

4. Power transmission

41 Clutch

Specifications

Clutch

Volvo S40/V40 has a single plate, dry clutch with servo.

Clutch driven plate

Mechanical data:	Petrol engine Except B4184SM/SJ Excl petrol Turbo	Petrol turbo charged engines	D4192TX	B4184SM B4184SJ
Friction lining:				
-outer diameter mm	-1998 = 220 1998- = 215	-2001 = 240 2002- = 228	215	215
-inner diameter mm	-1998 = 150 1999- = 147	-	147	140
Thickness:				
-new clutch driven plate. Load at 4200 N mm	6.6-7.0	8.4	7.4 - 8.0	8.3
-minimum. Load at 4200 N mm	5.6	6.6	6.4	6.0
-minimum depth to rivets mm	-	-	-	0.3
Material in the friction lining (asbestos free)	K2081D or Valeo T202			

Clutch release bearing:	Other:	Gearbox M56:
Type	Self centring, rotating	Concentric, rotating

Brake fluid:	Quality:	Volvo P/N:
Reservoir, integrated with the brake system.	Use: Brake fluid: DOT 4+ Minimum requirement.	0.25 litres P/N: 94 37 430 0.8 litres P/N: 94 37 431 5 litres P/N: 94 37 432

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Specifications

Clutch pedal check values:		-98	99-
Play, clutch pedal	mm	1-3	1-3
Play, clutch pedal travel	mm	6-13	6-13
Check values			
Pedal height:			
-LHD CH: 136 725 -	mm	173.5 ±0.5	183.5 ±0.5
-LHD -CH: 136 724	mm	163.5 ±0.5	-
-Right-hand drive	mm	162.5 ±0.5	183.5 ±0.5
Turbocharged petrol engines:			
-Left-hand drive	mm	183 ±0.5	183.5 ±0.5
-Right-hand drive	mm	172 ±0.5	183.5 ±0.5
Length of pedal stroke:			
-Left-hand drive	mm	142-152	142-152
-Right-hand drive	mm	136-146	136-146

Master cylinder:	Petrol engine turbocharger (TC)	Other -98	Other 98-
Cylinder diameter	mm	19.00	15.87
Number of seal washers		2	2
Number of pistons		1	1
Normal stroke	mm	30	30
Length of clutch plate stroke	mm	114 ± 0.5 ¹	112 ± 0.5 ²

¹ Cannot be adjusted.

² When there is a white marking on the clutch hose, adjust according to 98-.

Slave cylinder:	Other	Petrol engines with manual gearbox M56
Cylinder diameter	mm	20.64
Number of pistons		1
Normal stroke	mm	18.8
		CSC type
		1
		-

Lubrication:	
Grease, fork, domed screws and bearing	Volvo P/N: 1161246-2

Tightening torques

Mechanical component:	Petrol engine	D4192TX	B4184SM B4184SJ
	Nm	Nm	Nm
Domed screw, clutch pedal	24	24	24
Pressure plate, screws Petrol	25	-	21
Diesel	-	20	-
Screw, socket cylinder (M56)	10	-	-
Bleed nipple, slave cylinder	10	10	10
Clutch housing, screws	50	50	49
Flywheel screws, use new screws:			
Petrol engines MT Stage 1	45	-	-
Stage 2	Tighten +65°	-	-
Petrol engines AT Stage 1	45	-	-
Stage 2	Tighten +50°	-	-
Diesel engine D4192 T/T2 / B4184SM/B4184SJ	-	55	98
Diesel engine D4192 T3/T4 Stage 1	-	20	-
Stage 2	-	Tighten +70°	-
Screw, flywheel sensor	20	20	-
Nut, pedal mounting cruise control	13	13	13
Nut, pressure plate adjustment screw	13	13	13
Screws, clutch slave cylinder to the clutch housing	30	30	18
Banjo screw, slave cylinder	25	25	25
Starter motor	50	50	50
Nuts, master cylinder	13	13	13
Brake pipe to master cylinder	15	15	15

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43 Gearbox

43 Gearbox

Information applicable to automatic gearboxes

Automatic gearbox AW50-42LE -2000

Torque converter:	B4184SX	B4204SX	B4204TX	B4194TX
Torque increase,				
Maximum K factor Nm	235	235	217	206
Gear ratio	2.1:1	2.1:1	2.0:1	1.9:1
Diameter mm	241	241	241	241
Normal stall speed (maximum 5 seconds), +/- 100 rpm				
rpm	2250	2400	2730	3025
Installation depth mm	10.5	10.5	10.5	10.5
Maximum axial play of the clutch plate at mounting points mm	0.2	0.2	0.2	0.2

Automatic gearbox AW55-50SN 2001-

Torque converter:	B4184S2	B4204S2	B4204T3	B4194T5
Torque increase,				
Maximum K factor Nm	217	217	206	206
Gear ratio	2.3:1	2.3:1	1.9:1	1.9:1
Diameter mm	241	241	241	241
Normal stall speed (maximum 5 seconds), +/- 100 rpm				
rpm	2250	2350	2550	2800
Installation depth mm	10.5	10.5	10.5	10.5
Maximum axial play of the clutch plate at mounting points mm	0.2	0.2	0.2	0.2

Automatic gearbox: AW50-42LE and AW55-50SN. No oil change is required with normal driving. Oil changes should be carried out however, in cars used as taxis or used frequently for towing. Replacement interval: 75 000 km (± 5 000 km)

Gearbox oil:	Grade / quantity:
Lubricating oil, type:	AW 50-42: Dexron III AW 55-50: JWS 3309 No other type of oil may be used.
Maximum capacity, at 20°C litres	7.5
Oil capacity, cooling system .. litres	0.4
Oil capacity at oil change, including flushing litres	6.5

Gearbox oil:	Grade / quantity:
Oil capacity at oil change, draining only litres	3.0
Level difference between MAX-MIN markings litres	AW50-42: 0.5 AW55-50: 0.2

Line pressure

Gear selector in position D:	Idling speed	0.36 - 0.42 MPa
	Stall speed (1500 rpm) ...	1.12 - 1.34 MPa
Gear selector in position R:	Idling speed	0.61 - 0.71 MPa
	Stall speed (1500 rpm) ...	1.67 - 2.01 MPa

Automatic gearbox AW 50-42LE

Oil temperature sensor:	Resistance:
Resistance at $\pm 0^{\circ}\text{C}$ Ω	1671 - 2463
Resistance at $+20^{\circ}\text{C}$ Ω	765 - 1035
Resistance at $+160^{\circ}\text{C}$ Ω	19 - 22

Automatic gearbox AW 50-42LE

Sensor resistance at $\pm 25^{\circ}\text{C}$	Ω	325 - 535
Gear change solenoid, resistance at $\pm 25^{\circ}\text{C}$	Ω	11 - 15
Lock up solenoid, resistance at $\pm 25^{\circ}\text{C}$	Ω	11 - 15
Linear solenoid, resistance at $\pm 25^{\circ}\text{C}$	Ω	3.3 - 3.7

Automatic gearbox AW 50-42LE

Reversing lamp, maximum current	5 A
Lock switch:	
Resistance measured between points 1-4	$k\Omega$ 10
Starter circuit (constant)	A 8
Starter circuit (momentary)	A 40
Position switch	mA 10

Automatic gearbox AW 55-50SN

For information about AW55-50SN see VADIS

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Information applicable to automatic gearboxes

Gear ratios, automatic gearbox AW 50–42LE

Engine / gear ratio:	AW50-42LE		
	B4184SX B4204SX	B4194TX	B4204TX
Gear:	Gear ratio:		
1st gear	3.74:1	3.61:1	3.61:1
2nd gear	2.14:1	2.06:1	2.06:1
3rd gear	1.42:1	1.37:1	1.37:1
4th gear	1.02:1 - '99 1.01:1 - '99	0.98:1	0.98:1
Reverse gear	-4.09:1	-3.95:1	-3.95:1
Final drive	3.09:1 - '96 3.10:1 '97-	2.56:1	2.76:1

Gear ratios, automatic gearbox AW 55–50SN

Engine / gear ratio:	AW55-50SN	
	B4184SX B4204SX	B4204TX
Gear:	Gear ratio:	
1st gear	4.77:1	4.77:1
2nd gear	2.99:1	2.99:1
3rd gear	1.96:1	1.96:1
4th gear	1.32:1	1,32,:1
5th gear	1.02:1	1.02:1
Reverse gear	-3.23:1	-3.23:1
Final drive	2.86:1	2.44:1

Tightening torques

Mechanical component:	Nm
Screws rear mounting on the housing	67
Engine speed (RPM) sensor	6
Oil drain plug	40
Screws, carrier plate to crankshaft: Petrol engines:	
-Stage 1	45
-Stage 2	Tighten +50°
Screws and nuts, gearbox to engine	50
Screws, torque converter to carrier plate	35
Nipple, coolant pipe	30
Nuts, gearbox cable mounting	25
Screws, gearbox cable to the mounting	25
Oil temperature sensor	10
Nut, arm to control shaft	25
Screws, control system cover	13
Screws, drive shaft cover:	
M6	10
M8	25
Solenoid	7
Gearbox speed sensor in/out	6
Test plug	8

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Information applicable to manual gearboxes

Information applicable to manual gearboxes

Gear ratios -1999

Gearbox type:	JB3	JC5	JB3	JC5	JC5
Engine:	B4184S	B4184S	B4164S	B4204S	D4192T
Gear:	Gear ratio:				
1st gear	3.36:1	3.36:1	3.36:1	3.36:1	3.73:1
2nd gear	2.05:1	1.86:1	1.86:1	1.86:1	2.05:1
3rd gear	1.32:1	1.32:1	1.32:1	1.32:1	1.32:1
4th gear	0.97:1	0.97:1	0.97:1	0.97:1	0.97:1
5th gear	0.76:1	0.79:1	0.80:1	0.76:1	0.76:1
Reverse gear	-3.55:1	-3.55:1	-3.55:1	-3.55:1	-3.55:1
Final drive	3.87:1 ¹	3.73:1	4.07:1	4.07:1	3.44:1

¹ 3.73:1 Applies to France.

Gear ratios 2000-

Gearbox type:	JB3	JC5	JC5
Engine:	B4164S2	B4184S2 B4148S3	D4192T2
Gear:	Gear ratio:		
1st gear	3.36:1	3.36:1	3.73:1
2nd gear	1.86:1	1.86:1	2.05:1
3rd gear	1.32:1	1.32:1	1.32:1
4th gear	1.03:1	1.03:1	0.97:1
5th gear	0.82:1	0.82:1	0.76:1
Reverse gear	-3.55:1	-3.55:1	-3.55:1
Final drive	4.07:1	3.87:1	3.44:1

Gear ratios -1999

Gearbox type:	M56L2	M56H	F5M42
Engine:	B4194T	B4204T	B4184SM
Gear:	Gear ratio:		
1st gear	3.39:1	3.07:1	3.58:1
2nd gear	1.91:1	1.77:1	1.95:1
3rd gear	1.19:1	1.19:1	1.27:1
4th gear	0.87:1	0.87:1	0.97:1
5th gear	0.65:1	0.70:1	0.77:1
Reverse gear	-3.18:1	-3.30:1	-3.36:1
Final drive	4.25:1	4.00:1	3.72:1

Gear ratios 2000 - 2001

Gearbox type:	M56H	M56L2	M56H
Engine:	B4204S2	B4194T2	B4204T2
Gear:	Gear ratio:		
1st gear	3.07:1	3.39:1	3.07:1
2nd gear	1.77:1	1.91:1	1.77:1
3rd gear	1.19:1	1.19:1	1.19:1
4th gear	0.87:1	0.87:1	0.87:1
5th gear	0.70:1	0.65:1	0.70:1
Reverse gear	-3.30:1	-3.18:1	-3.30:1
Final drive	4.45:1	4.25:1	4.00:1

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Information applicable to manual gearboxes

Gear ratios 2001-

Gearbox type:	M56H	F5M42	M56L2	M56H2
Engine:	B4204S2 B4204T3	B4184SJ	D4192T3 D4192T4	B4204T5
Gear:	Gear ratio:			
1st gear	3.07:1	3.58:1	3.39:1	3.07:1
2nd gear	1.77:1	1.95:1	1.90:1	1.77:1
3rd gear	1.19:1	1.27:1	1.19:1	1.19:1
4th gear	0.87:1	0.97:1	0.87:1	0.87:1
5th gear	0.70:1	0.82:1	0.65:1	0.65:1
Reverse gear	-2.99:1	-3.36:1	-3.30:1	-3.30:1
Final drive	B4204S2: 4.45:1 B4204T3: 4.00:1	4.25:1	3.77:1	4.25:1

Gear ratios 2001-

Gearbox type:	JB3	JC5	M56
Engine:	B4164S2	B4184SX	B4184SX
Gear:	Gear ratio:		
1st gear	3.36:1	3.36:1	3.07:1
2nd gear	1.86:1	1.86:1	1.77:1
3rd gear	1.32:1	1.32:1	1.19:1
4th gear	1.03:1	1.03:1	0.87:1
5th gear	0.82:1	0.82:1	0.70:1
Reverse gear	-3.55:1	-3.55:1	-2.99:1
Final drive	4.07:1	3.87:1	4.45:1

Oil: Gearbox

Gearbox:	Oil grade:	Oil change volume:
M56	Volvo P/N: 11 61 645	approx. 2.1 litre
F5M42	Volvo P/N: 11 61 520	2.2 litre
JB3, JC5	Volvo P/N: 11 61 681	3.4 litre

Tightening torques

Mechanical component:	JB3, JC5	M56	F5M42
	Nm	Nm	Nm
Screw, gearbox to engine	50	50	48
Screws, engine to gear box mountings on the gearbox	27	-	-
Screw, gear change mechanism, maximum	24	-	24
Screw, gearbox mounting, clutch pipes	48	-	-
Screw, gear selector rod to gear selector lever	16	-	-
Remote control lever to gearbox	16	-	16
Oil drain plug	22	-	-
Drain and filler plug	-	35	32
Level and filler plug	plastic 1.75	-	-
Level and filler plug	steel 2.2	-	-
Screws, gearbox side cover	25	-	7
Screws, gearbox mounting bracket, rear	40	40	69
Protective plugs	25	-	32
Screws, ground lead to gearbox, manual	40	40	40
Screws, ground lead to gearbox, automatic	50	50	-
Screw, gear selector lever mounting on bodywork	25	-	-
Reversing light switch	22	25	32
5th gear, pressure ring	24	-	-
Gear selector rod to gear selector lever	16	16	16
Screws, input shaft guide bushing	25	-	-
Engine mounting on the front side	67	67	69
Stud	50	50	-
Hydraulic pipe, mounting	48	-	-
Screw, engine or gearbox mounting on bodywork	98	98	98
Nuts, gearbox mounting, bodywork mounting	45	45	98
Screws, starter motor	50	50	50
Screws, lever cable mounting	-	-	18
Screws, lever mechanism	-	-	18
Mounting screw, shaft mechanism	-	-	30
Mounting screw, reverse gear	-	-	48

4. Power transmission


46 Drive shafts

46 Drive shafts

Specifications

Correct method for measuring for play in the drive shafts: See service information in VADIS, function group: 4 (46)

Seal:	
Seal, guide pin right drive shaft	Volvo P/N: 11 61 370

Splines, drive shaft: 	
Maximum play drive shaft splines mm	0.01
Lubricant ¹ :	Volvo P/N: 11 61 029

¹ Different types of grease must not be mixed during servicing

Tightening torques

Mechanical component:	Nm
Nut, drive shaft -1997	240
Nut, drive shaft 1998-2000 stage 1	120
stage 2	Tighten +60°
Nut, drive shaft 2001- stage 1	180
stage 2	Tighten +30°
Screws for boot, left, JB3, JC5	25
Bearing cap, drive shaft on the engine	25