



TECHNOMATIC EQUIPMENTS

SNOW CUTTER/BLOWER

TECHNOMATIC F-90

ILLUSTRATED PARTS CATALOGUE

FOR ENGINE

TECHNOMATIC EQUIPMENTS

SNOW CUTTER/ BLOWER F-90

ILLUSTRATED PARTS CATALOGUE

FOR ENGINE



VOLVO PENTA

TWD1683VE

16.12 Liters, in-line 6 cylinder-585 KW

EU Stage V US/ EPA 4 Final

TWD1683VE

16.12 liter, in-line 6 cylinder - 585 kW

EU Stage V US / EPA 4 Final



TWD1683VE is a powerful, reliable and fuel efficient off-road Diesel Engine built on the Volvo in-line six concept.

Low cost of ownership

World class fuel efficiency combined with a reliable Exhaust Aftertreatment System (EATS) gives high uptime as well as low cost of ownership.

Compact & simple installation

The TWD1683VE engine will have a dual stage turbo system, common rail fuel system and a water cooled charge air system for better fuel efficiency. Installation guidelines as well as drawings and CAD models are easy to access.

Material needed in order to install the engine can be ordered as optional equipment from Volvo Penta. The result is an engine and EATS that is easy to install and operate.

Durability & low noise

Long experience with SCR systems in combination with great knowledge of base engine development reduces risk of downtime. The in-line six cylinder engine together with common rail system produces smooth operation with low noise.

Power & torque

Outstanding torque response performance with maximum torque available at low rpm that continues to nominal power. The power and torque layout ensures the engine to operate in a wide engine speed range.

Low exhaust emission

Chosen engine design combined with optimized SCR only technology ensures that TWD1683VE complies with EU Stage V and US EPA 4 Final emissions.

Easy service & maintenance

Easily accessible service and maintenance points contribute to the ease of service of the engine. As optional equipment remotely mounted filters and service points can be chosen.

- Proven and straight-forward design - built on Volvo Group technology
- High torque already at low engine speed
- SCR only
- Compact, simple installation and easy to service
- Same engine footprint for all emission standards
- Wide range of optional equipment
- Extended oil service intervals 1000h (if fuel consumption <65liter/hour)

Power output as per ISO 14396, kW/hp 585/796

at speed, rpm 1900

Max. torque, Nm/lb/ft 3650/2692

at speed, rpm 1200

Min. idling speed, rpm 600

TWD1683VE

16.12 liter, in-line 6 cylinder - 585 kW
EU Stage V / US EPA 4 Final

Technical data

Configuration and no. of cylinders in-line 6
Displacement, l (in³) 16.12 (984)
Method of operation 4-stroke
Bore, mm (in.) 144 (5.67)
Stroke, mm (in.) 165 (6.50)
Dry weight ^{*}), engine only, kg (lb) 1658 (3655)
Compression ratio 16.8:1
Direction of rotation (viewed towards flywheel) counterclockwise

^{*}) The weight includes: engine coolant, engine oil, engine mounted filters, flywheel, 110A alternator, cac, cac pump, no compression brake, no airfilter, no air compressor, no ac compressor and no cooling system.

Technical description

Engine and block

- Cast iron cylinder block
- Wet, replaceable cylinder liners
- Replaceable valve guides and valve seats
- Overhead camshaft and four valves per cylinder

Lubrication system

- Full flow disposable spin-on oil filter, for extra high filtration
- Gear type lubricating oil pump, gear driven by the transmission
- Oil level sensor at startup

Fuel system

- Electronically controlled common rail system
- Fuel pre filter with water separator and water-in-fuel indicator/alarm
- Gear driven low-pressure fuel pump
- Fine fuel filter with manual feed pump and fuel pressure valve

Cooling system

- Belt driven coolant pump with high degree of efficiency
- Water-cooled charged air cooling system

Turbo charger

- Two stage turbo system
- Electronically controlled bypass-valve

Electrical system

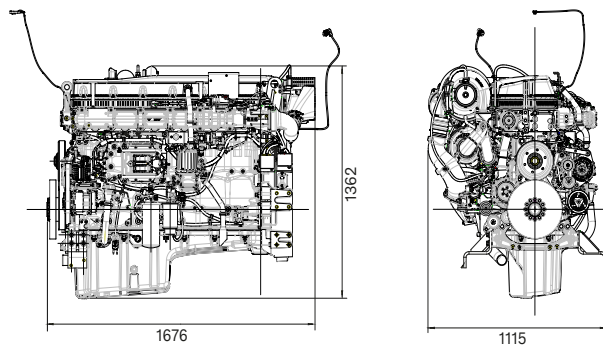
- Engine Management System (EMS), includes advanced features for diagnostics and fault tracing.
- The instruments and controls connect to the engine via the CAN SAE J1939 interface. Options available for engine control equipment.

Exhaust after treatment system

- SCR only
- Airless urea injection
- Wide range of options available, including different sized DEF tanks (also possible for OEM to design own tank).
- DEF Quality Level Temperature Sensor

Dimensions

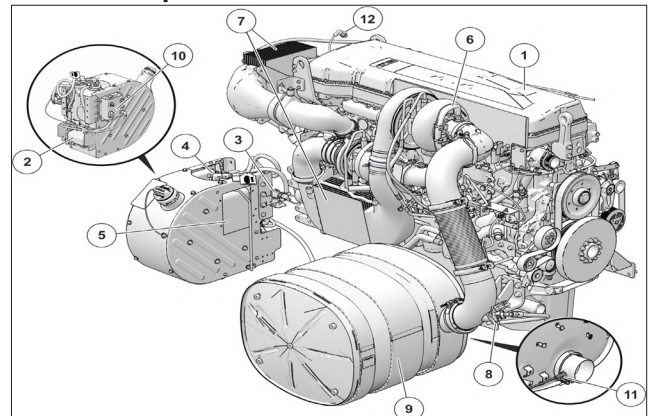
Not for installation. Dimensions in mm.



Please note that products illustrated may differ from production models.

Not all models and accessories are available in all markets, and standard equipment may vary between different markets. Every effort has been made to ensure that facts and figures are correct at the time of publication. However, Volvo Penta reserves the right to make changes without prior notice at any time.

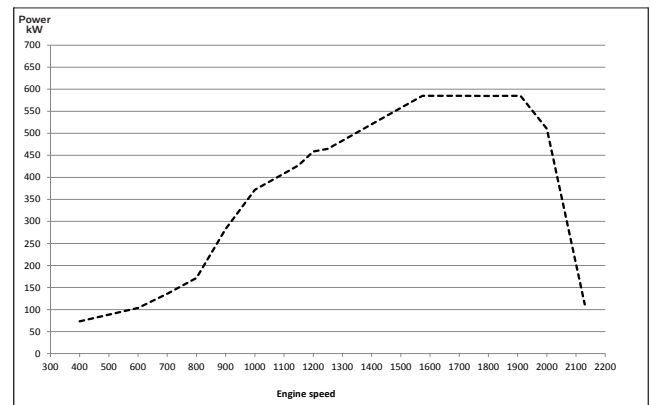
Main components



- | | |
|--|--|
| 1. Engine with common rail fuel system | 8. Urea dosage Valve |
| 2. AdBlue Pump Unit | 9. Muffler with Catalytic Converter |
| 3. Solenoid Valve, urea tank heating | 10. After treatment Control Module (ACM) |
| 4. Tank armature with sensors and heater element | 11. NOx Sensor |
| 5. AdBlue tank | 12. Air inlet Temperature Sensor and pressure sensor |
| 6. NOx Sensor | |
| 7. Water-cooled charged air cooling system | |

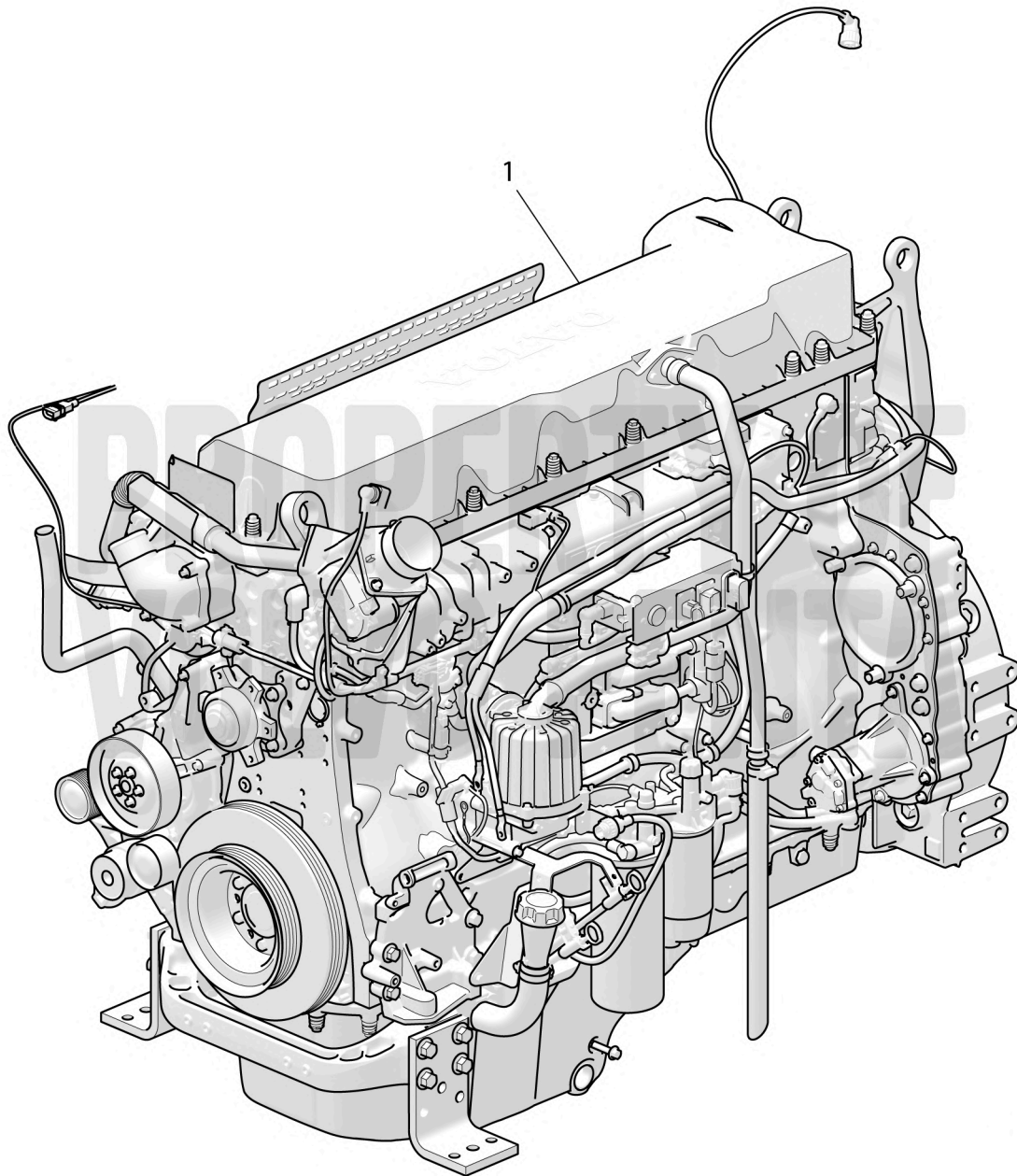
All necessary components are available in various lengths and sizes, cables, heated hoses and tanks. A complete system.

Characteristics



Reman Engines

Reference no. 0000000541



30310

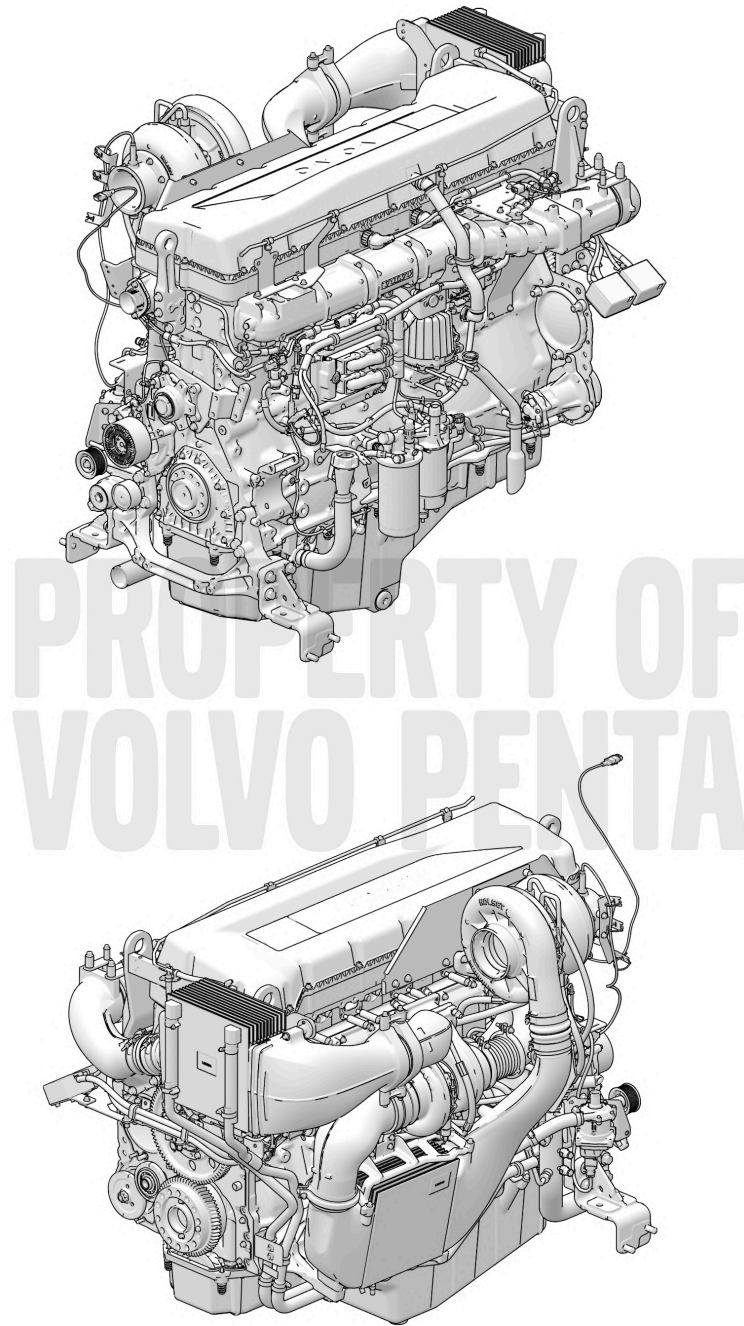


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	3801952	1	Engine, Reman

Reman Engine

Reference no. 000009051



0000718667

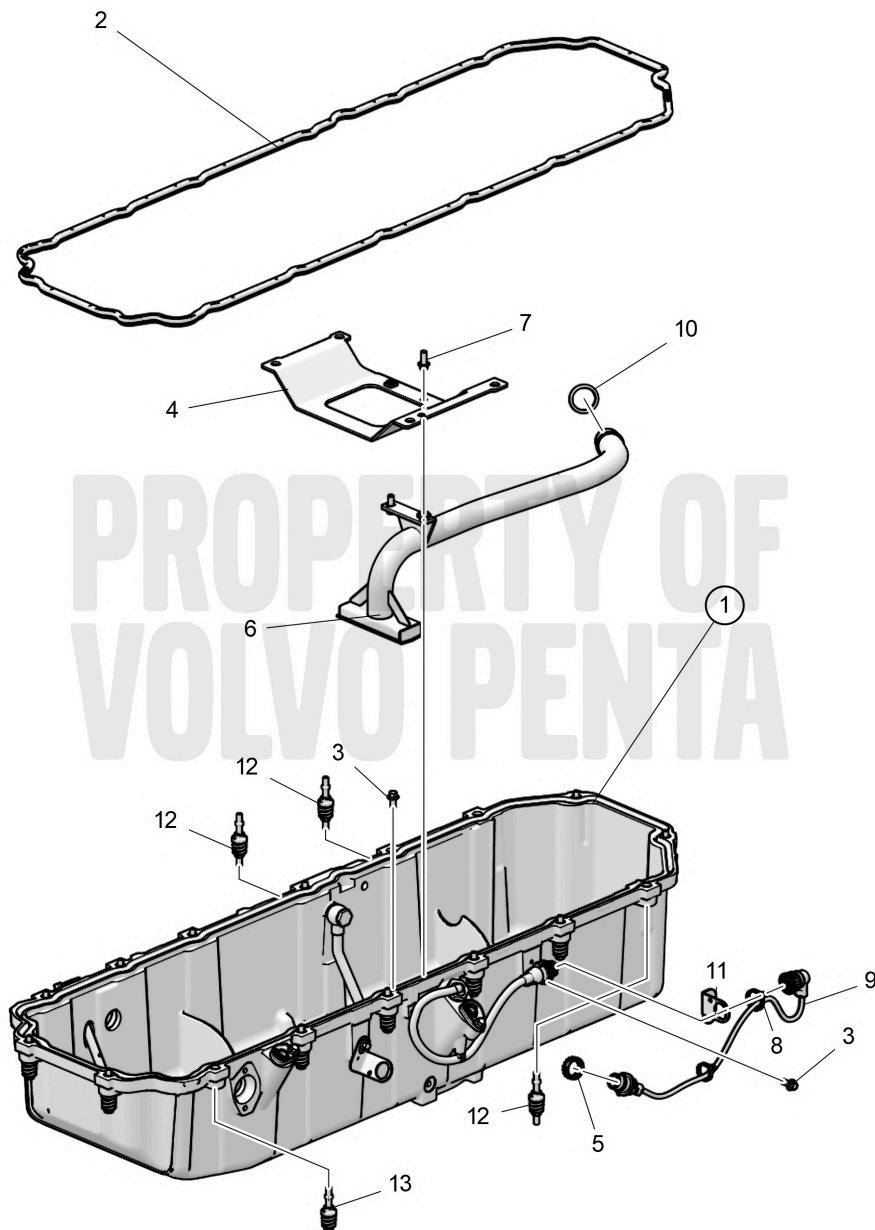


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	3802415	1	Engine, Reman See Parts Bulletin

Aluminum oil pan, shallow

Reference no. 0000006132



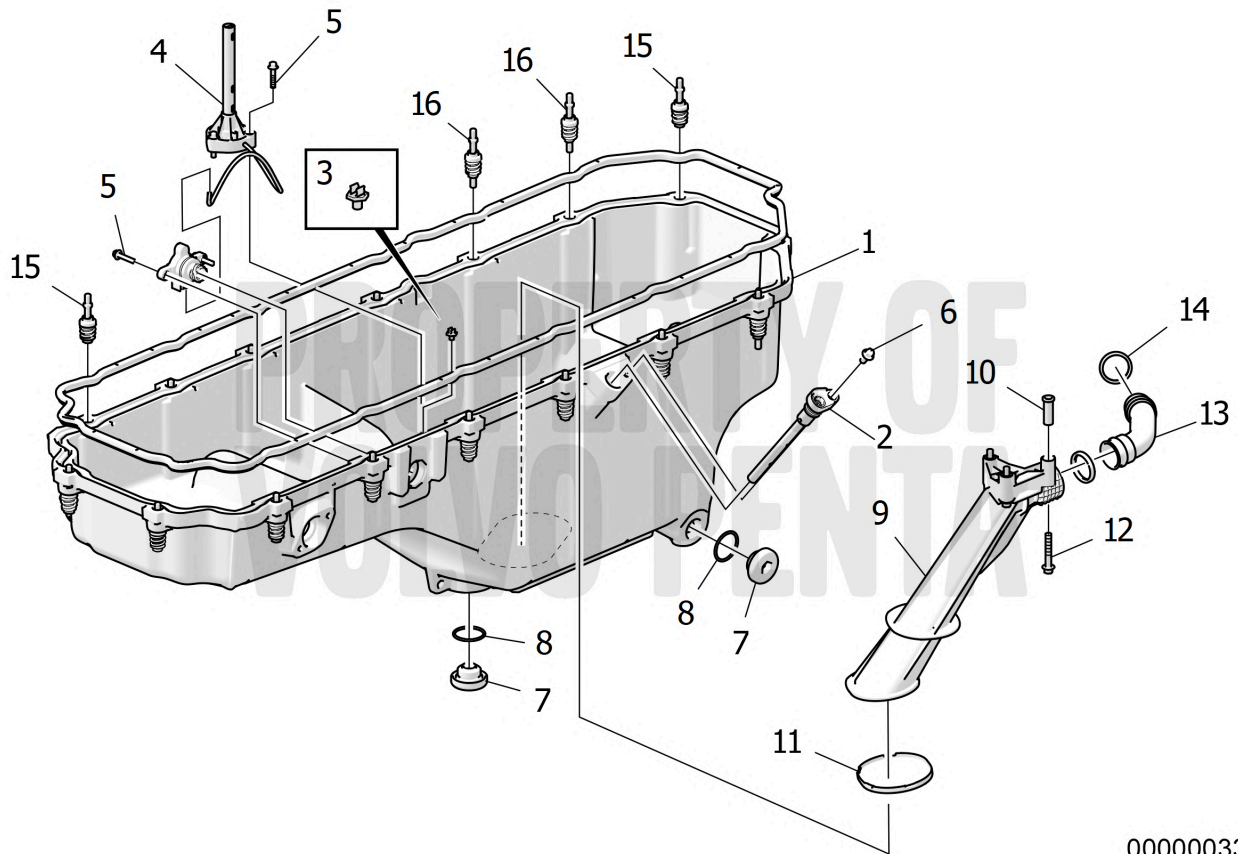
Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

Part Sections: Aluminum oil pan, shallow - Volvo Penta Shop

#	Part number	Qty	Description
1	24331913	1	Oil Pan
2	20734156	1	Sealing Strip
3	984733	1	Flange Screw
4	23744200	1	Bracket
5	3963413	1	Ring
6	23744690	1	Oil Strainer
7	994446	2	Flange Screw
8	948211	2	Cable Tie
9	24447836	1	Extension Cable
10	22194880	1	Sealing Ring
11	3988328	1	Bracket
12	22859765	3	Flange Screw
13	22859764	13	Flange Screw

Oil Sump Aluminium

Reference no. 0000002022



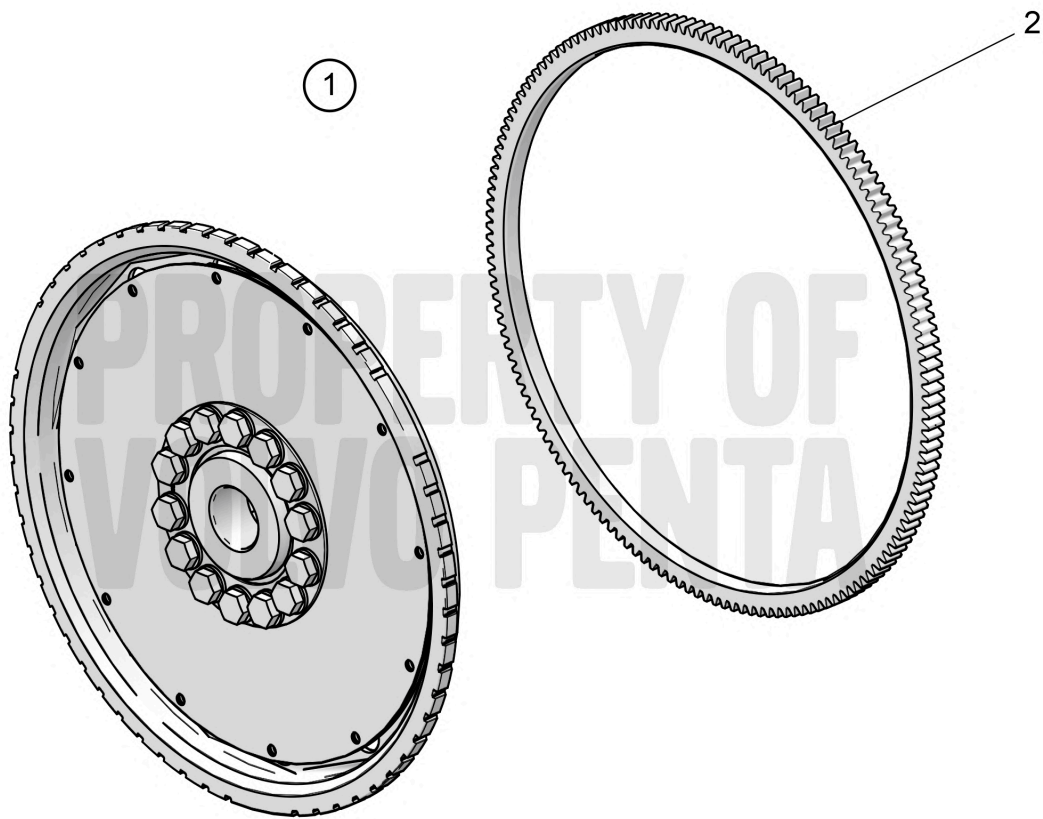
000003363

i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23528265	1	Oil Pan
2	21523327	1	Pipe
3	20700754	1	Retainer
4	23285701	1	Oil Level Sensor Oil Level Sensor
5	984728	5	Flange Screw
6	984733	1	Flange Screw
7	11127354	2	Magnetic Plug
8	948610	2	O-Ring
9	20547257	1	Oil Strainer Oil Strainer
10	20547263	3	Spacer Sleeve
11	8131965	1	Strainer
12	994451	3	Flange Screw
13	21175297	1	Suction Pipe
14	22194880	2	Sealing Ring
15	22859764	13	Flange Screw
16	22859765	3	Flange Screw
17	20734156	1	Sealing Strip

Flywheel for Allison 4000 Series, components

Reference no. 0000005666

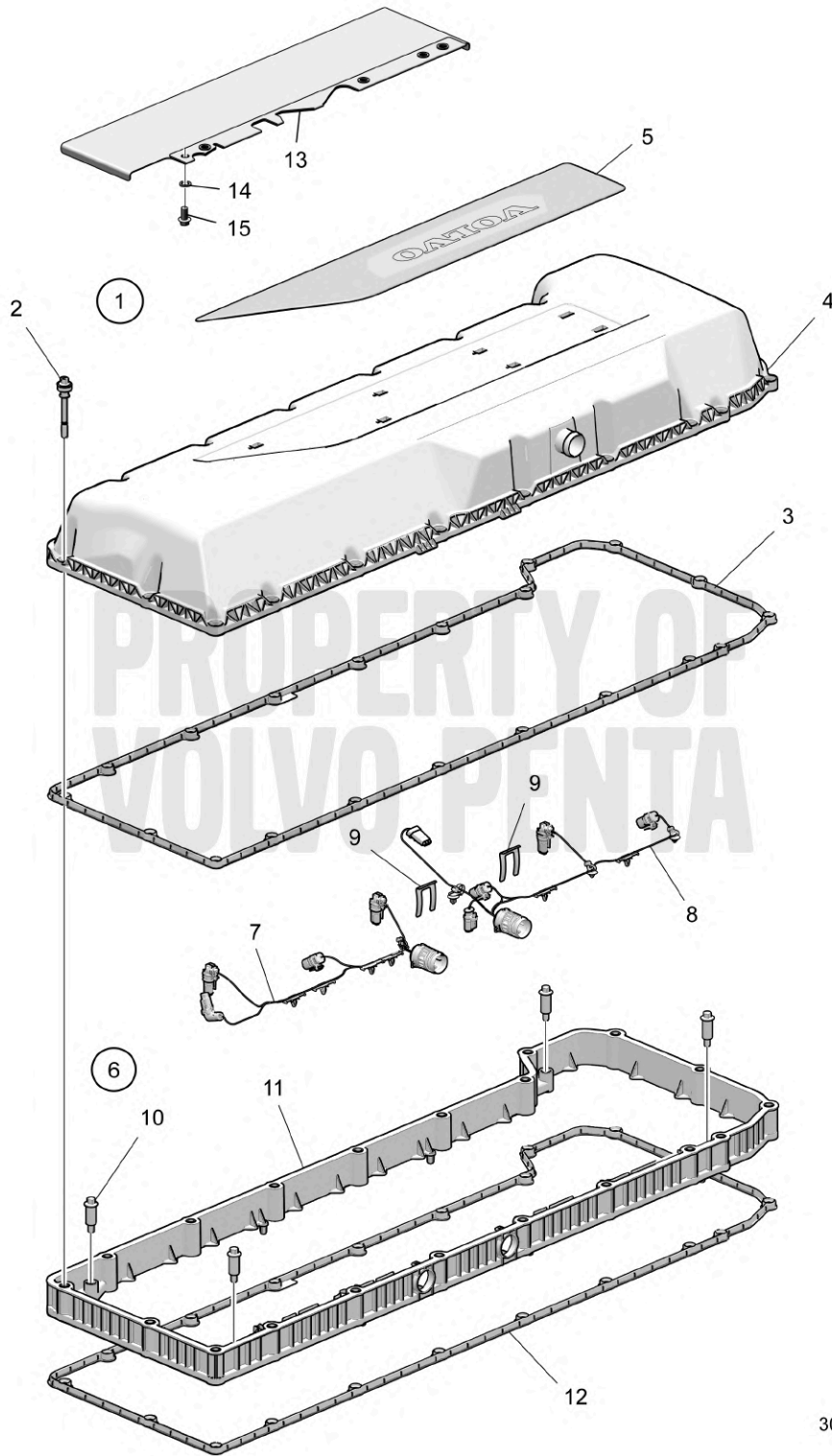


i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	21514065	1	Flywheel
2	20711957	1	Ring Gear

Valve Cover SN-2016152506

Reference no. 54166833



30602

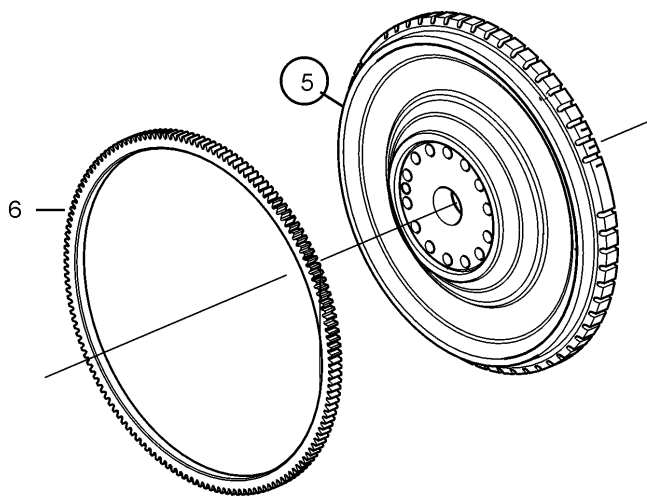
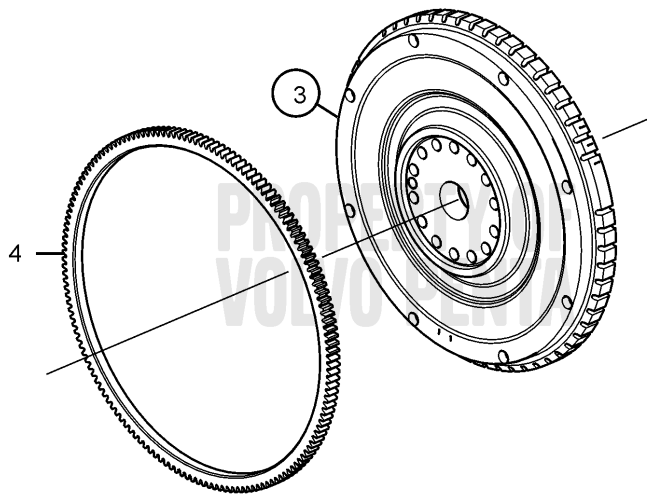
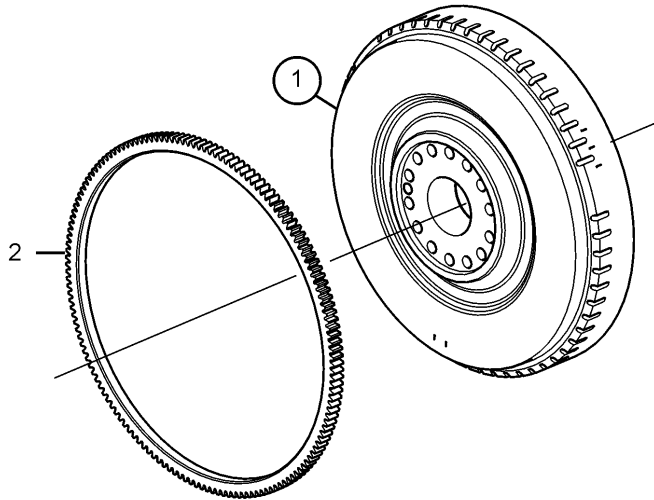


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23096752	1	Valve Cover Valve Cover
2	22806270	17	Screw
3	22598872	1	Gasket
4	23096763	1	Valve Cover Valve Cover
5	23014326	1	Name Plate
6	23465828	1	Valve Cover
7	23428254	1	Wiring Harness
8	23502055	1	Wiring Harness
9	21288956	2	Clip Retainer
10	21692659	4	Screw
11	23448972	1	Valve Cover
12	22598872	1	Gasket
13	23579360	1	Heat Shield
14	78587619	5	Socket
15	984752	5	Flange Screw

Flywheel

Reference no. 54166891



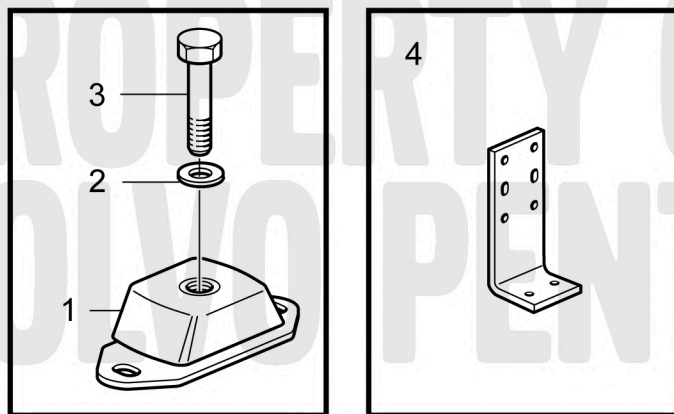
27547



Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	3840066	1	Flywheel
2	20711957	1	Ring Gear
3	3848344	1	Flywheel Flywheel For Clark Torque Converter 8000-9000
4	20711957	1	Ring Gear
5	22739170	1	Flywheel
6	20711957	1	Ring Gear

Rubber Cushion Kit
Reference no. 54167134



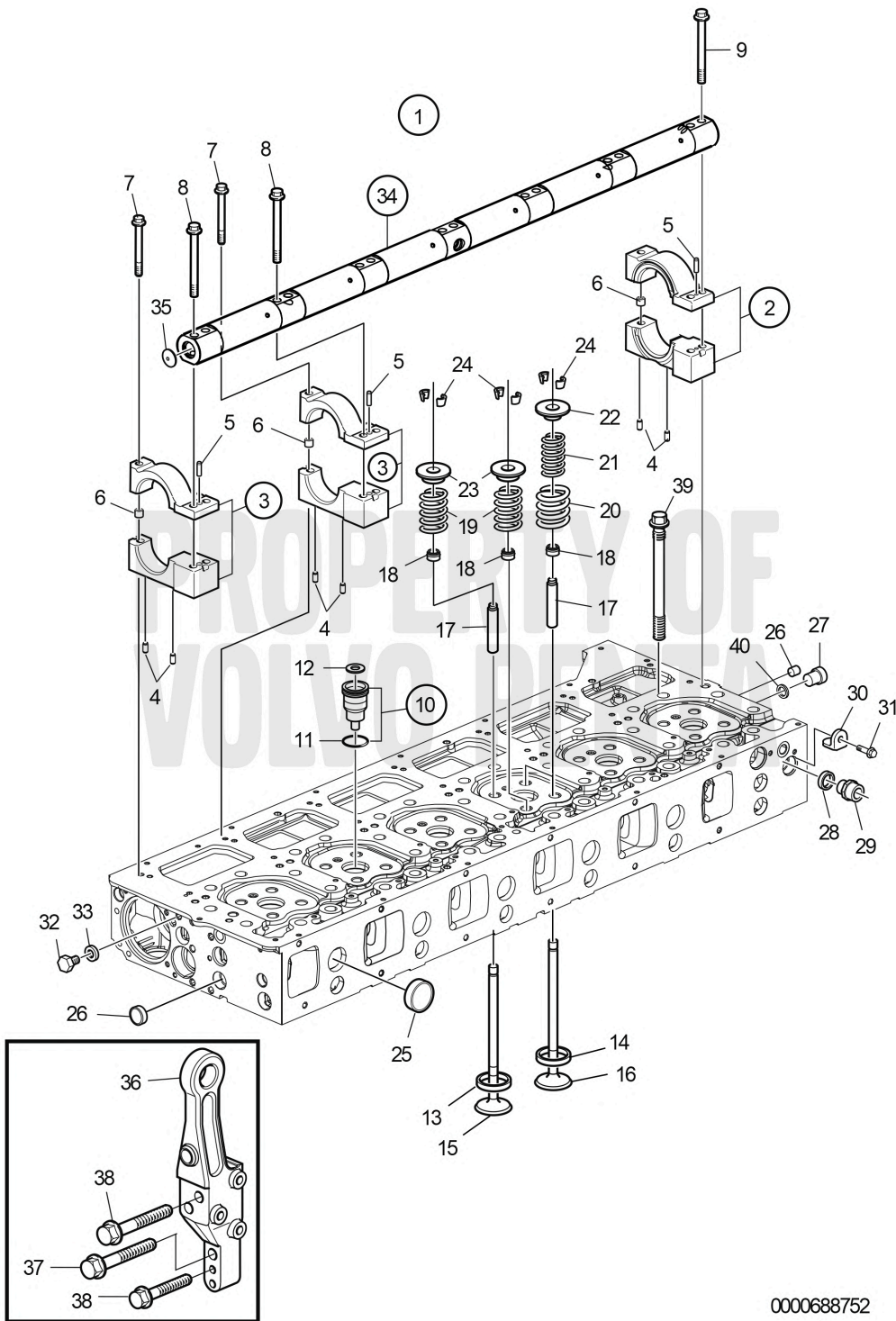
30619

i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23602987	4	Rubber Cushion
2	60113302	4	Washer
3	990978	4	Lock Nut
4	3827307	4	Engine Bracket

Cylinder Head

Reference no. 54166104



000688752



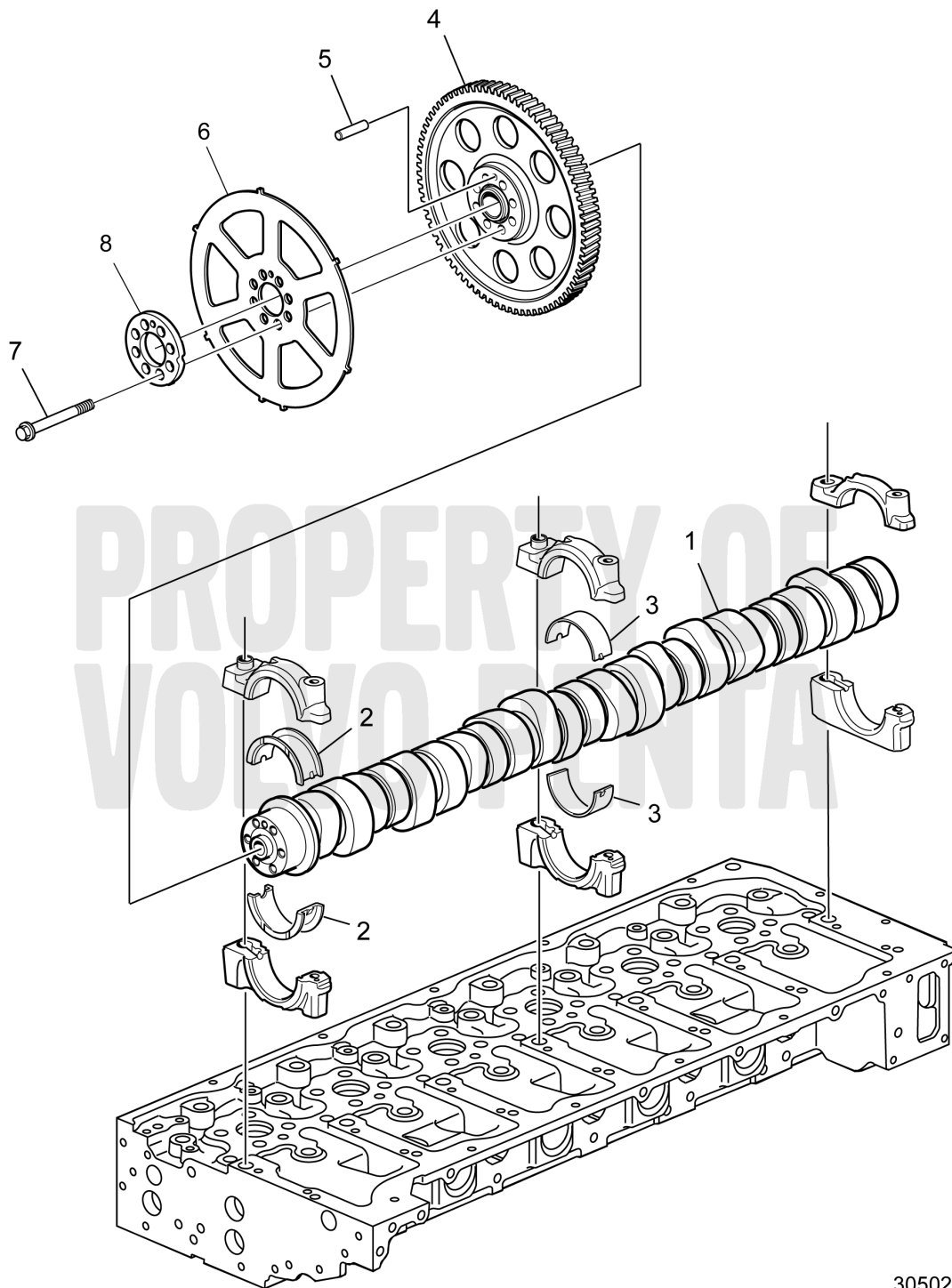
Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23306124	1	Cylinder Head
1	3801803	1	Cylinder Head, Reman Exchange
2	3184012	1	Bearing Housing
3	3184015	6	Bearing Housing
4	950562	14	Pin
5	950550	6	Pin
6	950542	7	Pin
7	975105	7	Flange Screw
8	21344753	12	Flange Screw
9	20412482	1	Flange Screw
10	21351717	6	Injector Sleeve
10	276948	1	O-Ring Kit
10	20981856	1	Sleeve
11	20536487	1	O-Ring
12	21261987	1	Washer
13	21780358	12	Valve Seat Intake
14	22059584	12	Valve Seat Exhaust
15	20739057	12	Inlet Valve
16	20513285	12	Exhaust Valve
17	21632997	24	Valve Guide Valve Guide
18	20924435	24	Valve Stem Seal
19	22527820	12	Valve Spring
20	23803426	12	Valve Spring
21	23803425	12	Valve Spring
22	8131835	12	Valve Spring Washer
23	8131328	12	Valve Spring Washer
24	8170995	48	Valve Collet
25	24426721	16	Expansion Plug
25	24426723	6	Expansion Plug
26	24426722	6	Expansion Plug

27	945065	1	Plug
28	1547252	2	Sealing Ring
29	20845995	2	Plug
30	20844430	1	Lock Brace
31	984732	1	Flange Screw
32	965768	1	Plug
33	947281	1	Gasket
34	21534993	1	Rocker Arm Shaft
35	955096	2	Expansion Plug
36	23380365	1	Lifting Eye
37	984820	2	Flange Screw
38	975112	1	Flange Screw
39	21345129	38	Flange Screw
40	969011	1	Gasket

Camshaft

Reference no. 54166110



30502

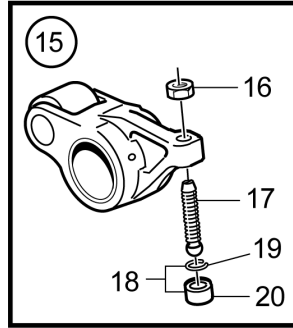
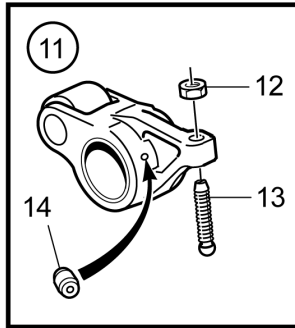
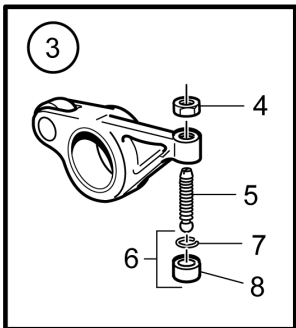
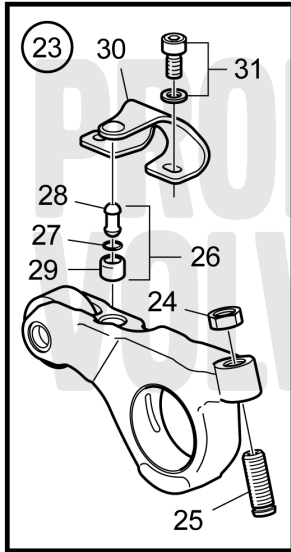
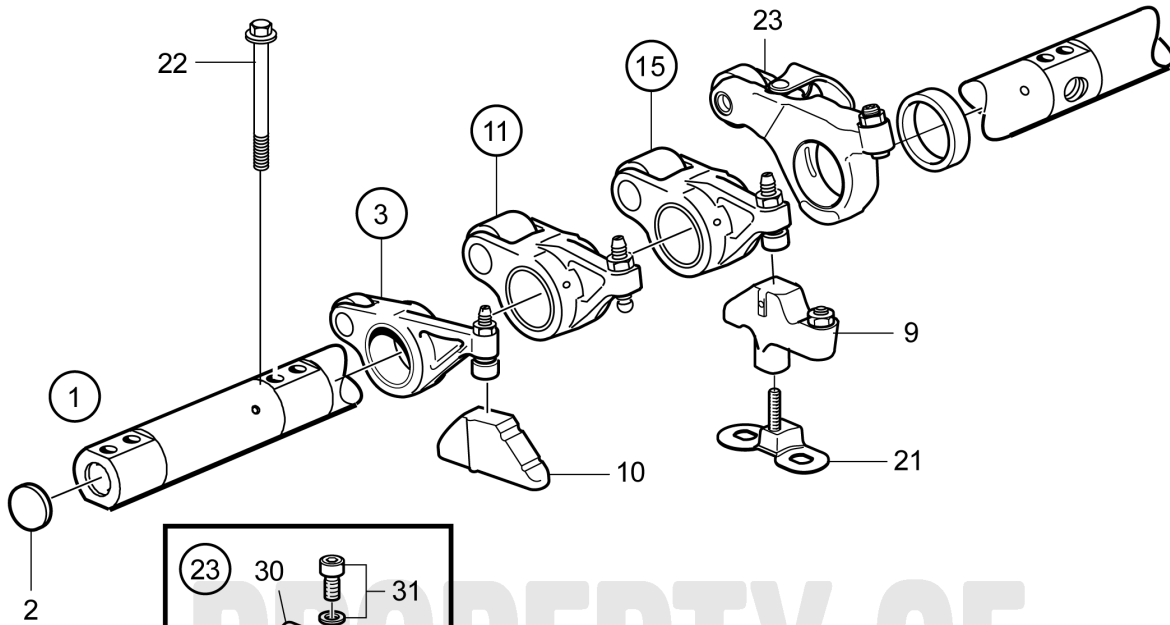


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23346006	1	Camshaft
2	21006109	1	Camshaft Bearing Kit
3	21006103	6	Camshaft Bearing Kit
4	21456239	1	Gear
5	950553	1	Pin
6	22706184	1	Sensor Wheel
7	8192804	8	Flange Screw
8	22706186	1	Spacer

Valve Mechanism For VCB

Reference no. 54166503



30360



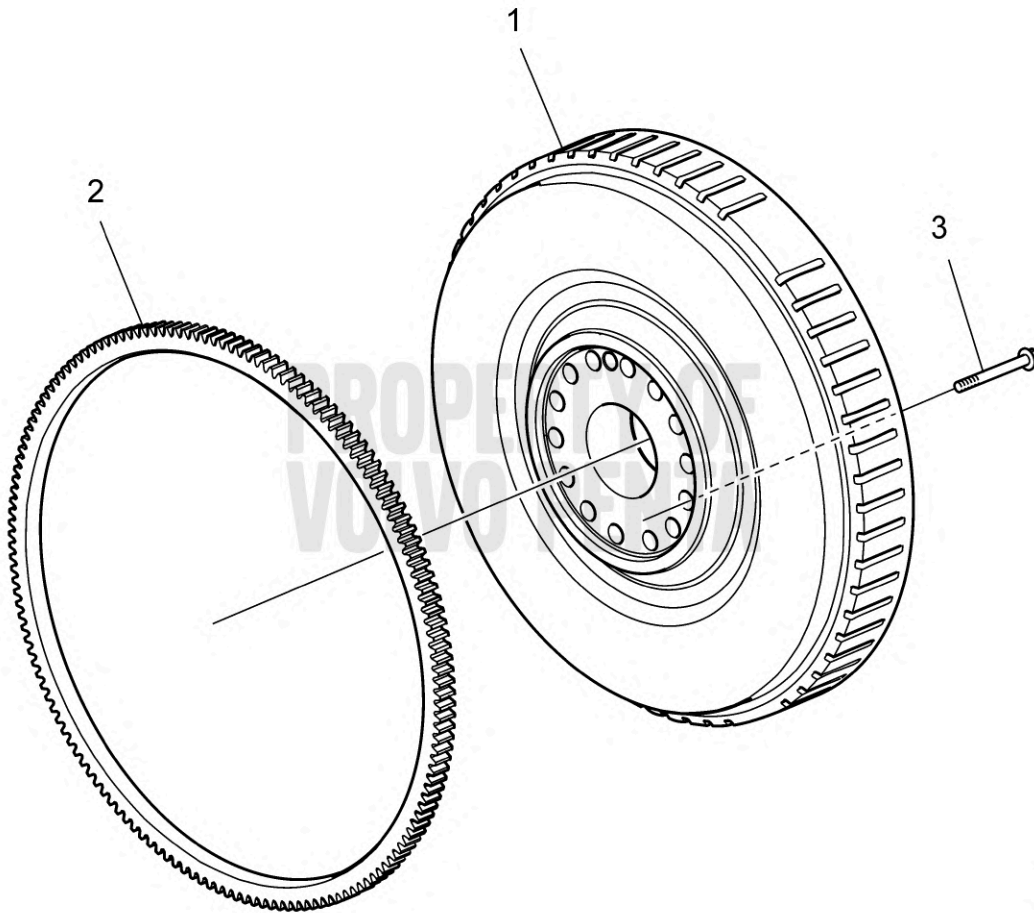
Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	21534993	1	Rocker Arm Shaft Rocker Arm Shaft
2	955096	2	Expansion Plug
3	22255550	6	Rocker Arm Intake
4	60111964	1	Hexagon Nut
5	20501055	1	Ball Stud
6	21054149	1	Ball Socket Ball Socket
7	944364	1	O-Ring
8	21054152	1	Ball Socket
9	23385975	6	Valve Caliper Exhaust
10	21061323	6	Valve Bridge Intake
11	21732658	6	Rocker Arm Fuel Injector
12	1677396	1	Hexagon Nut
13	21794321	1	Adjusting Screw
14	3964817	1	Jet
15	21415409	6	Rocker Arm Exhaust
16	60111964	1	Hexagon Nut
17	20501055	1	Ball Stud
18	21054149	1	Ball Socket Ball Socket
19	944364	1	O-Ring
20	21054152	1	Ball Socket
21	23386005	6	Guide
22	21344753	12	Flange Screw
22	20412482	1	Flange Screw
23	21732664	6	Rocker Arm Rocker Arm Exhaust Brake
24	1677396	1	Hexagon Nut
25	20775143	1	Adjusting Screw
26	20724261	1	Ball Socket Ball Socket
27	976012	1	O-Ring
28	20724248	1	Push Rod
29	20724253	1	Ball Socket

30	20724250	1	Leaf Spring
31	20775507	1	Hex. Socket Screw

Flywheel

Reference no. 54166890



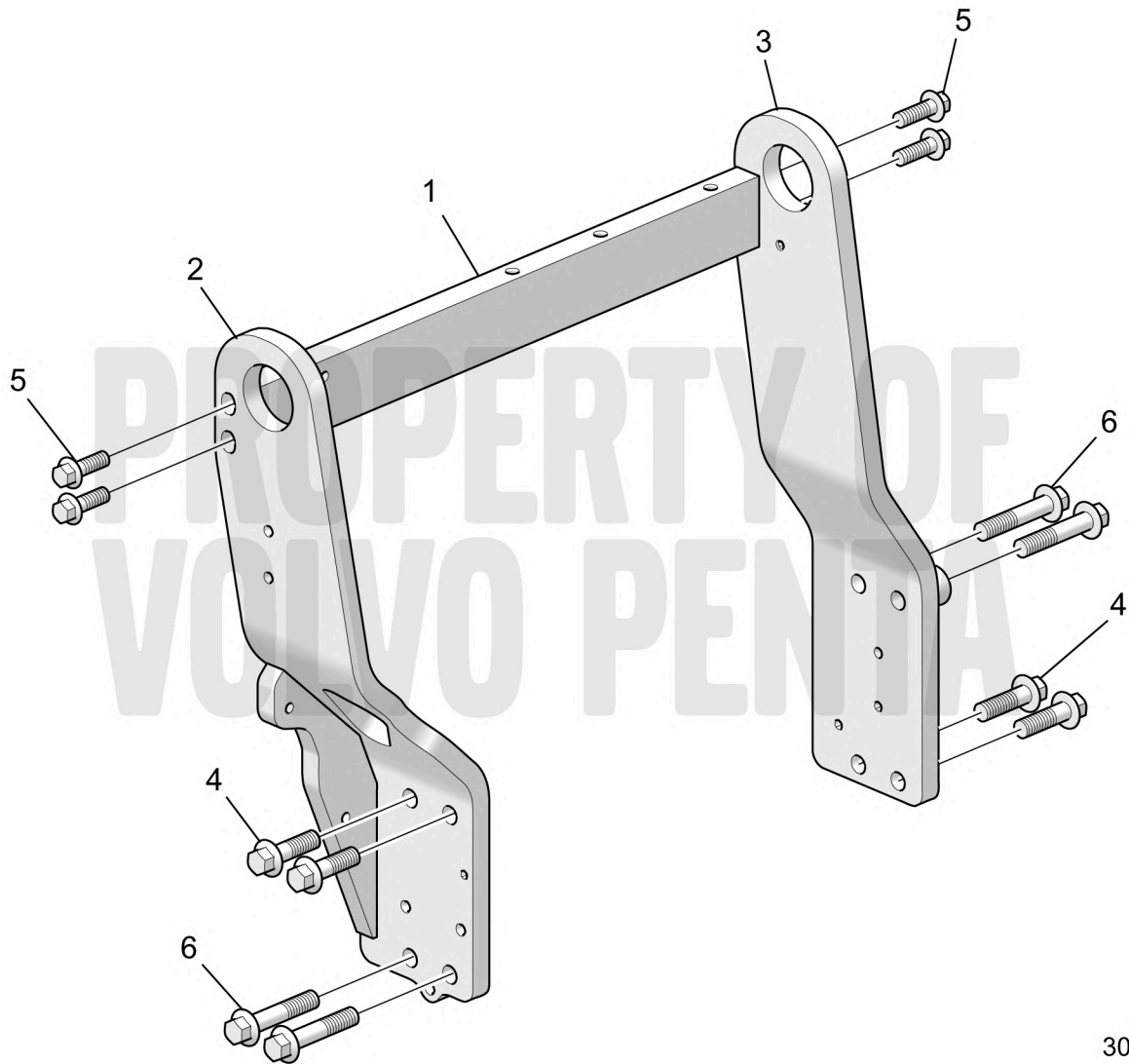
29362

i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	22334637	1	Flywheel
2	20711957	1	Ring Gear
3	21344746	14	Flange Screw

Lifting Eye

Reference no. 54167121



30604

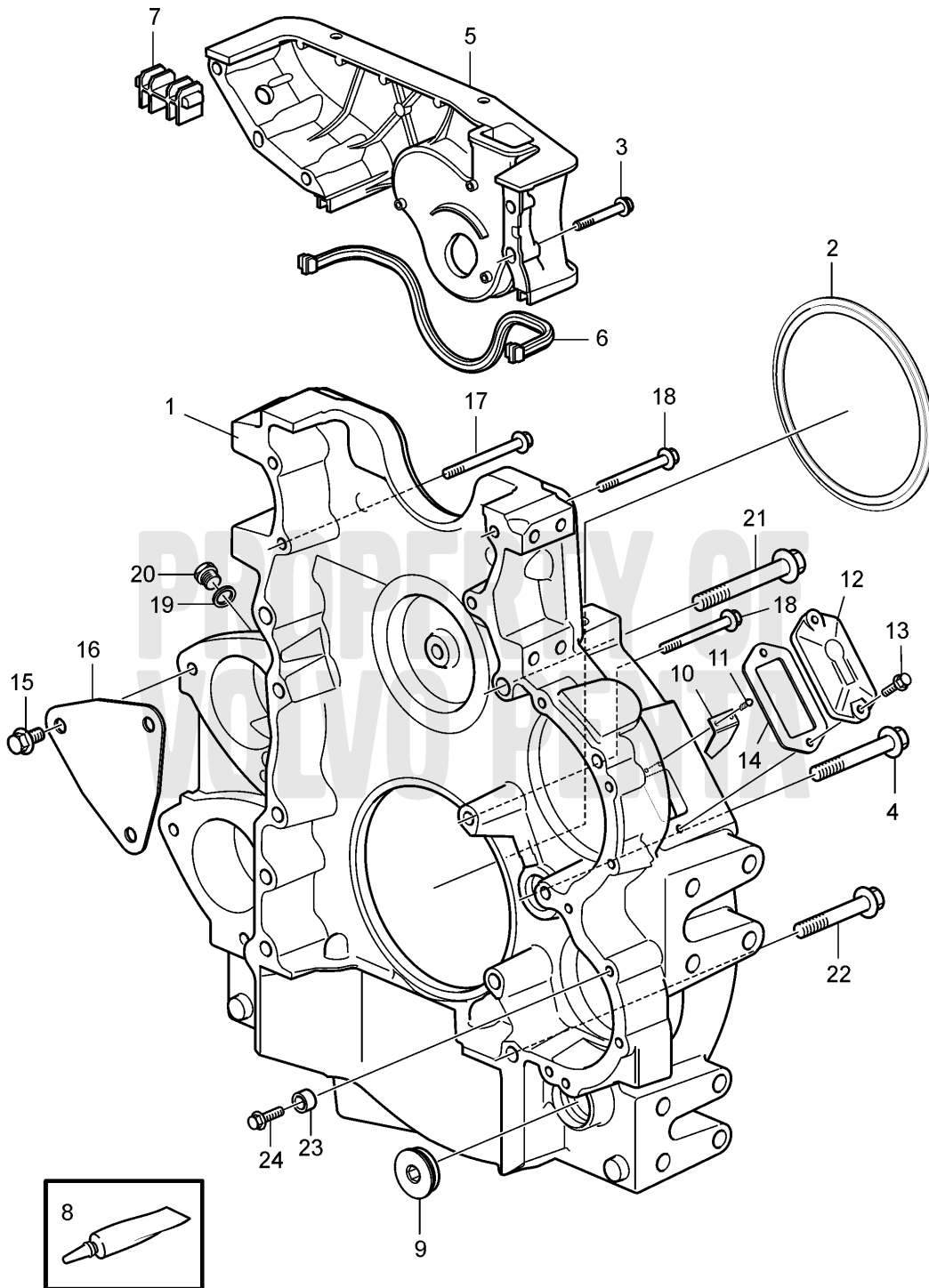


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23380356	1	Support Plate
2	23982830	1	Lifting Eye
3	23471681	1	Lifting Eye
4	984816	4	Flange Screw
5	969445	4	Flange Screw
6	975112	4	Flange Screw

Flywheel Housing

Reference no. 54166107



26218



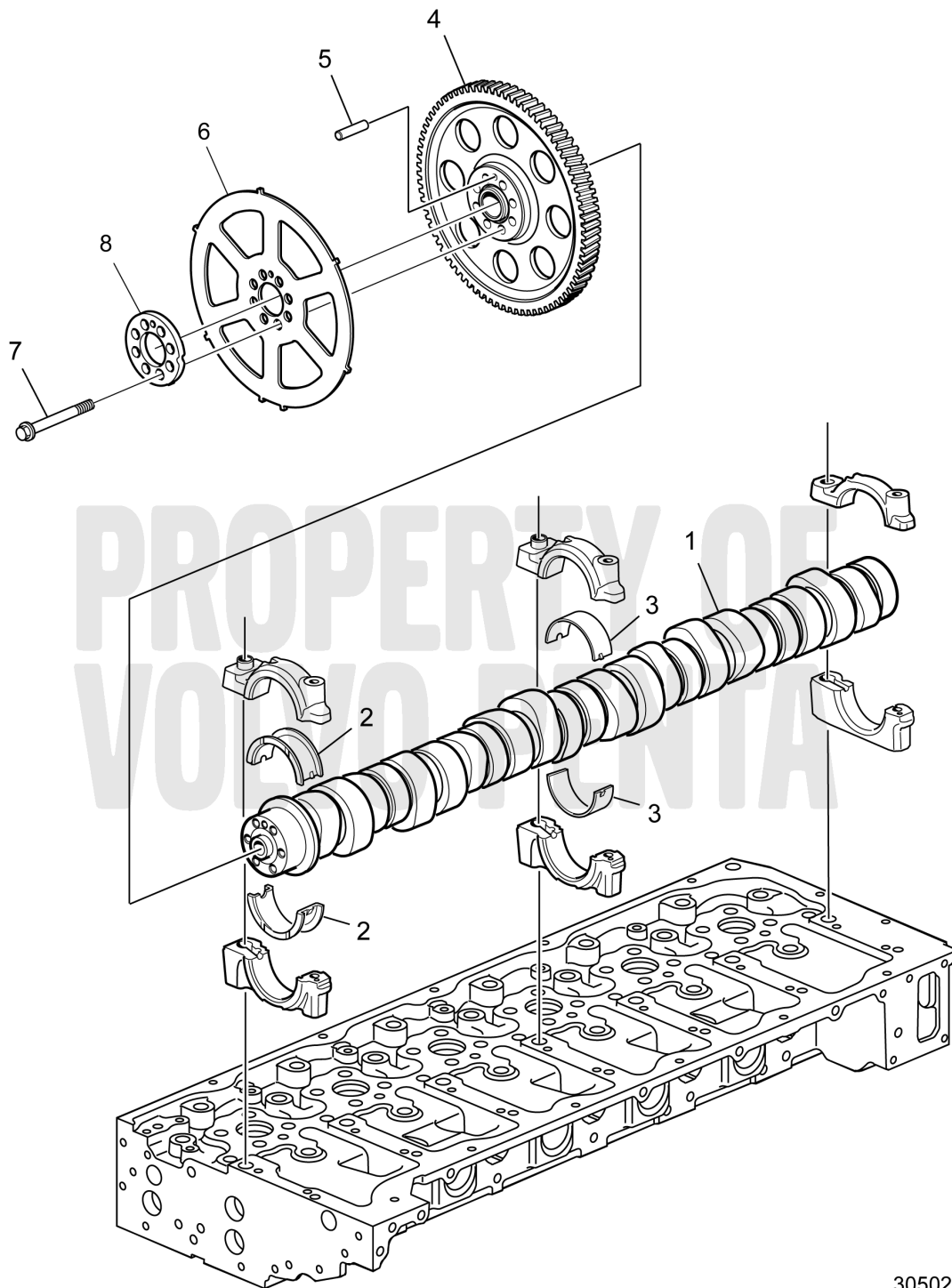
Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	78467586	1	Flywheel Housing
2	22191895	1	Crankshaft Seal
3	984738	4	Flange Screw
3	984740	1	Flange Screw
4	984863	1	Flange Screw
5	22997662	1	Timing Gear Cover
6	20815558	1	Sealing Strip
7	21185132	2	Seal
8	1161231	1	Silicon Adhesives – Black
8	1161277	1	Silicon Adhesives – Black
9	15134976	1	Plug
10	849405	1	Setting Indicator
11	984813	2	Flange Screw
12	4772168	1	Cover
13	60114374	2	Flange Screw
14	4804167	1	Gasket
15	984813	7	Flange Screw
16	849135	1	Cover
17	984762	2	Flange Screw
18	984760	3	Flange Screw
19	11998	1	Gasket
20	966144	1	Plug
21	975130	2	Flange Screw
22	984862	6	Flange Screw
23	994943	5	Spacer Washer
24	984736	5	Flange Screw

#	Part number	Qty	Description
1	3841895	1	Engine Anchorage
2	984838	2	Flange Screw
3	974007	1	Flange Screw
4	984836	3	Flange Screw
5	22352560	2	Engine Bracket
6	984833	6	Flange Screw
7	990953	4	Flange Lock Nut

Camshaft with VCB

Reference no. 54166500



30502

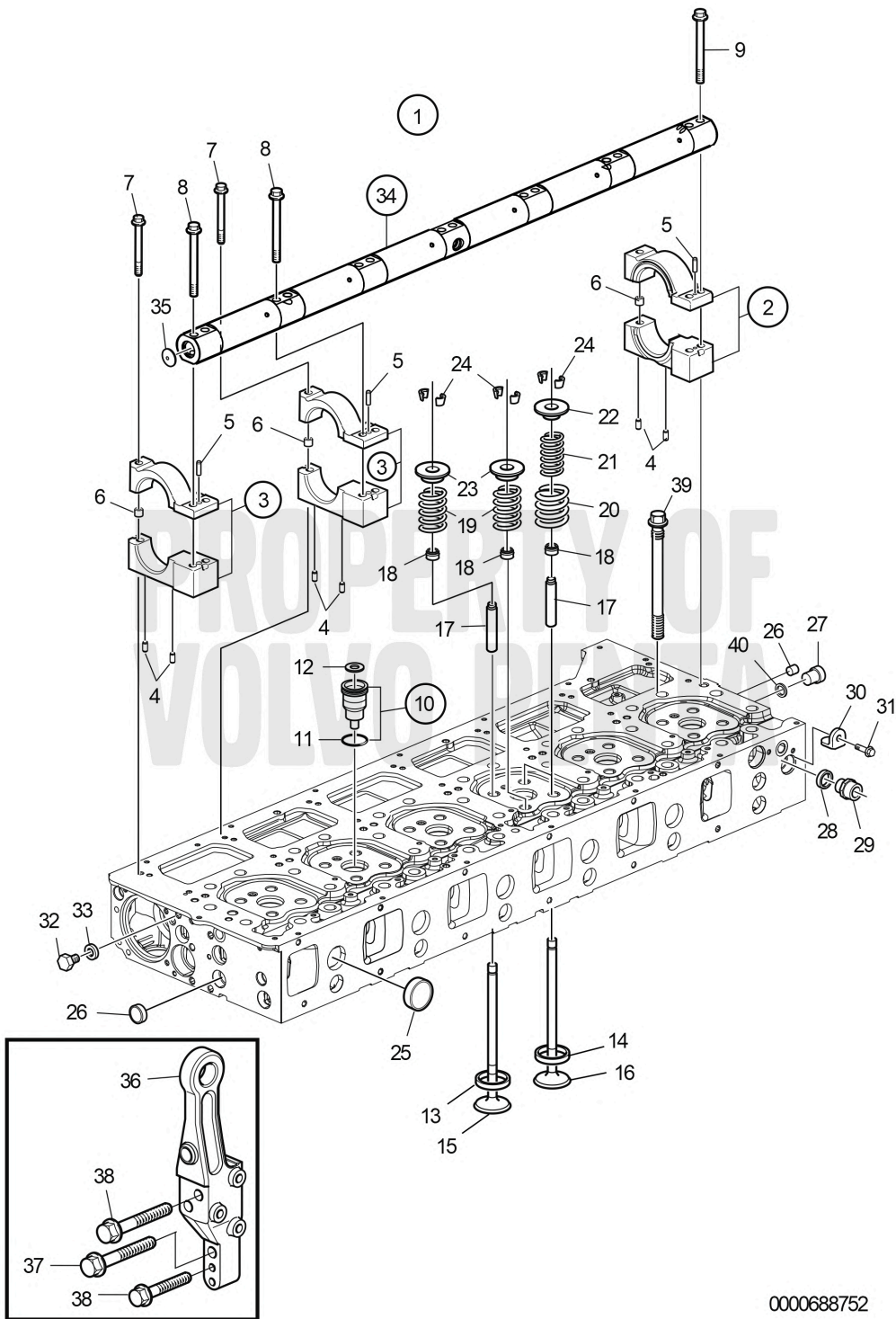


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23346005	1	Camshaft
2	21006109	1	Camshaft Bearing Kit Camshaft Bearing Kit
3	21006103	6	Camshaft Bearing Kit Camshaft Bearing Kit
4	21456239	1	Gear
5	950553	1	Pin
6	22706184	1	Sensor Wheel
7	8192804	8	Flange Screw
8	22706186	1	Spacer

Cylinder Head with VCB

Reference no. 54166501



000688752



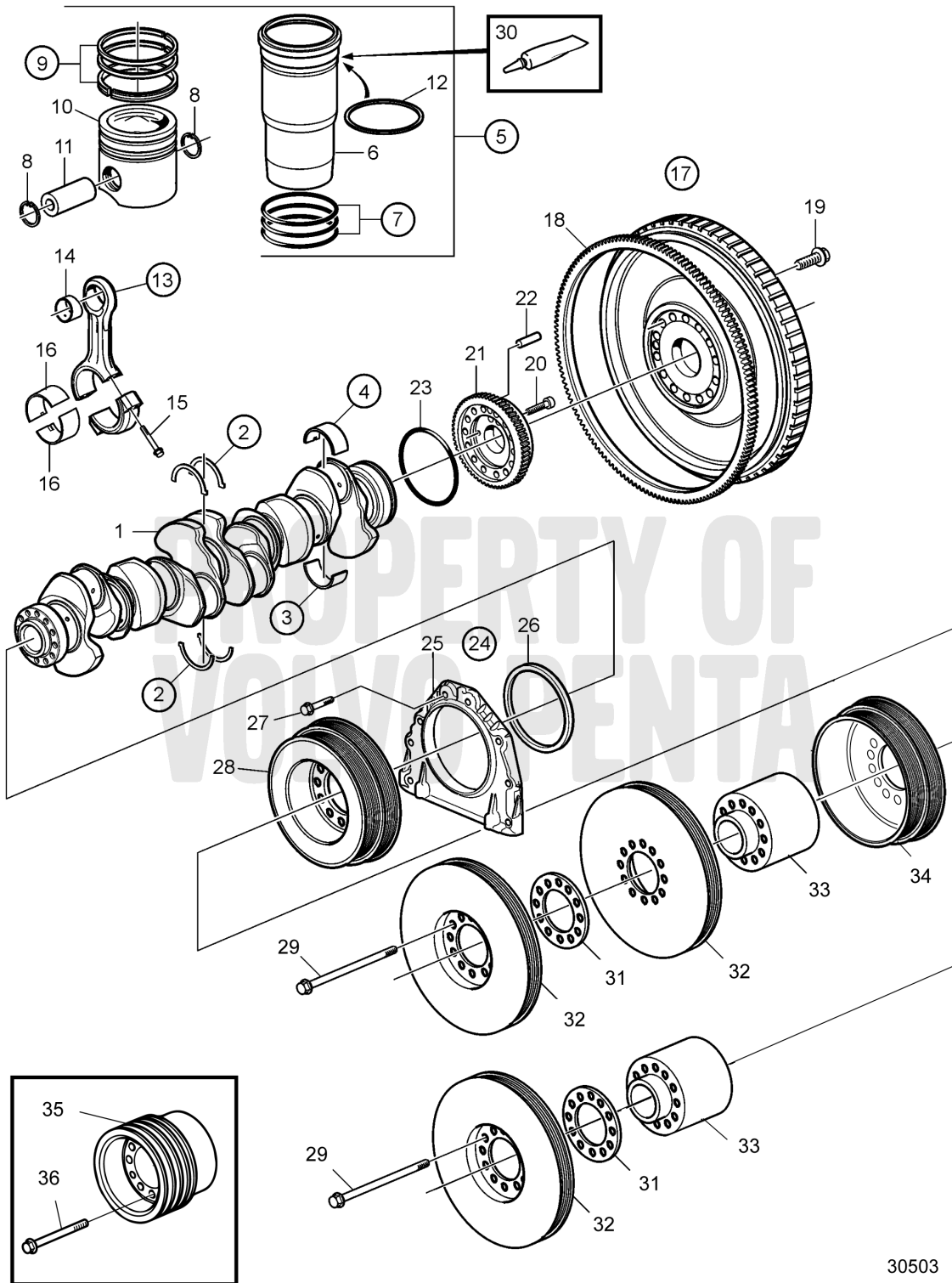
Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23306121	1	Cylinder Head
1	3801804	1	Cylinder Head, Reman Exchange
2	3184012	1	Bearing Housing
3	3184015	6	Bearing Housing
4	950562	14	Pin
5	950550	6	Pin
6	950542	7	Pin
7	975105	7	Flange Screw
8	21344753	12	Flange Screw
9	20412482	1	Flange Screw
10	21351717	6	Injector Sleeve Injector Sleeve Kit
10	276948	1	O-Ring Kit
10	20981856	1	Sleeve
11	20536487	1	O-Ring
12	21261987	1	Washer
13	21780358	12	Valve Seat Intake
14	22059584	12	Valve Seat Exhaust
15	20739057	12	Inlet Valve
16	20513285	12	Exhaust Valve
17	21632997	24	Valve Guide Valve Guide
18	20924435	24	Valve Stem Seal
19	22527820	12	Valve Spring
20	21564308	12	Valve Spring
21	23803425	12	Valve Spring
22	8131835	12	Valve Spring Washer
23	8131328	12	Valve Spring Washer
24	8170995	48	Valve Collet
25	24426721	16	Expansion Plug
25	24426723	6	Expansion Plug
26	24426722	6	Expansion Plug

27	945065	1	Plug
28	1547252	2	Sealing Ring
29	20845995	2	Plug
30	20844430	1	Lock Brace
31	984732	1	Flange Screw
32	965768	1	Plug
33	947281	1	Gasket
34	21534993	1	Rocker Arm Shaft Rocker Arm Shaft
35	955096	2	Expansion Plug
36	23380365	1	Lifting Eye
37	984820	2	Flange Screw
38	975112	1	Flange Screw
39	21345129	38	Flange Screw
40	969011	1	Gasket

Crank Mechanism, SN-2016176102

Reference no. 54166111



30503



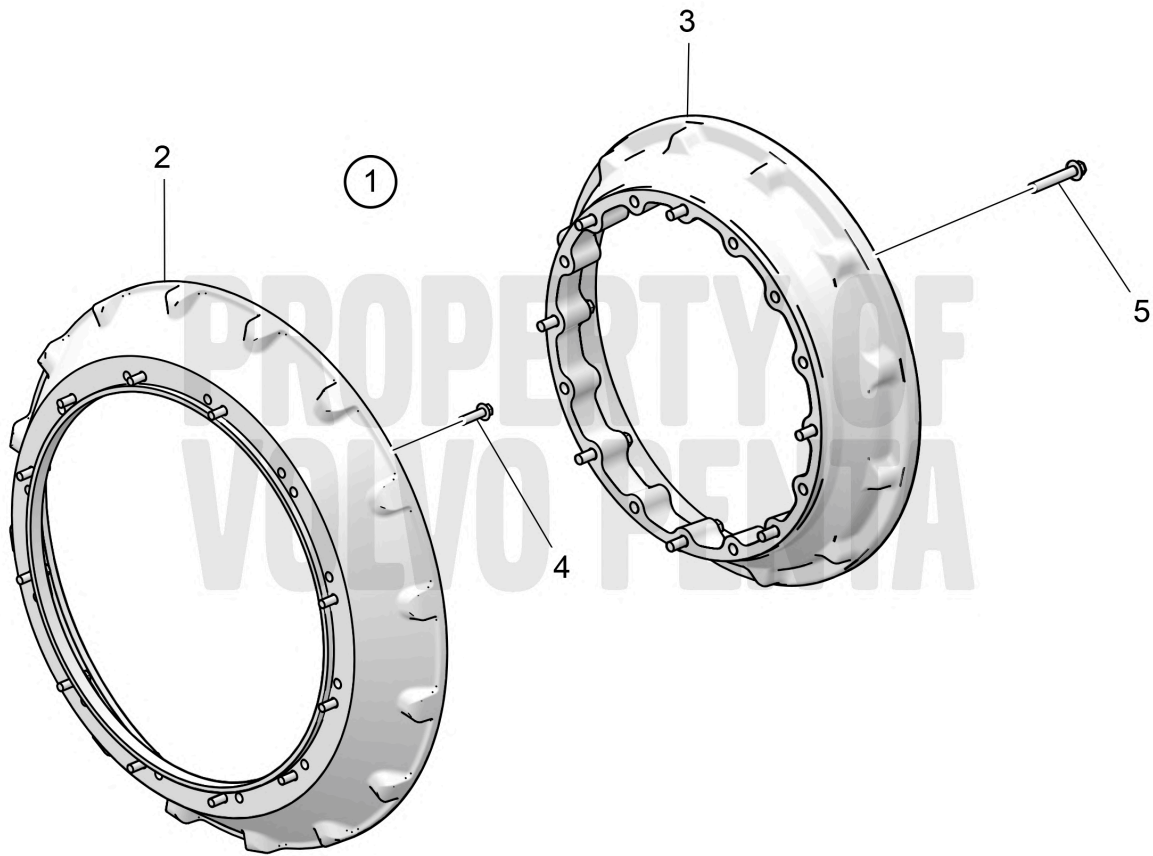
Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23799849	1	Crankshaft
2	21948268	1	Thrust Washer Kit
2	21948270	1	Thrust Washer Kit
2	270931	1	Thrust Washer Kit
2	270932	1	Thrust Washer Kit
3	20578851	6	Main Bearing Kit
3	20700881	6	Main Bearing Kit
3	20700882	6	Main Bearing Kit
3	20700885	6	Main Bearing Kit
3	20700886	6	Main Bearing Kit
4	20578853	1	Main Bearing Kit
4	20700890	1	Main Bearing Kit
4	20700891	1	Main Bearing Kit
4	20700892	1	Main Bearing Kit
4	20700893	1	Main Bearing Kit
4	20700895	1	Main Bearing Kit
5	22431900	6	Cylinder Liner Kit
6	20737361	1	Cylinder Liner
7	20520607	1	Sealing Ring Kit
8	945483	2	Snap Ring
9	22215257	1	Piston Ring Kit
9	21393583	1	Oil Scraper Ring
9	21251602	1	Compression Ring
9	20737364	1	Compression Ring
10	21161902	1	Piston
11	20737366	1	Gudgeon Pin
12	20523555	1	Shim
12	20523556	1	Shim
12	20523557	1	Shim
13	21535917	6	Connecting Rod

14	20898010	6	Bushing
15	8131198	24	Flange Screw
16	20586602	6	Big-End Bearing Kit Big-End Bearing Kit
16	20586603	6	Big-End Bearing Kit
16	20586604	6	Big-End Bearing Kit
16	20586605	6	Big-End Bearing Kit
16	20586606	6	Big-End Bearing Kit
16	20586607	6	Big-End Bearing Kit
17	3840066	1	Flywheel
18	20711957	1	Ring Gear
19	21344746	14	Flange Screw
20	984738	2	Flange Screw
21	21430914	1	Gear
22	950656	1	Pin
23	997790	1	O-Ring
25	20777236	1	Cover
26	21779548	1	Crankshaft Seal
27	984736	8	Flange Screw
28	20585893	1	Vibration Damper
29	984824	12	Flange Screw
29	984825	12	Flange Screw
30	1161231	1	Silicon Adhesives – Black
30	1161277	1	Silicon Adhesives – Black
31	23958344	1	Spacer
32	23229865	2	Vibration Damper
33	23961145	1	Adapter
34	3837486	1	Pulley
35	3829173	1	Pulley
36	984821	12	Flange Screw

Adapter SAE 1 to SAE 0

Reference no. 0000007031

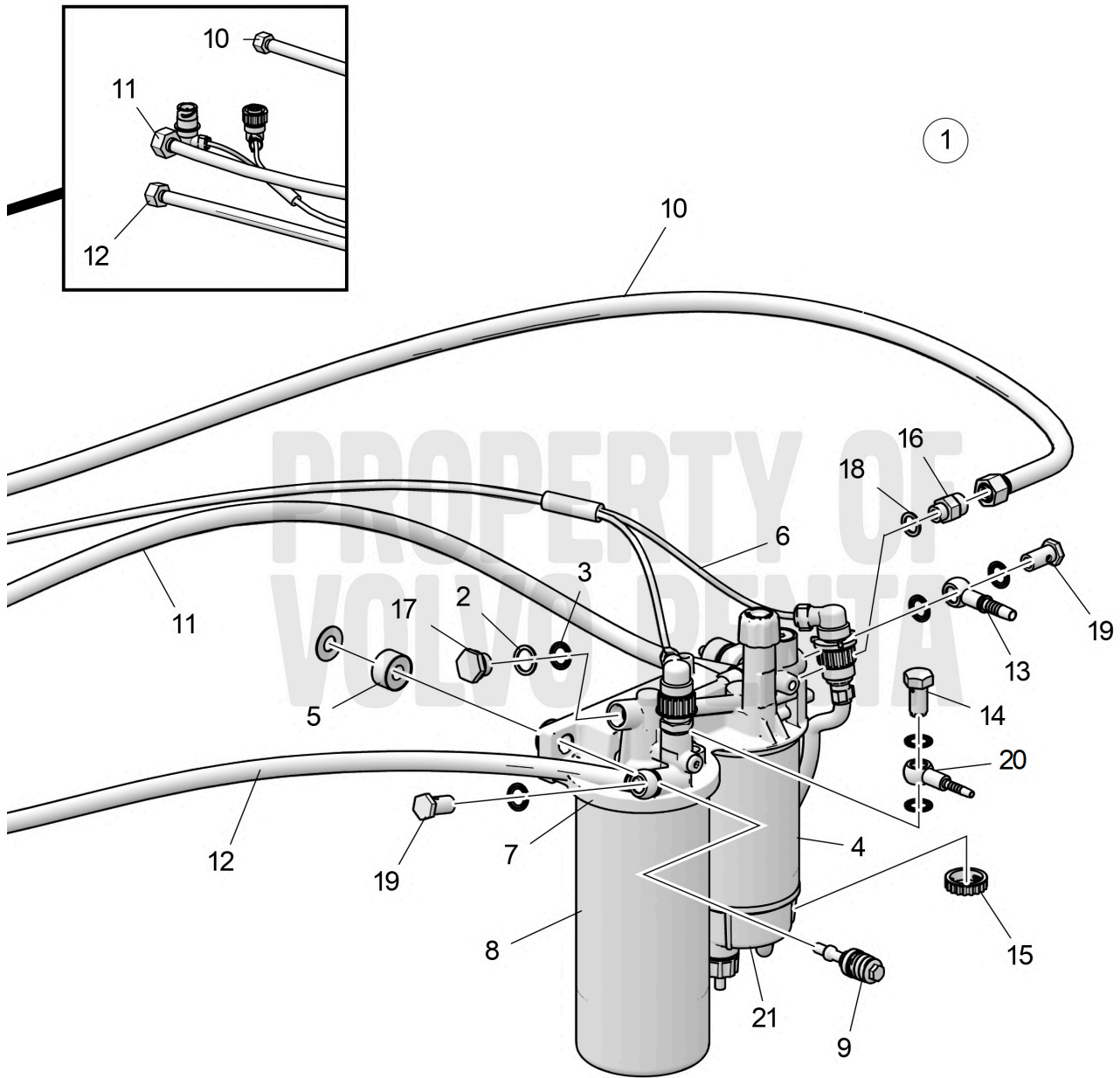


i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	24373180	1	Adapter
2	24370825	1	Adapter
3	24380429	1	Adapter
4	984754	12	Flange Screw
5	990813	8	Flange Screw

Remote mounted fuel filter kit, steel braided hoses

Reference no. 0000007916



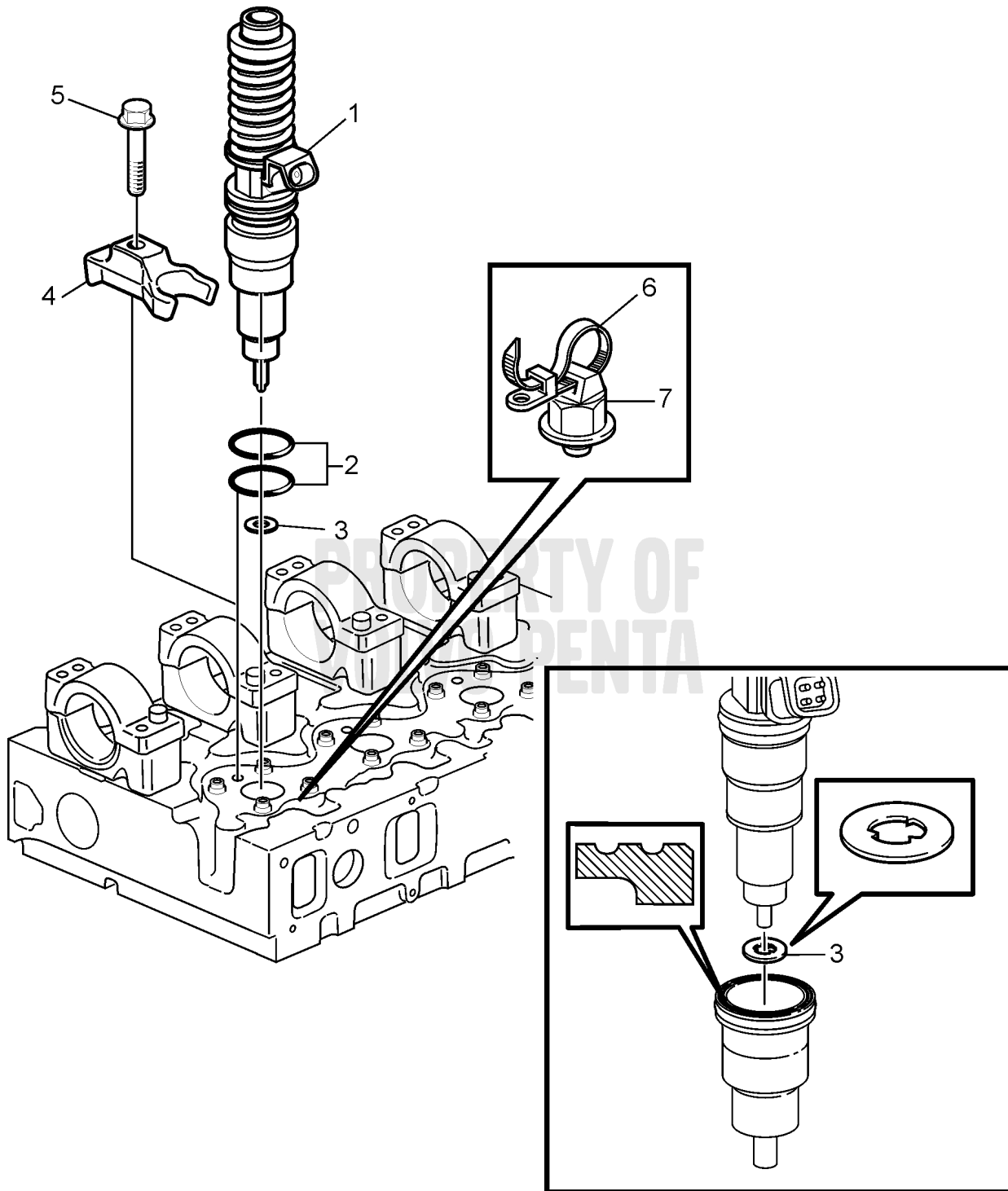
0000699483

i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	24359370	1	Fuel Filter Kit
2	11998	1	Gasket
3	20852764	9	Sealing Ring
4	20998367	1	Fuel Filter
5	21091546	3	Rubber Element
6	21472660	1	Wiring Harness
7	22035823	1	Fuel Filter Housing Fuel Filters Housing
8	24063189	1	Fuel Filter
9	22859766	3	Flange Screw
10	24160638	1	Fuel Hose
11	24160641	1	Fuel Hose
12	24160643	1	Fuel Hose
13	3587322	1	Banjo Nipple
14	3594288	1	Valve
15	3963413	1	Ring
16	946602	1	Nipple
17	960632	1	Plug
18	969011	1	Gasket
19	991048	3	Hollow Screw
20	993586	1	Banjo Nipple
21	21333413	1	Bowl

Unit Injector

Reference no. 54166121



24998

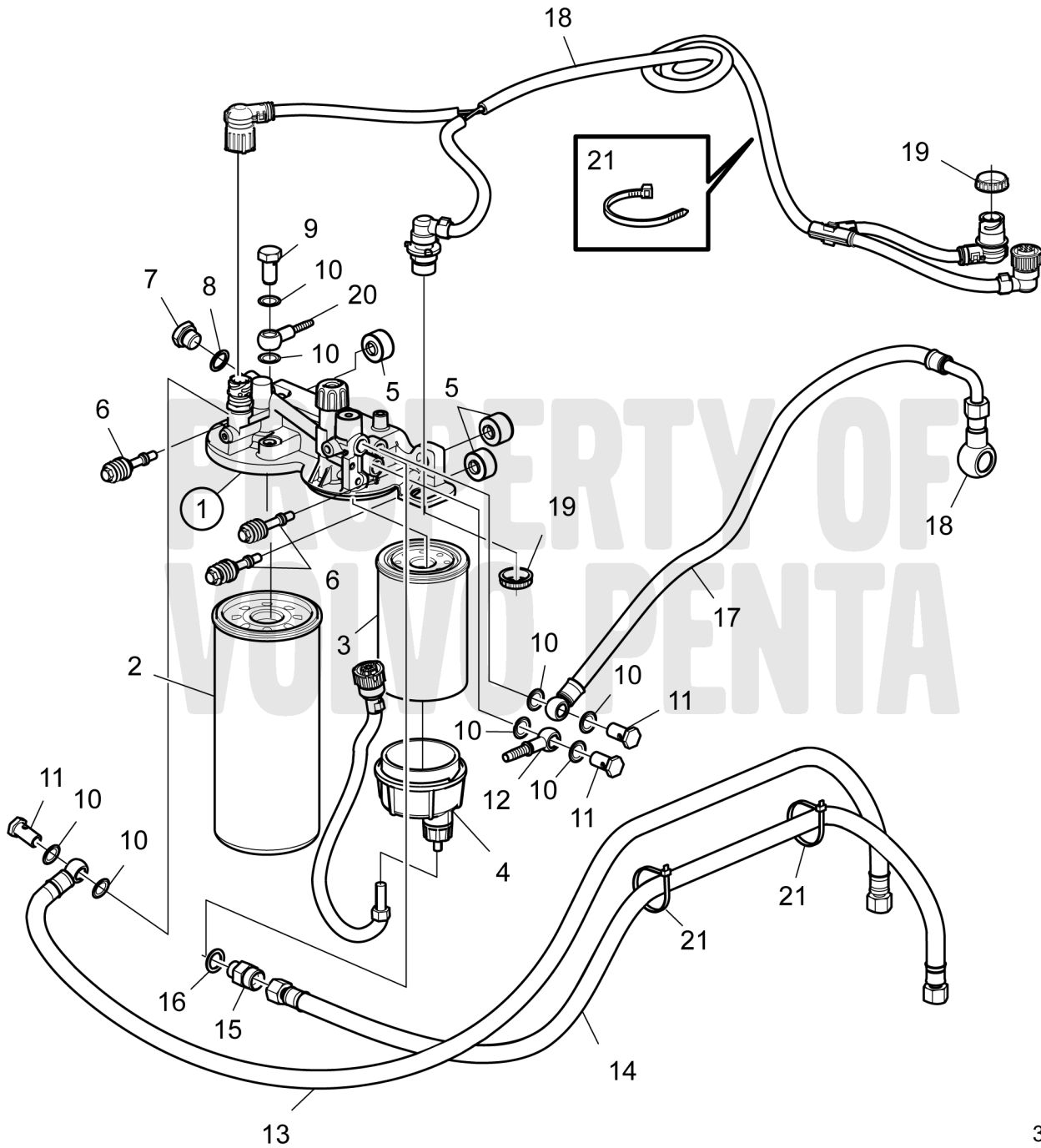


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23238954	6	Injector
1	3801907	6	Unit Injector, Reman
2	276948	1	O-Ring Kit Kit
3	21261987	6	Washer
4	21801388	6	Yoke
5	21344774	6	Flange Screw
6	994891	6	Cable Tie
7	8131393	6	Retainer

Remote Fuel Kit

Reference no. 54167135



30620

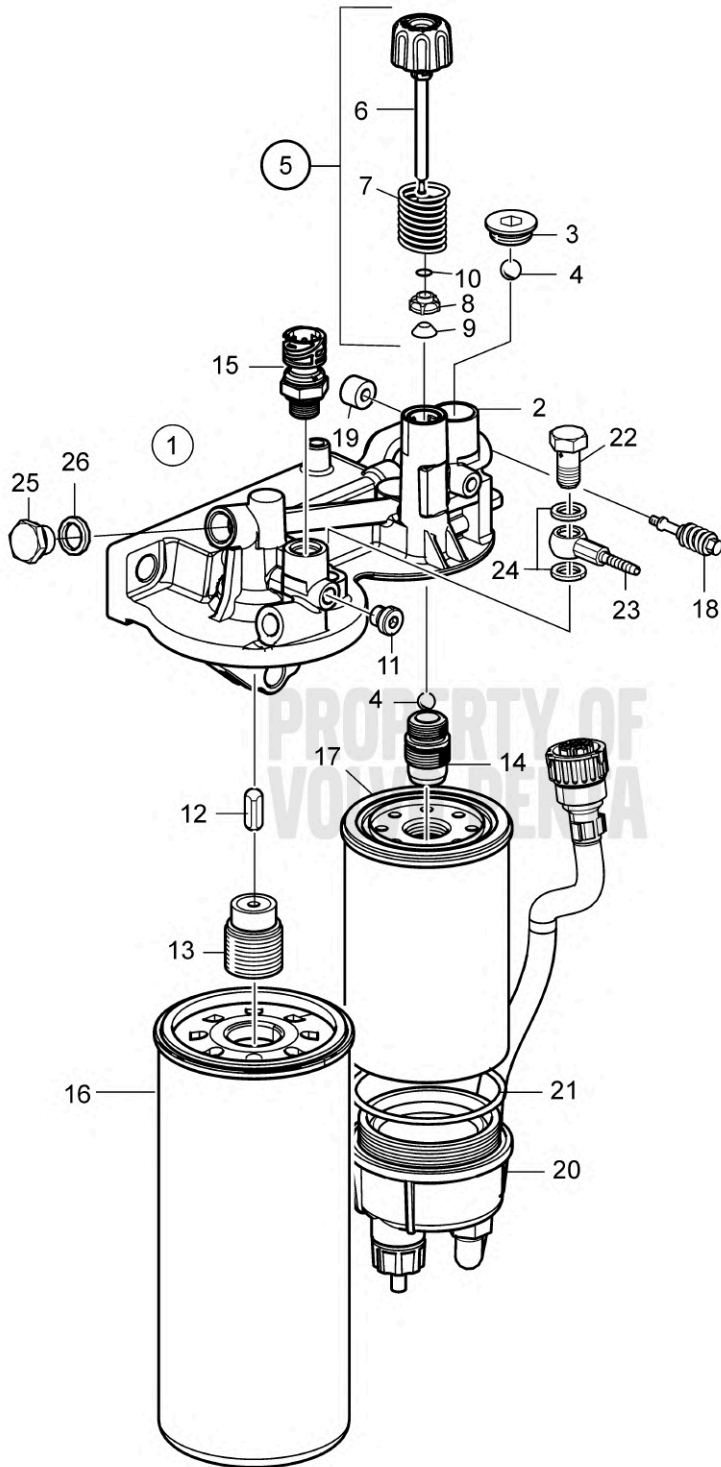


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	22035823	1	Fuel Filter Housing Fuel Filters Housing
2	24063189	1	Fuel Filter
3	20998367	1	Fuel Filter
4	21333413	1	Bowl
5	21091546	3	Rubber Element
6	22859766	3	Flange Screw
7	960632	1	Plug
8	11998	1	Gasket
9	3594288	1	Valve
10	993685	8	Gasket
11	991048	3	Hollow Screw
12	3587322	1	Banjo Nipple
13	21417371	1	Fuel Hose
14	21417373	1	Fuel Hose
15	946602	1	Nipple
16	969011	1	Gasket
17	21417375	1	Fuel Hose
18	21472660	1	Wiring Harness
19	3963413	2	Ring
20	993586	1	Banjo Nipple
21	948211	2	Cable Tie

Fuel Filter Housing, Components. Fuel filter

Reference no. 54167136



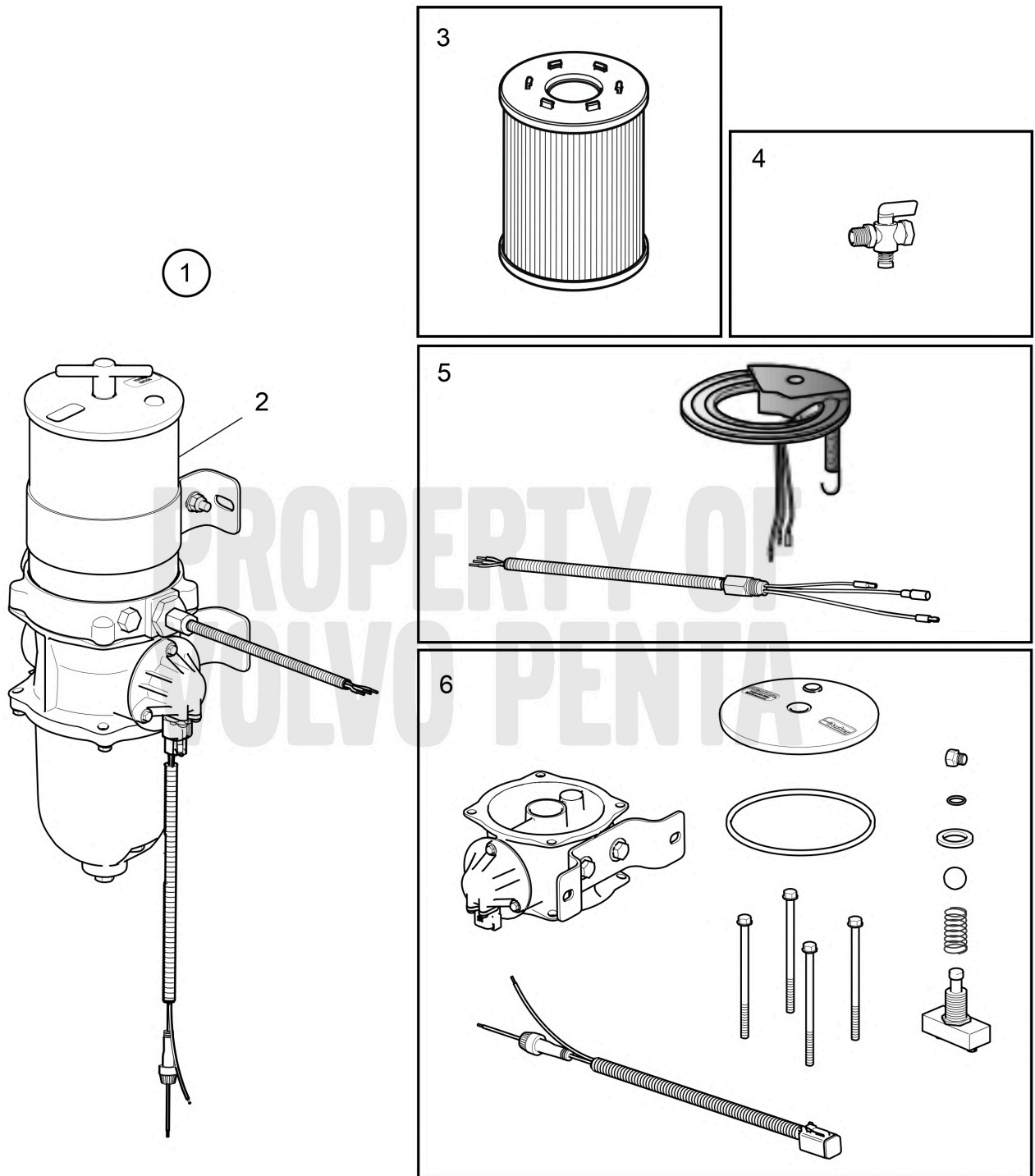
28733

i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	22035823	1	Fuel Filter Housing Fuel Filters Housing
2	40005127	1	Fuel Filter Housing
3	20744692	1	Cap
4	20528999	2	Ball
5	22763401	1	Hand Pump
6	20784020	1	Pump Shaft
7	20784027	1	Spring
8	20528992	1	Plunger
9	20528991	1	Back-Up Ring
10	20528990	1	O-Ring
11	20542751	1	Plug
12	-	1	Valve
13	-	1	Nipple
14	21019860	1	Nipple
15	22899626	1	Pressure Sensor
16	24063189	1	Fuel Filter
17	20998367	1	Fuel Filter
18	22859766	3	Flange Screw
19	21091546	3	Rubber Element
20	21086803	1	Bowl
20	21333413	1	Bowl
21	967344	1	O-Ring
22	3594288	1	Valve
23	993586	1	Banjo Nipple
24	20852764	2	Sealing Ring
25	960632	1	Plug
26	11998	1	Gasket

Electrical Priming Pump

Reference no. 000000101



00000741 1

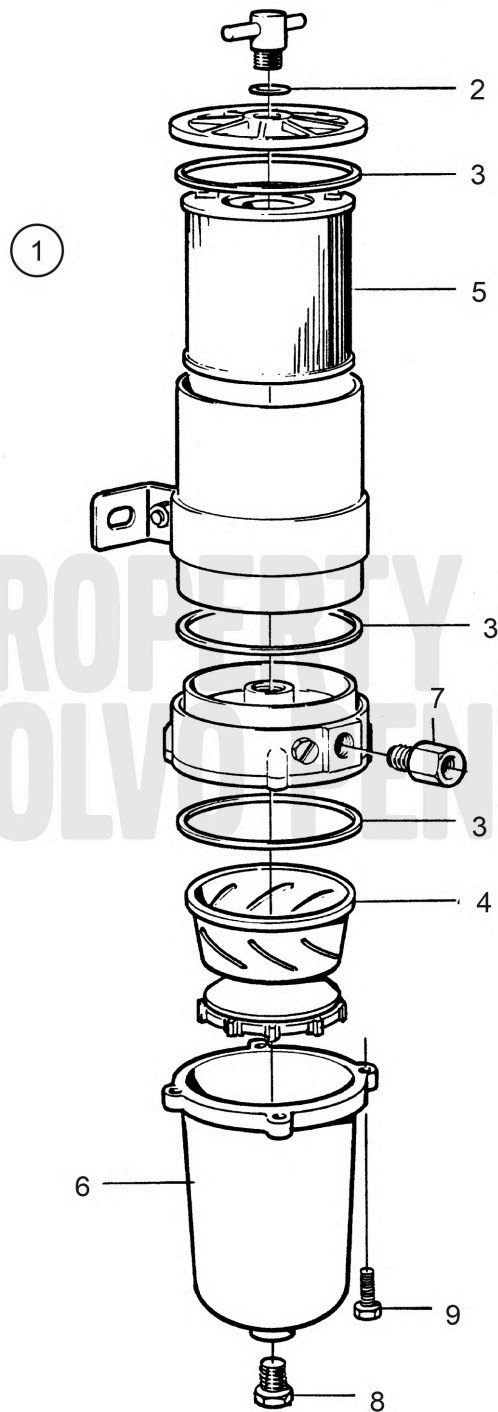


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23566130	1	Pump
2	23566131	1	Fuel Filter Fuel Filter With Water Separation
3	889419	1	Filter Element For 877769, 877768 And 22677640
4	23566136	1	Shut-Off Valve
5	23566134	1	Heater
6	23566133	1	Pump

Fuel Cleaner/ Water Separator, Single. Classifiable Fuel System

Reference no. 54166119



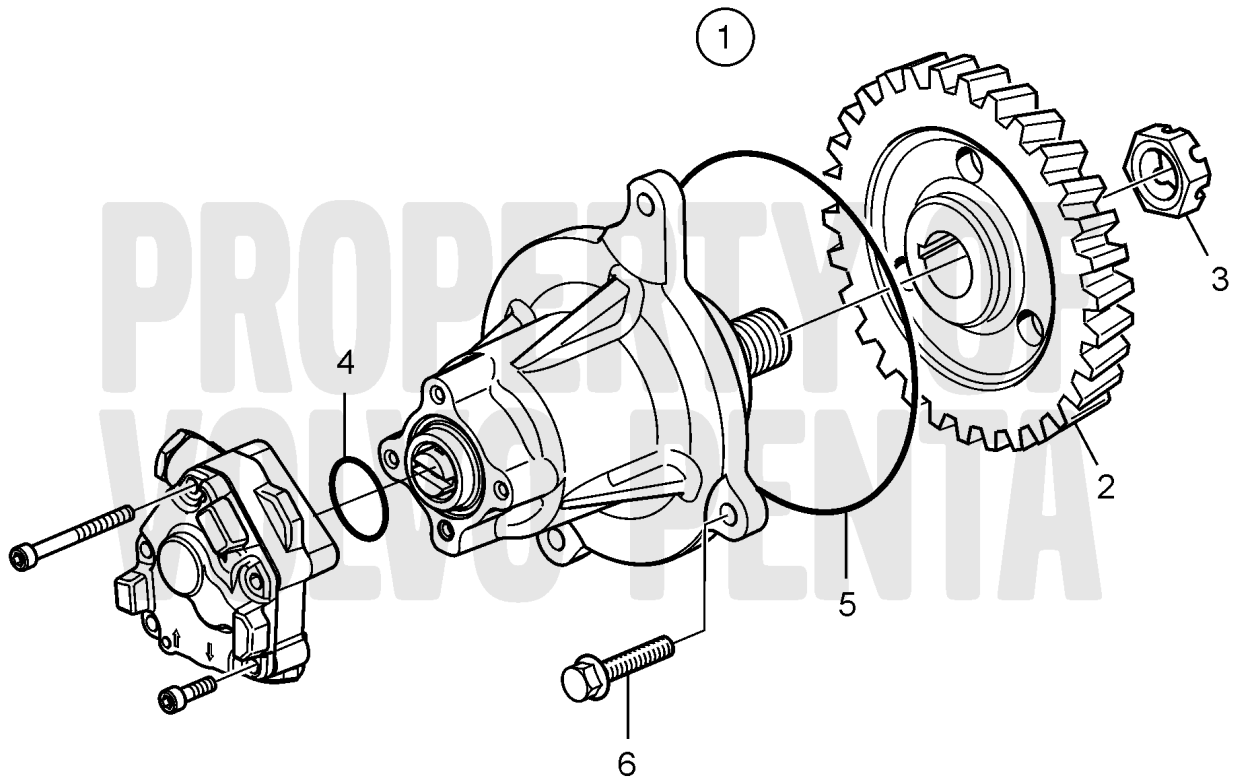
0000012937

i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	877768	1	Fuel Filter/Water Separator, Diesel Engines Fuel Cleaner/ Water Separator
2	838505	1	O-Ring
3	846719	3	Gasket
4	3825028	1	Turbine
5	3838852	1	Filter Element For 877769, 877768 And 22677640
6	3838851	1	Bowl
7	846620	2	Nipple
8	952075	1	Plug
9	940094	4	Hexagon Screw

Fuel Pump

Reference no. 54166118



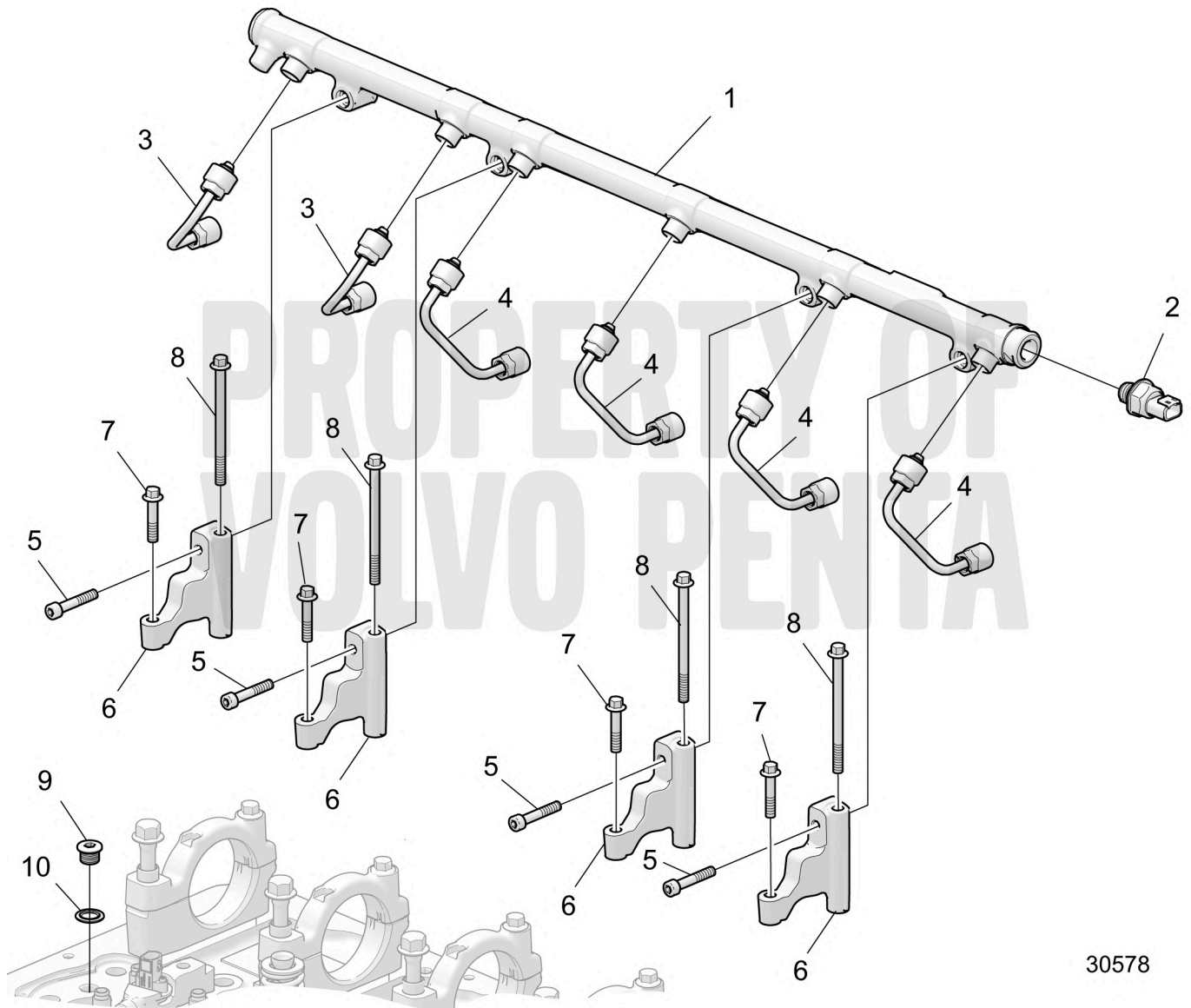
28676

i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	22677520	1	Fuel Pump
2	8131292	1	Gear
3	22885952	1	Castle Nut
4	948610	1	O-Ring
5	977030	1	O-Ring
6	984738	3	Flange Screw

Common Rail System

Reference no. 54166993



30578

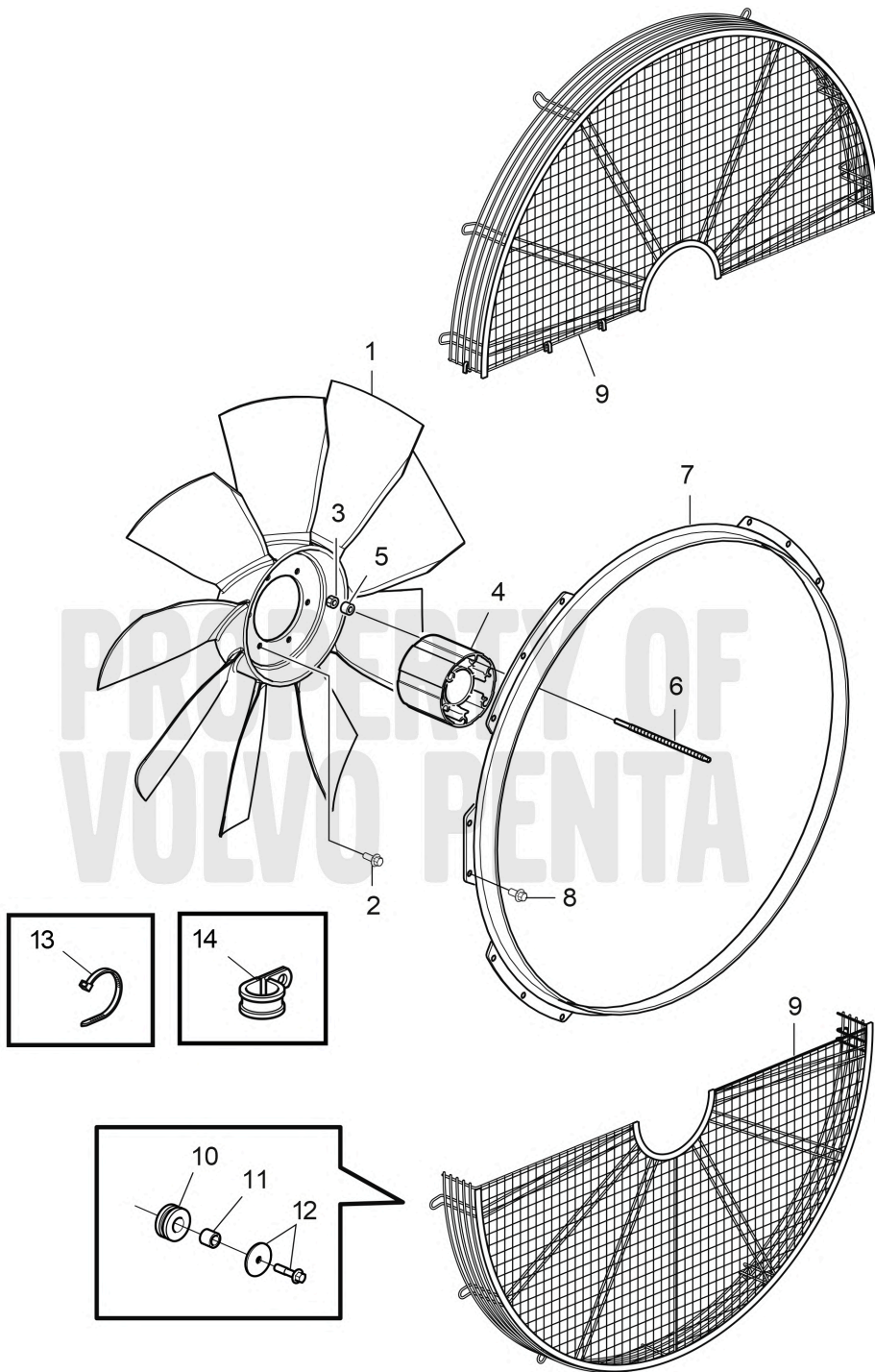


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23693935	1	Common Rail
2	23488937	1	Pressure Sensor
3	23002535	2	Pipe
4	23002546	4	Pipe
5	60111169	4	Hex. Socket Screw
6	21743258	4	Bracket
7	984738	4	Flange Screw
8	995478	4	Flange Screw
9	966143	1	Plug
10	21121914	1	Gasket

Pusher Fan, Fixed Fan Drive

Reference no. 0000004450



0000602010

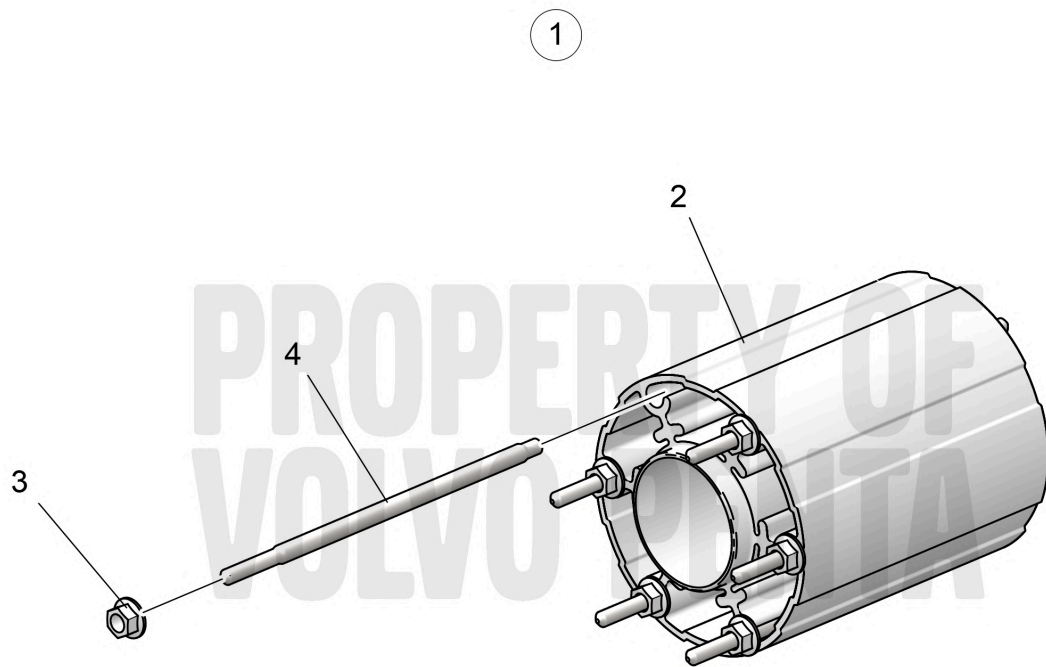


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	3595217	1	Fan
2	21318856	6	Six Point Screw
3	990941	6	Flange Nut
4	3829537	1	Fan Hub
5	842930	6	Spacer Sleeve
6	130201	6	Stud
7	3827612	1	Fan Ring
8	984734	12	Flange Screw
9	22118112	2	Fan Guard
10	21860181	12	Rubber Damper
11	845988	12	Spacer Sleeve
12	22147274	12	Flange Screw
13	948211	2	Cable Tie
14	942810	1	Clamp

Cooling Kit

Reference no. 0000008950



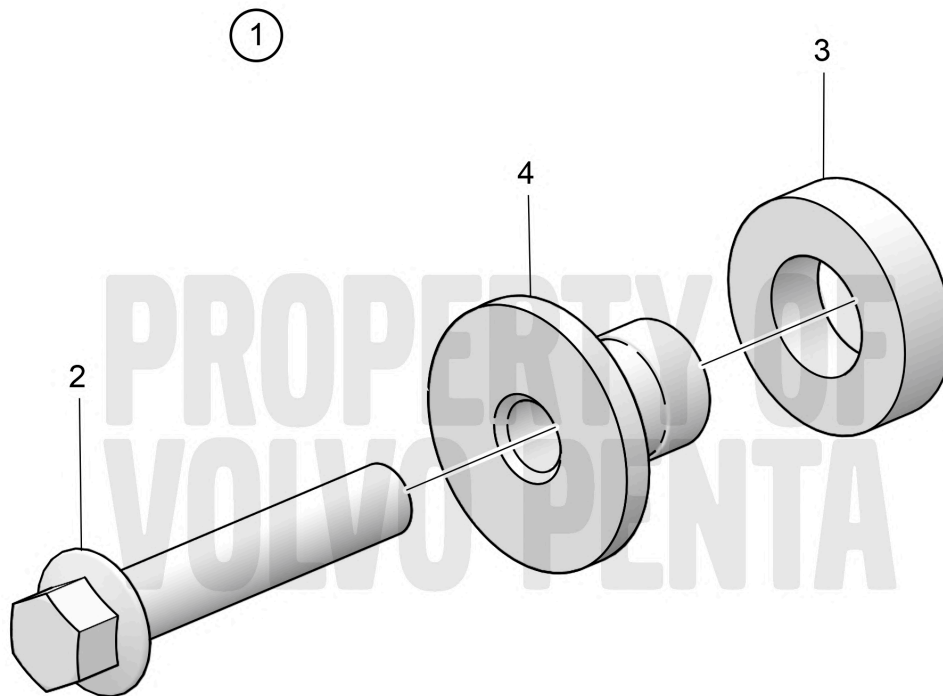
0000718620

i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	24914530	1	Cooling Kit
2	3837740	1	Fan Hub
3	990941	6	Flange Nut
4	130204	6	Stud

Attaching Fitting

Reference no. 0000004551

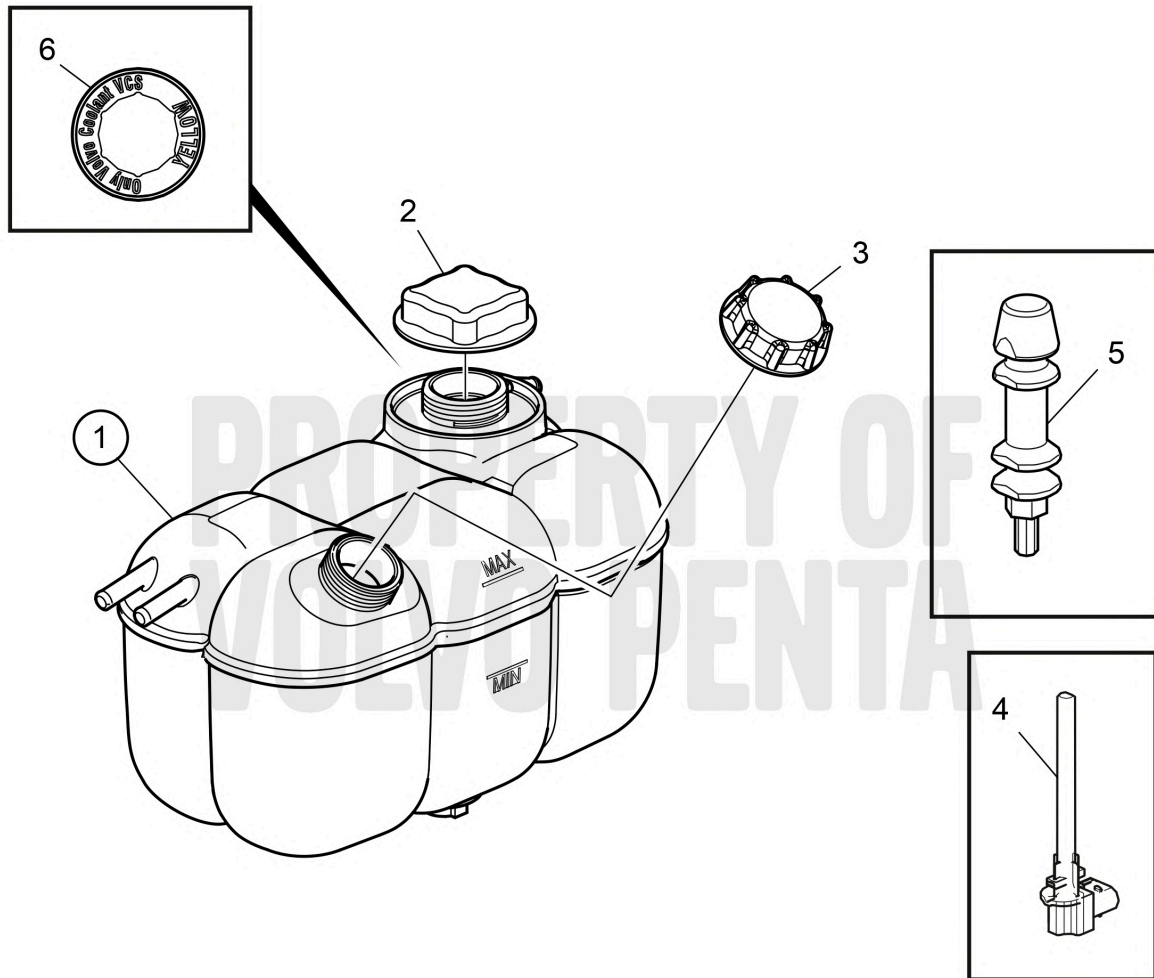


i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	22488137	1	Attaching Fitting
2	990812	1	Flange Screw
3	866857	1	Rubber Bushing
4	22423301	1	Spacer Sleeve

Expansion Tank

Reference no. 54167137



0000601489

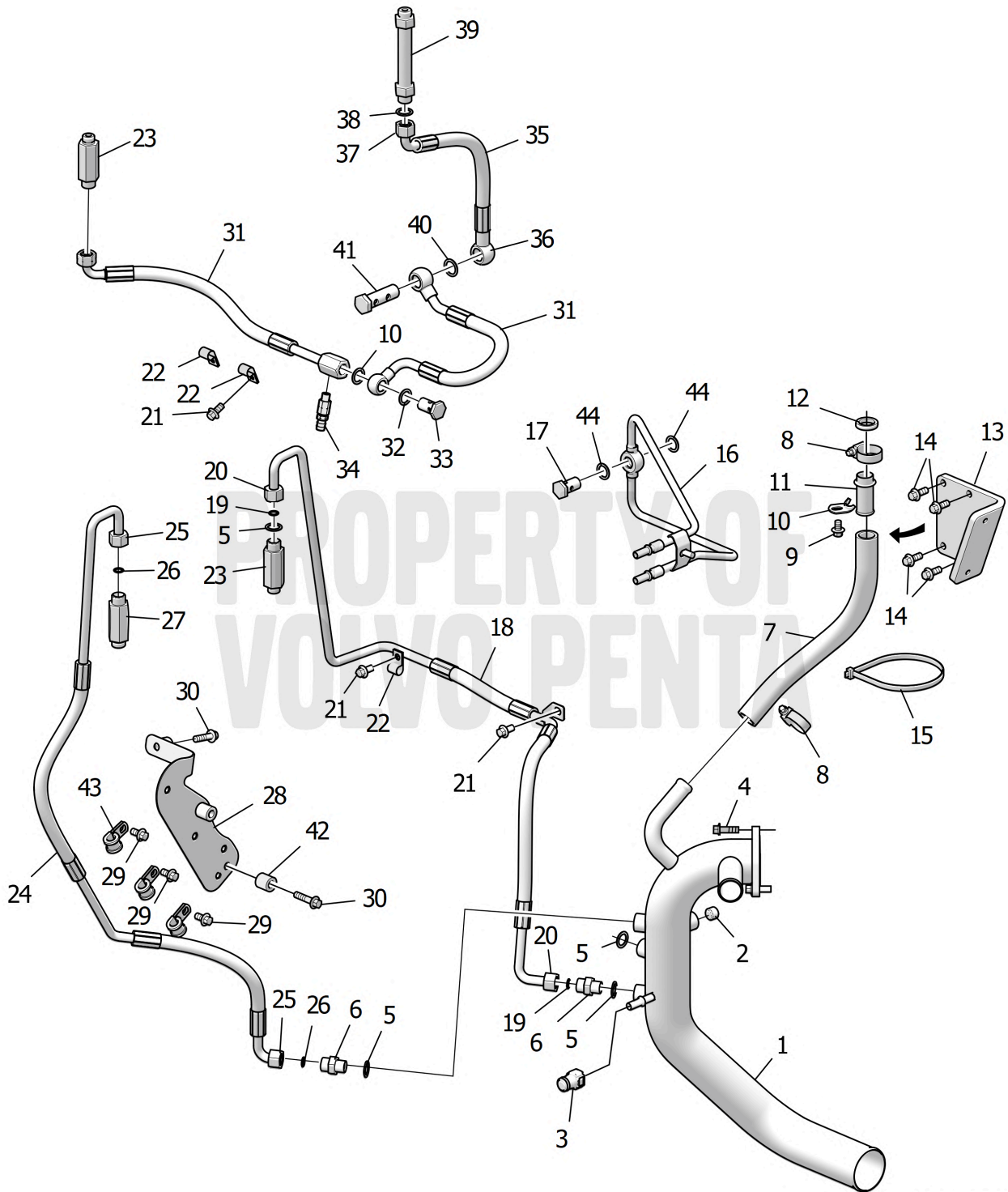


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	22951083	1	Expansion Tank
2	1674083	1	Pressure Cap
3	3979593	1	Filler Cap
4	21271982	1	Sensor
5	21914444	2	Anchorage
6	21506995	1	Decal

Water Pump and Thermostat SN2016151168-

Reference no. 0000004426



0000698062



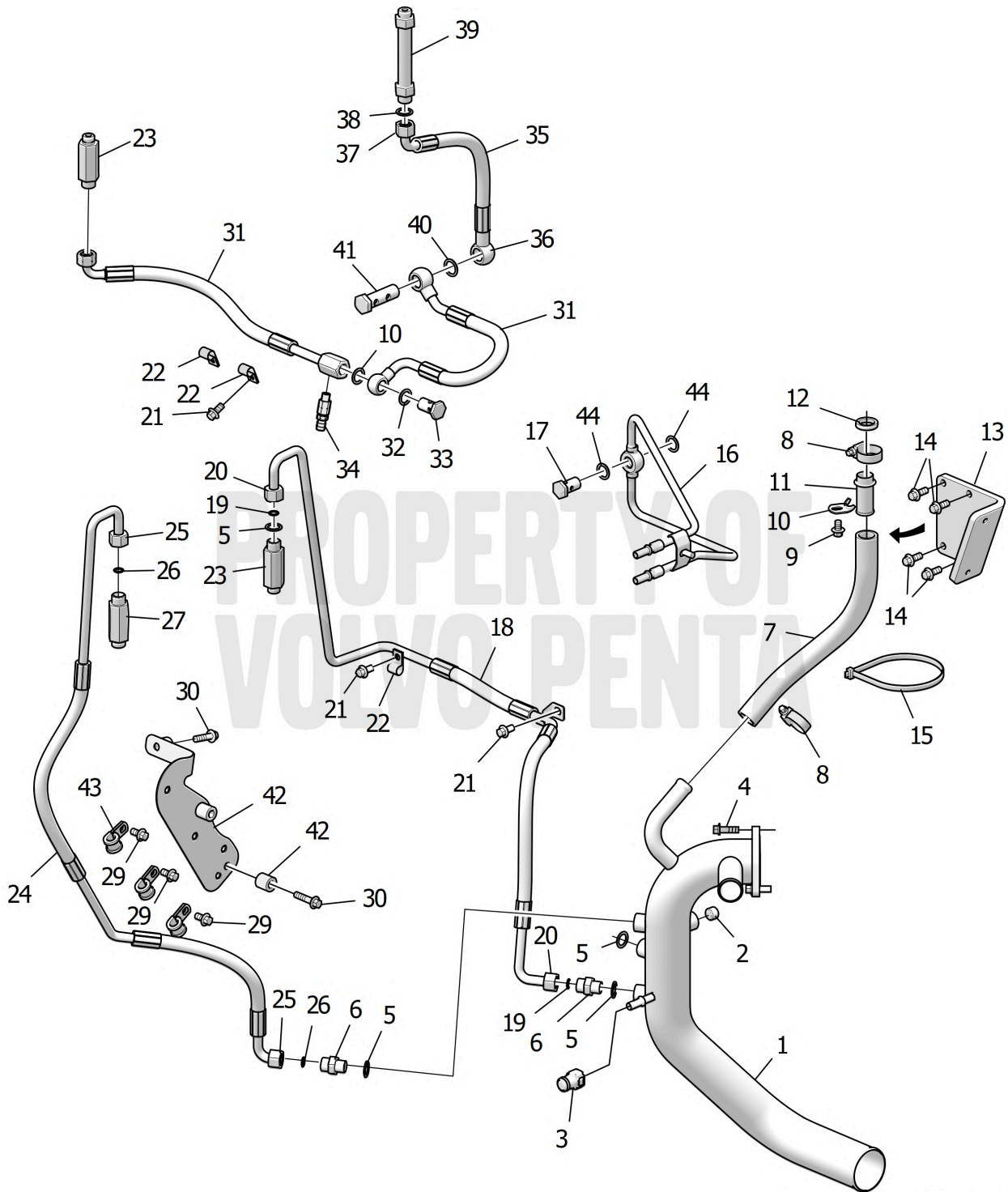
Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	78623192	1	Coolant Pipe
2	996104	1	Plug
3	21280355	1	Quick Coupling Kit
4	995463	2	Flange Screw
5	11996	4	Gasket
6	963948	2	Nipple
7	969033	1	Rubber Hose 350 Mm
8	994559	2	Hose Clamp
9	984732	1	Flange Screw
10	20844430	1	Lock Brace
11	22829974	1	Hose
12	1547252	1	Sealing Ring
13	23879104	1	Cover
14	984734	4	Flange Screw
15	980464	1	Cable Tie
16	23177941	1	Water Pipe
17	991046	1	Hollow Screw
18	78610573	1	Hose
19	976971	2	O-Ring
20	956984	2	Fitting Nut
21	984737	7	Flange Screw
22	190635	1	Clamp
23	23306100	2	Connector
24	78494672	1	Hose
25	956984	2	Fitting Nut
26	976971	2	O-Ring
27	23306101	1	Electric Socket
28	23959368	1	Bracket
29	984733	3	Flange Screw
30	984737	2	Flange Screw

31	24057475	1	Hose
32	11996	1	Gasket
33	991046	1	Hollow Screw
34	966871	1	Shut-Off Cock
35	23653465	1	Hose
36	993588	1	Banjo Nipple
37	956984	1	Fitting Nut
38	976971	1	O-Ring
39	23645840	1	Nipple
40	11998	1	Gasket
41	16221	1	Hollow Screw
42	826652	1	Spacer Sleeve
43	949746	2	Clamp
44	20852765	2	Sealing Ring

Water Pump and Thermostat SN-2016151167

Reference no. 54167149



0000603601



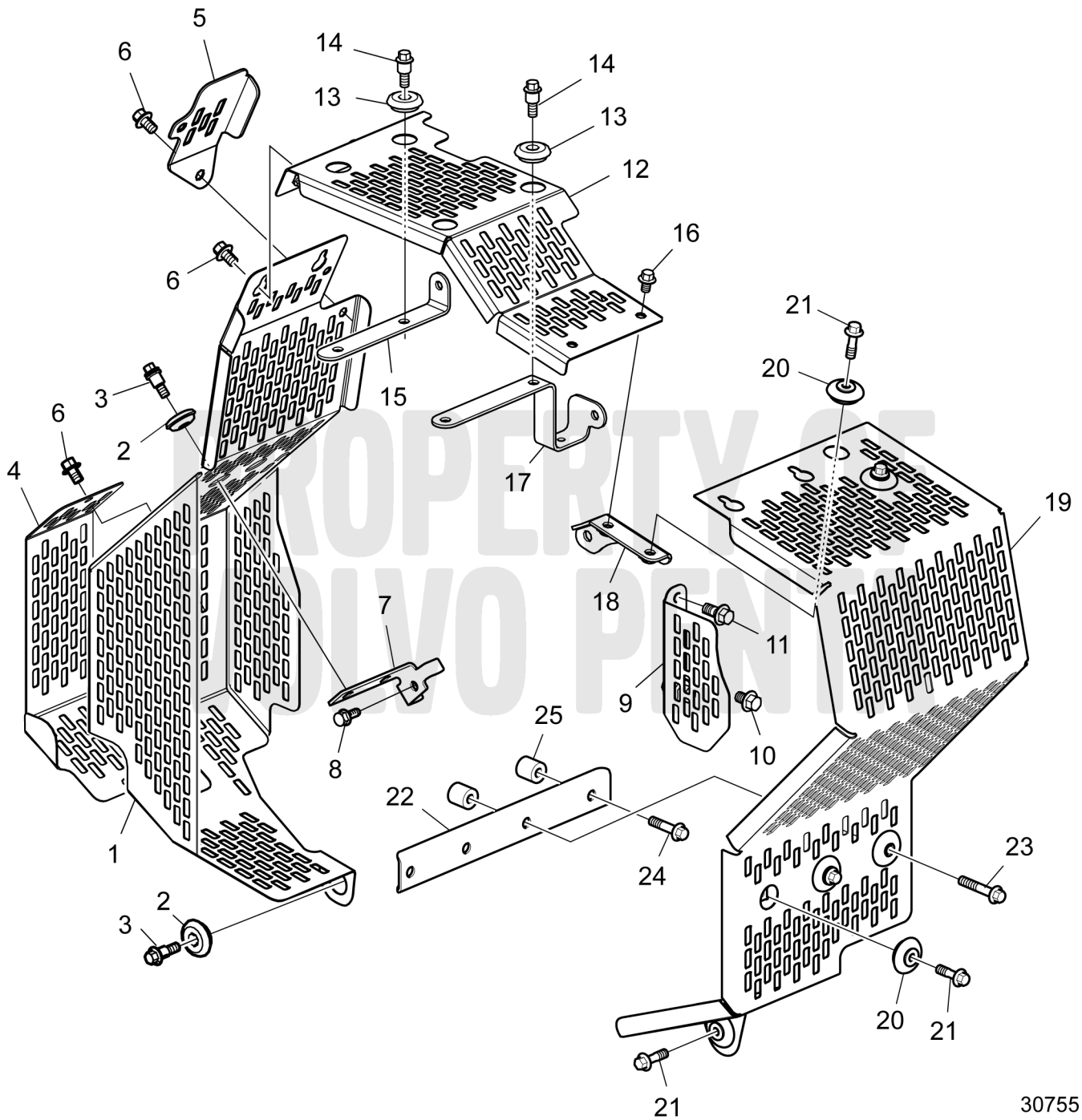
Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23469405	1	Coolant Pipe
2	996104	1	Plug
3	21280355	1	Quick Coupling Kit
4	995463	2	Flange Screw
5	11996	4	Gasket
6	963948	2	Nipple
7	969033	1	Rubber Hose
8	994559	2	Hose Clamp
9	984732	1	Flange Screw
10	20844430	1	Lock Brace
11	22829974	1	Hose
12	1547252	1	Sealing Ring
13	23879104	1	Cover
14	984734	4	Flange Screw
15	980464	1	Cable Tie
16	23177941	1	Water Pipe
17	991046	1	Hollow Screw
18	78494670	1	Hose
19	976971	2	O-Ring
20	956984	2	Fitting Nut
21	984737	7	Flange Screw
22	190635	1	Clamp
23	23306100	2	Connector
24	78494672	1	Hose
25	956984	2	Fitting Nut
26	976971	2	O-Ring
27	23306101	1	Electric Socket
28	23959368	1	Bracket
29	984733	3	Flange Screw
30	984737	2	Flange Screw

31	23706466	1	Hose
32	11996	2	Gasket
33	991046	1	Hollow Screw
34	966871	1	Shut-Off Cock
35	23653465	1	Hose
36	993588	1	Banjo Nipple
37	956984	1	Fitting Nut
38	976971	1	O-Ring
39	23645840	1	Nipple
40	11998	1	Gasket
41	16221	1	Hollow Screw
42	826652	1	Spacer Sleeve
43	949746	2	Clamp
44	20852765	2	Sealing Ring

Belt Guard Without AC

Reference no. 54167285



30755

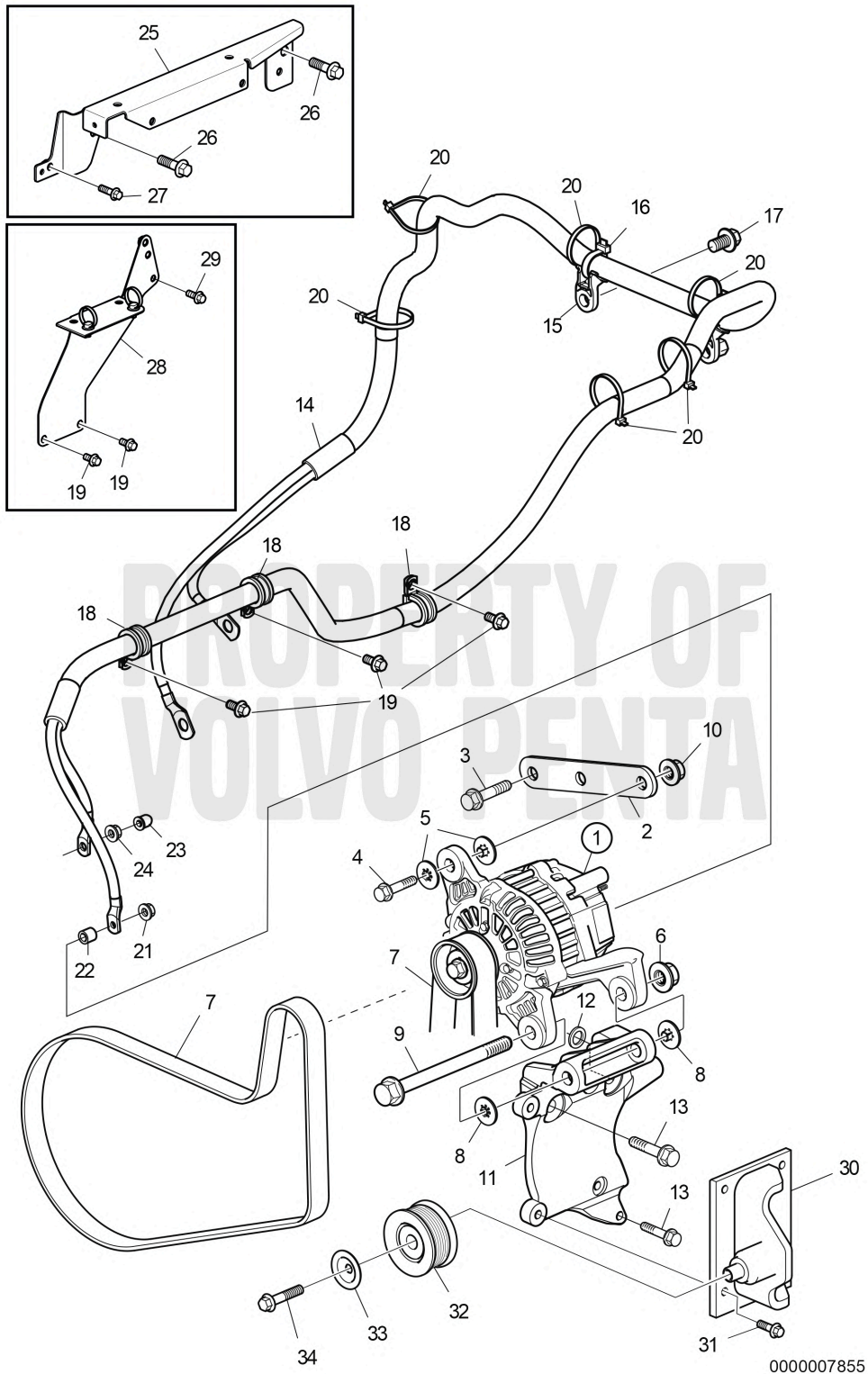


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23057319	1	Protecting Screen
2	3883499	3	Rubber Bushing
3	21972025	3	Shoulder Screw
4	21504794	1	Cover
5	21973203	1	Protecting Screen
6	984732	4	Flange Screw
7	3828856	1	Bracket
8	984733	1	Flange Screw
9	3818878	1	Protecting Screen
10	984813	1	Flange Screw
11	984751	1	Flange Screw
12	22591397	1	Protecting Screen
13	3883499	4	Rubber Bushing
14	21972025	4	Shoulder Screw
15	3883529	1	Bracket
16	984732	4	Flange Screw
17	3839523	1	Bracket
18	23062349	1	Bracket
19	23054454	1	Protecting Screen
20	3883499	6	Rubber Bushing
21	21972025	5	Shoulder Screw
22	3819955	1	Bracket
23	994385	1	Flange Screw
24	984737	1	Flange Screw
25	826652	2	Spacer Sleeve

Alternator, 28V 110A and 150A

Reference no. 54166898



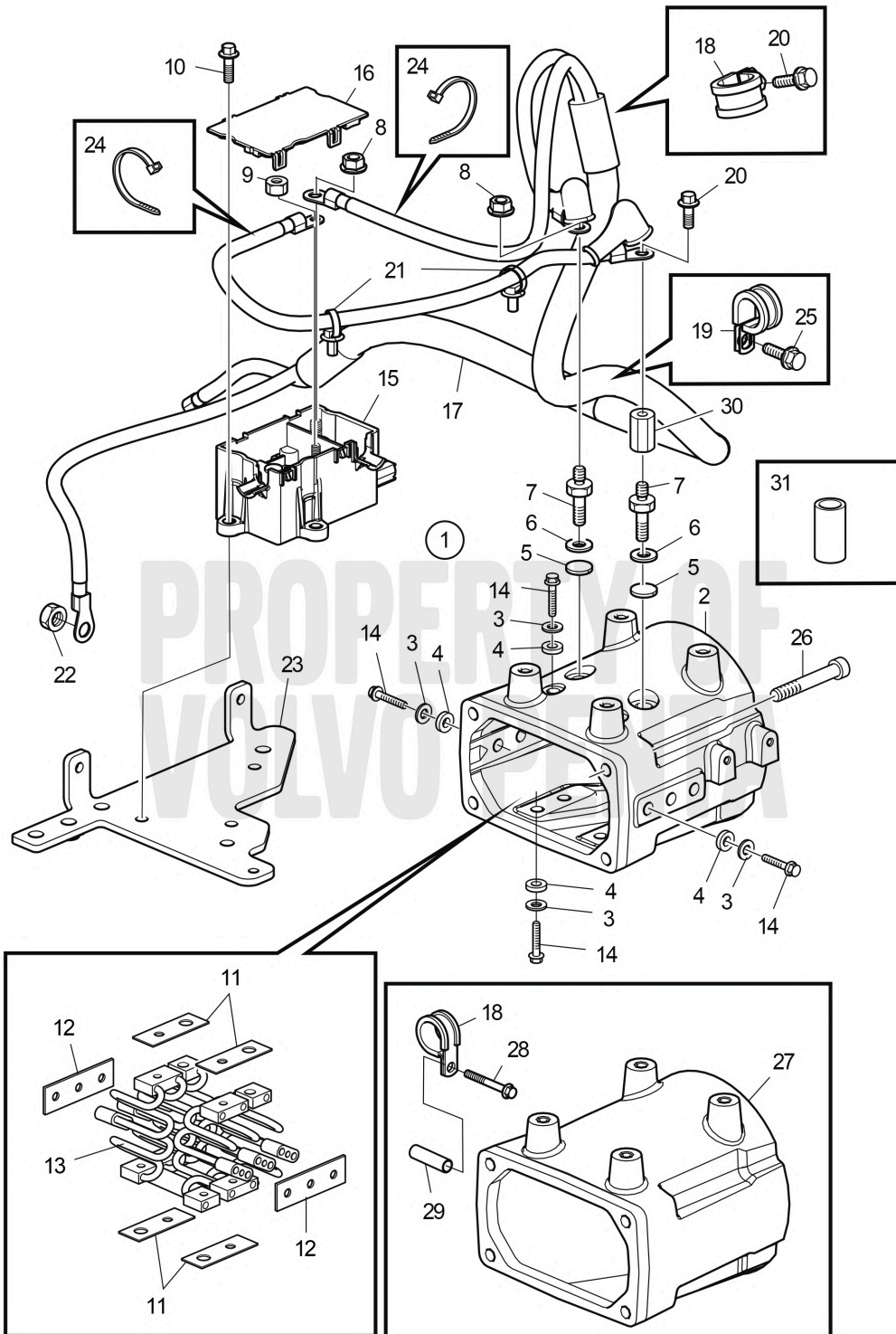
Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	21429786	1	Alternator
1	22591478	1	Alternator
2	3829091	1	Bracket
3	984738	1	Flange Screw
4	984753	1	Flange Screw
5	21308514	2	Insulating Bushing
6	990950	1	Flange Lock Nut
7	20464710	1	V-Ribbed Belt
8	21328137	2	Insulating Bushing
9	984826	1	Flange Screw
10	990960	1	Flange Lock Nut
11	3885364	1	Bracket
12	8192190	1	Sealing Ring
13	969445	4	Flange Screw
14	23752272	1	Power Cable Braided
15	22327851	2	Retainer
16	980464	2	Cable Tie
17	984813	2	Flange Screw
18	990487	5	Clamp
19	984733	5	Flange Screw
20	948211	1	Cable Tie
21	983714	2	Hexagon Nut
22	1357345	1	Spacer Sleeve
23	20576874	1	Cap Plug
24	983715	1	Hexagon Nut
25	21927928	1	Bracket
26	984816	2	Flange Screw
27	984737	1	Flange Screw
28	78570976	1	Bracket
29	984734	1	Flange Screw

30	23931957	1	Bracket
31	984735	4	Flange Screw
32	20357382	1	Idler Pulley
33	8097084	1	Cover
34	984756	1	Flange Screw

Starter Element SN2016154546-

Reference no. 0000004402



0000600935



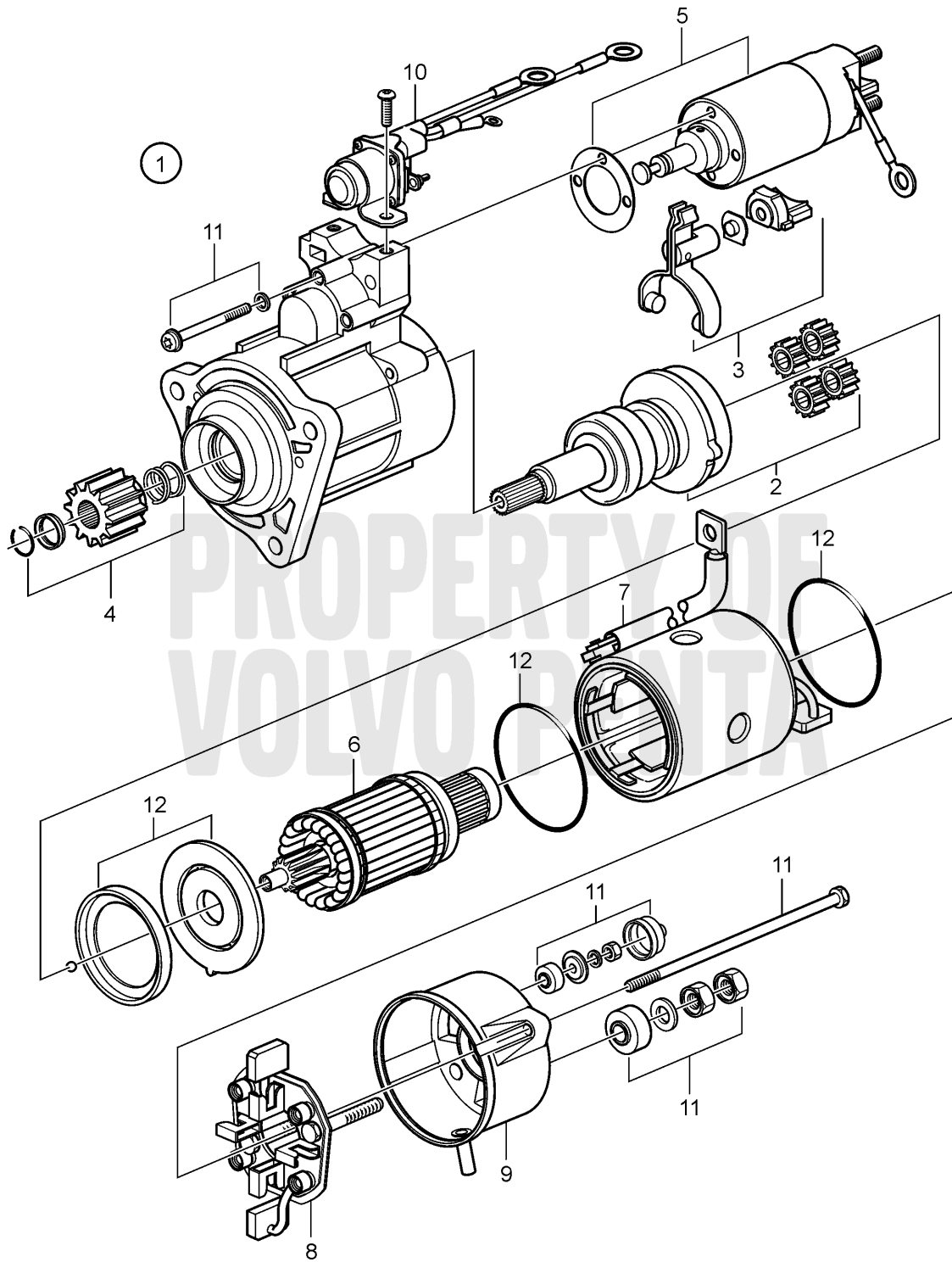
Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	3886863	1	Starter Element
2	3884475	1	Adapter
3	994867	12	Washer
4	468468	12	Sleeve
5	21980343	2	Guide Sleeve
6	994860	2	Washer
7	20707039	2	Terminal Screw
8	983715	2	Hexagon Nut
9	983714	1	Hexagon Nut
10	984734	3	Flange Screw
11	477268	4	Insulating Plate
12	477113	2	Insulating Plate
13	477276	1	Heater
14	994782	12	Six Point Socket Screw
15	24122689	1	Relay
16	21930585	1	Cover
16	24122691	1	Cover
17	23753485	1	Power Cable
18	1545432	2	Attaching Clamp
19	981665	1	Clamp
20	984733	2	Flange Screw
21	980881	2	Cable Tie
22	983716	2	Hexagon Nut
23	78637483	1	Bracket
24	948211	4	Cable Tie
25	994383	1	Flange Screw
26	963702	4	Hex. Socket Screw
27	23116796	1	Adapter
28	984742	1	Flange Screw
29	822791	1	Spacer Sleeve

30	855314	1	Spacer
31	943369	1	Rubber Hose

Starter Motor, Components

Reference no. 54166143



20128

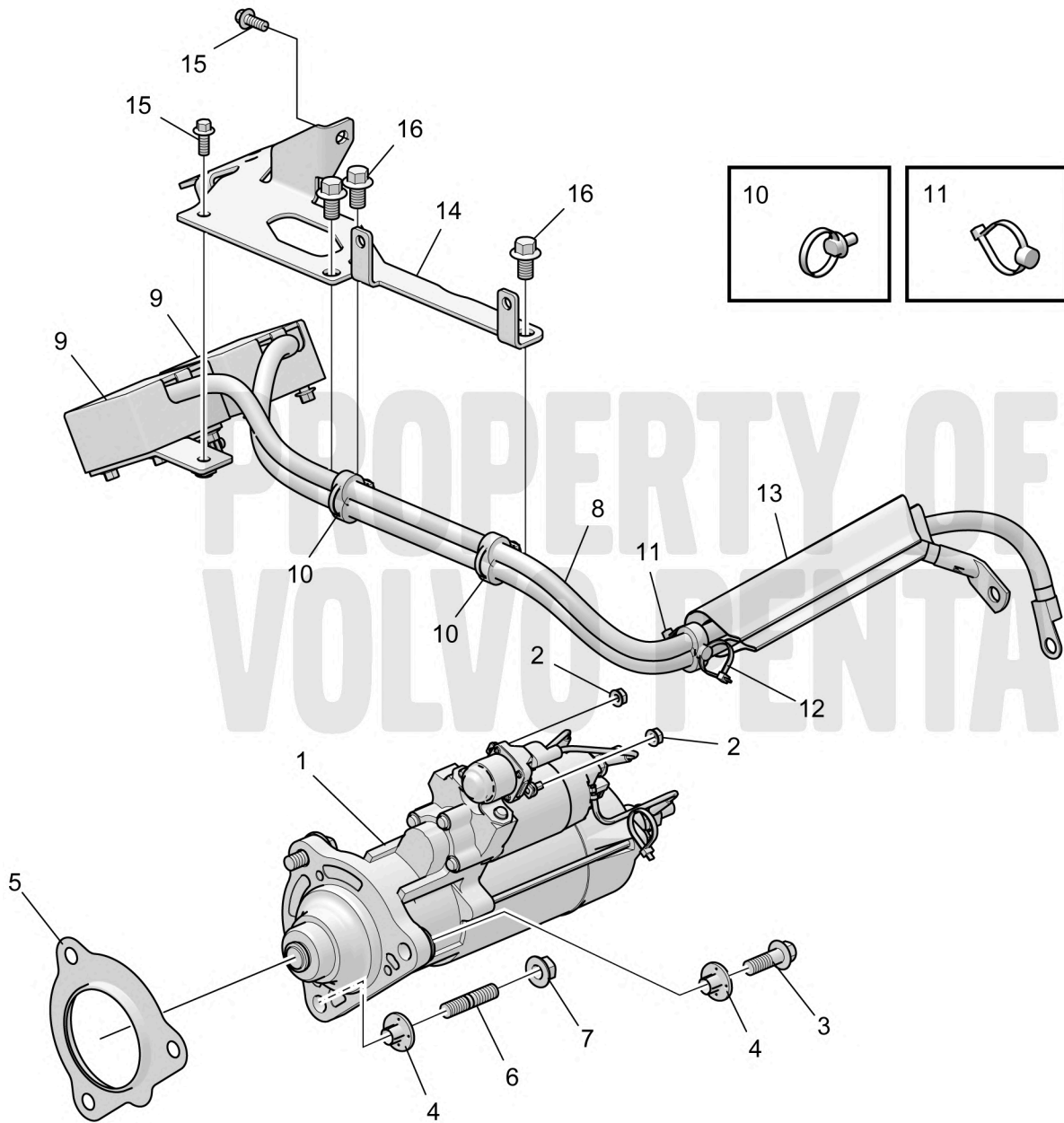


Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23288365	1	Starter Motor
2	874744	1	Shaft
3	874737	1	Arm
4	874738	1	Starter Pinion
5	874745	1	Solenoid
6	874739	1	Rotor
7	874740	1	Stator
8	874741	1	Carbon Brush Retainer
9	874742	1	Bearing Shield
10	874743	1	Starter Relay
11	874747	1	Screw Kit
12	874746	1	Gasket Kit

Starter Motor

Reference no. 54166142



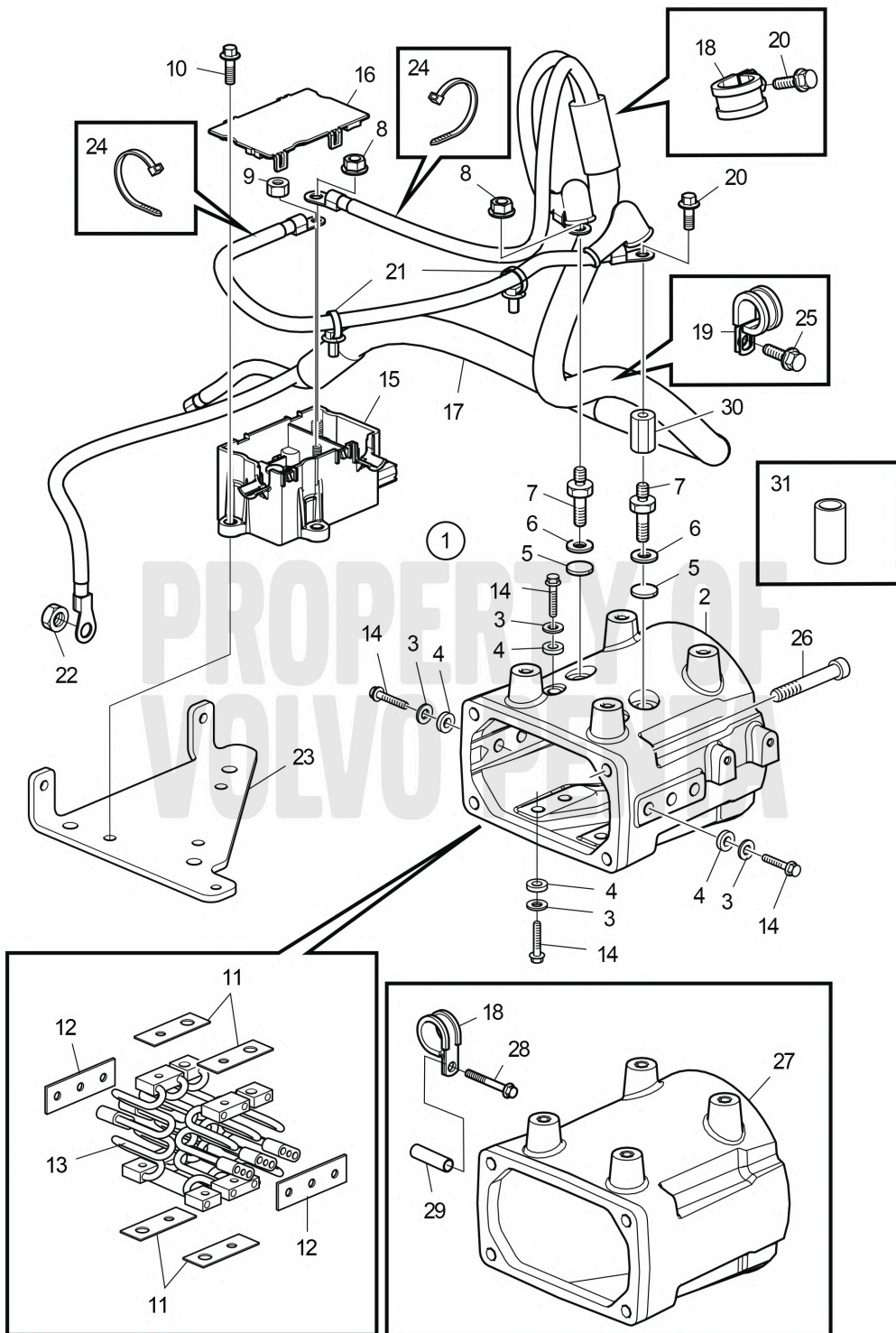
30605

i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	23288365	1	Starter Motor
2	983717	2	Hexagon Nut
3	990809	2	Flange Screw
4	21308514	3	Insulating Bushing
5	3888763	1	Gasket
6	953098	1	Stud
7	990942	1	Flange Nut
8	23753298	1	Power Cable
9	3885093	2	Junction Box
10	980881	2	Cable Tie
11	996791	1	Cable Tie
12	948211	1	Cable Tie
13	20711293	1	Tube
14	78573095	1	Bracket
15	984734	2	Flange Screw
16	984813	3	Flange Screw

Starter Element SN-2016154545

Reference no. 54166122



000007708

i Exploded view is NOT an assembly instruction and all work must be done with correct equipment, manuals and training/certification

#	Part number	Qty	Description
1	3886863	1	Starter Element
2	3884475	1	Adapter
3	994867	12	Washer
4	468468	12	Sleeve
5	21980343	2	Guide Sleeve
6	994860	2	Washer
7	20707039	2	Terminal Screw
8	983715	2	Hexagon Nut
9	983714	1	Hexagon Nut
10	984734	3	Flange Screw
11	477268	4	Insulating Plate
12	477113	2	Insulating Plate
13	477276	1	Heater
14	994782	12	Six Point Socket Screw
15	23314469	1	Relay
16	21930585	1	Cover
17	23753485	1	Power Cable
18	1545432	2	Attaching Clamp
19	981665	1	Clamp
20	984733	2	Flange Screw
21	980881	2	Cable Tie
22	983716	2	Hexagon Nut
23	23621120	1	Bracket
24	948211	4	Cable Tie
25	994383	1	Flange Screw
26	963702	4	Hex. Socket Screw
27	23116796	1	Adapter
28	984742	1	Flange Screw
29	822791	1	Spacer Sleeve
30	855314	1	Spacer

