C (32°F) ..... Ω	5 800	
+ 20°C (68°F) ..... Ω	2 500	
+ 80°C (176°F) ..... Ω	330	

HEATED OXYGEN SENSOR (HO2S)	- 1993	1994
NGK, P/N	OTA4F-B	
Volvo, P/N	35 17 394-7	35 47 445-1
Resistance of preheating resistor:		
cold probe (20°C (68°F)) ..... Ω	3	
hot probe (above 350°C (662°F)) .... Ω	13	
Tightening torque .....Nm(ft lb)	55 (41)	

FUEL PUMP	Volvo	Delco
P/N	35 07 736-1	644 3440
Pump capacity at system pressure 350 kPa and + 20°C (68°F):		
12 V ....l/h	130	
11 V ....l/h	108	
10 V ....l/h	65	
Current consumption at system pressure 350 kPa and + 20°C (68°F), 13.5 V:		
maximum ....A	8.8	

FUEL FILTER	Volvo	Knecht
P/N	13 89 562-8	7139173/FB821/4
Tightening torque ....Nm(ft lb)	27 (20)	

SYSTEM RELAY	Volvo
Volvo, P/N	35 23 608-3

Group 25 Intake and exhaust systems

Turbo-engines

Engine variant	B 230 FT/GT	B 204 FT	B 200 FT
Charge pressure, at full load and .....rpm	3000	3000	3000
control value.....kPa	48 - 54	73 - 83	53 - 59
adjustment value .....kPa	51	40 - 44	56
Pressure regulator, density check .....kPa	60 - 70	50 - 60	
Overflow valve, fully open at under-pressure .....kPa	22	22	

Tightening torque

Turbocharger (TC) - manifold*	Nm(ft lb) 30 (22)
Use special tool 999 5411 (90° angle to torque wrench)	
Turbocharger (TC) - exhaust manifold*	Nm(ft lb) 30 (22)

* Use lubricant (P/N 11 61 035-9)

Group 26 Cooling system

General

Use Genuine Volvo green coolant, type C, mixed 50/50 with clean water.

This mixture helps prevent corrosion and damage by freezing.

- Never top up with only water. Use Genuine Volvo coolant mixed 50/50 with clean water.
- The coolant does not normally need to be changed. In the case of major repairs requiring the draining of coolant, fresh coolant must be used since the drained coolant will have been subjected to oxidation and will contain dirt particles.
- Clean the cooling system when changing the coolant.

Engine type	Approx volume litres	Expansion tank. Pressure valve opens at		Thermostat			
		Pos. pressure, kPa	Neg. pressure, kPa	Type	Marking	Starts opening °C (°F)	Fully open °C (°F)
B 200/230	8.5	150	7	1 2	87 92	87 (189) 92 (198)	97 (207) 102 (216)
B 204/234	9.5	150	7	1 2	87 92	87 (189) 92 (198)	97 (207) 102 (216)

Group 28 Distributor ignition (DI) system

General

Engine type	Ignition system	Ignition setting		Spark plugs		
		° btdc	Engine speed r/s (rpm)	Design.	P/N	Set no.
B 200 E	EZ 118 K	12	15.0 ± 0.8 (900 ± 50)	WR6DC	13 67 529-3	270 747-9
B 200 F	EZ 116 K	12	12.9 ± 0.8 (775 ± 50)	WR7DC	13 67 528-5	270 746-1
B 200 G	EZ 116 K	12	12.9 ± 0.8 (775 ± 50)	WR7DC	13 67 528-5	270 746-1
B 200 FT	EZ 116 K	12	12.9 ± 0.8 (775 ± 50)	WR6DC	13 67 529-3	270 747-9
B 230 E	EZ 118 K	12	15.0 ± 0.8 (900 ± 50)	WR6DC	13 67 529-3	270 747-9
B 230 F	EZ 116 K	12	12.9 ± 0.8 (775 ± 50)	WR7DC	13 67 528-5	270 746-1
B 230 F	Rex-I	10	12.9 ± 0.8 (775 ± 50)	WR7DC	13 67 528-5	270 746-1
B 230 G	EZ 116 K	12	12.9 ± 0.8 (775 ± 50)	WR7DC	13 67 528-5	270 746-1
B 230 FB	EZ 116 K	12	12.9 ± 0.8(775 ± 50)	WR7DC	13 67 528-5	270 746-1
B 230 FD	EZ 116 K	12	12.9 ± 0.8 (775 ± 50)	WR7DC	13 67 528-5	270 746-1
B 230 FT	EZ 116 K	12	12.5 ± 0.8 (750 ± 50)	WR7DC	13 67 528-5	270 746-1
B 230 GT	EZ 116 K	12	12.5 ± 0.8 (750 ± 50)	WR7DC	13 67 528-5	270 746-1
B 204 E	EZ 116 K	15	15.0 ± 0.8 (900 ± 50)	WR6DC	13 67 529-3	270 747-9
B 204 FT	EZ 116 K	10	13.3 ± 0.8 (800 ± 50)	WR6DC	13 67 529-3	270 747-9
B 234 F	EZ 116 K	15	14.2 ± 0.8 (850 ± 50)	WR6DC	13 67 529-3	270 747-9
B 234 G	EZ 116 K	15	14.2 ± 0.8 (850 ± 50)	WR6DC	13 67 529-3	270 747-9

Spark plugs, electrode gap .....mm 0.7 - 0.8
tightening torque .....Nm (ft.lb) 25 (15)

Components

Control module

Engine type	Volvo P/N	Manuf. P/N
B 200 E	13 36 800-6	0 261 201 **010**
B 200 F/G	35 31 830-2	0 227 400 **176**
B 200 FT	35 31 722-1	0 227 400 **177**
B 230 E	13 36 503-6	0 261 201 **009**
B 230 F, (S,N,DK)	35 31 325-3	0 227 400 **169**
B 230 F, (REX-I) - 91	35 31 649-6	S 101 500 102 A
B 230 F, (REX-I) 91 -	35 07 696-7	S 101 500 102 D
B 230 F, (EGR,EL) Calif, 91 - 92	35 17 855-7	0 227 400 **162**
B 230 F, (EGR,EL) Calif, 92 -	68 42 495-1	0 227 400 **209**
B 230 FB	35 31 648-8	0 227 400 **175**
B 230 FD	35 07 348-5	0 227 400 **196**
B 230 FT/GT	35 17 369-9	0 227 400 **148**
B 230 FT/GT, (EGR), - 92	35 17 360-8	0 227 400 **149**
B 230 FT/GT, (EGR,EL), 92 - 93	68 42 496-9	0 222 400 **214**
B 230 FT/GT, (EGR,EL), 93	91 35 869-7	0 227 400 **214**
B 230 FT, (EGR,EL) man, 94	91 35 590-9	0 227 400 **219**
B 230 FT, (EGR,EL) auto, 94	68 42 449-8	0 227 400 **207**
B 230 G	35 31 648-8	0 227 400 **175**
B 204 E	13 67 178-9	0 227 400 **143**
B 204 FT, - 92	35 17 719-5	0 227 400 **159**
93 -	35 31 520-9	0 227 400 **208**
B 234 F/G, - 91	35 17 609-8	0 227 400 **152**
B 234 F/G, 91 - 92	35 07 646-2	0 227 400 **152**
B 234 F/G, (EGR,EL), - 91	35 07 645-4	0 227 400 **147**
B 234 F/G, (EGR,EL), 91 -	35 07 213-1	

Power stage

Engine type (model year)	Volvo P/N	Bosch P/N
1991 –	35 01 921-5	0 227 100 **124**

Distributor

Engine type	Volvo P/N	Bosch P/N
B 200/230 E	13 36 087-0	0 237 502 **001**
B 200/230 F/FB/FD/G	13 36 132-4	0 237 502 **002**
B 230 F, Regina, 94 -	13 67 468-4	0 237 523 **003**
B 204 E/FT, B 234 F/G	13 67 197-9	0 237 502 **003**

Ignition coil

Ignition system	Volvo P/N	Manuf. P/N	Resistance of coils	
			primary (1 and 15)	secondary (1 and high)
EZ-K (Bosch)	13 46 071-2	0 221 601 **005**	0.6 - 0.9 Ω	7.0 - 8.5 kΩ
Rex I (Bendix)	13 67 438-7	S 102 020 004 A	0.5 - 0.6 Ω	5.0 - 7.0 kΩ

Knock sensor (KS)

Engine type (model year)	Volvo P/N	Bosch P/N	Tightening torque
1991 –	13 67 644-0	0 261 231 **046**	20 Nm (15 ft lb)

RPM sensor

Engine type (model year)	Volvo P/N	Manuf. P/N	Resistance of coil(Ω)	Inductance of coil(mH)
– 1991	13 89 399-5	14.64.039.0000	240 ± 25	55 ± 10 (10kHz)
1991 –	35 47 847-8	14.64.042.0000	170 ± 30	44 ± 15 (10kHz)