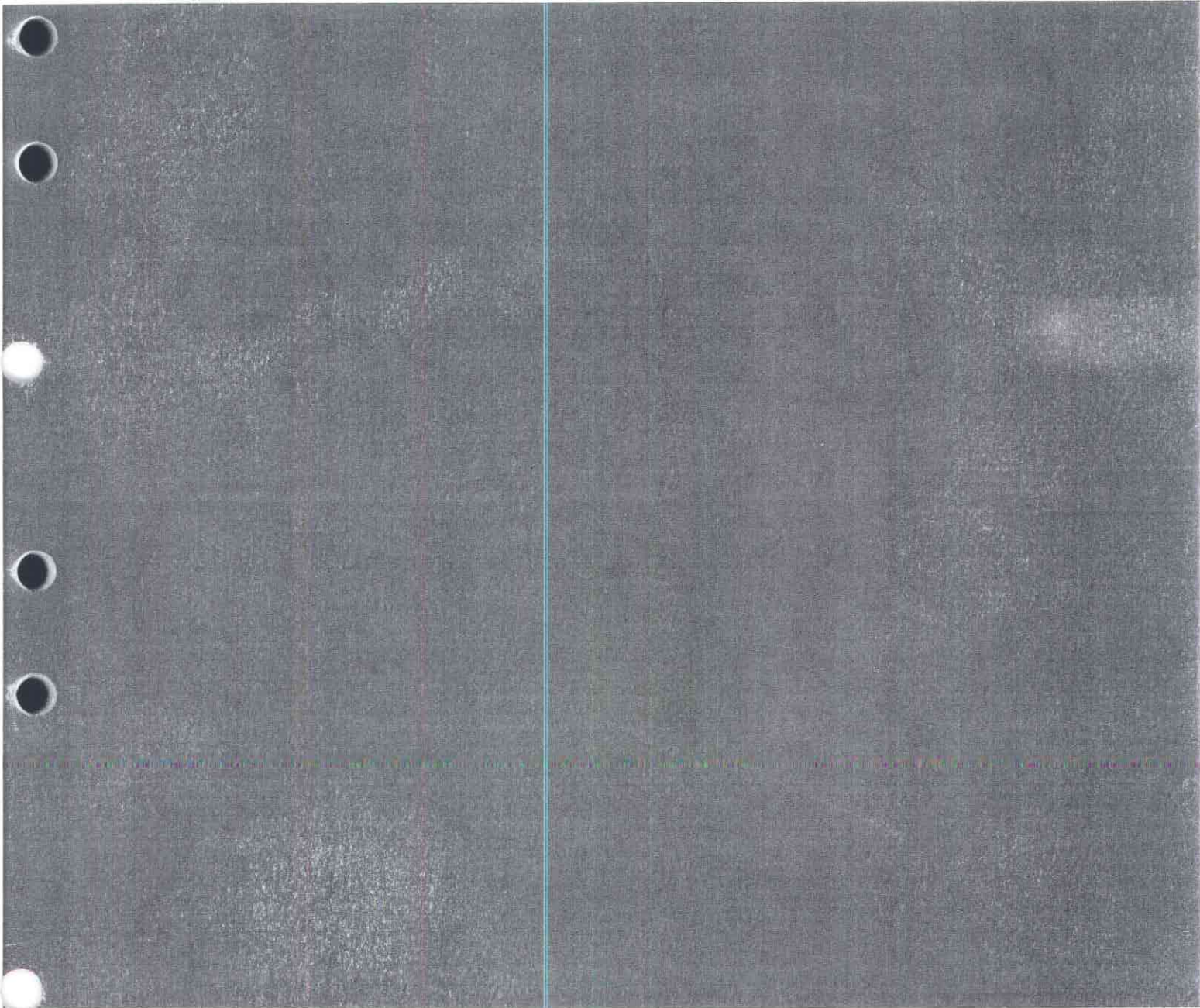
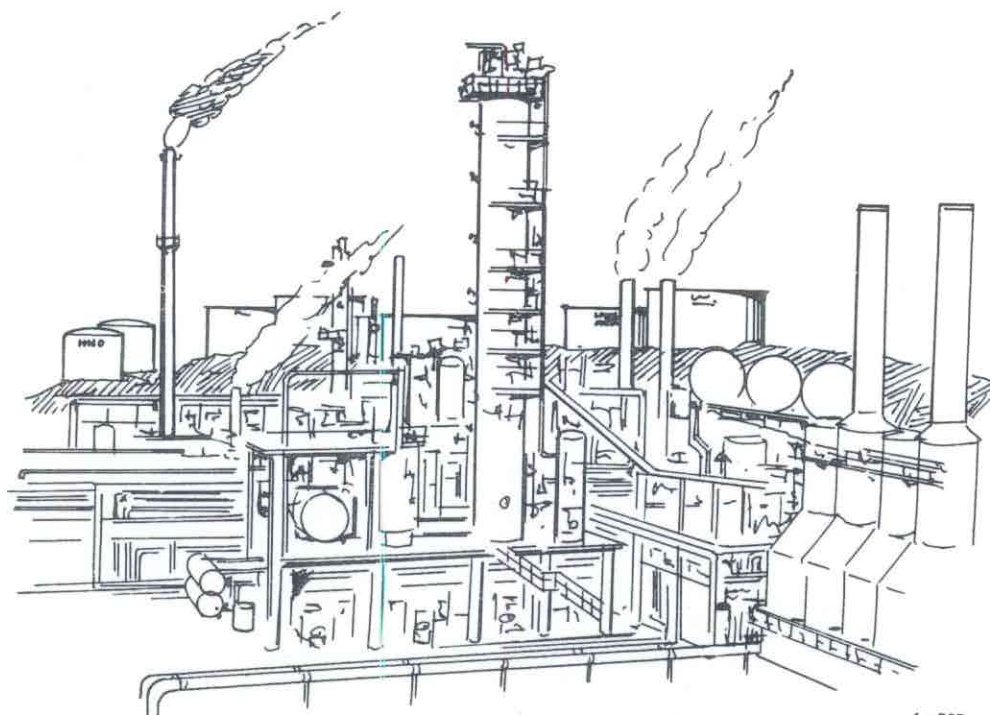


# Service Manual Trucks

Group **16**  
Lubricants, Fluids, Consumables.





1-525

## Foreword

The descriptions and service procedures contained in this manual are based on design and method studies up to December, 1986.

The products are under continuous development. Vehicles and components produced after the above date may therefore have different specifications and repair methods. When this is judged to have a significant bearing on this manual, supplementary service bulletins will be issued to cover the changes. The new edition of this manual will update the changes.

**Volvo Truck Corporation**  
Göteborg

© 1986 Volvo Truck Corporation, Göteborg, Sweden

All rights reserved. No part of this publication may be reproduced, stored in retrieval system, or transmitted in any forms by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of Volvo Truck Corporation.

Order number TSP 21143/1  
Replaces earlier manual TP 11747/1

# Contents

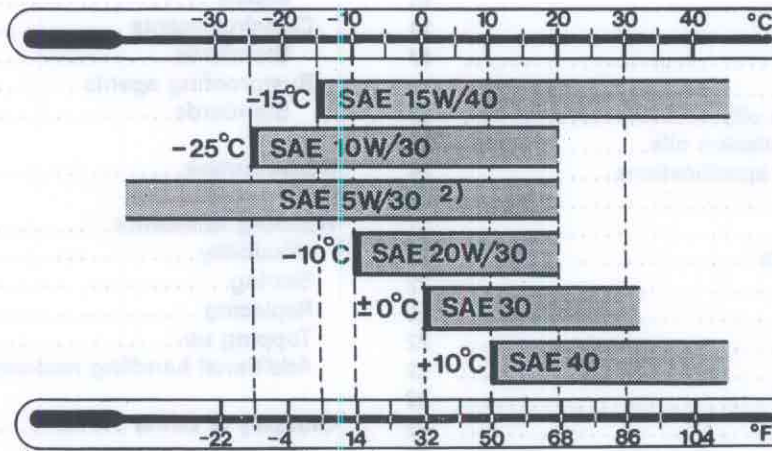
	Page		Page
<b>Recommendations for Volvo Trucks</b> .....	2	<b>Lubricating grease</b> .....	28
<b>Ready reference</b> .....	5	General.....	28
Engine oil.....	5	Type classification according to manufacturing method.....	28
Transmission oil.....	5	Type classification according to range of use.....	29
Hydraulic oil.....	5	Testing.....	30
Lubricating grease.....	5	Laboratory tests.....	30
Brake and clutch fluid.....	5	Rig tests.....	30
Fluids for cooling systems.....	6	Standards.....	31
<b>Lubricants for overhaul work</b> .....	6	Makes.....	32
<b>Lubricants for central lubrication</b> .....	10	<b>Service fluids</b> .....	33
<b>Lubricants for climate unit</b> .....	10	Brake fluid.....	33
<b>Lubricating oils</b> .....	11	Fluid for cooling system.....	33
Engine oil.....	12	Hydraulic oil.....	34
Synthetic engine oils.....	13	Makes.....	35
Oil analysis.....	14	Cleaning agents.....	36
Transmission oil.....	17	Standards.....	37
Quality.....	19	Rustproofing agents.....	38
API system – Engine oils.....	19	Standards.....	39
API system – Transmission oils.....	20	<b>Consumables</b> .....	40
MIL-American military specifications.....	20	<b>Handling lubricants</b> .....	42
Engine oils.....	20	Miscibility.....	42
Transmissions oils.....	21	Storing.....	43
Other quality standards.....	21	Replacing.....	43
<b>Viscosity</b> .....	22	Topping up.....	44
General.....	22	Additional handling recommendations.....	44
Dynamic viscosity.....	22	<b>Glossary of terms</b> .....	45
Kinematic viscosity.....	22	<b>References to Service Bulletins</b> .....	48
Viscosity classification.....	22		
SAE system.....	22		
ISO system.....	26		
Viscosity index.....	26		
Designations.....	26		
Standards.....	27		
Engine oil – Volvo Drain Specification.....	27		
Makes.....	27		

# Recommendations for Volvo Trucks

Shown below are those lubricants currently recommended for Volvo Trucks. Also indicated are the pages in this service manual which contain a more detailed explanation of the symbols used. When lubricants are ordered, the designation which is associated with the general standardized specifications is stated. The supplier (oil company) is then responsible for ensuring that the product corresponds to the standard in question.

Symbol	Description	For explanation see page
□	<b>ENGINE OIL</b> .....	5, 12
	Quality:	
	Volvo Drain Specification (VDS) .....	27
	API Service CD .....	19

Select the viscosity<sup>1)</sup> from the following table.



<sup>1)</sup> Temperatures refer to stable ambient temperatures.

<sup>2)</sup> Concerns synthetic or semi synthetic oil.

NOTE! Only SAE 5W/30 may be used.

1-379

## Change intervals for oil and lube oil filter

Refer to Operator's Manual for respective truck.

Use only genuine Volvo lube oil filter



**Description**

For explanation  
see page

**TRANSMISSION OIL** .....

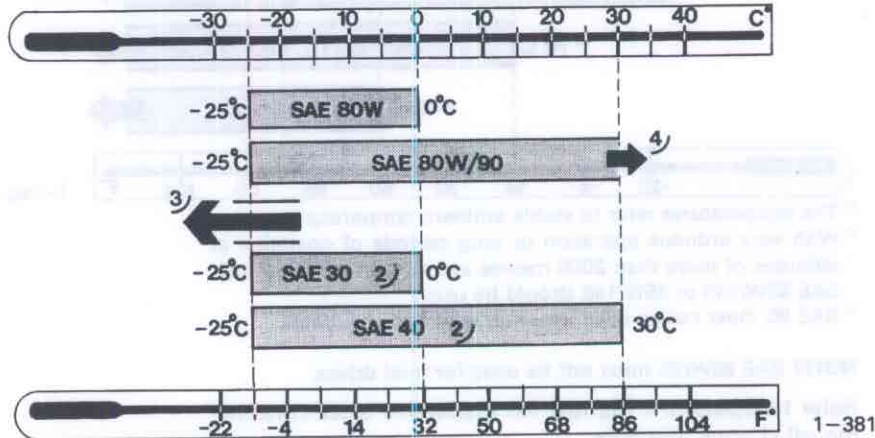
5, 17

**Manual gearbox**

**Quality:**

API-GL-1 .....	18, 20
alt. Engine oil SAE 30 or SAE 40 – API Service CD	
API-GL-4 (alt. for ZF gearboxes) .....	18, 20
alt. Engine oil SAE 30 or SAE 40 – API Service CD	

Select the viscosity<sup>1)</sup> from the following table:



- <sup>1)</sup> The temperatures refer to stable ambient temperatures.
- <sup>2)</sup> Multigrade oil must **not** be used.
- <sup>3)</sup> There are special recommendations for temperatures below -25°C. Consult with your Volvo dealer about a suitable oil.
- <sup>4)</sup> For gearboxes without oil cooler we recommend SAE 85W/140 or SAE 140 at temperatures above +30°C or with lengthy driving at altitudes of more than 2000 metres above sea level.

**Automatic transmission, Power steering**

**Quality:**

ATF, type Dexron II .....	5, 18
---------------------------	-------

Refer to Operator's Manual for respective truck concerning oil change intervals.



**Description**

For explanation

see page

5, 17

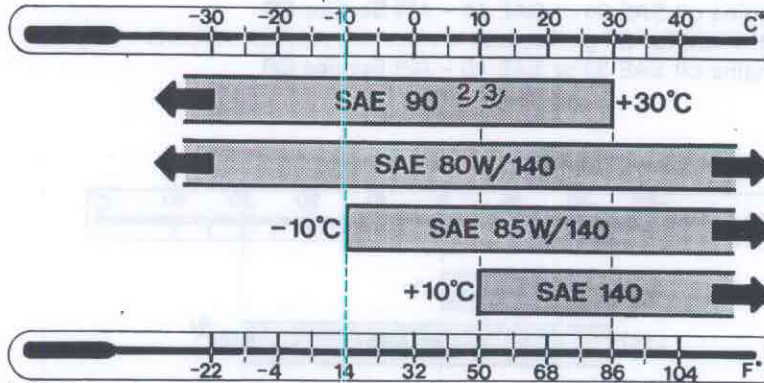
**FINAL DRIVE OIL** .....

Quality:

**API-GL-5 (MIL-L-2105 B or C)** .....

18, 20

Select the viscosity<sup>1)</sup> from the following table:



1-380

<sup>1)</sup> The temperatures refer to stable ambient temperatures.

<sup>2)</sup> With very arduous operation or long periods of operation at altitudes of more than 2000 metres above sea level, SAE 140, SAE 80W/140 or 85W/140 should be used.

<sup>3)</sup> SAE 90 must not be used for axles with hub reduction.

**NOTE!** SAE 80W/90 must not be used for final drives.

Refer to Operator's Manual for respective truck concerning oil change intervals.

**LUBRICATING GREASE ON LITHIUM BASE with EP-additive and consistency NLGI No. 2** .....

5, 28

**BRAKE FLUID, SAE J 1703 or DOT 4** .....

5, 33

**CLUTCH FLUID** (Brake fluid)

**ATF** .....

5, 18

**HYDRAULIC OIL (BLV)** .....

5, 34

**FLUID** for cooling system .....

6

**LUBRICANTS:**

Overhaul work .....

6

Central lubrication .....

10

Climate unit .....

10

**CONSUMABLES** .....

40

## Engine oil

Engine oil is a common designation for lubricating oils intended for combustion engines.

The quality designation, e.g., API Service CD, refers to API's latest specifications for diesel engines. The viscosity indication is associated with the SAE-system for engine oils.

**The oil supplier** is responsible for ensuring that the oil meets the requirements for the designation on the packaging.

## Transmission oil

### GEARBOX OIL

#### Manual gearbox

Gearbox oil according to API-GL-I means that the oil contains no special additives.

The quality designation API-GL-1 respectively API-GL-4 refers to API's standard specifications for transmission oils.

The viscosity indication is associated with the SAE-system for transmission oils.

**The oil supplier** is responsible for ensuring that the oil meets the requirements for the designation on the packaging.

**ATF** (Automatic Transmission Fluid)

#### Automatic transmissions, Power steering

By ATF is meant a fluid which is produced specifically for automatic transmissions and power steering.

The quality designation is type Dexron IID. Type Dexron IID refers to General Motor's later standard "Dexron", which indicates more modern and extensive testing and stringent requirements.

**The oil supplier** is responsible for ensuring that the ATF meets the stated standard.

### FINAL DRIVE OIL

By final drive oil, also called hypoid or EP oil, is meant a mineral oil which is made suitable via chemical additives for final drives, etc. The quality designation API-GL-5 refers to API's standard specifications for transmission oils.

MIL-L-2105B or C are similar specifications designed by the American army. The viscosity indication is associated with the SAE-system for transmission oils.

**The oil supplier** is responsible for ensuring that the oil meets the requirements for the designation on the packaging.

## Hydraulic oil

By hydraulic oil is meant a mineral oil which has been made suitable via special additives for use in vehicle hydraulic systems, such as bogie lifts, tippers, cranes etc.

The quality designation SHS 32 refers to the provisional standard issued by the National Association of Swedish Mechanical Engineers.

MIL-H-5606 is the American army designation of a thin hydraulic oil.

Even here the oil supplier is responsible for ensuring that the oil meets the requirements as per standard SHS 32 or MIL-H-5606.

Details of some of the product names are to be found on page 35.

## Lubricating grease on lithium base with EP additive and consistency NLGI No. 2

The subject definition is our recommendation for grease used for chassis lubrication. Greases corresponding to this recommendation are those which meet AB Volvo standards for "Durable grease for wheel bearings", or "Molybdenum disulphide grease".

## Brake and clutch fluid

Brake fluid consists of glycol ethers and certain other components. The fluid is used in hydraulic brake systems and clutch systems. **On no account** may it be replaced by any form of mineral oil. The designations SAE J 1703 and DOT 4 refer to the specifications for brake fluids. **The manufacturer** is responsible for ensuring that the brake fluid meets the requirements for the designation indicated on the packaging.

## Fluids for cooling system

### ANTI-FREEZE

In general, anti-freeze consists of ethylene glycol with corrosive-protective and anti-foaming additives. AB Volvo prescribes for its own products an anti-freeze (glycol) of type C (Volvo art.no. 1129700-9). This anti-freeze gives better protection against corrosion than earlier anti-freezes and is in addition free from nitrites and amines, which is an advantage from an environmental point of view. A mixture of water and glycol should contain at least 40% glycol of type C, which protects the cooling system down to a temperature of  $-25^{\circ}\text{C}$ .

The coolant should be replaced once a year, suitably in the autumn.

### RUSTPROOFING AGENT

When anti-freeze is not used in the cooling system a rustproofing agent is used instead. Volvo's rustproofing agent is available in 1/2 litre tins, Volvo art.no. 1129709-0. As soon as the cooling system has been filled with this agent, the engine should be run warm in order for the additive to provide the best results.

**NOTE!** Glycol or another type of anti-freeze must not be blended with this rustproofing agent.

## Lubricants for overhaul work

To facilitate the choice of lubricants in connection with overhaul work, the following pages list suitable lubricants which can be used.

**Main rule:** During assembling, the parts should be oiled or greased with the same type of lubricant they usually operate with. For example, the master cylinder piston with brake fluid, the synchro rings with gear oil, and so on.

The following table also includes exceptions to the above main rule.

Component	Lubricant	Packaging	Volvo art.no.
<b>SECTION 0. GENERAL</b>			
Sealing rings:			
Rubber (synthetic)	Vaseline/Bushing paste	tin 100 g	116 1153-0
Leather	Lube grease Li/EP	tube 80 g	116 1241-3
		cartridge 400 g	116 1251-2
Felt – Saturated in hot oil	Engine or Gear oil		
<b>SECTION 2. ENGINE</b>			
Camshaft	Paste $\text{MoS}_2$	spray 450 g	116 1006-0
Tappets	"	"	"
Cylinder liner – sealing:			
All	Special	bottle 0,5 l	116 1249-6
Sealing ring, cylinder	Fitted dry		
block-cylinder head	Fitted dry		
Cleaning plug (teflon)	Silicone 0.8 mm string	tube special	116 1277-7
Liner – liner step	Silicone paste	cartridge 300 ml	116 1231-4
Flywheel casing – cylinder block	"	"	"
Timing gear cover – cylinder block	Silicone oil-Viscosity		
Thermostat-regulated fan	$\text{mm}^2/\text{s}$ (cSt)		
	9000	1/2 liter	116 288-4
	12 500	1/2 liter	116 307-2
	16 500	1/2 liter	116 308-0
	20 000	1/2 liter	116 309-8
	30 000	1/2 liter	116 310-6
Hoses, coolant	Vaseline/Bushing paste	tin 100 g	116 1153-0
Coolant pump – belt	Special grease	sachet 20 g	116 1140-7
tensioner		tube 225 g	116 1121-7

Component	Lubricant	Packaging	Volvo Art.no.
Turbo:			
-shaft end, piston ring grooves	Bolting paste	tin 250 g	116 1035-9
-bolts – turbine housing	"	tube 50 g	116 1273-6
<b>SECTION 3 ELECTRICAL</b>			
Battery terminals	Rustproofing	aerosol 0.4 l	116 1038-3
Alternator:			
Slip bearings	Light engine oil	bottle 1 l	134 3306-5
Angle ball bearing	Lube grease Li/EP	tube 80 g	116 1241-3
Radial ball bearing	"	"	"
Alternator	Special grease (-40 to +100°C)	tube 125 g	116 1236-3
Starter motor:			
Bushings	Light engine oil	bottle 1 l	134 3306-5
Other parts	Silicone grease (-60° to +100°C)	tube 50 g	116 1326-2
Distributor:			
Lube felt	Light engine oil	bottle 1 l	134 3306-5
Bushings	"	"	"
Breaker cam, abutment	Lube grease Li/EP	tube 80 g	116 1241-3
Wiper motor	Special grease (-50 to +80°C)	tube 125 g	116 1236-3
<b>SECTION 4</b>			
<i>Group 41. Clutch</i>			
Seal, control	Lube grease Li/EP	tube 80 g	116 1241-3
Bushing, pedal carrier	"	"	"
Master cylinder and control cylinder	Brake fluid SAE J 1703, DOT 4	1 l 5 l 25 l	112 8748-9 112 8749-7 112 8750-5
Clutch servo:			
Air-operated	Silicone grease	tube 115 g	116 1326-2
Hydraulic-operated	Brake fluid SAE J 1703, DOT 4	1 l 5 l 25 l	112 8748-9 112 8749-7 112 8750-5
Clutch levers	Synthetic Molybdenum	tube 50 g	116 1037-5
Thrust plate slide surfaces	Lube grease Li/EP	tube 80 g	116 1241-3
Plate hub, shaft	Heat-resistant grease	tin 250 g	116 1311-4
<i>Group 42. Torque converter</i>			
Bearings	Light engine oil	bottle 1 l	134 3306-5
Splines	Heat-resistant grease	tin 250 g	116 1311-4
Automatic transmission rubber bushings	Vaseline/Bushing paste	tin 100 g	116 1153-0
Automatic transmission flange seal	Synthetic Molybdenum	tube 50 g	116 1037-5

Component	Lubricant	Packaging	Volvo Art.no.
<b>Group 43. Gearbox</b>			
Shift frame	Lube grease Li/EP	tube 80 g	116 1241-3
Control cylinder-housing	Rustproofing	bottle 1 l	282 036-3
Inhibitor valve R5, R/SR6	Special grease (-40° to +100°C)	tube 125 g	116 1236-3
Remote control SR 61:	Lube grease Li/EP	tube 80 g	116 1241-3
Shift fork bushing	Lube grease Li/EP	tube 80 g	116 1241-3
Input shaft needle bearing	Special grease	tin 100 g	116 1003-7
Gasket material	Silicone Sealant	300 ml	116 1240-0
<b>Group 45. Propeller shaft</b>			
Splines	Molybdenum disulphide grease	tin 250 g	116 1078-9
<b>Group 46. Rear axle</b>			
Flange, nut	Molybdenum disulphide grease	tin 250 g	116 1078-9
Differential – wheel	Glidlack	spray 400 ml tin 500 g	116 1327-0 116 1008-6
<b>SECTION 5. BRAKES</b>			
Hydraulic master cylinder and control cylinder	Brake fluid SAE J 1703, DOT 4	1 l 5 l 25 l	112 8748-9 112 8749-7 112 8750-5
Hydrovac airpak:			
Hydraulic-plunger	Synthetic-Molybdenum Silicone grease	tube 50 g tube 115 g	116 1037-5 116 1326-2
Servo-air	Engine oil		
Vacuum pump	Brake fluid	1 l	112 8748-9
Equalizing valve	SAE J 1703, DOT 4	5 l 25 l	112 8749-7 112 8750-5
Pedal journalling	Lube grease Li/EP	tube 80 g	116 1241-3
Maxibrake	"	"	"
Wedge brakes, piston cylinders	"	"	"
Z-cam housing components	"	"	"
Valves (compressed air)	Silicone grease	tube 115 g	116 1326-2
Pivot pin – Roller (TB)	Bolting paste	tin 225 g	116 1035-9
Contact area, shoe Z-kam	"	"	"
<b>SECTION 6. STEERING</b>			
King-pin journalling	Lube grease Li/EP	tube 80 g	116 1241-3
Ball joint steering rod	"	"	"
Steering column, splines	Molybdenum disulphide grease	tin 250 g	116 1078-9
Servo cylinder	ATF	can 5 l	282 996-8
Steering gear, mechanical	Final drive oil GL 5		
Steering gear, power:			
Loose balls and rollers	Vaseline/Bushing paste	tin 100 g	116 1153-0
Other parts	ATF	can 5 l	282 996-8
Servo pump	"	"	"