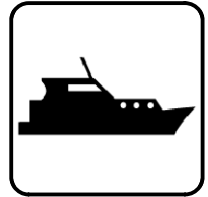


# Service Parts

## Marine Generator Sets



Models:

**4CCFOZ**  
**4/6.5EFOZ**  
**5CCOZ**  
**5/8EOZ**

**KOHLER**<sup>®</sup>  
POWER SYSTEMS

**9001**  
**KOHLER**  
POWER SYSTEMS  
NATIONALLY REGISTERED

Specification Series 126

TP-5616 9/05c

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# Introduction

This manual lists service replacement parts for Kohler 4CCFOZ, 5CCOZ, 4/6.5EFOZ, and 5/8EOZ marine generator sets.

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This manual includes the following main sections:

**Table of Contents.** Lists the sections of the manual.

**Introduction (and other information sections).** Contains introductory material about part numbers, illustrations, and hardware.

**Specification Number Index.** Lists the generator set specs and groups.

**Group Parts Lists.** List the part numbers of parts in the groups.

**Kit Sections.** List modules and accessories and their parts.

**Appendices.** Include Abbreviations, Common Hardware Application Guidelines, General Torque Specifications, Common Hardware Identification, and Common Hardware List.

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## Numbering System Significance

This manual uses the following numbering systems:

**Specification Number.** The product identification number located on the generator set nameplate. Specification numbers break down into groups.

**Group Number.** A unique number representing a parts group needed to assemble a generator set function. For example, Group 101 is the Air Intake group.

**Variation or Module Number.** A group might have several variations. Each variation performs the same function with different parts lists. For example, a 50 Hz generator alternator and a 60 Hz generator alternator both perform the same function; however, with different parts. Each difference requires a group variation or module number.

**Part Number.** The part number identifies an individual assembly, subassembly, component, or accessory kit.

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## Illustrations

Illustrations (or exploded-view drawings) best representing the widest range of variations accompany most groups in this manual. Illustrations do not depict all details and may not show all parts. Do not use illustrations for assembly or disassembly instructions.

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## How to Find Part Numbers

Use the following steps to locate a service replacement part.

1. Locate the generator set nameplate to **identify the generator set spec number**.
2. Locate a second generator set nameplate listing accessories to **identify installed modules**. On some models the accessory nameplate is mounted inside the generator junction box.
3. **Turn to the Specification Number Index**. The first column lists the generator set spec numbers. The headings identify the groups of parts that make up the generator set.
4. **Identify the group** most likely to include the service part number.
5. **Find the group variation number** at the intersection of the spec number row and the group column. Note the variation number.
6. **Page forward to locate the group** identified in step 4 or find the appropriate page in the Table of Contents.
7. **Find the part on the illustration** and note the item number of the part or **find the part description in the parts list**.
8. Select the **part number that corresponds to your group variation**. The first column lists the illustration item number. Find the variation identified in the Specification Number Index or the module number found on the generator set nameplate in the appropriate column on the right side of the parts list table. Find the quantity used at the intersection of the item number row and the variation column. A blank space at the intersection means the variation/module does not use that part number.

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## Hardware References

Many common hardware items do not appear in parts manuals or will appear as common hardware entries. A common hardware entry lists the size of the hardware. For example, an item that appears as "Hardware, 3/8-16" in the text means that the piece is 3/8-16 size. Obtain common hardware locally or, if contacting the factory, use the Common Hardware List in the appendix to identify the common hardware part number and specifications. See Common Hardware Application Guidelines in the appendix for mating hardware instructions.

Some hardware items require a specific size or some other characteristic. In that case, use the part number listed in the text.

**When replacing hardware, do not substitute inferior grade hardware.** Replacement hardware grade should be equal to or better than the grade of the manufacturer's original hardware. Use the Common Hardware List in the appendix to identify the common hardware hardness.

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# Specification Number Index

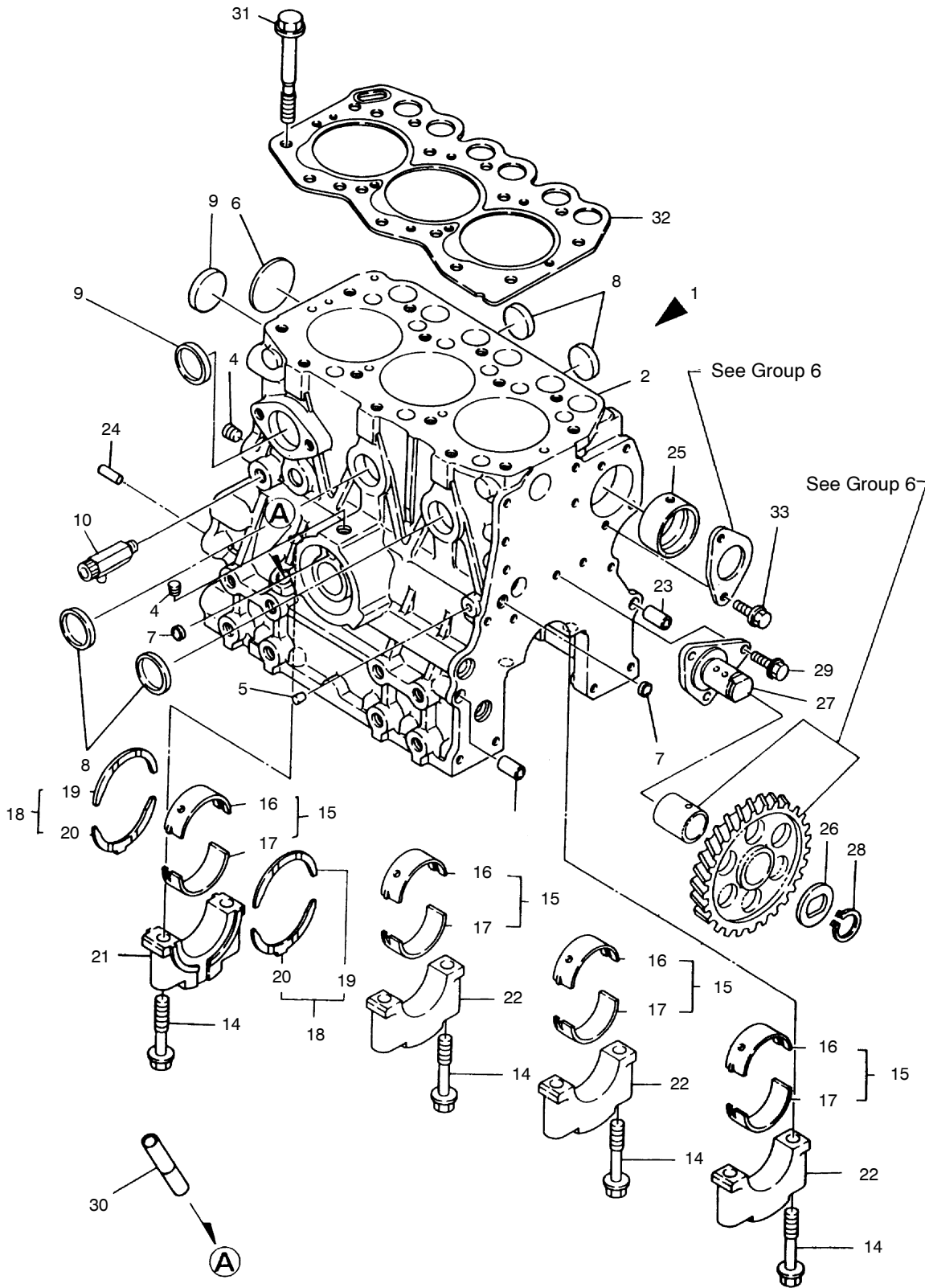
Group Title	<div style="display: flex; justify-content: space-around;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Cylinder Block</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Gear Housing</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Flywheel Housing &amp; Oil Sump</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Cylinder Head &amp; Bonnet</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Intake Manifold</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Camshaft &amp; Drive Gear</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Crankshaft &amp; Piston</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Lub. Oil System</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Cooling Water System</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Fuel Injection Pump</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Fuel Line</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Governor</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Starting Motor</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Gasket Set</div> </div>														
Group No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Spec No.	Variation Number														
126116	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
126122	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
126134	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
126139	2	2	1	2	1	1	2	2	2	2	2	2	2	1	2
126141	2	2	1	2	1	1	2	2	2	2	2	2	2	1	2
126143	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
126145	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
126166	2	2	1	2	1	1	2	2	2	2	2	2	2	1	2
126167	2	2	1	2	1	1	2	2	2	2	2	2	2	1	2
126176	3	3	3	3	3	3	3	3	3	3	3	3	3	1	3
GM28311-GA1	3	3	3	3	3	3	3	3	3	3	3	3	3	1	3

# Specification Number Index

Group Title	<i>Air Intake</i>	<i>Fuel System</i>	<i>Cooling System</i>	<i>Engine</i>	<i>Nameplates and Decals</i>	<i>Skid and Plant Mounting</i>	<i>Generator and Mounting</i>	<i>Controller and Mounting</i>	<i>Housing</i>	<i>Literature</i>
Group No.	101	103	104	105	107	109	201	301	501	701
Spec. No.	Variation Number									
126116	1	5	8	18	7	11	18	22	—	11
126122	1	5	10	23	7	11	18	22	—	11
126134	1	5	10	23	7	11	18	27	2	11
126139	1	5	11	25	11	11	18	33	—	12
126141	1	5	12	28	11	11	18	32	6	12
126143	1	5	8	18	7	11	18	22	—	11
126145	1	5	10	23	7	11	18	27	2	11
126166	1	5	11	25	11	11	26	33	—	18
126167	1	5	12	28	11	11	26	32	6	18
126176	4	10	18	35	14	12	32	44	—	15
GM28311-GA1	4	10	18	GR1	14	12	32	44	—	15

# Group 1: Cylinder Block

Items not shown 3, 11, 12, 31



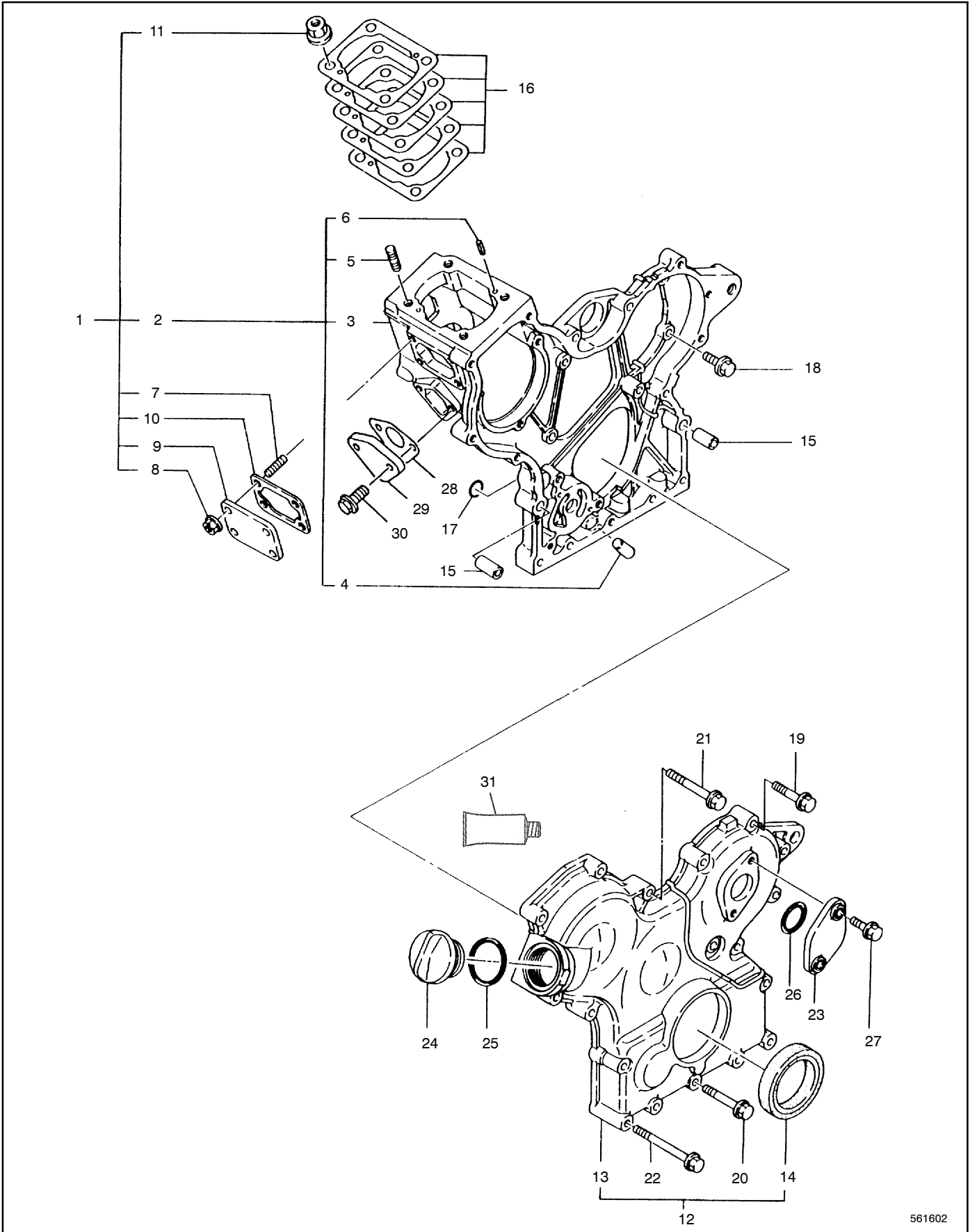
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# Group 1: Cylinder Block

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	229784	Block assembly, cylinder (includes items 2-30)	1		
1	225435	Block assembly, cylinder (includes items 2-30)		1	
1	363225	Block assembly, cylinder (includes items 2-30)			1
2	X	Block subassembly (includes items 3-9)	1	1	1
3	X	Block, cylinder (not shown)	1	1	1
4	225078	Plug, PT1/8	2	2	
4	363018	Plug, PT1/4			1
5	229778	Plug, 6 x 10	1	1	
5	256515	Plug, PT1/8, screw			1
6	229779	Plug, 40	1	1	
6	363214	Plug, 45			1
7	229511	Plug, 10	1	1	
7	252728	Plug, 12			1
8	229780	Plug, 25	1	1	
9	225824	Plug, 30	6	6	
9	252731	Plug, 30			6
10	252394	Drain cock (includes items 11-13)	1		
10	225704	Drain cock (includes items 11-13)		1	1
11	X	Body (not shown)	1	1	1
12	X	Valve (not shown)	1	1	1
13	X	O-ring (not shown)	1	1	
14	229574	Bolt	8	8	
14	225703	Bolt			8
15	229576	Main bearing (includes items 16 and 17)	4	4	
15	229785	Bearing, main, undersize, 0.25	4	4	
15	363218	Bearing, main (includes items 16 and 17)			4
15	363219	Bearing, main, undersize, 0.25			4
16	X	Bearing, main, upper	4	4	4
17	X	Bearing, main, lower	4	4	4
18	229577	Bearing, thrust (includes items 19 and 20)	2	2	
18	363220	Bearing, thrust (includes items 19 and 20)			2
19	X	Bearing, thrust, upper	2	2	2
20	X	Bearing, thrust, lower	2	2	2
21	X	Cap, bearing	1	1	1
22	X	Cap, bearing	3	3	3
23	229674	Pipe, knock	4	4	
24	256750	Parallel pin	2	2	
25	229575	Bushing, camshaft	1	1	
25	363060	Bushing, camshaft			1
26	229675	Retainer, idle gear	1	1	
27	229676	Shaft, idle gear	1	1	
28	229742	Circlip	1	1	
29	225817	Bolt, M6 x 12 plated	2	2	
30	252759	Guide, dipstick	1	1	
31	229568	Bolt, cylinder head	14	14	
31	363025	Bolt, cylinder head			14
32	229567	Gasket, cylinder head	1		
32	225361	Gasket, cylinder head		1	
32	363052	Gasket, cylinder head			1
33	225816	Bolt, M6 x 12 plated	2	2	2

X Item not sold separately

# Group 2: Gear Housing



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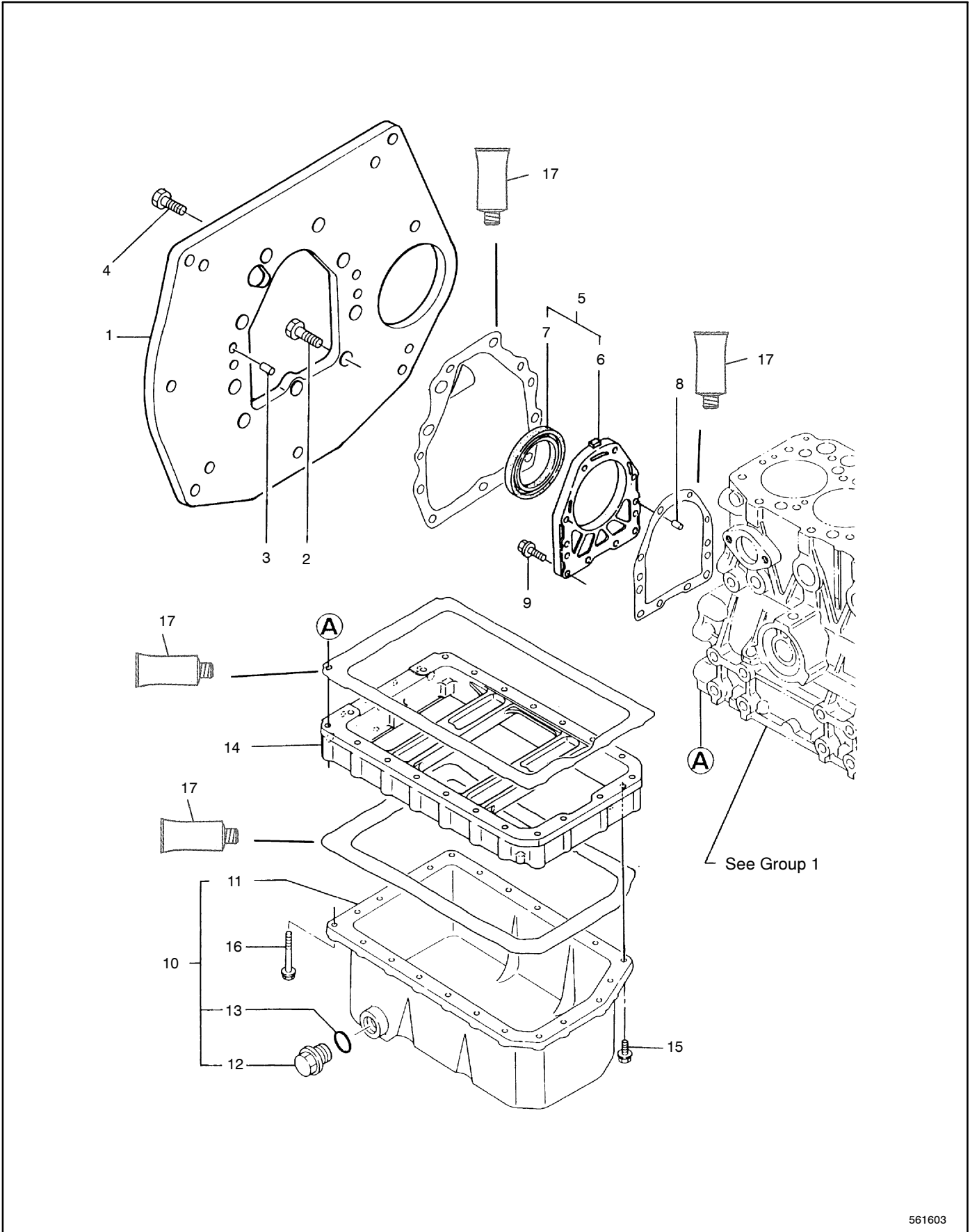


## Group 2: Gear Housing

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	229797	Housing assembly, gear (includes items 2-11)	1	1	
2	229569	Housing, gear (includes items 3-6)	1	1	
2	363023	Housing, gear (includes items 3-6)			1
3	X	Housing	1	1	1
4	229570	Plug	1	1	
4	363066	Plug, 10 x 14			1
5	252409	Stud, M8 x 22	4	4	4
6	252668	Spring pin	2	2	2
7	229670	Stud, M6 x 12	4	4	4
8	250989	Nut, M6	4	4	4
9	229668	Cover	1	1	1
10	229669	Gasket	1	1	1
11	225802	Nut w/washer	4	4	4
12	229572	Cover assembly (includes items 13 and 14)	1	1	
12	363024	Cover assembly (includes items 13 and 14)			1
13	229572	Cover, gear housing	1	1	
13	X	Cover, gear housing			1
14	229634	Seal, oil	1	1	1
15	229674	Pipe, knock	2		2
15	225383	Pipe, knock		2	
16	229635	Shim set	1	1	
16	363053	Shim set			1
17	250801	O-ring	2	2	2
18	252693	Bolt, M6 x 16 plated	5	5	
18	252693	Bolt, M6 x 16 plated			7
19	229763	Bolt, M6 x 30 plated	5	5	
19	229763	Bolt, M6 x 30 plated			8
20	225921	Bolt, M6 x 40 plated	3	3	
20	363207	Bolt, M6 x 60 plated			3
21	229765	Bolt, M6 x 50 plated	4	4	
21	363207	Bolt, M6 x 60 plated			1
22	256799	Bolt, M6 x 65 plated	6	6	
22	363208	Bolt, M6 x 80 plated			6
23	252750	Cover, blind	1	1	1
24	250837	Cap, lub. oil supply	1	1	1
25	252684	O-ring	1	1	1
26	256796	O-ring	1	1	1
27	229760	Bolt, M6 x 18 plated	2	2	2
28	252061	Gasket	1	1	1
29	229711	Cover, blind	1	1	1
30	252693	Bolt, M6 x 16 plated	2	2	2
31	252998	Gasket, liquid		1	1

X Item not sold separately

# Group 3: Flywheel Housing and Oil Sump



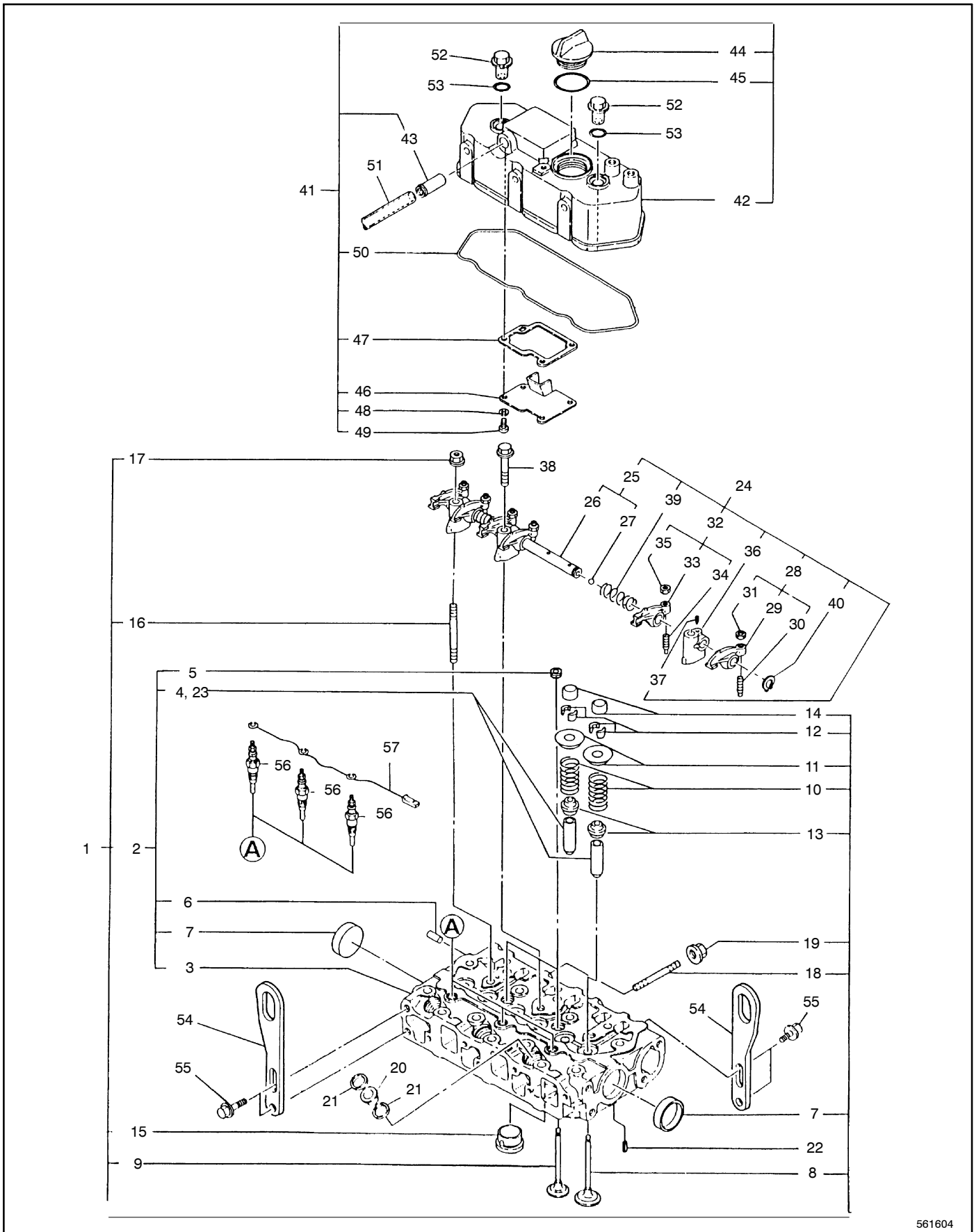
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## Group 3: Flywheel Housing and Oil Sump

Item	Part Number	Description	Quantity	
			Variation Number	
			1	3
1	229288	Back plate	1	1
2	229505	Bolt, M10 x 20	6	6
3	256750	Parallel pin, 8 x 16	2	2
4	252714	Bolt, M10 x 25	3	3
5	229671	Case assembly, oil seal (includes items 6 and 7)	1	1
6	229672	Case, oil seal	1	1
7	250836	Seal, oil	1	1
8	256750	Parallel pin	2	
8	363026	Parallel pin		2
9	229761	Bolt, M6 x 22 plated	10	10
10	229573	Sump assembly, lub. oil (includes items 11-13)	1	
10	363227	Sump assembly, lub. oil (includes items 11-13)		1
11	X	Refer to item 10	11	11
12	229710	Plug, M16	1	
12	225386	Drain plug, M22		1
13	229756	O-ring	1	
13	X-25-145	Washer seal		1
14	229622	Spacer, oil sump	1	
14	363019	Spacer, oil sump		1
15	229498	Bolt, M6 x 10 plated	3	
15	225816	Bolt, M6 x 12		3
16	229764	Bolt, M6 x 45 plated	20	
17	252998	Gasket liquid	AR	AR

X Item not sold separately

# Group 4: Cylinder Head



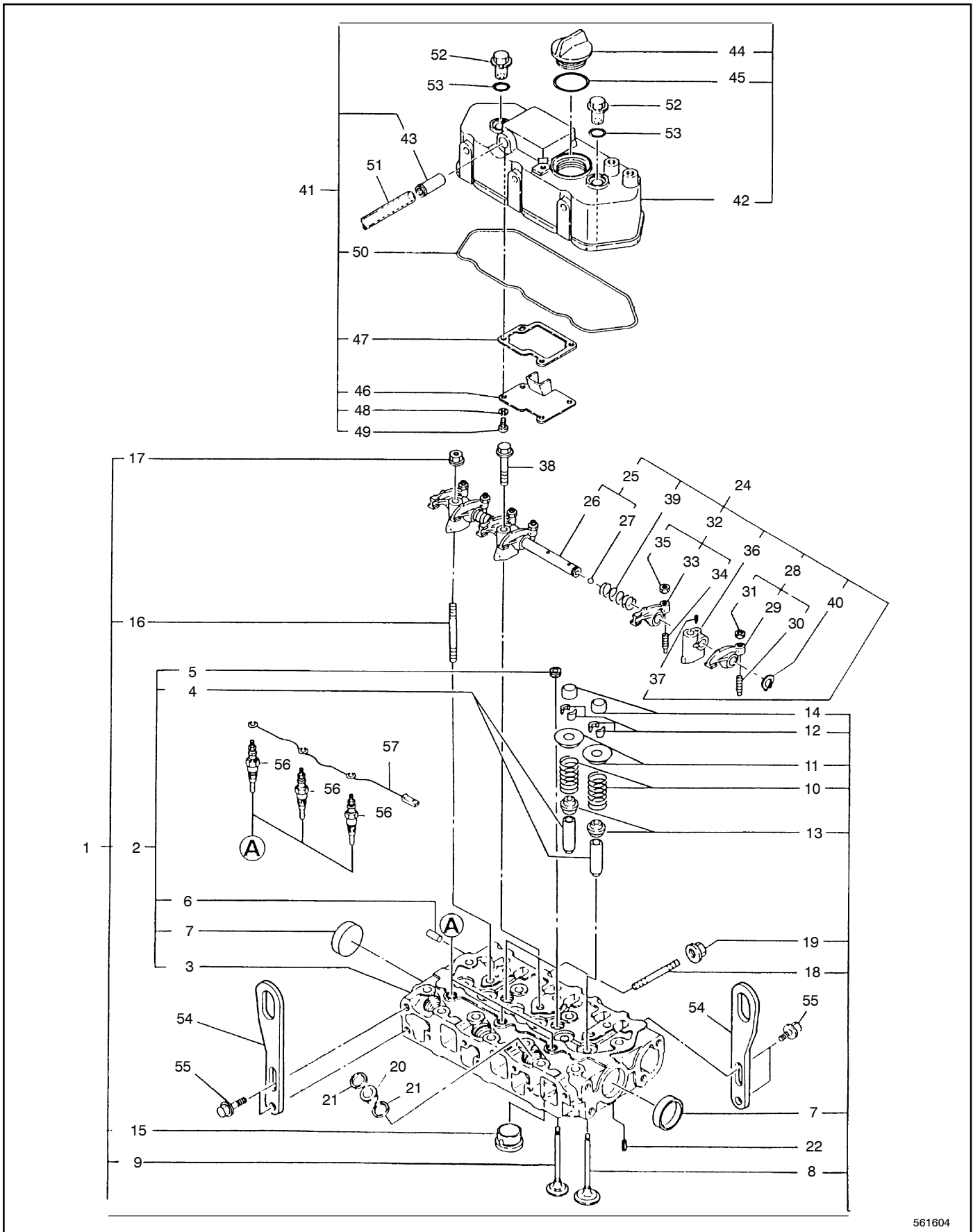
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## Group 4: Cylinder Head

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	229788	Head assembly, cylinder (includes items 2-19)	1		
1	225362	Head assembly, cylinder (includes items 2-19)		1	
1	363226	Head assembly, cylinder (includes items 2-19)			1
2	X	Refer to item 1	1	1	1
3	X	Head, cylinder	1	1	1
4	229126	Guide, valve	6	6	
4	250856	Guide, valve			6
5	250974	Plug, Pt 1/4 screw	2	2	
5	252677	Plug, Pt 1/4 screw			2
6	229777	Plug, 5 x 8	1	1	1
7	229781	Plug, 35	2	2	
7	252732	Plug, 40			2
8	229580	Valve, intake	3	3	
8	363054	Valve, intake			3
9	229581	Valve, exhaust	3	3	
9	363029	Valve, exhaust			3
10	229558	Spring, valve	6	6	
10	363030	Spring, valve			6
11	229559	Retainer, spring	6	6	
11	363031	Retainer, spring			6
12	229557	Cotter	12	12	
12	225700	Cotter			6
13	229589	Seal, valve stem	6	6	
13	225766	Seal, valve stem, intake			3
13	250844	Seal, valve stem, exhaust			3
14	229590	Cap, valve	6	6	
14	250999	Cap, valve			6
15	X	Plug, hot	3	3	3
16	229637	Stud	2	2	2
17	252723	Nut, M8	2	2	2
18	229771	Stud, M6 x 40 plated	2	2	
19	229507	Nut, M6	2	2	
20	229623	Protector, nozzle	3	3	3
21	229624	Gasket, nozzle	6	6	6
22	250963	Spring pin	2	2	2
23	X	See item 4	1	1	
24	229584	Support, assembly, rocker (includes items 25-40)	1		
24	225375	Support, assembly, rocker (includes items 25-40)		1	
24	363074	Support, assembly, rocker (includes items 25-40)			1
25	229583	Shaft, rocker arm (includes items 26 and 27)	1	1	
25	363032	Shaft, rocker arm (includes items 26 and 27)			1
26	X	Shaft, arm	1	1	1
27	X	Ball	2	2	2
28	229786	Arm assembly, rocker (includes items 29-31)	6		
28	225437	Arm assembly, rocker (includes items 29-31)		6	
28	363229	Arm assembly, rocker (includes items 29-31)			3
29	X	Arm, intake valve	3	3	3
30	229554	Screw, valve	6	6	6
31	225825	Lock nut, M6 plated	6	6	6
32	229787	Arm assembly, rocker (includes items 33-35)	6		
32	225438	Arm assembly, rocker (includes items 33-35)		6	
32	363022	Arm assembly, rocker (includes items 33-35)			3
33	X	Arm, intake valve	3	3	3
34	229554	Screw, valve	6	6	6
35	225825	Lock nut, M6 plated	6	6	6
36	229584	Support, rocker arm	3	3	
36	363033	Support, rocker arm			3
37	229585	Screw	1	1	
37	363213	Screw, M5 x 16			1
38	252703	Bolt, M8 x 45 plated	1	1	1

X Item not sold separately

# Group 4: Cylinder Head, continued



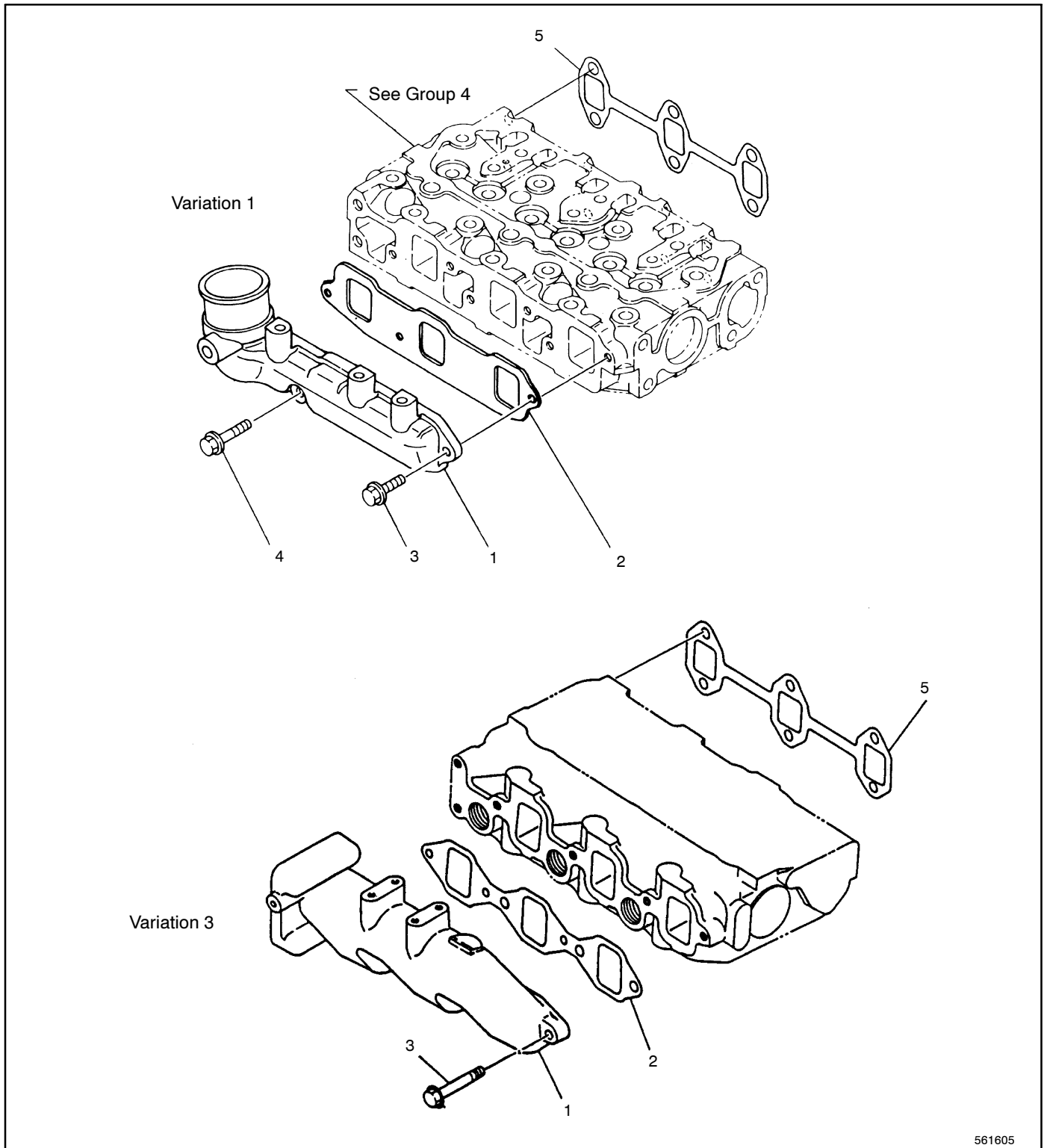
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## Group 4: Cylinder Head, continued

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
39	229586	Spring	2	2	
39	363034	Spring			2
40	252344	Circlip	2	2	
40	252345	Circlip			2
41	225715	Bonnet assembly (includes items 42-50)	1		
41	225434	Bonnet assembly (includes items 42-50)		1	
41	363065	Bonnet assembly (includes items 42-50)			1
42	X	Bonnet	1	1	1
43	225380	Joint	1	1	1
44	250837	Cap, lub. oil supply	1	1	
44	363076	Cap, lub. oil supply			1
45	252684	O-ring	1	1	
46	229578	Plate, shelter	1	1	
46	363027	Plate, shelter			1
47	229579	Gasket	1	1	
47	363028	Gasket			1
48	229741	Spring washer	4	4	
49	229774	Screw, M5 x 10	4	4	
49	363201	Screw 5 x 10, tapping			4
50	229587	Gasket, bonnet	1	1	
50	363035	Gasket, bonnet			1
51	229750	Pipe, vinyl	1	1	
51	X-6242-4	Hose			1
51	X-426-10	Clamp, hose (not shown)			2
52	252470	Knob	3	3	3
53	250801	O-ring	3	3	3
54	256532	Lifter, engine	1	1	
54	363015	Lifter, engine			1
55	225818	Bolt, M8 x 14 plated	4	4	4
56	252940	Plug, glow	3	3	3
57	229663	Connector, glow plug	1	1	1

X Item not sold separately

# Group 5: Intake Manifold



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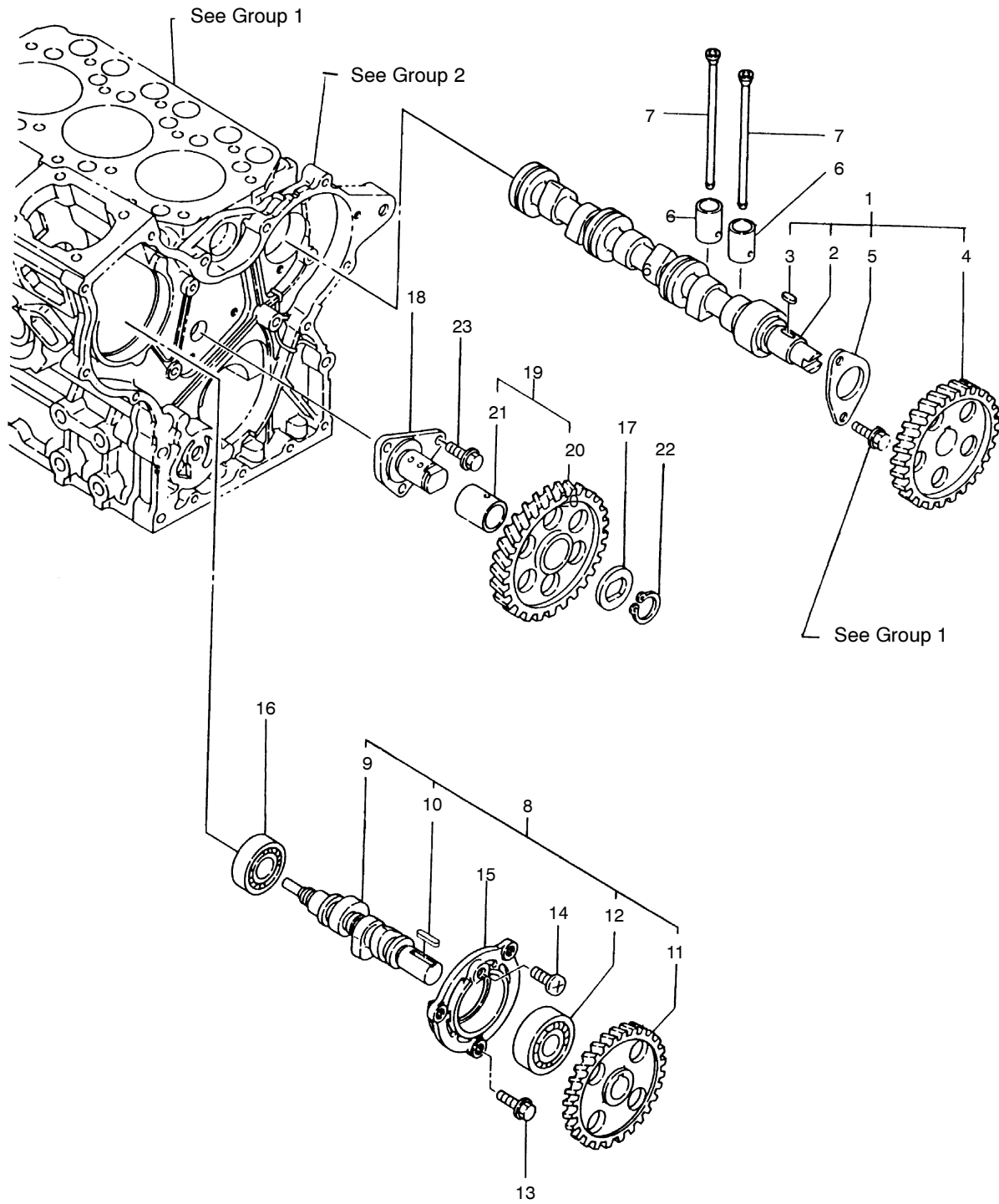


## Group 5: Intake Manifold

Item	Part Number	Description	Quantity	
			Variation Number	
			1	3
1	229614	Manifold, intake	1	
1	GM35924	Manifold, intake		1
2	229615	Gasket, intake manifold	1	
2	363036	Gasket, intake manifold		1
3	252693	Bolt, M6 x 16 plated	2	
3	225817	Bolt, M6 x 20		6
4	229762	Bolt, M6 x 28 plated	1	
5	229592	Gasket, exhaust manifold	1	
5	363037	Gasket, exhaust manifold		1

# Group 6: Camshaft and Drive Gear

Item not shown 20



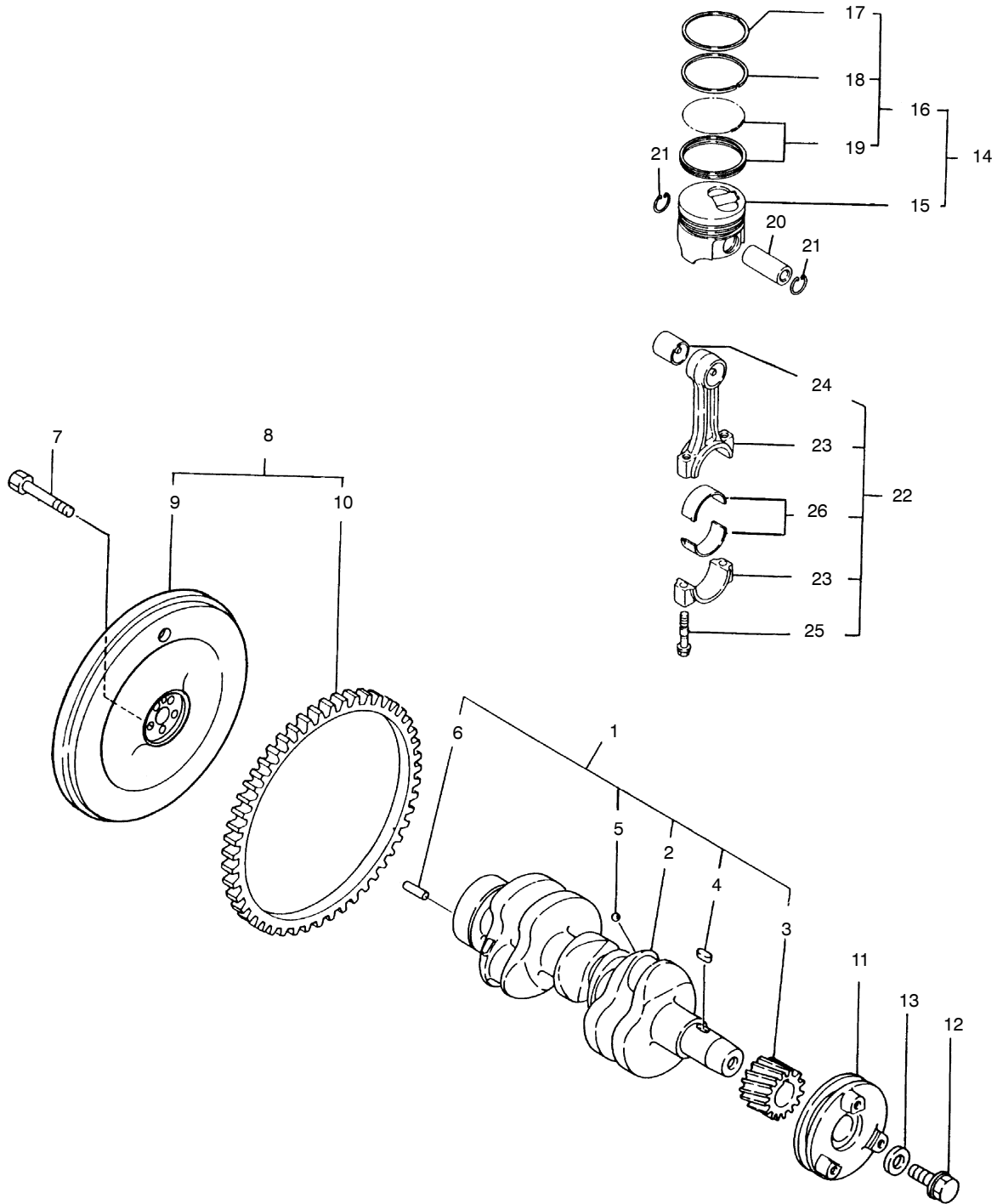
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## Group 6: Camshaft and Drive Gear

Item	Part Number	Description	Quantity	
			Variation Number	
			1	3
1	229595	Camshaft assembly (includes items 2-5)	1	
1	363061	Camshaft assembly (includes items 2-5)		1
2	X	Camshaft	1	1
3	229748	Key	1	1
4	229593	Gear, camshaft	1	
4	363038	Gear, camshaft		1
5	229636	Bearing, thrust	1	1
6	229594	Tappet	6	
6	363039	Tappet		6
7	229591	Rod, push	6	
7	363040	Rod, push		6
8	229560	Camshaft assembly, fuel injection pump (includes items 9-12)	1	
8	363228	Camshaft assembly, fuel injection pump (includes items 9-12)		1
9	X	Camshaft, fuel injection pump	1	1
10	229748	Key	1	1
11	229602	Gear, fuel injection pump	1	
11	X	Gear, fuel injection pump		1
12	229755	Ball bearing	1	1
13	252693	Bolt, M6 x 16 plated	3	3
14	229776	Screw, M8 x 10	1	1
15	229673	Bearing	1	1
16	X	Ball bearing	1	
16	229754	Ball bearing		1
17	229675	Retainer, idle gear	1	1
18	229676	Shaft, idle gear	1	1
19	229601	Gear w/bushing, idle (includes items 20 and 21)	1	
19	363042	Gear w/bushing, idle (includes items 20 and 21)		1
20	X	Gear, idle (not shown)	1	1
21	229640	Bushing, idle gear	1	1
22	229742	Circlip	1	1
23	225816	Bolt, M6 x 12 plated	3	3

X Item not sold separately

# Group 7: Crankshaft and Piston



561607

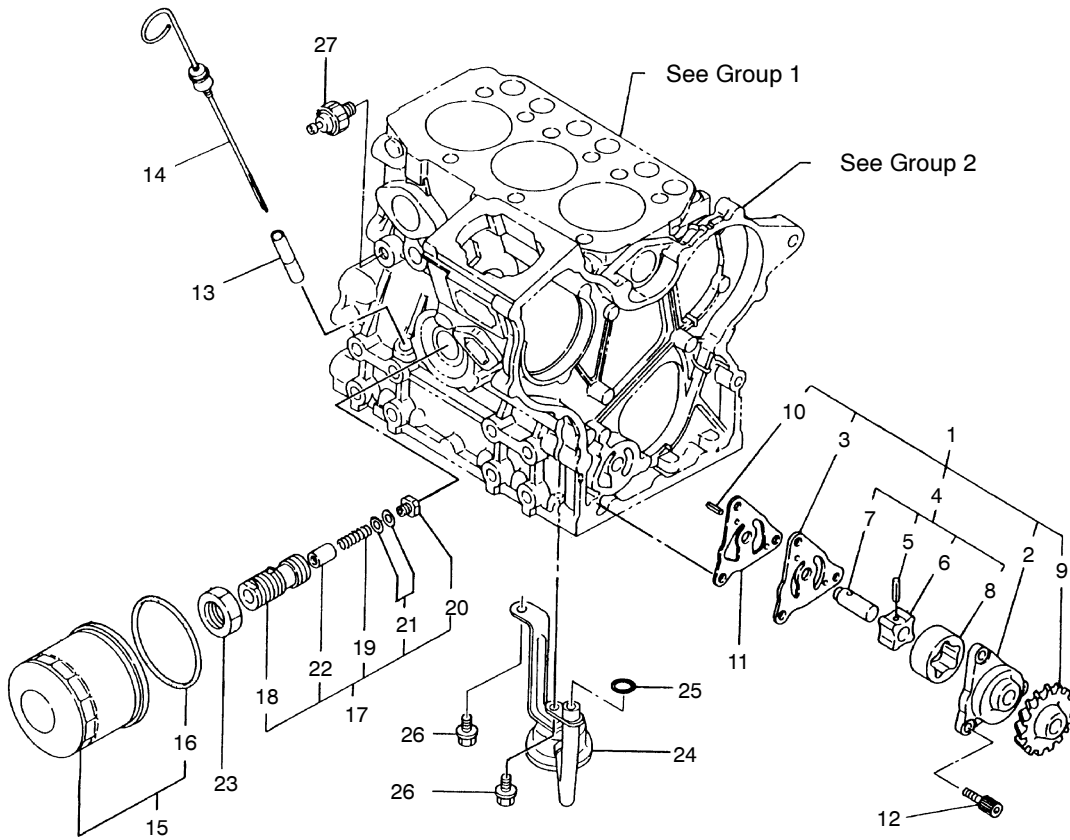
## Group 7: Crankshaft and Piston

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	229789	Crankshaft assembly (includes 2-6)	1		
1	225363	Crankshaft assembly (includes 2-6)		1	
1	363055	Crankshaft assembly (includes 2-6)			1
2	X	Crankshaft	1	1	1
3	229596	Gear, crankshaft	1	1	
3	363062	Gear, crankshaft			1
4	229748	Key	1	1	1
5	X	Ball, steel	3	3	3
6	256750	Parallel pin	1	1	1
7	229638	Bolt, flywheel	5	5	5
8	229620	Flywheel w/ring gear	1	1	1
9	X	Flywheel	1	1	1
10	229705	Gear, drive	1	1	1
11	229597	V-pulley	1	1	
11	363021	V-pulley			1
12	229664	Bolt, M12 x 1.25	1	1	
12	229748	Bolt, M12 x 1.25			1
13	229639	Washer	1	1	1
14	229616	Piston w/rings (includes items 15 and 16)	3		
14	225366	Piston w/rings (includes items 15 and 16)		3	
14	363056	Piston w/rings (includes items 15 and 16)			3
14	229795	Piston w/rings, oversized 0.25 (includes items 15 and 16)	3		
14	225367	Piston w/rings, oversized 0.25 (includes items 15 and 16)		3	
14	363058	Piston w/rings, oversized 0.25 (includes items 15 and 16)			3
14	229617	Piston w/rings, oversized 0.50 (includes items 15 and 16)	3		
15	X	Piston	3	3	3
16	229793	Ring set (includes items 17-19)	3		
16	225365	Ring set (includes items 17-19)		3	
16	363057	Ring set (includes items 17-19)			3
16	229794	Ring set, oversized 0.25 (includes items 17-19)	3		
16	225368	Ring set, oversized 0.25 (includes items 17-19)		3	
16	363059	Ring set, oversized 0.25 (includes items 17-19)			3
16	229618	Ring set, oversized 0.50 (includes items 17-19)	3		
17	X	Top ring, piston	3	3	3
18	X	Second ring, piston	3	3	3
19	X	Oil ring assembly	3	3	3
20	229598	Pin, piston	3		
20	225364	Pin, piston		3	
20	363003	Pin, piston			3
21	250818	Circlip	6		
21	229742	Circlip		6	
21	363199	Circlip			6
22	229790	Rod assembly, connecting (includes items 23-26)	3		
22	225369	Rod assembly, connecting (includes items 23-26)		3	
22	363221	Rod assembly, connecting (includes items 23-26)			3
23	X	Rod, connecting	3	3	3
24	229600	Bushing, piston pin	3	3	
24	363041	Bushing, piston pin			3
25	229599	Bolt, rod	6		
25	225370	Bolt, rod		6	
25	250820	Bolt, rod			6
26	229791	Bearing, crankpin	3	3	
26	363222	Bearing, crankpin			3
26	229792	Bearing, crankpin, undersized 0.25	3	3	
26	363223	Bearing, crankpin, undersized 0.25			3

X Item not sold separately

# Group 8: Lube Oil System

Items not shown 28-31



561608

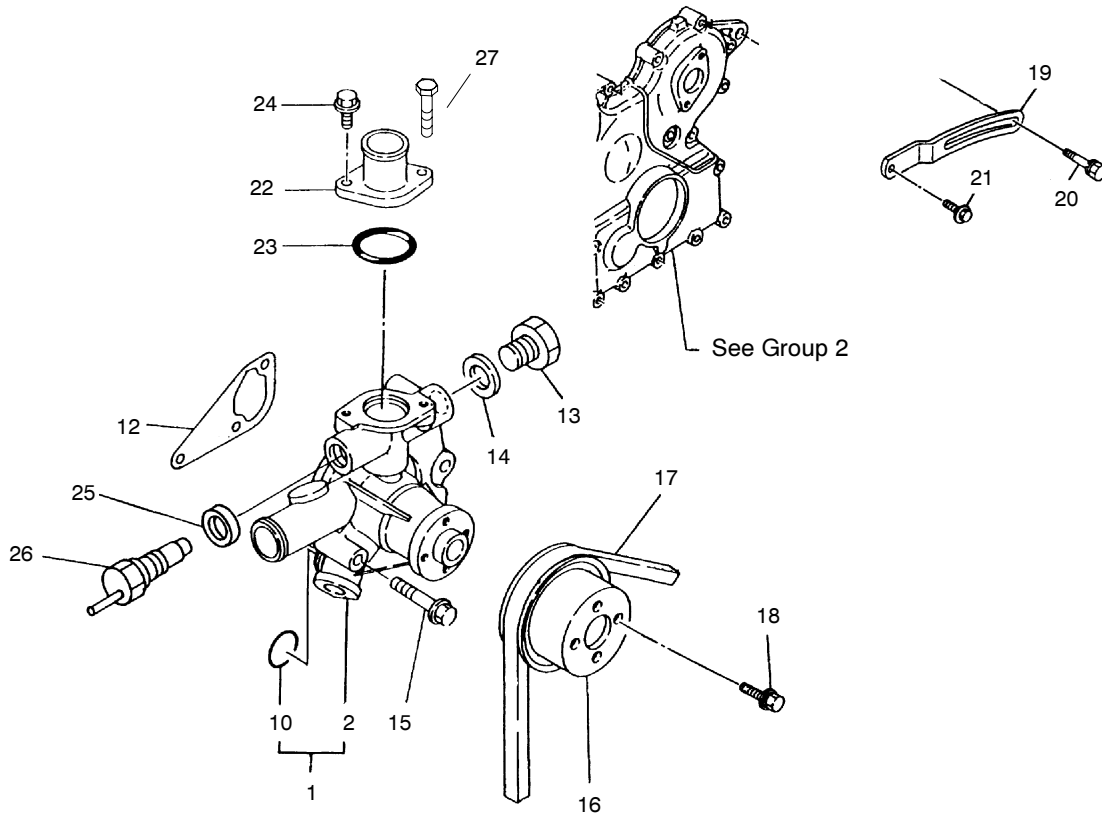
## Group 8: Lube Oil System

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	229603	Pump assembly, oil (includes items 2-10)	1	1	
1	363067	Pump assembly, oil (includes items 2-10)			1
2	X	Body	1	1	1
3	X	Cover	1	1	1
4	X	Rotor assembly (includes items 5-8)	1	1	1
5	X	Pin	1	1	1
6	X	Rotor, inner	1	1	1
7	X	Shaft	1	1	1
8	X	Rotor, outer	1	1	1
9	X	Gear, lube oil pump	1	1	1
10	X	Bolt, M6 x 20	2	2	2
11	229677	Gasket, lube oil pump	1	1	1
12	229773	Bolt, M6 x 20	3	3	3
13	252759	Guide, dipstick	1	1	1
14	229625	Dipstick, lube oil	1	1	
14	225701	Dipstick, lube oil			1
15	229678	Filter, lube oil	1	1	1
16	250953	O-ring, lube oil filter	1		
16	225373	O-ring, lube oil filter		1	
17	229561	Valve assembly, oil pressure (includes items 18-22)	1	1	
17	363070	Valve assembly, oil pressure (includes items 18-22)			1
18	X	Body	1	1	1
19	X	Spring	1	1	1
20	X	Retainer (not shown)	1	1	1
21	X	Shim pack	1	1	1
22	X	Valve	1	1	1
23	252835	Nut	1	1	1
24	229604	Pipe assembly, oil intake	1	1	
24	363020	Pipe assembly, oil intake			1
25	250801	O-ring	1	1	
25	363014	O-ring			1
26	225816	Bolt, M6 x 12 plated	2	2	
26	229498	Bolt, M6 x 12 plated			2
27	256530	Switch, oil pressure	1		
27	363083	Switch, oil pressure		1	1
28	363068	Bracket, oil filter (not shown)			1
29	363069	Gasket (not shown)			1
30	252697	Bolt, M8 x 20 (not shown)			2
31	250981	O-ring (not shown)			1

X Item not sold separately

# Group 9: Cooling Water System

Items not shown 2-9, 10, 28



561609

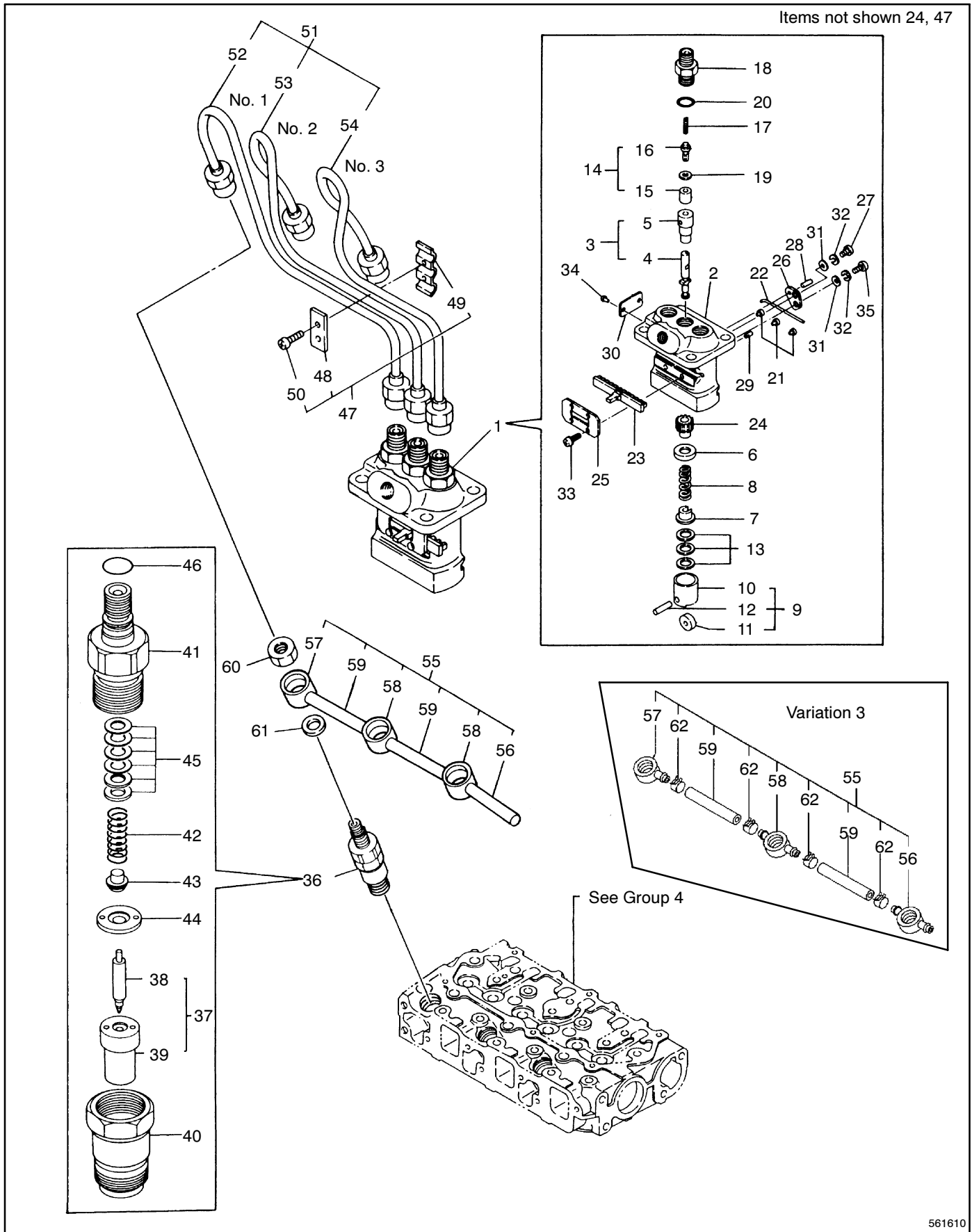


## Group 9: Cooling Water System

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	229605	Pump assembly, cooling water (includes items 2-11)	1		
1	225371	Pump assembly, cooling water (includes items 2-11)		1	
1	363071	Pump assembly, cooling water (includes items 2-11)			1
2	X	Body (not shown)	1	1	1
3	X	Plug (not shown)	1	1	1
4	X	Gasket (not shown)	1	1	1
5	X	Plate (not shown)	1	1	1
6	X	Impeller (not shown)	1	1	1
7	X	Bearing (not shown)	1	1	1
8	X	Flange, V-pulley	1	1	
9	X	Seal, mechanical	1	1	
10	229562	O-ring	1		
10	225426	O-ring		1	
10	363044	O-ring			1
11	X	Screw, M6 x 12 (not shown)	3	3	3
12	229606	Gasket, water pump	1	1	
12	363043	Gasket, water pump			1
13	252757	Plug	1	1	1
13	225358	Plug, drain (not shown)		1	
14	229752	Gasket	1	1	
14	252773	Gasket			1
15	252703	Bolt, M8 x 45 plated	3	3	3
16	229641	V-pulley	1	1	
16	363072	V-pulley			1
17	229553	V-belt	1	1	
17	363064	V-belt			1
18	225816	Bolt, M6 x 12 plated	4	4	
19	229693	Adjuster, belt	1	1	1
20	252692	Bolt, M8 x 25	1	1	
21	229499	Bolt, M8 x 18 plated	1	1	
21	252706	Bolt, M8 x 65			1
22	See Group 104	Cover, thermostat	1		
22	229408	Cover, thermostat		1	1
23	250802	O-ring, gasket	1		
23	225420	O-ring, gasket		1	1
24	229499	Bolt, M6 x 18 plated	2		
24	256798	Bolt, M6 x 18 plated		2	
24	363209	Bolt, M8 x 65			1
25	252773	Gasket 16	1	1	1
26	229782	Sender	1		
26	252752	Sender		1	1
27	252699	Bolt, M8 x 25 plated		1	
27	252706	Bolt, M8 x 65			1
28	250975	Plug, PT3/8, screw (not shown)			1

X Item not sold separately

# Group 10: Fuel Injection Pump

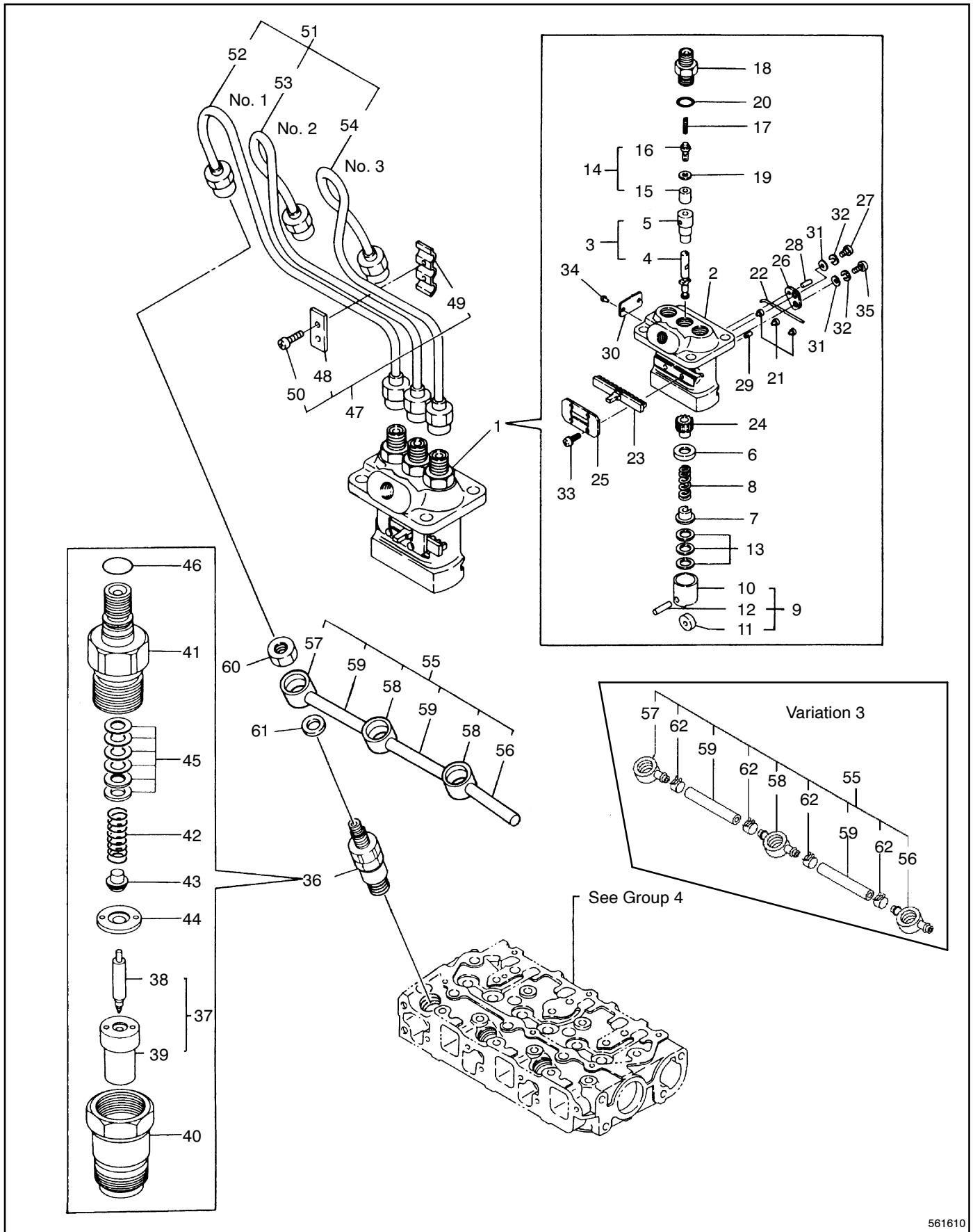


# Group 10: Fuel Injection Pump

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	229783	Pump assembly, fuel pump (includes items 2-35)	1		
1	225433	Pump assembly, fuel pump (includes items 2-35)		1	
1	363224	Pump assembly, fuel pump (includes items 2-35)			1
2	X	Body, fuel injection pump	1	1	1
3	229563	Plunger w/barrel	3	3	
3	363045	Plunger w/barrel			3
4	X	Barrel, plunger	3	3	3
5	X	Plunger	3	3	3
6	229642	Retainer	3	3	3
7	229643	Retainer	3	3	3
8	229644	Spring, plunger	3	3	3
9	229656	Tappet assembly (includes items 10-12)	3	3	3
10	X	Guide, roller	3	3	3
11	X	Roller	3	3	3
12	X	Pin, roller	3	3	3
13	229645	Shim pack	3	3	3
14	229564	Valve w/seat, delivery	3	3	
14	363046	Valve w/seat, delivery			3
15	X	Seat	3	3	3
16	X	Valve, delivery	3	3	3
17	229555	Spring, valve	3	3	3
18	229646	Holder, delivery valve	3	3	3
19	229647	Gasket, delivery	3	3	3
20	229648	O-ring	3	3	3
21	229649	Guide, plunger	3	3	3
22	229650	Pin	2	2	2
23	229680	Rack	2	2	2
24	229651	Pinion (not shown)	1	1	1
25	229680	Retainer, rack	1	1	
25	363073	Retainer, rack			1
26	229652	Plate	1	1	1
27	229653	Screw	2	2	2
28	229654	Pin	2	2	2
29	229655	Pin	1	1	1
30	X	Label, caution	1	1	
31	229740	Washer	2	2	2
32	225803	Spring washer	2	2	
32	363197	Spring washer			2
33	229759	Screw, M4 x 8	4	4	4
34	X	Rivet	2	2	
35	229775	Screw, M4 x 10	2	2	2
36	229798	Valve assembly, fuel injection	3	3	
36	363217	Valve assembly, fuel injection			3
37	229657	Nozzle assembly, fuel injection	3	3	3
38	X	Valve	3	3	3
39	X	Body	3	3	3
40	229658	Nut, valve w/case	3	3	3
41	229659	Holder, valve w/case	3	3	3
42	229660	Spring, valve	3	3	3
43	256522	Seat, nozzle spring	3	3	3
44	256523	Spacer, valve stop	3	3	3
45	256524	Shim pack	3	3	3
46	252856	O-ring	3	3	3
47	256774	Retainer, injection pipe (not shown)	1	1	1
48	X	Retainer	1	1	1
49	X	Retainer	1	1	1
50	225777	Bolt, M4 x 12	2	2	
50	225418	Bolt, M4 x 14			2
51	X	Pipe set, fuel inlet	1	1	1
52	229566	Pipe, fuel injection	1	1	
52	363048	Pipe, fuel injection			1

X Item not sold separately

# Group 10: Fuel Injection Pump, continued

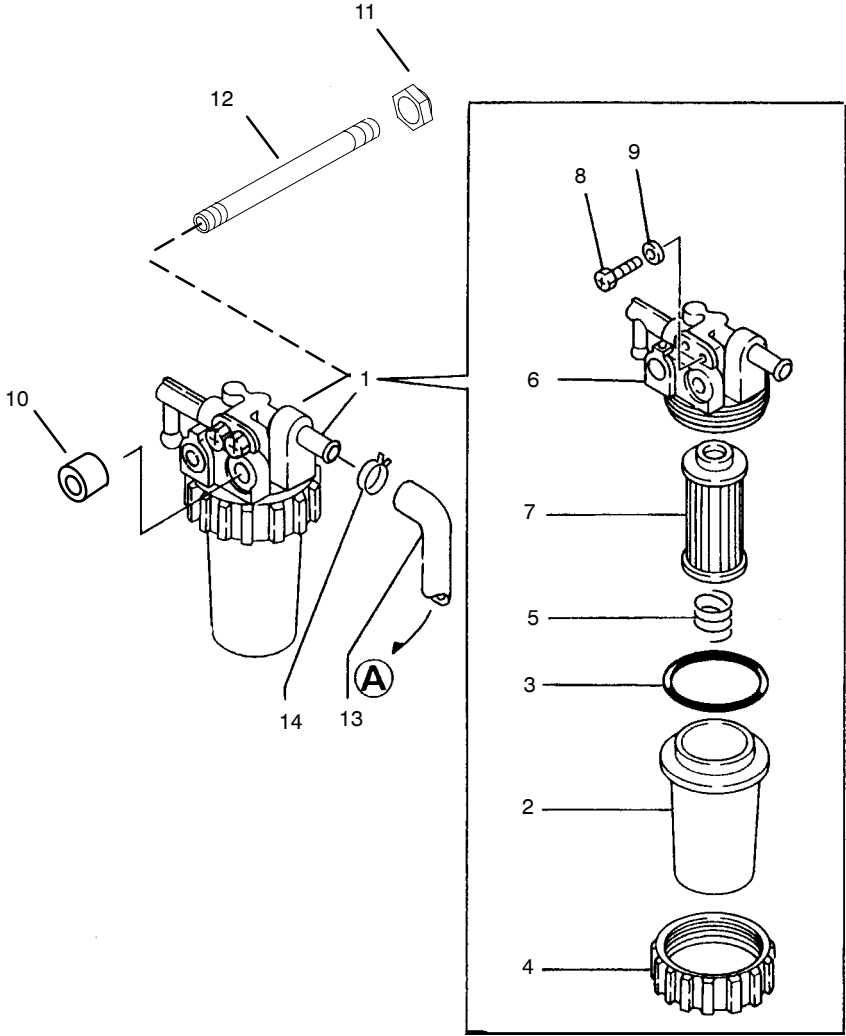
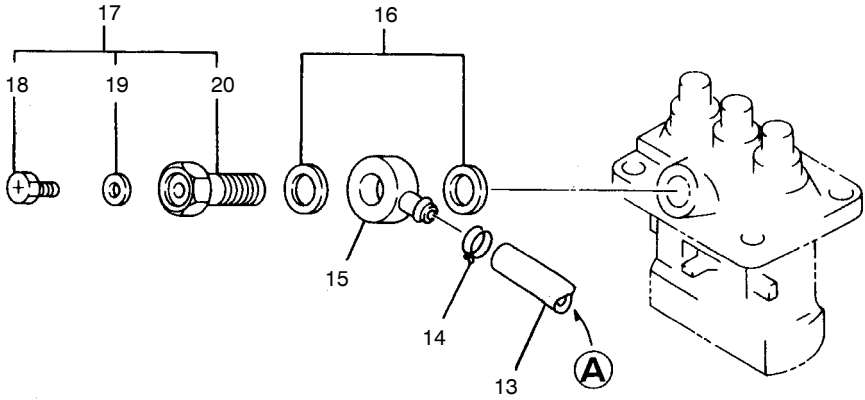


561610

## Group 10: Fuel Injection Pump, continued

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
53	229612	Pipe, fuel injection	1	1	
53	363049	Pipe, fuel injection			1
54	229613	Pipe, fuel injection	1	1	
54	363050	Pipe, fuel injection			1
55	229621	Pipe assembly, fuel (includes items 56-59)	1	1	
55	363047	Pipe assembly, fuel (includes items 56-59, 62)			1
56	229751	Pipe	1	1	
57	229610	Joint	1	1	
57	363016	Joint			1
58	229611	Joint	2	2	
58	363017	Joint			2
59	229751	Pipe	2	2	
59	363001	Pipe			2
60	229662	Nut	3	3	
61	252675	Gasket, round	3	3	
62	225411	Clamp 8			4

# Group 11: Fuel Injection Lines



561611

## Group 11: Fuel Injection Lines

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	229565	Filter assembly, fuel	1	1	1
2	229709	Cup, filter	1	1	1
3	229550	O-ring	1	1	
4	250821	Ring, retaining	1	1	1
5	229708	Spring	1	1	1
6	X	Body	1	1	
7	229715	Element, fuel	1	1	1
8	252369	Plug	2	2	2
9	252360	Gasket, nylon	2	2	2
10	X-400-104	Spacer, .344 x .750 x .500	1	1	1
11	X-6053-2	Nut, hex M8 x 1.25	1	1	1
12	229887	Stud	1	1	1
12	229758	Bolt, M8 x 70*	1		
13	X-386-74	Line, flex. fuel 1/4 x 18.5	1	1	1
13	X-672-7	Clamp, insulating .44 in. (not shown)	1	1	1
13	X-672-28	Clamp, insulating .88 in. (not shown)	1	1	1
13	X-6050-8	Screw, M8 x 1.25 (not shown)	1	1	1
13	229556	Pipe, fuel*	1	1	
14	X-426-9	Clamp, hose	2	2	2
14	229716	Clamp, hose*	2		
15	X-6288-1	Joint, pipe	1	1	1
16	252739	Gasket	2	2	2
17	250996	Bolt, w/plug and seal	1	1	1
18	252081	Plug	1	1	1
19	250994	Seal washer	1	1	
19	225423	Seal washer			1
20	250997	Bolt, joint	1	1	

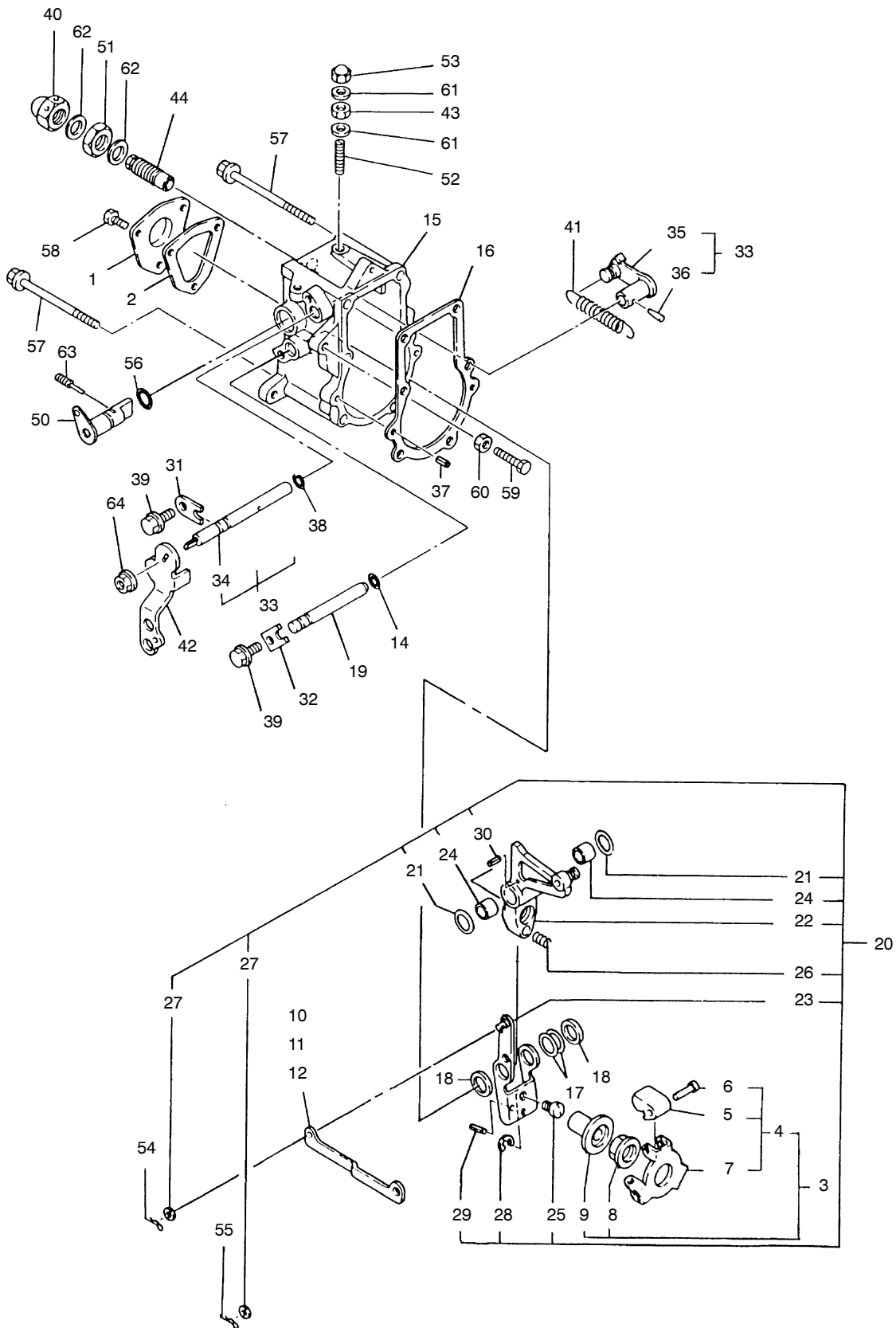
\*Variation 1 only: Use this part number before generator set serial number 319499.

X Item not sold separately

# Group 12: Governor

Variation 1

Items not shown 13, 45-49



561612A



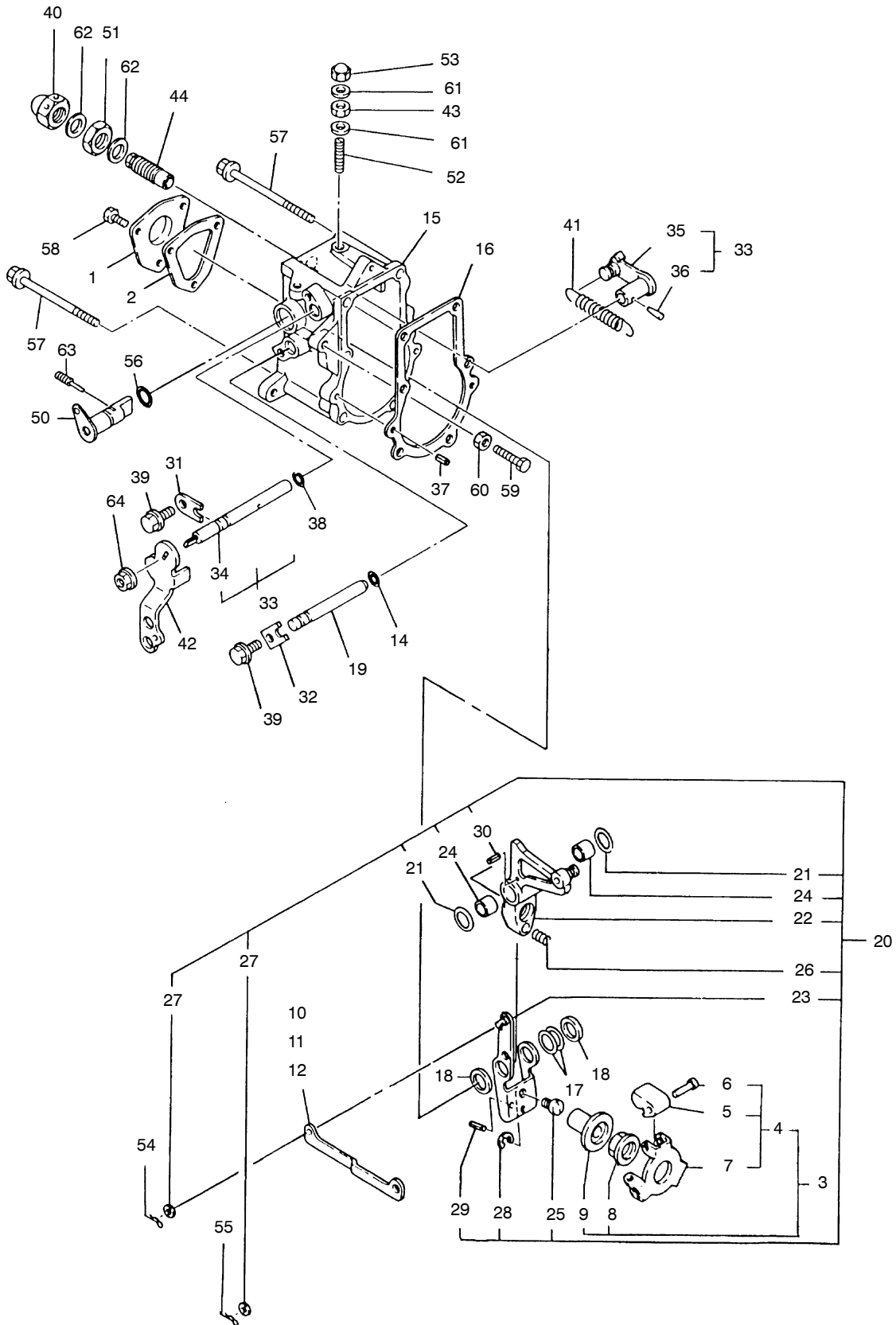
## Group 12: Governor

Item	Part Number	Description	Quantity
			Variation Number 1
1	229683	Cover, governor case	1
2	229626	Gasket, case cover	1
3	229627	Driving set, governor	1
4	229628	Weight assembly, governor (includes items 5-9)	1
5	X	Weight	3
6	X	Pin, governor weight	3
7	X	Support	1
8	229687	Nut, governor weight	1
9	229688	Sleeve	1
10	229684	Link, 88.8 mm, no color	1
11	229685	Link, 88.6 mm, white	1
12	229686	Link, 89.0 mm, red	1
13	229619	Case assembly, governor (includes items 14-39)	1
14	252849	O-ring	1
15	229681	Case, governor	1
16	229682	Gasket, governor case	1
17	229689	Shim set	1
18	229722	Spacer assembly	2
19	229690	Shaft, governor lever	1
20	229629	Lever assembly, governor (includes items 21-30)	1
21	252592	Shim set	1
22	X	Lever, tension	1
23	X	Lever, governor	1
24	X	Bushing	2
25	229630	Shifter	1
26	229631	Spring, starting	1
27	225803	Washer	2
28	225805	Circlip	1
29	229744	Spring pin	1
30	229745	Spring pin	1
31	229691	Retainer, shaft	1
32	229692	Retainer, shaft	1
33	252794	Shaft assembly, control	1
34	X	Shaft	1
35	X	Lever, regulator	1
36	229743	Taper pin	1
37	252668	Spring pin	2
38	229757	O-ring	1
39	229498	Bolt, M6 x 10 plated	1
40	225770	Nut, cap	1
41	229632	Spring, regulator	1

X Item not sold separately

# Group 12: Governor, continued

## Variation 1



561612A

## Group 12: Governor, continued

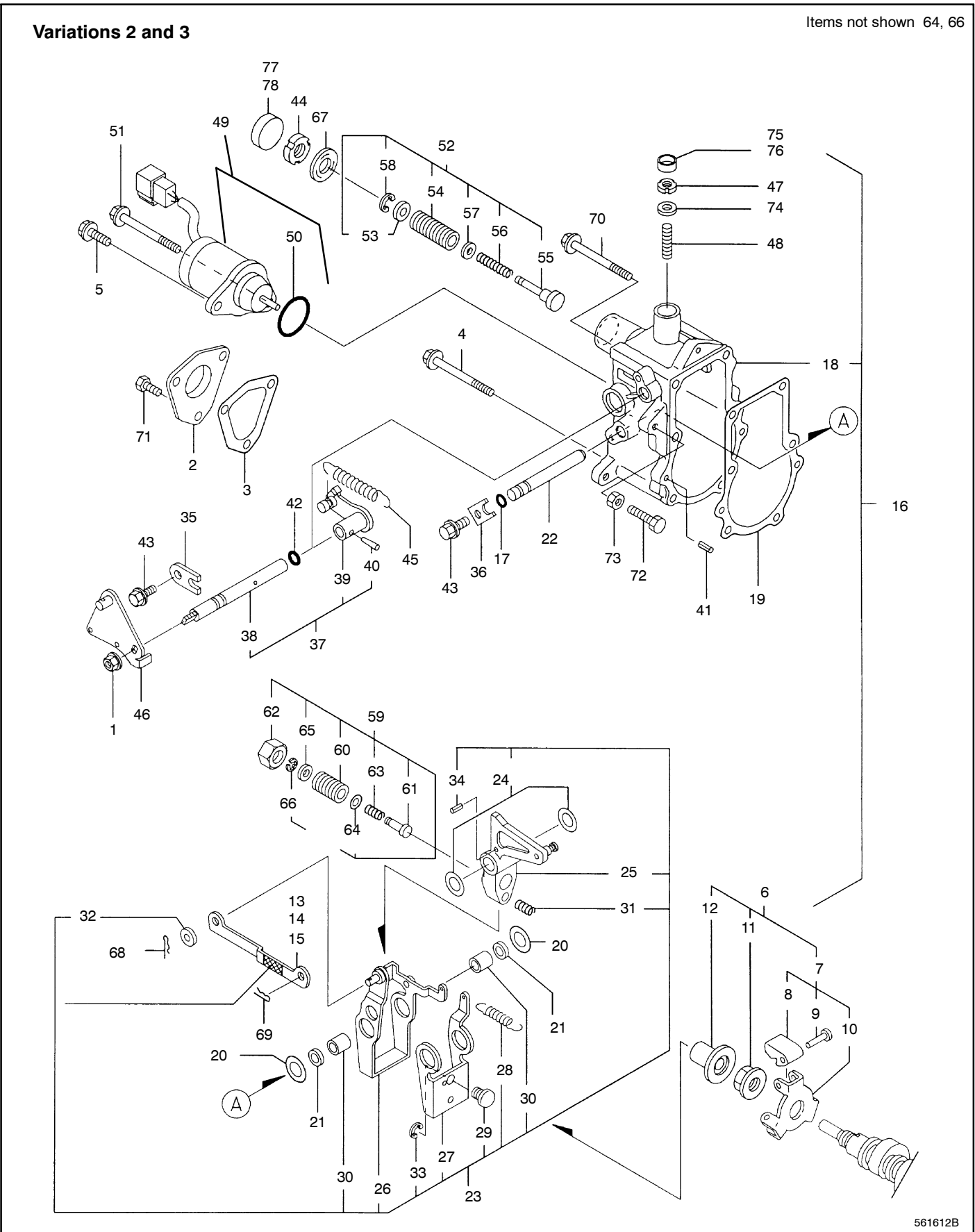
Item	Part Number	Description	Quantity
			Variation Number 1
42	229665	Lever, regulator	1
43	225767	Lock nut, M6	1
44	229633	Torque spring assembly	1
45	X	Pin, controller (not shown)	1
46	X	Body, controller (not shown)	1
47	X	Spring, controller (not shown)	1
48	X	Shim set (not shown)	1
49	X	Lock nut, M5 plated (not shown)	2
50	229667	Lever, stop	1
51	229717	Lock nut, M12	1
52	229712	Screw, adjustment	1
53	225702	Nut, cap	1
54	229746	Snap pin	1
55	229747	Snap pin	1
56	225811	O-ring	1
57	229767	Bolt, M6 x 70 plated	6
58	229769	Bolt, M5 x 10 plated	3
59	229770	Bolt, M6 x 30 plated	1
60	225825	Lock nut, M6 plated	1
61	225828	Seal washer	2
62	252367	Seal washer	2
63	229713	Screw, stop	1
64	225802	Nut w/washer	1

X Item not sold separately

# Group 12: Governor, continued

Variations 2 and 3

Items not shown 64, 66



561612B

## Group 12: Governor, continued

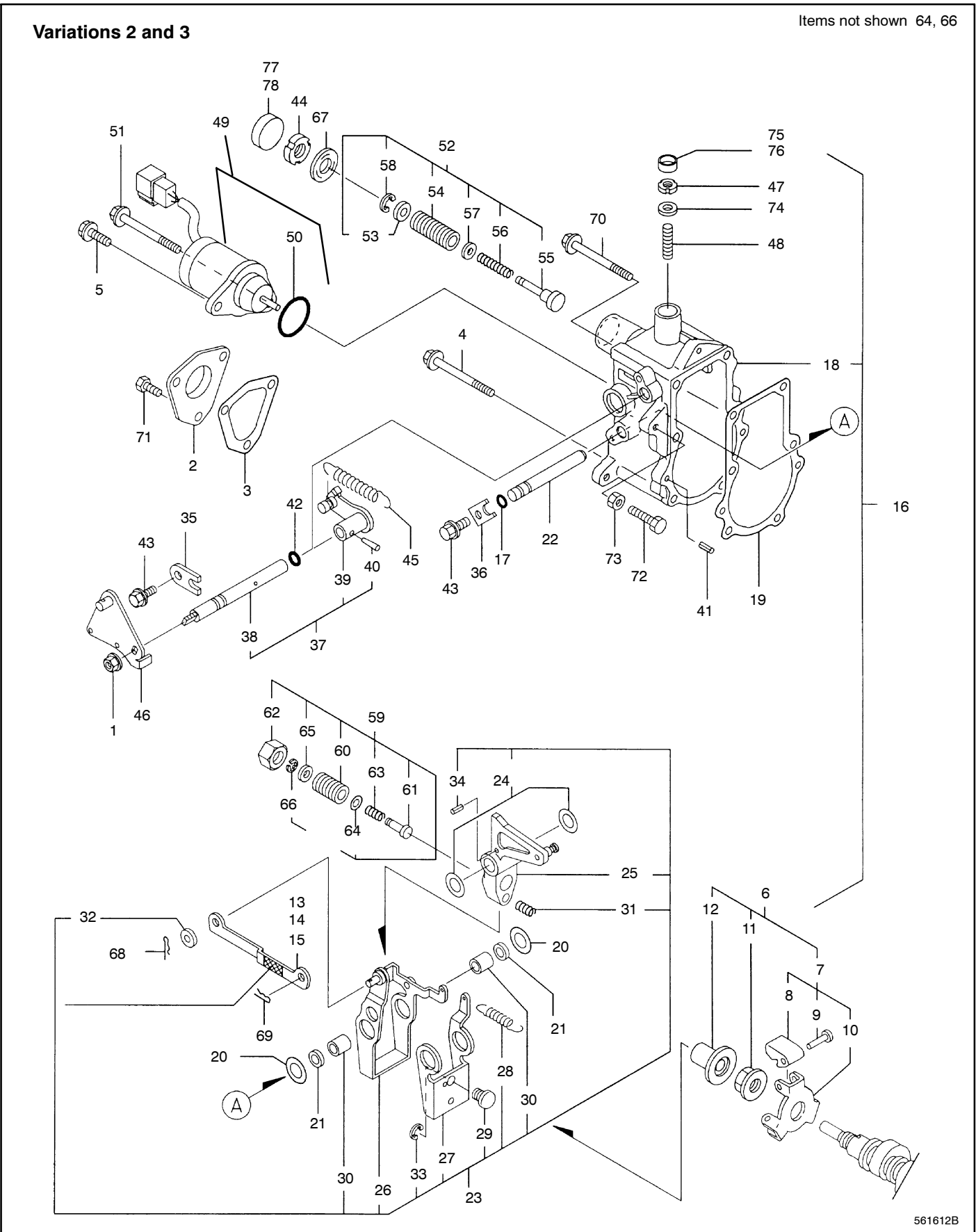
Item	Part Number	Description	Quantity	
			Variation Number	
			2	3
1	225802	Nut, with washer 8	1	1
2	229683	Cover, governor case	1	1
3	229626	Gasket	1	1
4	225429	Bolt, M6 x 75	3	3
4	363194	Washer, 6 (not shown)	3	3
5	252425	Bolt, M6 x 16	1	1
6	229627	Driving set, governor (includes items 7-12)	1	1
7	229628	Weight assembly, governor (includes items 8-10)	1	1
8	X	Weight, governor	3	3
9	X	Pin, governor weight	3	3
10	X	Support, governor weight	1	1
11	229687	Nut, governor weight	1	1
12	229688	Sleeve, governor	1	1
13	229684	Link, L=88.8, no color	1	1
14	229885	Link, L=88.6, white	1	1
15	229686	Link, L=89.0	1	1
16	225384	Case assembly, governor (includes items 17-43)	1	1
17	252849	O-ring	1	1
18	X	Case, governor	1	1
19	229682	Gasket	1	1
20	229689	Shim set	1	1
21	229722	Spacer assembly	1	1
22	229690	Shaft, governor lever	1	1
23	225359	Lever assembly, governor (includes items 24-34)	1	1
24	252592	Shim set	2	2
25	X	Lever, tension	1	1
26	X	Governor lever	1	1
27	X	Governor lever	1	1
28	225360	Spring, lever	1	1
29	225378	Shifter, PTO	1	1
30	X	Needle bearing	2	2
31	225389	Spring, starting	1	1
32	225803	Washer	1	1
33	225805	Circlip	1	1
34	229745	Spring pin, 3 x 14	1	1
35	229691	Retainer, shaft	1	1
36	229692	Retainer, shaft	1	1
37	225372	Shaft assembly, regulator (includes items 38-40)	1	1
38	X	Shaft, regulator	1	1
39	X	Lever, regulator	1	1
40	X	Taper pin, 3 x 16	1	1
41	252668	Spring pin, 4 x 10	2	2
42	229757	O-ring	1	1
43	229498	Bolt, M6 x 10	2	2
44	225390	Carb nut limit	1	1
45	225376	Spring, regulator	1	1
45	363075	Spring, regulator	1	1
46	229665	Lever, regulator	1	1
47	225391	Carb nut high idle	1	1
48	252451	Screw, adjustment	1	1
48	229712	Screw, adjustment	1	1
49	225461	Solenoid kit (includes item 50)	1	1
50	225427	O-ring	1	1
51	225430	Bolt, M6 x 95	1	1
52	225377	Fuel limiter	1	1
53	X	Shim set	1	1
54	X	Body	1	1
55	X	Pin	1	1
56	X	Spring, controller	1	1

X Item not sold separately

# Group 12: Governor, continued

Variations 2 and 3

Items not shown 64, 66



561612B

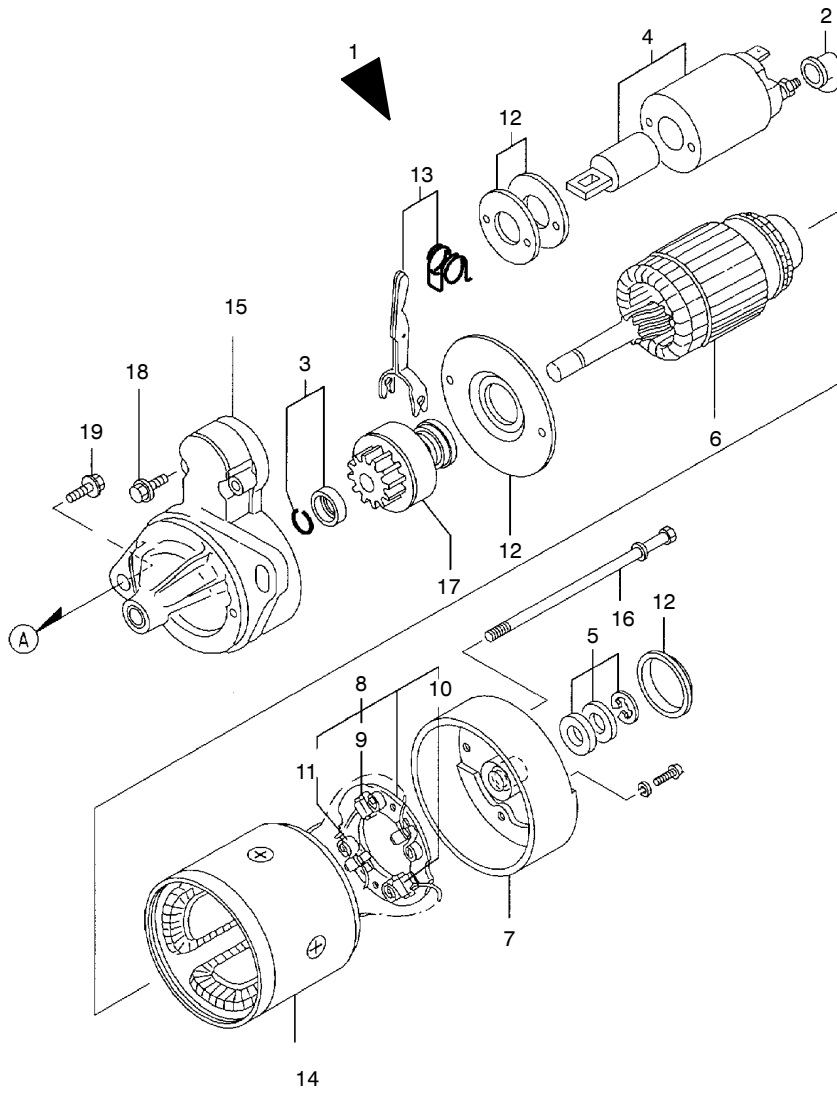
## Group 12: Governor, continued

Item	Part Number	Description	Quantity	
			Variation Number 2	Variation Number 3
57	X	Shim set	1	1
58	X	Circlip	1	1
59	225379	Angleich assembly (includes items 60-66)	1	1
60	X	Case, angleich	1	1
61	X	Shifter	1	1
62	X	Nut	1	1
63	X	Spring	1	1
64	X	Shim set (not shown)	1	1
65	X	Washer	1	1
66	X	Circlip (not shown)	1	1
67	225424	Washer, seal, 12S	1	1
68	229746	Pin, snap, 4	1	1
69	229747	Pin, snap, 6	1	1
70	229767	Bolt, M6 x 70	2	2
71	225431	Bolt, M5 x 20	3	
71	229769	Bolt, M5 x 10		3
72	229770	Bolt, M6 x 30	1	1
73	225825	Nut, lock, M6	1	1
74	225423	Washer, seal, 6	1	1
75	X	Plug, 14	1	
76	225382	Plug, 14	1	1
77	X	Plug, 22		1
78	225381	Plug, 22	1	1

X Item not sold separately

# Group 13: Starting Motor

Items not shown 20, 21



561613

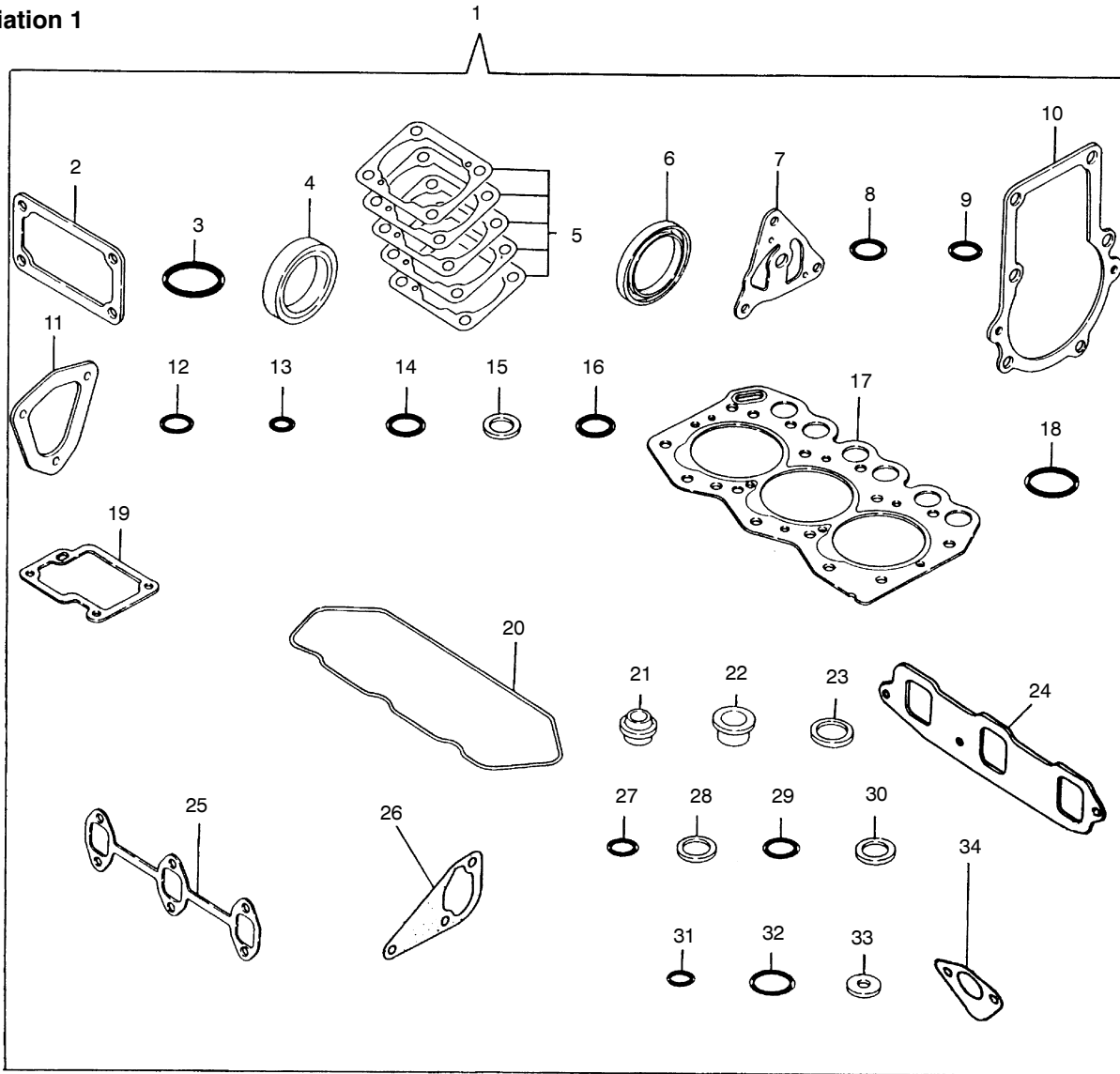


## Group 13: Starting Motor

Item	Part Number	Description	Quantity
			Variation Number
1	229704	Starter (includes items 3-21)	1
2	252481	Cover, terminal	1
3	252630	Stopper set, pinion	1
4	229965	Switch, magnetic	1
5	252631	Washer set, thrust	1
6	363004	Armature	1
7	229817	Cover assembly, rear	1
7	252627	Cover, rear	1
8	229824	Holder assembly, brush	1
9	229822	Brush (-)	1
10	250868	Brush (+)	2
11	229823	Spring, brush	3
12	229821	Cover kit, dust	1
13	229820	Lever set, shift	1
14	229819	Coil assembly, field	1
15	252627	Cover	1
16	225859	Through bolt	2
17	363079	Pinion	1
18	229818	Bolt	2
19	229768	Bolt, M10 x 30 plated	1
20	225862	Screw, pole core (not shown)	4
21	252618	Bolt, M4 x 12 (not shown)	2

# Group 14: Gasket Set

Variation 1



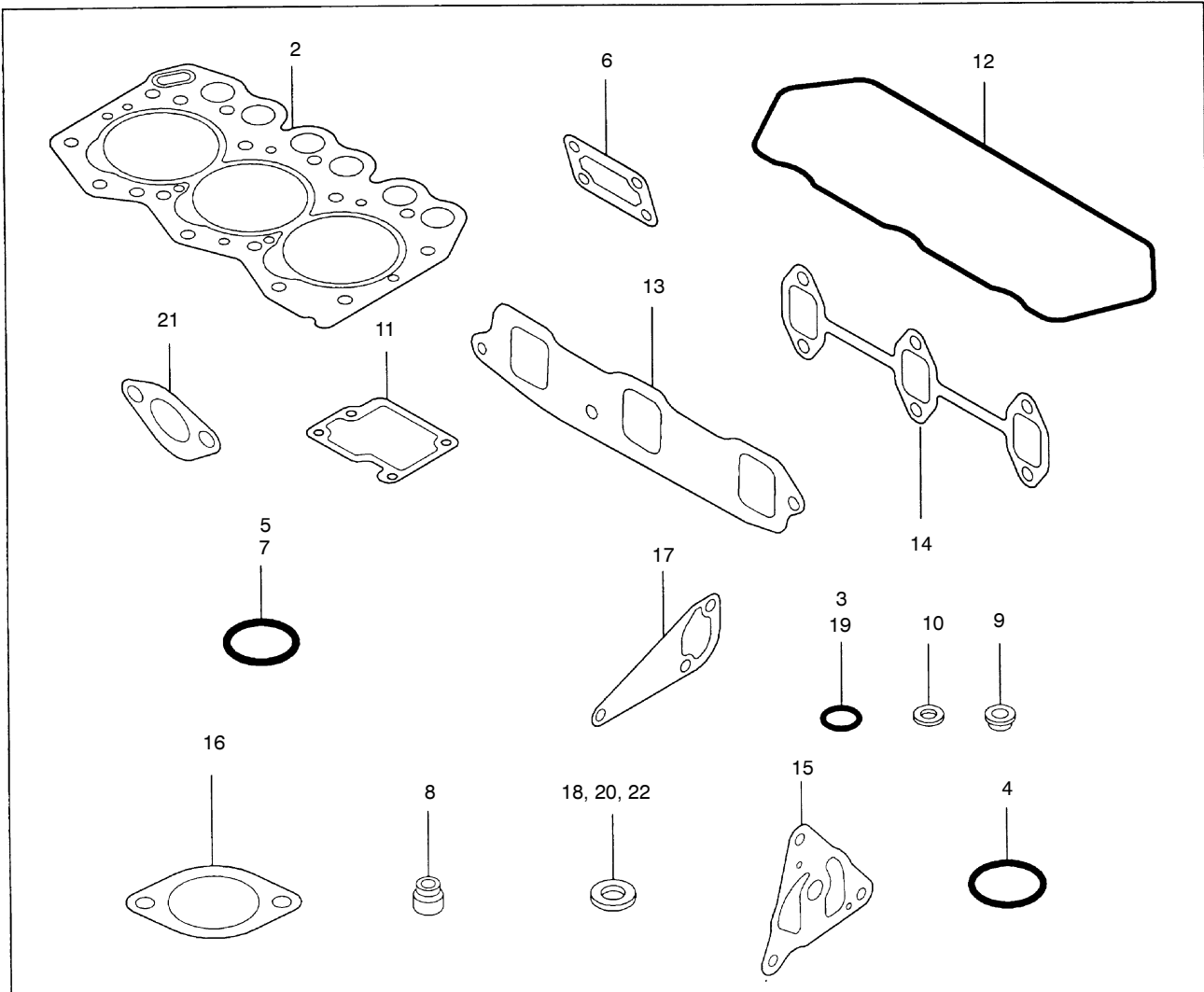
561614A

## Group 14: Gasket Set

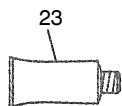
Item	Part Number	Description	Quantity
			Variation Number
			1
1	229796	Gasket set (Includes items 2-34)	1
2	229669	Gasket	1
3	229756	O-ring	1
4	229634	Seal, oil	1
5	229635	Shim set	1
6	250836	Seal, oil	1
7	229677	Gasket, lube oil pump	1
8	252849	O-ring	1
9	229757	O-ring	1
10	229682	Gasket	1
11	229626	Gasket	1
12	250801	O-ring	2
13	225811	O-ring	1
14	256796	O-ring	1
15	225828	Seal washer	2
16	229756	O-ring	1
17	229567	Gasket, cylinder head	1
18	252684	O-ring	1
19	229579	Gasket	1
20	229587	Gasket, bonnet	1
21	229589	Seal, valve stem	6
22	229623	Protector, nozzle	3
23	229624	Gasket, nozzle	6
24	229615	Gasket, intake manifold	1
25	229592	Gasket, exhaust manifold	1
26	229606	Gasket, C.W. pump	1
27	252773	Packing	1
28	252739	Gasket	2
29	252856	O-ring	3
30	252675	Gasket	3
31	250801	O-ring	2
32	250802	O-ring	1
33	250994	Seal washer	1
34	252061	Gasket, pump	1
35	252998	Gasket, liquid	1

# Group 14: Gasket Set, continued

## Variation 2



1



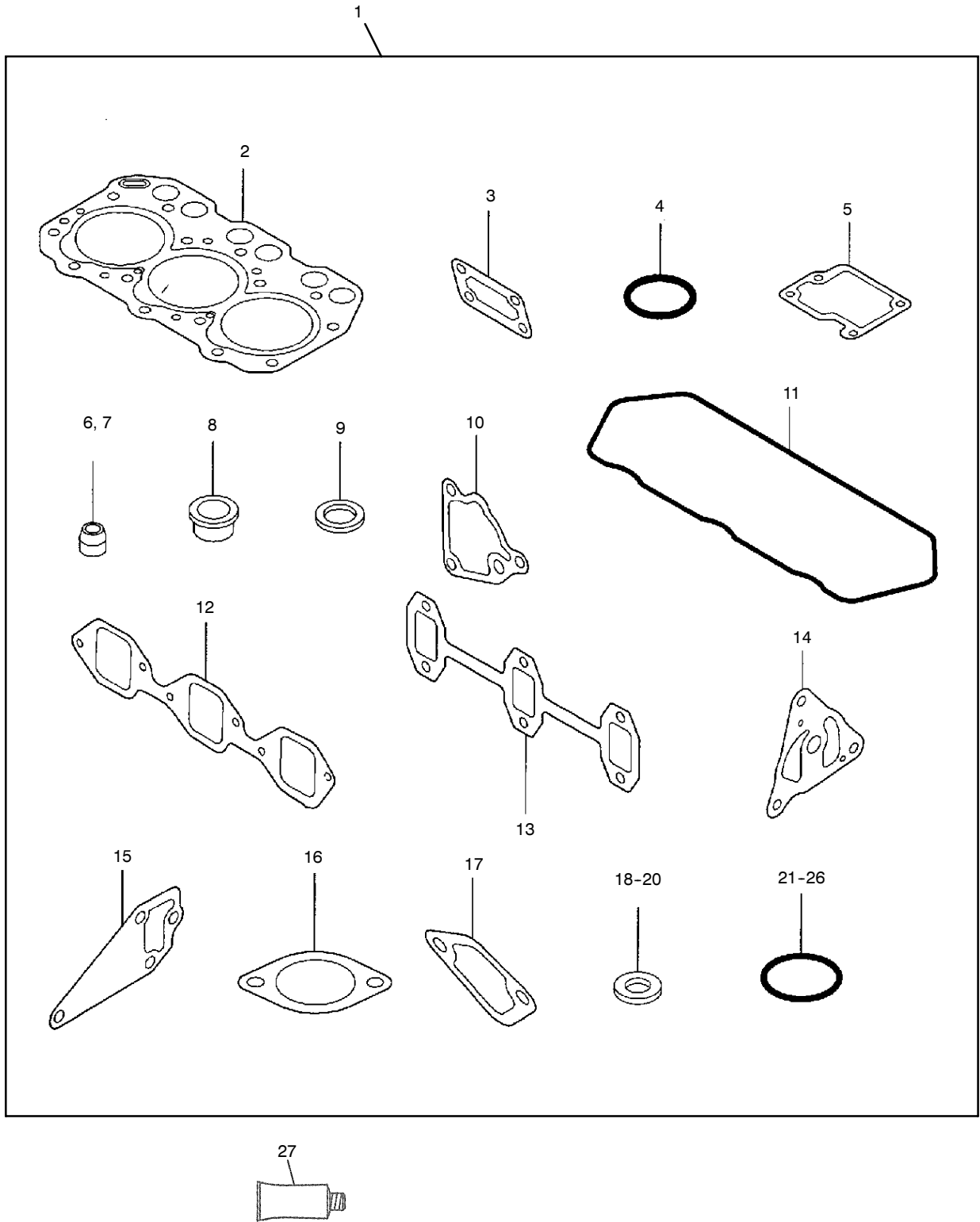
561614B

## Group 14: Gasket Set, continued

Item	Part Number	Description	Quantity
			Variation Number
1	225436	Gasket set (includes items 2-22)	1
2	225361	Gasket, cylinder head	1
3	250801	O-ring	2
4	229756	O-ring	1
5	256796	O-ring	1
6	229669	Gasket	1
7	229756	O-ring	1
8	229589	Seal, valve stem	6
9	229623	Protector, nozzle	3
10	229624	Gasket, nozzle	6
11	229579	Gasket	1
12	229587	Gasket, bonnet	1
13	229615	Gasket, intake manifold	1
14	229592	Gasket, exhaust manifold	1
15	229677	Gasket, lube oil pump	1
16	225420	Gasket	1
17	229606	Gasket, C.W. pump	1
18	252773	Packing	1
19	252856	O-ring	3
20	252675	Gasket	3
21	252061	Gasket, pump	1
22	252739	Gasket	2
23	252998	Gasket, liquid	1

# Group 14: Gasket Set, continued

Variation 3

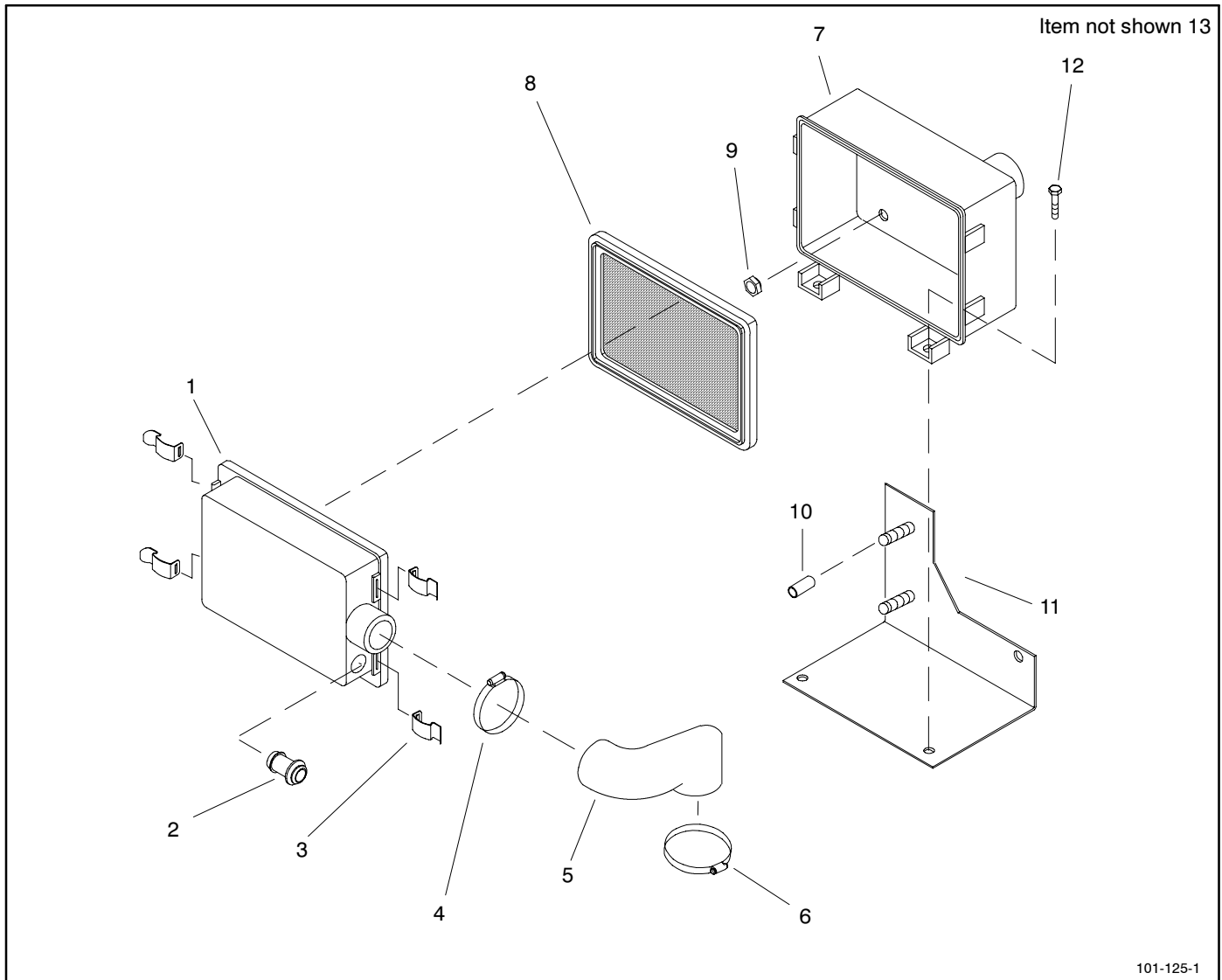


561614C

## Group 14: Gasket Set, continued

Item	Part Number	Description	Quantity
			Variation Number
1	363230	Gasket set (includes items 2-26)	1
2	363052	Gasket, cylinder head	1
3	229669	Gasket	1
4	252684	O-ring	1
5	363028	Gasket	1
6	250844	Seal, valve stem	3
7	225766	Seal, valve stem	3
8	229623	Protector, nozzle	3
9	229624	Gasket, nozzle	6
10	363069	Gasket	1
11	363035	Gasket, valve cover	1
12	363036	Gasket	1
13	363037	Gasket, exhaust manifold	1
14	229677	Gasket, oil pump	1
15	363043	Gasket, water pump	1
16	225420	Gasket	1
17	256061	Gasket	1
18	252773	Gasket 16	2
19	252739	Gasket 12	2
20	252675	Gasket 14, round	3
21	250801	O-ring	4
22	252856	O-ring	3
23	256796	O-ring	1
24	252687	O-ring	1
25	250981	O-ring	1
26	363014	O-ring	1
27	252998	Gasket, liquid	1

# Group 101: Air Intake



101-125-1

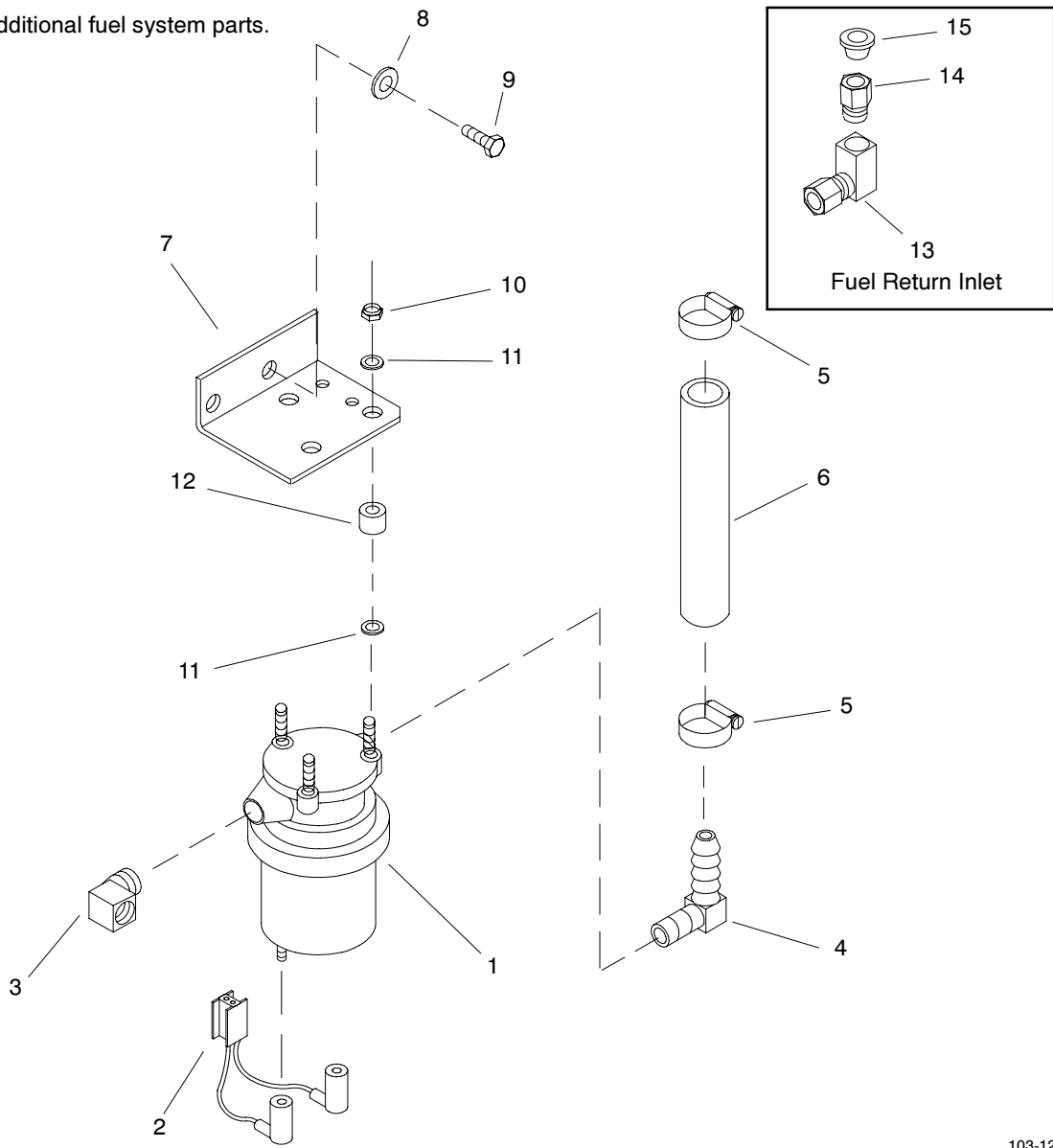
Item	Part Number	Description	Quantity	
			Variation Number 1	Variation Number 4
1	227463	Cover, plastic	1	1
2	278805	Adapter, nylon hose	1	1
3	278862	Clip, air cleaner	4	4
4	X-426-6	Clamp, hose, 1 9/16 x 2 1/2	1	1
4	X-426-10	Clamp, hose, .5/1 in.	1	
5	229338	Hose, air intake	1	
5	344900	Hose, molded air intake		1
6	X-426-19	Clamp, hose	1	1
7	246495	Base, air cleaner	1	
7	344899	Base, air cleaner		1
8	278612	Element, filter	1	
8	278858	Element, filter		1
8	278857	Filter		1
9	#	Nut, #10-32	2	
10	X-400-127	Spacer	2	
11	229299	Bracket, air cleaner	1	
11	344898	Bracket, air cleaner		1
11	X-465-6	Screw, 1/4-20 x .50		2
12	#	Hardware, 1/4-20	3	
13	X-422-33	Line, flex (not shown)	1	

# Common hardware; procure locally.



# Group 103: Fuel System

See Group 11 for additional fuel system parts.

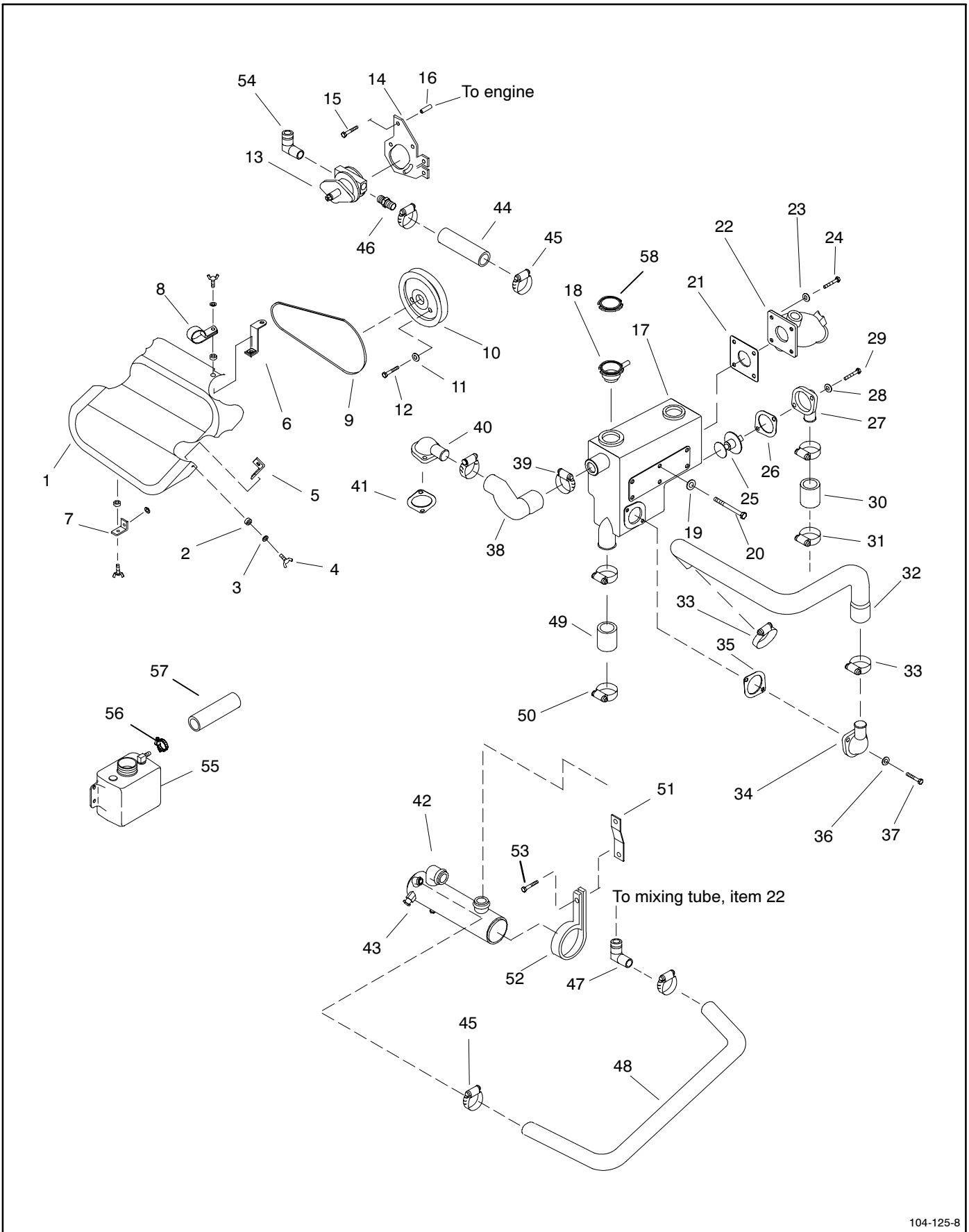


103-125-5

Item	Part Number	Description	Quantity	
			5	10
1	229051	Pump, fuel	1	1
2	229168	Lead assembly	1	1
3	X-555-1	Elbow, street, 1/4 x 1/4	1	1
4	X-391-20	Connector, hose elbow	1	1
5	X-426-9	Clamp, hose	2	2
6	X-386-6	Line, fuel	1	1
7	229290	Bracket, fuel pump	1	1
8	#	Washer, 1/2	2	2
9	X-6051-2	Screw, HC, M12-1.75 x 2	2	2
10	X-101-25	Nut, lock	3	3
11	#	Washer, 1/4	6	6
12	X-284-39	Grommet	3	3
13	X-382-1	Elbow, compression	1	1
14	X-509-1	Adapter, pipe 1/4 x 1/8	1	1
15	X-519-10	Plug, cap, 1/4	1	1

# Common hardware; procure locally.

# Group 104: Cooling System



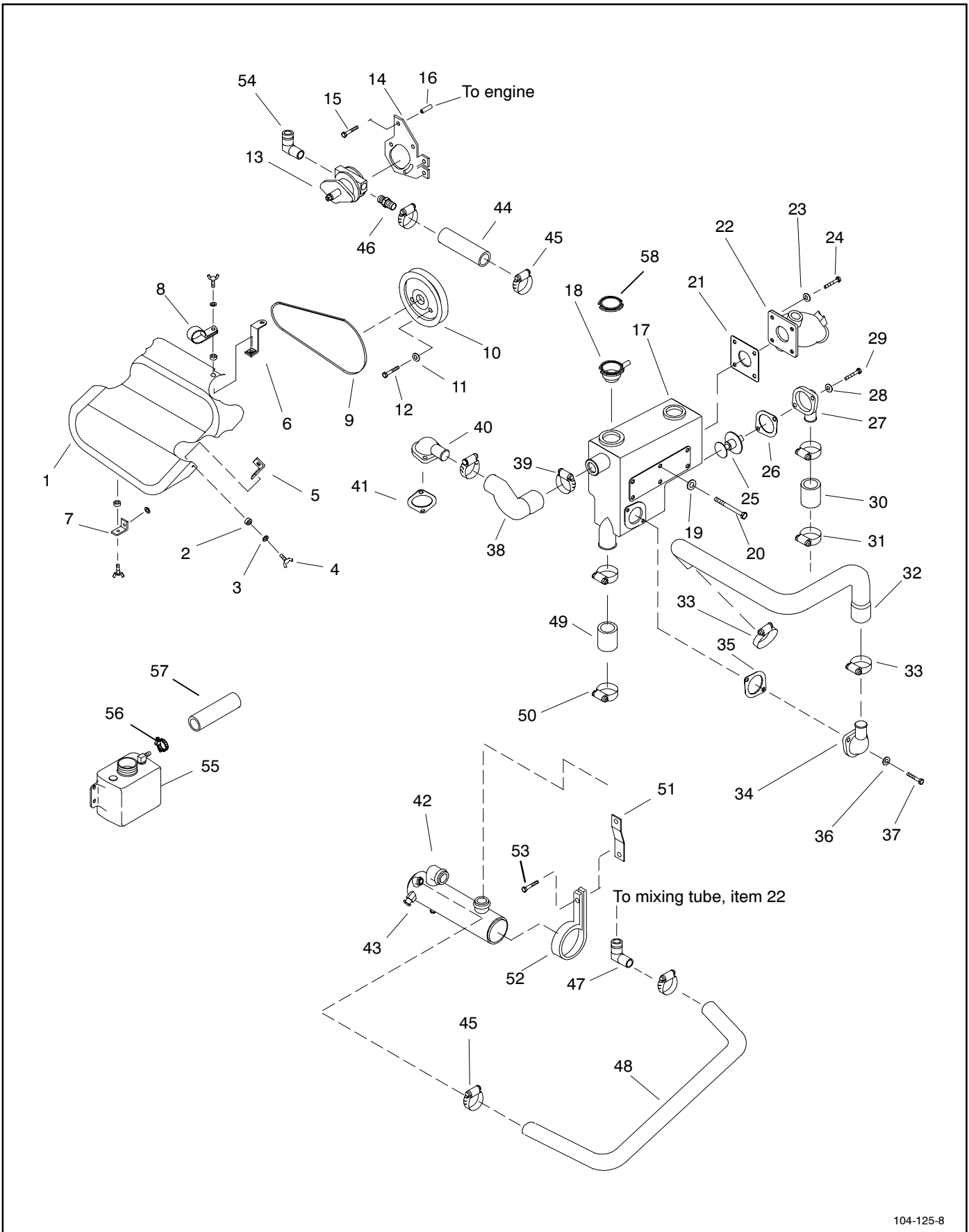
104-125-8

## Group 104: Cooling System

Item	Part Number	Description	Quantity				
			Variation Number				
			8	10	11	12	18
1	229273	Guard, belt	1	1			
1	344318	Guard, belt			1	1	
1	344878	Guard, belt					1
2	X-284-39	Grommet	3	3	3	3	3
3	#	Washer, 1/4	3	3	3	3	3
4	229330	Screw, wing	3	3	3	3	3
5	229286	Bracket, belt guard	1	1	1	1	
5	344894	Bracket, belt guard					1
6	229285	Bracket, belt guard	1	1			
6	344165	Bracket, belt guard			1	1	
6	344893	Bracket, belt guard					1
7	229287	Bracket, belt guard	1	1	1	1	
7	344897	Bracket, belt guard					1
7	X-25-68	Washer, plain, .281 ID x .625 in. OD					1
8	X-672-25	Clamp, insulated	1	1	1	1	
9	229326	V-Belt, seawater pump	1	1			
9	GM13660	V-Belt, 26 in.			1	1	1
10	229274	Pulley, pump drive	1	1	1	1	1
10	X-25-28	Washer (not shown)					3
11	#	Washer, 7/16	3	3	3	3	
12	X-6051-3	Screw, HC, M10-1.50	3	3	3	3	3
	See chart on						
13	page 54	Pump, seawater	1	1	1	1	1
14	229284	Bracket, seawater pump	1	1	1	1	
14	344892	Bracket, seawater pump					1
15	X-6049-4	Screw, HC, M6-1	3	3	3	3	
15	X-6049-10	Screw, HC					2
15	X-6049-13	Screw, HC					2
16	X-400-190	Spacer	2	2	2	2	
16	X-400-226	Spacer					2
16	X-400-142	Spacer					1
17	229836	Manifold, exhaust	1	1	1	1	
17	344847	Manifold, exhaust					1
18	241311	Neck, 50 440 01	1	1	1	1	1
19	#	Washer, 1/4	6	6	6	6	6
20	M931-06145-60	Screw, hex hd cap	6	6	6	6	
20	X-6050-6	Screw, hex hd cap					2
20	X-6050-21	Screw, hex hd cap					4
21	249905	Gasket, exhaust	1	1	1	1	1
22	229063	Tube, mixing	1	1	1	1	1
23	#	Washer, 5/16	4	4	4	4	4
24	X-125-5	Screw, 5/16-18 x 1, ref.	4	4	4	4	4
25	254920	Thermostat	1	1	1	1	1
26	229963	Gasket, water outlet	1	1	1	1	1
27	229064	Cover, thermostat	1	1	1	1	1
28	#	Washer, 5/16	2	2	2	2	2
29	X-125-31	Screw, 5/16-8 x .875, ref.	2	2	2	2	2
30	229278	Hose, coolant	1	1	1	1	
30	344882	Hose, coolant					1
31	X-426-8	Clamp, hose 1 15/16 x 1 3/16	2	2	2	2	2
32	229272	Hose, molded	1	1	1	1	1
33	X-426-8	Clamp, hose, 1 15/16 x 1 3/16	2	2	2	2	2
34	229064	Cover, thermostat	1	1	1	1	1
35	229963	Gasket, water outlet	1	1	1	1	1
36	#	Washer, 5/16	2	2	2	2	2
37	X-125-31	Screw, 5/16-8 x .875, ref.	2	2	2	2	2
38	229271	Hose, molded	1	1			
38	344164	Hose, molded			1	1	
38	344880	Hose, molded					1
39	X-426-8	Clamp, hose, 1 15/16 x 1 3/16	2	2	2	2	2
40	229269	Cover, thermostat	1	1			
41	229176	Gasket, water outlet	1	1			
42	229280	Exchanger, heat	1	1	1	1	
42	GM24940	End cap, heat exchanger (not shown)	1	1	1	1	
42	GM24941	Gasket, heat exchanger (not shown)	1	1	1	1	
42	359398	Exchanger, heat (not shown)					1
42	GM15464	Cover, heat exchanger (not shown)					1
42	GM15465	Gasket, heat exchanger (not shown)					1
43	260085	Zinc anode	1	1	1	1	1

# Common hardware; procure locally.

# Group 104: Cooling System, continued



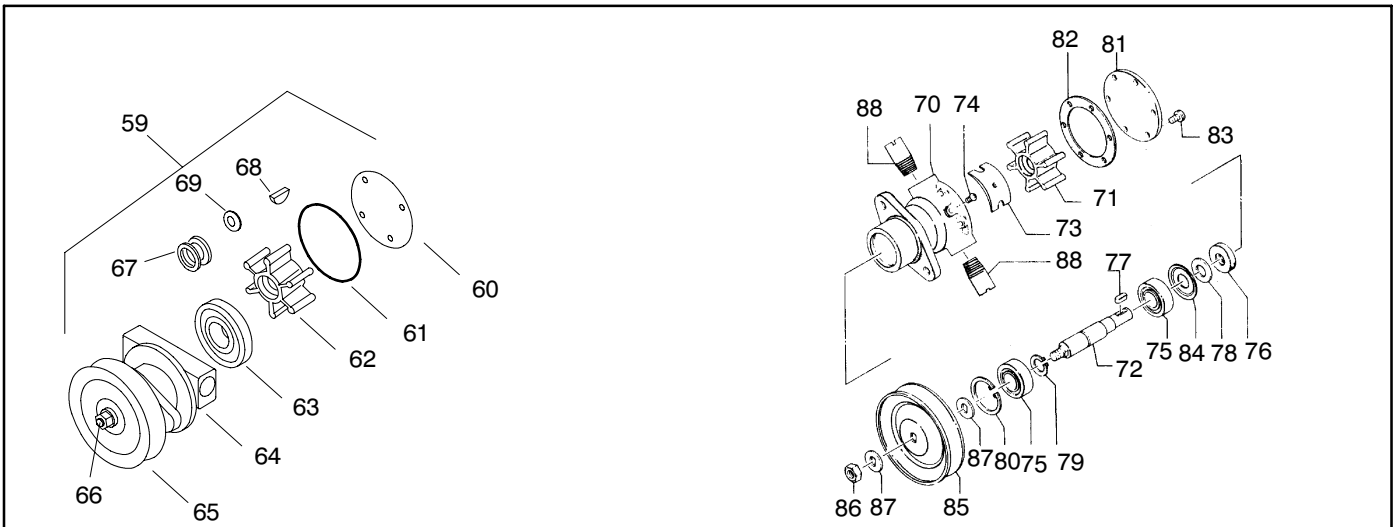
104-125-8

## Group 104: Cooling System, continued

Item	Part Number	Description	Quantity				
			Variation Number				
			8	10	11	12	18
44	X-312-17	Hose	1	1	1	1	
44	359399	Hose					1
45	X-426-3	Clamp, hose, 1/2 x 1 13/32	4	4	4	4	4
46	X-582-19	Connector, hose	1	1	1	1	1
46	X-582-2	Connector, hose			1	1	1
48	X-312-5	Hose	1	1	1	1	
48	X-312-24	Hose					1
49	229279	Hose, coolant	1	1	1	1	
49	344883	Hose					1
50	X-426-8	Clamp, hose, 1 15/16 x 1 3/16	2	2	2	2	2
51	229283	Bracket, heat exchanger	2	2	2	2	2
52	X-672-18	Clamp, insulated	2	2	2	2	
52	X-672-22	Clamp, insulated					2
53	#	Hardware, 1/4-20	2	2	2	2	2
54	X-391-26	Connector, hose, 5/8 x 3/8	1	1	1	1	1
54	X-391-2	Connector, hose, 5/8 x 3/8			1	1	1
55	249396	Bottle, overflow	1	1	<del>1</del>	<del>1</del>	
55	359037	Bottle, overflow			1	1	1
55	GM13621	Bracket, water bottle				1	
55	359036	Bracket, water bottle					1
55	X-6050-8	Screw					2
56	X-426-9	Clamp, hose			1	1	2
57	X-386-34	Hose			1	1	1
58	229980	Cap	1	1	1	1	1

# Common hardware; procure locally.

# Group 104: Cooling System, continued

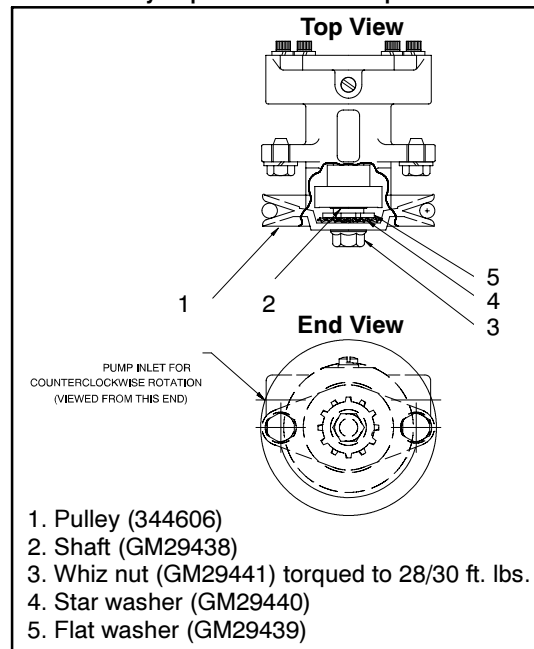


**Seawater Pump Component Parts**

Item	Description	Part Number	
		Serial Numbers 296898 and before	Serial Numbers 296899 and above
59	Pump, seawater (includes the following)	267373	344089
60	Plate, cover	N/A	344306
61	Gasket	252475	344584
62	Impeller kit (includes gasket)	229955	229826
63	Bearing, ball	N/A	344043
64	Housing	N/A	344585
65	Pulley	N/A	344606
66	Shaft, drive	N/A	GM29438
67	Seal	N/A	GM16865
68	Key, impeller end	N/A	GM17702
69	Seat, ceramic	N/A	GM22995
70	Refer to item 59	X	N/A
71	Impeller	250872	N/A
72	Shaft, pump	252437	N/A
73	Cam	252476	N/A
74	Screw, M4 x 10	#	N/A
75	Bearing	252364	N/A
76	Seal, oil	250871	N/A
77	Key, feather	252473	N/A
78	Drip, water	252474	N/A
79	Circlip, 15-S	252346	N/A
80	Circlip, 35-H	252348	N/A
81	Cover	252439	N/A
82	Gasket	252475	N/A
83	Screw, M4 x 8	#	N/A
84	Cover, bearing	252438	N/A
85	V-pulley	252464	N/A
86	U-nut, M8	252336	N/A
87	Washer	252466	N/A
88	Joint, 3/8 NPT	252443	N/A

Multiple seawater pump pulley failures on seawater pump number 344089 indicate shaft wear. Replace both the pulley and shaft using kit GM29437 to prevent future pulley failure.

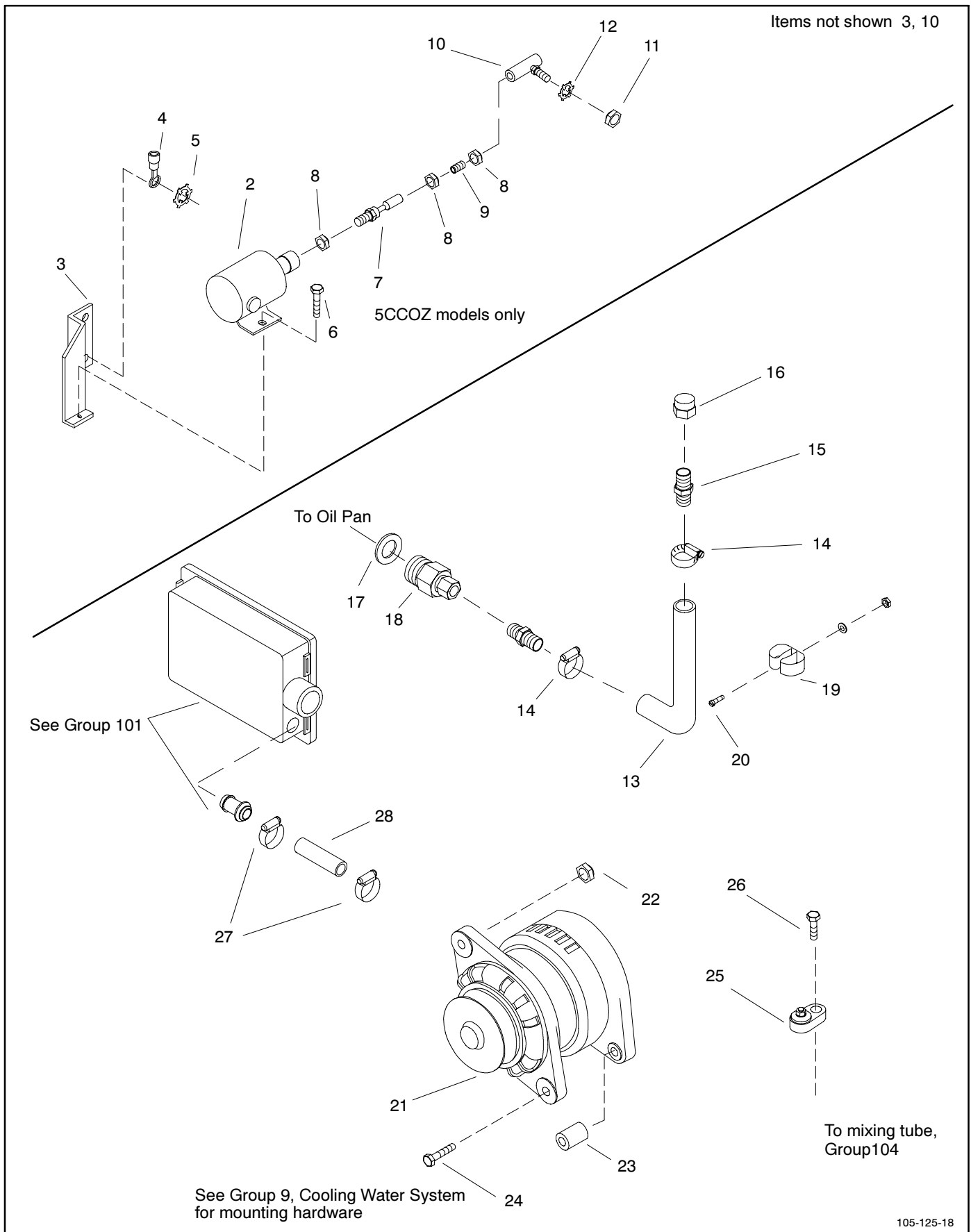
**Pulley Replacement Kit Components**



#Common Hardware. Procure Locally.

# Notes

# Group 105: Engine



105-125-18



# Group 105: Engine

Item	Part Number	Description	Quantity					
			Variation Number					
			18	23	25	28	35	GR1
1	A-229304	Engine assembly (not shown; see Groups 1-14 for parts) (3TN66)	1	1				
1	A-344046	Engine assembly (not shown; see Groups 1-14 for parts) (3TNE68C)			1	1		
1	A-344896	Engine assembly (not shown; see Groups 1-14 for parts) (3TNE74C)					1	1
2	258628	Solenoid, fuel See Group 12, Governor, for solenoid on engine variations 25, 28, and 35.						
2	229344	Solenoid, fuel*	1	1				
3	229881	Bracket, solenoid	1	1				
3	229293	Bracket, solenoid*	1					
3	265861	Spacer, (not shown)*	2					
4	X-283-15	Terminal	1	1				
5	X-22-12	Washer, shakeproof, 1/4	2	2				
6	#	Hardware, 1/4-20	2	2				
7	229352	Ball joint	1	1				
7	273731	Ball joint*	1					
8	X-81-9	Nut, hex, 1/4-28	2	2				
9	X-352-82	Stud	1					
10	273730	Ball joint	1	1				
10	276570	Ball joint*	1					
10	229343	Spacer (not shown)*	1					
10	X-465-19	Screw, 1/4-28 x.50, ref.*	1					
11	#	Nut, 1/4-20	1	1				
12	X-22-11	Washer, lock, 1/4	2	2				
13	X-651-34	Hose	1	1			1	
13	X-651-19	Hose						1
14	X-426-9	Clamp, hose	2		2			
14	X-426-9	Clamp, hose					1	1
15	X-652-1	Fitting, hose	2					
16	X-268-3	Cap, pipe	1					
17	X-25-135	Washer, plain	1		1	1		
17	X-25-145	Washer, plain					1	1
18	229303	Valve, drain	1					
18	344827	Valve, drain			1	1		
18	344828	Valve, drain					1	
18	X-75-10	Plug, pipe		1				
18	225127	Bushing, adapter		1				
19	X-6084-1	Clip, hose	1		1		1	1
20	#	Hardware, 1/4-20	1		1		1	
21	256924	Alternator	1	1	1	1	1	
22	X-6053-6	Nut, hex. M5 x .80	1	1	1	1	1	
23	X-400-152	Spacer	1	1	1	1		
23	X-400-228	Spacer					1	
24	#	Hardware, 5/16-18	1	1	1	1	1	
25	249872	Switch, high temperature cutout	1	1	1	1	1	1
26	X-6238-10	Screw, 3/8-16 x .75	1	1	1	1	1	1
27	X-426-10	Clamp, hose					2	2
28	X-6242-4	Hose					1	1
29	GM13660	V-belt, 25.5 in. (not shown, see Group 104)				1	1	1

\*Variation 18 only: Use this part number before generator set serial number 319499.

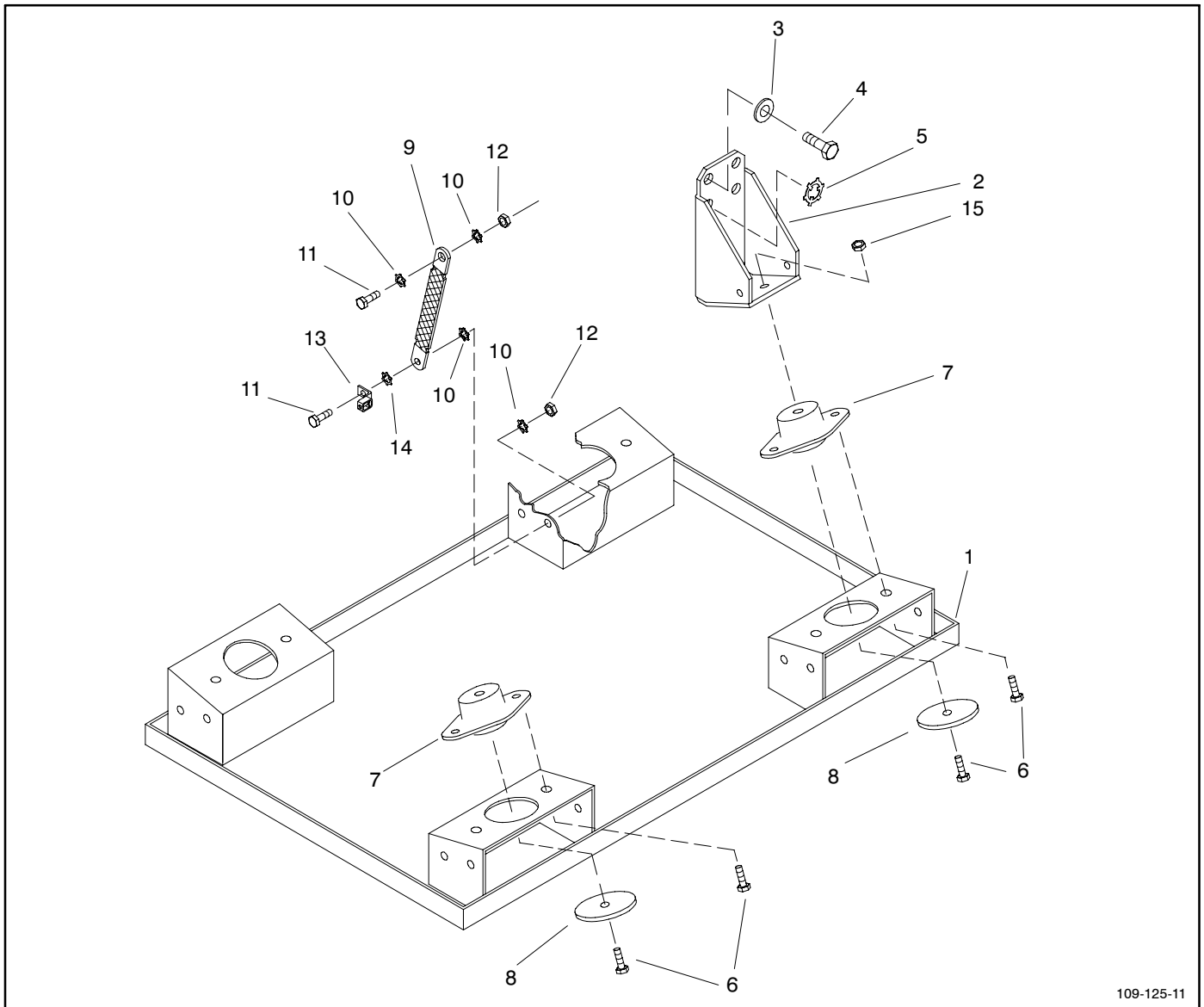
# Common hardware; procure locally.

## Group 107: Nameplate and Decals

Item	Part Number	Description	Quantity		
			Variation Number		
			7	11	14
1	249810	Decal, warning "Hot Coolant"	1	1	1
2	246274	Decal, "Notice Zinc Anode"	1		
2	344282	Decal, "Notice Zinc Anode"		1	1
3	226917	Decal, negative battery connection	1	1	1
4	290435	Decal, equipment ground	1		
4	344295	Decal, equipment ground		1	1
5	GM14167	Decal, drain	3	3	3
6	249808	Decal, warning, "Rotating Parts"	1	1	1
7	224233	Decal, 1-800 number	1	1	1
8	267468	Decal, Coast Guard	1	1	1
9	249809	Decal, warning "Hot Engine"	1	1	1
10	229177	Nameplate	1	1	1
11	X-793-3	Rivet, pop	4		4
12	X-6348-6	Decal		1	1
13	229831	Decal, reconnection	1	1	1
14	344486	Decal, CE		1	1
15	294520	Decal, danger high voltage		1	1

Nameplate and decals not illustrated.

# Group 109: Skid and Plant Mounting

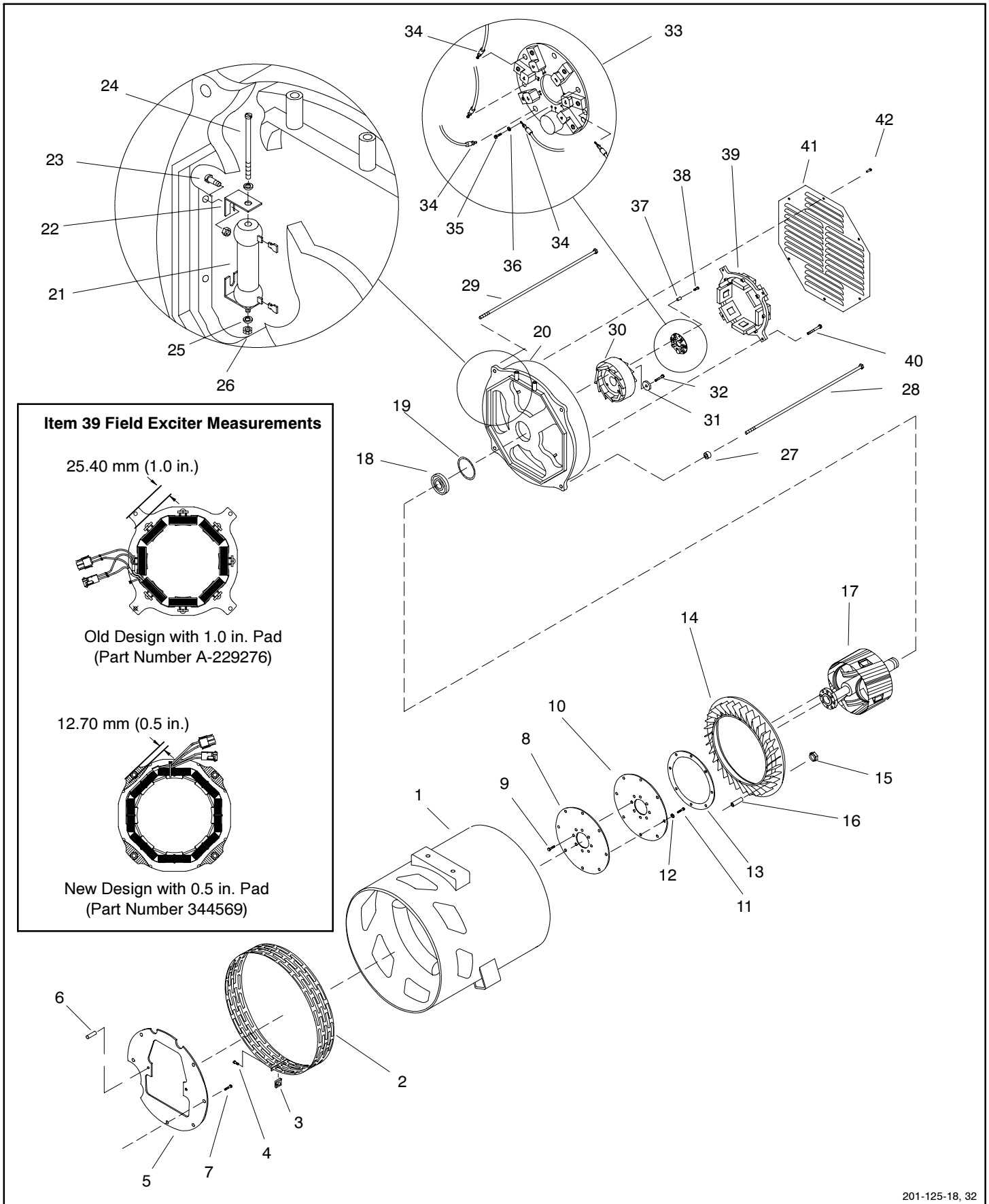


109-125-11

Item	Part Number	Description	Quantity	
			11	12
1	229282	Tray	1	1
2	344895	Bracket, engine mounting	2	2
3	#	Washer, 1/2	7	7
4	X-6051-2	Screw, hex hd, M10-1.50	8	8
5	X-22-15	Washer, lock, 7/16	1	1
6	#	Hardware, 5/16-18	12	12
7	225124	Vibromount	4	4
8	X-25-96	Washer, plain	4	4
9	245297	Strap, ground	1	1
10	X-22-12	Washer, shakeproof, 1/4	4	4
11	#	Hardware, 5/16-18	2	2
12	#	Hardware, 1/4-20	2	2
13	X-377-12	Connector, cable	1	1
14	X-22-11	Washer, lock, 1/4	1	1
15	X-101-16	Nut, elastic stop, 5/16-18	2	2

# Common hardware; procure locally.

# Group 201: Generator and Mounting



201-125-18, 32

## Group 201: Generator and Mounting

Item	Part Number	Description	Quantity		
			Variation Number		
			18	26	32
1	229838	Stator assembly	1	1	1
2	229109	Guard, generator fan	1	1	1
3	257442	Clip, speed	1	1	1
4	X-67-125	Screw, tapping, 10-24	1	1	1
5	229349	Plate, locator	1	1	1
6	229356	Pin, knurled	2	2	2
7	M933-10012-60	Screw, M10-1.50	5	5	5
8	229389	Disc, drive	1	1	1
9	X-6238-3	Screw, 3/8-16 x .875	8	8	8
10	229347	Disc, drive	2	2	2
11	M933-08016-60	Screw, HC, M8-1.25	6	6	6
12	#	Washer, 5/16 W	8	8	8
13	229346	Disc, fan locator	1	1	1
14	225215	Fan, generator	1	1	1
15	X-101-9	Nut, elastic stop, 10-24	4	4	4
16	X-400-189	Spacer	4	4	4
17	A-229837	Rotor assembly (includes item 18)	1	1	1
18	X-758-15	Bearing, ball	1	1	1
19	229110	O-ring	1	1	1
20	See note below	Bracket, end	1		
20	344566	Bracket, end		1	1
21	229877	Resistor assembly	1	1	
21	229350	Resistor assembly			1
22	X-363-1	Bracket, resistor mounting	2	2	2
23	#	Hardware, 1/4-20	2	2	2
24	X-51-46	Screw, RHM 8-32 x 5	1	1	1
25	X-364-4	Washer, resistor	2	2	2
26	#	Nut, 8/32	1	1	1
27	X-801-3	Washer, hardened	4	4	4
28	X-6051-14	Screw, HC, M10 -1.5	3	3	3
29	X-6051-20	Screw, HC, M10 -1.5	1	1	1
30	229098	Exciter, armature	1		
30	344567	Exciter, armature		1	1
31	X-25-129	Washer, plain	1	1	1
32	X-6238-3	Screw, 3/8-16 x .875	1	1	1
32	X-22-1	Washer, lock		1	1
33	A-229152	Circuit board, diode board	1	1	1
34	X-283-3	Terminal	3	3	3
35	X-51-8	Screw, 8-32 x .75	5	5	5
36	#	Washers, #8	5	5	5
37	X-712-17	Spacer	3	3	3
38	X-67-135	Screw, tapping, 10-24	3	3	3
39	See note below	Exciter assembly, field	1		
39	344569	Exciter assembly, field		1	1
40	X-97-15	Screw, hex, 10-24	4	4	4
41	225545	Panel, end bracket	1	1	1
42	X-67-113	Screw, tapping, 10-32	6	6	6

# Common hardware; procure locally.

### Note

The replacement part numbers of the end bracket and field exciter assembly in variation 18 depend on the length of the field exciter's (item 39) mounting pad.

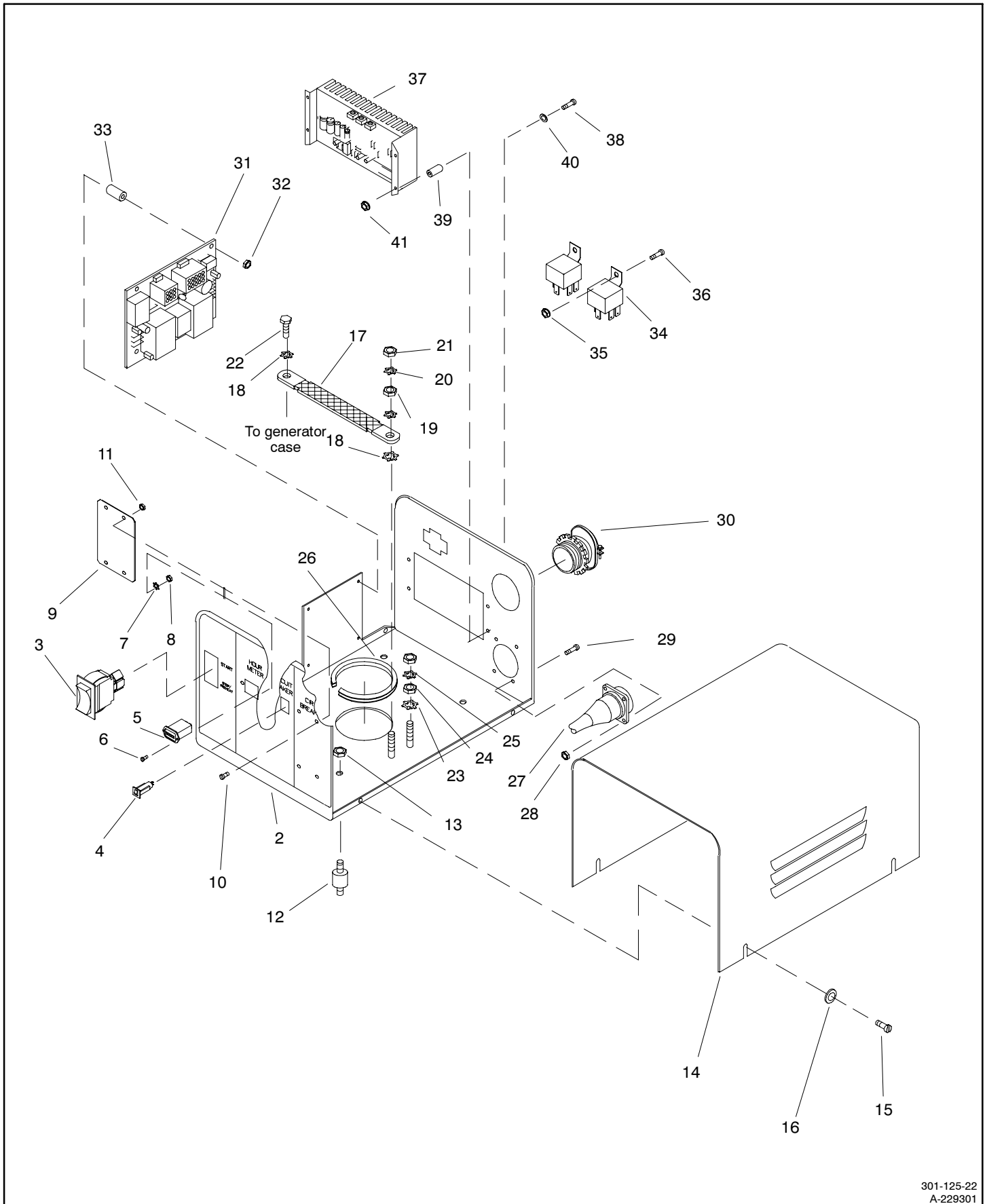
Measure the pad after referring to the measurement points on the drawing insert on the opposite page. Use the adjacent table to determine the end bracket and exciter part numbers.

Use the following table to determine replacement service part numbers.

### Service Part Numbers

Approximate Length of Field Exciter Mounting Pad	Replacement Part Number	
	Item 20, End Bracket	Item 39, Field Exciter
12.70 mm (0.5 in.)	344566	344569
25.40 mm (1.0 in.)	Order kit 354241*	
* Kit includes both the end bracket and field exciter.		

# Group 301: Controller and Mounting



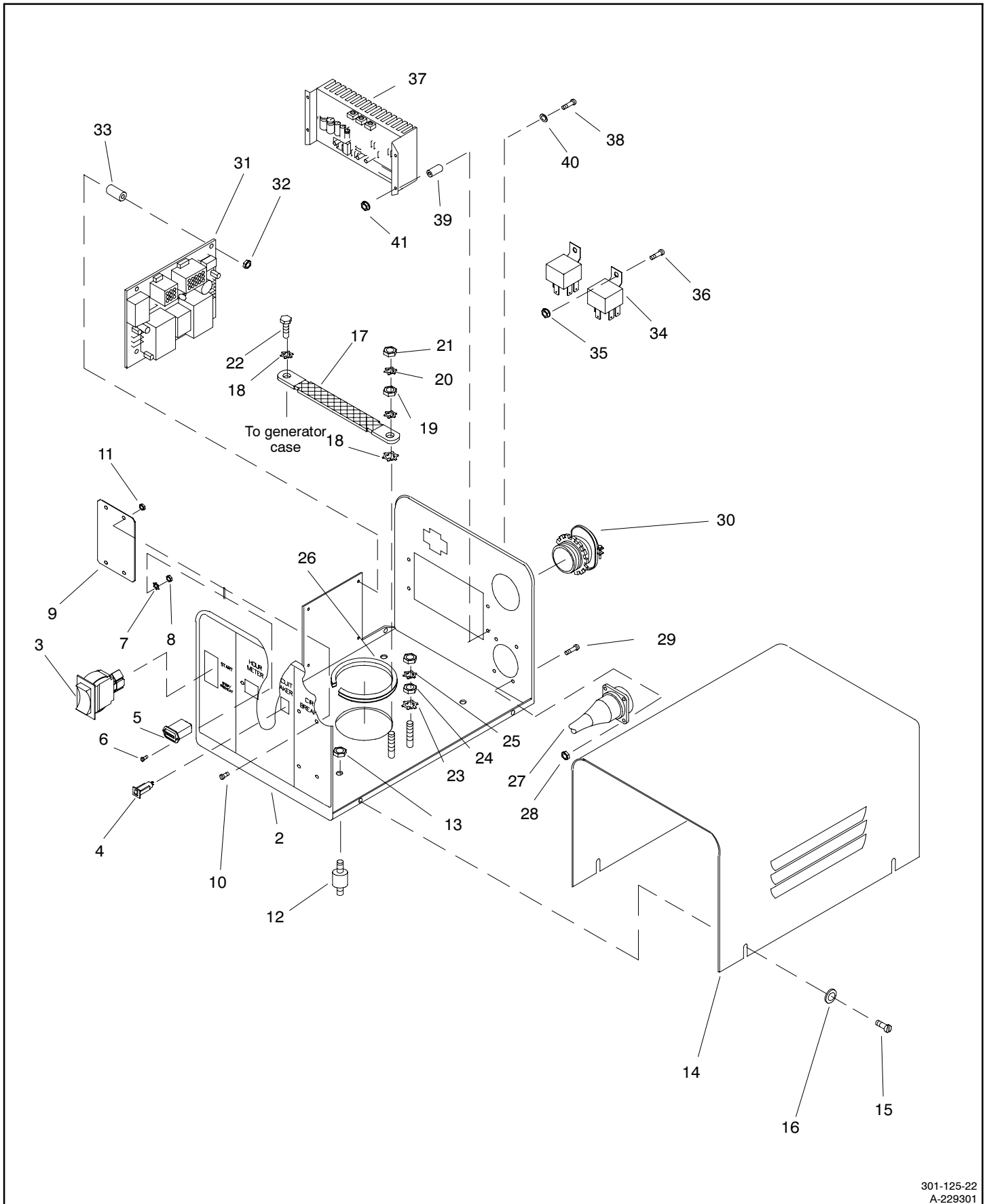
301-125-22  
A-229301

## Group 301: Controller and Mounting

Item	Part Number	Description	Quantity				
			Variation Number				
			22	27	32	33	44
1	A-229301	Controller assembly	1				
1	A-344002	Controller assembly (includes items 2-27)		1			
1	A-344322	Controller assembly (includes items 2-27)			1		
1	A-344321	Controller assembly (includes items 2-11, 14, 17-41)				1	1
2	229332	Box, controller	1			1	1
2	334004	Box, controller		1	1		
3	249406	Switch, rocker	1			1	1
3	229997	Switch, rocker		1	1		
4	250719	Breaker, circuit, 10 amp	1	1	1	1	1
5	238736	Hourmeter	1	1	1	1	1
6	X-49-26	Screw, 6-32 x .625	2	2	2	2	2
7	X-22-6	Washer, lock, #6	2	2	2	2	2
8	X-71-2	Nut, hex, 6-32	2	2	2	2	2
9	245264-BLK	Plate, cover	1			1	1
9	X-506-50	Breaker, circuit		1			
9	X-506-47	Breaker, circuit			1		
10	X-49-25	Screw, 6-32 x 5	4	4	4	4	4
11	#	Nut, 6-32	4	4	4	4	4
12	229353	Mount, controller	4	4	4	4	4
13	#	Nut, 1/4-20	4	4	4	4	4
14	229305	Cover, controller	1	1	1	1	1
15	X-67-52	Screw, hex head, 10-24	4	4	4	4	4
16	#	Washer, #10	4	4	4	4	4
17	246083	Strap, ground	1	1	1	1	1
18	X-22-12	Washer, shakeproof	2	2	2	2	2
19	#	Hardware, 1/4-20	1	1	1	1	1
20	X-22-11	Washer, lock 1/4	3	3	3	3	3
21	X-81-8	Nut, hex 1/4-20, green	1	1	1	1	1
22	#	Bolt, 1/4-20	1	1	1	1	1
23	X-22-12	Washer, shakeproof, 1/4	2	2	2	2	2
24	#	Hardware, 1/4-20	2	2	2	2	2
25	X-22-11	Washer, lock, 1/4	1	1	1	1	1
26	X-6033-4	Grommet, nylon	1	1	1	1	1
27	229333	Harness, controller	1			1	1
27	344020	Harness, controller (includes the following)		1	1		
27	223316	Fuse, 10 amp	1	1	1	1	1
27	233959	Diode, 6 amp, 100 V	4	4	4	4	4
27	239496	Connector, 22-pin	1	1	1	1	1
27	241616	Connector, 6-pin	1	1	1	1	1
27	258405	Fuse, 8 amp	1	1	1	1	1
27	259689	Connector, 9-pin	1	1	1	1	1
27	269216	Fuse holder	2	2	2	2	2
27	269366	Connector, 15-pin	1	1	1	1	1
27	269190	Connector, 6-pin (P5)	1	1	1	1	1
28	X-71-2	Nut, hex 6-32	4	4	4	4	4

# Common hardware; procure locally.

# Group 301: Controller and Mounting, continued



301-125-22  
A-229301



## Group 301: Controller and Mounting, continued

Item	Part Number	Description	Quantity				
			Variation Number				
			22	27	32	33	44
29	X-49-26	Screw, 6-32 x .625	4	4	4	4	4
30	X-6266-1	Connector, cable	1	1	1	1	1
31	H-239563	Circuit board assembly	1	1	1	1	1
32	X-71-2	Nut, hex, 6-32	4	4	4	4	4
33	X-712-11	Spacer, fiber	5	5	5	5	5
34	259391	Relay	2	2	2	2	2
35	#	Nut, 10-24	2	2	2	2	2
36	X-50-13	Screw, #10-24 x .375	2	2	2	2	2
37	228605	Voltage regulator (PBIIE)	1	1	1	1	1
37	G-278598	PCB assembly					1
38	X-51-5	Screw, #8-32 x .438	4	4	4	4	4
39	249986	Spacer	4	4	4	4	4
40	#	Washer, #8	4	4	4	4	4
41	#	Nut, #8-32	4	4	4	4	4
42	229325	Harness, engine wiring (not shown)	1				
42	344016	Harness, engine wiring (not shown)		1			
42	344217	Harness, engine wiring (not shown)			1		
42	344216	Harness, engine wiring (not shown)				1	1
43	248362	Relay		1	1		
44	233442	Relay, status		1	1		
45	229233	Harness, air heater relay		1	1		

**Note:** Controller assembly includes items 2-11, 14, 17-41

# Common hardware; procure locally.

## Group 501: Housing

Variation 2: See parts list of sound shield kit PA-229943 in accessories section for parts listing.

Variation 6: See parts list of sound shield kit PA-334330 in accessories section for parts listing.

## Group 701: Literature

Item	Part Number	Description	Quantity			
			Variation Number			
			11	12	15	18
1	TP-5365	S/M Yanmar 3TN82E/4TN8E (AOC1752)	1	1		
1	TP-5876	S/M Yanmar TNE Series (AOA5063)			1	1
1	TP-5968	O/M Yanmar TNE Series (AOB5017-I)			1	
2	TP-5586	O/I/M 5/9CCOZ; 3.5/8CCFOZ, Marine	1			
2	TP-5766	O/I/M 5/9EOZ, Marine		1		
2	TP-5766	O/I/M 5/9EOZ, Marine		1		
2	TP-5969	O/M Yanmar 4TNE98 Series				1
2	TP-6068	O/M 4-32EOZ/EFOZ (TNE Engines), Marine			1	
3	TP-6069	I/M 3.5-150EOZ/EFOZ, Marine			1	
4	TP-5588	S/M 5/9CCOZ, 4/8CCFOZ, Marine	1	1		
4	TP-5936	S/M 32EOZ/27EFOZ, Marine				1
4	TP-6053	S/M 5/8/9/10EOZ, 4/6.5/8/9EFOZ, Marine			1	
4	TP-6054	S/M Yanmar 4TNE94/98/106/T (AOA5062)				1
5	TP-5620	Safety Precautions, Marine	1	1	1	1
6	TP-5375	Warranty, Marine			1	1

## Paint and Miscellaneous Parts

Item	Part Number	Description	Quantity			
			Variation Number			
			11	12	15	18
1	221334	Gallon can of white paint	1	1	1	1
1	221335	Spray can of white paint	1	1	1	1

# Parts List: Accessories

Qty.	Description	Part No.
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## Battery Cables Kits

<b>Battery Cable Kit</b>		<b>PA-250761</b>
1	Cable, battery, positive	X-545-47
1	Cable, battery, negative	X-545-48

## Circuit Breaker Kits

<b>Circuit Breaker Kit</b>		<b>PA-225630</b>
1	Breaker, circuit, 25 amp	X-506-40
1	Decal, notice	246242
1	Jumper	249956
1	Installation Instructions	TT-875

<b>Circuit Breaker Kit</b>		<b>PA-225640</b>
1	Breaker, circuit, 40 amp	X-506-50
1	Plate, cover	229183
1	Decal, notice	246242
1	Installation Instructions	TT-875

<b>Circuit Breaker Kit</b>		<b>PA-228670</b>
1	Breaker, circuit, 20 amp	X-506-53
1	Decal, notice	246242
1	Plate, cover	229183
1	Installation Instructions	TT-875

<b>Circuit Breaker Kit</b>		<b>PA-229184</b>
1	Breaker, circuit, 35 amp	X-506-46
1	Decal, notice	246242
1	Plate, cover	229183
1	Installation Instructions	TT-875

<b>Circuit Breaker Kit</b>		<b>PA-229185</b>
1	Breaker, circuit, 55 amp	X-506-47
1	Decal, notice	246242
1	Plate, cover	229183
1	Installation Instructions	TT-875

<b>Circuit Breaker Kit</b>		<b>PA-344050</b>
1	Breaker, circuit, 25 amp	X-506-40
1	Decal, notice	246242
1	Installation Instructions	TT-875

<b>Circuit Breaker Kit</b>		<b>PA-344051</b>
1	Breaker, circuit, 22 amp	X-506-41
1	Decal, notice	246242
1	Installation Instructions	TT-875

<b>Circuit Breaker Kit</b>		<b>PA-344106</b>
1	Breaker, circuit, 22 amp	X-506-57
1	Decal, notice	246242
1	Jumper	249956
1	Installation Instructions	TT-875

<b>Circuit Breaker Kit</b>		<b>PA-344309</b>
1	Breaker, circuit, 22 amp	X-506-57
1	Decal, notice	246242
1	Installation Instructions	TT-875

Qty.	Description	Part No.
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## Flexible Fuel Line Kits

<b>Flexible Fuel Line</b>		<b>PA-250798</b>
2	Hose, fuel overflow	258344

## Fuel Attachment Block

<b>Fuel Block</b>		<b>PA-229834</b>
1	Installation Instructions	TT-1010
2	Screw	X-125-29
1	Line, Fuel, 1/4 in.	X-386-19
1	Line, Fuel, 1/2 in.	X-386-57
2	Elbow, hose connector	X-391-20
2	Spacer, 0.344 x 0.625 x 0.656	X-400-100
4	Clamp, hose	X-426-9
3	Fitting, hose	X-652-3
1	Block, fuel	229835

## Harnesses

<b>Extension Harness Kit, 15 Ft.</b>		<b>PA-249334</b>
1	Strap, wire, 5/8	X-526-3
1	Harness, extension	249334

<b>Extension Harness Kit, 25 Ft.</b>		<b>PA-249336</b>
1	Strap, wire, 5/8	X-526-3
1	Harness, extension	249336

<b>Remote Harness, Pigtail</b>		<b>PA-249941</b>
1	Harness, extension	249935

<b>Fire System Interface</b>		<b>PA-229833</b>
1	Harness, wiring	229832
1	Installation Instructions	TT-930

## Coolant Overflow Extension Hose

<b>Coolant Overflow Extension Hose</b>		<b>PA-229931</b>
2	Clamp, hose	X-426-10
1	Hose, 10.8 ft.	X-651-30

# Parts List: Accessories

Qty.	Description	Part No.
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Qty.	Description	Part No.
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## Panel and Meter Kits

### Remote Start Panel Kit

#### PA-250797

1	Decal, warning	249494
1	Installation Instructions	TT-642
1	Panel assembly, remote (includes the following)	A-250795
1	Connector, plug	241617
1	Panel, remote	250796
1	Switch, rocker	269296

### Remote Start and 4-Meter Panel

#### PAA-267414

1	Screw, RHM, 8-32 x 3/4	X-51-11
1	Installation Instructions	TT-688
1	Decal, warning	249494
1	Panel assembly, control (includes the following)	A-267414
1	Switch, rocker	249330
1	Harness, wiring	249467
1	Panel	249419
1	Gauge, oil pressure	249438
1	Gauge, water temperature	249440
1	Meter, hour	249461
1	Voltmeter, battery	249462

### Remote Start and 2-Meter Panel

#### PAA-267415

1	Installation Instructions	TT-687
1	Screw, RHM, 8-32 x 3/4	X-51-11
1	Decal, warning	249494
1	Panel assembly, control (includes the following)	A-267415
1	Switch, rocker	249330
1	Harness, wiring	249331
1	Panel	249332
1	Gauge, oil pressure	249438
1	Gauge, water temperature	249440

### Remote Start and 2-Meter Panel

#### PA-344040

1	Installation Instructions	TT-1072
1	Decal, warning	249494
1	Panel assembly, control (includes the following)	A-344033
1	Switch, rocker	344039
1	Harness, wiring	344031
1	Panel	344029
1	Gauge, oil pressure	344036
1	Gauge, water temperature	344035

### Panel, Remote Start and 4 Meter (12 V)

#### PA-344041

1	Instructions, installation	TT-1073
1	Decal, warning	249494
1	Panel Assembly (includes the following)	A-344034
1	Panel	344030
1	Harness, wiring	344032
1	Gauge, water temperature	344035
1	Gauge, oil pressure	344036
1	Voltmeter	344037
1	Switch, rocker	344039
1	Gauge, hourmeter kit	GM28814
1	Nut, hex	M934-04-B

## Preheat Kit

### Air Intake Heater Kit

#### PA-229240

1	Washer, shakeproof	X-22-12
2	Washer, plain	X-25-40
1	Terminal	X-431-38
1	Screw, H.C., 1/4-20 x .75	X-465-16
1	Screw, H.C., 1/4-20 x .50	X-465-2
2	Nut, whiz lock, 1/4-20	X-6210-2
1	Harness, air heater	229233
1	Relay	233442
1	Installation Instructions	TT-897

## Seawater Strainers

1	Filter, water, 1/2 in.	X-661-1
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## Sender Kits

### Sender Kit

#### (Oil Pressure and Water Temperature)

#### PA-229390

1	Bushing, reducer, 1/8 x 1/4	X-202-27
1	Sender, oil pressure	344305
1	Sender, water temperature	249348
1	Installation Instructions	TT-896

### Sender Kit

#### PA-229354

1	Adapter, sender	229323
1	Sender, oil pressure	267408
1	Sender, water temperature	249348
1	Installation Instructions	TT-896

### Sender Kit

#### GM24405-KA1

1	Adapter, sender	225307
1	Sender, water temperature	249287
1	Fitting, 45 deg. street elbow	267428
1	Sender, oil pressure	343473
1	Installation Instructions	TT-1337

## Ship-To-Shore Switches

### Transfer Switch Kit

#### PAA-246617

1	Switch, transfer	A-246617
1	Installation Instructions	TT-535

## Siphon Break

### Siphon Break Kit

#### PA-229928

1	Valve, siphon	229928
1	Installation Instructions	TT-1268

### Siphon Break Kit

#### PA-267965

1	Valve, siphon	367935
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# Parts List: Accessories

Qty.	Description	Part No.
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## Sound Shields

### Sound Shield Kit

### PA-229322

5	Grommet	D-1128
4	Screw, H.C., #10-32 x .625	X-117-3
4	Washer, .406 x .812 x .065, plain	X-25-37
6	Washer, .281 x .625 x .065, plain	X-25-40
4	Washer, .208 x .75 x .060, plain	X-25-45
2	Hose, radiator	X-281-31
3	Plug, button	X-301-36
6	Plug, button	X-301-37
1	Plug, button	X-301-39
1	Hose	X-312-48
2	Connector, hose elbow	X-391-19
4	Spacer	X-400-192
6	Spacer	X-400-194
8	Clamp, hose	X-426-16
2	Clamp, hose, 1/2	X-426-3
2	Clamp, hose, 1-15/16	X-426-8
6	Screw, hex	X-465-18
6	Nut, whiz	X-6210-2
4	Screw, hex head	X-6216-1
4	Screw, 3/8	X-6238-3
4	Washer, nylon	X-6278-1
1	Duct, carburetor	227549
1	Coupling, bulkhead	229270
1	Rail, sound shield	229365
1	Rail, sound shield	229367
1	Rail, end	229366
1	Base	229368
2	Seal, dampening	229378
1	Insulation, foam	229380
2	Insulation, foam	229381
2	Insulation, foam	229382
1	Seal, dampening	229379
1	Plate, controller	229386
1	Tube, exhaust	229889
1	Tube, exhaust	229890
4	Mount, controller	246267
1	Enclosure, sound shield (includes all the following)	A-229369
1	Logo, Kohler	X-6267-1
1	Logo, Kohler	X-6267-2
2	Bracket, door catch	229341
1	Panel, right door	229358
1	Panel, left door	229359
1	Panel, top door	229360
1	Panel, rear right	229361
1	Panel, rear left	229362
1	Panel, front	229363
1	Panel, rear	229364
2	Support, rear mounting	229901
2	Support, rear mounting	229902
1	Latch, door	229951
1	Decal, caution	343165
1	Decal, CE	344486
1	Installation Instructions	TT-908

Qty.	Description	Part No.
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### Sound Shield Kit

### PA-229943

5	Grommet	D-1128
1	Grommet	X-294-23
4	Screw, H.C., #10-32 x .625	X-117-3
4	Washer, .281 x .625 x .065, plain	X-25-45
2	Hose, radiator	X-281-31
3	Plug, button	X-301-36
6	Plug, button	X-301-37
1	Plug, button	X-301-39
4	Spacer	X-400-192
6	Spacer	X-400-194
4	Clamp, hose	X-426-16
2	Clamp, hose, 1-15/16	X-426-8
4	Screw, hex head	X-6216-1
4	Washer, nylon	X-6278-1
1	Duct, carburetor	227549
1	Rail, end	229366
1	Rail, sound shield	229367
1	Base	229368
2	Seal, dampening	229378
1	Insulation, foam	229380
2	Insulation, foam	229381
2	Insulation, foam	229382
1	Seal, dampening	229379
1	Plate, controller	229386
1	Tube, exhaust	229889
1	Tube, exhaust	229890
1	Rail, sound shield	229896
4	Mount, controller	246267
1	Enclosure, sound shield (includes all the following)	A-229369
1	Logo, Kohler	X-6267-1
1	Logo, Kohler	X-6267-2
2	Bracket, door catch	229341
1	Panel, right door	229358
1	Panel, left door	229359
1	Panel, top door	229360
1	Panel, rear right	229361
1	Panel, rear left	229362
1	Panel, front	229363
1	Panel, rear	229364
2	Support, rear mounting	229901
2	Support, rear mounting	229902
1	Latch, door	229951
1	Decal, caution	343165
1	Decal, CE	344486
1	Installation Instructions	TT-908

# Parts List: Accessories

Qty.	Description	Part No.
<b>Sound Shield Kit PA-344330</b>		
5	Grommet	D-1128
4	Screw, H.C., #10-32 x .625	X-117-3
4	Washer, .281 x .625 x .065, plain	X-25-45
2	Hose, radiator	X-281-31
3	Plug, button	X-301-36
6	Plug, button	X-301-37
1	Plug, button	X-301-39
1	Hose	X-312-48
2	Connector, hose elbow	X-391-19
4	Spacer	X-400-192
6	Spacer	X-400-194
8	Clamp, hose	X-426-16
2	Clamp, hose, 1/2	X-426-3
2	Clamp, hose, 1 15/16	X-426-8
4	Screw, hex head	X-6216-1
4	Washer, nylon	X-6278-1
1	Duct, carburetor	227549
1	Coupling, bulkhead	229270
1	Rail, sound shield	229365
1	Rail, end	229366
1	Rail, sound shield	229367
1	Base	229368
2	Seal, dampening	229378
1	Seal, dampening	229379
1	Insulation, foam	229380
2	Insulation, foam	229381
2	Insulation, foam	229382
1	Plate, controller	229386
1	Tube, exhaust	229889
1	Tube, exhaust	229890
4	Mount, controller	246267
1	Enclosure, sound shield (includes all the following)	A-344326
1	Decal	X-6348-3
2	Bracket, door catch	229341
1	Panel, right door	229358
1	Panel, left door	229359
1	Panel, top door	229360
1	Panel, rear right	229361
1	Panel, rear left	229362
1	Panel, front	229363
1	Panel, rear	229364
2	Support, rear mounting	229901
2	Support, rear mounting	229902
1	Latch, door	229951
1	Decal, caution	343165
1	Decal, CE	344486
1	Installation Instructions	TT-908

Qty.	Description	Part No.
<b>Sound Shield Kit GM22730-KP1</b>		
28	Washer (0.281 x 0.625 x 0.065)	X-25-142
1	Washer, plain .281 ID x .625 in. OD	X-25-68
4	Washer, plain (0.406 x 0.812 x 0.065)	X-25-37
8	Clamp, hose (2.75 x 1.81)	X-426-16
2	Clamp, hose (1.06 x 0.56)	X-426-3
28	Screw, hex cap (1/4-20)	X-465-24
4	Screw, hardened (3/8-16 x 0.62)	X-6238-2
6	Screw, PHM (1/4-20 x 2)	X-73-33
2	Hose (2 x 6.5 in.)	GM10073
6	Washer, fiber (0.25 in. ID x 0.71 in. OD)	222889
1	Tube, exhaust (2 in. OD)	229889
6	Connector, outside	GM15486
2	Connector, inside	GM15487
1	Base (22.25 x 35.0 in.)	344961
1	Support, R.H. service side	GM22947
1	Support, L.H. nonservice side	GM22948
2	Extruded rail (13.40 in.)	359016
2	Extruded rail (6.25 in.)	344682
2	Extruded rail (0.98 in.)	GM22872
2	Extruded rail (15.44 in.)	344938
2	Extruded rail (19.31 in.)	344939
3	Extruded rail (16.75 in.)	344940
1	Tube, exhaust (2 in. OD)	344694
1	Door, engine end (18 x 15.6 in.)	359513-S
1	Door, generator end (18 x 9.69 in.)	359515-S
1	Door, rear (18 x 3.41 in.)	359514-S
1	Door, L.H. nonservice side (17.31 x 15.6 in.)	359519-S
1	Door, R.H. service side (17.31 x 15.6 in.)	359523-S
1	Duct, end bracket (18.06 x 15.12 in.)	359527-S
1	Panel, nonservice side (11.16 x 9.72 in.)	359534-S
1	Panel, service side, with decal (11.16 x 9.72 in.)	359535-S
1	oof, generator (18 x 7.9 in.)	359538-S
1	Roof, engine (18 x 17.31 in.)	359542-S
1	Rail, service side (28.75 x 4.48 in.)	363512-S
1	Rail, engine end (18.25 x 4.48 in.)	363516-S
1	Rail, nonservice side (28.75 x 4.48 in.)	363519-S
1	Rail, generator end (18.25 x 4.48 in.)	363523-S
42	Screw, drill (#8 stainless steel)	X-794-5
12	Clip, speed	297596
1	Hose (0.62 in. ID)	229259
1	Installation Instructions	TT-1323

# Parts List: Accessories

Qty.	Description	Part No.
<b>Sound Shield Kit</b>		<b>GM22729-KP1</b>
17	Washer (0.281 x 0.625 x 0.065)	X-25-142
4	Washer, plain (0.406 x 0.812 x 0.065)	X-25-37
8	Clamp, hose (2.75 x 1.81)	X-426-16
2	Clamp, hose (1.06 x 0.56)	X-426-3
17	Screw, hex cap (1/4-20)	X-465-24
4	Screw, hardened (3/8-16 x 0.62)	X-6238-2
12	Screw, PHM (1/4-20 x 2)	X-73-33
1	Hose (2 x 6.5 in.)	GM10073
12	Washer, fiber (0.25 in. ID x 0.71 in. OD)	222889
1	Tube, exhaust (2 in. OD)	229889
6	Connector, outside	GM15486
2	Connector, inside	GM15487
1	Base (31.49 x 21.37 in.)	GM13435
1	Support, R.H. service side	GM22946
1	Support, L.H. nonservice side	GM22948
2	Extruded rail (13.40 in.)	359016
2	Extruded rail (5.0 in.)	344687
2	Extruded rail (0.98 in.)	GM22872
2	Extruded rail (13.19 in.)	GM13448
1	Extruded rail (19.31 in.)	344939
1	Extruded rail (19.31 in.)	GM24884
2	Extruded rail (15.88 in.)	GM13449
1	Extruded rail (15.88 in.)	GM13499
1	Tube, exhaust (2 in. OD)	344694
1	Door, engine end (17.1 x 15.6 in.)	GM13568-S
1	Door, generator end (17.1 x 9.7 in.)	GM13569-S
1	Door, rear (17.1 x 3.4 in.)	GM13570-S
1	Door, L.H. nonservice side (15.1 x 15.6 in.)	GM13567-S
1	Door, R.H. service side (15.1 x 15.6 in.)	GM13566-S
1	Duct, end bracket (17.18 x 15.23 in.)	GM13571-S
1	Panel, nonservice side (9.9 x 9.7 in.)	GM13572-S
1	Panel, service side, with decal (9.9 x 9.7 in.)	GM13573-S
1	Roof, generator (17.12 x 6.64 in.)	GM13574-S
1	Roof, engine (15.06 x 17.12 in.)	GM13575-S
1	Rail, service side (25.25 x 4.48 in.)	GM13556-S
1	Rail, engine end (17.37 x 4.48 in.)	GM13557-S
1	Rail, nonservice side (25.25 x 4.48 in.)	GM13558-S
1	Rail, generator end (17.37 x 4.48 in.)	GM13559-S
42	Screw, drill (#8 stainless steel)	X-794-5
16	Clip, speed	297596
1	Hose (0.62 in. ID)	X-312-18
2	Nut, hex (1/4-20)	X-6234-1
1	Hose, exhaust (2 x 4 in.)	GM10074
1	Installation Instructions	TT-1322

# Appendix A Abbreviations

The following list contains abbreviations that may appear in this publication.

A, amp	ampere	cfm	cubic feet per minute	exh.	exhaust
ABDC	after bottom dead center	CG	center of gravity	ext.	external
AC	alternating current	CID	cubic inch displacement	F	Fahrenheit, female
A/D	analog to digital	CL	centerline	fglass.	fiberglass
ADC	analog to digital converter	cm	centimeter	FHM	flat head machine (screw)
adj.	adjust, adjustment	CMOS	complementary metal oxide substrate (semiconductor)	fl. oz.	fluid ounce
ADV	advertising dimensional drawing	cogen.	cogeneration	flex.	flexible
AHWT	anticipatory high water temperature	com	communications (port)	freq.	frequency
AISI	American Iron and Steel Institute	coml	commercial	FS	full scale
ALOP	anticipatory low oil pressure	Coml/Rec	Commercial/Recreational	ft.	foot, feet
alt.	alternator	conn.	connection	ft. lbs.	foot pounds (torque)
Al	aluminum	cont.	continued	ft./min.	feet per minute
ANSI	American National Standards Institute (formerly American Standards Association, ASA)	CPVC	chlorinated polyvinyl chloride	g	gram
AO	anticipatory only	crit.	critical	ga.	gauge (meters, wire size)
API	American Petroleum Institute	CRT	cathode ray tube	gal.	gallon
approx.	approximate, approximately	CSA	Canadian Standards Association	gen.	generator
AR	as required, as requested	CT	current transformer	genset	generator set
AS	as supplied, as stated, as suggested	Cu	copper	GFI	ground fault interrupter
ASE	American Society of Engineers	cu. in.	cubic inch	GND, 	ground
ASME	American Society of Mechanical Engineers	cw.	clockwise	gov.	governor
assy.	assembly	CWC	city water-cooled	gph	gallons per hour
ASTM	American Society for Testing Materials	cyl.	cylinder	gpm	gallons per minute
ATDC	after top dead center	D/A	digital to analog	gr.	grade, gross
ATS	automatic transfer switch	DAC	digital to analog converter	GRD	equipment ground
auto.	automatic	dB	decibel	gr. wt.	gross weight
aux.	auxiliary	dBA	decibel (A weighted)	H x W x D	height by width by depth
A/V	audiovisual	DC	direct current	HC	hex cap
avg.	average	DCR	direct current resistance	HCHT	high cylinder head temperature
AVR	automatic voltage regulator	deg., °	degree	HD	heavy duty
AWG	American Wire Gauge	dept.	department	HET	high exhaust temperature, high engine temperature
AWM	appliance wiring material	dia.	diameter	hex	hexagon
bat.	battery	DI/EO	dual inlet/end outlet	Hg	mercury (element)
BBDC	before bottom dead center	DIN	Deutsches Institut für Normung e. V. (also Deutsche Industrie Normenausschuss)	HH	hex head
BC	battery charger, battery charging	DIP	dual inline package	HHC	hex head cap
BCA	battery charging alternator	DPDT	double-pole, double-throw	HP	horsepower
BCI	Battery Council International	DPST	double-pole, single-throw	hr.	hour
BDC	before dead center	DS	disconnect switch	HS	heat shrink
BHP	brake horsepower	DVR	digital voltage regulator	hsg.	housing
blk.	black (paint color), block (engine)	E, emer.	emergency (power source)	HVAC	heating, ventilation, and air conditioning
blk. htr.	block heater	EDI	electronic data interchange	HWT	high water temperature
BMEP	brake mean effective pressure	EFR	emergency frequency relay	Hz	hertz (cycles per second)
bps	bits per second	e.g.	for example ( <i>exempli gratia</i> )	IC	integrated circuit
br.	brass	EG	electronic governor	ID	inside diameter, identification
BTDC	before top dead center	EGSA	Electrical Generating Systems Association	IEC	International Electrotechnical Commission
Btu	British thermal unit	EIA	Electronic Industries Association	IEEE	Institute of Electrical and Electronics Engineers
Btu/min.	British thermal units per minute	EI/EO	end inlet/end outlet	IMS	improved motor starting
C	Celsius, centigrade	EMI	electromagnetic interference	in.	inch
cal.	calorie	emiss.	emission	in. H <sub>2</sub> O	inches of water
CARB	California Air Resources Board	eng.	engine	in. Hg	inches of mercury
CB	circuit breaker	EPA	Environmental Protection Agency	in. lbs.	inch pounds
cc	cubic centimeter	EPS	emergency power system	Inc.	incorporated
CCA	cold cranking amps	ER	emergency relay	ind.	industrial
ccw.	counterclockwise	ES	engineering special, engineered special	int.	internal
CEC	Canadian Electrical Code	ESD	electrostatic discharge	int./ext.	internal/external
cert.	certificate, certification, certified	est.	estimated	I/O	input/output
cfh	cubic feet per hour	E-Stop	emergency stop	IP	iron pipe
		etc.	et cetera (and so forth)	ISO	International Organization for Standardization
				J	joule
				JIS	Japanese Industry Standard



k	kilo (1000)	MTBF	mean time between failure	RHM	round head machine (screw)
K	kelvin	MTBO	mean time between overhauls	rly.	relay
kA	kiloampere	mtg.	mounting	rms	root mean square
KB	kilobyte (2 <sup>10</sup> bytes)	MW	megawatt	rnd.	round
kg	kilogram	mW	milliwatt	ROM	read only memory
kg/cm <sup>2</sup>	kilograms per square centimeter	μF	microfarad	rot.	rotate, rotating
kgm	kilogram-meter	N, norm.	normal (power source)	rpm	revolutions per minute
kg/m <sup>3</sup>	kilograms per cubic meter	NA	not available, not applicable	RS	right side
kHz	kilohertz	nat. gas	natural gas	RTV	room temperature vulcanization
kJ	kilojoule	NBS	National Bureau of Standards	SAE	Society of Automotive Engineers
km	kilometer	NC	normally closed	scfm	standard cubic feet per minute
kOhm, kΩ	kilo-ohm	NEC	National Electrical Code	SCR	silicon controlled rectifier
kPa	kilopascal	NEMA	National Electrical Manufacturers Association	s, sec.	second
kph	kilometers per hour	NFPA	National Fire Protection Association	SI	<i>Système international d'unités</i> , International System of Units
kV	kilovolt	Nm	newton meter	SI/EO	side in/end out
kVA	kilovolt ampere	NO	normally open	sil.	silencer
kVAR	kilovolt ampere reactive	no., nos.	number, numbers	SN	serial number
kW	kilowatt	NPS	National Pipe, Straight	SPDT	single-pole, double-throw
kWh	kilowatt-hour	NPSC	National Pipe, Straight-coupling	SPST	single-pole, single-throw
kWm	kilowatt mechanical	NPT	National Standard taper pipe thread per general use	spec, specs	specification(s)
L	liter	NPTF	National Pipe, Taper-Fine	sq.	square
LAN	local area network	NR	not required, normal relay	sq. cm	square centimeter
L x W x H	length by width by height	ns	nanosecond	sq. in.	square inch
lb.	pound, pounds	OC	overcrank	SS	stainless steel
lbm/ft <sup>3</sup>	pounds mass per cubic feet	OD	outside diameter	std.	standard
LCB	line circuit breaker	OEM	original equipment manufacturer	stl.	steel
LCD	liquid crystal display	OF	overfrequency	tach.	tachometer
ld. shd.	load shed	opt.	option, optional	TD	time delay
LED	light emitting diode	OS	oversize, overspeed	TDC	top dead center
Lph	liters per hour	OSHA	Occupational Safety and Health Administration	TDEC	time delay engine cooldown
Lpm	liters per minute	OV	overvoltage	TDEN	time delay emergency to normal
LOP	low oil pressure	oz.	ounce	TDES	time delay engine start
LP	liquefied petroleum	p., pp.	page, pages	TDNE	time delay normal to emergency
LPG	liquefied petroleum gas	PC	personal computer	TDOE	time delay off to emergency
LS	left side	PCB	printed circuit board	TDON	time delay off to normal
L <sub>wa</sub>	sound power level, A weighted	pF	picofarad	temp.	temperature
LWL	low water level	PF	power factor	term.	terminal
LWT	low water temperature	ph., ∅	phase	TIF	telephone influence factor
m	meter, milli (1/1000)	PHC	Phillips head crimplite (screw)	TIR	total indicator reading
M	mega (10 <sup>6</sup> when used with SI units), male	PHH	Phillips hex head (screw)	tol.	tolerance
m <sup>3</sup>	cubic meter	PHM	pan head machine (screw)	turbo.	turbocharger
m <sup>3</sup> /min.	cubic meters per minute	PLC	programmable logic control	typ.	typical (same in multiple locations)
mA	milliampere	PMG	permanent-magnet generator	UF	underfrequency
man.	manual	pot	potentiometer, potential	UHF	ultrahigh frequency
max.	maximum	ppm	parts per million	UL	Underwriter's Laboratories, Inc.
MB	megabyte (2 <sup>20</sup> bytes)	PROM	programmable read-only memory	UNC	unified coarse thread (was NC)
MCM	one thousand circular mils	psi	pounds per square inch	UNF	unified fine thread (was NF)
MCCB	molded-case circuit breaker	pt.	pint	univ.	universal
meggar	megohmmeter	PTC	positive temperature coefficient	US	undersize, underspeed
MHz	megahertz	PTO	power takeoff	UV	ultraviolet, undervoltage
mi.	mile	PVC	polyvinyl chloride	V	volt
mil	one one-thousandth of an inch	qt.	quart, quarts	VAC	volts alternating current
min.	minimum, minute	qty.	quantity	VAR	voltampere reactive
misc.	miscellaneous	R	replacement (emergency) power source	VDC	volts direct current
MJ	megajoule	rad.	radiator, radius	VFD	vacuum fluorescent display
mJ	millijoule	RAM	random access memory	VGA	video graphics adapter
mm	millimeter	RDO	relay driver output	VHF	very high frequency
mOhm, mΩ	milliohm	ref.	reference	W	watt
MOhm, MΩ	megohm	rem.	remote	WCR	withstand and closing rating
MOV	metal oxide varistor	Res/Coml	Residential/Commercial	w/	with
MPa	megapascal	RFI	radio frequency interference	w/o	without
mpg	miles per gallon	RH	round head	wt.	weight
mph	miles per hour			xfmr	transformer
MS	military standard				
m/sec.	meters per second				

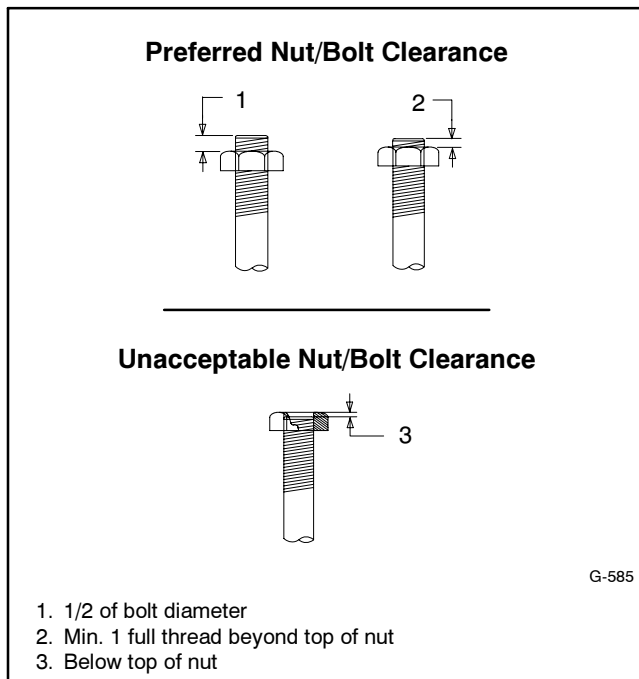
# Appendix B Common Hardware Application Guidelines

Use the information below and on the following pages to identify proper fastening techniques when no specific reference for reassembly is made.

**Bolt/Screw Length:** When bolt/screw length is not given, use Figure 1 as a guide. As a general rule, a minimum length of one thread beyond the nut and a maximum length of 1/2 the bolt/screw diameter beyond the nut is the preferred method.

**Washers and Nuts:** Use split lock washers as a bolt locking device where specified. Use SAE flat washers with whiz nuts, spirallock nuts, or standard nuts and preloading (torque) of the bolt in all other applications.

See Appendix C, General Torque Specifications, and other torque specifications in the service literature.



**Figure 1** Acceptable Bolt Lengths

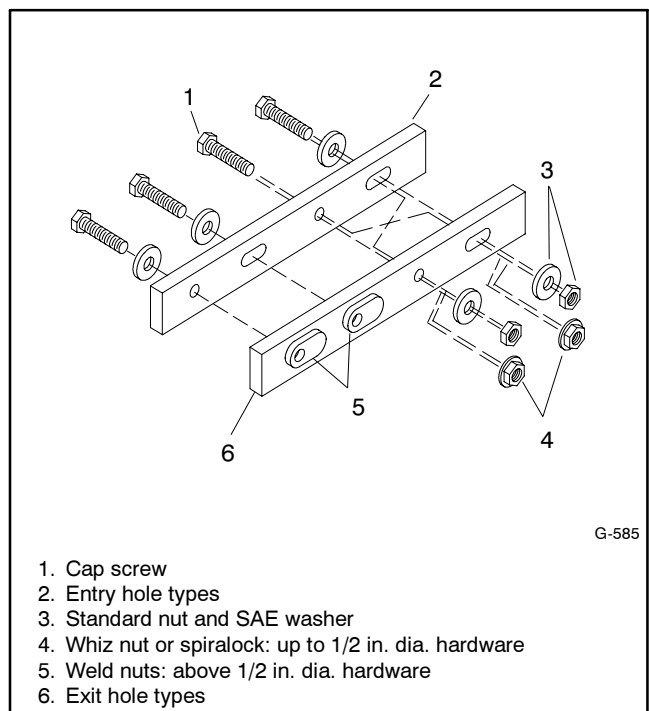
1. 1/2 of bolt diameter
2. Min. 1 full thread beyond top of nut
3. Below top of nut

Steps for common hardware application:

1. Determine entry hole type: round or slotted.
2. Determine exit hole type: fixed female thread (weld nut), round, or slotted.

For round and slotted exit holes, determine if hardware is greater than 1/2 inch in diameter, or 1/2 inch in diameter or less. Hardware that is *greater than 1/2 inch* in diameter takes a standard nut and SAE washer. Hardware *1/2 inch or less* in diameter can take a properly torqued whiz nut or spirallock nut. See Figure 2.

3. Follow these SAE washer rules after determining exit hole type:
  - a. Always use a washer between hardware and a slot.
  - b. Always use a washer under a nut (see 2 above for exception).
  - c. Use a washer under a bolt when the female thread is fixed (weld nut).
4. Refer to Figure 2, which depicts the preceding hardware configuration possibilities.



**Figure 2** Acceptable Hardware Combinations

1. Cap screw
2. Entry hole types
3. Standard nut and SAE washer
4. Whiz nut or spirallock: up to 1/2 in. dia. hardware
5. Weld nuts: above 1/2 in. dia. hardware
6. Exit hole types

## Appendix C General Torque Specifications















Use the following torque specifications when service literature instructions give no specific torque values. The charts list values for new plated, zinc phosphate, or












oiled threads. Increase values by 15% for nonplated threads. All torque values are +0%/-10%.






<b>American Standard Fasteners Torque Specifications</b>					
Size	Torque Measurement	Assembled into Cast Iron or Steel			Assembled into Aluminum Grade 2 or 5
		Grade 2	Grade 5	Grade 8	
8-32	Nm (in. lb.)	1.8 (16)	2.3 (20)	—	1.8 (16)
10-24	Nm (in. lb.)	2.9 (26)	3.6 (32)	—	2.9 (26)
10-32	Nm (in. lb.)	2.9 (26)	3.6 (32)	—	2.9 (26)
1/4-20	Nm (in. lb.)	6.8 (60)	10.8 (96)	14.9 (132)	6.8 (60)
1/4-28	Nm (in. lb.)	8.1 (72)	12.2 (108)	16.3 (144)	8.1 (72)
5/16-18	Nm (in. lb.)	13.6 (120)	21.7 (192)	29.8 (264)	13.6 (120)
5/16-24	Nm (in. lb.)	14.9 (132)	23.1 (204)	32.5 (288)	14.9 (132)
3/8-16	Nm (ft. lb.)	24.0 (18)	38.0 (28)	53.0 (39)	24.0 (18)
3/8-24	Nm (ft. lb.)	27.0 (20)	42.0 (31)	60.0 (44)	27.0 (20)
7/16-14	Nm (ft. lb.)	39.0 (29)	60.0 (44)	85.0 (63)	—
7/16-20	Nm (ft. lb.)	43.0 (32)	68.0 (50)	95.0 (70)	—
1/2-13	Nm (ft. lb.)	60.0 (44)	92.0 (68)	130.0 (96)	—
1/2-20	Nm (ft. lb.)	66.0 (49)	103.0 (76)	146.0 (108)	—
9/16-12	Nm (ft. lb.)	81.0 (60)	133.0 (98)	187.0 (138)	—
9/16-18	Nm (ft. lb.)	91.0 (67)	148.0 (109)	209.0 (154)	—
5/8-11	Nm (ft. lb.)	113.0 (83)	183.0 (135)	259.0 (191)	—
5/8-18	Nm (ft. lb.)	128.0 (94)	208.0 (153)	293.0 (216)	—
3/4-10	Nm (ft. lb.)	199.0 (147)	325.0 (240)	458.0 (338)	—
3/4-16	Nm (ft. lb.)	222.0 (164)	363.0 (268)	513.0 (378)	—
1-8	Nm (ft. lb.)	259.0 (191)	721.0 (532)	1109.0 (818)	—
1-12	Nm (ft. lb.)	283.0 (209)	789.0 (582)	1214.0 (895)	—

<b>Metric Fasteners Torque Specifications, Measured in Nm (ft. lb.)</b>					
Size (mm)	Assembled into Cast Iron or Steel			Assembled into Aluminum Grade 5.8 or 8.8	
	Grade 5.8	Grade 8.8	Grade 10.9		
M6 x 1.00	5.6 (4)	9.9 (7)	14.0 (10)	5.6 (4)	
M8 x 1.25	13.6 (10)	25.0 (18)	35.0 (26)	13.6 (10)	
M8 x 1.00	21.0 (16)	25.0 (18)	35.0 (26)	21.0 (16)	
M10 x 1.50	27.0 (20)	49.0 (35)	68.0 (50)	27.0 (20)	
M10 x 1.25	39.0 (29)	49.0 (35)	68.0 (50)	39.0 (29)	
M12 x 1.75	47.0 (35)	83.0 (61)	117.0 (86)	—	
M12 x 1.50	65.0 (48)	88.0 (65)	125.0 (92)	—	
M14 x 2.00	74.0 (55)	132.0 (97)	185.0 (136)	—	
M14 x 1.50	100.0 (74)	140.0 (103)	192.0 (142)	—	
M16 x 2.00	115.0 (85)	200.0 (148)	285.0 (210)	—	
M16 x 1.50	141.0 (104)	210.0 (155)	295.0 (218)	—	
M18 x 2.50	155.0 (114)	275.0 (203)	390.0 (288)	—	
M18 x 1.50	196.0 (145)	305.0 (225)	425.0 (315)	—	

# Appendix D Common Hardware Identification

Screw/Bolts/Studs	
Head Styles	
Hex Head or Machine Head	
Hex Head or Machine Head with Washer	
Flat Head (FHM)	
Round Head (RHM)	
Pan Head	
Hex Socket Head Cap or Allen™ Head Cap	
Hex Socket Head or Allen™ Head Shoulder Bolt	
Sheet Metal Screw	
Stud	
Drive Styles	
Hex	
Hex and Slotted	
Phillips®	
Slotted	
Hex Socket	

Nuts	
Nut Styles	
Hex Head	
Lock or Elastic	
Square	
Cap or Acorn	
Wing	
Washers	
Washer Styles	
Plain	
Split Lock or Spring	
Spring or Wave	
External Tooth Lock	
Internal Tooth Lock	
Internal-External Tooth Lock	

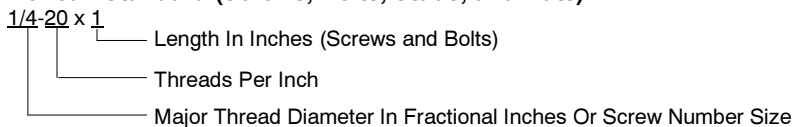
Hardness Grades	
American Standard	
Grade 2	
Grade 5	
Grade 8	
Grade 8/9 (Hex Socket Head)	
Metric	
Number stamped on hardware; 5.8 shown	

Allen™ head screw is a trademark of Holo-Krome Co.

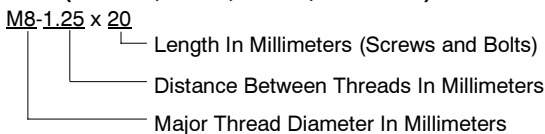
Phillips® screw is a registered trademark of Phillips Screw Company.

## Sample Dimensions

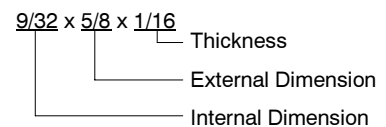
### American Standard (Screws, Bolts, Studs, and Nuts)



### Metric (Screws, Bolts, Studs, and Nuts)



### Plain Washers



### Lock Washers



# Appendix E Common Hardware List

The Common Hardware List lists part numbers and dimensions for common hardware items.

## American Standard

### Part No. Dimensions Hex Head Bolts (Grade 5)

X-465-17	1/4-20 x .38
X-465-6	1/4-20 x .50
X-465-2	1/4-20 x .62
X-465-16	1/4-20 x .75
X-465-18	1/4-20 x .88
X-465-7	1/4-20 x 1.00
X-465-8	1/4-20 x 1.25
X-465-9	1/4-20 x 1.50
X-465-10	1/4-20 x 1.75
X-465-11	1/4-20 x 2.00
X-465-12	1/4-20 x 2.25
X-465-14	1/4-20 x 2.75
X-465-21	1/4-20 x 5.00
X-465-25	1/4-28 x .38
X-465-20	1/4-28 x 1.00
X-125-33	5/16-18 x .50
X-125-23	5/16-18 x .62
X-125-3	5/16-18 x .75
X-125-31	5/16-18 x .88
X-125-5	5/16-18 x 1.00
X-125-24	5/16-18 x 1.25
X-125-34	5/16-18 x 1.50
X-125-25	5/16-18 x 1.75
X-125-26	5/16-18 x 2.00
230578	5/16-18 x 2.25
X-125-29	5/16-18 x 2.50
X-125-27	5/16-18 x 2.75
X-125-28	5/16-18 x 3.00
X-125-22	5/16-18 x 4.50
X-125-32	5/16-18 x 5.00
X-125-35	5/16-18 x 5.50
X-125-36	5/16-18 x 6.00
X-125-40	5/16-18 x 6.50
X-125-43	5/16-24 x 1.75
X-125-44	5/16-24 x 2.50
X-125-30	5/16-24 x .75
X-125-39	5/16-24 x 2.00
X-125-38	5/16-24 x 2.75
X-6238-2	3/8-16 x .62
X-6238-10	3/8-16 x .75
X-6238-3	3/8-16 x .88
X-6238-11	3/8-16 x 1.00
X-6238-4	3/8-16 x 1.25
X-6238-5	3/8-16 x 1.50
X-6238-1	3/8-16 x 1.75
X-6238-6	3/8-16 x 2.00
X-6238-17	3/8-16 x 2.25
X-6238-7	3/8-16 x 2.50
X-6238-8	3/8-16 x 2.75
X-6238-9	3/8-16 x 3.00
X-6238-19	3/8-16 x 3.25
X-6238-12	3/8-16 x 3.50
X-6238-20	3/8-16 x 3.75
X-6238-13	3/8-16 x 4.50
X-6238-18	3/8-16 x 5.50
X-6238-25	3/8-16 x 6.50

### Part No. Dimensions Hex Head Bolts, cont.

X-6238-14	3/8-24 x .75
X-6238-16	3/8-24 x 1.25
X-6238-21	3/8-24 x 4.00
X-6238-22	3/8-24 x 4.50
X-6024-5	7/16-14 x .75
X-6024-2	7/16-14 x 1.00
X-6024-8	7/16-14 x 1.25
X-6024-3	7/16-14 x 1.50
X-6024-4	7/16-14 x 2.00
X-6024-11	7/16-14 x 2.75
X-6024-12	7/16-14 x 6.50
X-129-15	1/2-13 x .75
X-129-17	1/2-13 x 1.00
X-129-18	1/2-13 x 1.25
X-129-19	1/2-13 x 1.50
X-129-20	1/2-13 x 1.75
X-129-21	1/2-13 x 2.00
X-129-22	1/2-13 x 2.25
X-129-23	1/2-13 x 2.50
X-129-24	1/2-13 x 2.75
X-129-25	1/2-13 x 3.00
X-129-27	1/2-13 x 3.50
X-129-29	1/2-13 x 4.00
X-129-30	1/2-13 x 4.50
X-463-9	1/2-13 x 5.50
X-129-44	1/2-13 x 6.00
X-129-51	1/2-20 x .75
X-129-45	1/2-20 x 1.25
X-129-52	1/2-20 x 1.50
X-6021-3	5/8-11 x 1.00
X-6021-4	5/8-11 x 1.25
X-6021-2	5/8-11 x 1.50
X-6021-1	5/8-11 x 1.75
273049	5/8-11 x 2.00
X-6021-5	5/8-11 x 2.25
X-6021-6	5/8-11 x 2.50
X-6021-7	5/8-11 x 2.75
X-6021-12	5/8-11 x 3.75
X-6021-11	5/8-11 x 4.50
X-6021-10	5/8-11 x 6.00
X-6021-9	5/8-18 x 2.50
X-6239-1	3/4-10 x 1.00
X-6239-8	3/4-10 x 1.25
X-6239-2	3/4-10 x 1.50
X-6239-3	3/4-10 x 2.00
X-6239-4	3/4-10 x 2.50
X-6239-5	3/4-10 x 3.00
X-6239-6	3/4-10 x 3.50
X-792-1	1-8 x 2.25
X-792-5	1-8 x 3.00
X-792-8	1-8 x 5.00

### Part No. Dimensions Type

#### Hex Nuts

X-6009-1	1-8	Standard
X-6210-3	6-32	Whiz
X-6210-4	8-32	Whiz
X-6210-5	10-24	Whiz
X-6210-1	10-32	Whiz
X-6210-2	1/4-20	Spiralock
X-6210-6	1/4-28	Spiralock
X-6210-7	5/16-18	Spiralock
X-6210-8	5/16-24	Spiralock
X-6210-9	3/8-16	Spiralock
X-6210-10	3/8-24	Spiralock
X-6210-11	7/16-14	Spiralock
X-6210-12	1/2-13	Spiralock
X-6210-15	7/16-20	Spiralock
X-6210-14	1/2-20	Spiralock
X-85-3	5/8-11	Standard
X-88-12	3/4-10	Standard
X-89-2	1/2-20	Standard

#### Washers

Part No.	ID	OD	Thick.	Bolt/ Screw
X-25-46	.125	.250	.022	#4
X-25-9	.156	.375	.049	#6
X-25-48	.188	.438	.049	#8
X-25-36	.219	.500	.049	#10
X-25-40	.281	.625	.065	1/4
X-25-85	.344	.687	.065	5/16
X-25-37	.406	.812	.065	3/8
X-25-34	.469	.922	.065	7/16
X-25-26	.531	1.062	.095	1/2
X-25-15	.656	1.312	.095	5/8
X-25-29	.812	1.469	.134	3/4
X-25-127	1.062	2.000	.134	1

## Metric

Hex head bolts are hardness grade 8.8 unless noted.

Part No.	Dimensions	Part No.	Dimensions	Part No.	Dimensions
<b>Hex Head Bolts (Partial Thread)</b>		<b>Hex Head Bolts (Partial Thread), continued</b>		<b>Hex Head Bolts (Full Thread), continued</b>	
M931-05055-60	M5-0.80 x 55	M960-16090-60	M16-1.50 x 90	M933-12016-60	M12-1.75 x 16
M931-06040-60	M6-1.00 x 40	M931-16090-60	M16-2.00 x 90	M933-12020-60	M12-1.75 x 20
M931-06055-60	M6-1.00 x 55	M931-16100-60	M16-2.00 x 100	M961-12020-60F	M12-1.50 x 20
M931-06060-60	M6-1.00 x 60	M931-16100-82	M16-2.00 x 100*	M933-12025-60	M12-1.75 x 25
M931-06060-SS	M6-1.00 x 60	M931-16120-60	M16-2.00 x 120	M933-12025-82	M12-1.75 x 25*
M931-06070-60	M6-1.00 x 70	M931-16150-60	M16-2.00 x 150	M961-12030-60	M12-1.25 x 30
M931-06070-SS	M6-1.00 x 70	M931-20065-60	M20-2.50 x 65	M933-12030-82	M12-1.75 x 30*
M931-06075-60	M6-1.00 x 75	M931-20090-60	M20-2.50 x 90	M961-12030-82F	M12-1.50 x 30*
M931-06090-60	M6-1.00 x 90	M931-20100-60	M20-2.50 x 100	M933-12030-60	M12-1.75 x 30
M931-06145-60	M6-1.00 x 145	M931-20120-60	M20-2.50 x 120	M933-12035-60	M12-1.75 x 35
M931-06150-60	M6-1.00 x 150	M931-20140-60	M20-2.50 x 140	M961-12040-82	M12-1.25 x 40*
M931-08035-60	M8-1.25 x 35	M931-20160-60	M20-2.50 x 160	M933-12040-60	M12-1.75 x 40*
M931-08040-60	M8-1.25 x 40	M931-22090-60	M22-2.50 x 90	M933-12040-82	M12-1.75 x 40*
M931-08045-60	M8-1.25 x 45	M931-22120-60	M22-2.50 x 120	M961-14025-60	M14-1.50 x 25
M931-08050-60	M8-1.25 x 50	M931-22160-60	M22-2.50 x 160	M933-14025-60	M14-2.00 x 25
M931-08055-60	M8-1.25 x 55	M931-24090-60	M24-3.00 x 90	M961-14050-82	M14-1.50 x 50*
M931-08055-82	M8-1.25 x 55*	M931-24120-60	M24-3.00 x 120	M961-16025-60	M16-1.50 x 25
M931-08060-60	M8-1.25 x 60	M931-24160-60	M24-3.00 x 160	M933-16025-60	M16-2.00 x 25
M931-08070-60	M8-1.25 x 70	M931-24200-60	M24-3.00 x 200	M961-16030-82	M16-1.50 x 30*
M931-08070-82	M8-1.25 x 70*			M933-16030-82	M16-2.00 x 30*
M931-08075-60	M8-1.25 x 75	<b>Hex Head Bolts (Full Thread)</b>		M933-16035-60	M16-2.00 x 35
M931-08080-60	M8-1.25 x 80	M933-04006-60	M4-0.70 x 6	M961-16040-60	M16-1.50 x 40
M931-08090-60	M8-1.25 x 90	M933-05030-60	M5-0.80 x 30	M933-16040-60	M16-2.00 x 40
M931-08095-60	M8-1.25 x 95	M933-05035-60	M5-0.80 x 35	M961-16045-82	M16-1.50 x 45*
M931-08100-60	M8-1.25 x 100	M933-05050-60	M5-0.80 x 50	M933-16045-82	M16-2.00 x 45*
M931-08110-60	M8-1.25 x 110	M933-06010-60	M6-1.00 x 10	M933-16050-60	M16-2.00 x 50
M931-08120-60	M8-1.25 x 120	M933-06012-60	M6-1.00 x 12	M933-16050-82	M16-2.00 x 50*
M931-08130-60	M8-1.25 x 130	M933-06014-60	M6-1.00 x 14	M933-16060-60	M16-2.00 x 60
M931-08140-60	M8-1.25 x 140	M933-06016-60	M6-1.00 x 16	M933-16070-60	M16-2.00 x 70
M931-08150-60	M8-1.25 x 150	M933-06020-60	M6-1.00 x 20	M933-18035-60	M18-2.50 x 35
M931-08200-60	M8-1.25 x 200	M933-06025-60	M6-1.00 x 25	M933-18050-60	M18-2.50 x 50
M931-10040-82	M10-1.25 x 40*	M933-06030-60	M6-1.00 x 30	M933-18060-60	M18-2.50 x 60
M931-10040-60	M10-1.50 x 40	M933-06040-60	M6-1.00 x 40	M933-20050-60	M20-2.50 x 50
M931-10045-60	M10-1.50 x 45	M933-06050-60	M6-1.00 x 50	M933-20055-60	M20-2.50 x 55
M931-10050-60	M10-1.50 x 50	M933-07025-60	M7-1.00 x 25	M933-24060-60	M24-3.00 x 60
M931-10050-82	M10-1.25 x 50*	M933-08010-60	M8-1.25 x 10	M933-24065-60	M24-3.00 x 65
M931-10055-60	M10-1.50 x 55	M933-08012-60	M8-1.25 x 12	M933-24070-60	M24-3.00 x 70
M931-10060-60	M10-1.50 x 60	M933-08016-60	M8-1.25 x 16		
M931-10065-60	M10-1.50 x 65	M933-08020-60	M8-1.25 x 20	<b>Pan Head Machine Screws</b>	
M931-10070-60	M10-1.50 x 70	M933-08025-60	M8-1.25 x 25	M7985A-03010-20	M3-0.50 x 10
M931-10080-60	M10-1.50 x 80	M933-08030-60	M8-1.25 x 30	M7985A-03012-20	M3-0.50 x 12
M931-10080-82	M10-1.25 x 80*	M933-08030-82	M8-1.25 x 30*	M7985A-04010-20	M4-0.70 x 10
M931-10090-60	M10-1.50 x 90	M933-10012-60	M10-1.50 x 12	M7985A-04016-20	M4-0.70 x 16
M931-10090-82	M10-1.50 x 90*	M961-10020-60	M10-1.25 x 20	M7985A-04020-20	M4-0.70 x 20
M931-10100-60	M10-1.50 x 100	M933-10020-60	M10-1.50 x 20	M7985A-04050-20	M4-0.70 x 50
M931-10110-60	M10-1.50 x 110	M933-10025-60	M10-1.50 x 25	M7985A-04100-20	M4-0.70 x 100
M931-10120-60	M10-1.50 x 120	M961-10025-60	M10-1.25 x 25	M7985A-05010-20	M5-0.80 x 10
M931-10130-60	M10-1.50 x 130	M933-10025-82	M10-1.50 x 25*	M7985A-05012-20	M5-0.80 x 12
M931-10140-60	M10-1.50 x 140	M961-10030-60	M10-1.25 x 30	M7985A-05016-20	M5-0.80 x 16
M931-10180-60	M10-1.50 x 180	M933-10030-60	M10-1.50 x 30	M7985A-05020-20	M5-0.80 x 20
M931-10235-60	M10-1.50 x 235	M933-10030-82	M10-1.50 x 30*	M7985A-05025-20	M5-0.80 x 25
M931-10260-60	M10-1.50 x 260	M961-10035-60	M10-1.25 x 35	M7985A-05030-20	M5-0.80 x 30
M960-10330-60	M10-1.25 x 330	M933-10035-60	M10-1.50 x 35	M7985A-05080-20	M5-0.80 x 80
M931-12045-60	M12-1.75 x 45	M933-10035-82	M10-1.50 x 35*	M7985A-05100-20	M5-0.80 x 100
M960-12050-60	M12-1.25 x 50	M961-10040-60	M10-1.25 x 40	M7985A-06100-20	M6-1.00 x 100
M960-12050-82	M12-1.25 x 50*				
M931-12050-60	M12-1.75 x 50			<b>Flat Head Machine Screws</b>	
M931-12050-82	M12-1.75 x 50*			M965A-04012-SS	M4-0.70 x 12
M931-12055-60	M12-1.75 x 55			M965A-05012-SS	M5-0.80 x 12
M931-12060-60	M12-1.75 x 60			M965A-05016-20	M5-0.80 x 16
M931-12060-82	M12-1.75 x 60*			M965A-06012-20	M6-1.00 x 12
M931-12065-60	M12-1.75 x 65				
M931-12075-60	M12-1.75 x 75				
M931-12080-60	M12-1.75 x 80				
M931-12090-60	M12-1.75 x 90				
M931-12100-60	M12-1.75 x 100				
M931-12110-60	M12-1.75 x 110				

\* This metric hex bolt's hardness is grade 10.9.

## Metric, continued

Part No.	Dimensions	Type
<b>Hex Nuts</b>		
M934-03-50	M3-0.50	Standard
M934-04-50	M4-0.70	Standard
M934-04-B	M4-0.70	Brass
M934-05-50	M5-0.80	Standard
M934-06-60	M6-1.00	Standard
M934-06-64	M6-1.00	Std. (green)
M6923-06-80	M6-1.00	Spirallock
M982-06-80	M6-1.00	Elastic Stop
M934-08-60	M8-1.25	Standard
M6923-08-80	M8-1.25	Spirallock
M982-08-80	M8-1.25	Elastic Stop
M934-10-60	M10-1.50	Standard
M934-10-60F	M10-1.25	Standard
M6923-10-80	M10-1.50	Spirallock
M6923-10-62	M10-1.50	Spirallock†
M982-10-80	M10-1.50	Elastic Stop
M934-12-60	M12-1.75	Standard
M934-12-60F	M12-1.25	Standard
M6923-12-80	M12-1.75	Spirallock
M982-12-80	M12-1.75	Elastic Stop
M982-14-60	M14-2.00	Elastic Stop
M6923-16-80	M16-2.00	Spirallock
M982-16-80	M16-2.00	Elastic Stop
M934-18-80	M18-2.5	Standard
M982-18-60	M18-2.50	Elastic Stop
M934-20-80	M20-2.50	Standard
M982-20-80	M20-2.50	Elastic Stop
M934-22-60	M22-2.50	Standard
M934-24-80	M24-3.00	Standard
M982-24-60	M24-3.00	Elastic Stop
M934-30-80	M30-3.50	Standard

## Washers

Part No.	ID	OD	Thick.	Bolt/ Screw
M125A-03-80	3.2	7.0	0.5	M3
M125A-04-80	4.3	9.0	0.8	M4
M125A-05-80	5.3	10.0	1.0	M5
M125A-06-80	6.4	12.0	1.6	M6
M125A-08-80	8.4	16.0	1.6	M8
M125A-10-80	10.5	20.0	2.0	M10
M125A-12-80	13.0	24.0	2.5	M12
M125A-14-80	15.0	28.0	2.5	M14
M125A-16-80	17.0	30.0	3.0	M16
M125A-18-80	19.0	34.0	3.0	M18
M125A-20-80	21.0	37.0	3.0	M20
M125A-24-80	25.0	44.0	4.0	M24

† This metric hex nut's hardness is grade 8.

**TP-5616 9/05c**

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