Document Title: **Description**	Function Group: **000**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **BL61B Volvo**			

Go back to Index Page

Description

Showing Selected Profile

Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo	Wroclaw	1202054	1210000

The **BL61B** machine is a four-wheel drive rigid backhoe loader.

The engine is a low-emission, direct-injection, turbocharged, 4 cylinders, four-stroke, 4.8l displacement, liquid-cooled Volvo diesel engine. The engine is conforming EPA Tier 3 and Stage IIIA regulations.

The machine has a mechanical Powershuttle transmission with four forward and four reverse fully synchronized gears. The transmission has a single stage hydraulic torque converter.
The machine can be equipped with an optional automatic Powershift transmission with four forward and reverse speeds. The Powershift transmission features electro-hydraulic forward/reverse lever on steering column. Automatic mode is activated when fourth gear is engaged.

The front and rear axles have fully floating drive shafts with planetary type reductions. The rear axle has a dog-clutch type differential lock and integral oil immersed multi-disc brakes.

The service brake is a hydraulically operated, multi-plate, oil-immersed, servo power-assisted brake with self adjusting inboard disc brakes.
The parking brake is mechanically operated.

The steering system is hydrostatic with a load-sensing steering unit and a double acting steering cylinder.

The machine is equipped with a redesigned cab. The new cab has an improved all around visibility and ergonomic layout.
An optional canopy is available.

The electrical system voltage is 12 VDC. Electrical and electro-hydraulic functions are monitored and controlled by a Vehicle Electronic Control Unit (V-ECU).
On the side console several machine functions can be controlled and monitored in a display. For electrical troubleshooting a special service mode can be activated in the display.

The hydraulic system has one working pump with fixed displacement. The pump is an open centre gear pump.

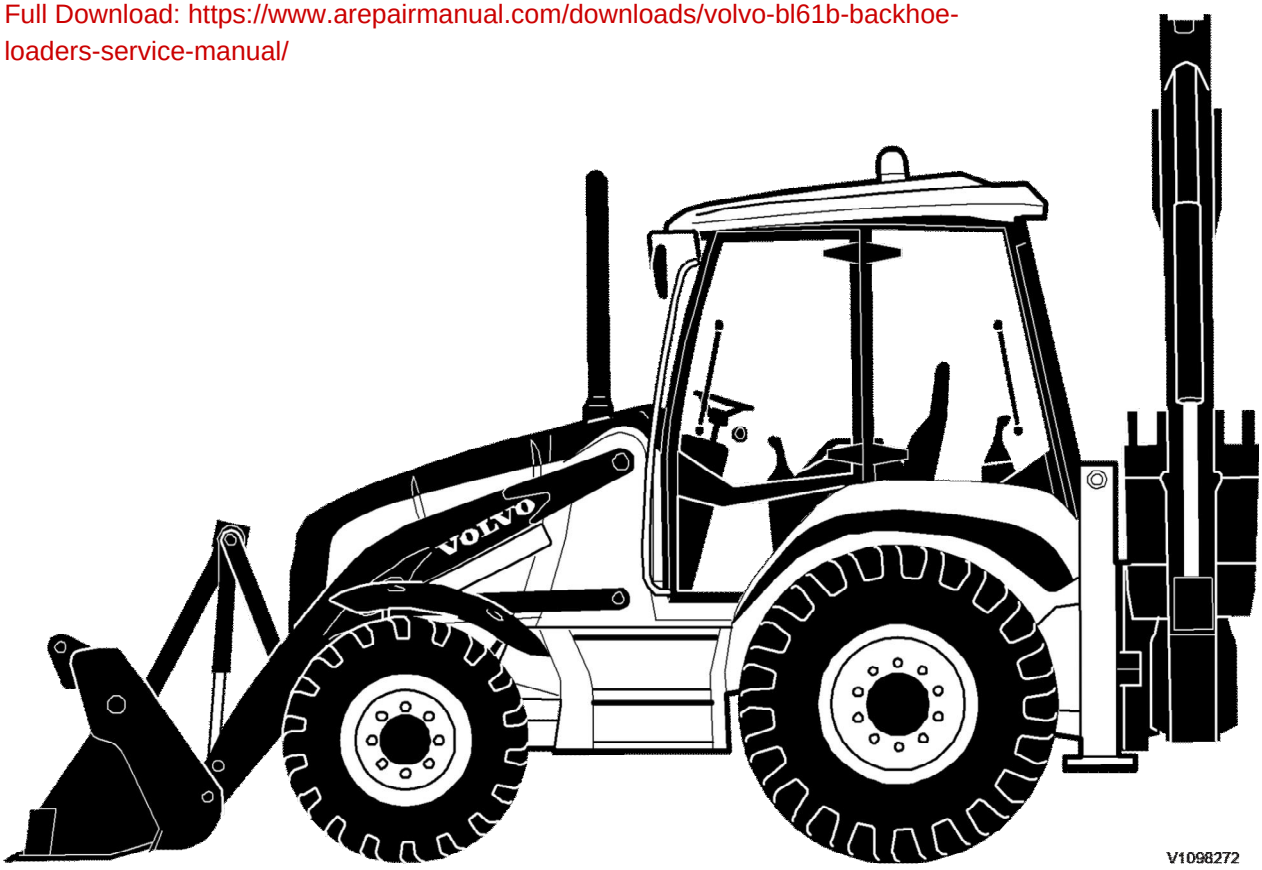

Figure 1
Backhoe loader BL61B

Document Title: **Description**	Function Group: **000**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **BL61B Volvo**			

Go back to Index Page

Description

Showing Selected Profile

Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo	Wroclaw	230101	240000

The **BL61B** machine is a four-wheel drive rigid backhoe loader.

The engine is a straight four-cylinder, four-stroke, turbocharged diesel engine with direct injection and charge air cooler. The engine meets governing legislation according to Tier 4 interim and Stage IIIB for exhaust emissions.
All of the engine's electronic functions are controlled by the E-ECU.

The machine has a mechanical Powershuttle transmission with four forward and four reverse fully synchronized gears. The transmission has a single stage hydraulic torque converter.
The machine can be equipped with an optional automatic Powershift transmission with four forward and reverse speeds. The Powershift transmission features electro-hydraulic forward/reverse lever on steering column. Automatic mode is activated when fourth gear is engaged.

The front and rear axles have fully floating drive shafts with planetary type reductions. The rear axle has a dog-clutch type differential lock and integral oil immersed multi-disc brakes.

The service brake is a hydraulically operated, multi-plate, oil-immersed, servo power-assisted brake with self adjusting inboard disc brakes.
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The steering system is hydrostatic with a load-sensing steering unit and a double acting steering cylinder.

The machine is equipped with a redesigned cab. The new cab has an improved all around visibility and ergonomic layout.
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The electrical system voltage is 12 VDC. Electrical and electro-hydraulic functions are monitored and controlled by a Vehicle Electronic Control Unit (V-ECU).
On the side console several machine functions can be controlled and monitored in a display. For electrical troubleshooting a special service mode can be activated in the display.

The hydraulic system has one working pump with fixed displacement. The pump is an open centre gear pump.

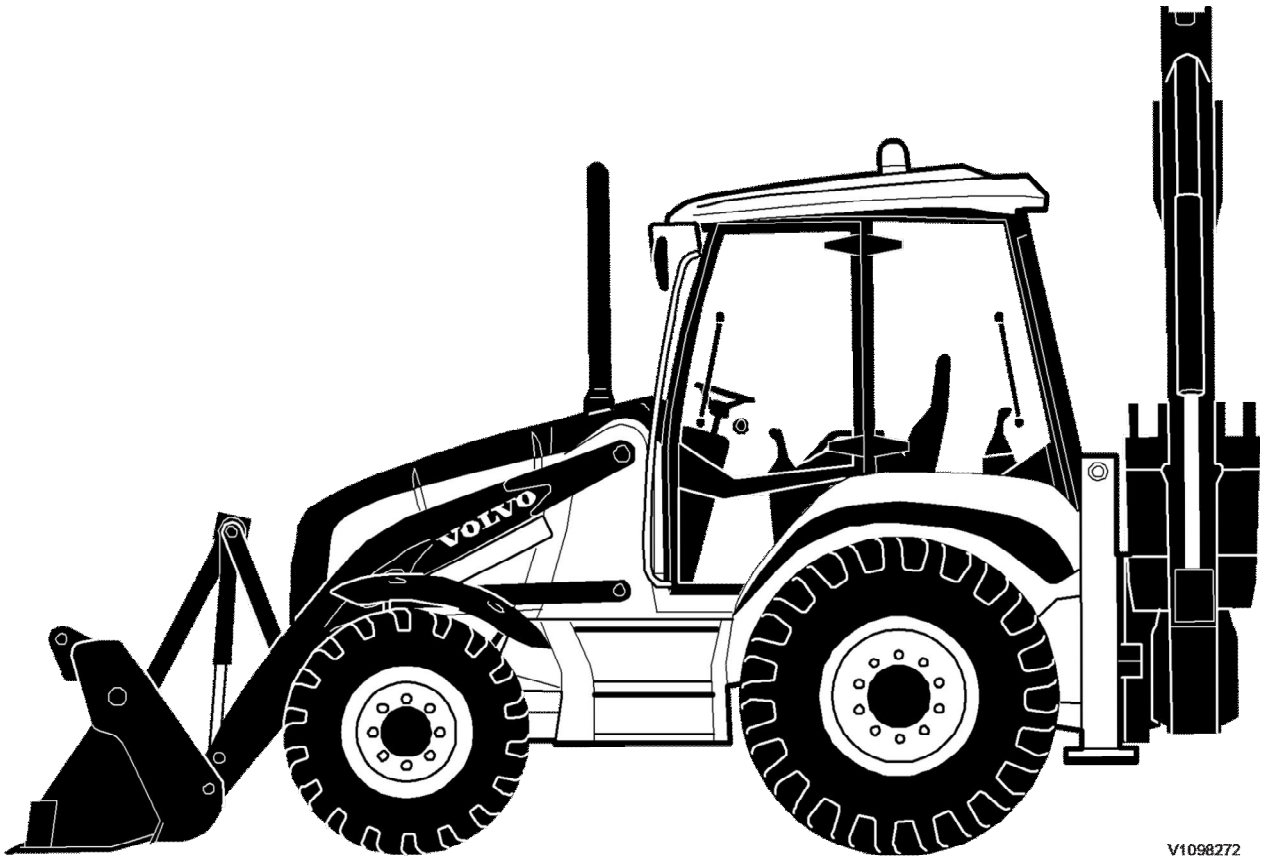


Figure 1
Backhoe loader BL61B

Document Title: **Volvo standard tightening torques**	Function Group: **030**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **BL61B Volvo**			

Volvo standard tightening torques

Showing Selected Profile

Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo			

The tightening torques in the following tables apply to bolts and nuts with tensile strength. The tables should be used as a general instruction for tightening bolts and nuts without specified values. The charts contains values for course thread bolts and nuts.
Torque values should be increased with ≈10%, for flange bolts.
All standard torques for bolts are without surface treatment.
The standard torque for bolts lubricated with oil should be reduced with 20% of the given value.

Standard tightening torque charts

Bolt size Metric Coarse Threads	**Tensile strength 8.8**		**Tensile strength 10.9**	
	(Nm)	**(lbf ft)**	**(Nm)**	**(lbf ft)**
M5	6	4	8	6
M6	10	7	14	11
M8	25	18	35	26
M10	50	37	70	52
M12	87	64	122	90
M14	139	103	195	144
M16	213	157	299	220
M18	293	216	413	305
M20	416	307	585	432
M24	719	530	1010	745
M27	1060	782	1490	1100
M30	1140	840	2025	1493
M36	2500	1844	3600	2653

Bolt size Inch SAE Coarse Threads	**Tensile strength 5**		**Tensile strength 8**	
	(lbf ft)	**(Nm)**	**(lbf ft)**	**(Nm)**
1/4	10	13,6	14	19
5/16	21	28,5	29	39,3
3/8	37	50,2	52	70
7/16	59	80	84	114
1/2	90	122	128	174
9/16	130	176	184	250
5/8	180	244	254	345

3/4	320	434	451	612
7/8	515	700	728	988
1	775	1052	1091	1480
1 1/8	953	1290	1545	2100
1 1/4	1344	1823	2180	2960
1 3/8	1600	2170	2650	3600
1 1/2	2000	2714	3200	4340

Document Title: **Conversion tables**	Function Group: **030**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **BL61B Volvo**			

Conversion tables

Showing Selected Profile

Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo			

Length

Unit	**cm**	**m**	**km**	**in**	**ft**	**yd**	**mile**
cm	1	0.01	0.00001	0.3937	0.03281	0.01094	0.000006
m	100	1	0.001	39.37	3.2808	1.0936	0.00062
km	100000	1000	1	39370.7	3280.8	1093.6	0.62137
in	2.54	0.0254	0.000025	1	0.08333	0.02777	0.000015
ft	30.48	0.3048	0.000304	12	1	0.3333	0.000189
yd	91.44	0.9144	0.000914	36	3	1	0.000568
mile	160930	1609.3	1.6093	63360	5280	1760	1
1 mm = 0.1 cm - 1 mm = 0.001 mm							

Area

Unit	**cm^2**	**m^2**	**km^2**	**a**	**ft^2**	**yd^2**	**in^2**
cm^2	1	0.0001	-	0.000001	0.001076	0.000012	0.155000
m^2	10000	1	0.000001	0.01	10.764	1.1958	1550.000
km^2	-	1000000	1	10000	1076400	1195800	-
a	0.01	100	0.0001	1	1076.4	119.58	-
ft^2	-	0.092903	-	0.000929	1	0.1111	144.000
yd^2	-	0.83613	-	0.008361	9	1	1296.00
in^2	6.4516	0.000645	-	-	0.006943	0.000771	1
1 ha = 100 a - 1 $mile^2$ = 259 ha = 2.59 km^2							

Volume

Unit	**cm^3 = cc**	**m^3**	**l**	**in^3**	**ft^3**	**yd^3**
cm^3 = ml	1	0.000001	0.001	0.061024	0.000035	0.000001
m^3	1000000	1	1000	61024	35.315	1.30796
dm^3(l)	1000	0.001	1	61.024	0.035315	0.001308
in^3	16.387	0.000016	0.01638	1	0.000578	0.000021
ft^3	28316.8	0.028317	28.317	1728	1	0.03704
yd^3	764529.8	0.76453	764.53	46656	27	1
1 gal (US) = 3785.41 cm^3 = 231 in^3 = 0.83267 gal (UK)						

Weight

Unit	g	kg	t	oz	lb
g	1	0.001	0.000001	0.03527	0.0022
kg	1000	1	0.001	35.273	2.20459
t	1000000	1000	1	35273	2204.59
oz	28.3495	0.02835	0.000028	1	0.0625
lb	453.592	0.45359	0.000454	16	1
1 ton (metric) = 1.1023 ton (US) = 0.9842 ton (UK)					

Pressure

Unit	kp/cm^2	bar	$Pa=N/m^2$	kPa	lbf/in^2	lbf/ft^2
kp/cm^2	1	0.98067	98066.5	98.0665	14.2233	2048.16
bar	1.01972	1	100000	100	14.5037	2088.6
$Pa=N/m^2$	0.00001	0.001	1	0.001	0.00015	0.02086
kPa	0.01020	0.01	1000	1	0.14504	20.886
lbf/in^2	0.07032	0.0689	6894.76	6.89476	1	144
lbf/ft^2	0.00047	0.00047	47.88028	0.04788	0.00694	1
kg/cm^2 = 735.56 Dry (mmHg) = 0.96784 atm						

Unit explanations

Unit	abbreviation
Newton meter	Nm
Kilopoundmeter	kpm
Kilopascal	kPa
Megapascal	MPa
Kilowatt	kW
kilojoule	kJ
British thermal unit	Btu
Calorie	ca

Approx. conversion

SI unit	Conversion factor	Non SI	Conversion factor	SI
Torque				
Nm	x10.2	=kg/cm	x0.8664	=lb in
Nm	x0.74	=lbf·ft	x1.36	=Nm
Nm	x0.102	=kg/m	x7.22	=lbft
Pressure (Pa = N/m^2)				
kPa	x4.0	$=in.H_2O$	x0.249	=kPa
kPa	x0.30	=in.Hg	x3.38	=kPa
kPa	x0.145	=psi	x6.89	=kPa
bar	x14.5	=psi	x0.069	=bar
kp/cm^2	x14.22	=psi	x0.070	$=kp/cm^2$
N/mm^2	x145.04	=psi	x0.069	=bar
MPa	x145	=psi	x0.00689	=MPa
Power (W = J/s)				
kW	x1.36	=hp(cv)	x0.736	=kW

kW	x1.34	=bhp	x0.746	=kW
kW	x0.948	=Btu/s	x1.055	=kW
W	x0.74	=ft·lb/s	x1.36	=W
Energy (J = Nm)				
kJ	x0.948	=Btu	x1.055	=kJ
J	x0.239	=calorie	x4.19	=J
Speed and acceleration				
m/s^2	x3.28	$=ft/s^2$	x0.305	$=m/s^2$
m/s	x3.28	=ft/s	x0.305	=m/s
km/h	x0.62	=mph	x1.61	=km/h
Horsepower/torque				
Bhp x5252 rpm= TQ (lb·ft)			TQ x rpm 5252=bhp	
Temperature				
ºC =(ºF-32)/1.8			ºF =(ºC x1.8) +32	
Flow factor				
l/min (dm^3/min)	x0.264	= US gal/min x3.785		=liter/min

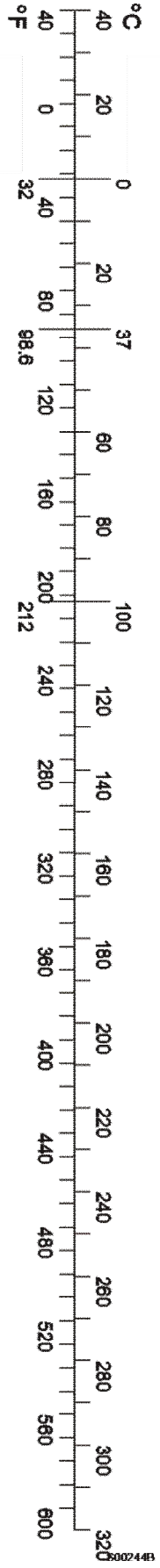


Figure 1

Document Title: **Operation numbers for additional work**	Function Group: **070**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **Backhoe Loaders (BHL)**			

Operation numbers for additional work

Showing Selected Profile

These operations can be used to identify work that is not included in the time guide or described in the methods in the Service Manual. When these operations are used, a description of the work that has been performed must be provided.

Other work related to engine
Op. no. 070-210
This operation can be used when work has been done related to the engine and function group 2 when no applicable method description was available. When this operation is used, additional information is required:

- Description of work that has been done

Other work related to electrical system
Op. no. 070-310
This operation can be used when work has been done related to the electrical system and function group 3 when no applicable method description was available. When this operation is used, additional information is required:

- Description of work that has been done

Other work related to transmission, gearbox, travel motor, swing motor
Op. no. 070-410
This operation can be used when work has been done related to the transmission, gearbox, travel motor or swing motor and function group 4 when no applicable method description was available. Hhen this operation is used, additional information is required:

- Description of work that has been done

Other work related to drive axle
Op. no. 070-470
This operation can be used when work has been done related to the drive axle and function group 46 when no applicable method description was available. When this operation is used, additional information is required:

- Description of required work that have been done

Other work related to brake system
Op. no. 070-510
This operation can be used when work has been done related to the brake system and function group 5 when no applicable

method description was available. When this operation is used, additional information is required:

- Description of work that has been done

Other work related to steering system
Op. no. 070-610
This operation can be used when work has been done related to the steering system and function group 6 when no applicable method description was available. When this operation is used, additional information is required:

- Description of work that has been done

Other work related to frame link, axle suspension
Op. no. 070-710
This operation can be used when work has been done related to the frame link, axle suspension and other parts related to function group 7 when no applicable method description was available. When this operation is used, additional information is required:

- Description of work that has been done

Other work related to cab, air conditioning
Op. no. 070-810
This operation can be used when work has been done related to the cab, air conditioning and other parts related to function group 8 when no applicable method description was available. When this operation is used, additional information is required:

- Description of work that has been done

Other work related to hydraulic system
Op. no. 070-910
This operation can be used when work has been done related to the hydraulic system and other parts related to function group 9 when no applicable method description was available. When this operation is used, additional information is required:

- Description of work that has been done

Document Title: **E 1708, Checking point**	Function Group: **080**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **BL61B Volvo**			

E 1708, Checking point

Showing Selected Profile

Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo			

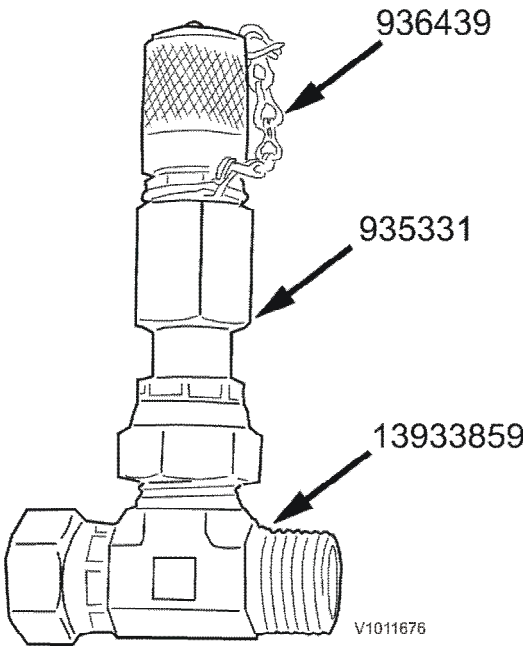


Figure 1

Document Title: **E1820**	Function Group: **080**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **BL61B Volvo**			

E1820

Showing Selected Profile

Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo			

Bolt, M20×320 mm, part No. 13977717
Nut, M20
Washers, part No. 433065, 2 pcs. To be welded onto both ends of the pipe.

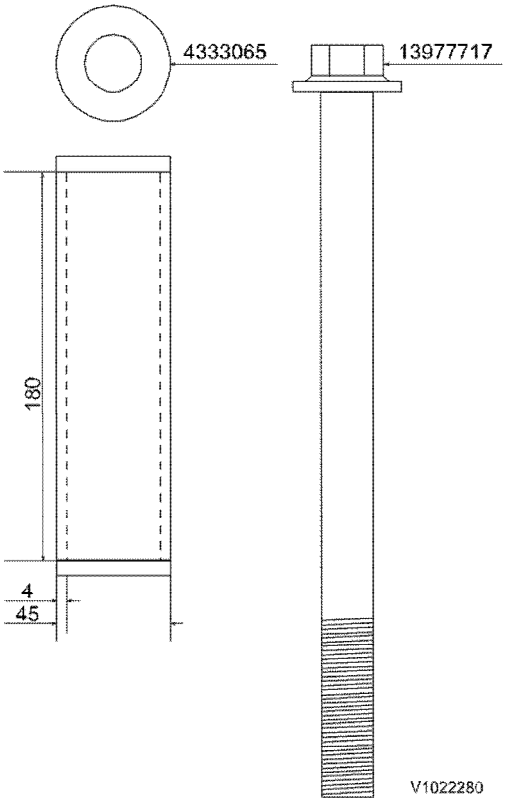


Figure 1
E1820

Document Title: **E-5001**	Function Group: **080**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **BL61B Volvo**			

E-5001

Showing Selected Profile

Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo			

Protection plate and sealing (stabiliser cylinder, changing)

Create a protection plate and a sealing according to the image. Use a metal sheet with a thickness of 3 mm for the protection plate.

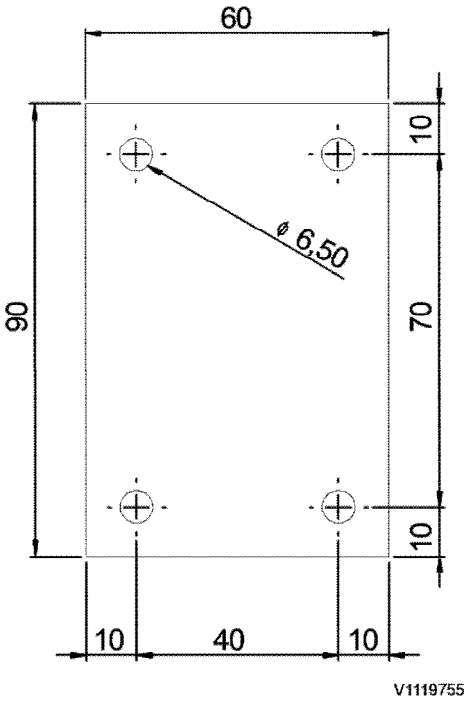


Figure 1
Protection plate and sealing
Dimensions on the drawing are given in mm.

VOLVO

Service Information

Document Title:	Function Group:	Information Type:	Date:
E-5002	**080**	**Service Information**	**4/13/2025**
Profile: **BL61B Volvo**			

E-5002

Showing Selected Profile

Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo			

Transmission support for jack (special tool 9999954), when removing/installing Powershift transmission (valid for BHL B-Series)

Create a transmission support according to the image.

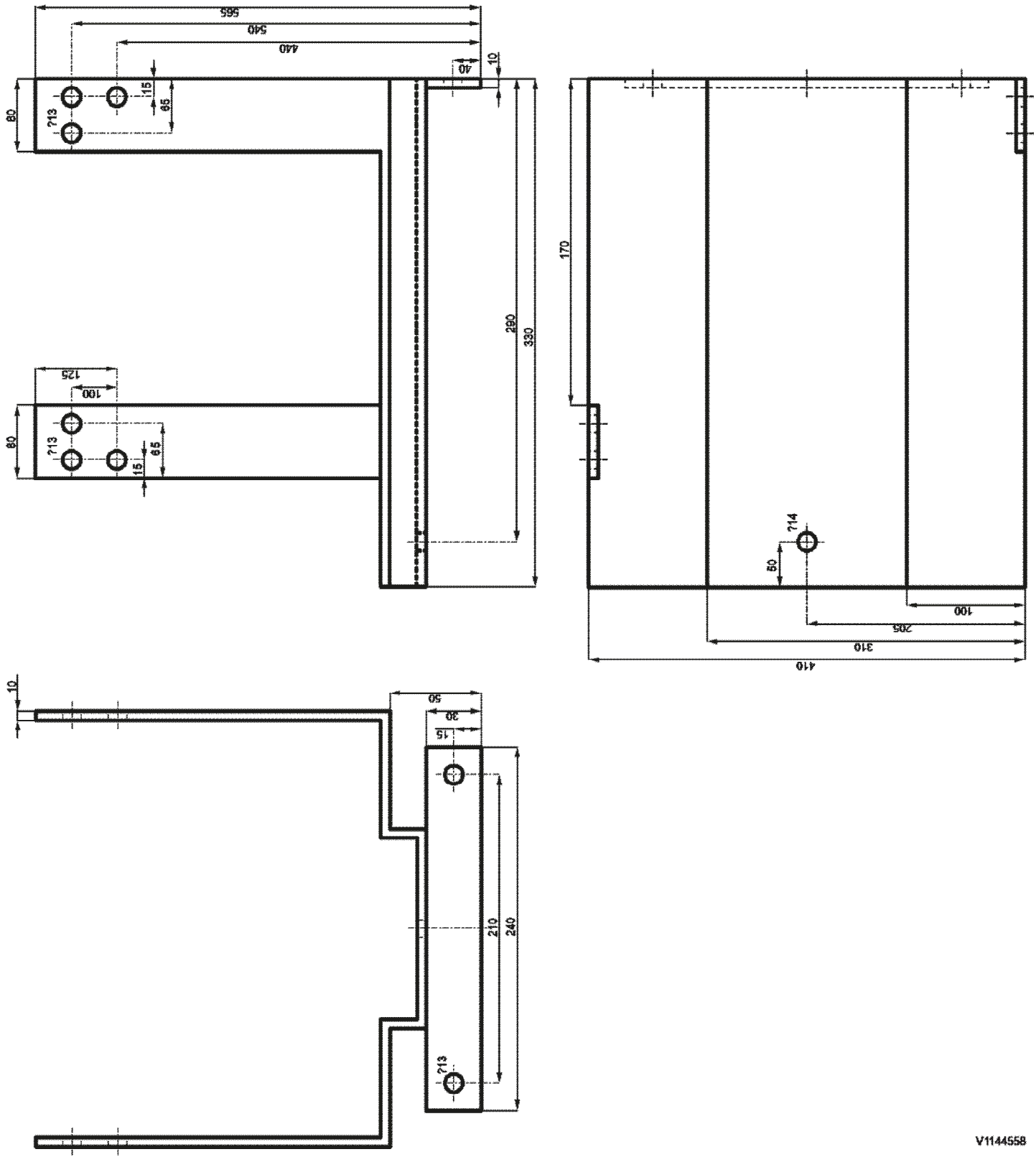


Figure 1
transmission support (valid for BHL B-Series Powershift transmission)

VOLVO

Service Information

Document Title:	Function Group:	Information Type:	Date:
E-5003	**080**	**Service Information**	**4/13/2025**
Profile: **BL61B Volvo**			

E-5003

Showing Selected Profile

Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo			

Transmission support for jack (special tool 9999954), when removing/installing Powershuttle transmission (valid for BHL B-Series)

Create a transmission support according to the image.

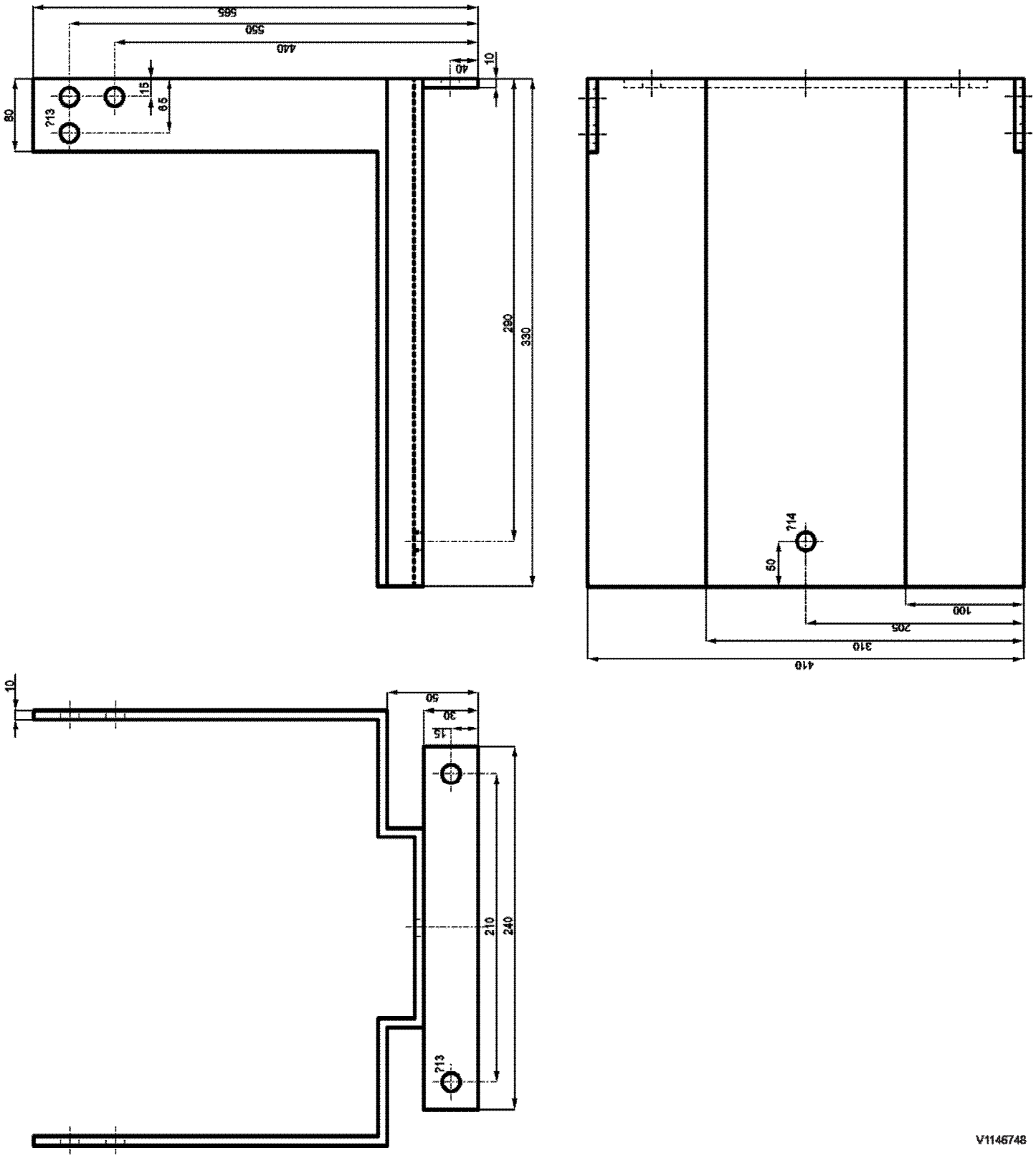


Figure 1
transmission support (valid for BHL B-Series Powershuttle transmission)

VOLVO

Service Information

Document Title: **Recommended lubricants, oils**	Function Group: **160**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **BL61B Volvo**			

Go back to Index Page

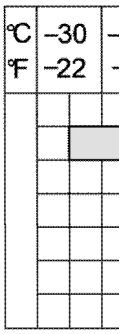
Recommended lubricants, oils

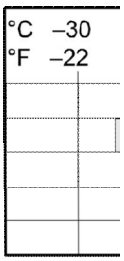
Showing Selected Profile

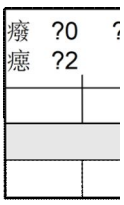
Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo	Wroclaw	1202054	1210000

For questions about oils, lubricants, and extreme outdoor temperatures, contact your dealer for more information.

NOTE!
BIO-OIL and mineral oil (carbon-hydrogen-oil) must be disposed of separately. Mixing is prohibited!

	Oil grade	**Recommended viscosity at varying ambient temperatures**
ENGINE	**Volvo Ultra Diesel Engine oil VDS-3** or **Volvo Super Diesel Engine Oil** or VDS-3 or VDS-2 plus ACEA-E7	 **Figure 1**

	or VDS-2 plus API CI-4 or VDS-2 or VDS + ACEA -E3 or ACEA : E7, E4 or API: CI-4, CH-4, CG-4 For recommended change intervals according to the oil's grade and sulphur content in the fuel, see page Fuel.		
HYDRAULIC SYSTEM	**Volvo Super Hydraulic Oil** As an alternative there is also Volvo Biodegrada	 **Figure 2**	

ering system Working hydraulics	ble Hydraulic Oil 46. Contact your dealer for more information.	
FRONT and REAR AXLES, TRANSMISSION and HUBS	**Volvo WB 101** Volvo Wet Brake Transaxle Oil	 **Figure 3**
COOLING SY	**Volvo Coolant VCS**	Volvo Coolant VCS should be used only. (For correct mixture,

S T E M	see page Coolant).

VOLVO

Service Information

Document Title: **Recommended lubricants, oils**	Function Group: **160**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **BL61B Volvo**			

Go back to Index Page

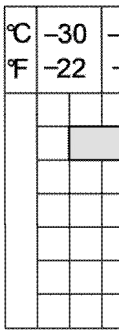
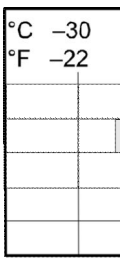
Recommended lubricants, oils

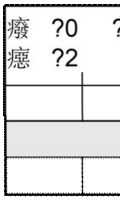
Showing Selected Profile

Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo	Wroclaw	230101	240000

For questions about oils, lubricants, and extreme outdoor temperatures, contact your dealer for more information.

NOTE!
BIO-OIL and mineral oil (carbon-hydrogen-oil) must be disposed of separately. Mixing is prohibited!

	Oil grade	**Recommended viscosity at varying ambient temperatures**
ENGINE	**Volvo Ultra Diesel Engine oil VDS-4**	 **Figure 1**
HYDRAULICSYST	**Volvo Super Hydraulic Oil** As an alternative there is	 **Figure 2**

EM	also Volvo Biodegradable Hydraulic Oil 46. Contact your dealer for more information.	
Steering system Working hydraulics		
FRONT and REAR AXLES, TRANSMISSION and HUBS	**Volvo WB 101** Volvo Wet Brake Transaxle Oil	 **Figure 3**
COOLI	**Volvo Coolant**	Volvo Coolant VCS should be

NGSYSTEM	**VCS**	used only. (For correct mixture, see page Coolant).

Document Title: **Fuel**	Function Group: **160**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **BL61B Volvo**			

Go back to Index Page

Fuel

Showing Selected Profile

Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo	Wroclaw	1202054	1210000

Quality requirements

The fuel should at least meet the legal requirements, and national and international standards for marketed fuels, for example: EN590 (with nationally adapted temperature requirements), ASTM D 975 No 1D and 2D, BS 2896 Class A 2, ISO 8217 DMX.
The cetane number must not be below 49 according to EN 590 ISO 5165 (40 according to ASTM D 975 Grade No 1-D and 2-D). If the cetane number is too low, it may cause starting problems and white smoke development.

Sulphur content

According to legal requirements the sulphur content must not exceed 0.3 percent by weight according to ISO 8754, EN 24260.

Biodiesel fuel

Vegetable oils and/or esters, also called "biodiesel", e.g. rapeseed methyl ester (RME), are offered on some markets both as a pure product and for mixing with diesel fuel.
Volvo accept max 7% biodiesel fuel in the diesel fuel ready-mixed from the oil companies. The fuel should follow EN14214 or ASTM D6751.
More than 7% admixture of biodiesel fuel may, among other things, result in:

- increased emission of nitric oxide (therefore does not meet existing legislation requirements)
- shorter service life of engine and injection system
- increased fuel consumption
- altered engine power
- halving of the interval between engine oil changes
- shortened service life of rubber materials in the fuel system
- impaired cold handling properties of the fuel
- limited storage life of the fuel which may lead to clogging of the fuel system, if the machine has not been used over a long period.

Warranty

The warranty does not apply to damage caused by an admixture of more than 7% of biodiesel fuel.

Document Title: **Fuel**	Function Group: **160**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **BL61B Volvo**			

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Fuel

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Valid for serial numbers			
Model	**Production site**	**Serial number start**	**Serial number stop**
BL61B Volvo	Wroclaw	230101	240000

Fuel quality requirements

The fuel should at least meet the legal requirements, and national and international standards for marketed fuels, for example:
EN590 (with nationally adapted temperature requirements), ASTM D 975 No 1D and 2D, JIS KK 2204.

For fuel specification according to the working temperature, please contact a workshop authorized by Volvo.

Sulphur content: For machines equipped with a Diesel Particulate Filter (DPF) it is mandatory to use diesel fuel with a sulphur content below 0.0015 percent (15 ppm).

Bio-diesel fuel

Vegetable oils and / or esters, also called “bio-diesel”, (e.g. rape-seed methyl ester RME fuel), which are offered on certain markets both as pure products and as mixed into the diesel fuel.

Volvo Construction Equipment accepts a maximum intermix of 7% bio-diesel fuel in the diesel fuel, ready mixed from the oil companies.

A higher intermix than 7% of bio-diesel fuel may cause:

- Increased emission of nitrogen oxide (thereby not meeting legal requirements)
- The short service life of motor and injection system
- Increased fuel consumption
- Altered engine output
- Shortening the engine oil change interval to a half
- Shortened service life of rubber materials in the fuel system
- Less good cold handling properties of the fuel
- Limit storage time for the fuel, which may cause clogging up of the fuel system if the machine is laid up for a longer period

Warranty condition

The warranty does not cover damage caused by an intermix of more than 7% of bio-diesel fuel.

Document Title: **Alternative fuels**	Function Group: **160**	Information Type: **Service Information**	Date: **4/13/2025**
Profile: **Backhoe Loaders (BHL)**			

Alternative fuels

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This statement is only valid for Volvo branded engines.

Hydro-treated vegetable oil (HVO) and fatty acid methyl ester (FAME) biodiesel are both made from renewable raw materials such as vegetable oils and animal fats, but they are chemically processed in different ways.

Hydro-treated vegetable oil (HVO)
HVO is created using a chemical process called hydro-treating. Hydro-treating creates an oxygen-free hydrocarbon product that is very similar to distillate diesel fuel and is well suited for use in diesel engines. HVO fuels complying with the CEN diesel fuel standard EN 590:2013 or with the European Fuel Quality Directive 98/70/EC are approved for use in all Volvo Construction Equipment diesel engines with no changes to maintenance intervals. Paraffinic diesel fuels complying with the CEN standard EN 15940 may be used in all machines operating outside the European Union and for EU-certified engines up to the emission level Stage IV. These fuels may also be used for the EU-certified D11, D13 and D16 engines meeting the emission level Stage V.

Biodiesel
Biodiesel is a product made from renewable resources such as vegetable oils or animal fat. Biodiesel that has been chemically processed into fatty acid methyl ester (FAME) can be blended with distillate diesel fuel and used in some diesel engines. Unblended biodiesel is referred to as B100 because it is 100% biodiesel.
Rapeseed methyl ester (RME) is the most common type of FAME used in Europe. Soy methyl ester (SME) and sunflower oil methyl ester (SOME) are the most common types of FAME used in the US.
Although use of FAME biodiesel is now a legal requirement in some markets, it is not as suitable for use in diesel engines as conventional diesel fuel or HVO (hydro-treated vegetable oil).

Biodiesel fuel requirements
The FAME biodiesel blends specified in the table below are approved for use if:

- The biodiesel is pre-blended by the fuel supplier
- The biodiesel used in the blend conforms to EN14214 or ASTM D6751
- The distillate fuel used in the blend meets fuel sulphur requirements
- The distillate fuel used in the blend conforms to EN590 or ASTM D975
- B1-B5 biodiesel blends conform to EN590 or ASTM D975
- B6-B7 biodiesel blends conform to EN590 or ASTM D7467
- B8-B20 biodiesel blends conform to EN16709(B20) or ASTM D7467

Engine emission designation	Engine size	Acceptable blend
EU Stage II / US Tier 2 * EU Stage IIIA / US Tier 3 * EU Stage IIIB / US Tier 4 interim EU Stage IV / US Tier 4 final EU Stage V	Below D4 / 4 litres	Up to B7
EU Stage II / US Tier 2 * EU Stage IIIA / US Tier 3 * EU Stage IIIB / US Tier 4 interim EU Stage IV / US Tier 4 final	D4–D8	Up to B7
EU Stage II / US Tier 2 * EU Stage IIIA / US Tier 3 * US Tier 4 final, special North America arrangement **	D9–D16	Up to B20
EU Stage IIIB / US Tier 4 interim EU Stage IV / US Tier 4 final	D11–D16	Up to B10

EU Stage IIIB / US Tier 4 interim, equipped with High Sulphur Fuel Conversion Kit (only available in unregulated markets) EU Stage IV / US Tier 4 final, equipped with High Sulphur Fuel Conversion Kit (only available in unregulated markets)	D4–D16	Up to B20
EU Stage V	D4–D16	Up to B7
* As Tier 2 and Tier 3 emissions regulations ended in 2005 and 2010 respectively, engines produced since then typically **meet Stage II / Stage IIIA regulations**, allowing their sale in less regulated markets. ** With additional restrictions and special operating conditions, equipment used in North America may operate on B20 diesel.		

NOTE!
Failures directly caused by the use of poor quality biofuel, or any other fuel not conforming to standards, are not factory defects and the manufacturer's warranty does not apply.

Maintenance interval requirements
Additional service actions and shorter maintenance intervals are mandatory when using biodiesel blends above B10.

Every 10 hours
○ Check the engine oil and change if it rises above the maximum fill level ○ Inspect the fuel system components and replace as necessary
Half of original interval
○ Change the engine oil and filter ○ Replace the fuel filter(s)
Every year, regardless of operating hours
○ Change the engine oil and filter ○ Clean the fuel tank

Effects of biodiesel on engine oil
Using biodiesel can lead to increased oil dilution. Use engine oil analysis tools frequently to check for fuel dilution and monitor engine oil condition. Check the engine oil level daily. Always change the engine oil if the oil level rises above the maximum fill level.

Effects of biodiesel on fuel systems
Biodiesel dissolves and loosens some fuel system deposits. During the initial conversion to biodiesel, loosened deposits will travel to the fuel filters and require more frequent fuel filter replacements. Start with new fuel filters when using biodiesel for the first time.

Biodiesel is aggressive to some materials used in fuel system components. Inspect seals, hoses, rubber and plastic components every 10 hours. Repair or replace any components that are damaged, softened or leaking. Clean biodiesel from painted surfaces immediately to prevent paint damage.

Biodiesel is more sensitive to bacteria and water contamination than distillate diesel fuel.

- Use as much fuel as possible before refilling the fuel tank in order to prevent bacteria growth if a machine is in regular use, e.g. regularly uses up a tank of fuel within a week. In climates where condensation is a risk, or when the machine is working for short durations, keep the fuel tank full.
- Do not use biodiesel in machines with low utilization or operating time.
- Do not store machines for more than 4 weeks without flushing biodiesel out of the fuel system by operating the machine through at least one full tank of distillate diesel fuel.
- Always follow the manufacturer's storage recommendations and "best-before" dates for each delivery of biodiesel.

Effects of biodiesel on exhaust aftertreatment systems
Biodiesel leaves higher levels of ash in diesel particulate filters and may require more frequent diesel particulate filter (DPF) regeneration and cleaning. Biodiesel can cause deviations in temperatures and functionality of the DPF burner and may cause fault codes or errors.

Biodiesel exhaust gas is aggressive to some materials used in selective catalytic reduction systems (SCR) and may require more frequent cleaning, repairing or replacing of SCR parts.

Effects of biodiesel on cold weather operation

Biodiesel has a high viscosity at temperatures below 0 ˚C (32 ˚F) and may cause problems starting the engine. Use a fuel heater or park machines in a heated building if possible.

Effects of biodiesel on engine performance

Biodiesel B100 has about 8% lower energy density compared to regular diesel fuel. Blends equal or lower than B20 have a small impact on engine performance.

Effects of biodiesel on emissions compliance

Engines are certified to comply with U.S. EPA, California and EU emissions standards based upon the use of test fuels with specifications established by these regulatory agencies. Alternative fuels, including biodiesel, that are not substantially similar to the required test fuels may adversely affect engine emissions compliance. As a result, Volvo does not warrant that the engine will conform to applicable Federal or California and EU emissions limits when operated on, or having previously being operated on, biodiesel or other alternative fuels that are not substantially similar to specified test fuels used for certification, nor if biodiesel / regular diesel is used in blends that exceed the recommendations.

However, the use of biodiesel up to a maximum of 20% (B20) in and of itself, will not affect the manufacturer's mechanical warranty as to engine or emissions system, provided the bio fuel used in the blend conforms to the applicable standards and the additional steps outlined herein are followed.