

# Service Parts

## Marine Generator Sets



Models:

**8CCFOZ/9CCOZ**

**8EFOZ/9EOZ**

**9EFOZ/10EOZ**

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

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

TP-5587 2/08d

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# Introduction

This manual lists service replacement parts for 8–10 kW generator sets.

At the time of print this manual applied to the generator set specification (spec) numbers listed in the Specification Number Index. On occasion this manual may apply to specs not listed in the Specification Number Index.

Information in this publication represents data available at the time of print. Kohler Co. reserves the right to change this publication and the products represented without notice and without any obligation or liability whatsoever.

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.

**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.

## Numbering System Significance

This manual uses the following numbering systems:

**Specification Number.** A six-digit number with a PA-prefix. The Specification Number Index does not show the prefix. Spec 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 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.

## 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.

## 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.

## 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.

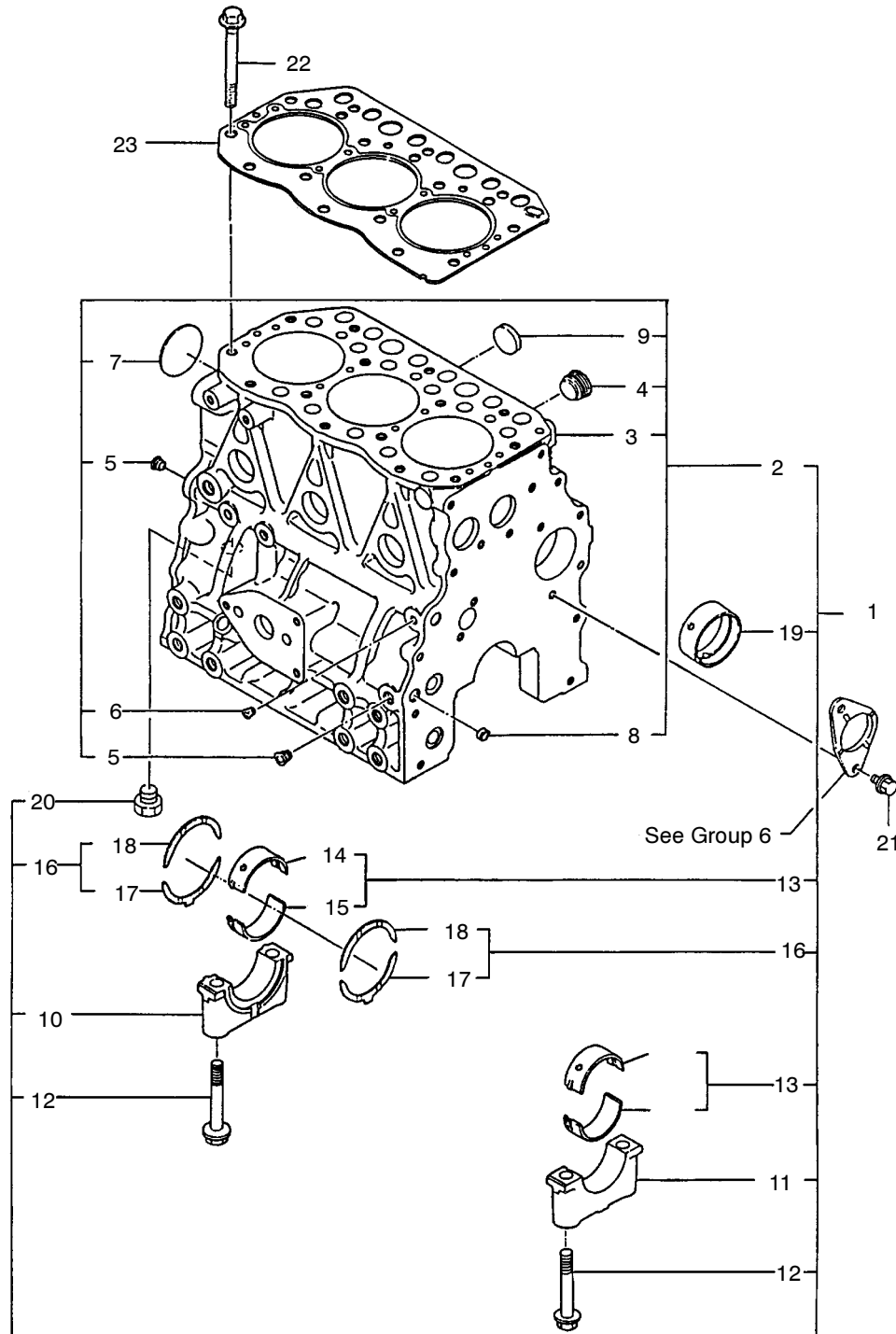
# Specification Number Index

Group Title		<i>Cylinder Block</i>	<i>Gear Housing</i>	<i>Flywheel Housing &amp; Oil Sump</i>	<i>Cylinder Head</i>	<i>Intake Manifold</i>	<i>Camshaft</i>	<i>Crankshaft, Flywheel, &amp; Pistons</i>	<i>Lube Oil System</i>	<i>Cooling Water System</i>	<i>Fuel Injection Pump</i>	<i>Fuel Injection Lines</i>	<i>Fuel Line &amp; Filter</i>	<i>Governor</i>
Group No..	1	2	3	4	5	6	7	8	9	10	11	12	13	
Spec No.	VARIATION NUMBER													
<b>8CCFOZ/ 9CCOZ</b>														
126117	1	1	1	1	1	1	1	1	1	1	1	1	1	1
126123	1	1	1	1	1	1	1	1	1	1	1	1	1	1
126135	1	1	1	1	1	1	1	1	1	1	1	1	1	1
126140	2	2	2	2	2	1	2	2	2	2	2/3	2/3	2	2
126142	2	2	2	2	2	1	2	2	2	2	2/3	2/3	2	2
126144	1	1	1	1	1	1	1	1	1	1	1	1	1	1
126146	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<b>8EFOZ/9EOZ</b>														
126168	2	2	2	2	2	1	2	2	2	2	2/3	2/3	2	2
126169	2	2	2	2	2	1	2	2	2	2	2/3	2/3	2	2
126171	2	2	2	2	2	1	2	2	3	2	2/3	4	3	3
126179	2	2	2	2	2	1	2	2	2	2	2/3	2/3	2	2
<b>9EFOZ/10EOZ</b>														
126195	3	3	2	3	2	1	3	2	2	3	4	5	2	2
126196	3	3	2	3	2	1	3	2	3	3	4	6	3	3
GM28314-GA1	3	3	2	3	2	1	3	2	2	3	4	5	2	2

# Specification Number Index

Group Title	<i>Starting Motor</i>	<i>Gasket Set</i>	<i>Air Intake</i>	<i>Fuel System</i>	<i>Cooling System</i>	<i>Engine</i>	<i>Nameplate 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.	14	15	101	103	104	105	107	109	201	301	501	701
Spec No.	VARIATION NUMBER											
<b>8CCFOZ/ 9CCOZ</b>												
126117	1	1	2	2	6	19	7	8	19	23	—	8
126123	1	1	2	2	9	24	7	8	19	23	—	8
126135	1	1	2	2	9	24	7	8	19	28	3	8
126140	1	2	3	6	13	29	11	8	19	34	—	12
126142	1	2	3	6	14	30	11	8	19	35	7	12
126144	1	1	2	6	6	19	7	8	19	23	—	8
126146	1	1	2	6	9	24	7	8	19	28	3	8
<b>8EFOZ/9EOZ</b>												
126168	1	2	3	6	13	29	11	8	27	34	—	19
126169	1	2	3	6	14	30	11	8	27	35	13	19
126171	2	2	3	9	16	34	11	8	27	41	—	19
126179	1	2	3	6	14	30	11	8	27	35	10	12
<b>9EFOZ/10EOZ</b>												
126195	3	3	3	6	13	38	11	8	27	34	—	19
126196	4	3	3	9	16	39	11	8	27	41	—	19
GM28314-GA1	3	3	3	6	13	GR1	11	8	27	34	—	19

# Group 1: Cylinder Block



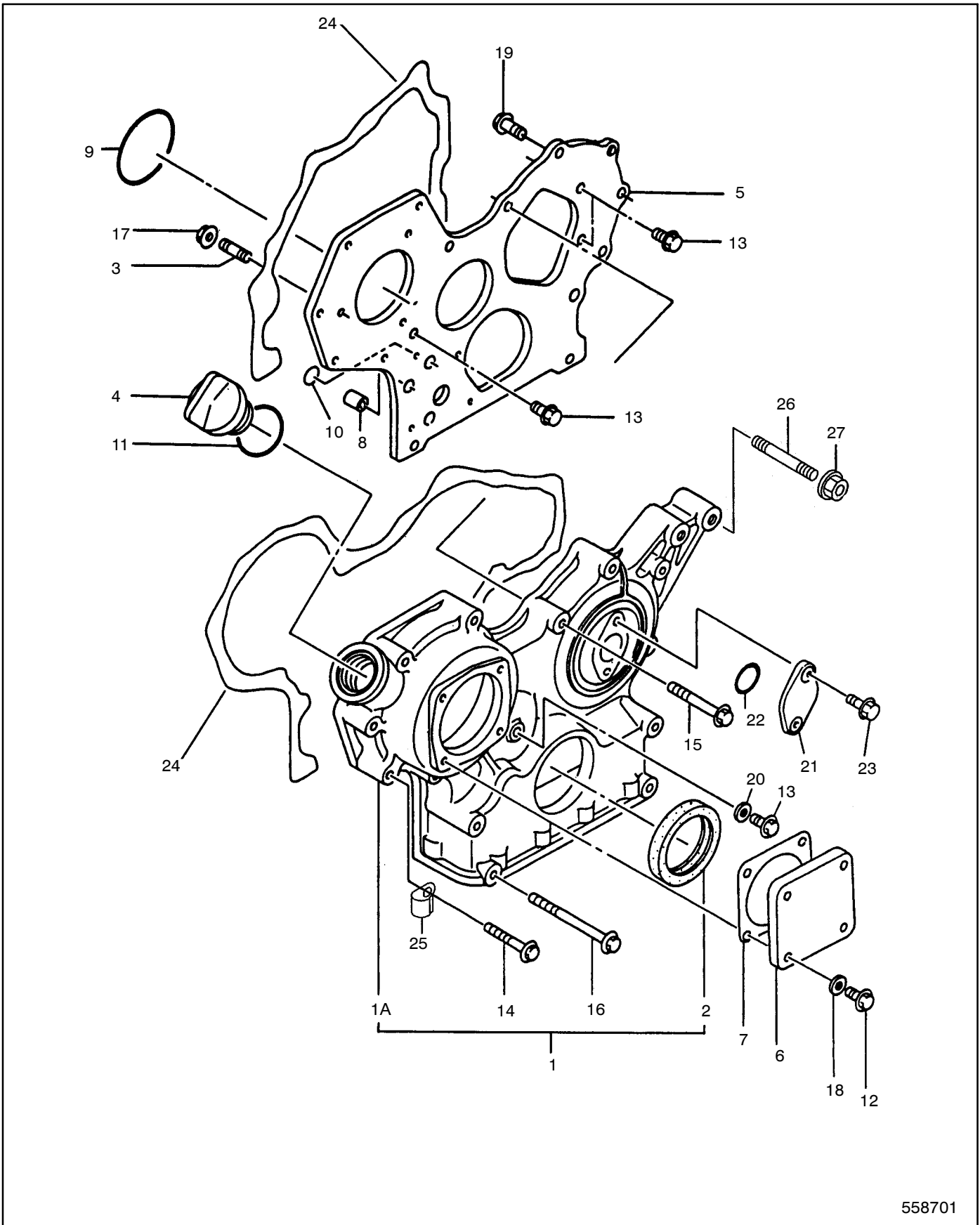
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# Group 1: Cylinder Block

Item	Part Number	Description	Quantity		
			Variation Number 1	Variation Number 2	Variation Number 3
1	229806	Block assembly, cylinder (includes items 2-20)	1		
1	225441	Block assembly, cylinder (includes items 2-20)		1	
1	GM13811	Block assembly, cylinder (includes items 2-20)			1
2	X	Block assembly, cylinder	1	1	
3	X	Block, cylinder	1	1	
4	252566	Plug	1	1	1
5	252771	Plug, PT 1/4	2	2	2
6	256515	Plug, PT 1/8, screw	1	1	
6	GM13812	Plug, PT 1/8, screw			1
7	225827	Plug 50	1	1	1
8	252728	Plug 12	2	2	2
9	252731	Plug 30	6	6	6
10	X	Bearing cap	1	1	
11	X	Bearing cap	3	3	
12	225703	Bolt, bearing cap	8	8	8
13	229801	Main bearing	4		
13	225832	Main bearing		4	4
13	225709	Main bearing, undersize 0.25	4	4	4
14	X	Main bearing	4	4	
15	X	Main bearing	4	4	
16	229802	Bearing, thrust	2		
16	225833	Bearing, thrust		2	2
16	225710	Bearing, thrust, oversize 0.25	2	2	2
17	X	Bearing, thrust	2	2	
18	X	Bearing, thrust	2	2	
19	252933	Bush, camshaft	1	1	1
20	256518	Plug 12, hex	2	2	
20	252771	Plug, PT 1/4			1
21	252696	Bolt, M8 x 16 plated	2		
21	225818	Bolt, M8 x 14 plated		2	2
22	225705	Bolt, cylinder head	14	14	14
23	GM33837	Gasket, cylinder head	1		
23	225399	Gasket, cylinder head		1	
23	GM33836	Gasket, cylinder head			1

X Item not sold separately

# Group 2: Gear Housing



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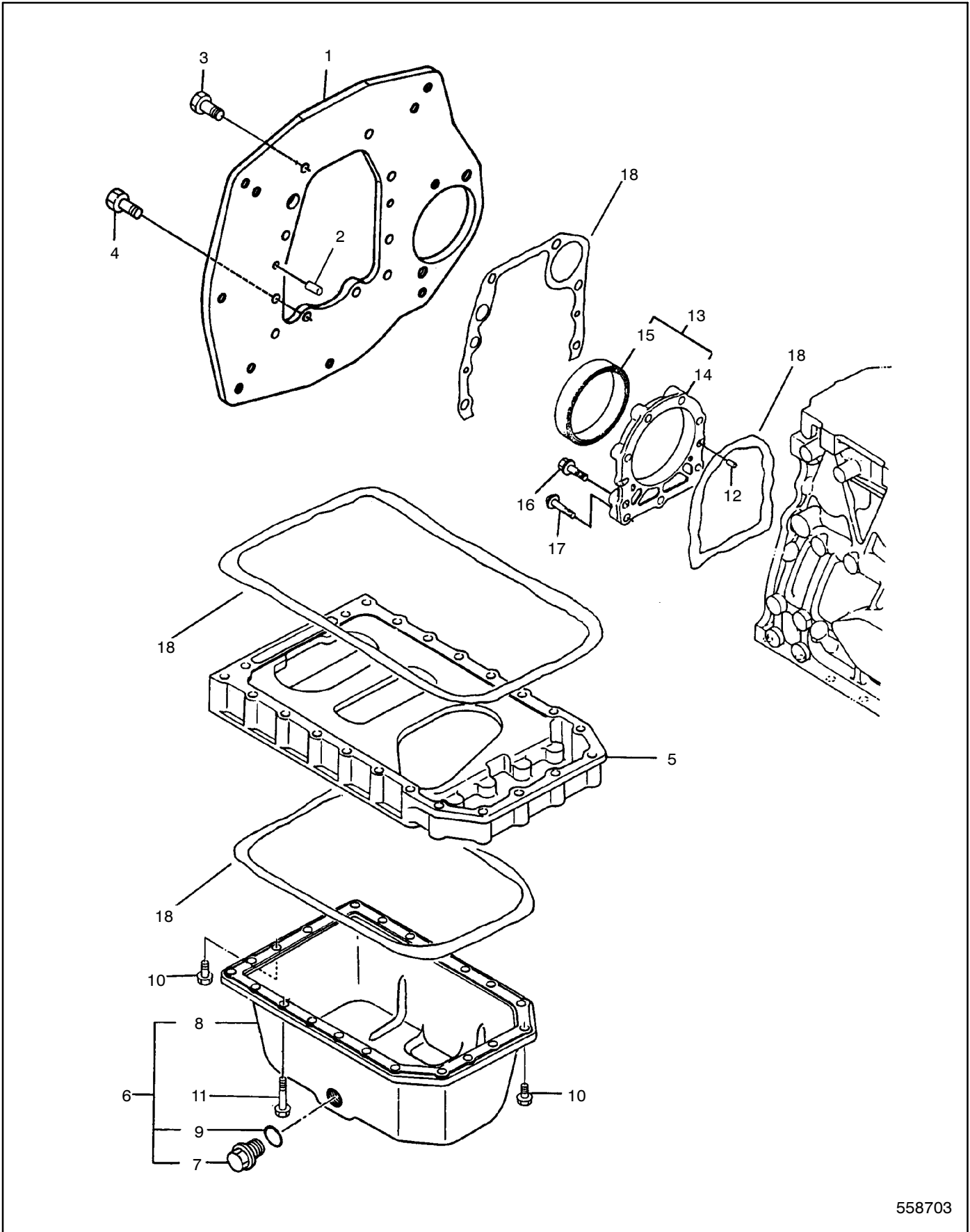


## Group 2: Gear Housing

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	229799	Housing assembly, gear	1	1	1
1A	X	Housing, gear	1	1	1
2	252931	Seal, oil	1	1	1
3	252409	Stud, M8 x 22	3	3	3
4	250837	Cap, lub. oil supply	1	1	1
5	252861	Flange, gear housing	1	1	1
6	256531	Cover	1	1	1
7	252085	Gasket	1	1	1
8	252932	Pipe, knock	2	2	2
9	252764	O-ring, fuel injection pump	1	1	1
10	250981	O-ring	2	2	2
11	252684	O-ring	1	1	1
12	252695	Bolt, M8 x 12 plated	4	4	4
13	252696	Bolt, M8 x 16 plated	4	4	4
14	252703	Bolt, M8 x 45 plated	6	6	6
15	256798	Bolt, M8 x 55 plated	3	3	3
16	256799	Bolt, M8 x 85 plated	4	4	4
17	252723	Nut, M8	3	3	3
18	252734	Seal, washer 8	4	4	4
19	252697	Bolt, M8 x 20 plated	2	2	2
20	252734	Seal, washer 8	1	1	1
21	252750	Cover, blind	1	1	1
22	256796	O-ring	1	1	1
23	225816	Bolt, M6 x 12 plated	2	2	
23	252693	Bolt, M6 x 16 plated			2
24	252998	Liquid gasket	AR	AR	AR
25	252808	Retainer		1	1
26	252756	Stud		1	1
26	GM13815	Stud			1
27	229772	Nut, M10		1	1

X Item not sold separately

# Group 3: Flywheel Housing & Oil Sump



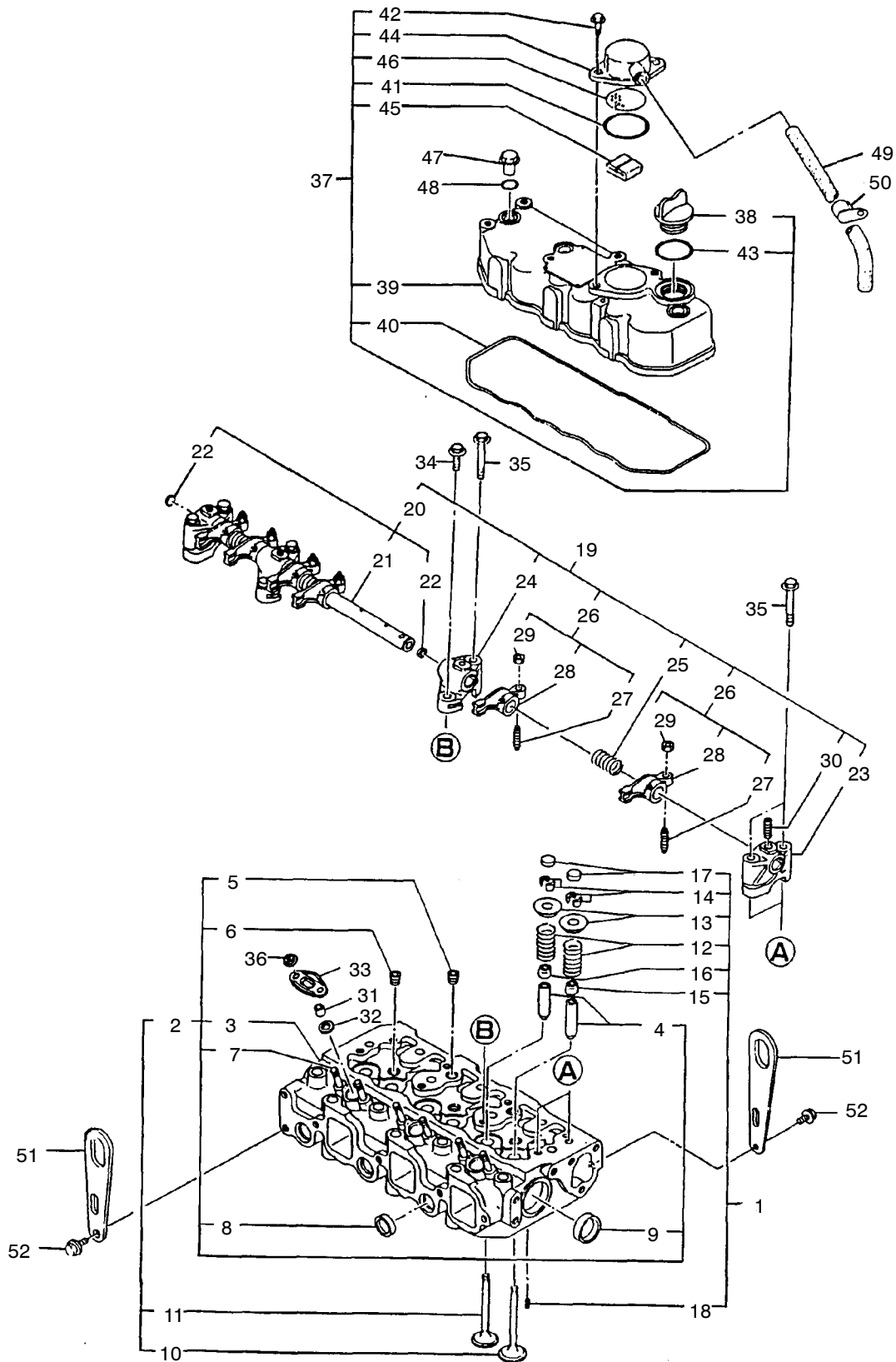
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## Group 3: Flywheel Housing & Oil Sump

Item	Part Number	Description	Quantity	
			Variation Number	
			1	2
1	229114	Back plate	1	1
2	229489	Parallel pin, 8 x 20	2	
2	256750	Parallel pin, 8 x 16		2
3	229505	Bolt, M10 x 20	6	6
4	252714	Bolt, M10 x 25	4	4
5	225706	Spacer, oil sump	1	1
6	229694	Sump assembly, lub. oil (includes items 7-9)	1	1
7	252943	Plug 22	1	
7	225386	Plug 22		1
8	X	Refer to item 6		
9	256796	O-ring	1	
9	225425	Seal, washer 22S		1
10	252696	Bolt, M8 x 16 plated	6	6
11	252703	Bolt, M8 x 45 plated	22	22
12	256750	Parallel pin, 8 x 16	2	2
13	225755	Case assembly, oil seal (includes items 14 and 15)	1	1
14	229702	Case, oil seal	1	1
15	225707	Seal, oil	1	1
16	363430	Bolt, M8 x 30 plated	6	6
17	252701	Bolt, M8 x 35 plated	3	3
18	252998	Liquid gasket	AR	AR

X Item not sold separately

# Group 4: Cylinder Head



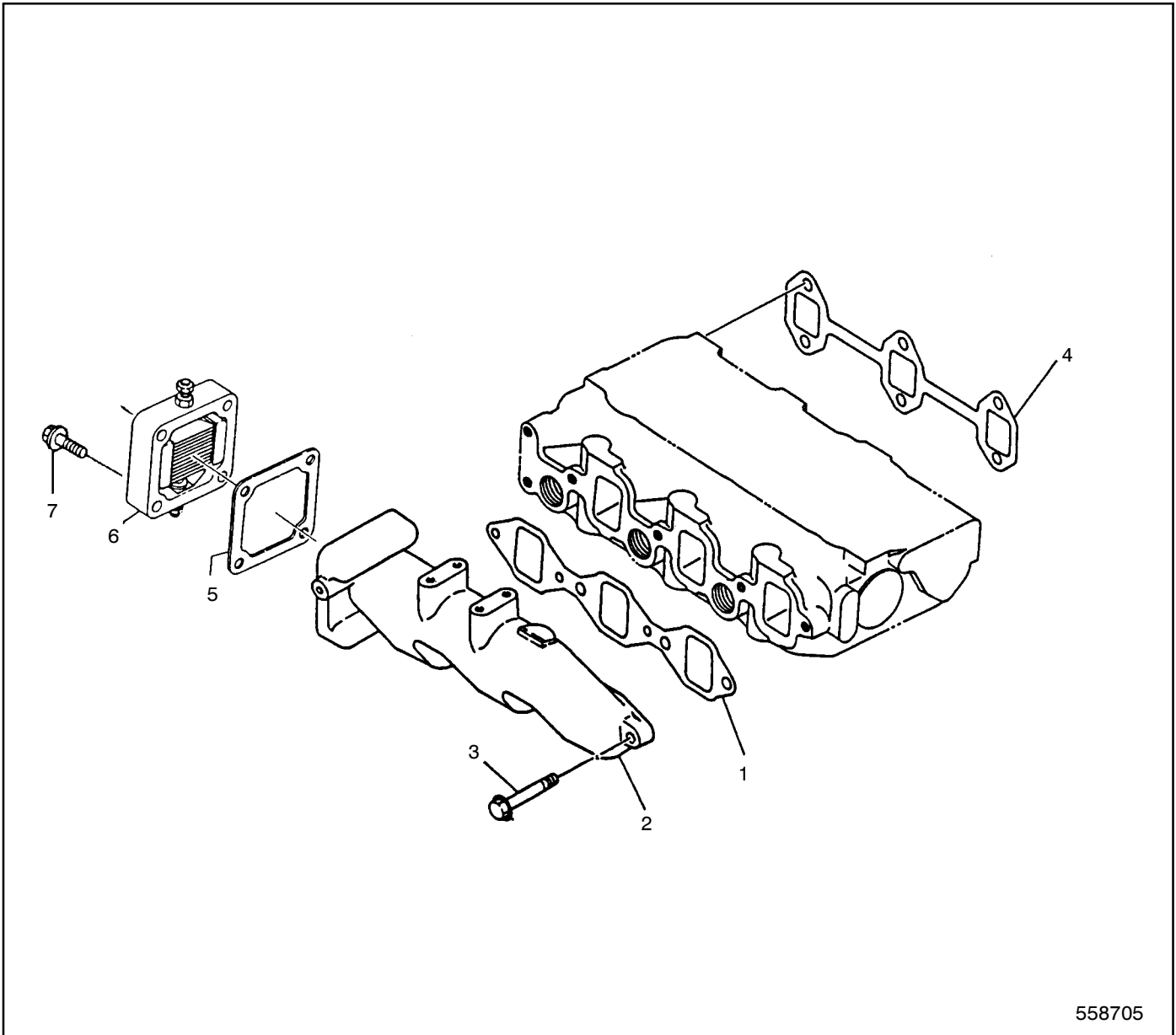
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## Group 4: Cylinder Head

Item	Part Number	Description	Quantity		
			Variation 1	Variation 2	Variation 3
1	229804	Head assembly, cylinder (includes items 2-18)	1		
1	225392	Head assembly, cylinder (includes items 2-18)		1	1
2	X	Head assembly, cylinder (includes items 3-9)	1	1	1
3	X	Head, cylinder	1	1	1
4	250835	Guide, valve	6	6	6
5	256825	Plug, Pt 1/4	2	2	2
6	250975	Plug, Pt 3/8, screw	3	3	3
7	225822	Stud, M6 x 30 plated	6	6	6
8	252729	Plug 22	3	3	3
9	252732	Plug 40	2	2	2
10	225711	Valve, intake	3	3	3
11	229695	Valve, exhaust	3	3	3
12	225713	Spring, valve	6	6	6
13	250882	Retainer, spring	6	6	6
14	225700	Cotter	6	6	
14	250806	Cotter 7			6
15	225766	Seal, valve stem	3	3	3
16	250844	Seal, valve stem	3	3	3
17	250999	Cap, valve	6	6	6
18	250963	Spring pin, 6 x 12	2	2	2
19	229703	Support assembly, rocker (includes items 20-30)	1	1	1
20	225714	Shaft, rocker arm (includes items 21 and 22)	1	1	1
21	X	Shaft	1	1	1
22	229511	Plug 10	2	2	2
23	252843	Support, rocker arm	2	2	2
24	252844	Support, rocker arm	2	2	2
25	252815	Spring	3	3	3
26	229803	Arm assembly, rocker (includes items 27-29)	6	6	6
27	229844	Screw, valve	6	6	6
28	X	Arm, rocker	6	6	6
29	252817	Nut, M8	6	6	6
30	252722	Stud, M8 x 18 plated	3	3	3
31	252743	Protector, nozzle	3	3	3
32	252744	Seat, nozzle	3	3	3
33	252745	Retainer	3	3	3
34	252699	Bolt, M8 x 25 plated	2	2	2
35	252704	Bolt, M8 x 50 plated	6	6	6
36	250989	Nut, M6	6	6	6
37	225715	Bonnet assembly (includes items 38-46)	1		
37	225439	Bonnet assembly (includes items 38-46)		1	1
38	250837	Cap, lub. oil supply	1	1	1
39	229696	Bonnet	1	1	1
40	225758	Gasket, bonnet	1	1	1
41	225812	O-ring	1	1	1
42	252696	Bolt, M8 x 16 plated	2	2	2
43	252684	O-ring	1	1	1
44	225773	Cover, breather	1	1	1
45	252805	Baffle, breather	1	1	1
46	252806	Plate, shelter	1	1	1
47	252470	Knob	3	3	3
48	250801	O-ring	3	3	3
49	See group 105	Pipe, breather	1	1	
49	229414	Pipe, breather			1
50	229425	Clamp			1
51	256532	Lifter, engine	1	1	1
52	225818	Bolt, M8 x 14 plated	4	4	4

X Item not sold separately

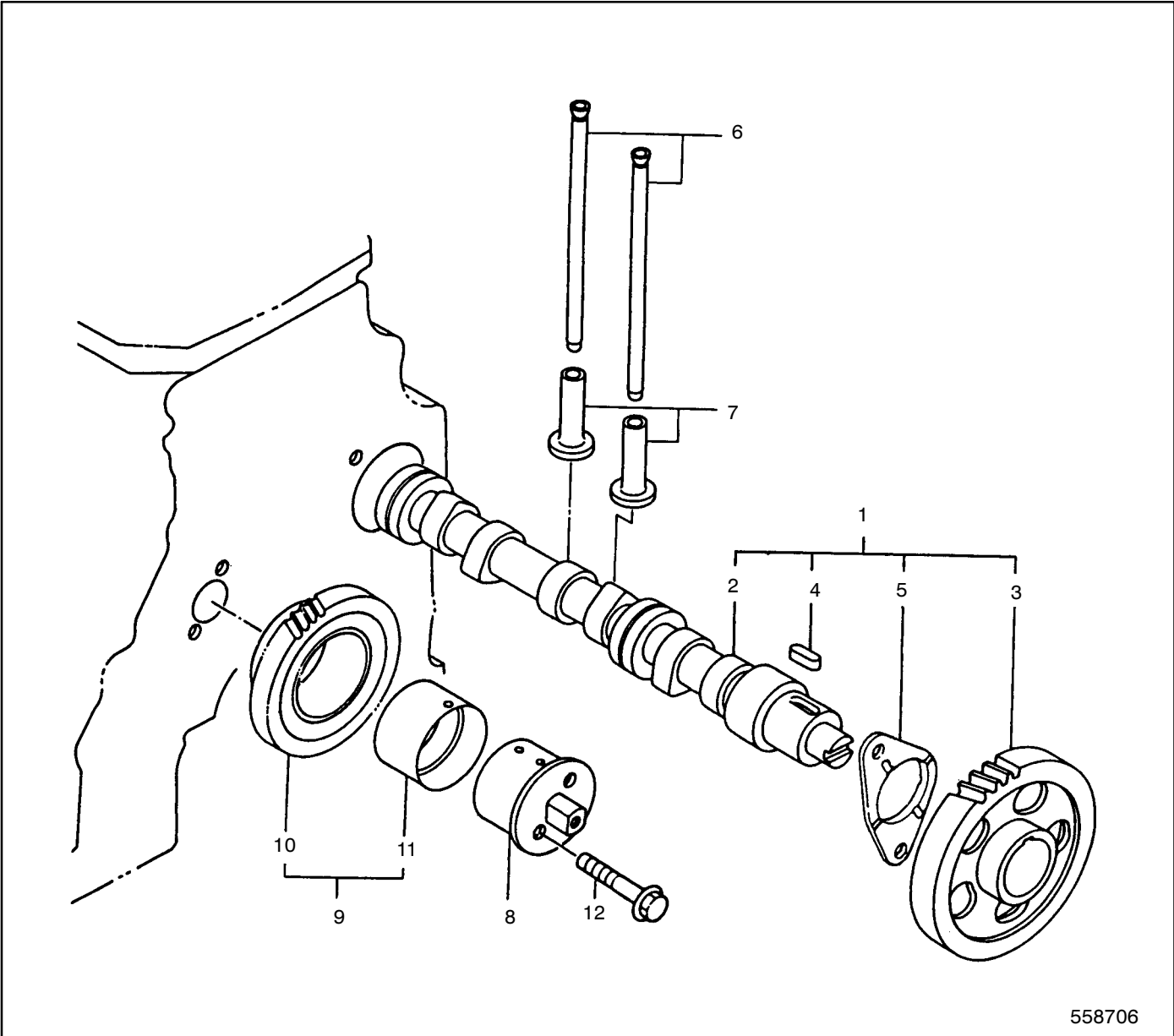
# Group 5: Intake Manifold



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Item	Part Number	Description	Quantity	
			Variation Number 1	Variation Number 2
1	225716	Gasket	1	
1	GM33685	Gasket		1
2	225763	Manifold intake	1	
2	225393	Manifold intake		1
3	252699	Bolt, M8 x 25 plated	3	3
4	225717	Gasket, exhaust manifold	1	1
5	229719	Gasket, air heater	1	1
6	256760	Air heater	1	1
7	252701	Bolt, M8 x 35 plated		1

# Group 6: Camshaft

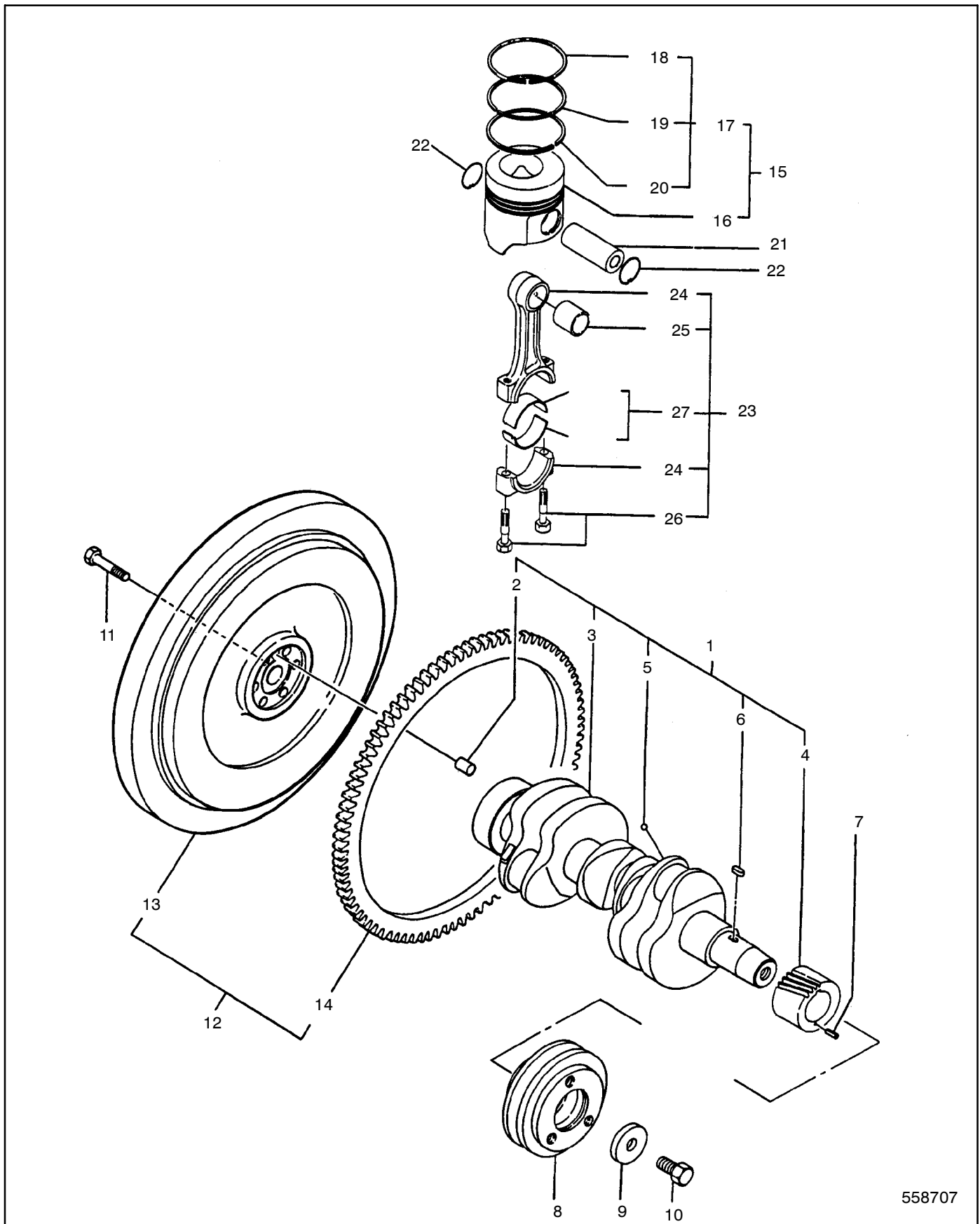


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Item	Part Number	Description	Quantity
			Variation Number
1	229697	Camshaft assembly (includes item 2-5)	1
2	X	Camshaft	1
3	256587	Gear, camshaft	1
4	252669	Key	1
5	252804	Bearing, thrust	1
6	225718	Rod, push	6
7	252819	Tappet	6
8	252782	Shaft, idle gear	1
9	256590	Gear, idle (includes items 10 and 11)	1
10	X	Gear, idle	1
11	252825	Bush, idle gear	1
12	252703	Bolt, M8 x 45 plated	2

X Item not sold separately

# Group 7: Crankshaft, Flywheel, & Pistons



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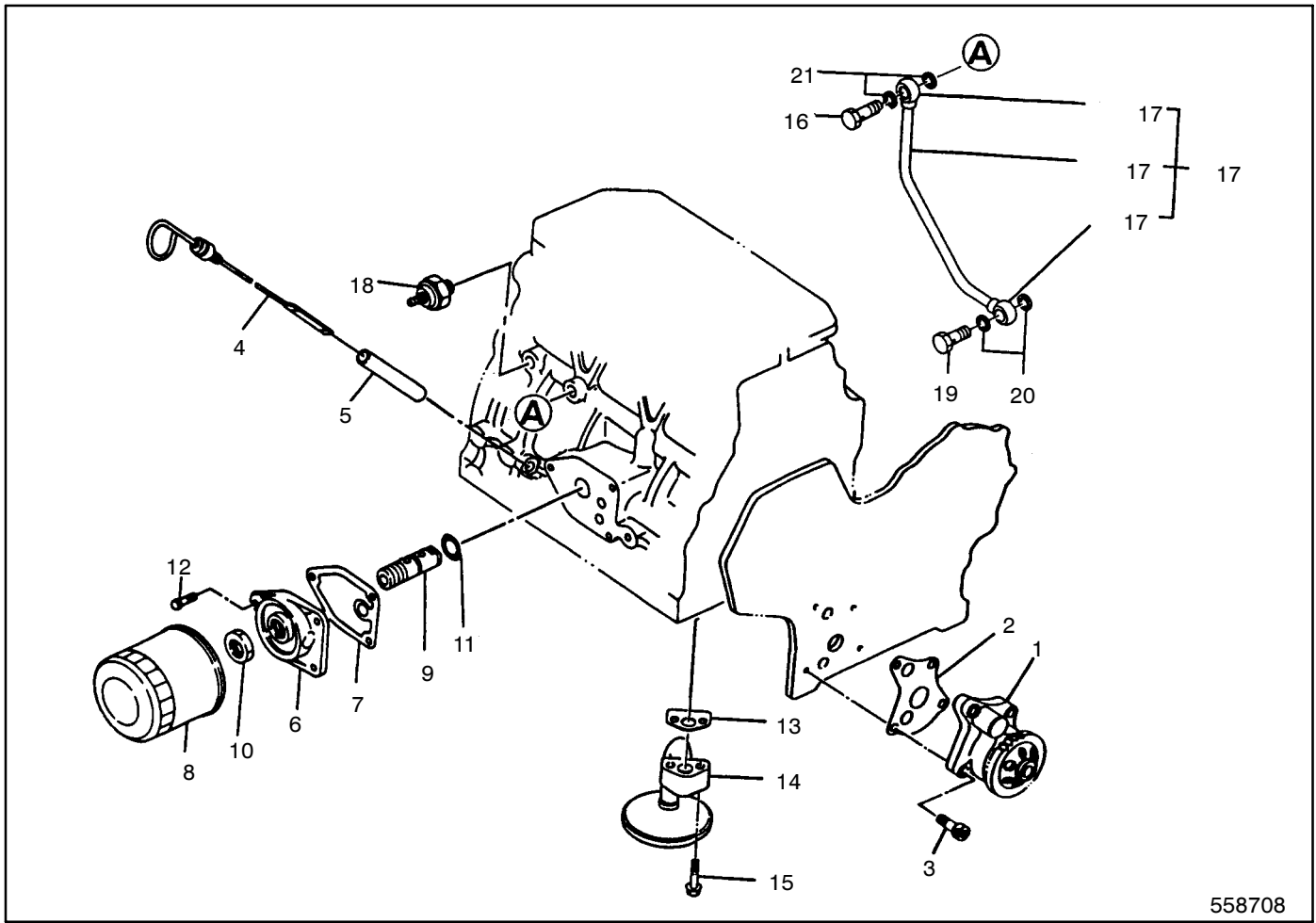


# Group 7: Crankshaft, Flywheel, & Pistons

Item	Part Number	Description	Quantity		
			Variation Number 1	Variation Number 2	Variation Number 3
1	229807	Crankshaft assembly (includes items 2-6)	1		
1	225394	Crankshaft assembly (includes items 2-6)			
2	256750	Parallel pin, 8 x 16	1	1	1
3	X	Crankshaft	1	1	1
4	252821	Gear, crankshaft	1	1	1
5	X	Ball, steel	3	3	3
6	252669	Key	1	1	1
7	252668	Spring pin	1	1	1
8	252918	V-pulley	1	1	1
9	252937	Washer	1	1	1
10	252763	Bolt, V-pulley	1	1	1
11	252401	Bolt, flywheel	6	6	6
12	229115	Flywheel assembly (includes items 13 and 14)	1	1	1
13	X	Flywheel	1	1	1
14	252774	Gear, ring	1	1	1
15	229700	Piston w/rings (includes items 16 and 17)	3		
15	225400	Piston w/rings (includes items 16 and 17)		3	
15	GM13816	Piston w/rings (includes items 16 and 17)			3
15	229808	Piston w/rings, oversized 0.25 (includes items 16 and 17)	3		
15	225402	Piston w/rings, oversized 0.25 (includes items 16 and 17)		3	
15	GM13818	Piston w/rings, oversized 0.25 (includes items 16 and 17)			3
15	229701	Piston w/rings, oversized 0.50 (includes items 16 and 17)	3		
16	X	Piston	3	3	3
17	229810	Ring set (includes items 18-20)	3		
17	225401	Ring set (includes items 18-20)		3	
17	GM13817	Ring set (includes items 18-20)			3
17	229815	Ring set, oversized 0.25 (includes items 18-20)	3		
17	225403	Ring set, oversized 0.25 (includes items 18-20)		3	
17	GM13819	Ring set, oversized 0.25 (includes items 18-20)			3
17	229701	Ring set, oversized 0.50 (includes items 18-20)	3		
18	X	Ring, top	3	3	3
19	X	Ring, second	3	3	3
20	X	Ring, oil	3	3	3
21	250879	Pin, piston	3		
21	225395	Pin, piston		3	3
22	229738	Circlip	6	6	6
23	225838	Rod assembly, connecting (includes items 24-27)	3	3	3
24	X	Rod, connecting	3	3	3
25	225726	Bush, piston pin	3	3	3
26	225723	Bolt, connecting rod	6	6	6
27	225724	Bearing, crankpin	3	3	3
27	225725	Bearing, pin, undersized 0.25	3	3	3

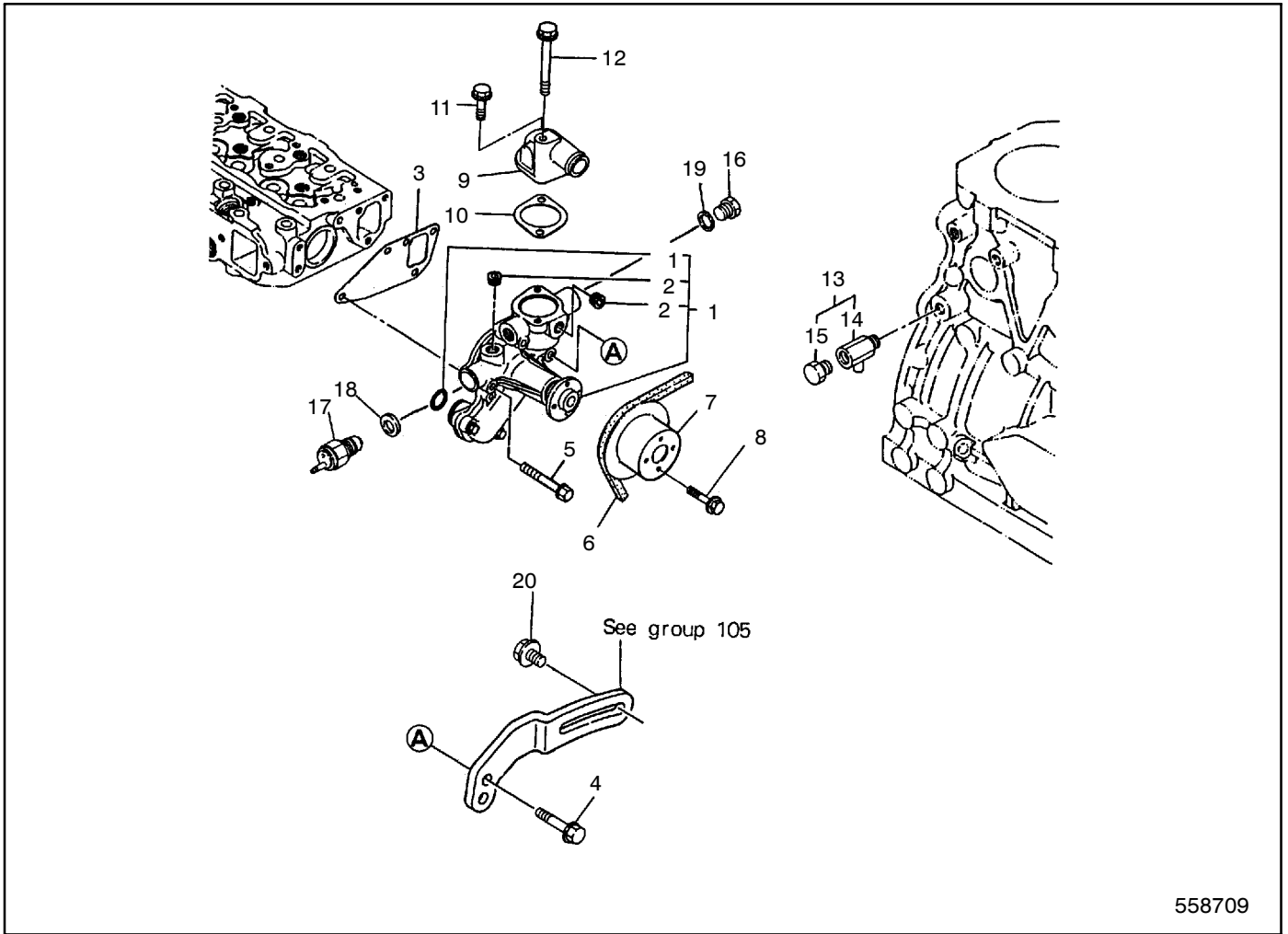
X Item not sold separately

# Group 8: Lube Oil System



Item	Part Number	Description	Quantity	
			1	2
1	225727	Pump assembly, oil	1	
1	225412	Pump assembly, oil		1
2	252829	Gasket, oil pump	1	1
3	252724	Bolt, M6 x 25	4	4
4	225701	Dipstick	1	1
5	252759	Guide, dipstick	1	1
6	256591	Bracket, filter	1	1
7	225776	Gasket	1	1
8	229841	Oil filter	1	1
9	252747	Valve assembly, oil pressure	1	
9	225413	Valve assembly, oil pressure		1
10	252835	Nut	1	1
11	250981	O-ring	1	1
12	252697	Bolt, M8 x 20 plated	1	1
13	225775	Gasket	1	1
14	229698	Pipe, oil inlet	1	1
15	252701	Bolt, M8 x 35 plated	2	2
16	252084	Joint bolt 10	1	1
17	225729	Pipe assembly, lub. oil	1	1
18	256530	Switch, low oil pressure	1	1
19	252090	Bolt	1	1
20	252734	Seal washer	2	2
21	250968	Gasket, 10 round	2	2

# Group 9: Cooling Water System



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Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	225003	Pump assembly, cooling pump (includes item 2)	1	1	1
1	252839	O-ring	1	1	1
1	250876	Impeller (not shown)	1	1	1
2	250975	Plug, Pt 3/8, screw	2	2	2
3	252838	Gasket, water pump	1	1	1
4	252701	Bolt, M8 x 35 plated	1	1	1
5	256798	Bolt, M8 x 55 plated	3	3	3
6	225022	V-belt (alternator)	1		
6	225428	V-belt (alternator)		1	
6	226929	V-belt, 40 in. (alternator)			1
7	252845	V-pulley	1	1	1
8	225919	Bolt, M6 x 14	4	4	4
9	229706	Cover, thermostat	1	1	1
10	249865	Gasket	1	1	1
11	252699	Bolt, M8 x 25 plated	1	1	1
12	252706	Bolt, M8 x 65 plated	1	1	1
13	225704	Drain cock assembly	1	1	1
14	X	Body	1	1	1
15	X	Valve	1	1	1
16	252757	Plug, M16	1	1	1
17	229782	Sender	1	1	1
18	252773	Gasket	1	1	1
19	252773	Gasket	1	1	1
20	252692	Bolt, M8 x 25	1	1	1

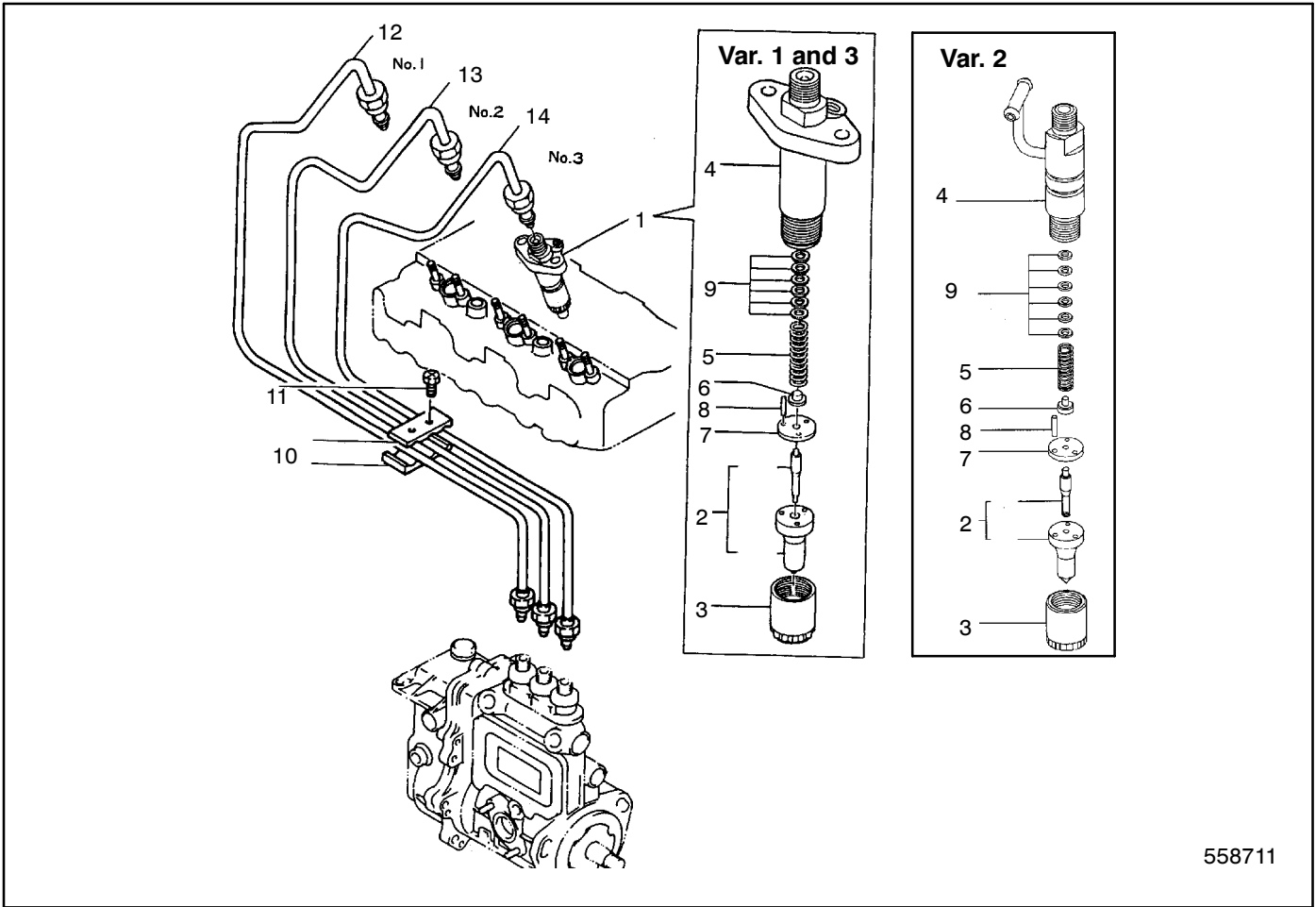
X Item not sold separately



## Group 10: Fuel Injection Pump

Item	Part Number	Description	Quantity		
			Variation 1	Variation 2	Variation 3
1	229809	Pump assembly, fuel inject. w/gov.(includes items 2-61)	1		
1	225442	Pump assembly, fuel inject. w/gov.(includes items 2-61)		1	
1	GM13820	Pump assembly, fuel inject. w/gov.(includes items 2-61)			1
2	256735	Camshaft	1	1	1
3	256543	Ball bearing, thrust	1	1	1
4	256535	Retainer, bearing	1	1	1
5	256528	Key	1	1	1
6	252864	Plunger w/barrel	3		
6	225416	Plunger w/barrel		3	3
7	256721	Pin, barrel locking	3	3	3
8	252589	Retainer	3	3	3
9	256536	Spring shoe, plunger	3	3	3
10	252490	Spring, plunger	3	3	3
11	252848	Tappet assembly (includes item 12-14)	3	3	3
12	252593	Roller assembly	3	3	3
12	X	Roller, inner	3	3	3
12	X	Roller, outer	3	3	3
12	X	Guide, roller	3	3	3
13	256722	Bolt, adjusting	3	3	3
14	229739	Pin, roller	3	3	3
15	256537	Locking, tappet	3	3	3
16	252849	O-ring	3	3	3
17	250849	Valve w/seat, delivery	3		
17	256583	Valve w/seat, delivery		3	3
17	X	Seat	3	3	3
17	X	Valve, delivery	3	3	3
18	256777	Spring, valve	3	3	3
19	256724	Valve guard, delivery	3	3	3
20	250839	Gasket, delivery	3	3	3
21	250840	O-ring	3	3	3
22	256725	Stopper, valve	3	3	3
23	256726	Locking	3	3	3
24	256727	Locking	2	2	2
24	229741	Spring washer 5		2	2
25	256728	Deflector	1	1	1
26	256778	Check bolt, deflector	1	1	1
27	256729	Shim set, adjusting	1	1	1
28	256730	Rack, control	1	1	1
29	256780	Bush, rack	1	1	1
30	256694	Spacer, aux. spring	1	1	1
31	256695	Circlip	1	1	1
32	256696	Pinion, control	3	3	3
33	256697	Screw, pinion	3	3	3
34	256698	Pinion	3	3	3
35	256781	Plug	1	1	1
36	252850	O-ring	1	1	1
37	256699	Spring, rack	1	1	1
38	256700	Shim pack	3	3	3
39	256782	Cover	1	1	1
40	252926	Gasket	1	1	1
41	225893	Cover, side	1	1	1
42	252927	Gasket	1	1	1
43	256701	Locking, rack	1	1	1
44	225791	Label, caution	1	1	1
45	256702	Spacer, 3.25 mm	1	1	1
46	256703	Spacer, 1.5 mm	1	1	1
47	225804	Spring washer	2	2	2
48	225808	Spring pin	2	2	2
49	256794	Ball bearing	1	1	1
50	252686	O-ring	1	1	1
51	256776	Stud, feed pump	2	2	2
52	225814	Screw, M5 x 10	4	4	4
53	225814	Screw, M5 x 10	4	4	4
54	225815	Screw, M6 x 16	4	4	4
55	252725	Nut, M6	2	2	2
56	225821	Bolt, M5 x 30 plated	2	2	2
57	256779	Plug	1	1	1
58	256663	Seal washer	1	1	1
59	252851	Gasket	1	1	1
60	256755	Cover, blind	1	1	1
61	X	Governor assembly (see Group 13)	1	1	1
62	252827	Gear	1	1	1
63	252666	Washer 12, spring	1	1	1
64	252725	Nut, M12	1	1	1

# Group 11: Fuel Injection Lines



558711

## Group 11: Fuel Injection Lines

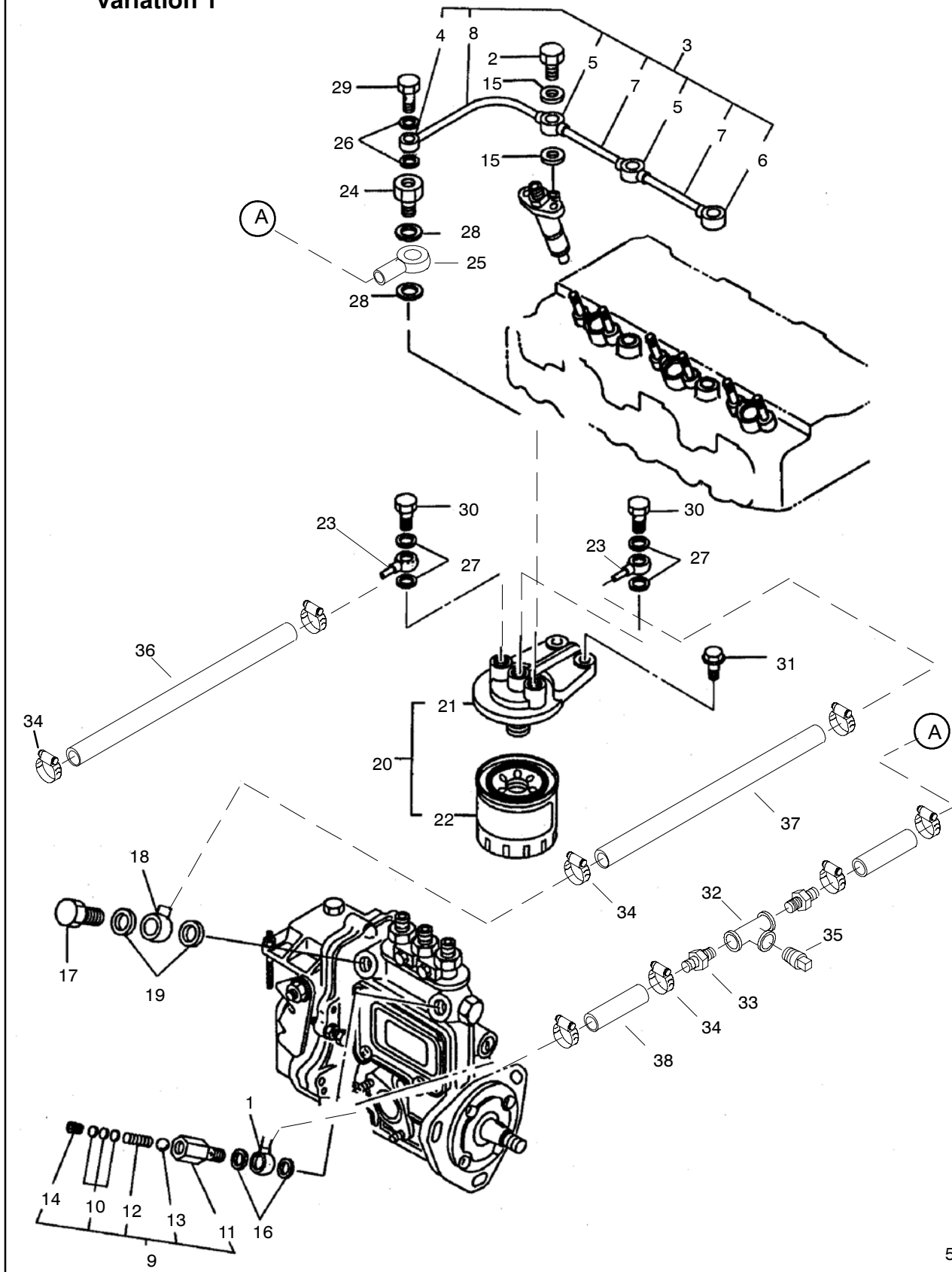
Item	Part Number	Description	Quantity			
			Variation Number			
			1	2	3	4
1	256800	Valve assembly, fuel injection* (includes items 2-9)	3		3	3
1	252975	Valve assembly, fuel injection* (includes items 2-9)		3		
2	252746	Nozzle assembly, fuel injection*	3			3
2	225404	Nozzle assembly, fuel injection*		3	3	
2	X	Valve	3	3	3	3
2	X	Body	3	3	3	3
3	256520	Nut, nozzle case	3	3	3	3
4	256706	Holder*	3		3	3
4	252790	Holder*		3		
5	256521	Spring, nozzle	3	3	3	3
6	256522	Seat, nozzle spring	3	3	3	3
7	256523	Plate, stop	3	3	3	3
8	256707	Pin*	6	6	6	6
9	256524	Shim pack	3	3	3	3
10	252453	Retainer*	1			
10	225374	Retainer*		1		1
10	256774	Retainer*			1	1
10	X	Clamp, upper	1	1		1
10	X	Clamp, lower	1	1		1
11	225777	Bolt, M4 x 12*	2		2	
11	225418	Bolt, M4 x 12*		2		2
12	225731	Pipe, fuel injection*	1			
12	225396	Pipe, fuel injection*		1	1	1
13	225732	Pipe, fuel injection*	1			
13	225397	Pipe, fuel injection*		1	1	1
14	225733	Pipe, fuel injection*	1			
14	225398	Pipe, fuel injection*		1	1	1

\* Variation 2 only: fuel return changed from rubber to steel return line. Use variation 3 (steel line) after Yanmar engine 3TNE78AC serial number 00326.

X Item not sold separately

# Group 12: Fuel Line & Filter

## Variation 1



558712A



## Group 12: Fuel Line & Filter

Item	Part Number	Description	Quantity
			Variation Number 1
1	256567	Joint 12, pipe	1
2	256713	Bolt, pipe joint	3
3	225799	Pipe, fuel return (includes items 4-8)	1
4	X	Joint	1
5	X	Joint, pipe	2
6	X	Joint, pipe	1
7	X	Pipe	1
8	X	Pipe	1
9	252792	Valve assembly, check	1
10	X	Shim set	1
11	X	Body	1
12	X	Spring	1
13	X	Ball, 1/4 steel	1
14	X	Plug 10	1
15	252355	Gasket 6, round	6
16	250969	Gasket 12, round	2
17	229552	Bolt, pipe joint	1
18	256567	Joint 12, pipe	1
19	252739	Gasket	2
20	256609	Filter assembly, fuel (includes items 23 and 24)	1
21	X	Body, fuel filter	1
22	225021	Filter, fuel	1
23	X-6288-1	Union, banjo	2
24	225796	Bolt, pipe joint	1
25	X-6288-2	Union, banjo	1
26	252356	Gasket	2
27	250969	Gasket, round	4
28	252675	Gasket, round	2
29	225810	Bolt, M3 joint	1
30	250972	Bolt, M6 joint	2
31	225820	Bolt, M10 x 30 plated	2
32	X-203-10	Tee, pipe	1
33	X-380-1	Connector, hose 1/8 x 1/4	2
34	X-426-9	Clamp, hose	8
35	X-75-1	Plug, pipe 1/8	1
36	X-386-74	Line, fuel	1
37	X-386-6	Line, fuel	1
38	X-386-99	Line, fuel	1

X Item not sold separately



## Group 12: Fuel Line & Filter, continued

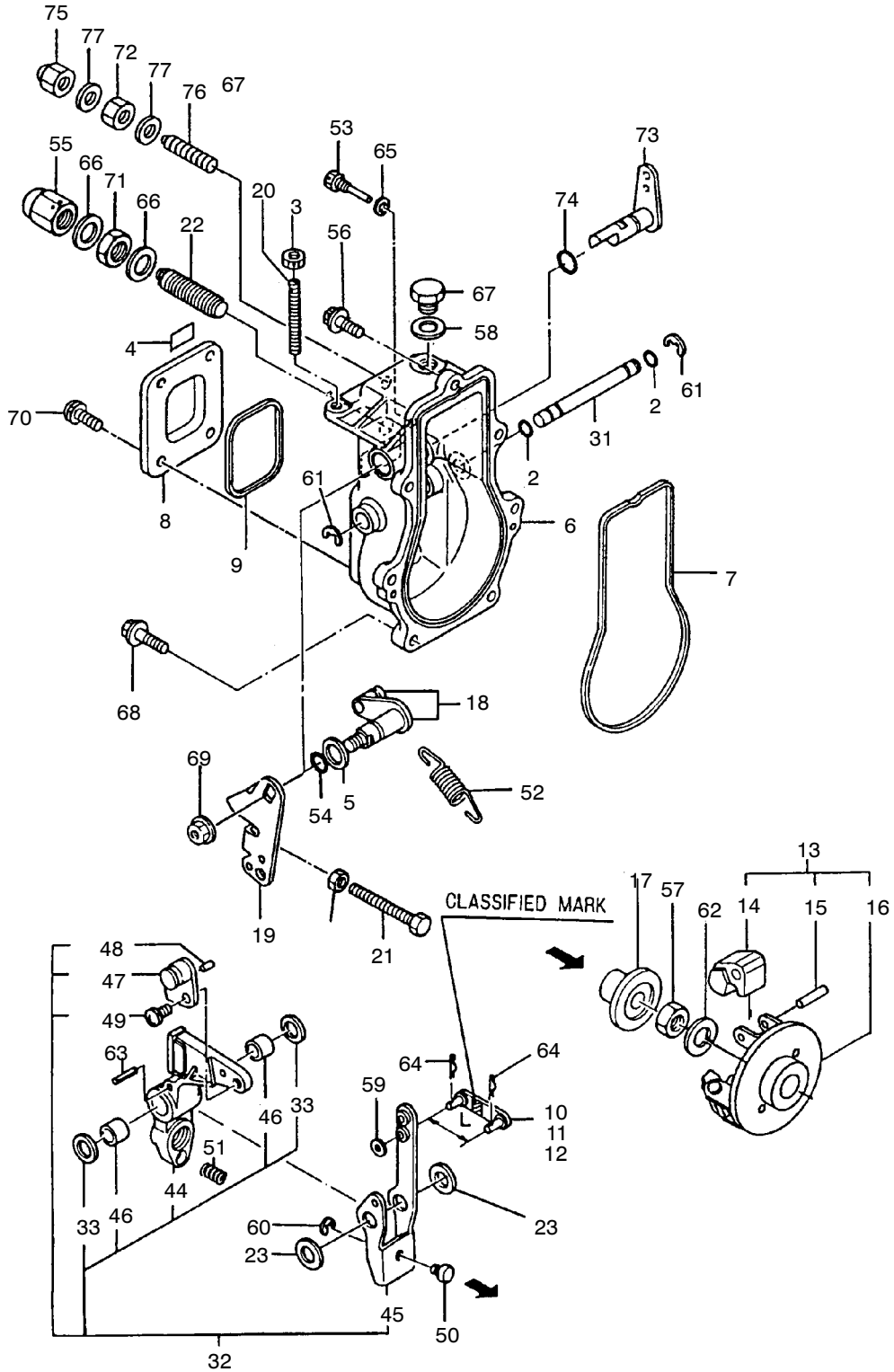
Item	Part Number	Description	Quantity				
			Variation Number				
			2	3	4	5	6
1	256609	Filter assembly, fuel	1	1	1	1	1
2	225422	Body, fuel filter	1	1	1	1	1
3	225021	Filter, fuel	1	1	1	1	1
4	X-426-9	Clamp, hose	1	1	1	1	1
5	X-386-62	Line, flexible fuel	1	1		1	
5	X-386-14	Line, flexible fuel			1		1
6	X-6288-1	Union, banjo	2	2	2	2	2
7	250972	Joint bolt 6	1	1	1	1	1
8	250969	Gasket 12, round	4	4	4	4	4
9	225820	Bolt, M10 x 30 plated	2	2	2	2	2
10	X-386-14	Line, flexible fuel 1/4 x 9 in.	1	1	1	1	1
11	X-6288-3	Union, banjo	1	1	1	1	1
12	225810	Joint bolt 3	1	1	1	1	1
13	252356	Gasket 8	2	2	2	2	2
14	225796	Bolt, pipe joint	2	2	2	2	2
15	252675	Gasket 14, round	2	2	2	2	2
16	X-6288-2	Union, banjo	1	1	1	1	1
17	X-386-74	Line, flexible fuel	1				
17	X-386-99	Line, flexible fuel		1	1	1	1
18	229552	Bolt, pipe joint	1	1	1	1	1
19	225424	Seal washer	2	2	2	2	2
20	256569	Joint 12, pipe	1	1	1	1	1
21	225411	Clamp 8	6				
22	252753	Pipe, fuel*	2				
23	GM28396	Pipe, steel fuel return		1	1	1	1
24	252792	Valve assembly, check	1	1	1	1	1
25	225406	Joint	1				
25	256567	Joint		1	1	1	1
26	250969	Gasket 12, round	2	2	2		
26	225424	Seal washer				2	2
27	X-386-99	Line, flexible fuel	1				
27	X-386-74	Line, flexible fuel		1		1	
27	X-386-48	Line, flexible fuel			1		1
28	25 326 03	Connector, hose 1/8	1	1	1	1	1
29	X-203-10	Tee, pipe	1	1	1	1	1
30	X-75-2	Plug, pipe	1	1	1	1	1
30	X-509-1	Adapter, pipe 1/4 x 1/8 (not shown)	1	1	1	1	1
31	X-380-6	Connector, hose	1				
32	X-6078-1	Line, flexible fuel	1				
33	D-244	Connector, compression		1		1	1
34	256713	Bolt, pipe joint		3	3	3	3
35	252355	Gasket 6, round		6	6		
35	363451	Seal washer				6	6
36	225419	Cap	1				
37	225405	Pipe, fuel inject	1				

\* Fuel return changed from rubber to steel return line. Use Variation 3 after Yanmar 3TNE78A engine serial number 00326.

X Item not sold separately

# Group 13: Governor

## Variation 1



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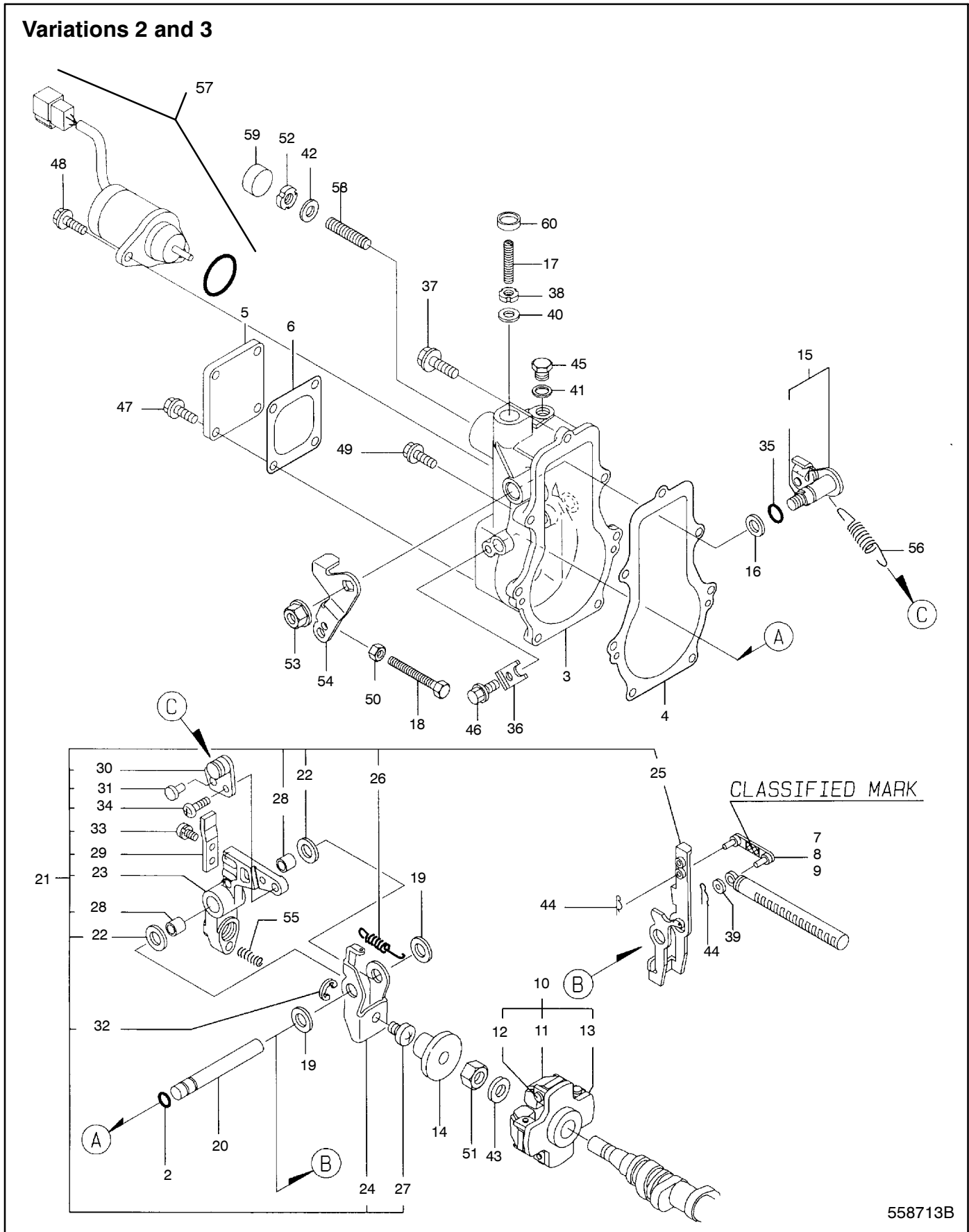
## Group 13: Governor

Item	Part Number	Description	Quantity
			Variation Number 1
1	X	Governor assembly (includes items 2-63)	1
2	252849	O-ring	2
3	225767	Nut, lock	1
4	X	Label	1
5	225782	Spacer, shaft	1
6	229486	Case, governor	1
7	252853	Gasket, governor case	1
8	252854	Cover, governor case	1
9	252855	Gasket, case cover	1
10	256787	Link, 30 mm	1
11	256558	Link, 31 mm	1
12	256559	Link, 30.5 mm	1
13	252974	Weight assembly, governor (includes items 14-16)	1
14	X	Weight	4
15	X	Pin, governor weight	4
16	X	Support	1
17	225781	Sleeve	1
18	252794	Shaft assembly, control	1
19	225800	Lever, control	1
20	225783	Bolt, limit	1
21	225784	Bolt, idle limit	1
22	225785	Bolt, fuel control	1
23	225786	Spacer assembly	2
31	225787	Shaft, governor lever	1
32	252795	Lever assembly, governor (includes items 33-49)	1
33	252592	Shim set	2
44	X	Lever, tension	1
45	X	Lever, governor	1
46	X	Bush	2
47	X	Hook	1
48	X	Pin	1
49	X	Screw, M6 x 12	1
50	225788	Shifter	1
51	256732	Spring, fuel control	1
52	225795	Spring governor	1
53	225789	Pin, stop lever	1
54	252856	O-ring	1
55	225702	Nut, cap	1
56	225790	Bolt, washer based	1
57	225826	Nut, lock M12 plated	2
58	225829	Seal washer	1
59	225803	Washer	1
60	225805	Circlip	1
61	225806	Circlip	2
62	256704	Washer	1
63	225807	Spring pin	1
64	225809	Snap pin	2
65	250994	Seal washer 6	1
66	252367	Seal washer 12	2
67	256517	Plug	1
68	225817	Bolt, M6 x 20 plated	6
69	252723	Nut, M8	1
70	225814	Screw, M5 x 10	4
71	225826	Nut, lock M12 plated	1
72	225825	Nut, lock M6 plated	2
73	225801	Lever assembly, stop	1
74	225811	O-ring	1
75	225770	Nut, cap	1
76	225783	Bolt, revol. limit	1
77	228828	Seal washer 6	2

X Item not sold separately

# Group 13: Governor, continued

## Variations 2 and 3



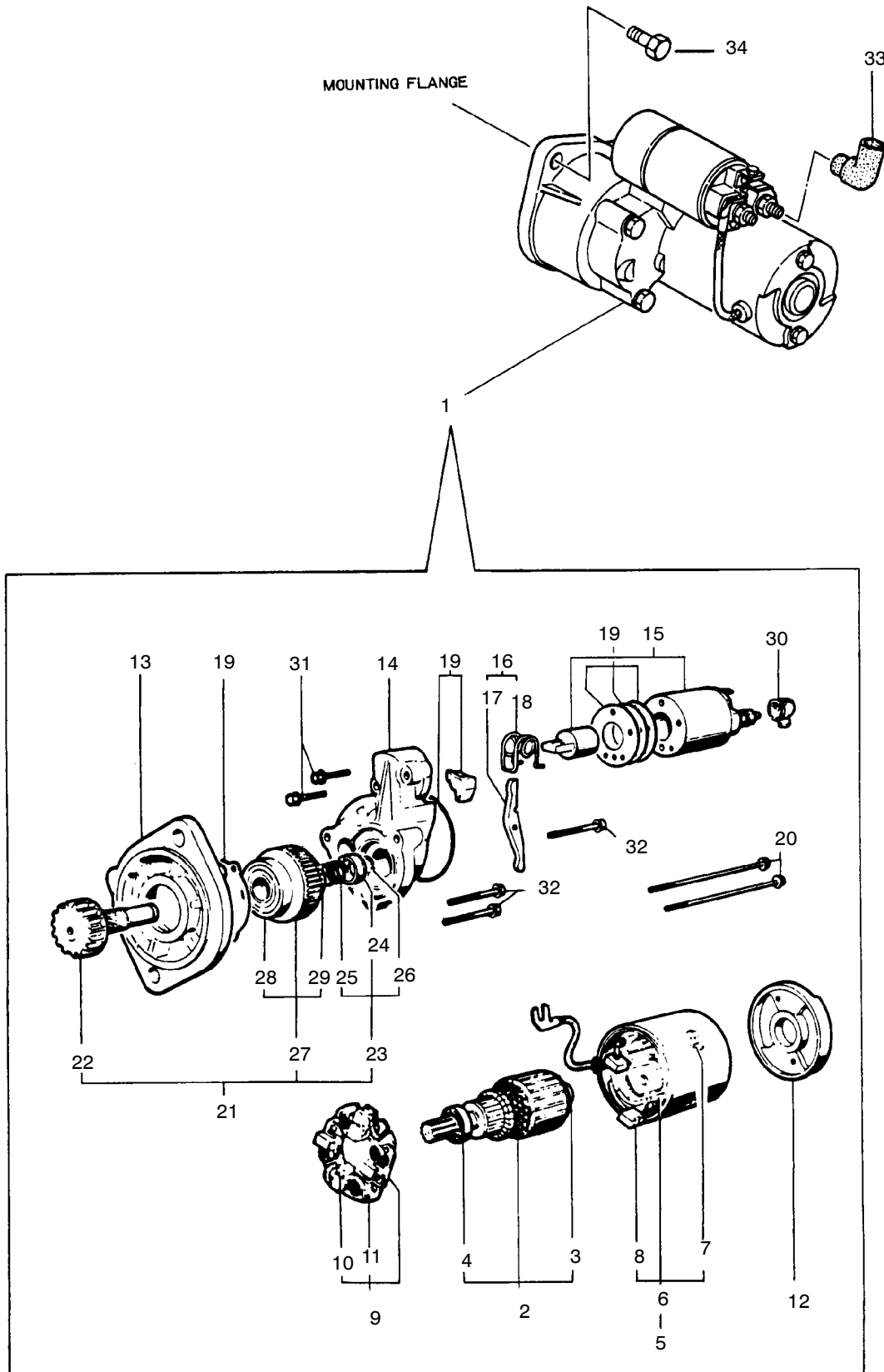
558713B

## Group 13: Governor, continued

Item	Part Number	Description	Quantity	
			Variation Number 2	Variation Number 3
1	X	Governor assembly (includes items 2-52)	1	1
2	252849	O-ring	2	2
3	X	Case, governor	1	1
4	225417	Gasket, spacer	1	1
5	225414	Cover	1	1
6	225408	Packing	1	1
7	256787	Link 30 mm	1	1
8	256558	Link 31 mm	1	1
9	256559	Link 30.5 mm	1	1
10	252974	Weight assembly, governor (includes items 11-13)	1	1
11	X	Weight	4	4
12	X	Pin, governor weight	4	4
13	X	Support	1	1
14	225781	Sleeve	1	1
15	225409	Shaft assembly, control	1	1
16	225782	Spacer, shaft	1	1
17	225410	Bolt, limit	1	
17	GM13294	Bolt, limit		1
18	225784	Bolt, idle limit	1	1
19	225786	Spacer assembly	2	2
20	225415	Shaft, governor lever	1	1
21	225421	Lever assembly, governor (includes items 22-34)	1	1
22	252592	Shim set	2	2
23	X	Lever	1	1
24	X	Lever, governor	1	1
25	X	Lever, governor	1	1
26	225407	Spring	1	1
27	X	Shifter	1	1
28	X	Bush	2	2
29	X	Fitting	1	1
30	X	Hook, tension lever	1	1
31	X	Pin	1	1
32	X	Circlip	1	1
33	X	Screw, M6 x 12	1	1
34	X	Screw, M5 x 10	2	2
35	252856	O-ring	2	2
36	229692	Retainer, shaft	1	1
37	225790	Bolt, washer based	1	1
38	225391	Carb nut, high idle	1	1
39	225803	Washer 4	1	1
40	250994	Seal washer 6	1	1
41	225829	Seal washer 10	2	2
42	225424	Seal washer 12	2	2
43	256704	Washer 12	1	1
44	225809	Snap pin 4	2	2
45	256517	Plug	1	1
46	229498	Bolt, M6 x 10 plated	1	1
47	229498	Bolt, M6 x 10 plated	4	4
48	225818	Bolt, M6 x 14 plated	2	2
49	225817	Bolt, M6 x 20 plated	6	6
50	225825	Nut, lock M6 plated	1	1
51	225826	Nut, lock M12 plated	1	1
52	225390	Carb nut, flow limit	1	1
53	252723	Nut, M8	1	1
54	225800	Lever, control	1	1
55	GM13320	Spring, fuel control	1	1
56	225795	Spring governor	1	1
57	225461	Kit, fuel solenoid (O-ring 225427)	1	
57	344746	Fuel solenoid, 24 V (order O-ring 225427)		1
58	225785	Bolt, fuel control	1	1
59	225381	Plug 22	1	1
60	225382	Plug 14	1	1

X Item not sold separately

# Group 14: Starting Motor



558714



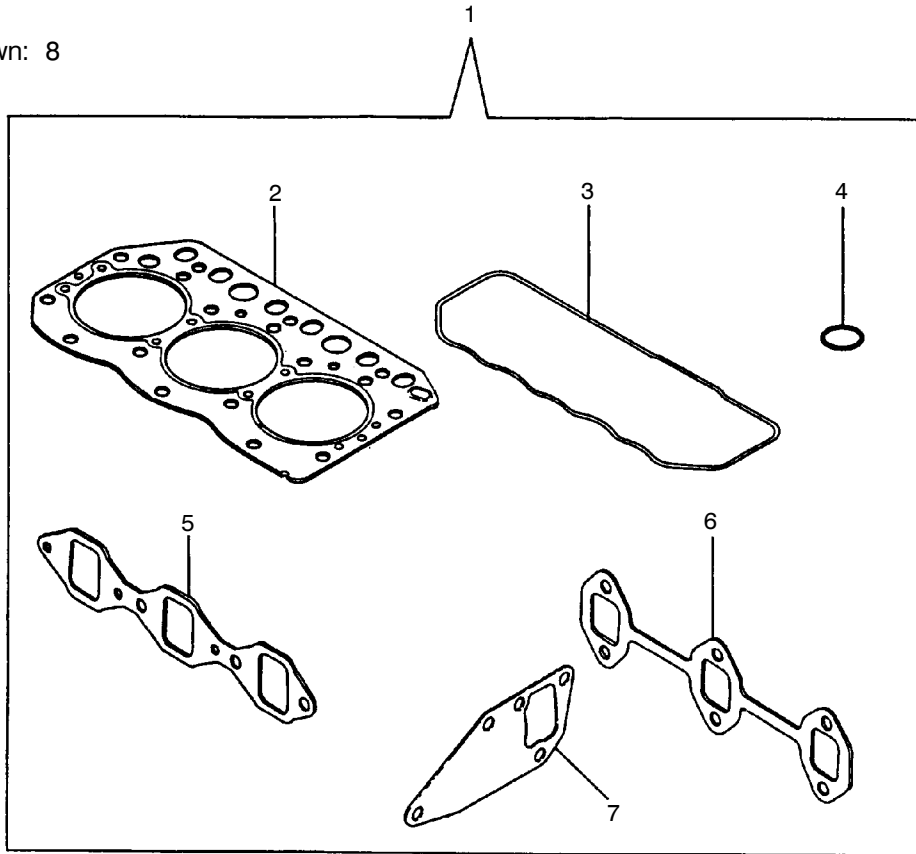
## Group 14: Starting Motor

Item	Part Number	Description	Quantity			
			Variation Number			
			1	2	3	4
1	225013	Starter (includes items 2-32)	1		1	
1	344743	Starter, 24V		1		
1	GM39020	Starter, 24V				1
2	225895	Armature assembly (includes items 3 and 4)	1		1	
3	225896	Bearing	1		1	
4	225897	Bearing	1		1	
5	229477	Yoke assembly (includes items 6-8)	1		1	
6	225898	Coil assembly, field	1		1	
7	225899	Screw, pole core set	4		4	
8	225900	Brush (+)	2		2	
9	225901	Holder assembly, brush (includes items 10 and 11)	1		1	
10	225902	Brush (-)	2		2	
11	225903	Spring, brush	4		4	
12	225904	Cover, rear	1		1	
13	225905	Housing assembly, gear	1		1	
14	225906	Housing, center	1		1	
15	225907	Switch, magnetic	1		1	
16	225908	Lever set, shift (includes items 17 and 18)	4		4	
17	229478	Lever	1		1	
18	229479	Spring	1		1	
19	225909	Dust cover	1		1	
20	225910	Bolt, through	2		2	
21	225911	Pinion assembly (includes items 22-29)	1		1	
22	225912	Shaft, pinion	1		1	
23	225913	Stopper set, pinion (includes items 24-26)	1		1	
24	229480	Stopper, pinion	1		1	
25	229481	Spring	1		1	
26	229482	Clip, pinion stopper	1		1	
27	225914	Clutch assembly (includes items 28 and 29)	1		1	
28	225915	Ball bearing	1		1	
29	225916	Ball bearing	1		1	
30	225917	Cover, terminal	1		1	
31	225920	Bolt, M6 x 32 plated	2		2	
32	225921	Bolt, M6 x 40 plated	3		3	
33	252481	Cover, terminal	1	1	1	1
34	252713	Bolt, M12 x 30 plated	2	2		
34	252712	Bolt, M12 x 25 plated			2	2

# Group 15: Gasket Set

## Variation 1

Item not shown: 8



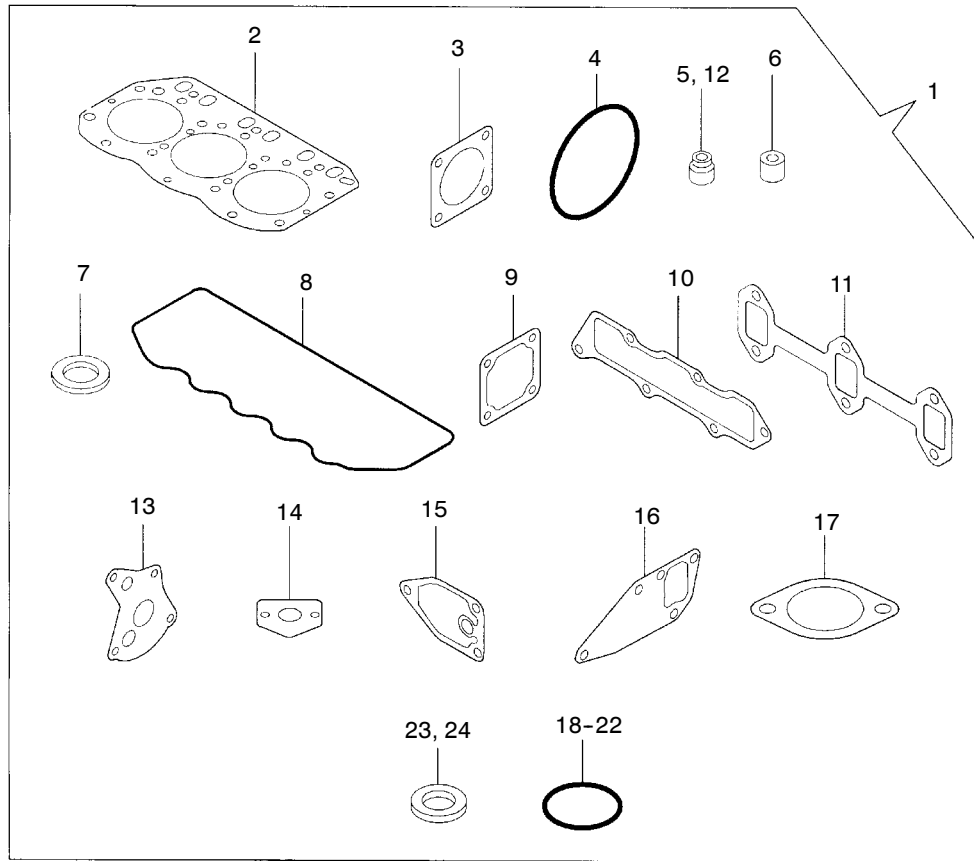
558715A

Item	Part Number	Description	Quantity
			Variation Number
1	229805	Gasket set	1
2	229699	Gasket, cylinder head	1
3	225758	Gasket, bonnet	1
4	250801	O-ring	1
5	225716	Gasket, intake manifold	1
6	225717	Gasket, exhaust manifold	1
7	252838	Gasket, cooling water pump	1
8	252998	Gasket, liquid (not shown)	1

# Group 15: Gasket Set

## Variations 2 & 3

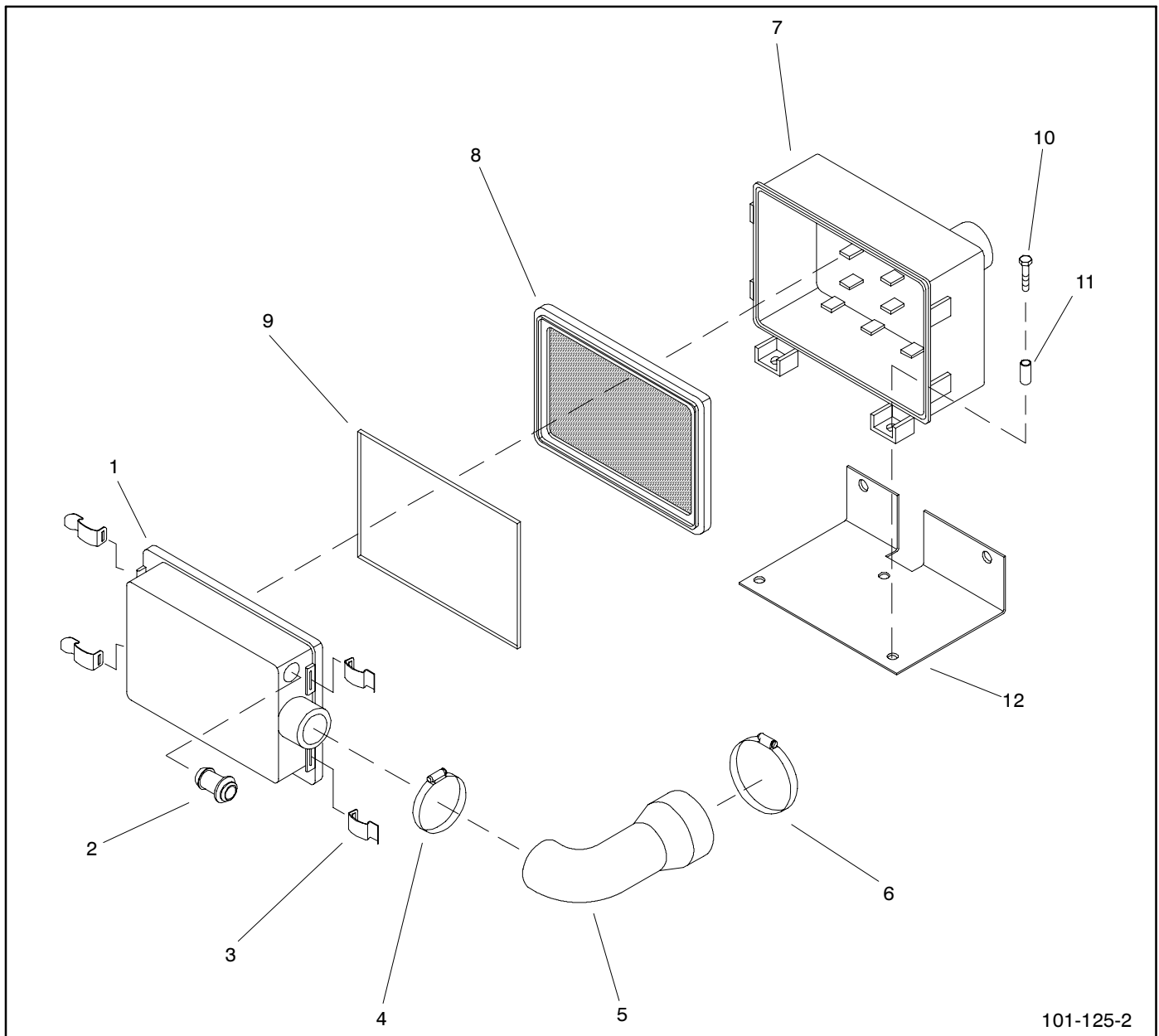
Item not shown: 25



558715B

Item	Part Number	Description	Quantity	
			Variation 2	Variation 3
1	225440	Gasket set, 3TNE78A engine	1	
1	GM13821	Gasket set, 3TNE82A engine		1
2	225399	Gasket, cylinder head	1	
2	GM13813	Gasket, cylinder head		1
3	252085	Gasket	1	1
4	252764	O-ring, fuel injection pump	1	1
5	225766	Seal, valve stem	3	3
6	225385	Protector, nozzle	3	3
7	252744	Seat, nozzle	3	3
8	225758	Gasket, valve cover	1	1
9	229719	Gasket, air heater	1	1
10	GM33685	Gasket, intake manifold	1	1
11	225717	Gasket, exhaust manifold	1	1
12	250844	Seal, valve stem	3	3
13	252829	Gasket, oil pump	1	1
14	225775	Gasket	1	1
15	225776	Gasket	1	1
16	252838	Gasket, water pump	1	1
17	249865	Gasket	1	1
18	250801	O-ring, 1A P 12.0	3	3
19	250981	O-ring, 1A P 16.0	3	3
20	252684	O-ring, 1A P 32.0	1	1
21	256796	O-ring, 1A P 50.0	1	1
22	256796	O-ring, 1A P 24.0	1	1
23	250968	Gasket 10, round	2	2
24	252773	Gasket 16	2	
24	250969	Gasket 12, round		4
25	252998	Gasket, liquid (not shown)	1	1

# Group 101: Air Intake



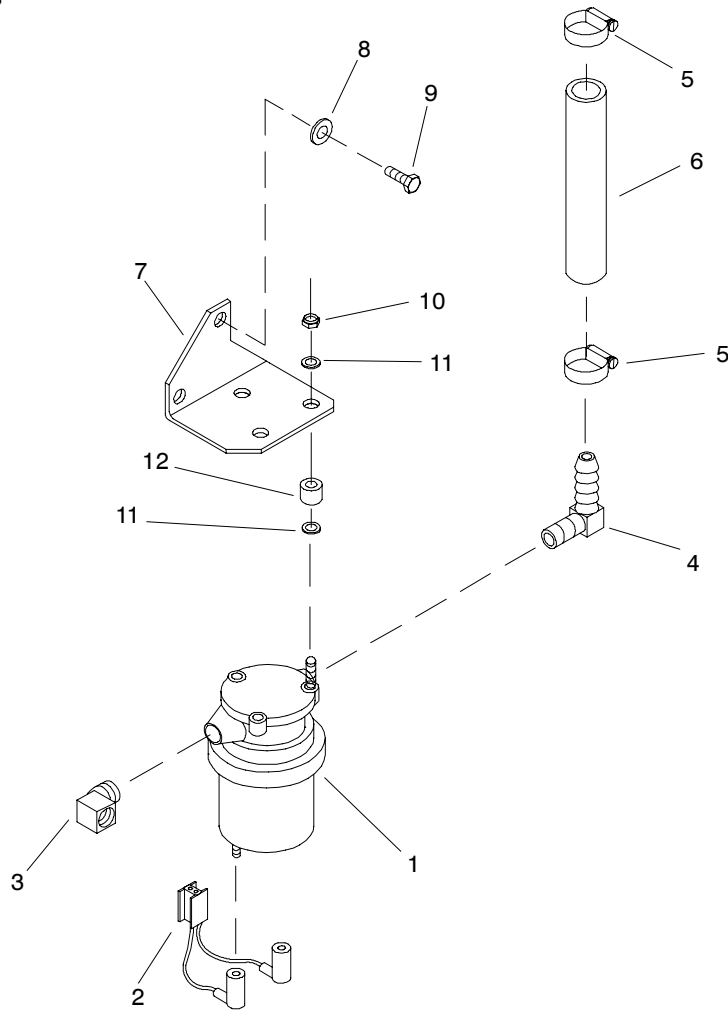
101-125-2

Item	Part Number	Description	Quantity	
			2	3
1	227463	Cover, plastic	1	1
2	278805	Adapter, nylon hose	1	1
3	278862	Clip, air cleaner	4	4
4	X-426-4	Clamp, hose, 1.31/2.25	1	
4	X-426-19	Clamp, hose 1/2 in.		1
5	229383	Hose, air intake	1	
5	344224	Hose, air intake		1
6	X-426-6	Clamp, hose 1-9/16 x 2-1/2	1	1
7	278855	Base, air cleaner	1	1
8	278858	Element, filter	1	1
9	278857	Filter	1	1
10	X-6050-8	Screw, HC	2	2
11	X-400-28	Spacer	1	1
12	229387	Bracket, air cleaner	1	1
12	#	Hardware, 1/4-20	3	3

# Common hardware. Procure locally.

# Group 103: Fuel System

See Group 12, Fuel Line for additional Fuel System components

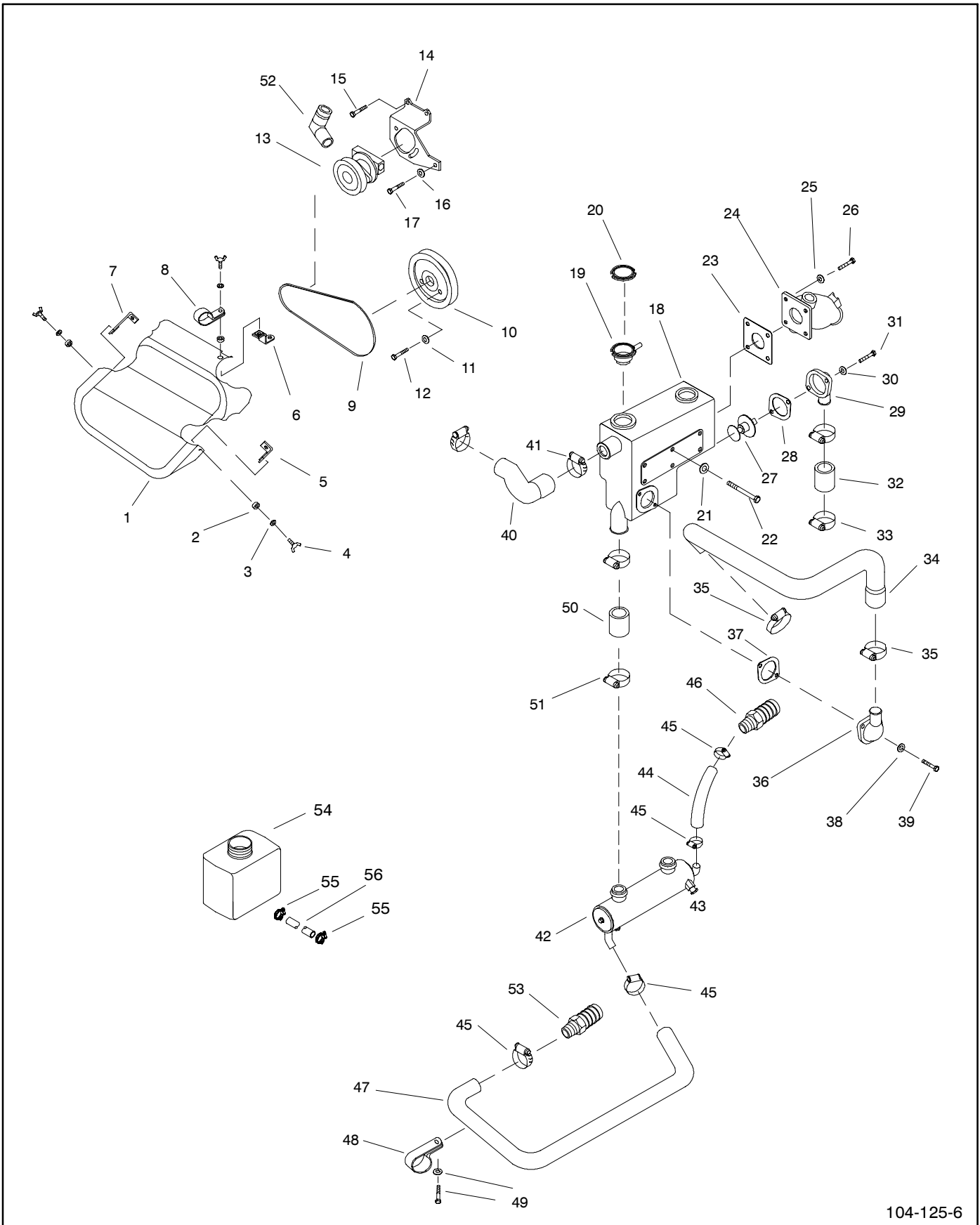


103-125-2

Item	Part Number	Description	Quantity		
			2	6	9
1	229051	Pump, fuel	1	1	
1	344740	Pump, fuel			1
2	229168	Lead assembly	1	1	1
3	X-555-1	Elbow, street 1/4 x 1/4	1	1	1
4	X-391-20	Connector, hose elbow	1	1	1
5	X-426-9	Clamp, hose	2	2	2
6	X-386-74	Line, fuel	1		
6	X-386-62	Line, fuel		1	
6	X-386-14	Line, fuel			1
7	229065	Bracket, fuel pump	1	1	1
8	#	Washer, 1/2	2	2	2
9	X-6052-1	Screw, HC M12 -1.75 x 2	2	2	2
10	X-101-25	Nut, hex elastic stop	3	3	3
11	#	Washer, 1/4	3	3	3
12	X-284-39	Grommet	3	3	3

# Common hardware. Procure locally.

# Group 104: Cooling System



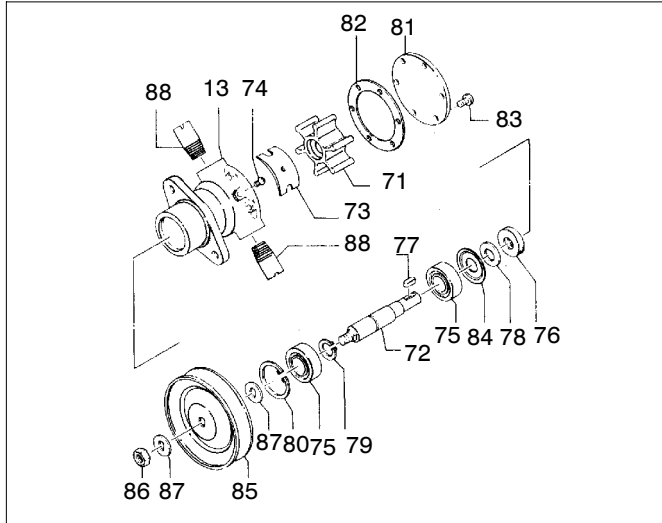
104-125-6

## Group 104: Cooling System

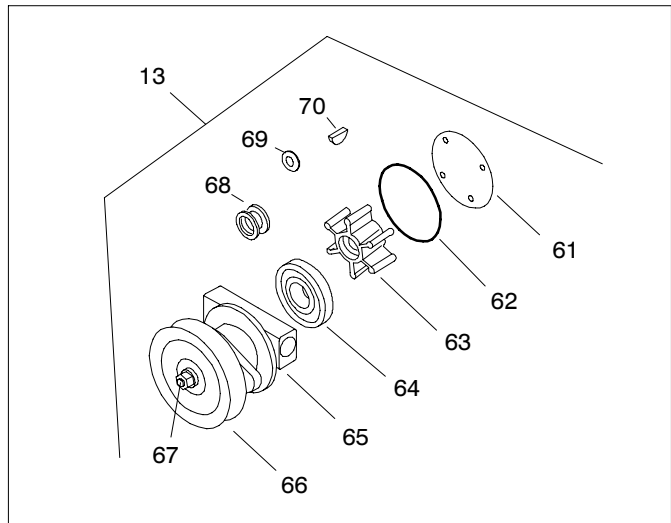
Item	Part Number	Description	Quantity				
			Variation Number				
			6	9	13	14	16
1	229062	Guard, belt	1	1			
1	344319	Guard, belt			1	1	1
1	344815	Guard, alternator fan (not shown)					1
2	X-284-39	Grommet	3	3	3	3	3
3	#	Washer, 1/4	3	3	3	3	3
4	229330	Screw, wing	3	3	3	3	3
5	229069	Bracket, belt guard	1	1	1	1	
5	344816	Bracket, belt guard					1
6	229067	Bracket, belt guard	1	1	1	1	
6	344817	Bracket, belt guard					1
7	229068	Bracket, belt guard	1	1	1	1	
7	344818	Bracket, belt guard					1
8	X-672-25	Clamp, insulated	1	1	1	1	1
9	229125	V-Belt	1	1	1	1	1
10	229054	Pulley, seawater pump	1	1	1	1	1
11	#	Washer, 7/16	2	2	2	2	2
12	X-6051-3	Screw, H.C	2	2	2	2	2
13	See Table on page 38	Pump, seawater	1	1	1	1	1
14	344844	Bracket, seawater pump	1	1	1	1	1
15	X-6068-4	Screw, HC	2	2	2	2	2
16	X-400-199	Spacer	1	1	1	1	1
17	X-6050-6	Screw, hex head cap	1	1	1	1	1
18	260115	Manifold, exhaust	1	1	1	1	1
19	241311	Neck (50 440 01)	1	1	1	1	1
20	276954	Cap, 7 psi	1	1	1	1	
20	229980	Cap, 14 psi	1	1	1	1	
20	226734	Cap, 14 psi					1
21	#	Washer, 5/16	6	6	6	6	6
22	X-6050-14	Screw, hex head cap	6	6	6	6	6
23	249905	Gasket, exhaust	1	1	1	1	1
24	229063	Tube, mixing	1	1	1	1	1
25	#	Washer, 5/16	4	4	4	4	4
26	X-125-5	Screw, 5/16-18 x 1, ref.	4	4	4	4	
27	254920	Thermostat	1	1	1	1	1
28	229963	Gasket, water outlet	1	1	1	1	1
29	229064	Cover, thermostat	1	1	1	1	1
30	#	Washer, 5/16	2	2	2	2	2
31	X-125-31	Screw, 5/16-8 x .875, ref.	2	2	2	2	2
32	229232	Hose, coolant	1	1	1	1	1
33	X-426-8	Clamp, hose 15/16 x 1-3/4	2	2	2	2	
34	229272	Hose, molded	1	1	1	1	
34	344825	Hose, molded					1
35	X-426-8	Clamp, hose 15/16 x 1-3/4	2	2	2	2	2
36	229064	Cover, thermostat	1	1	1	1	1
37	229963	Gasket, water outlet	1	1	1	1	1
38	#	Washer, 5/16	2	2	2	2	2
39	X-125-31	Screw, 5/16-8 x .875, ref.	2	2	2	2	2
40	229057	Hose, molded	1	1	1	1	1
41	X-426-8	Clamp, hose 15/16 x 1-3/4	2	2	2	2	2
42	229058	Exchanger, heat (includes item 43)	1	1	1	1	1
43	260085	Zinc anode 0.375 in., 9.52 mm	1	1	1	1	1
43	229972	Zinc anode 0.5 in., 12.70 mm	1	1	1	1	1
44	X-312-16	Hose	1	1	1	1	1
45	X-426-3	Clamp, hose 1/2 x 1-13/32	4	4	4	4	4
46	X-391-26	Connector, hose	1	1			
46	X-391-2	Connector, hose			1	1	1
47	X-312-46	Hose	1	1	1	1	1
48	X-672-3	Clamp, insulating	1	1	1	1	1
49	#	Washer, 5/16	1	1	1	1	1
50	229232	Hose, coolant	1	1	1	1	1
51	X-426-8	Clamp, hose 15/16 x 1-3/4	2	2	2	2	2
52	X-391-26	Elbow, 90 deg. hose connector	1				
52	X-391-31	Elbow, 90 deg. hose connector		1		1	
52	X-391-2	Elbow, 90 deg. hose connector			1		1
53	X-582-19	Hose connector	1	1			
53	X-582-2	Hose connector			1	1	1
54	249396	Bottle, overflow (cap 229980)	1	1			
54	359037	Bottle, overflow			1	1	1
54	359038	Bracket, water bottle (not shown)			1	1	1
54	X-400-74	Spacer (not shown)			1	1	1
54	X-6050-8	Screw, hex head cap (not shown)			1	1	1
55	X-426-9	Clamp, hose	1	1	2	2	2
56	X-386-34	Line, flex fuel 5/16 x 28			1	1	1

# Common hardware. Procure locally.

# Group 104: Cooling System, continued



**Pump 267373 Components  
S/N 296898 and before**



**Pump 344089 and GM46936 Components  
S/N 296899 and later**

## Seawater Pump Component Parts

Item	Description	Part Number		
		Serial Numbers 296898 and before	Serial Numbers 296899 through 2104902	Serial Numbers 2104903 and above
13	Seawater Pump (includes the following) Service Kit, Seawater Pump	267373 N/A	344089 GM46959*	GM46936 N/A
61	Cover Plate	N/A	344306	344306
62	Gasket	252475	344584	344584
63	Impeller Kit (includes gasket)	229955	229826	229826
64	Ball Bearing	N/A	344043	344043
65	Housing	N/A	344585	order item 13
66	Pulley	N/A	344606	order item 13
67	Drive Shaft	N/A	344587	order item 13
68	Seal	N/A	GM16865	GM16865
69	Seat, ceramic	N/A	GM22995	GM22995
70	Key	N/A	GM17702	GM17702
71	Impeller	250872	N/A	N/A
72	Shaft, pump	252437	N/A	N/A
73	Cam	252476	N/A	N/A
74	Screw, M4 x 10	#	N/A	N/A
75	Bearing	252364	N/A	N/A
76	Seal, oil	250871	N/A	N/A
77	Key, feather	252473	N/A	N/A
78	Drip, water	252474	N/A	N/A
79	Circlip, 15-S	252346	N/A	N/A
80	Circlip, 35-H	252348	N/A	N/A
81	Cover	252439	N/A	N/A
82	Gasket	252475	N/A	N/A
83	Screw, M4 x 8	#	N/A	N/A
84	Cover, bearing	252438	N/A	N/A
85	V-pulley	252464	N/A	N/A
86	U-nut, M8	252336	N/A	N/A
87	Washer	252466	N/A	N/A
88	Joint, 3/8 NPT	252443	N/A	N/A
	Seawater pump repair kit (includes items 71, 72, 75-82, 84, 87)	GM28669	N/A	N/A

\* Effective with serial number 2104903, seawater pump GM46936 replaced seawater pump 344089. New seawater pump GM46936 incorporates a pressed-on pulley.

When service stock of 344089 seawater pumps is depleted, replace the 344089 pump with seawater pump service kit GM46959.

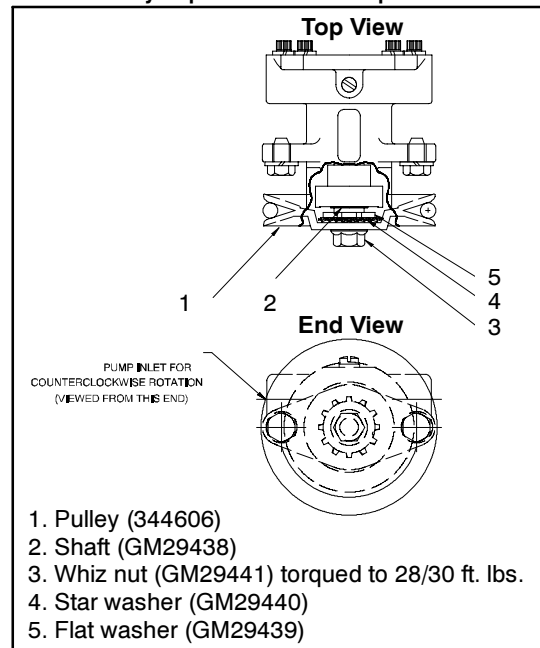
Seawater pump service kit includes pump GM46936, item 14 bracket, and hardware. After installing the kit, refer to seawater pump GM46936 column in the table above for seawater pump component parts.



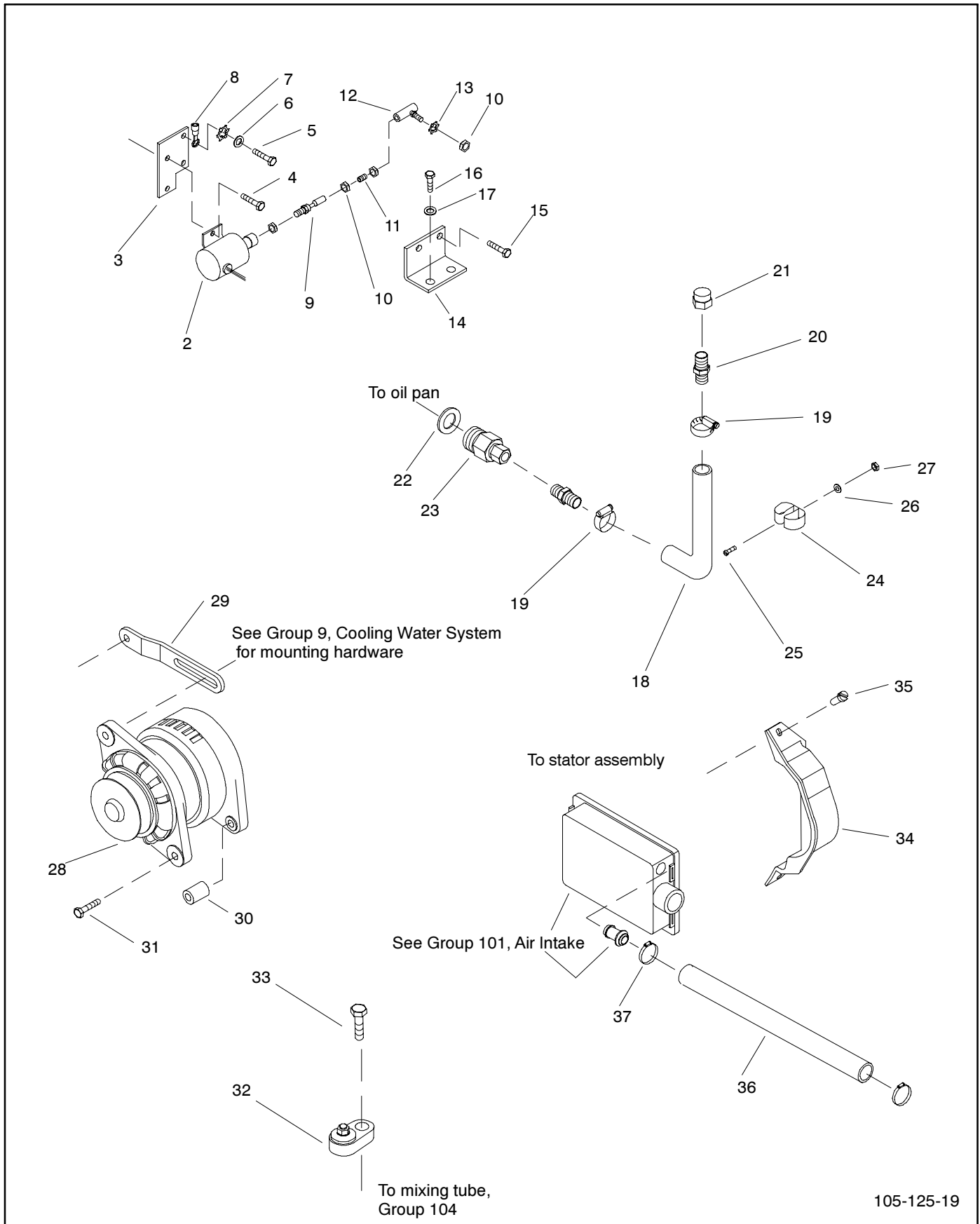
## Group 104: Cooling System, continued

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

### Pulley Replacement Kit Components



# Group 105: Engine



# Group 105: Engine

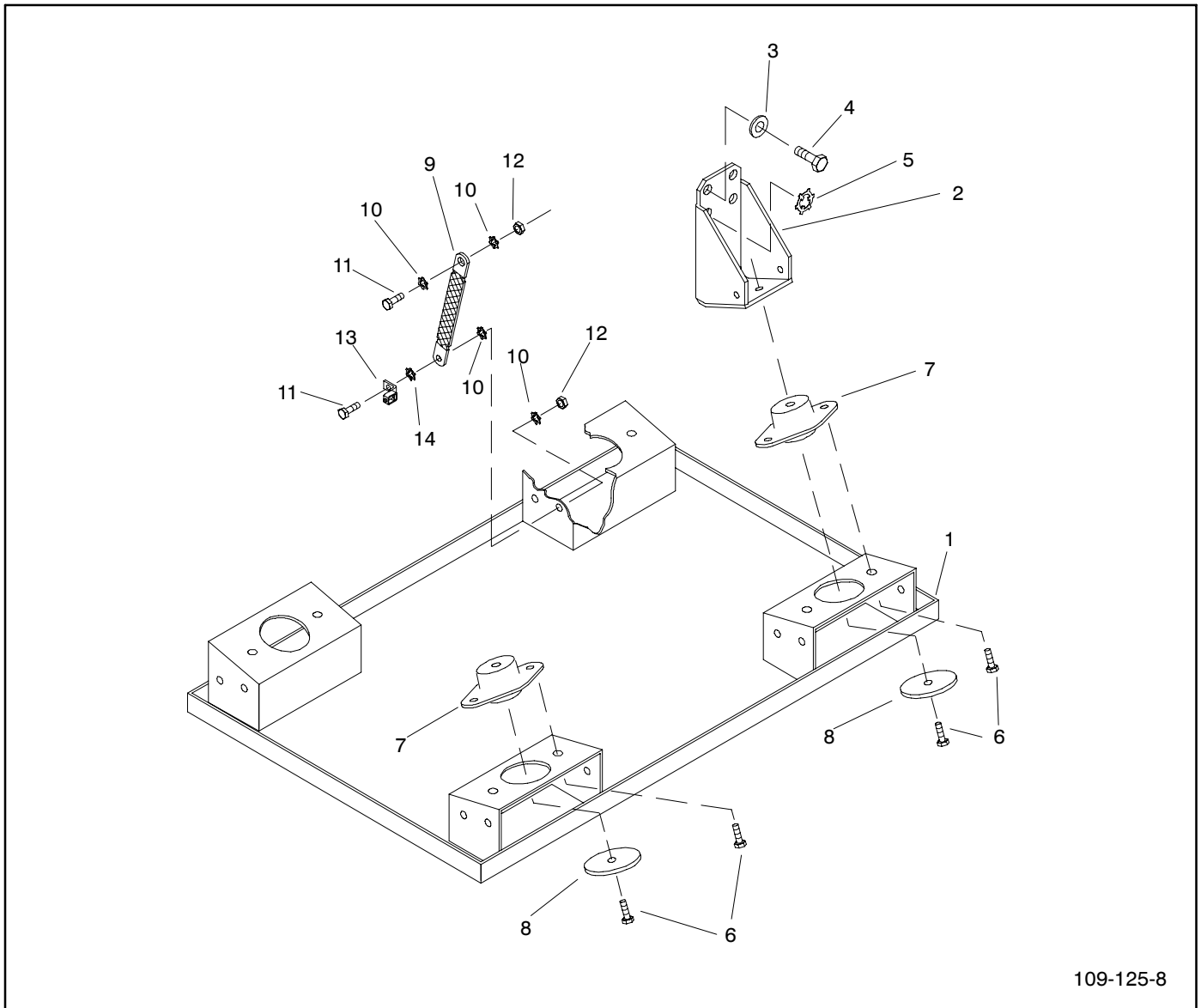
Item	Part Number	Description	Quantity							GR1
			Variation Number							
			19	24	29	30	34	38	39	
1	A-229187	Engine assembly (groups 1-15) (model 3TNC78E)	1	1						
1	A-344047	Engine assembly (groups 1-15) (model 3TNE78A)			1	1	1			
1	A-359553-BLK	Engine assembly (groups 1-15) (model 3TNE82A)						1	1	1
2	258628	Solenoid, fuel	1	1						
3	229302	Bracket, solenoid	1	1						
4	#	Hardware, 1/4-20	2	2	2	2	2	2	2	2
5	X-6050-8	Screw, HC	2	2			2		2	
6	#	Washer, 5/16	2	2	2	2	2	2	2	2
7	X-22-16	Washer, lock 5/16	1	1	1	1	1	1	1	1
8	X-283-15	Terminal	1	1						
9	273731	Ball joint	1	1						
10	X-81-9	Nut, hex	4	4						
11	X-352-82	Stud	1	1						
12	273730	Ball joint	1	1						
13	X-22-11	Washer, lock 1/4	1	1						
14	229170	Bracket, fuel filter	1	1						
14	344225	Bracket, fuel filter			1	1	1	1	1	1
15	X-6050-8	Screw, HC	4	4	4	4	4	4	4	4
16	#	Hardware, 3/8-16	2	2	2	2	2	2	2	2
17	#	Washer, 3/8	2	2	2	2	2	2	2	2
18	X-651-34	Hose	1		1	1		1		1
19	X-426-9	Clamp, hose	2		2		2	2	2	2
20	X-652-1	Fitting, hose	2		2			2		2
21	X-268-3	Cap, pipe	1		1			1		1
21	X-75-10	Plug, drain		1		1				
22	X-25-145	Washer, plain	1	1	1	1	1	1	1	1
23	229179	Valve, drain	1							
23	344828	Valve, drain			1	1	1		1	
23	359653	Valve, drain						1		1
23	249959	Adapter		1				1		1
24	X-6084-1	Clip, hose	1		1		1	1	1	1
25	#	Screw, 1/4-20	1	1	1	1	1	1	1	1
26	#	Washer, #8	1	1	1	1	1	1	1	1
27	#	Nut, 1/4-20	1	1	1	1	1	1	1	1
28	256924	Alternator	1	1	1	1		1		
28	344742	Alternator, 24V					1		1	
29	229212	Bracket, alt. adjusting	1	1	1	1		1		1
29	254784	Bracket, alt. adjusting					1		1	
30	X-400-184	Spacer	1	1	1	1		1		
30	X-400-152	Spacer					1		1	
31	#	Hardware, 5/16-18	1	1	1	1	1	1	1	
32	249872	Switch, high temp. cutout	1	1	1	1	1	1	1	1
33	X-6238-10	Screw, HC, ref.	1	1	1	1		1		1
34	229113	Guard, generator fan	1	1	1	1	1	1	1	1
35	X-67-113	Screw, self-tapping	2	2	2	2	2	2	2	2
36	X-577-35	Hose, oil proof	1	1						
36	X-577-41	Hose, oil proof			1	1	1			
36	—	Use hose supplied with engine (group 4)						1	1	1
37	X-426-10	Clamp, hose	2	2	2	2	2			

# Common hardware. Procure locally.

## Group 107: Nameplate and Decals

Item	Part Number	Description	Quantity	
			Variation Number	
			7	11
1	249810	Decal, warning "hot coolant"	1	1
2	246274	Decal, "notice zinc anode"	1	
2	344282	Decal, "notice zinc anode"		1
3	241655	Decal, neg. battery connection	1	
3	226917	Decal, neg. battery connection		1
4	290435	Decal, equipment ground	1	
4	344295	Decal, equipment ground		1
5	280561	Decal, water drain	2	
5	GM14167	Decal, drain		2
6	249808	Decal, warning "rotating parts"	1	1
7	280562	Decal, oil drain	1	
7	GM14167	Decal, drain		1
8	224233	Decal, 1-800 number	1	1
9	267468	Decal, Coast Guard	1	
10	249809	Decal, warning "hot engine"	1	1
11	229177	Nameplate	1	1
12	X-793-3	Rivet, pop	4	4
13	229831	Decal, reconnection	1	1
14	X-6348-6	Decal, Kohler Power System	1	1
15	344486	Decal, CE	1	1
16	294520	Decal, danger, high voltage		1

# Group 109: Skid and Plant Mounting

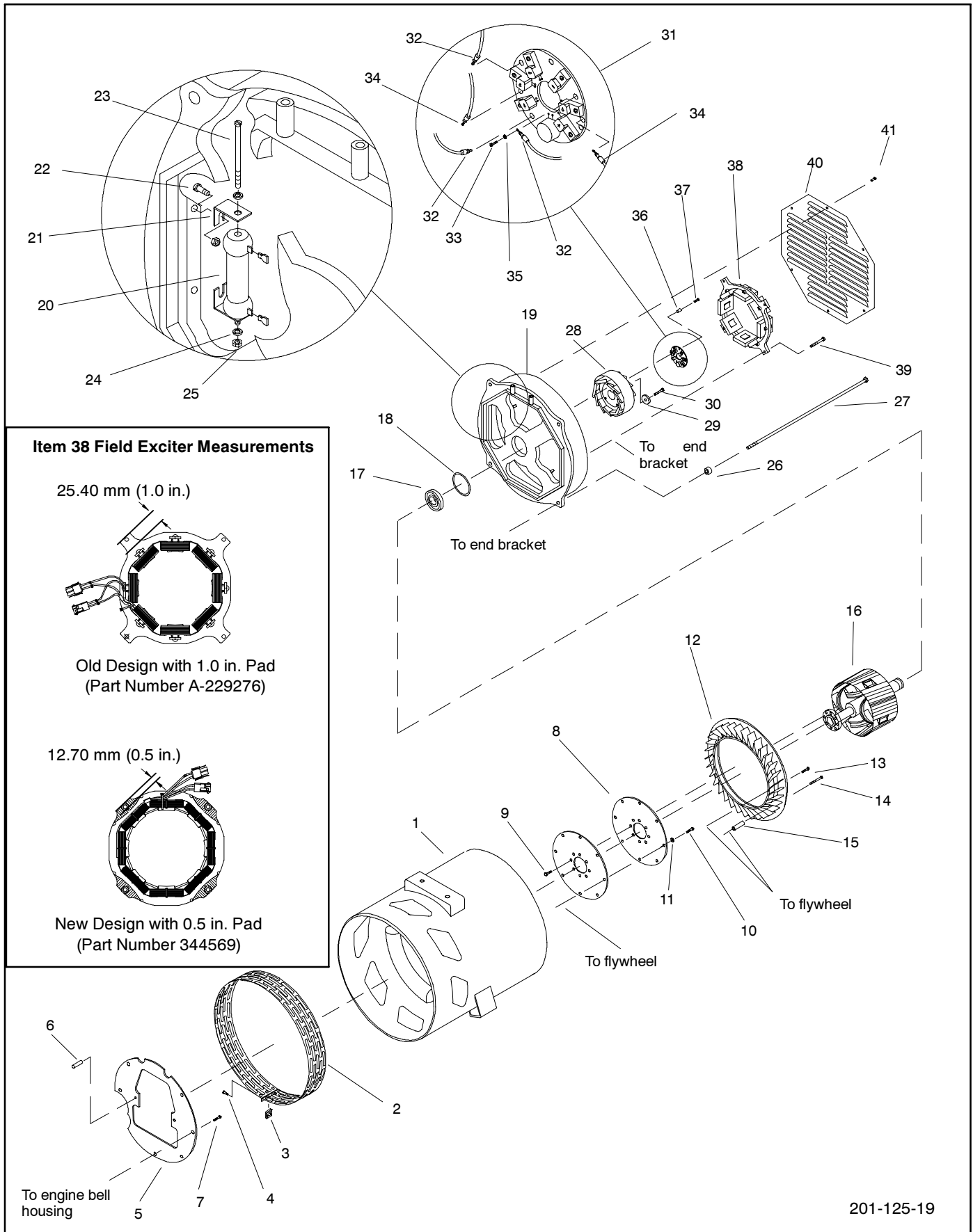


109-125-8

Item	Part Number	Description	Quantity
			Variation Number 8
1	229081	Tray	1
2	229079	Bracket, engine mounting	2
3	#	Washer, 1/2	7
4	X-6052-1	Screw, hex head cap	8
5	X-22-4	Washer, lock	1
6	#	Hardware, 5/16-18	12
7	278322	Vibromount	4
8	X-25-96	Washer, plain	4
9	245297	Strap, ground	1
10	X-22-12	Washer, shakeproof	4
11	#	Hardware, 1/4-20	2
12	#	Hardware, 1/4-20	2
13	X-377-12	Connector, cable	1
14	X-22-11	Washer, lock 1/4	1

# Common hardware. Procure locally.

# Group 201: Generator and Mounting



201-125-19

# Group 201: Generator and Mounting

Item	Part Number	Description	Quantity	
			Variation Number	
			19	27
1	229385	Stator assembly	1	1
2	229109	Guard, generator fan	1	1
3	257442	Clip, speed	1	1
4	X-67-125	Screw, self-tapping	1	1
5	229097	Plate, locator	1	1
6	229356	Pin, knurled	2	2
7	X-6051-13	Screw, HC	6	6
8	257017	Disc, armature drive	2	2
9	X-6238-3	Screw, 3/8-16 x .875	8	8
10	X-6050-8	Screw, HC	8	8
11	#	Washer, 5/16	8	8
12	225215	Fan, generator	1	1
13	X-6284-1	Screw, M5 x .8 x 10mm	4	4
14	X-6284-2	Screw, M5 x .8 x 45mm	4	4
15	X-400-189	Spacer	4	4
16	A-229147	Rotor assembly (includes item 17)	1	1
17	X-758-15	Bearing, ball	1	1
18	229110	O-ring	1	1
19	See note below	Bracket, end	1	
19	344566	Bracket, end		1
20	229350	Resistor assembly	1	1
21	X-363-1	Bracket, resistor mounting	2	2
22	#	Screw, 1/4-20	2	2
23	X-51-46	Screw, RHM 8-32 x 5	1	1
24	X-364-4	Washer, resistor	2	2
25	#	Nut, 8/32	1	1
26	X-801-3	Washer, hardened	4	4
27	X-6051-16	Screw, HC M10 x 1.5	4	4
28	344567	Exciter, armature	1	1
29	X-25-129	Washer, plain	1	
29	X-67-135	Washer, plain		1
30	X-6238-3	Screw, 3/8-16 x .875	1	1
31	A-229152	Circuit board, diode board	1	1
32	X-283-3	Terminal	3	3
33	X-51-8	Screw, 8-32 x .75	5	5
34	X-6020-3	Sleeve	2	
35	X-22-7	Washers, #8	5	5
36	X-712-17	Spacer	3	3
37	X-67-135	Screw, self-tapping	3	3
38	See note below	Exciter assembly, field	1	
38	344569	Exciter assembly, field		1
39	X-97-15	Screw, hex. head machine	4	4
40	225545	Panel, end bracket	1	1
41	X-67-113	Screw, self-tapping	6	6

# Common hardware. Procure locally.

## Note

The replacement part numbers of the end bracket and field exciter assembly in variation 19 depend on the length of the field exciter's (item 38) 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 19, End Bracket	Item 38, 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

Item	Part Number	Description	Quantity				
			Variation Number				
			23	28	34	35	41
1	A-229301	Controller assembly	1				
1	A-344002	Controller assembly		1			
1	A-344321	Controller assembly			1		
1	A-344322	Controller assembly				1	
1	A-344744	Controller assembly					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	Meter, hour	1	1	1	1	1
6	X-49-26	Screw, 6-32 x .625	6	6	6	6	6
7	X-22-6	Washer, lock #6	6	6	6	6	6
8	X-71-2	Nut, hex 6-32	2	2	2	2	2
9	245264-BLK	Plate, cover	1	1	1	1	1
9	X-506-43	Breaker, circuit		1		1	
9	249956	Terminal (not shown)		1		1	
10	X-49-25	Screw, 6-32 x .25	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	#	Washers, #10	4	4	4	4	4
17	LK-0616-1515	Lead	1	1	1	1	1
18	X-22-12	Washer, shakeproof	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	1	1	1	1
22	#	Bolt, 1/4-20	1	1	1	1	1
23	X-22-12	Washer, shakeproof	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-634-18	Bushing	1	1	1	1	1
27	229333	Harness, controller	1		1		1
27	344011	Harness, controller		1		1	
28	X-71-2	Nut, hex 6 32	4	4	4	4	4
29	X-49-26	Screw, 6 32 x .50	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	
31	A-344753	Circuit board assembly					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	
34	272684	Relay					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 (PBIIIIE)	1	1	1	1	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	229384	Harness, engine (not shown)	1				1
42	344020	Harness, engine (not shown)		1		1	
42	344222	Harness, engine (not shown)			1		
43	248362	Relay (not shown)		1		1	
44	233442	Relay, status (not shown)		1		1	
45	229233	Harness, air heater relay (not shown)		1		1	

# Common hardware. Procure locally.

## Group 501: Housing

Variation 3: See parts list of sound shield kit 229925 in accessories section for parts listing.

Variation 7: See parts list of sound shield kit 334333 in accessories section for parts listing.

Variation 10, 13: See parts list of sound shield kit 334832 in accessories section for parts listing.

## Group 701: Literature

Item	Part Number	Description	Quantity		
			Variation Number		
			8	12	19
1	TP-5365	Service manual, Yanmar engine	1	1	
1	TP-5876	Service manual, Yanmar engine			1
2	TP-5586	Operation manual, 5/9CCOZ	1		
2	TP-5766	Operation manual, 5/9EOZ, 4/8EFOZ		1	
2	TP-5856	Operation manual, 5-32 kW			1
3	TP-5857	Installation manual, Yanmar engine			1
4	TP-5587	Parts catalog, 9CCOZ/9EOZ	1	1	1
5	TP-5588	Service manual, 5/9CCOZ, 4/8CCFOZ	1	1	
5	TP-6053	Service manual, 5/8/9/10EOZ, 4/6.5/8/9EFOZ			1
6	TP-5620	Safety precautions	1	1	1

## Paint and Miscellaneous Parts

Item	Part Number	Description	Quantity
			Variation Number all
1	221334	Gallon can of white paint (Chris Craft white)	1
1	221335	Spray can of white paint (Chris Craft white)	1

# Parts List: Accessories

Qty.	Description	Part No.
<b>Battery Cables Kits</b>		
<b>Battery Cable Kit</b>		
1	Cable, battery, positive	PA-250761 X-545-47
1	Cable, battery, negative	X-545-48
<b>Circuit Breaker Kits</b>		
<b>Circuit Breaker Kit</b>		
1	Breaker, circuit, 35 amp	PA-229184 X-506-46
1	Plate, cover	229183
1	Decal, notice	246242
1	Installation Instructions	TT-875
<b>Circuit Breaker Kit</b>		
1	Breaker, circuit, 70 amp	PA-229186 X-506-48
1	Plate, cover	229183
1	Installation Instructions	TT-875
<b>Circuit Breaker Kit</b>		
1	Breaker, circuit, 35 amp	PA-229392 X-506-42
1	Installation Instructions	TT-875
<b>Circuit Breaker Kit</b>		
1	Breaker, circuit, 42 amp	PA-229393 X-506-43
1	Terminal, jumper	249956
1	Installation Instructions	TT-875
<b>Circuit Breaker Kit</b>		
1	Breaker, circuit, 42 amp	PA-229394 X-506-36
1	Decal, notice	246242
1	Terminal, jumper	249956
1	Installation Instructions	TT-875
<b>Circuit Breaker Kit</b>		
1	Breaker, circuit 50 amp	PA-229542 X-506-38
1	Terminal, jumper	249956
1	Installation Instructions	TT-875
<b>Circuit Breaker Kit</b>		
1	Breaker, circuit, 30 amp	PA-344052 X-506-36
1	Decal, notice	246242
1	Installation Instructions	TT-875
<b>Circuit Breaker Kit</b>		
1	Breaker, circuit, 50 amp	PA-344053 X-506-38
1	Decal, notice	246242
1	Installation Instructions	TT-875
<b>Circuit Breaker Kit</b>		
1	Breaker, circuit, 42 amp	PA-344054 X-506-43
1	Installation Instructions	TT-875
<b>Circuit Breaker Kit</b>		
1	Breaker, circuit, 42 amp	PA-359286 X-506-60
1	Plate, cover	229183
1	Decal, notice	246242
1	Installation Instructions	TT-875

Qty.	Description	Part No.
<b>Circuit Breaker Kit</b>		
1	Breaker, circuit	PA-359555 X-506-69
1	Plate, cover	229183
1	Installation Instructions	TT-875
<b>Conversion Kits</b>		
<b>24-Volt Conversion Kit</b>		
1	Screw	PA-344901 X-125-122
1	Spacer	X-400-152
1	Terminal	X-431-37
1	Arm, alternator	254784
2	Relay	272684
1	Pump, fuel	344740
1	Alternator	344742
1	Motor, starting	GM39020
1	Solenoid, fuel	344746
1	Guard, alternator fan	344815
1	Belt, V	226929
1	PCB assembly 24 volts DC	A-344753
1	TT 12 to 24-Volt Conv, 8.5-10EOZ/EFOZ	TT-1348
<b>Keel Cooling Kit</b>		
1	Installation Instructions	PA-359015 TT-1182
1	Gasket, exhaust	249905
1	Flange, exhaust	254692
<b>Flexible Fuel Line Kits</b>		
<b>Flexible Fuel Line</b>		
2	Hose, fuel overflow	PA-250798 258344
<b>Fuel Attachment Block</b>		
<b>Fuel Block</b>		
1	Installation Instructions	PA-229834 TT-1010
2	Bolt, hex cap	230578
1	Fuel line, 1/4 in.	X-386-19
1	Fuel line, 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
<b>Harnesses</b>		
<b>Extension Harness Kit, 15 Ft.</b>		
1	Strap, wire, 5/8	PA-249334 X-526-3
1	Harness, extension	249334

# Parts List: Accessories, continued

Qty.	Description	Part No.
<b>Extension Harness Kit, 25 Ft.</b>		
1	Strap, wire 5/8	X-526-3
1	Harness, extension	249336
<b>Remote Harness, Pigtail 12 In.</b>		
1	Harness, extension	249935
<b>Fire System Interface</b>		
1	Harness, wiring	229832
1	Installation Instructions	TT-930
<b>Coolant Overflow Extension Hose</b>		
<b>Coolant Overflow Extension Hose</b>		
2	Clamp, hose	X-426-10
1	Hose, 10.8 ft.	X-651-30
<b>Panel and Meter Kits</b>		
<b>Remote Start Panel Kit (12 volt)</b>		
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
<b>Remote Start &amp; 4-Meter Panel</b>		
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	Hourmeter	249461
1	Voltmeter, battery	249462
<b>Remote Start &amp; 2-Meter Panel</b>		
1	Screw, RHM 8-32 x 3/4	X-51-11
1	Decal, warning	249494
1	Installation Instructions	TT-687
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

Qty.	Description	Part No.
<b>Remote Start &amp; 2-Meter Panel (12 volt)</b>		
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
1	Hourmeter	GM28814
<b>Remote Start &amp; 4-Meter Panel (12 volt)</b>		
1	Installation Instructions	TT-1073
1	Decal, warning	249494
1	Panel assembly, control (includes the following)	A-344034
1	Switch, rocker	344039
1	Harness, wiring	344032
1	Panel	344030
1	Gauge, oil pressure	344036
1	Gauge, water temperature	344035
1	Voltmeter	344037
1	Hourmeter	GM28814
<b>Remote Start &amp; 2-Meter Panel (24 volt)</b>		
1	Installation Instructions	TT-1072
1	Decal, warning	249494
1	Panel assembly, control (includes the following)	A-344840
1	Panel, control	344029
1	Harness, wiring	344031
1	Gauge, temperature	344035
1	Gauge, oil pressure	344036
1	Switch, rocker	344839
2	Bulb, light	GM28614
2	Resistor, gauge	GM28615
<b>Remote Start &amp; 4-Meter Panel (24 volt)</b>		
1	Installation Instructions	TT-1073
1	Decal, warning	249494
1	Panel assembly, control (includes the following)	A-344841
1	Panel control	344030
1	Harness, wiring	344032
1	Gauge, temperature	344035
1	Gauge, oil pressure	344036
1	Gauge, volt	GM33131
1	Gauge, hourmeter	GM28814
1	Switch, rocker	344839
<b>Remote Start Panel Kit</b>		
1	Decal, warning	249494
1	Panel assembly, remote (includes the following)	A-226965
1	Panel, control	226964
1	Harness, wiring	226979
1	Meter, run time, 10,000 hour	238736
1	Switch, rocker, 1 pole	344039
1	Installation Instructions	TT-1245

# Parts List: Accessories, continued

Qty.	Description	Part No.
<b>Remote Start Panel (24 volt)</b>		
		<b>GM23015-KP1</b>
1	Installation Instructions	TT-1245
1	Decal, warning	249494
1	Panel assembly, control (includes the following)	GM23014
1	Panel control	226964
1	Harness, wiring	226979
1	Meter, runtime	238736
1	Switch, rocker	344839

## Preheat Kit

<b>Air Intake Heater Kit (12 volt)</b>		
		<b>PA-229240</b>
1	Installation Instructions	TT-897
1	Washer, shakeproof	X-22-12
2	Washer, plain	X-25-40
1	Screw, HC 1/4-20 x 0.75	X-465-16
1	Screw, HC 1/4-20 x 0.50	X-465-6
2	Nut, whiz lock 1/4-20	X-6210-2
1	Harness, air heater	229233
1	Relay	233442
1	Boot	238915

<b>Air Intake Heater Kit (24 volt)</b>		
		<b>PA-344748</b>
1	Installation Instructions	TT-897
1	Washer, shakeproof	X-22-12
2	Washer, plain	X-25-40
1	Screw, HC 1/4-20 x 0.75	X-465-16
1	Screw, HC 1/4-20 x 0.50	X-465-6
2	Nut, whiz lock 1/4-20	X-6210-2
1	Harness, air heater	229233
1	Solenoid	344741
1	Heater, air	344903
2	Heater, air	344904
1	Boot	238915

## Seawater Strainers

1	Filter, water 1/2 in.	X-661-1
1	Filter, water 1 in.	X-661-2

## Sender Kits

<b>Sender Kit (Oil Pressure and Water Temp.)</b>		
		<b>PA-229390</b>
1	Bushing, reducer 1/8 x 1/4	X-202-27
1	Installation Instructions	TT-896
1	Sender, oil pressure	344305
1	Sender, water temperature	249348

<b>Sender Kit</b>		
		<b>PA-344288</b>
1	Installation Instructions	TT-896
1	Adapter, sender	225307
1	Sender, oil pressure	344305
1	Sender, water temperature	249348

Qty.	Description	Part No.
<b>Ship-To-Shore Switches</b>		
<b>Transfer Switch Kit</b>		
		<b>PAA-246617</b>
1	Switch, transfer	A-246617
1	Installation Instructions	TT-535

## Siphon Break

<b>Siphon Break Kit</b>		
		<b>PA-229928</b>
1	Installation Instructions	TT-1268
1	Tubing, clear flexible plastic	GM34883
1	Clamp, hose, 0.25/0.70 in.	X-426-9
1	Valve, siphon break (includes the following)	GM32985
1	Valve, duct	328666
1	Cap, siphon valve	GM32984
1	Loop, siphon valve vent	GM32988

<b>Siphon Break Kit</b>		
		<b>PA-267965</b>
1	Valve, anti-siphon	267935
1	Installation Instructions	TT-715

<b>Siphon Break Kit</b>		
		<b>PA-359115</b>
1	Installation Instructions	TT-1184
2	Grommet	X-284-42
1	Hose	X-312-4
1	Hose	X-312-43
2	Clamp, hose 1/2-1-13	X-426-3
1	Valve, siphon	229928
2	Connector, hose	344934

# Parts List: Accessories, continued

Qty.	Description	Part No.
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Qty.	Description	Part No.
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## Sound Shields

### Sound Shield Kit

Qty.	Description	Part No.
5	Grommet	D-1128
4	Screw, H.C. #10-32 x .625	X-117-3
4	Washer, 0.406 x 0.812 x 0.065, plain	X-25-37
6	Washer, 0.281 x 0.625 x 0.065, plain	X-25-40
4	Washer, 0.208 x 0.75 x 0.060, plain	X-25-45
1	Hose, radiator	X-281-30
3	Plug, button	X-301-36
6	Plug, button	X-301-37
1	Connector, hose elbow	X-391-19
4	Spacer	X-400-192
4	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
1	Connector, hose	X-582-1
4	Washer, nylon	X-6278-1
1	Duct, carburetor	227549
1	Rail, sound shield	229213
1	Rail, sound shield	229214
1	Rail, end	229222
1	Base	229238
2	Seal, dampening	229235
1	Hose, molded	229259
1	Insulation, acoustic	229256
1	Insulation, acoustic	229257
1	Insulation, acoustic	229258
1	Coupling, bulkhead	229270
1	Seal, dampening	229327
2	Insulation, acoustic	229538
4	Mount, controller	246267
1	Enclosure, sound shield (includes the following)	A-229225
1	Logo, Kohler	X-6267-1
1	Logo, Kohler	X-6267-2
1	Panel, front	229215
1	Panel, left rear	229216
1	Panel, right rear	229217
1	Panel, top	229218
1	Panel, left door	229219
1	Panel, right door	229220
1	Panel, rear	229221
4	Bracket, door catch	229341
1	Decal, caution	267957

### Sound Shield Kit

5	Grommet	D-1128
4	Screw, HC #10-32 x .625	X-117-3
4	Washer, 0.406 x 0.812 x 0.065, plain	X-25-37
6	Washer, 0.281 x 0.625 x 0.065, plain	X-25-40
4	Washer, 0.208 x 0.75 x 0.060, plain	X-25-45
3	Plug, button	X-301-36
6	Plug, button	X-301-37
1	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
1	Connector, hose	X-582-1
4	Washer, nylon	X-6278-1
1	Hose, radiator	153417
1	Duct, carburetor	227549
1	Rail, sound shield	229213
1	Rail, sound shield	229214
1	Rail, end	229222
1	Base	229238
2	Seal, dampening	229235
1	Hose, molded	229259
1	Insulation, acoustic	229256
1	Insulation, acoustic	229257
1	Insulation, acoustic	229258
1	Coupling, bulkhead	229270
1	Plate, controller mounting	229321
1	Seal, dampening	229327
2	Insulation, acoustic	229538
1	Tube, exhaust	229889
1	Tube, exhaust	229890
1	Rail, end	229903
4	Mount, controller	246267
1	Enclosure, sound shield (includes the following)	A-229921
1	Logo, Kohler	X-6267-1
1	Logo, Kohler	X-6267-2
1	Panel, front	229215
1	Panel, left rear	229216
1	Panel, right rear	229217
1	Panel, top	229218
1	Panel, left door	229219
1	Panel, right door	229220
4	Bracket, door catch	229341
2	Support, rear mounting	229902
2	Support, rear mounting	229907
1	Panel, rear	229911
1	Latch, door	229951
1	Decal, caution	267957

### PA-229925

## Parts List: Accessories, continued

Qty.	Description	Part No.		Qty.	Description	Part No.	
<b>Sound Shield Kit</b>			<b>PA-344332</b>	<b>Sound Shield Kit</b>			<b>PA-344333</b>
5	Grommet, round	D-1128		5	Grommet	D-1128	
1	Installation Instructions	TT-907		4	Washer, 0.208 x 0.75 x 0.060 plain	X-25-45	
4	Screw, hex head machine	X-117-3		1	Grommet	X-284-23	
4	Washer, plain, 0.406 ID x 0.812 in. OD	X-25-37		3	Plug, button	X-301-36	
6	Washer, plain, 0.281 ID x 0.625 in. OD	X-25-40		6	Plug, button	X-301-37	
4	Washer, plain, 0.203 ID x 0.75 in. OD	X-25-45		4	Spacer	X-400-192	
3	Plug, button	X-301-36		6	Spacer	X-400-194	
6	Plug, button	X-301-37		8	Clamp, hose	X-426-16	
1	Fitting, hose connector 90°	X-391-19		2	Clamp, hose 1-15/16	X-426-8	
4	Spacer, 0.209 ID x 0.375 OD x 0.219 in.	X-400-192		4	Washer, nylon	X-6278-1	
6	Spacer, 0.257 ID x 0.312 OD x 0.281 in.	X-400-194		1	Hose, radiator	153417	
8	Clamp, hose, 1.81/2.75 in.	X-426-16		1	Duct, carburetor	227549	
2	Clamp, hose, 0.56/1.06 in.	X-426-3		1	Rail, sound shield	229213	
2	Clamp, hose, 0.81/1.75 in.	X-426-8		1	Rail, sound shield	229214	
6	Screw, hex head machine	X-465-18		2	Seal, dampening	229235	
1	Coupling, hose	X-582-1		1	Base	229238	
6	Nut, flange spiralock, 1/4-20	X-6210-2		1	Hose, molded	229259	
4	Screw, Phillips hex crimpite	X-6216-1		1	Insulation, acoustic	229256	
4	Screw, hex head machine	X-6238-3		1	Insulation, acoustic	229257	
4	Washer, nylon, 0.201 ID x 0.46 in. OD	X-6278-1		1	Insulation, acoustic	229258	
2	Hose, radiator, straight, 2 in. ID	153417		1	Plate, controller mounting	229321	
1	Duct, carburetor preheat	227549		1	Seal, dampening	229327	
1	Rail, sound shield	229213		2	Insulation, acoustic	229538	
1	Rail, sound shield	229214		1	Tube, exhaust	229889	
2	Seal, dampening	229235		1	Tube, exhaust	229890	
1	Base	229238		1	Rail, end	229897	
1	Insulator	229256		4	Mount, controller	246267	
1	Insulator	229257		1	Enclosure, sound shield (includes the following)	A-344327	
1	Insulator	229258		1	Decal	X-6348-3	
1	Hose, molded, 0.62 in. ID	229259		1	Panel, front	229215	
1	Coupling, bulkhead pipe	229270		1	Panel, rear left	229216	
1	Plate, controller mounting	229321		1	Panel, rear right	229217	
1	Seal, dampening	229327		1	Panel, top	229218	
2	Insulator	229538		1	Panel, left door	229219	
1	Tube, exhaust, fiberglass, 2 in. OD	229889		1	Panel, right door	229220	
1	Tube, exhaust, stainless steel, 2 in. O	229890		2	Support, rear mounting	229902	
1	Rail, end	229903		2	Support, rear mounting	229907	
4	Mount, controller	246267		1	Panel, rear	229911	
1	Enclosure, sound (includes the following)	A-344327		1	Latch, grabber	229951	
1	Decal	X-6348-3		1	Decal, caution-not a step	343165	
1	Panel, front	229215		1	Decal, CE	344486	
1	Panel, rear left	229216		5	Grommet, round	D-1128	
1	Panel, rear right	229217					
1	Panel, top	229218					
1	Panel, left door	229219					
1	Panel, right door	229220					
2	Support, rear mounting	229902					
2	Support, rear mounting	229907					
1	Panel, rear	229911					
1	Latch, grabber	229951					
1	Decal, caution-not a step	343165					
1	Decal, CE	344486					

# Parts List: Accessories, continued

Qty.	Description	Part No.	Qty.	Description	Part No.
<b>Sound Shield Kit</b>			<b>PA-344832</b>		
4	Washer, plain (0.39 x 1 x 0.065)	X-25-138	1	Rail, sound shield	344665
30	Washer (0.281 x 0.625 x 0.065)	X-25-142	1	Rail, sound shield	344666
1	Grommet	X-284-42	1	Rail, sound shield	344667
1	Line, flex fuel inlet (18.5 in.)	X-386-108	1	Rail, sound shield	344668
1	Line, flex fuel return (28 in.)	X-386-111	1	Support, sound shield	344679
1	Connector, hose elbow	X-391-16	1	Support, sound shield	344680
8	Clamp, hose (2.75 x 1.81)	X-426-16	2	Rail, sound shield	344681
2	Clamp, hose (1.06 x 0.56)	X-426-3	2	Rail, sound shield	344682
2	Clamp, hose (1.75 x 0.81)	X-426-8	2	Rail, sound shield	344683
4	Clamp, hose (0.70 x 0.25)	X-426-9	2	Rail, sound shield	344684
30	Screw, hex cap 1/4-20	X-465-24	2	Rail, sound shield	344685
1	Connector, hose	X-582-9	3	Rail, sound shield	344686
1	Channel, U (30.00 in.) grommet	X-6047-22	1	Elbow, hose	344934
1	Channel, U (38.12 in.) grommet	X-6047-25	1	Bushing, reducer	344947
10	Clip, speed	X-6220-1	1	Tube, exhaust	344694
4	Nut, hex	X-6234-7	1	Seal, dampening	344696
4	Screw, hardened (3/8 -16)	X-6238-29	1	Seal, dampening	344697
1	Connector, hose	X-652-1	2	Seal, dampening	344698
1	Clamp	X-672-21	1	Insulation, acoustic (15.3 in.)	344702
6	Screw, PHM 1/4-20 x 2	X-73-33	1	Insulation, acoustic (7 in.)	344706
1	Plug, pipe 3/8	X-75-10	1	Insulation, acoustic (18 in.)	344719
40	Rivet, pop	X-781-14	1	Insulation, acoustic (18 in.)	344720
2	Hose	153417	1	Insulation, acoustic (7 in.)	344750
1	Foam, PVC Seal (1.54 ft.)	19010 08112	2	Connector, hose	344754
6	Washer, fiber	222889	1	Roof	344855
1	Duct	227549	1	Roof	344857
1	Hose, molded	229259	1	Door	344860
1	Tube, exhaust	229889	1	Door	344863
4	Mount, controller	246267	1	Door	344866
10	Clip, speed	297596	1	Door	344869
6	Connector, outside	344137	1	Panel	344872
2	Connector, inside	344138	1	Door	344875
18	Bracket, corner rail	344635	2	Panel	344877
2	Bracket, corner rail	344636	1	Panel	344886
1	Base, sound shield	344664	1	Duct, end bracket	344889
			1	Silencer, air intake	359125
<b>Sound Shield Kit, continued</b>			<b>PA-344832</b>		



## Parts List: Accessories, continued

Qty.	Description	Part No.	Qty.	Description	Part No.
<b>Sound Shield Kit, continued</b>			<b>Sound Shield Kit, continued</b>		
		<b>PA-344333</b>			<b>PA-344333</b>
2	Insulation, acoustic, 13.38 x 1.20 in.	344708	1	Panel, subassembly sound shield	344872
2	Insulation, acoustic, 10.44 x 1.20 in.	344709	4	Rivet, pop, 0.187 in.	X-781-14
1	Insulation, acoustic, 13.38 x 8.88 in.	344711	2	Bracket, door locating	344366
1	Insulation, acoustic, 16.75 x 6.15 in.	344712	2	Stud, self-clinching, 0.223 x 0.75 in.	X-6205-29
1	Insulation, acoustic, 17.56 x 16.75 in.	344713	1	Panel, sound shield	344676
1	Insulation, acoustic, 17.06 x 16.35 in.	344714	1	Insulation, acoustic, foam, 8.75 x 7 in	344703
1	Insulation, acoustic, 17 x 16.35 in.	344715	1	Insulation, acoustic, 8.75 x 2.5 in.	344704
1	Insulation, acoustic, 17 x 8.81 in.	344716	1	Door, sound shield subassembly	344875
1	Insulation, acoustic, 15 x 4.25 in.	344718	2	Clip, speed	297596
1	Insulation, acoustic, 18 x 4.25 in.	344719	1	Door, sound shield (rear)	344674
1	Insulation, acoustic, 18 x 4.25 in.	344720	2	Insulation, acoustic, 15 x 4.25 in.	344718
1	Insulation, acoustic, 16.12 x 7.78 in.	344749	2	Panel, subassembly access	344877
1	Insulation, acoustic, foam, 7 x 4.25 in	344750	12	Washer, plain, 0.203 ID x 0.438 in. OD	X-25-115
2	Insulation, acoustic, foam, 5.38 x 5 in	344778	6	Rivet, pop, 0.187 in.	X-781-14
1	Roof subassembly	344855	2	Panel, access	344125
1	Grommet, round	X-284-10	6	Clip, spring	344146
4	Insert, threaded, 1/4-20 in.	344484	2	Insulation, acoustic, foam, 5.38 x 5 in.	344778
1	Roof, sound shield (alternator)	344669	1	Panel, subassembly sound shield	344886
1	Insulation, acoustic, 16.75 x 6.15 in.	344712	1	Decal	X-6348-3
1	Roof subassembly	344857	4	Rivet, pop, 0.187 in.	X-781-14
1	Decal, caution-not a step	343165	2	Bracket, door locating	344366
1	Roof, sound shield (engine)	344670	2	Stud, self-clinching, 0.223 x 0.75 in.	X-6205-29
1	Insulation, acoustic, 17.56 x 16.75 in.	344713	1	Panel, sound shield	344676
1	Door, sound shield subassembly	344860	1	Insulation, acoustic, foam, 8.75 x 7 in	344703
4	Washer, plain, 0.172 ID x 0.375 in. OD	X-25-6	1	Insulation, acoustic, 8.75 x 2.5 in.	344704
4	Screw, slotted flat machine	X-31-9	1	Duct, sound shield subassembly	344889
4	Nut, hex machine screw, 8-32	X-6234-8	2	Grommet, round	D-1128
4	Rivet, pop, 0.187 in.	X-781-14	1	Channel, U	X-6047-14
1	Door, fire extinguisher	344147	1	Seal, push-on trim	X-6422-2
2	Bracket, door locating	344366	1	Seal, push-on trim	X-6423-2
1	Decal, warning	344435	2	Grommet, round	200872
1	Decal, warning	344436	1	Duct, air intake (alternator)	344693
1	Door, sound shield	344671	1	Coupling, hose	344934
1	Latch, sound shield	344692	1	Silencer, air intake	359125
1	Insulation, acoustic, 17.06 x 16.35 in.	344714	1	Decal, fuel inlet	359278
1	Door, sound shield subassembly	344863	1	Decal, fuel return	359279
4	Rivet, pop, 0.187 in.	X-781-14			
2	Bracket, door locating	344366			
2	Stud, self-clinching, 0.223 x 0.75 in.	X-6205-29			
1	Door, sound shield (front)	344673			
1	Latch, sound shield	344692			
1	Insulation, acoustic, 17 x 16.35 in.	344715			
1	Door, sound shield subassembly	344866			
4	Rivet, pop, 0.187 in.	X-781-14			
2	Bracket, door locating	344366			
2	Stud, self-clinching, 0.223 x 0.75 in.	X-6205-29			
1	Door, sound shield alternator	344675			
1	Latch, sound shield	344692			
1	Insulation, acoustic, 17 x 8.81 in.	344716			
1	Door, sound shield subassembly	344869			
12	Rivet, pop, .187 in.	X-781-14			
2	Bracket, door locating	344366			
2	Stud, self-clinching, 0.223 x 0.75 in.	X-6205-29			
1	Door, sound shield	344672			
1	Duct, air outlet	344678			
1	Latch, sound shield	344692			
1	Insulation, acoustic, 16.12 x 7.78 in.	344705			
2	Insulation, acoustic, 13.38 x 1.20 in.	344708			
2	Insulation, acoustic, 10.44 x 1.20 in.	344709			
1	Insulation, acoustic, 13.38 x 8.88 in.	344711			
1	Insulation, acoustic, 16.12 x 7.78 in.	344749			

# Parts List: Accessories, continued

Qty.	Description	Part No.	Qty.	Description	Part No.
<b>Sound Shield Kit (10EOZ) 359480</b>			<b>Sound Shield Kit (10EOZ), continued 359480</b>		
28	Washer, plain, 0.281 ID x 0.625 in. OD	X-25-142	2	Rail, sound shield	344685
1	Grommet, round	X-284-42	3	Rail, sound shield	344686
8	Clamp, hose, 1.81/2.75 in.	X-426-16	4	Latch, sound shield	344692
2	Clamp, hose, 0.56/1.06 in.	X-426-3	1	Tube, exhaust, stainless steel, 2 in.	344694
2	Clamp, hose, 0.81/1.75 in.	X-426-8	1	Seal, dampening	344696
28	Screw, hex head machine	X-465-24	1	Seal, dampening	344697
1	Coupling, hose	X-582-9	2	Seal, dampening	344698
8	Clip, speed	X-6220-1	1	Coupling, hose	344934
8	Bushing, 0.938 x 1.187 in. NPT	X-634-14	12	Pin, threaded	345283
1	Bushing, 0.672 x 0.875 in. NPT	X-634-25	1	Decal, fuel inlet	359278
1	Decal	X-6348-3	1	Decal, fuel return	359279
1	Clamp, insulated, 1.68 in.	X-672-21	1	Connector, hose	359476
6	Screw, cross recess pan head machine	X-73-33	1	Roof, sound shield, alternator	359483
1	Plug, pipe	X-75-55	1	Roof, sound shield, engine	359484
48	Rivet, pop, .187 in.	X-781-14	1	Door, sound shield, RS	359485
2	Hose, exhaust 2 in. x 6.5 in.	GM10073	1	Door, sound shield, front	359486
6	Washer, fiber, 0.25 ID x .71 in. OD	222889	1	Door, sound shield, rear	359487
1	Hose, molded, 0.62 in. ID	229259	1	Door, sound shield alternator	359488
1	Tube, exhaust, fiberglass, 2 in. OD	229889	2	Panel, sound shield	359489
4	Mount, controller	246267	1	Duct, air intake (alternator)	359490
1	Decal, warning	249808	1	Door, sound shield (LS)	359543
12	Clip, speed	297596	1	Foam, acoustic (kit)	359557
1	Decal, caution-not a step	343165	1	Insulation, acoustic, foam, 15.3 in.	344702
6	Connector, outside corner	344137	2	Insulation, acoustic, foam, 8.75 x 7 in.	344703
2	Coupling, inside corner	344138	2	Insulation, acoustic, 8.75 x 2.5 in.	344704
1	Decal	GM10148	1	Insulation, acoustic, 16.12 x 7.78 in.	344705
1	Decal, warning	344436	1	Insulation, acoustic, foam, 7 x 4.25 in.	344706
16	Insert, threaded, 1/4-20 in.	344484	2	Insulation, acoustic, 13.38 x 1.20 in.	344708
18	Bracket, corner rail	344635	2	Insulation, acoustic, 10.44 x 1.20 in.	344709
2	Bracket, corner rail	344636	1	Insulation, acoustic, 13.38 x 8.88 in.	344711
1	Base	344664	1	Insulation, acoustic, 16.75 x 6.15 in.	344712
1	Rail, sound shield, RS	344665	1	Insulation, acoustic, 17.56 x 16.75 in.	344713
1	Rail, sound shield	344666	1	Insulation, acoustic, 17.06 x 16.35 in.	344714
1	Rail, sound shield	344667	1	Insulation, acoustic, 17 x 16.35 in.	344715
1	Duct, air outlet	344678	1	Insulation, acoustic, 17 x 8.81 in.	344716
1	Support, sound shield	344679	1	Insulation, acoustic, 15 x 4.25 in.	344718
1	Support, sound shield	344680	1	Insulation, acoustic, 18 x 4.25 in.	344719
2	Rail, sound shield	344681	1	Insulation, acoustic, 18 x 4.25 in.	344720
2	Rail, sound shield	344682	1	Insulation, acoustic, 16.12 x 7.78 in.	344749
2	Rail, sound shield	344683	1	Insulation, acoustic, foam, 7 x 4.25 in.	344750
2	Rail, sound shield	344684	1	Insulation, acoustic, foam	GM11484
			3	Insulation, acoustic, foam	359584
			1	Duct, carb preheater	359585
			1	Rail, sound shield, rear	359588

# Parts List: Accessories, continued

Qty.	Description	Part No.
<b>Sound Shield Kit (10EOZ)</b>		<b>GM22731-KP1</b>
28	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
28	Screw, hex cap, 1/4-20	X-465-24
4	Screw, hardened, 3/8-16 x 0.62	X-6238-2
1	Clamp, 1.68 in. ID	X-672-21
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	Hose, molded, 0.62 in. ID	229259
1	Tube, exhaust, 2 in. OD	229889
6	Connector, outside	GM15486
2	Connector, inside	GM15487
1	Base, 22.75 x 36.75 in.	344664
1	Support, R.H. service side	GM22698
1	Support, L.H. nonservice side	GM22699
2	Extruded rail, 14.02 in.	344681
2	Extruded rail, 6.25 in.	344682
2	Extruded rail, 2.60 in.	344683
2	Extruded rail, 17.19 in.	344684
2	Extruded rail, 21.56 in.	344685
3	Extruded rail, 17.25 in.	344686
1	Tube, exhaust, 2 in. OD	344694
1	Door, engine end, 18.5 x 17.85 in.	359505-S
1	Door, generator end, 18.5 x 10.31 in.	359508-S
1	Door, rear, 18.5 x 5.0 in.	359511-S
1	Door, L.H. nonservice side, 19.06 x 17.85 in.	359516-S
1	Door, R.H. service side, 19.06 x 17.85 in.	359520-S
1	Duct, end bracket, 18.56 x 15.62 in.	359524-S
1	Panel, nonservice side, 11.16 x 10.34 in.	359528-S
1	Panel, service side, 11.16 x 10.34 in.	359531-S
1	Roof, generator, 18.5 x 7.9 in.	359536-S
1	Roof, engine, 19.06 x 18.5 in.	359539-S
1	Rail, service side, 30.5 x 4.48 in.	363513-S
1	Rail, engine end, 18.75 x 4.48 in.	363517-S
1	Rail, nonservice side, 30.5 x 4.48 in.	363520-S
1	Rail, generator end, 18.75 x 4.48 in.	363524-S
44	Screw, drill, #8 stainless steel	X-794-5
12	Clip, speed	297596

Qty.	Description	Part No.
<b>Sound Shield Accessory Kits</b>		
<b>S.W. Hose Connector</b>		<b>GM17053-KP1</b>
1	Coupling, bulkhead pipe	229270
1	Connector, 90 deg., 5/8 in. ID hose	X-391-19
1	Connector, hose, 5/8 in. x 1/2 in.	X-582-1
2	Washer, copper, 1.188 ID x 1.732 in.	X-6427-1
<b>Siphon Break Kit</b>		<b>GM24866-KA1</b>
1	Tubing, clear flexible plastic	GM34883
1	Clamp, hose, 0.25/0.70 in.	X-426-9
1	Valve, siphon break (includes the following)	GM32985
1	Valve, duct	328666
1	Cap, siphon valve	GM32984
1	Loop, siphon valve vent	GM32988

# Appendix A Abbreviations

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

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

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

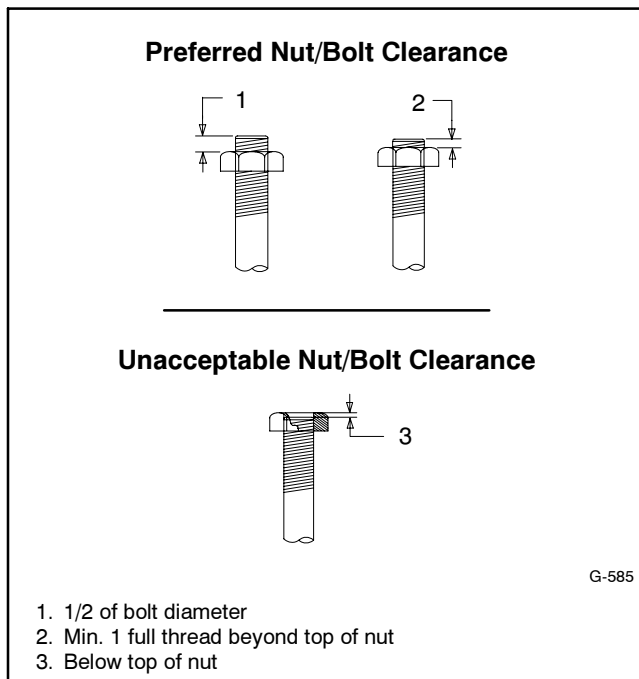
## Appendix B Common Hardware Application Guidelines

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.



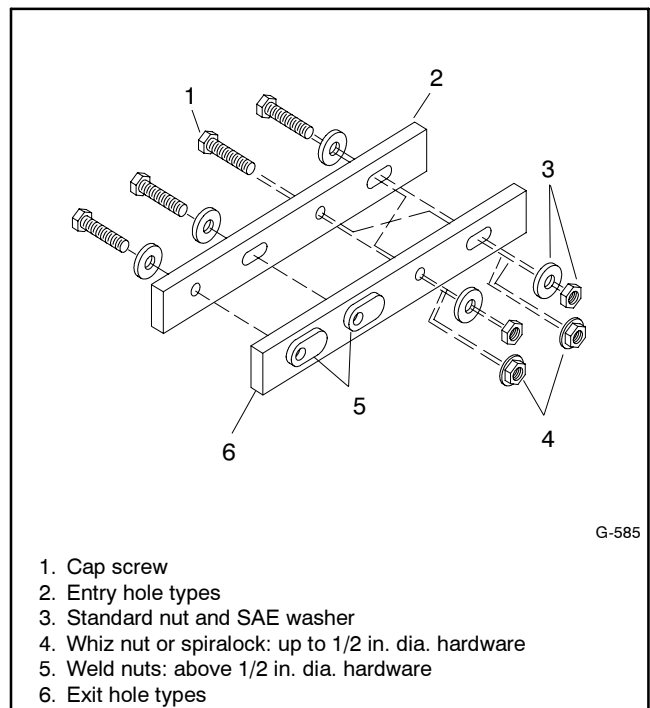
**Figure 1** Acceptable Bolt Lengths

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

# Appendix C General Torque Specifications















American Standard Fasteners Torque Specifications					
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)	—	See Note 3
10-24	Nm (in. lb.)	2.9 (26)	3.6 (32)	—	
10-32	Nm (in. lb.)	2.9 (26)	3.6 (32)	—	
1/4-20	Nm (in. lb.)	6.8 (60)	10.8 (96)	14.9 (132)	
1/4-28	Nm (in. lb.)	8.1 (72)	12.2 (108)	16.3 (144)	
5/16-18	Nm (in. lb.)	13.6 (120)	21.7 (192)	29.8 (264)	
5/16-24	Nm (in. lb.)	14.9 (132)	23.1 (204)	32.5 (288)	
3/8-16	Nm (ft. lb.)	24.0 (18)	38.0 (28)	53.0 (39)	
3/8-24	Nm (ft. lb.)	27.0 (20)	42.0 (31)	60.0 (44)	
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)	












Metric Fasteners Torque Specifications, Measured in Nm (ft. lb.)				
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	6.2 (4.6)	9.5 (7)	13.6 (10)	See Note 3
M8 x 1.25	15.0 (11)	23.0 (17)	33.0 (24)	
M8 x 1.00	16.0 (11)	24.0 (18)	34.0 (25)	
M10 x 1.50	30.0 (22)	45.0 (34)	65.0 (48)	
M10 x 1.25	31.0 (23)	47.0 (35)	68.0 (50)	
M12 x 1.75	53.0 (39)	80.0 (59)	115.0 (85)	
M12 x 1.50	56.0 (41)	85.0 (63)	122.0 (90)	
M14 x 2.00	83.0 (61)	126.0 (93)	180.0 (133)	
M14 x 1.50	87.0 (64)	133.0 (98)	190.0 (140)	
M16 x 2.00	127.0 (94)	194.0 (143)	278.0 (205)	
M16 x 1.50	132.0 (97)	201.0 (148)	287.0 (212)	
M18 x 2.50	179.0 (132)	273.0 (201)	390.0 (288)	
M18 x 1.50	189.0 (140)	289.0 (213)	413.0 (305)	






**Notes:**

1. The torque values above are general guidelines. Always use the torque values specified in the service manuals and/or assembly drawings when they differ from the above torque values.
2. The torque values above are based on new plated threads. Increase torque values by 15% if non-plated threads are used.
3. Hardware threaded into aluminum must have either two diameters of thread engagement or a 30% or more reduction in the torque to prevent stripped threads.
4. Torque values are calculated as equivalent stress loading on American hardware with an approximate preload of 90% of the yield strength and a friction coefficient of 0.125.

# 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	

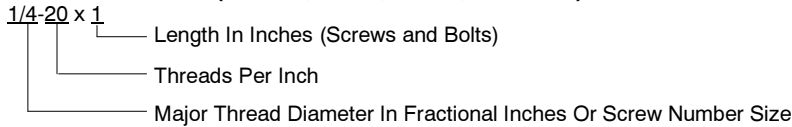
Nuts	
Nut Styles	
Hex Head	
Lock or Elastic	
Square	
Cap or Acorn	
Wing	
Washers	
Washer Styles	
Plain	
Split Lock or Spring	
Spring or Wave	
External Tooth Lock	
Internal Tooth Lock	
Internal-External Tooth Lock	

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

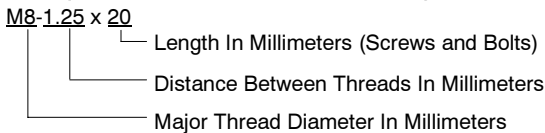
Allen™ head screw is a trademark of Holo-Krome Co.  
 Phillips® screw is a registered trademark of Phillips Screw Company.

## Sample Dimensions

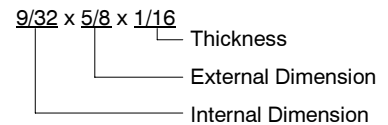
### American Standard (Screws, Bolts, Studs, and Nuts)



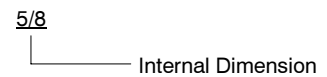
### Metric (Screws, Bolts, Studs, and Nuts)



### 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.

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

\* 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-5587 2/08d**

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