

# Service Parts

## Marine Generator Sets



Models:

**8EOZD**

**6.5EFOZD**

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

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

TP-6269 3/11b

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# Introduction

This manual lists service replacement parts for 6.5EFOZD/8EOZD generator sets.

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This manual includes the following main sections:

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

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

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

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

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

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

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## Numbering System Significance

This manual uses the following numbering systems:

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

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

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

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

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## Illustrations

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

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## How to Find Part Numbers

Use the following steps to locate a service replacement part.

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

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## Hardware References

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

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

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

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# Notes

# Specification Number Index

<b>Group Title</b>	<i>Cylinder Block</i>	<i>Gear Housing</i>	<i>Mounting Flange &amp; Oil Sump</i>	<i>Cylinder Head</i>	<i>Intake Manifold</i>	<i>Camshaft and Drive Gear</i>	<i>Crankshaft and Piston</i>	<i>Lube Oil System</i>	<i>Cooling Water System</i>	<i>Fuel Injection Pump</i>	<i>Governor</i>	<i>Fuel Injection Valve</i>	<i>Fuel Line and Filter</i>	<i>Starting Motor</i>
<b>Group No.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
<b>Spec No.</b>	<b>Variation Number</b>													

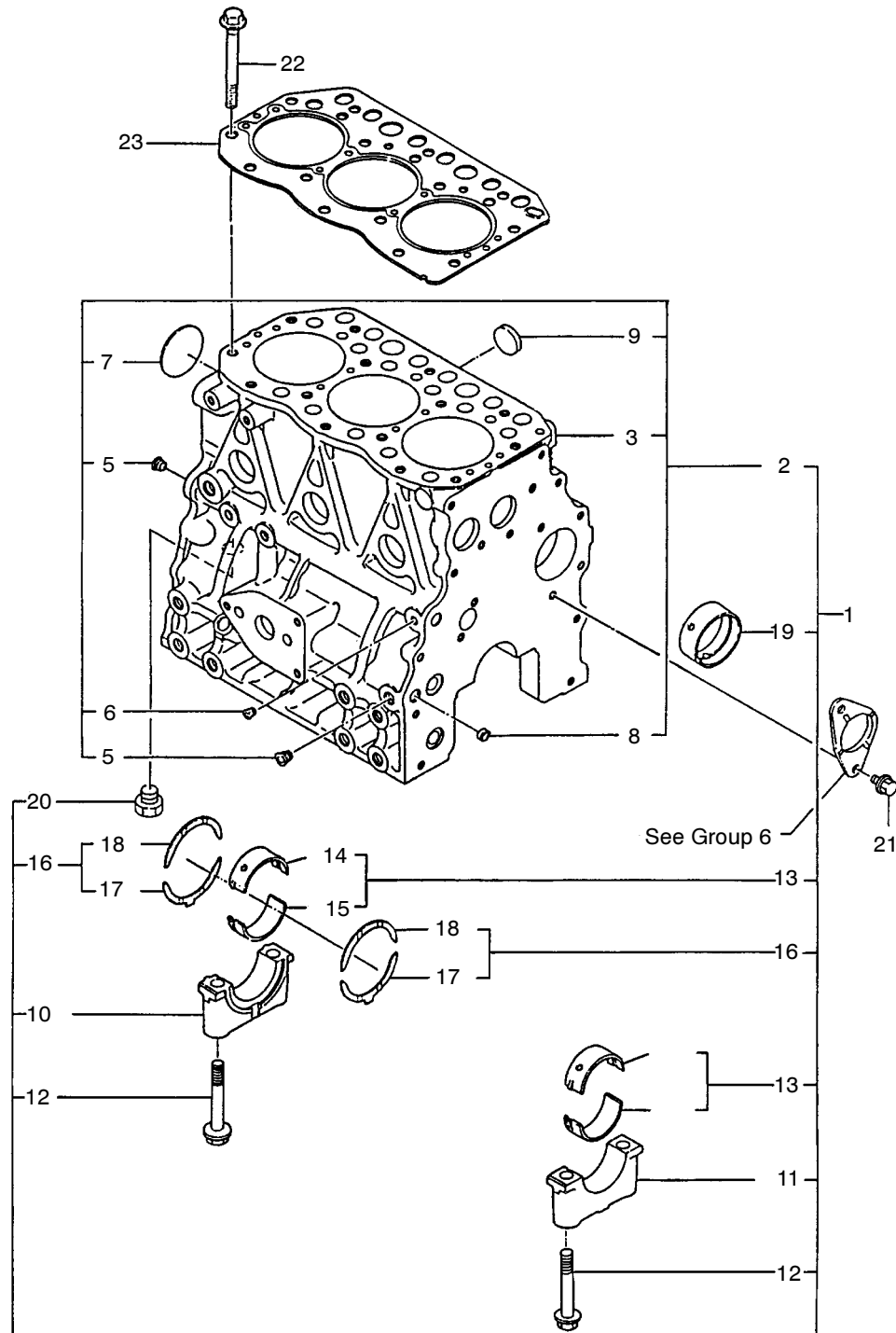
GM31949-GA1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GM31949-GA2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GM30220-GA1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

<b>Group Title</b>	<i>Gasket Set</i>	<i>Air Intake</i>	<i>Fuel System</i>	<i>Cooling System</i>	<i>Engine</i>	<i>Nameplates and Decals</i>	<i>Skid and Plant Mounting</i>	<i>Generator and Mounting</i>	<i>Controller and Mounting</i>	<i>Controller and Mounting</i>	<i>Literature</i>
<b>Group No.</b>	<b>15</b>	<b>101</b>	<b>103</b>	<b>104</b>	<b>105</b>	<b>107</b>	<b>109</b>	<b>201</b>	<b>301</b>	<b>301</b>	<b>701</b>
<b>Spec No.</b>	<b>Variation Number</b>										

GM31949-GA1	1	GR1	GR2	GR3	GR4	GR6	GR7	GR8	GR9*	GR10	43
GM31949-GA2	1	GR1	GR2	GR3	GR5	GR6	GR7	GR8	GR9*	GR10	43
GM30220-GA1	1	2	2	2	3	2	2	2	3	-	43

\* Units built before approximately April 1, 2007 used variation GR9.

# Group 1: Cylinder Block



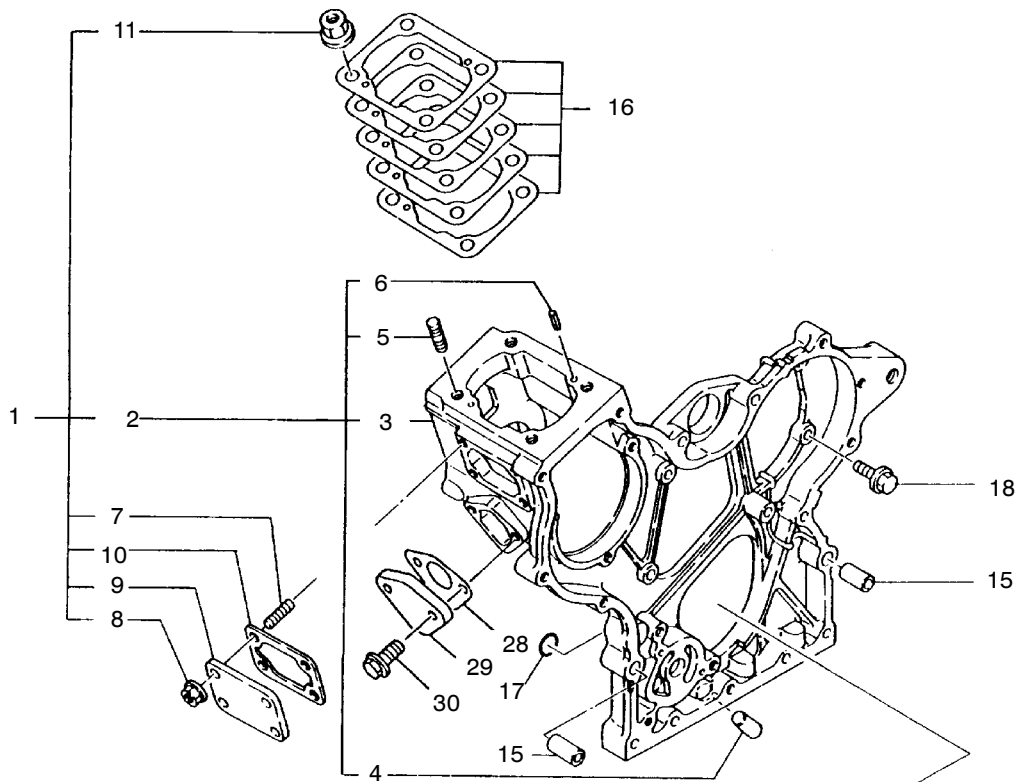
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# Group 1: Cylinder Block

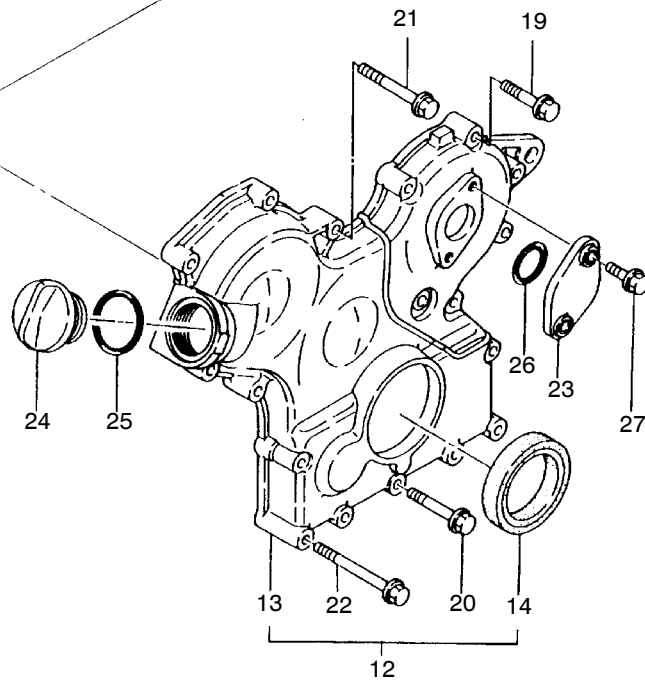
Item	Part Number	Description	Quantity
			Variation Number
			1
1	363225	Block assembly, cylinder (includes items 2-20)	1
2	X	Block assembly, cylinder	1
3	X	Block, cylinder	1
5	363018	Plug	1
6	256515	Plug, PT 1/8, screw	1
7	363214	Plug 45	1
8	252728	Plug 12	2
9	252731	Plug 30	6
10	X	Bearing cap	1
11	X	Bearing cap	3
12	225703	Bolt, bearing cap	8
13	363218	Main bearing	4
13	363219	Main bearing undersize 0.25	4
14	X	Main bearing	4
15	X	Main bearing	4
16	363220	Bearing, thrust	2
17	X	Bearing, thrust	2
18	X	Bearing, thrust	2
19	363060	Bush, camshaft	1
20	252771	Plug, PT 1/4	1
21	225818	Bolt, M8 x 14 plated	2
22	363025	Bolt, cylinder head	14
23	363052	Gasket, cylinder head	1

X Item not sold separately

# Group 2: Gear Housing



Item 31 not shown.



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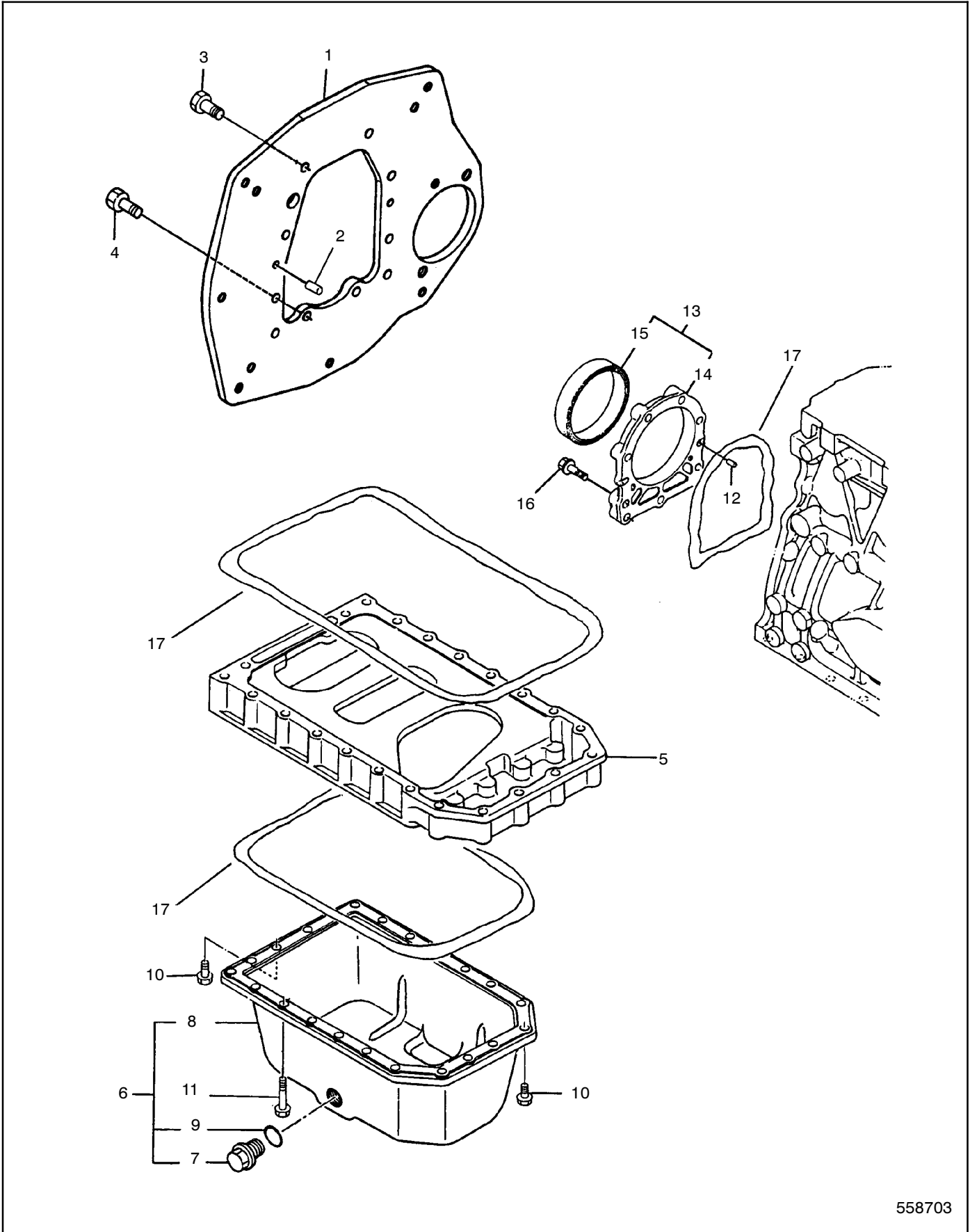


## Group 2: Gear Housing

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

X Item not sold separately

# Group 3: Mounting Flange & Oil Sump



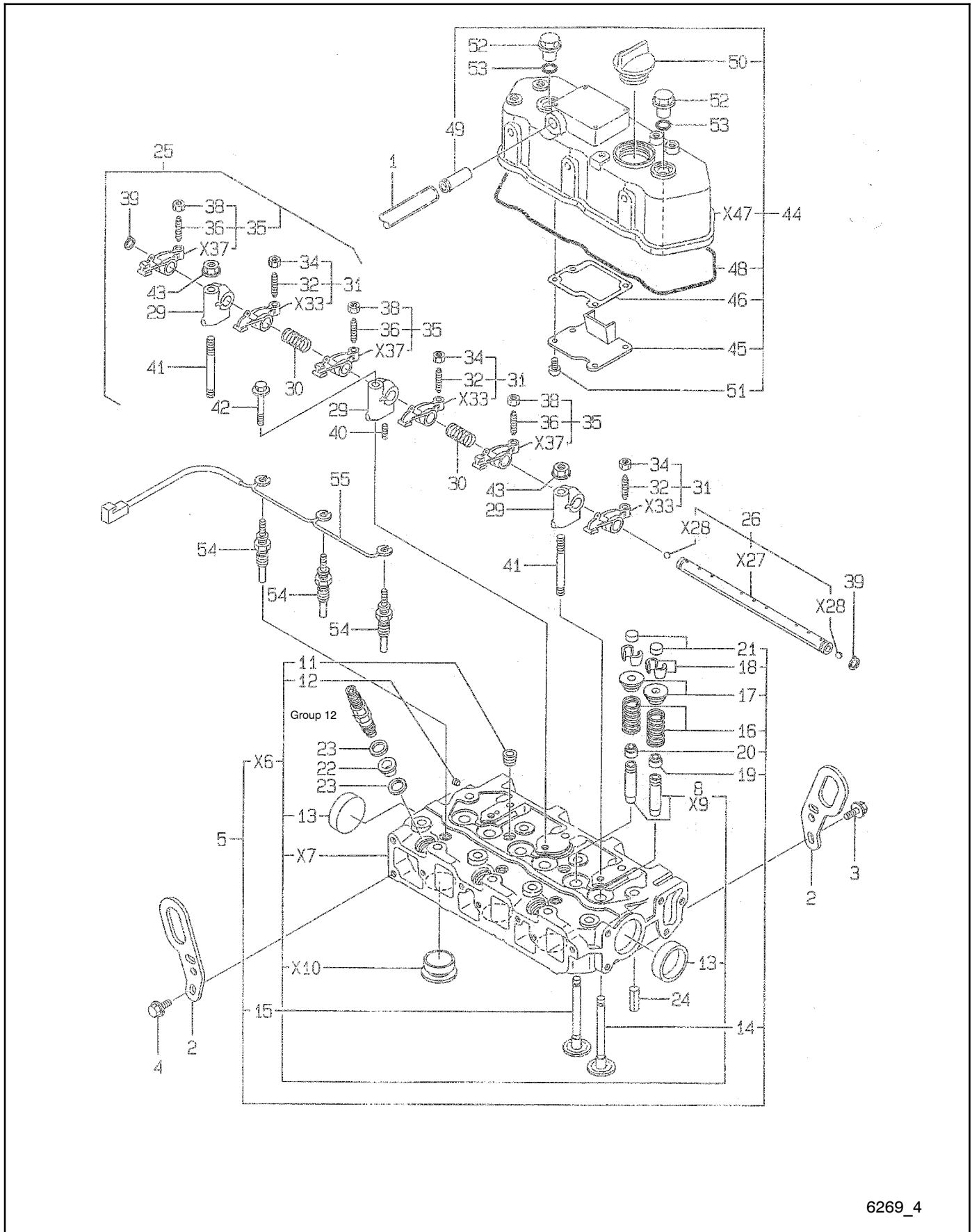
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## Group 3: Mounting Flange & Oil Sump

Item	Part Number	Description	Quantity
			Variation Number
			<b>1</b>
1	229288	Back plate	1
2	256750	Parallel pin, 8 x 16	2
3	229505	Bolt, M10 x 20	6
4	252714	Bolt, M10 x 25	3
5	363019	Spacer, oil sump	1
6	363227	Sump assembly, lube oil (includes items 7-9)	1
7	225386	Plug 22	1
8	X	Refer to item 6	1
9	225425	Seal, washer 22S	1
10	225816	Bolt, M6 x 12	3
11	229764	Bolt, M6 x 45 plated	20
12	363026	Parallel pin	2
13	229671	Case assembly, oil seal (includes items 14 and 15)	1
14	229672	Case, oil seal	1
15	250836	Seal, oil	1
16	229761	Bolt, M6 x 22 plated	10
17	252998	Liquid gasket	AR

X Item not sold separately

# Group 4: Cylinder Head



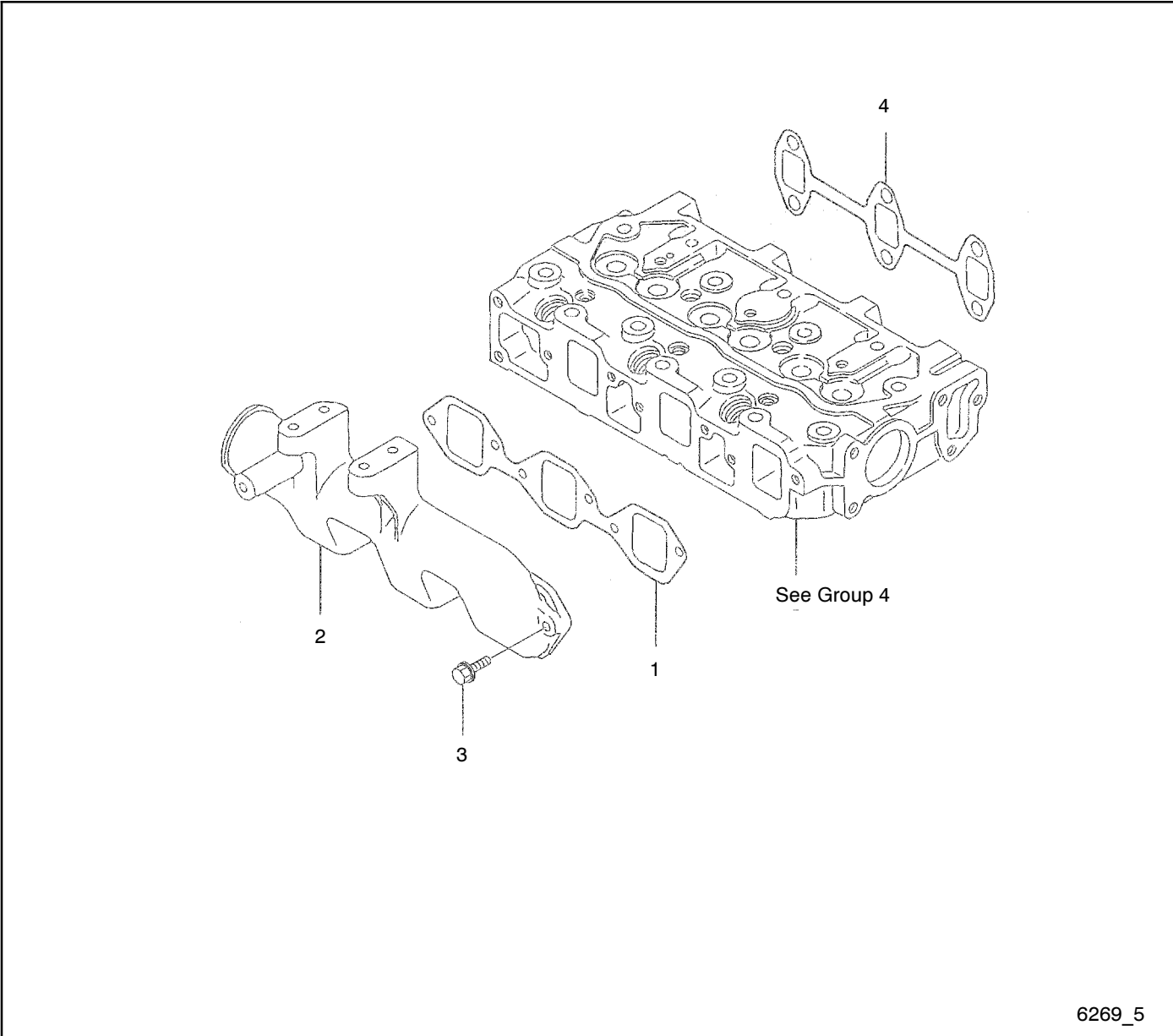
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## Group 4: Cylinder Head

Item	Part Number	Description	Quantity
			Variation Number
			1
1	229750	Hose, breather	1
2	363015	Lifter, engine	1
3	225818	Bolt, M8 x 14 plated	1
4	225818	Bolt, M8 x 14 plated	2
5	363226	Head assembly, cylinder	1
6	X	Head subassembly, cylinder	1
7	X	Head, cylinder	1
8	250835	Guide, valve	6
10	X	Plug, hot	3
11	250974	Plug, Pt 1/4	2
12	229777	Plug, 5 x 8	1
13	252732	Plug 40	2
14	363054	Valve, intake	3
15	363029	Valve, exhaust	3
16	225713	Spring, valve	6
17	363031	Retainer, spring	6
18	225700	Cotter	6
19	225766	Seal, valve stem	3
20	250844	Seal, valve stem (exhaust)	3
21	250999	Cap, valve	6
22	229623	Protector, nozzle	3
23	229624	Gasket, nozzle	6
24	250963	Spring pin, 6 x 12	2
25	363074	Support assembly, rocker	1
26	363032	Shaft, rocker arm	1
27	X	Shaft	1
28	X	Ball	2
29	363033	Support, rocker arm	3
30	363034	Spring	2
31	363229	Arm assembly, rocker	6
32	229554	Screw, valve	6
33	X	Arm, intake valve	3
34	225825	Nut, M6	6
35	363022	Arm assembly, rocker	6
36	229554	Screw, valve	6
37	X	Arm, intake valve	3
38	225825	Nut, M6	6
39	252345	Circlip	2
40	363213	Screw, M5 x 16	1
41	229637	Stud	2
42	252703	Bolt, M8 x 45	1
43	252723	Nut, M8	2
44	363065	Bonnet assembly	1
45	363027	Plate, shelter	1
46	363028	Gasket	1
47	X	Bonnet	1
48	363035	Gasket, bonnet	1
49	225380	Joint	1
50	250837	Cap, lube oil supply	1
51	363201	Screw, 5 x 10, tapping	4
52	252470	Knob	3
53	250801	O-ring	3
54	252940	Plug, glow	3
55	229663	Connector, glow plug	1

X Item not sold separately

# Group 5: Intake Manifold

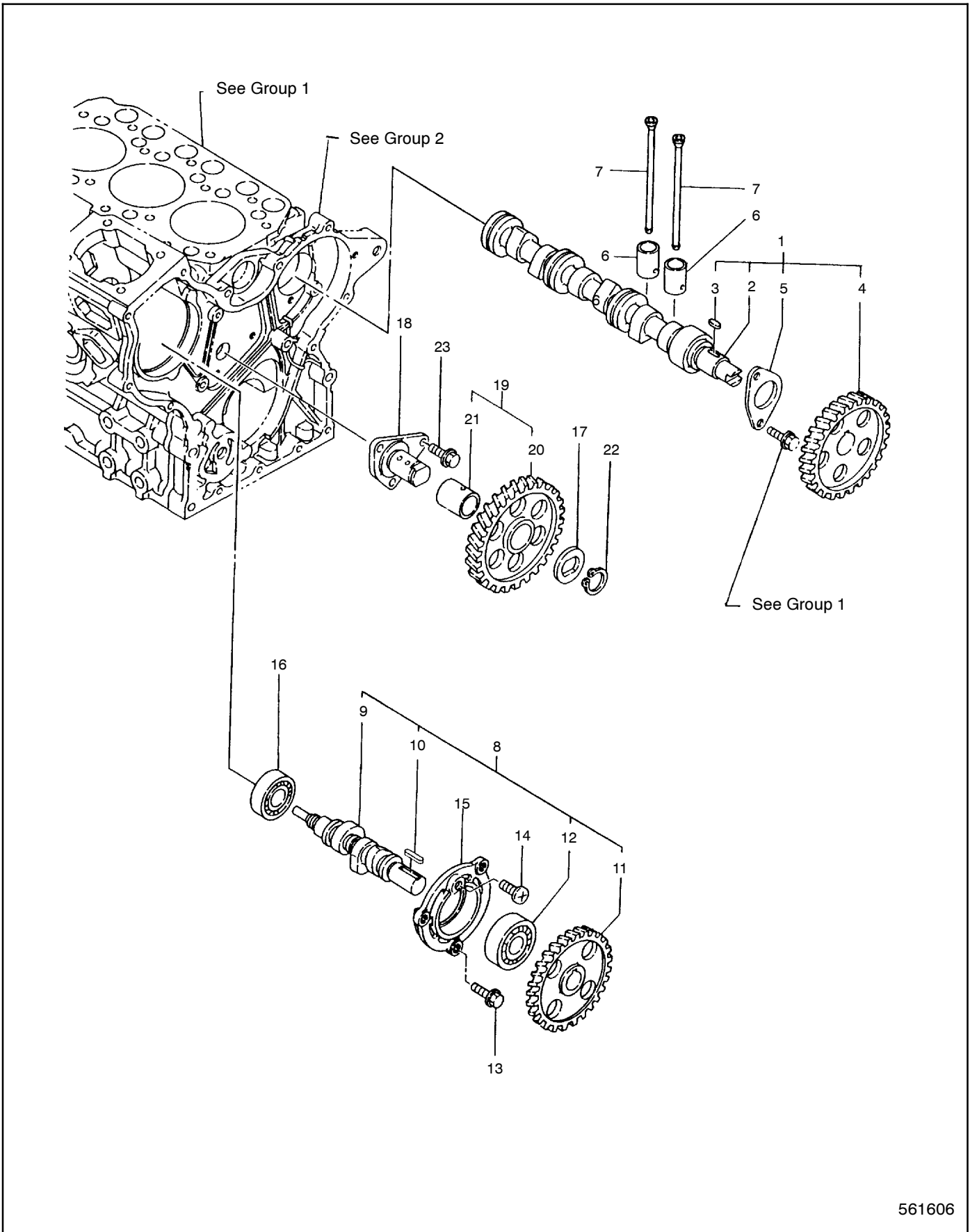


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## Group 5: Intake Manifold

Item	Part Number	Description	Quantity
			Variation Number
			1
1	363036	Gasket	1
2	GM35924	Manifold, intake	1
3	225817	Bolt, M6 x 20	6
4	363037	Gasket, exhaust manifold	1

# Group 6: Camshaft & Drive Gear



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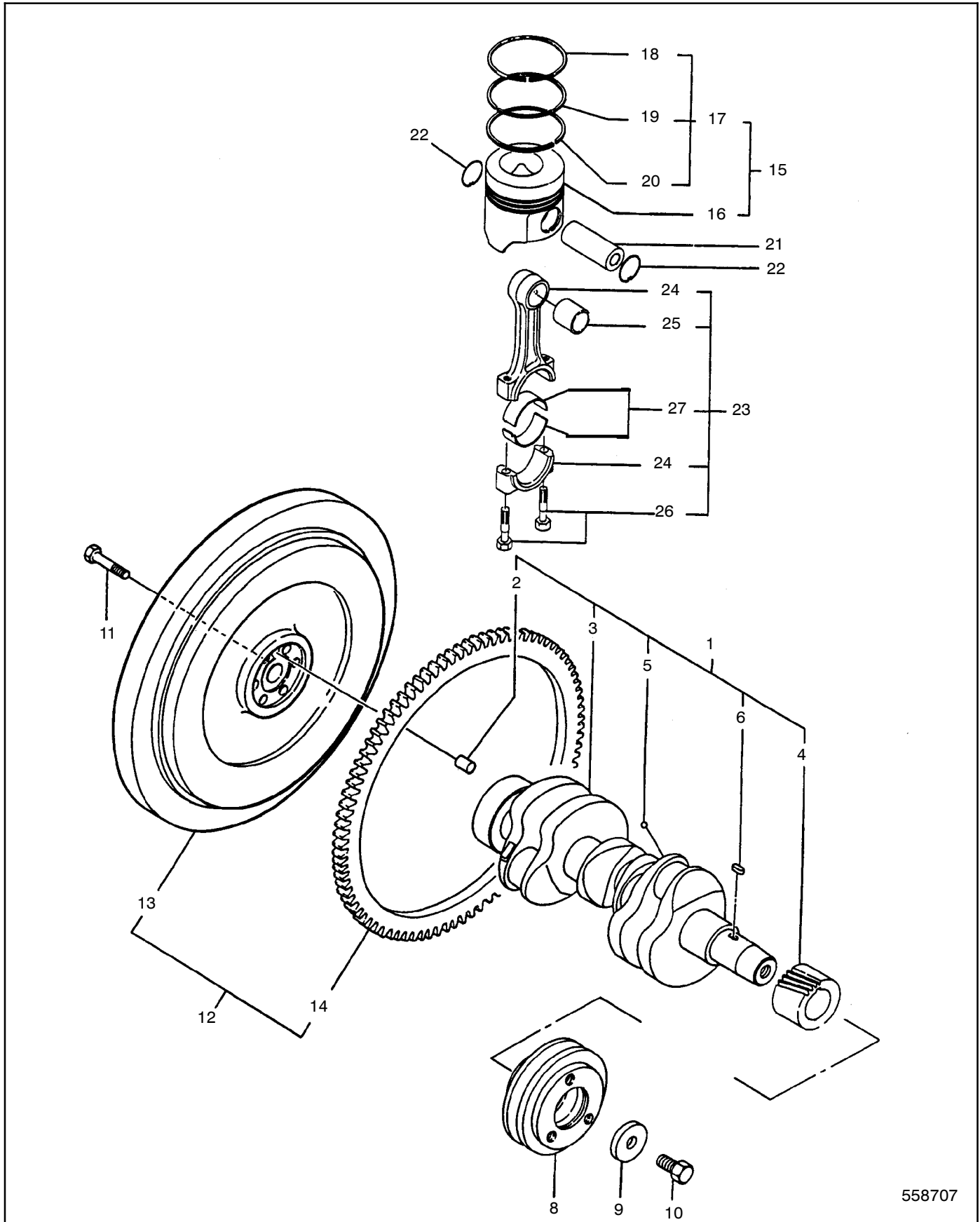


## Group 6: Camshaft & Drive Gear

Item	Part Number	Description	Quantity
			Variation Number
			1
1	363061	Camshaft assembly (includes items 2-5)	1
2	X	Camshaft	1
3	229748	Key	1
4	363038	Gear, camshaft	1
5	229636	Bearing, thrust	1
6	363039	Tappet	6
7	363040	Rod, push	6
8	363228	Camshaft assembly, fuel injection pump (includes items 9-12)	1
9	X	Camshaft, fuel injection pump	1
10	229748	Key	1
11	X	Gear, fuel injection pump	1
12	229755	Ball bearing	1
13	252693	Bolt, M6 x 16 plated	3
14	229776	Screw, M8 x 10	1
15	229673	Bearing	1
16	229754	Ball bearing	1
17	229675	Retainer, idle gear	1
18	229676	Shaft, idle gear	1
19	363042	Gear w/bushing, idle (includes items 20 and 21)	1
20	X	Gear, idle	1
21	229640	Bushing, idle gear	1
22	229742	Circlip	1
23	225816	Bolt, M6 x 12 plated	3

X Item not sold separately

# Group 7: Crankshaft, Flywheel, & Pistons



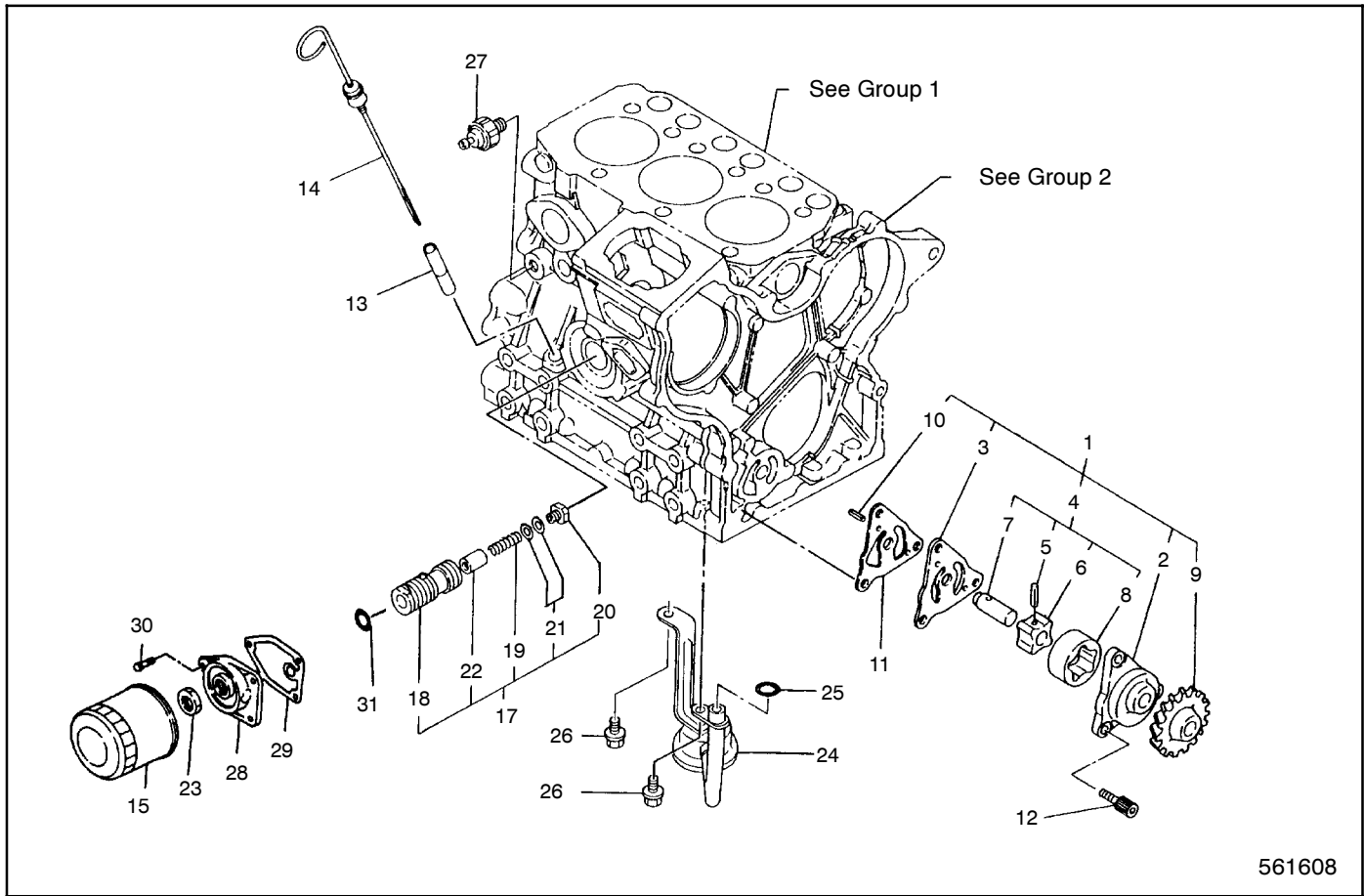
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## Group 7: Crankshaft, Flywheel, & Pistons

Item	Part Number	Description	Quantity
			Variation Number 1
1	363055	Crankshaft assembly (includes items 2-6)	1
2	256750	Parallel pin, 8 x 16	1
3	X	Crankshaft	1
4	363062	Gear, crankshaft	1
5	X	Ball, steel	3
6	229748	Key	1
8	363021	V-pulley	1
9	229639	Washer	1
10	229748	Bolt, V-pulley	1
11	229638	Bolt, flywheel	5
12	229620	Flywheel assembly (includes items 13 and 14)	1
13	X	Flywheel	1
14	229705	Gear, ring	1
15	363056	Piston w/rings (includes items 16 and 17)	3
15	363058	Piston w/rings (oversized 0.25) (includes items 16 and 17)	3
16	X	Piston	3
17	363057	Ring set (includes items 18-20)	3
17	363059	Ring set (oversized 0.25) (includes items 18-20)	3
18	X	Ring, top	3
19	X	Ring, second	3
20	X	Ring, oil	3
21	363003	Pin, piston	3
22	363199	Circlip	6
23	363221	Rod assembly, connecting (includes items 24-27)	3
24	X	Rod, connecting	3
25	363041	Bushing, piston pin	3
26	250820	Bolt, connecting rod	6
27	363222	Bearing, crankpin	3
27	363223	Bearing, pin (undersized 0.25)	3

X Item not sold separately

# Group 8: Lube Oil System

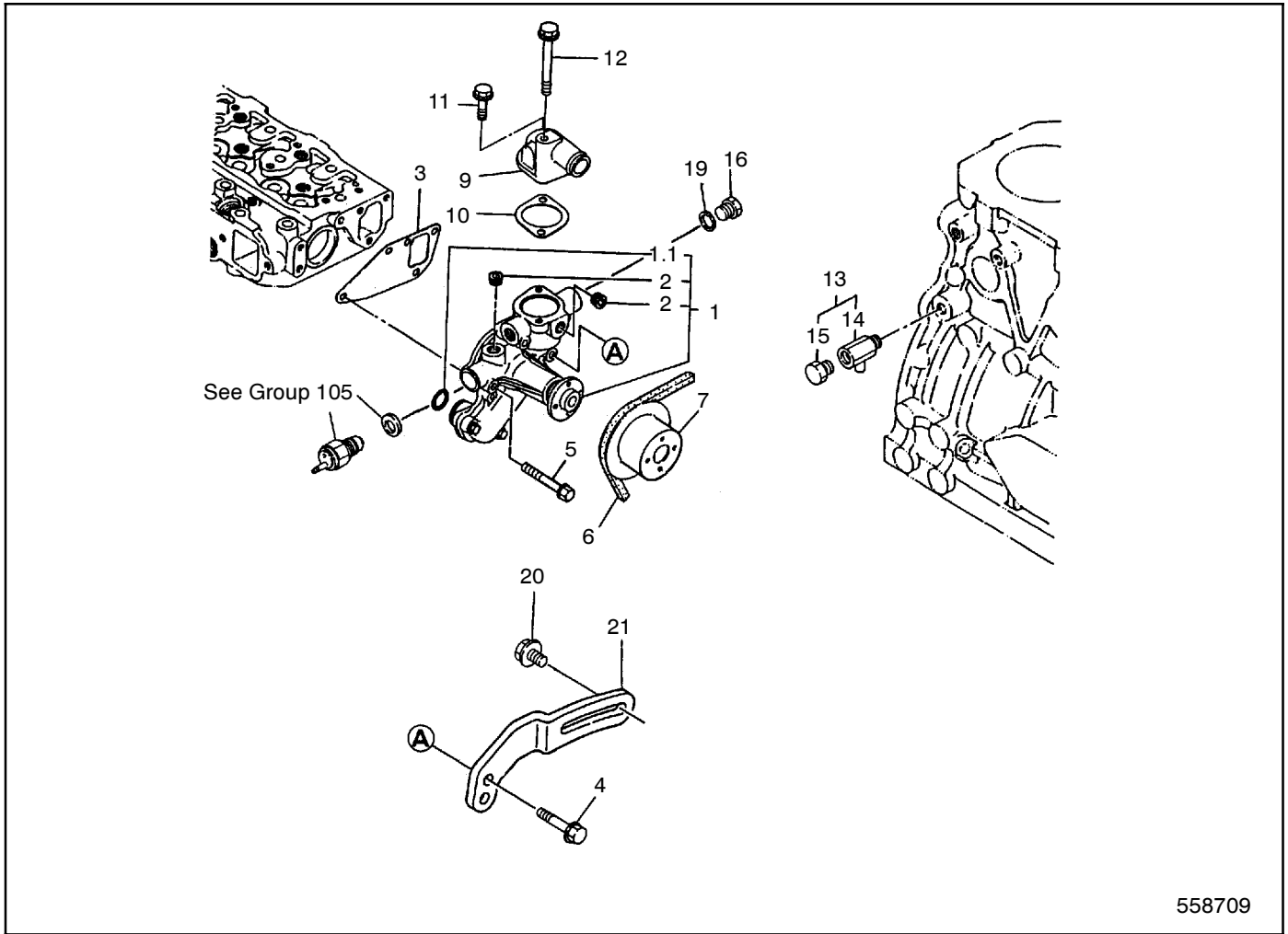


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Item	Part Number	Description	Quantity
			Variation Number
1	363067	Pump assembly, oil (includes items 2-10)	1
2	X	Body	1
3	X	Cover	1
4	X	Rotor assembly (includes items 5-8)	1
5	X	Pin	1
6	X	Rotor, inner	1
7	X	Shaft	1
8	X	Rotor, outer	1
9	X	Gear, lube oil pump	1
10	X	Bolt, M6 x 20	2
11	229677	Gasket, lube oil pump	1
12	229773	Bolt, M6 x 20	3
13	252759	Guide, dipstick	1
14	225701	Dipstick, lube oil	1
15	229678	Filter, lube oil	1
17	363070	Valve assembly, oil pressure (includes items 18-22)	1
18	X	Body	1
19	X	Spring	1
20	X	Retainer	1
21	X	Shim pack	1
22	X	Valve	1
23	252835	Nut	1
24	363020	Pipe assembly, oil intake	1
25	363014	O-ring	1
26	229498	Bolt, M6 x 12 plated	2
27	363083	Switch, oil pressure	1
28	363068	Bracket, oil filter	1
29	363069	Gasket	1
30	252697	Bolt, M8 x 20	2
31	250981	O-ring	1

X Item not sold separately

# Group 9: Cooling Water System

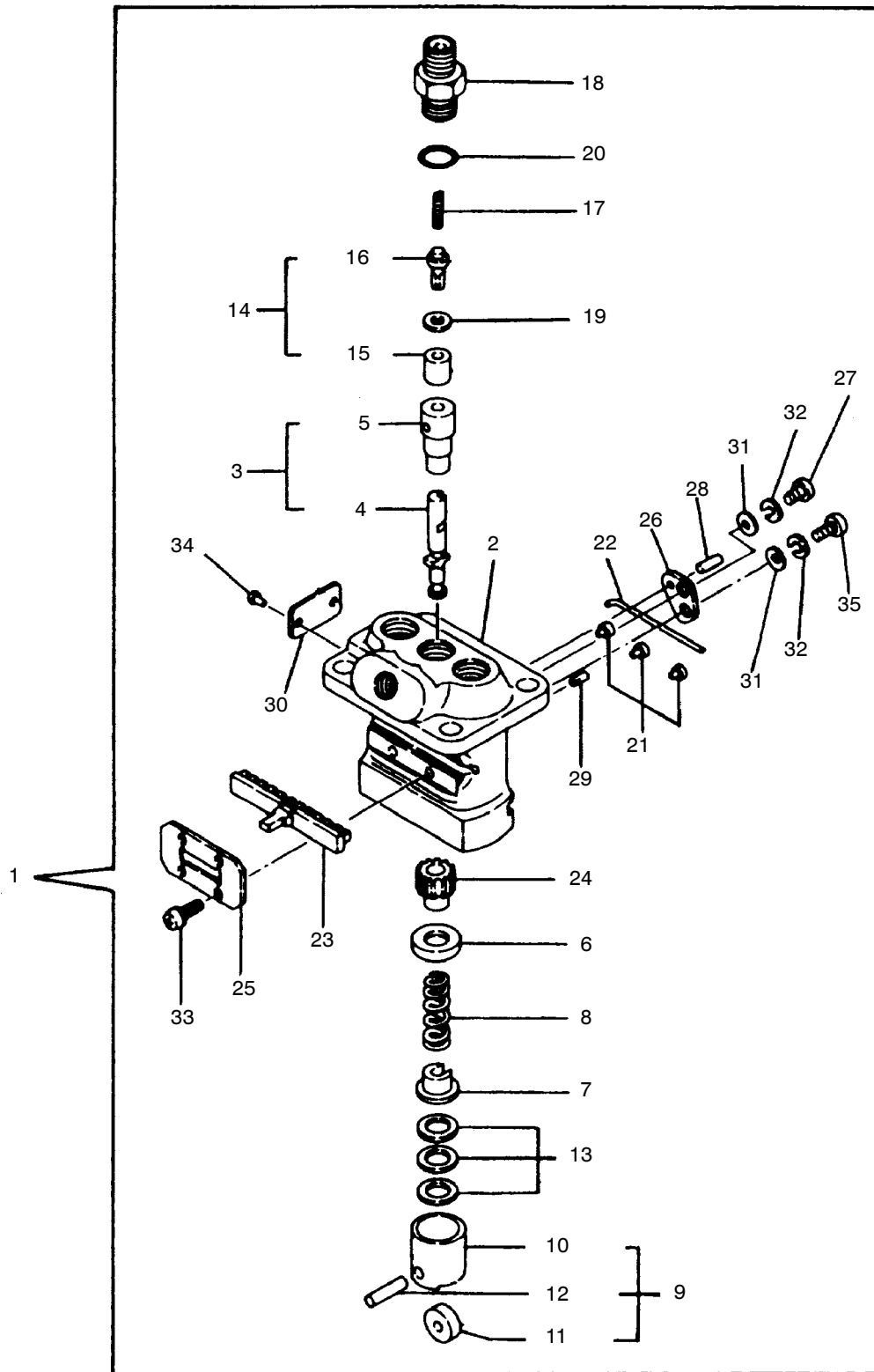


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Item	Part Number	Description	Quantity
			Variation Number
1	363071	Pump assembly, cooling pump (includes item 2)	1
1.1	363044	O-ring	1
2	250975	Plug, Pt 3/8, screw	1
3	363043	Gasket, water pump	1
4	252706	Bolt, M8 x 65 plated	1
5	252703	Bolt, M8 x 45 plated	3
6	363064	V-belt	1
7	363072	V-pulley	1
9	229408	Cover, thermostat	1
10	GM10849	Gasket	1
11	363209	Bolt, M8 x 65 plated	1
12	252706	Bolt, M8 x 65 plated	1
13	225704	Drain cock assembly (includes items 14 and 15)	1
14	X	Body	1
15	X	Valve	1
16	252757	Plug, M16	1
17	-	See Group 105	1
18	-	See Group 105	1
19	252773	Gasket	1
20	252692	Bolt, M8 x 25	1
21	229693	Adjuster, belt	1

X Item not sold separately

# Group 10: Fuel Injection Pump

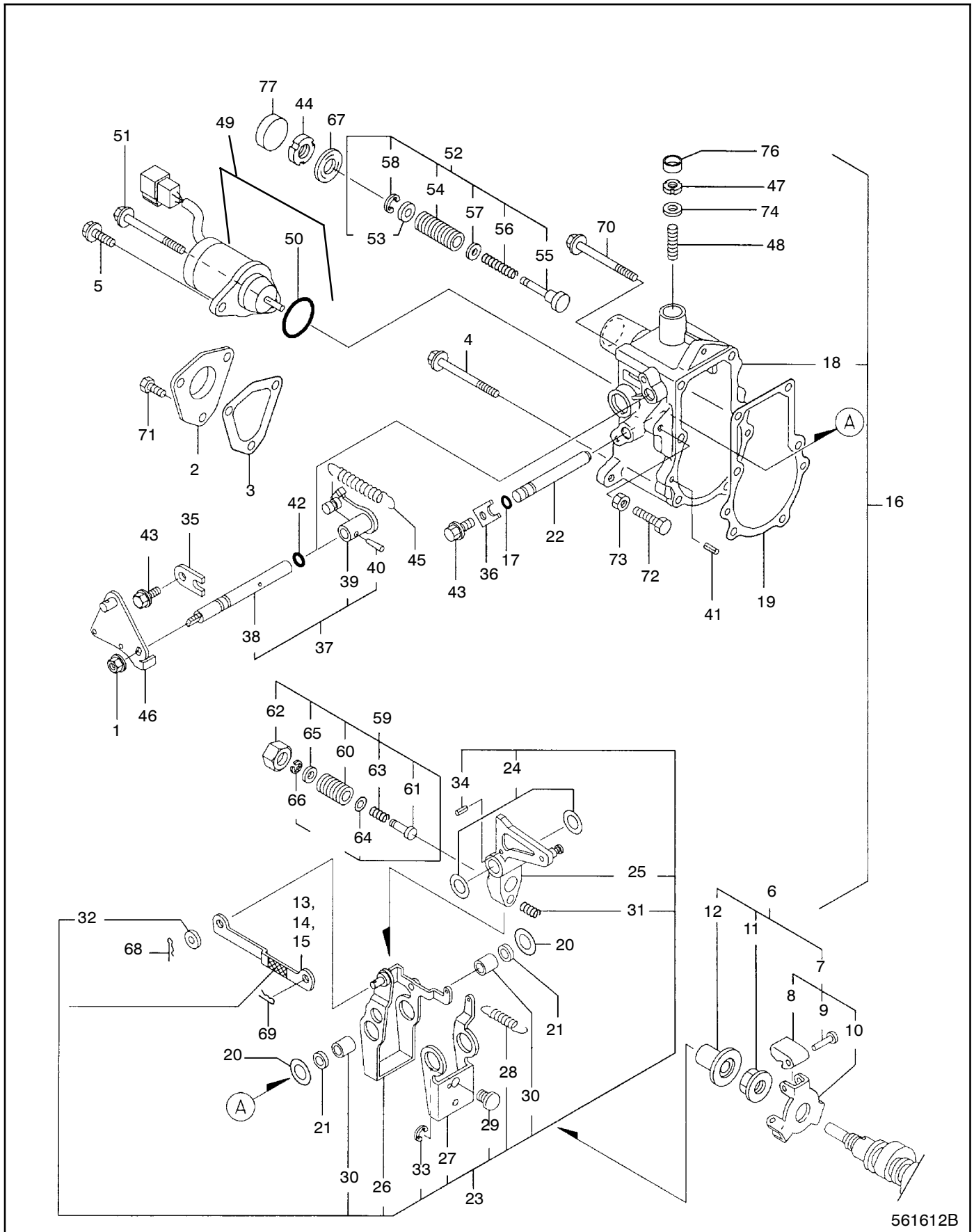


## Group 10: Fuel Injection Pump

Item	Part Number	Description	Quantity
			Variation Number
			1
1	363224	Pump assembly, fuel pump (includes items 2-35)	1
2	X	Body, fuel injection pump	1
3	363045	Plunger w/barrel (includes items 4-5)	3
4	X	Barrel, plunger	3
5	X	Plunger	3
6	229642	Retainer	3
7	229643	Retainer	3
8	229644	Spring, plunger	3
9	229656	Tappet assembly (includes items 10-12)	3
10	X	Guide, roller	3
11	X	Roller	3
12	X	Pin, roller	3
13	229645	Shim pack	3
14	363046	Valve w/seat, delivery (includes item 15-16)	3
15	X	Seat	3
16	X	Valve, delivery	3
17	229555	Spring, valve	3
18	229646	Holder, delivery valve	3
19	229647	Gasket, delivery	3
20	229648	O-ring	3
21	229649	Guide, plunger	3
22	229650	Pin	2
23	229680	Rack	2
24	229651	Pinion	1
25	363073	Retainer, rack	1
26	229652	Plate	1
27	229653	Screw	2
28	229654	Pin	2
29	229655	Pin	1
30	X	Label, caution	1
31	229740	Washer	2
32	363197	Spring washer	2
33	229759	Screw, M4 x 8	2
34	X	Rivet	4
35	229775	Screw, M4 x 10	2

X Item not sold separately

# Group 11: Governor



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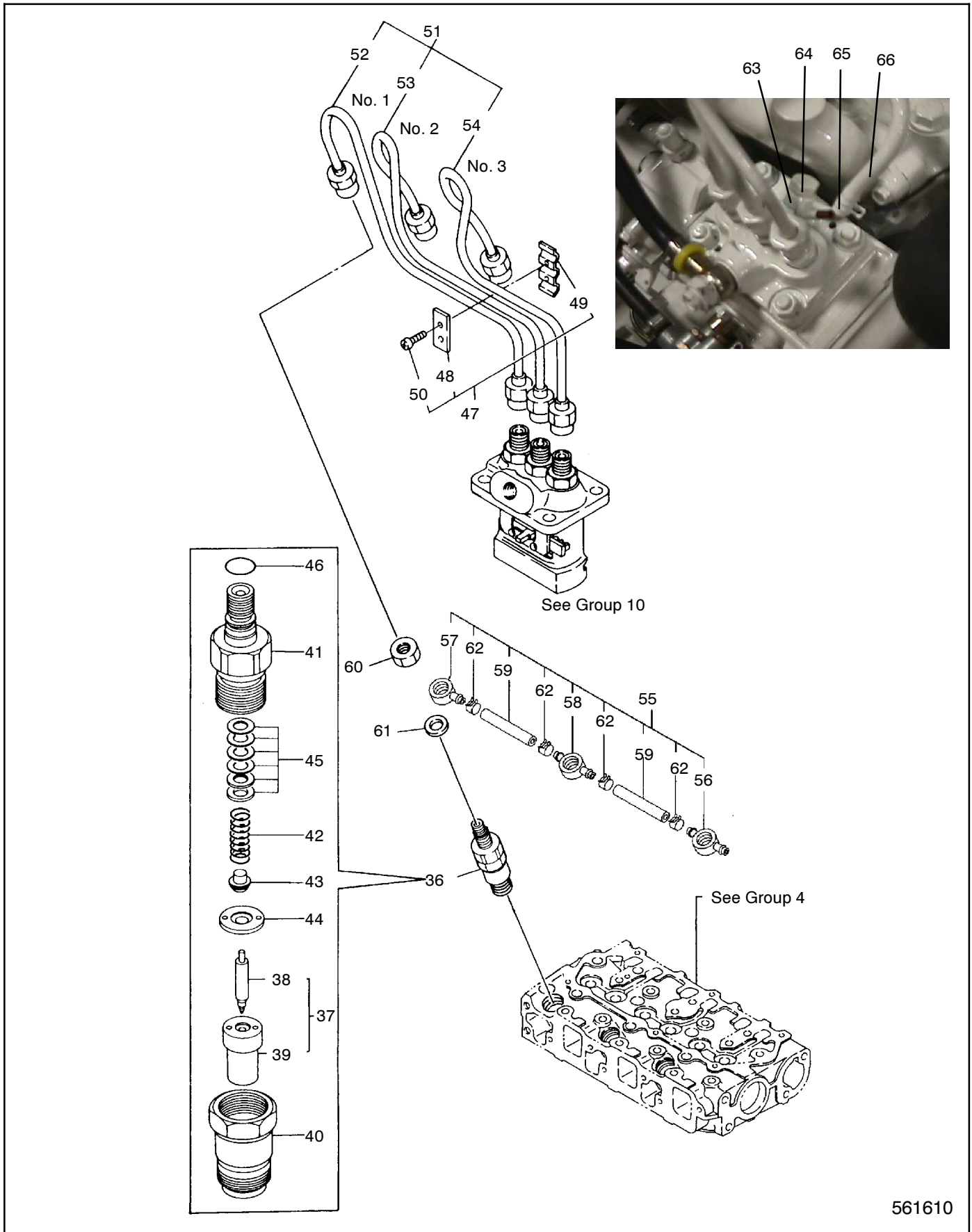
## Group 11: Governor

Item	Part Number	Description	Quantity
			Variation Number 1
1	225802	Nut, with washer 8 mm	1
2	229683	Cover, governor case	1
3	229626	Gasket	1
4	225429	Bolt, M6 x 75	3
4	363194	Washer, 6 (not shown)	3
5	252425	Bolt, M6 x 16	1
6	229627	Driving set, governor (includes items 7-12)	1
7	229628	Weight assembly, governor (includes items 8-10)	1
8	X	Weight, governor	3
9	X	Pin, governor weight	3
10	X	Support, governor weight	1
11	229687	Nut, governor weight	1
12	229688	Sleeve, governor	1
13	229684	Link, L=88.8 (no color)	1
14	229685	Link, L=88.6 (white)	1
15	229686	Link, L=89.0	1
16	225384	Case assembly, governor (includes items 17-43)	1
17	252849	O-ring	1
18	X	Case, governor	1
19	229682	Gasket	1
20	229689	Shim set	1
21	229722	Spacer assembly	1
22	229690	Shaft, governor lever	1
23	225359	Lever assembly, governor (includes items 24-34)	1
24	252592	Shim set	2
25	X	Lever, tension	1
26	X	Governor lever	1
27	X	Governor lever	1
28	225360	Spring, lever	1
29	225378	Shifter, PTO	1
30	X	Needle bearing	2
31	225389	Spring, starting	1
32	225803	Washer	1
33	225805	Circlip	1
34	229745	Spring pin, 3 x 14	1
35	229691	Retainer, shaft	1
36	229692	Retainer, shaft	1
37	225372	Shaft assembly, regulator (includes items 38-40)	1
38	X	Shaft, regulator	1

Item	Part Number	Description	Quantity
			Variation Number 1
39	X	Lever, regulator	1
40	X	Taper pin, 3 x 16	1
41	252668	Spring pin, 4 x 10	2
42	229757	O-ring	1
43	229498	Bolt, M6 x 10	2
44	225390	Carb nut, limit	1
45	363075	Spring, regulator	1
46	229665	Lever, regulator	1
47	225391	Carb nut, high idle	1
48	229712	Screw, adjustment	1
49	225461	Solenoid kit (includes item 50)	1
50	225427	O-ring	1
51	225430	Bolt, M6 x 95	1
52	225377	Fuel limiter	1
53	X	Shim set	1
54	X	Body	1
55	X	Pin	1
56	X	Spring, controller	1
57	X	Shim set	1
58	X	Circlip	1
59	225379	Angleich assembly (includes items 60-66)	1
60	X	Case, angleich	1
61	X	Shifter	1
62	X	Nut	1
63	X	Spring	1
64	X	Shim set	1
65	X	Washer	1
66	X	Circlip	1
67	225424	Seal washer 12S	1
68	229746	Snap pin 4	1
69	229747	Snap pin 6	1
70	229767	Bolt, M6 x 70	2
71	229769	Bolt, M5 x 10	3
72	229770	Bolt, M6 x 30	1
73	225825	Lock nut, M6	1
74	225423	Seal washer 6	1
75	X	Plug 14	1
76	225382	Plug 14	1
77	225381	Plug 22	1

X Item not sold separately

# Group 12: Fuel Injection Valve



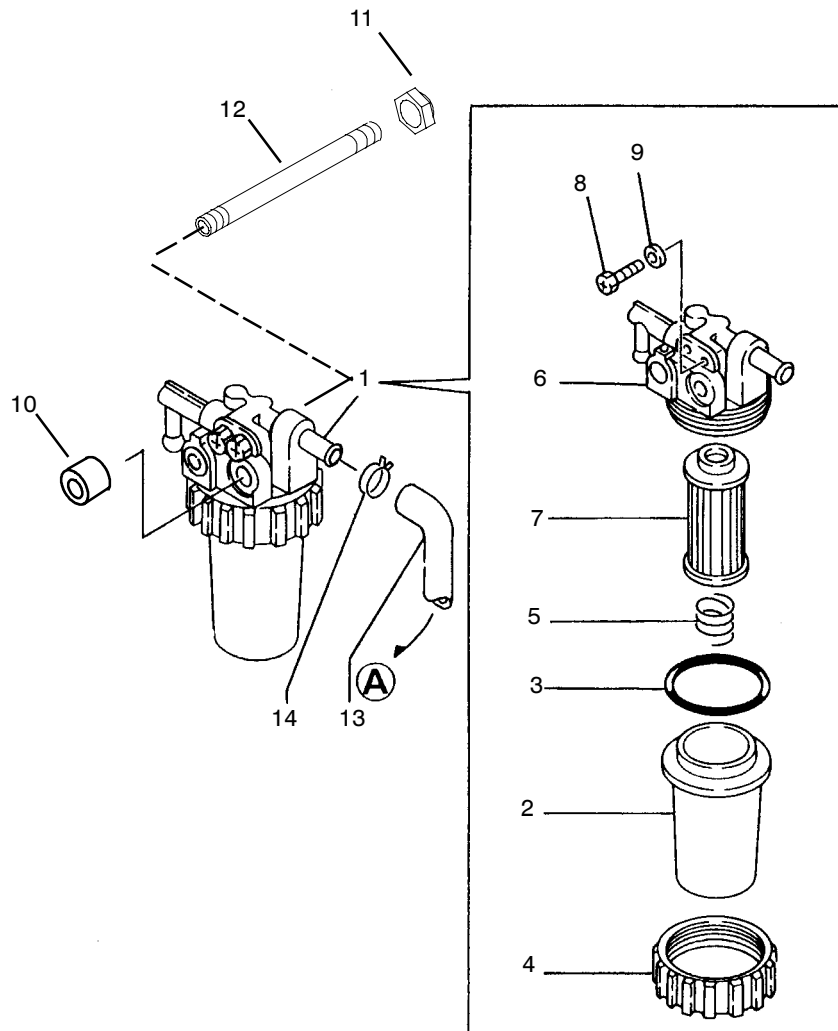
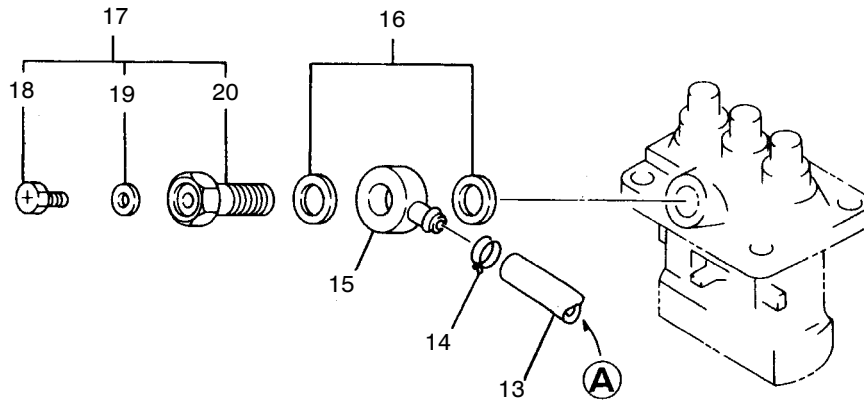
561610

## Group 12: Fuel Injection Valve

Item	Part Number	Description	Quantity
			Variation Number
			1
36	363217	Valve assembly, fuel injection	3
37	229657	Nozzle assembly, fuel injection (includes items 38-39)	3
38	X	Valve	3
39	X	Body	3
40	229658	Nut, valve w/case	3
41	229659	Holder, valve w/case	3
42	229660	Spring, valve	3
43	256522	Seat, nozzle spring	3
44	256523	Spacer, valve stop	3
45	256524	Shim pack	3
46	252856	O-ring	3
47	256774	Retainer, injection pipe	1
48	X	Retainer	1
49	X	Retainer	1
50	225418	Bolt, M4 x 14	2
51	X	Pipe set, fuel inlet	1
52	363048	Pipe, fuel injection	1
53	363049	Pipe, fuel injection	1
54	363050	Pipe, fuel injection	1
55	363047	Pipe assembly, fuel (includes items 56-59, 62)	1
56	363017	Joint	1
57	363016	Joint	1
58	363017	Joint	1
59	363001	Pipe	2
60	229662	Nut	3
61	252675	Gasket, round	3
62	225411	Clamp 8	4
63	GM33682	Hose fitting, banjo	1
64	GM32718	Bolt, banjo	1
65	225411	Clamp 8	2
66	GM35483	Fuel, line, return	1

X Item not sold separately

# Group 13: Fuel Line and Filter



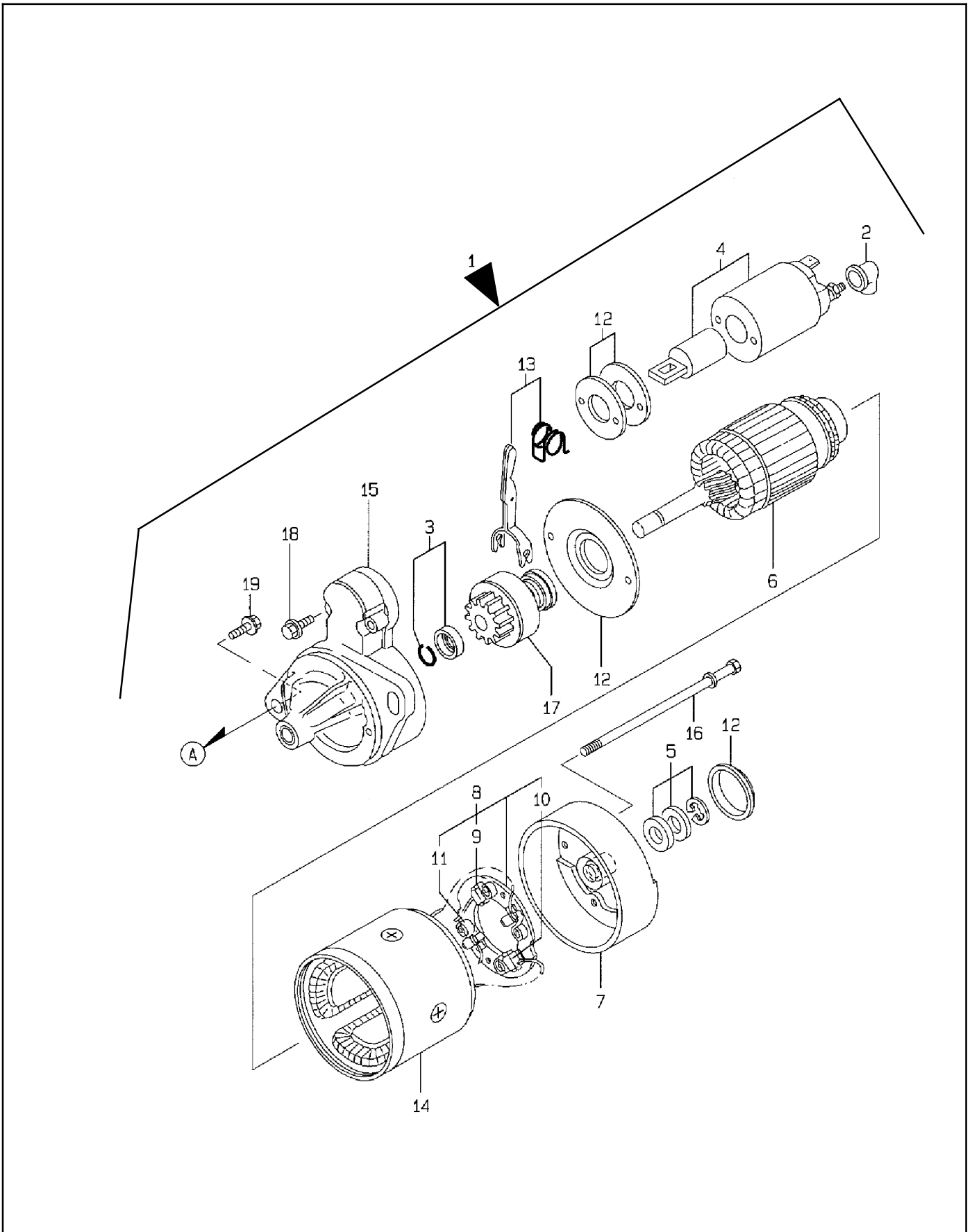
561611

## Group 13: Fuel Line and Filter

Item	Part Number	Description	Quantity
			Variation Number
			<b>1</b>
1	229565	Filter assembly, fuel	1
2	229709	Cup, filter	1
3	229550	O-ring	1
4	250821	Ring, retaining	1
5	229708	Spring	1
6	X	Body	1
7	229715	Element, fuel	1
8	252369	Plug	2
9	252360	Gasket, nylon	2
10	X-400-104	Spacer, .375 ID x .750 OD x .500 in.	1
11	M934-08-60	Nut, hex	1
12	229887	Stud, M8	1
13	X-386-74	Fuel line, flexible	1
14	X-429-9	Clamp, hose, .25/.70 in.	2
15	X-6288-1	Fitting, union, banjo	1
16	252739	Gasket	2
17	250996	Bolt, w/plug & seal	1
18	252081	Plug	1
19	225423	Seal washer	1
20	X	Bolt, joint	1

X Item not sold separately

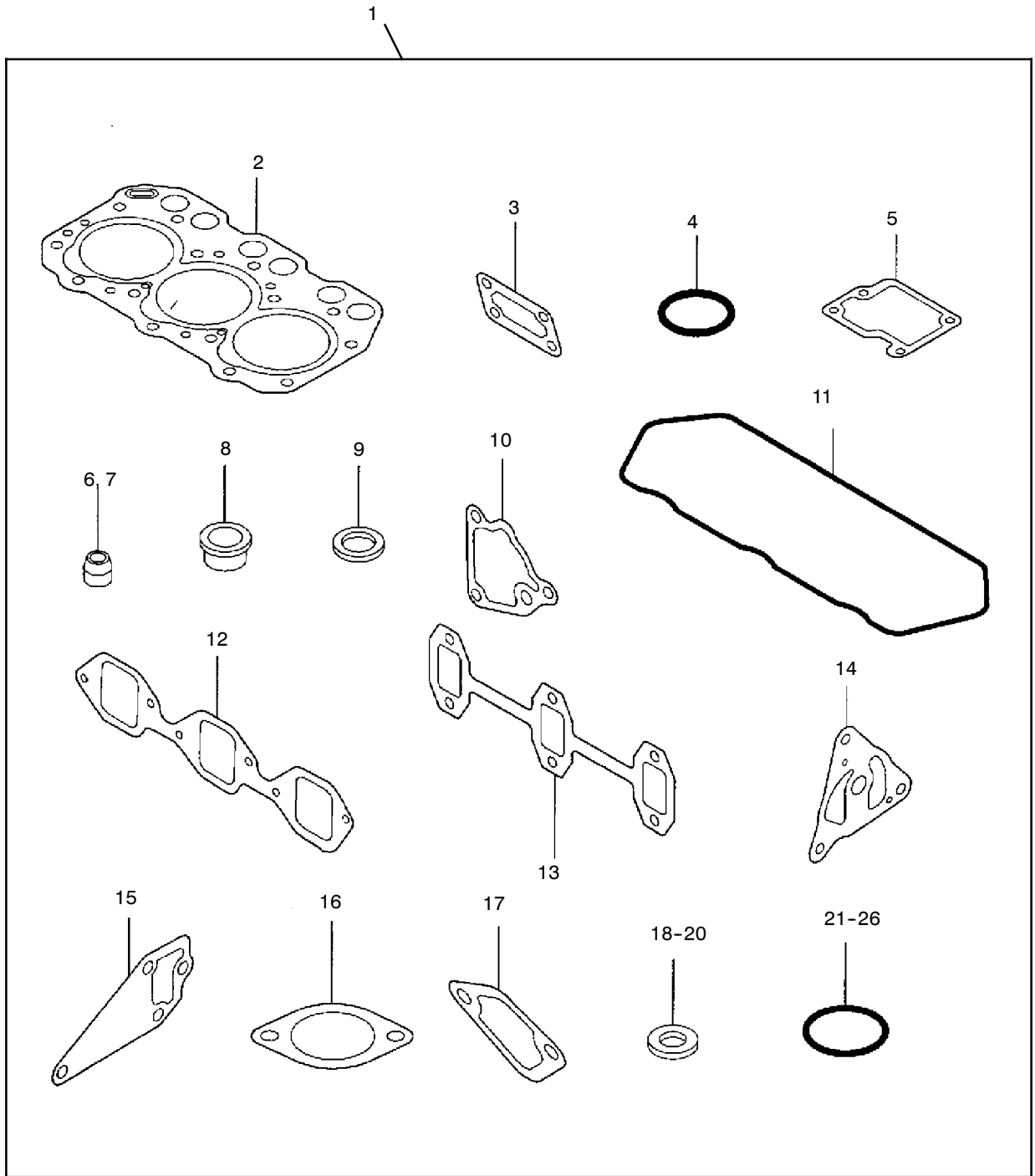
# Group 14: Starting Motor



## Group 14: Starting Motor

Item	Part Number	Description	Quantity
			Variation Number
1	229704	Starter (includes items 3-18)	1
2	252481	Cover, terminal	1
3	252630	Stopper set, pinion	1
4	229965	Switch, magnetic	1
5	252631	Washer set, thrust	1
6	363004	Armature	1
7	229817	Cover assembly, rear	1
8	229824	Holder assembly, brush	1
9	229822	Brush (-)	1
10	250868	Brush (+)	2
11	229823	Spring, brush	3
12	229821	Cover kit, dust	1
13	229820	Lever set, shift	1
14	229819	Coil assembly, field	1
15	252627	Cover	1
16	225859	Through bolt	2
17	363079	Pinion	1
18	229818	Bolt	2
19	229768	Bolt, M10 x 30 plated	1

# Group 15: Gasket Set



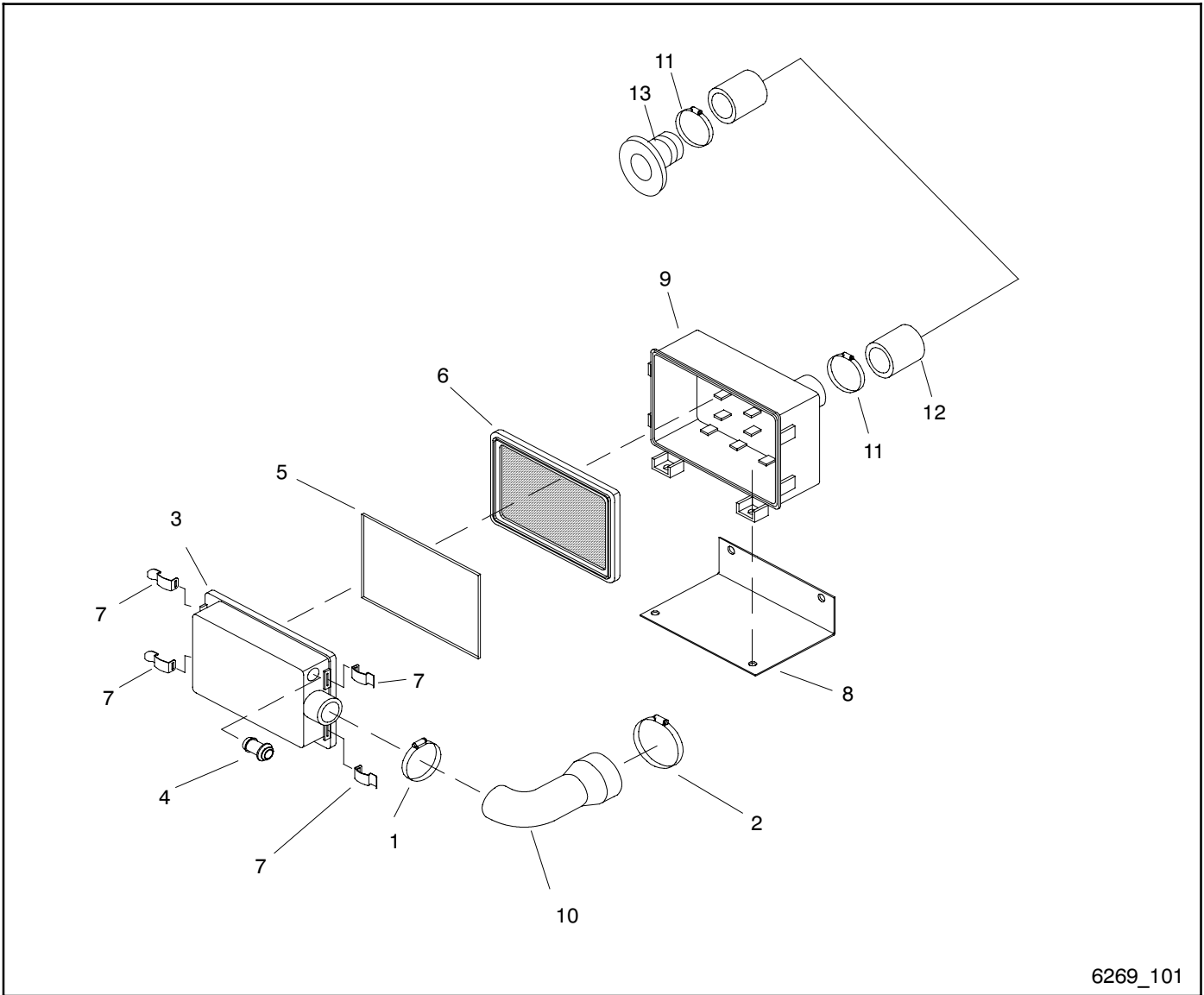
Item 27 not shown.



## Group 15: Gasket Set

Item	Part Number	Description	Quantity
			Variation Number
			1
1	363230	Gasket set (includes items 2-26)	1
2	363052	Gasket, cylinder head	1
3	229669	Gasket	1
4	252684	O-ring	1
5	363028	Gasket	1
6	250844	Seal, valve stem	3
7	225766	Seal, valve stem	3
8	229623	Protector, nozzle	3
9	229624	Gasket, nozzle	6
10	363069	Gasket	1
11	363035	Gasket, valve cover	1
12	363036	Gasket	1
13	363037	Gasket, exhaust manifold	1
14	229677	Gasket, oil pump	1
15	363043	Gasket, water pump	1
16	225420	Gasket	1
17	252061	Gasket	1
18	252773	Gasket 16	2
19	252739	Gasket 12	2
20	252675	Gasket 14, round	3
21	250801	O-ring	4
22	252856	O-ring	3
23	256796	O-ring	1
24	252687	O-ring	1
25	250981	O-ring	1
26	363014	O-ring	1
27	252998	Gasket, liquid	1

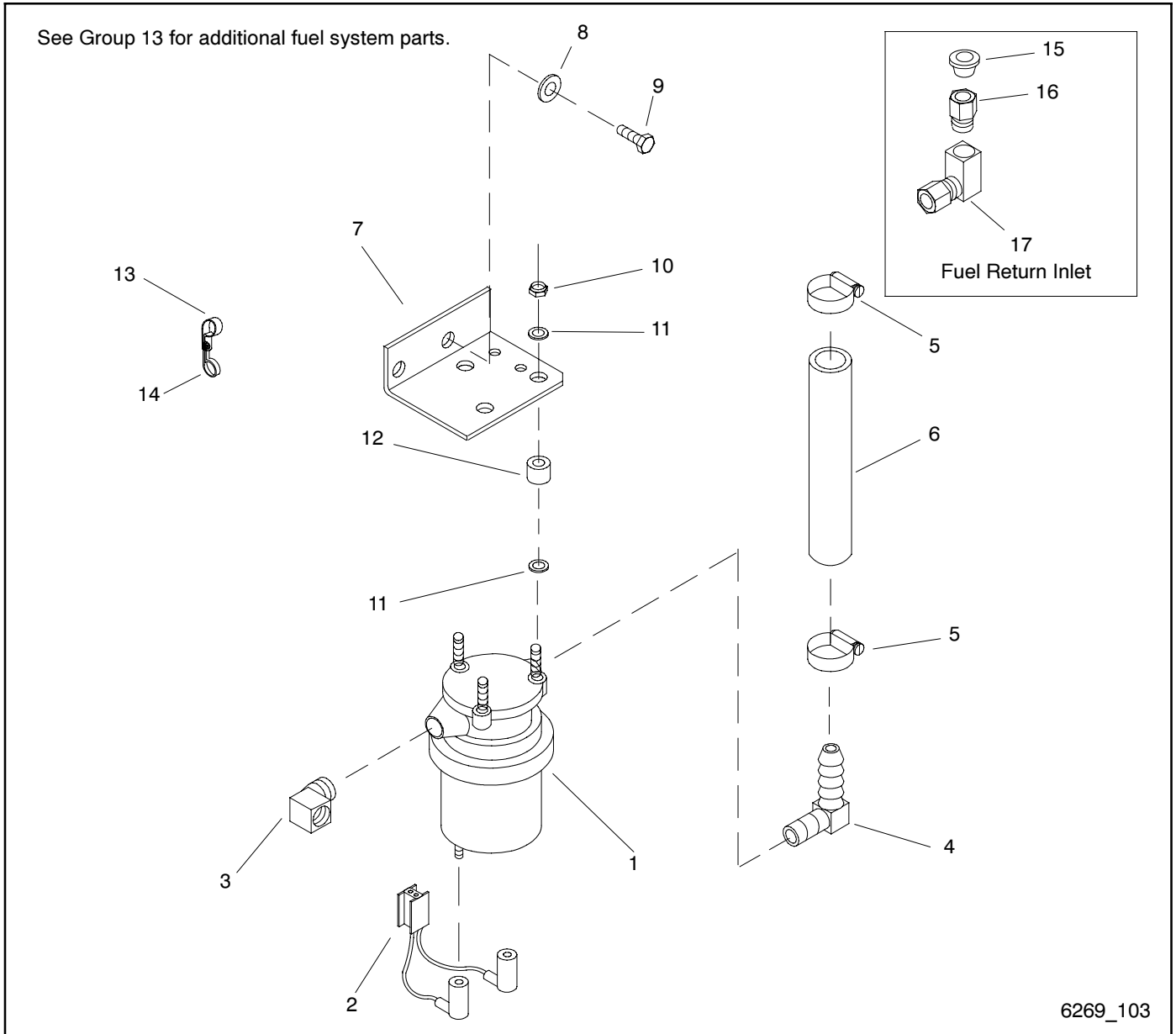
# Group 101: Air Intake



6269\_101

Item	Part Number	Description	Quantity	
			Variation Number	
			GR1	2
1	X-426-19	Clamp, hose, 1/2 in.	1	1
2	X-426-6	Clamp, hose, 1.56/2.5 in.	1	1
3	227463	Cover, plastic	1	1
4	278805	Adapter, nylon hose	1	1
5	278857	Filter, filter	1	1
6	278858	Element, air cleaner	1	1
7	278862	Clip, air cleaner	4	4
8	344898	Bracket, air cleaner mounting	1	1
9	344899	Base, air cleaner	1	1
10	344900	Hose, molded air intake, 1.75 in./1.29 in. ID	1	1
11	X-426-4	Clamp, hose, 1.31/2.25 in.	2	
11	X-426-8	Clamp, hose, .81/1.75 in.		2
12	359585	Duct	1	
12	359547	Duct		1
13	359476	Connector, hose	1	1

# Group 103: Fuel System

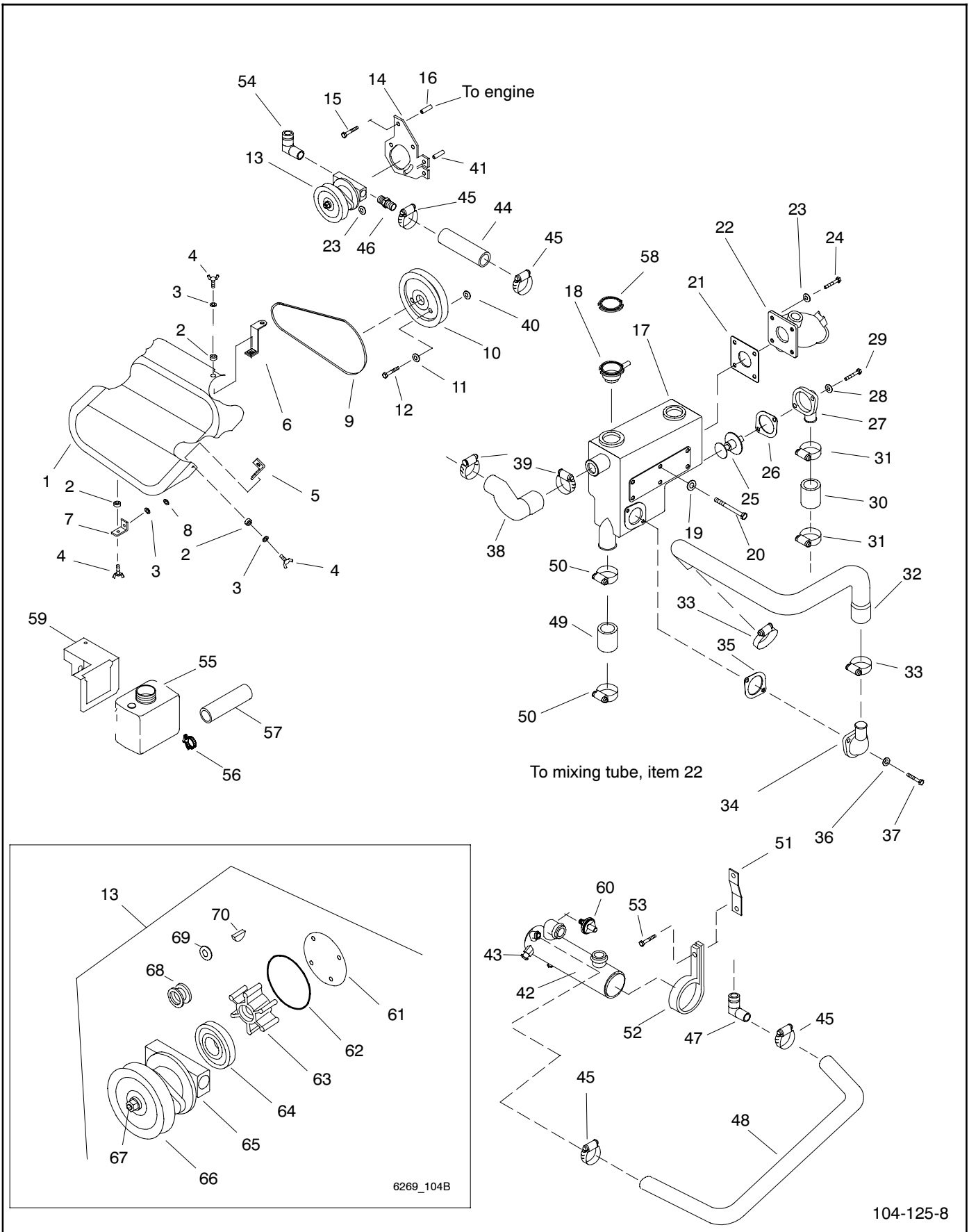


6269\_103

Item	Part Number	Description	Quantity	
			GR2	2
1	229051	Pump, fuel	1	1
2	229168	Lead assembly	1	1
3	X-555-1	Elbow, street, 1/4 x 1/4	1	1
4	X-391-20	Connector, hose elbow	1	1
5	X-426-9	Clamp, hose	2	2
6	X-386-6	Line, fuel	1	1
7	229290	Bracket, fuel pump	1	1
8	M125A-10-80	Washer	2	2
9	M933-10020-60	Bolt, hex head	2	2
10	X-101-25	Nut, lock	3	3
11	#	Washer, 1/4	6	6
12	X-284-39	Grommet	3	3
13	X-672-28	Clamp, insulated, .88 in.	1	1
14	X-672-7	Clamp, insulated, .44 in.	1	1
15	X-519-10	Plug, cap 1/4 in.	1	1
16	X-509-1	Adapter, pipe, 1/4 in.	1	1
17	X-382-1	Elbow, compression (90 deg.)	1	1

# Common hardware; procure locally.

# Group 104: Cooling System



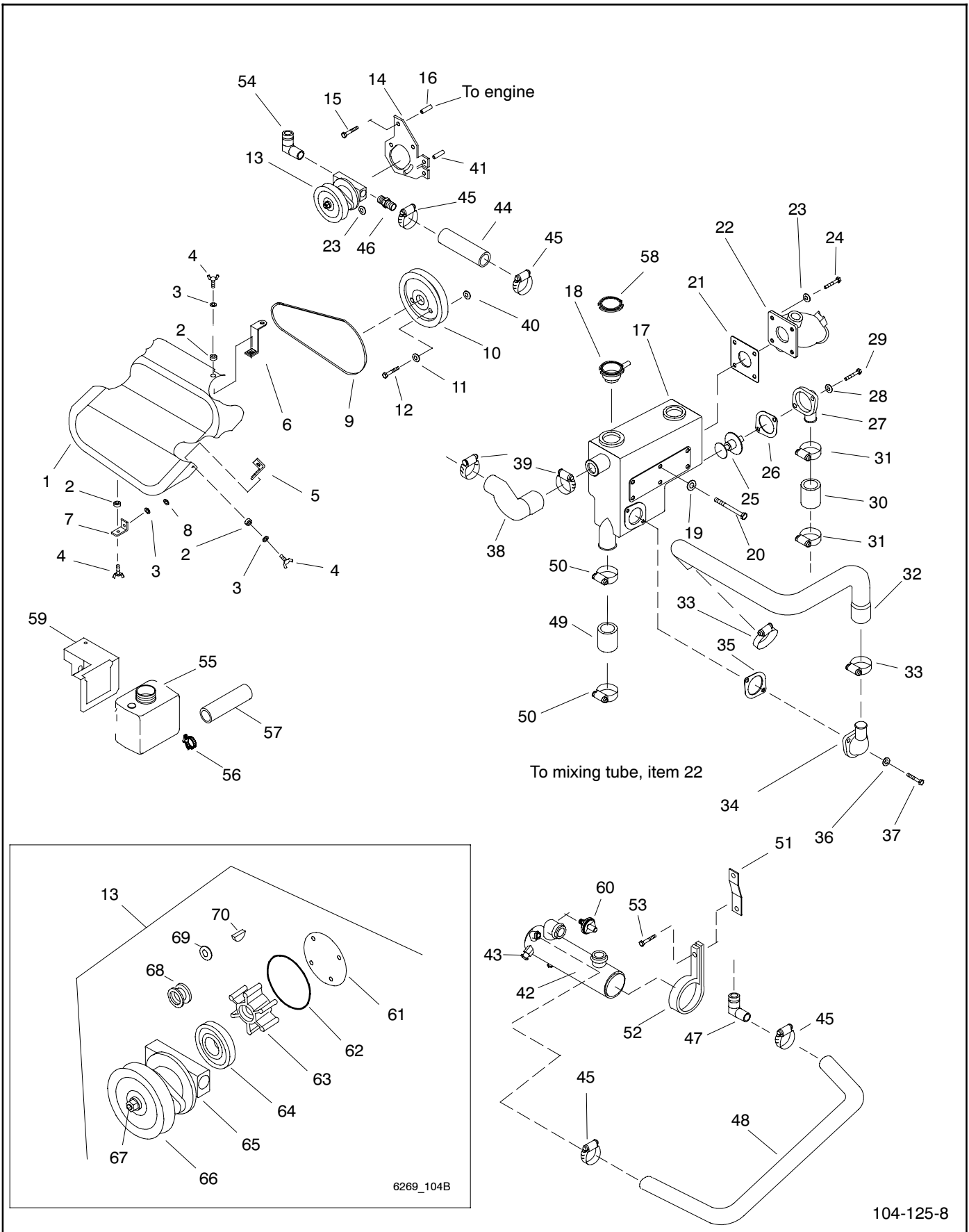
## Group 104: Cooling System

Item	Part Number	Description	Qty.	
			Var. No.	
			GR3	2
1	344878	Guard, belt	1	1
2	X-284-39	Grommet	3	3
3	X-25-40	Washer, plain	3	3
4	229330	Screw, wing	3	3
5	344894	Bracket, belt guard	1	1
6	344893	Bracket, belt guard	1	1
7	344897	Bracket, belt guard	1	1
8	X-25-68	Washer, plain, .281 ID x .625 in. OD	1	1
9	GM13660	V-Belt, 26 in.	1	1
10	GM42280	Pulley, pump drive	1	1
11	M125A-10-80	Washer, plain	3	3
12	M933-10025-60	Screw, HC M10-1.50	3	3
13	-	Pump, seawater (includes items 61-70)	1	1
13	GM46960	Kit, Service Seawater Pump*	1	1
14	344892	Bracket, seawater pump	1	1
15	M931-06060-60	Screw, HC	2	2
16	X-400-226	Spacer, .282 ID x .5 ID x 1.102 in.	2	2
17	344847	Manifold, exhaust	1	1
18	241311	Neck	1	1
19	M125A-08-80	Washer	6	6
20	M931-08100-60	Screw, hex head cap	2	2
20	M931-08140-60	Screw, hex head cap	4	4
21	249905	Gasket, exhaust	1	1
22	229063	Tube, mixing	1	1
23	X-25-85	Washer, 5/16	6	6
24	X-125-5	Screw, 5/16-18 x 1	4	4
25	GM47556	Thermostat	1	
25	254920	Thermostat		1
26	229963	Gasket, water outlet	1	1
27	229064	Cover, thermostat	1	1
28	X-25-85	Washer	2	2
29	X-125-31	Screw, 5/16-8 x .875	2	2
30	344882	Hose, coolant	1	1
31	X-426-8	Clamp, hose, 1 15/16 x 1 3/16	2	2
32	GM30020	Hose, molded	1	1
33	X-426-8	Clamp, hose, 1 15/16 x 1 3/16	2	2
34	229064	Cover, thermostat	1	1
35	229963	Gasket, water outlet	1	1
36	X-25-85	Washer	2	2
37	X-125-31	Screw, 5/16-8 x .875	2	2
38	344880	Hose, molded	1	1
39	X-426-8	Clamp, hose, 1 15/16 x 1 3/16	2	2
40	X-25-28	Washer, plain, .406 ID x .656 OD	3	3
41	X-400-142	Spacer, .260 ID x .5 ID x .188 in.		
42	GM30879	Exchanger, heat	1	
42	359398	Exchanger, heat		1
43	260085	Zinc anode	1	1
44	359399	Hose	1	1
45	X-426-3	Clamp, hose, 1/2 x 1 13/32	4	4
46	X-582-2	Connector, hose	1	1
47	X-391-2	Connector, hose, 5/8 x 3/8	1	1
48	X-312-62	Hose	1	
48	X-312-24	Hose		1
49	344883	Hose	1	1
50	X-426-8	Clamp, hose, 1 15/16 x 1 3/16	2	2
51	229283	Bracket, heat exchanger	2	2
52	X-672-33	Clamp, insulated	2	2
53	#	Hardware, 1/4-20	2	2
54	X-391-2	Connector, hose, 5/8 x 3/8	1	1
55	359037	Bottle, overflow	1	1
55	X-6050-8	Screw	2	2
56	X-426-9	Clamp, hose	2	2
57	X-386-34	Hose	1	1
58	229980	Cap	1	1
59	359036	Bracket, water bottle	1	1
60	GM30263	Switch, pressure	1	
61	344306	Plate, cover	1	1
62	344584	Gasket	1	1
63	229826	Kit, impeller (includes gasket)	1	1
64	344043	Bearing, ball	1	1
65	344585	Housing	1	1

\* Seawater pump service kit replaces pump 344089.  
Kit includes pump GM46936 (item 74), item 14 bracket, and hardware.

# Common hardware; procure locally.

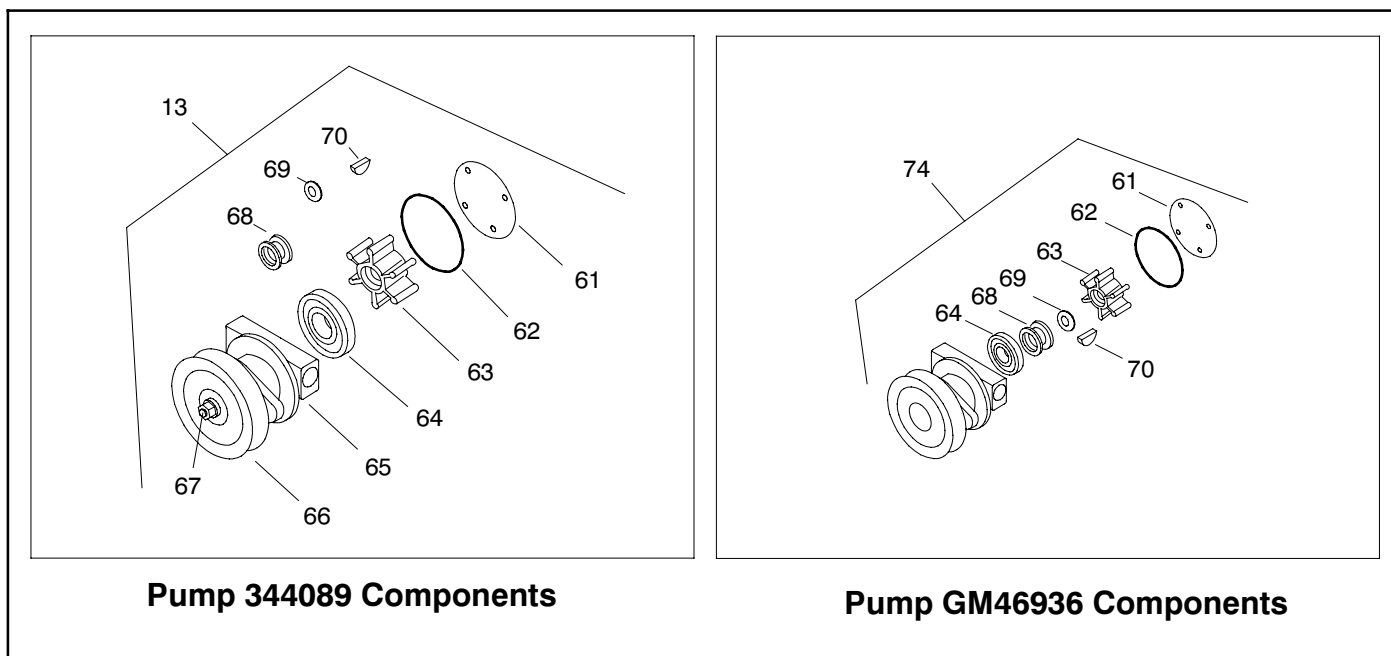
# Group 104: Cooling System, continued



6269\_104B

104-125-8

## Group 104: Cooling System, continued

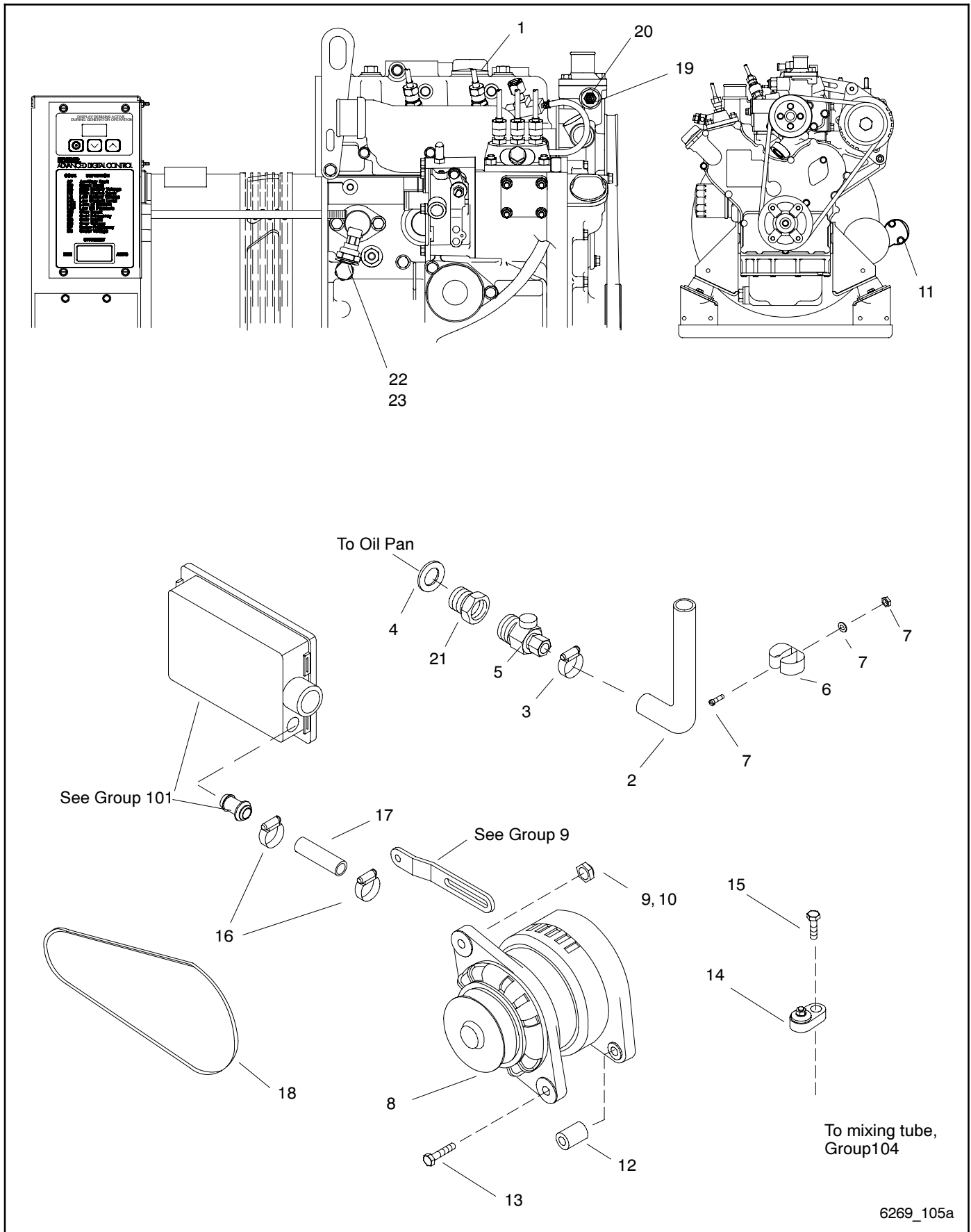


Item	Part Number	Description	Qty.	
			GR3	2
34	229064	Cover, thermostat	1	1
35	229963	Gasket, water outlet	1	1
36	X-25-85	Washer	2	2
37	X-125-31	Screw, 5/16-8 x .875	2	2
38	344880	Hose, molded	1	1
39	X-426-8	Clamp, hose, 1 15/16 x 1 3/16	2	2
40	X-25-28	Washer, plain, .406 ID x .656 OD	3	3
41	X-400-142	Spacer, .260 ID x .5 ID x .188 in.		
42	GM30879	Exchanger, heat	1	
42	359398	Exchanger, heat		1
43	260085	Zinc anode	1	1
44	359399	Hose	1	1
45	X-426-3	Clamp, hose, 1/2 x 1 13/32	4	4
46	X-582-2	Connector, hose	1	1
47	X-391-2	Connector, hose, 5/8 x 3/8	1	1
48	X-312-62	Hose	1	
48	X-312-24	Hose		1
49	344883	Hose	1	1
50	X-426-8	Clamp, hose, 1 15/16 x 1 3/16	2	2
51	229283	Bracket, heat exchanger	2	2
52	X-672-33	Clamp, insulated	2	2
53	#	Hardware, 1/4-20	2	2
54	X-391-2	Connector, hose, 5/8 x 3/8	1	1
55	359037	Bottle, overflow	1	1
55	X-6050-8	Screw	2	2
56	X-426-9	Clamp, hose	2	2
57	X-386-34	Hose	1	1
58	229980	Cap	1	1
59	359036	Bracket, water bottle	1	1
60	GM30263	Switch, pressure	1	
61	344306	Plate, cover	1	1
62	344584	Gasket	1	1
63	229826	Kit, impeller (includes gasket)	1	1
64	344043	Bearing, ball	1	1
65	344585	Housing	1	1
66	344606	Pulley	1	1
67	344587	Shaft, drive	1	1
68	GM16865	Seal	1	1
69	GM22995	Seat, ceramic	1	1
70	GM17702	Key	1	1
74	GM46936	Pump, seawater	1	1

\* Seawater pump service kit replaces pump 344089.  
Kit includes pump GM46936 (item 74), item 14 bracket, and hardware.

# Common hardware; procure locally.

# Group 105: Engine



6269\_105a



## Group 105: Engine

Item	Part Number	Description	Quantity		
			Variation Number		
			GR4	GR5	3
1	A-344896-BLK	Engine assembly (not shown; see Groups 1-15 for parts) (3TNE74C)	1	1	1
2	X-651-34	Hose	1		1
2	X-651-19	Hose		1	
3	X-426-9	Clamp, hose, .25/.720 in.	1	1	1
4	X-25-145	Washer, plain	1	1	1
5	GM50838	Kit, valve drain (includes valve 359653 and item 21)	1	1	1
6	X-6084-1	Clip, hose	1	1	1
7	#	Hardware, 1/4-20	1	1	1
8	256924	Alternator	1		1
8	229484	Pulley, tension assembly (not shown)		1	
9	M934-05-50	Nut, hex. 5 mm	1		1
10	M934-06-60	Nut, hex. 6 mm	1		1
11	M934-08-60	Nut, hex. 8 mm	1	1	1
12	X-400-228	Spacer, .344 ID x .625 OD x 1.141 in.	1		1
13	#	Hardware, 5/16-18	1		1
14	249872	Switch, high temperature cutout	1	1	1
15	X-6238-10	Screw, 3/8-16 x .75	2	2	2
16	X-426-10	Clamp, hose, .5/1 in.	2	2	2
17	X-6242-4	Hose	1	1	1
18	GM13660	V-Belt, 25.5 in.	1	1	1
19	GM28823	Sender, temperature	1	1	1
20	GM30245	Bushing, adapter	1	1	1
21	249959	Adapter, bushing	1	1	1
22	229323	Adapter, sender			1
23	GM70917-1	Sensor, pressure			1

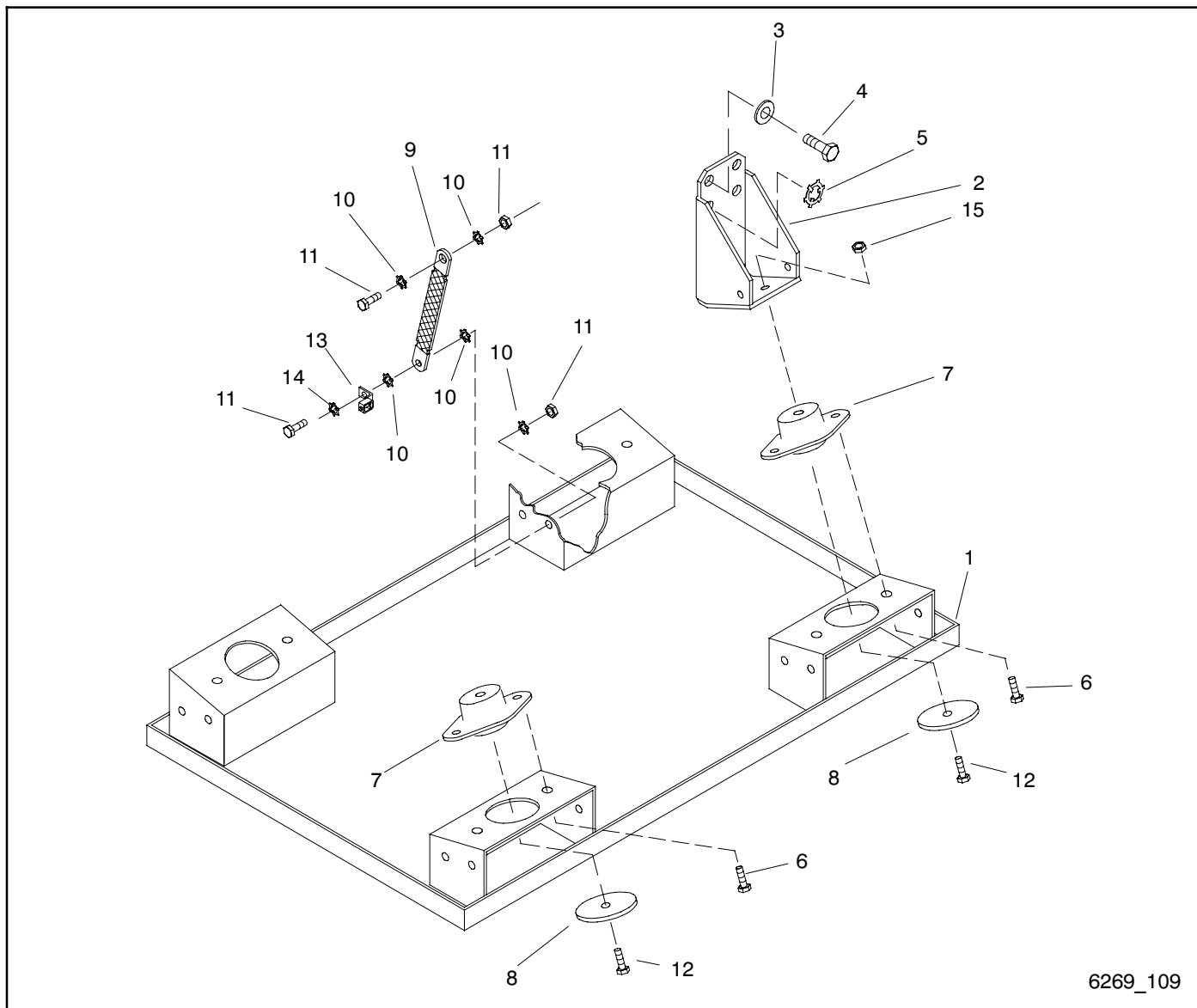
# Common hardware; procure locally.

## Group 107: Nameplate and Decals

Item	Part Number	Description	Quantity	
			Variation Number	
			GR6	2
1	249810	Decal, warning "Hot Coolant"	1	1
2	344282	Decal, "Notice Zinc Anode"	1	1
3	226917	Decal, negative battery connection	1	1
4	344295	Decal, equipment ground	1	1
5	GM14167	Decal, drain	3	3
6	249808	Decal, warning "Rotating Parts"	1	1
7	224233	Decal, 1-800 number	1	1
8	294520	Decal, danger "High Voltage"	1	1
9	249809	Decal, warning "Hot Engine"	1	1
10	359446	Nameplate	1	1
11	X-6348-10	Decal, Kohler Power System	1	
11	X-6348-6	Decal, Kohler Power System		1
12	GM35838	Decal, reconnection 1 phase	1	
13	344486	Decal, CE	1	1

Nameplate and decals not illustrated.

# Group 109: Skid and Plant Mounting

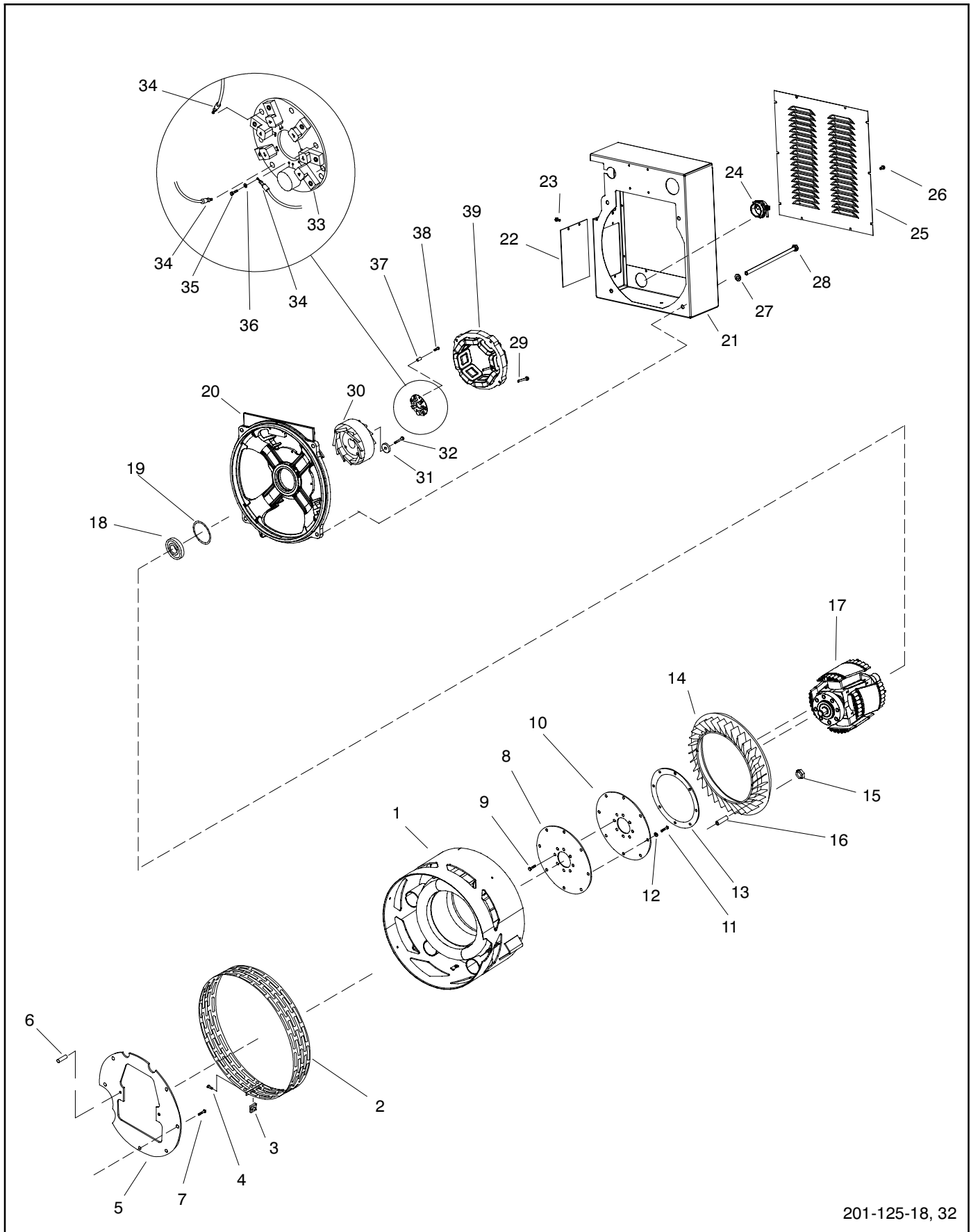


6269\_109

Item	Part Number	Description	Quantity	
			Variation Number GR7	2
1	GM31906	Tray, drip	1	
2	GM29302	Tray, drip		1
2	344895	Support, engine	2	2
3	M125A-10-80	Washer	7	7
4	M933-10020-60	Screw, hex head	8	8
5	X-22-14	Washer, lock, 7/16	1	1
6	#	Hardware, M8-1.25	8	8
7	225124	Vibromount	4	4
8	X-25-96	Washer, plain	4	4
9	LK-0606-1515	Lead	1	
9	245297	Strap, ground		1
10	X-22-12	Washer, shakeproof, 1/4	4	4
11	#	Hardware, M6-1.00	2	2
12	#	Hardware, M8-1.25	4	4
13	X-377-12	Connector, cable		1
14	X-22-11	Washer, lock, 1/4		1
15	M982-08-80	Nut, elastic stop	4	4

# Common hardware; procure locally.

# Group 201: Generator and Mounting

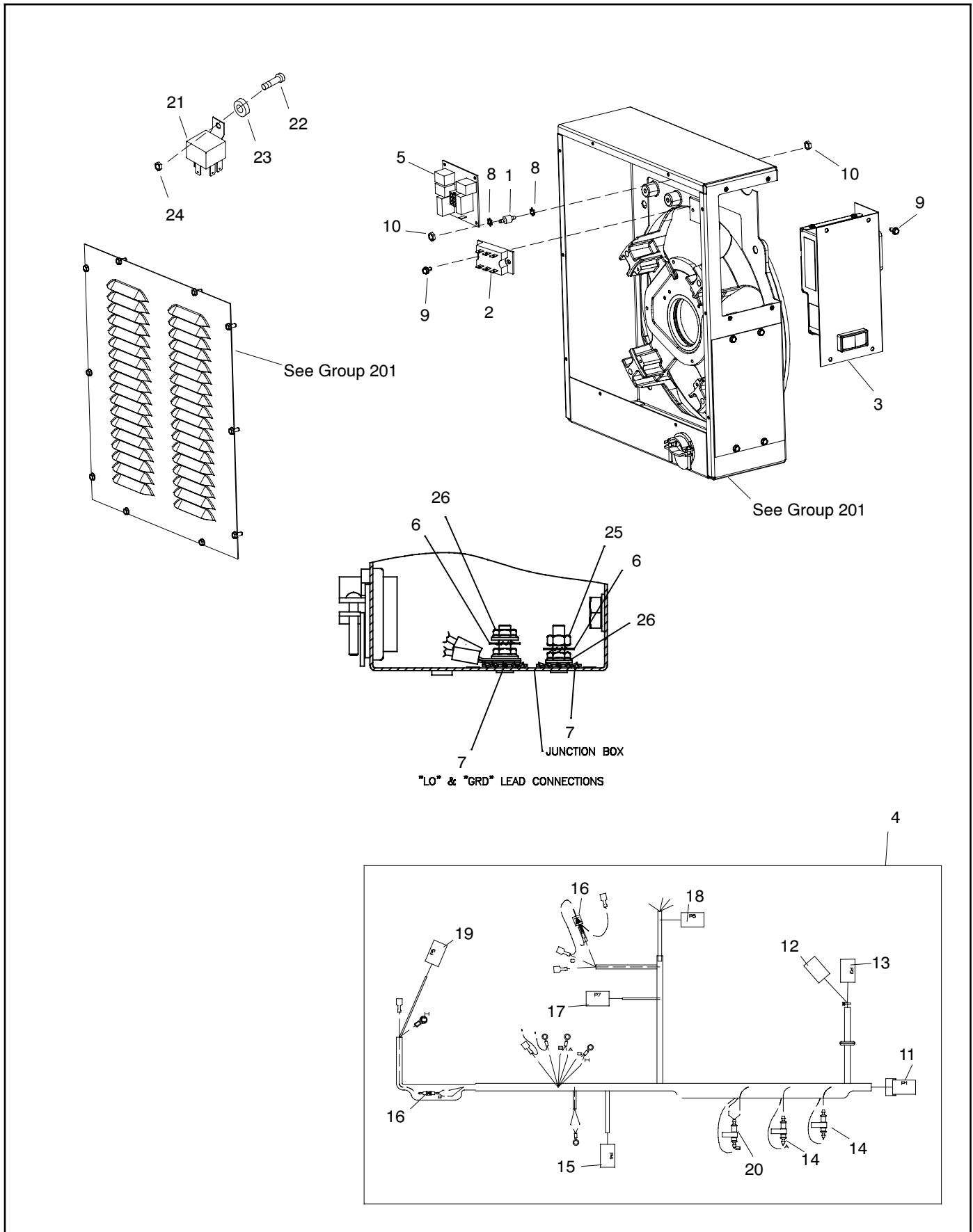


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## Group 201: Generator and Mounting

Item	Part Number	Description	Quantity	
			Variation Number	
			GR8	2
1	GM29301	Stator assembly	1	1
2	229109	Guard, generator fan	1	1
3	257442	Clip, speed	1	1
4	X-67-125	Screw, tapping, 10-24	1	1
5	229349	Plate, locator	1	1
6	229356	Pin, knurled	2	2
7	M933-10012-60	Screw, M10-1.50	5	5
8	229389	Disc, drive	1	1
9	X-6238-3	Screw, 3/8-16 x .875	8	8
10	229347	Disc, drive	2	2
11	M933-08016-60	Screw, HC M8-1.25	6	6
12	M125A-08-80	Washer	6	6
13	229346	Disc, fan locator	1	1
14	225214	Fan, generator	1	
14	225215	Fan, generator		1
15	X-101-9	Nut, elastic stop, 10-24	4	4
16	X-400-189	Spacer	4	4
17	A-229837	Rotor assembly (includes item 18)	1	1
18	X-758-15	Bearing, ball	1	1
19	229110	O-ring	1	1
20	GM24810	Bracket, end	1	1
21	GM37365	Box, junction	1	
21	GM29687	Box, junction		1
22	GM30021	Plate, circuit breaker	1	1
23	X-6216-1	Screw, Phillips hex crimpite	4	
23	X-67-64	Screw, self-tapping		4
24	X-6266-1	Connector, cable	1	1
25	GM32289	Panel, junction box louver	1	
25	GM29689	Panel, junction box louver		1
26	X-6216-1	Screw, Phillips hex crimpite	10	
26	X-67-64	Screw, self-tapping		10
27	X-801-3	Washer, hardened	3	4
27	X-22-14	Washer, lock, .391 ID x .975 in. OD	1	
28	M931-10235-60	Screw, hex head	4	4
29	X-97-15	Screw, hex, 10-24	4	4
30	344567	Exciter, armature	1	1
31	X-25-129	Washer, plain	1	1
32	X-6238-3	Screw, 3/8-16 x .875	1	1
32	X-22-1	Washer, lock	1	1
33	A-229152	Circuit Board, diode board	1	1
34	X-283-3	Terminal	3	3
35	X-51-8	Screw, 8-32 x .75	5	5
36	X-22-7	Washers, #8	5	5
37	X-712-17	Spacer	3	3
38	X-67-135	Screw, tapping, 10-24	3	3
39	GM30341	Exciter assembly, field	1	1
-	X-672-31	Clamp, insulated, .75 in. (not shown)	1	

# Group 301: Controller and Mounting



## Group 301: Controller and Mounting

Item	Part Number	Description	Quantity		
			Variation Number		
			GR9	GR10	3
1	282829	Vibromount	4	4	4
2	GM28483	SCR module	1	1	1
3	GM34969	Controller assembly, ADC 2100 (kit includes instructions)	1	1	1
4	GM29246	Harness, engine (serviced with Kit GM50489-S that includes GM50489)	1		1
4	GM50489	Harness, engine (used with relay containing an integrated diode)		1	
5	GM29671	PCB assembly, relay board, 12V	1	1	
5	GM29779	PCB assy, relay board, 12V PCB Assy, Relay Board 12V w/Opt Relay			1
6	X-22-11	Washer, lock, .262 ID x .469 in. OD	2	2	2
7	X-22-12	Washer, lock, .262 ID .743 in. OD	2	2	2
8	X-22-20	Washer, lock, .172 ID x .373 in. OD	8	8	8
9	X-67-64	Screw, self-tapping	6	6	6
10	X-6210-4	Nut, flange whiz, 8-32	8	8	8
11	GM28678	Connector, weathertight	1	1	1
12	320711	Connector, 9-position	1	1	1
13	GM29998	Connector, 6-position, blk, male	1	1	1
14	358337	Fuse, 10 A, 250 V (F1 and F2)	2	2	2
15	229989	Connector, receptacle	1	1	1
16	233959	Diode, 6 A	4	4	4
17	GM15493	Connector, weathertight, 3-position	1	1	1
18	292370	Connector, plug, 2-position	1	1	1
19	GM29249	Connector	1	1	1
20	223316	Fuse, 10 A, 250 V (F3)	1	1	1
21	259391	Relay, 24 VDC (use GM49746 and modify harness GM29246)	1		
21	GM49746	Relay, 24 VDC (contains integrated diode, used w/harness GM50489)		1	
22	M7985A-05012-20	Screw, pan head mach.	1	1	
23	200705	Grommet, round	1	1	
24	M934-05-50	Nut, Hex 5mm	1	1	
25	X-81-8	Nut, hex, 1/4-20	1	1	1
26	X-6210-2	Nut, flange spirallock, 1/4-20	3	3	3

\* Units built before approximately April 1, 2007 used variation GR9.

## Group 701: Literature

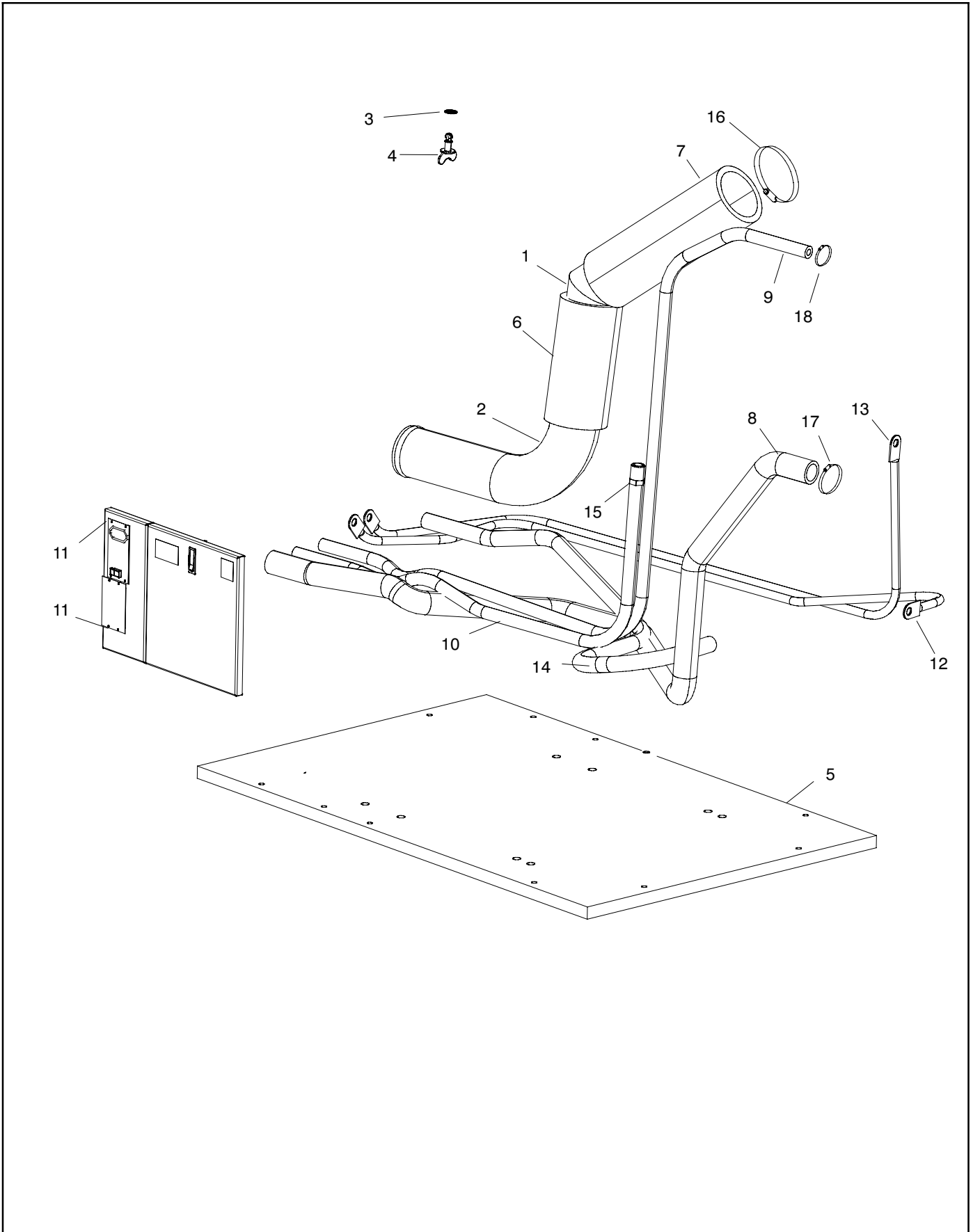
Item	Part Number	Description	Quantity
			Variation Number
			43
1	TP-5375	Warranty, Marine	1
2	TP-5620	Safety Precautions, Marine	1
3	TP-5876	S/M Yanmar TNE Series (AOA5063)	1
4	TP-5968	O/M Yanmar 4TNE98 Series	1
5	TP-6252	O/M 5-32EOZD, Marine	1
6	TP-6253	I/M 5-32EOZD, Marine	1
7	TP-6255	S/M 8-15.5EOZD/6.5-13EFOD, Marine	1
8	TP-6269	P/C 8EOZ/6.5EFOZD Marine	1

## Paint and Miscellaneous Parts

Item	Part Number	Description
1	221334	White paint, gallon can (Chris Craft White)
1	221335	White paint, spray can (Chris Craft White)
1	GM48126	White paint, spray can (Matterhorn White)

The change from Chris Craft to Matterhorn White was made in production on 1/1/2006; the serial break is #2082007.

# Sound Shield



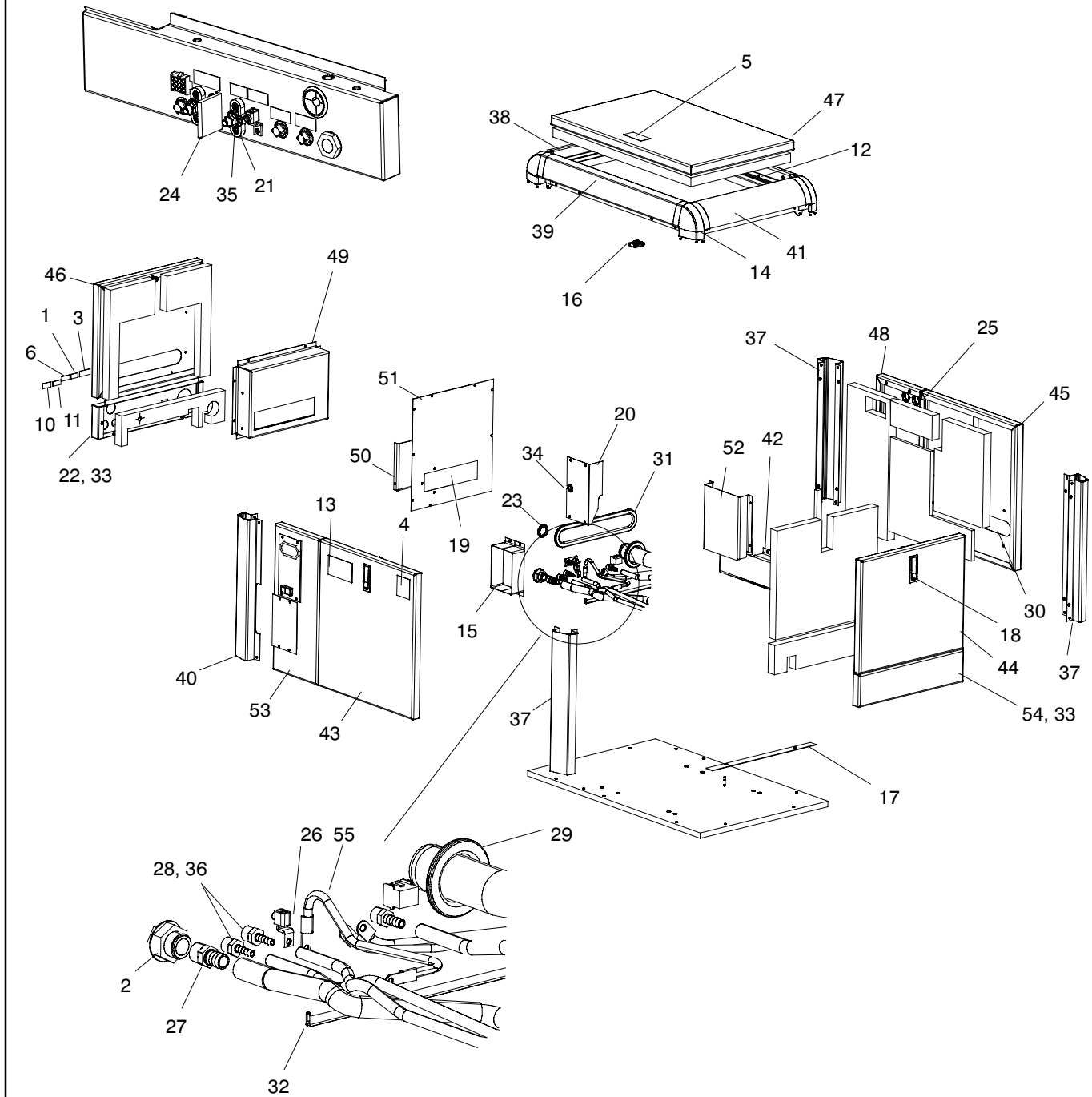


# Sound Shield

Item	Part Number	Description	Quantity
			Kit Number GM31950-KA1(KP1)
1	229889	Tube, exhaust, fiberglass, 2 in. OD	1
2	344694	Tube, exhaust elbow, 2.00 in. OD, ST	1
3	GM29918	Retainer	2
4	GM29920	Stud, wing head	2
5	GM31924	Base, sound shield	1
6	GM32052	Hose, radiator	1
7	GM32053	Hose, radiator	1
8	X-312-13	Hose, .63 in. ID	1
9	X-386-136	Fuel line, flexible	1
10	X-386-48	Fuel line, flexible	1
11	X-50-15	Screw, pan head. 10-24x1/2	8
12	X-545-178	Cable, battery	1
13	X-545-175	Cable, battery, RED+	1
14	X-651-5	Hose, rubber, straight, .375 in. ID	1
15	X-652-3	Connector, hose + vibra seal	1
16	X-426-16	Clamp, hose, 1.81/2.75 in.	8
17	X-426-3	Clamp, hose, .56/1.06 in.	2
18	X-426-9	Clamp, hose, .25/.70 in.	5
—	X-22-12	Washer, lock, .262 ID x .743 in.	1
—	X-25-142	Washer, plain, .281 ID x .625 in. OD	8
—	X-465-22	Bolt, hex cap	4
—	X-465-24	Bolt, hex cap	4
—	X-6278-15	Washer, nylon	2
—	X-794-5	Screw, drill #8 stainless steel	24

# Sound Shield, continued

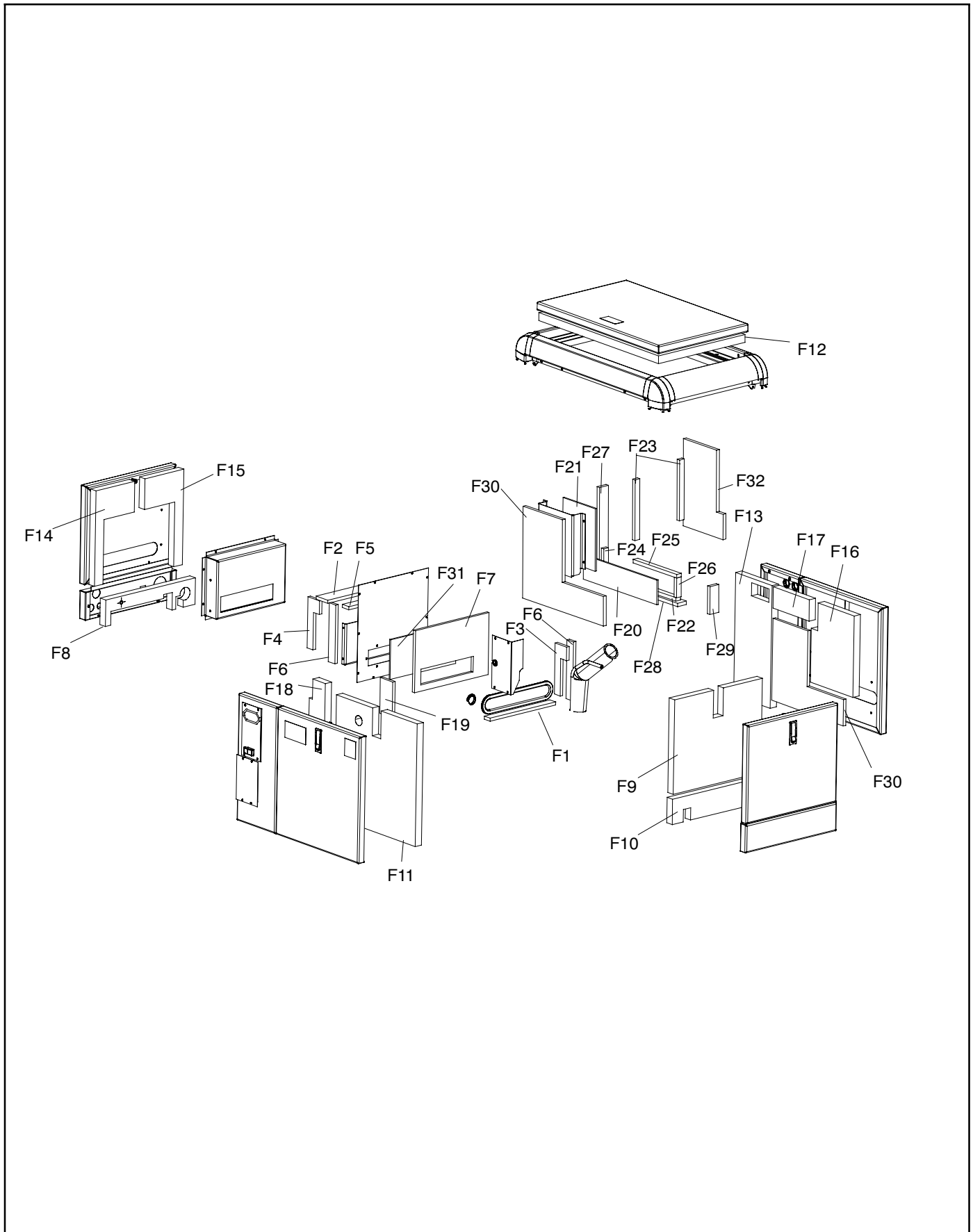
Items not shown: 7-9, 56-58



## Sound Shield, continued

Item	Part Number	Description	Quantity
			Kit Number GM31950-KA1(KP1)
1	226917	Decal, negative battery connect	1
2	229270	Coupling, bulkhead pipe	1
3	238162	Marker, adhesive	1
4	249808	Decal, warning rotating parts	1
5	343165	Decal, caution-not a step	1
6	344295	Decal, equipment grd	1
7	344484	Insert, threaded, 1/4-20 in.	18
8	345283	Pin, threaded, 1/4-20 x 1.18 in.	14
9	346258	Insert, threaded, #10-24	8
10	359278	Decal, fuel inlet	1
11	359279	Decal, fuel return	1
12	359584	Foam, acoustic insulation (Yanmar)	3
13	GM10148	Decal, warning fire port	1
14	GM15486	Connector, outside corner	4
15	GM29899	Frame, circuit breaker	2
16	GM29919	Clip, speed	2
17	GM29921	Seal, dampening	2
18	GM29980	Latch, lockable	4
19	GM30025	Screen, galvanized	1
20	GM30251	Panel, sound shield ADC lead	1
21	GM33684	Terminal, block	2
22	GM32109	Panel, bulkhead connection	1
23	X-284-44	Grommet, round	1
24	GM33828	Barrier, battery terminal	1
25	X-301-35	Button, plug	2
26	X-377-12	Connector, cable	1
27	X-582-1	Connector, hose + vibra seal	1
28	X-582-38	Connector, hose	2
29	X-6047-14	U-channel	1
30	X-6047-42	U-channel	1
31	X-6047-43	U-channel	1
32	X-6047-7	U-channel	1
33	X-6220-3	Clip, speed	4
34	X-634-25	Bushing, .672 x .875 in. NPT	1
35	X-22-14	Washer, lock, .391 ID x .975 in. OD	4
36	X-75-10	Plug, pipe, 3/8 in. NPTF	3
37	344939	Rail, sound shield	3
38	344940	Rail, sound shield	1
39	GM29317	Rail, sound shield	2
40	GM29909	Rail, sound shield	1
41	GM29984	Rail sound shield	1
42	GM25958	Duct, air outlet	1
43	GM29375	Door, sound shield (RH)	1
44	GM29377	Door, sound shield (front)	1
45	GM29378	Door, sound shield (LH)	1
46	GM29379	Door, sound shield (rear)	1
47	GM29380	Roof, sound shield	1
48	GM29826	Panel, sound shield (LH)	1
49	GM29914	Duct, air inlet	1
50	GM29915	Baffle, air intake duct	1
51	GM29992	Panel, junction box	1
52	GM30019	Duct, air outlet	1
53	GM31957	Panel, sound shield (RH)	1
54	GM32183	Rail, sound shield (front)	1
55	LK-0616-1515	Lead	1
56	X-22-11	Washer, lock, .262 ID x .469 OD	1
57	X-22-12	Washer, lock, .262 ID x .743 in. OD	1
58	X-781-14	Rivet, pop, .187 in.	31

# Sound Shield, continued



## Sound Shield, continued

Item	Part Number	Description	Quantity
			Kit Number GM31950-KA1(KP1)
F1	GM26354	Foam, acoustic insulation	1
F2	GM26355	Foam, acoustic insulation	1
F3	GM26356	Foam, acoustic insulation	1
F4	GM26357	Foam, acoustic insulation	1
F5	GM26358	Foam, acoustic insulation	1
F6	GM26363	Foam, acoustic insulation	2
F7	GM26364	Foam, acoustic insulation	1
F8	GM26365	Foam, acoustic insulation	1
F9	GM30042	Foam, acoustic insulation	1
F10	GM30043	Foam, acoustic insulation	1
F11	GM30044	Foam, acoustic insulation	1
F12	GM30045	Foam, acoustic insulation	1
F13	GM30046	Foam, acoustic insulation	1
F14	GM30047	Foam, acoustic insulation	1
F15	GM30048	Foam, acoustic insulation	1
F16	GM30049	Foam, acoustic insulation	1
F17	GM30050	Foam, acoustic insulation	1
F18	GM30051	Foam, acoustic insulation	1
F19	GM30052	Foam, acoustic insulation	1
F20	GM30053	Foam, acoustic insulation	1
F21	GM30054	Foam, acoustic insulation	1
F22	GM30055	Foam, acoustic insulation	1
F23	GM30056	Foam, acoustic insulation	2
F24	GM30057	Foam, acoustic insulation	1
F25	GM30058	Foam, acoustic insulation	1
F26	GM30059	Foam, acoustic insulation	1
F27	GM30060	Foam, acoustic insulation	1
F28	GM30061	Foam, acoustic insulation	1
F29	GM30065	Foam, acoustic insulation	1
F30	GM30066	Foam, acoustic insulation	1
F31	GM30067	Foam, acoustic insulation	1
F32	GM30115	Foam, acoustic insulation	1

# Parts List: Accessories

Qty.	Description	Part No.
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## Circuit Breakers

<b>Circuit Breaker Kit</b>		<b>GM30331-KA(KP)1</b>
1	Installation Instructions	TT-1394
1	Decal, notice	246242
1	Plate, cover	229183
1	Plate, circuit breaker	GM30022
4	Screw, pan head	X-49-2
1	Circuit breaker, 30 A	X-506-49
2	Nut, flange whiz, 6-32	X-6210-3

<b>Circuit Breaker Kit</b>		<b>GM30331-KA(KP)3</b>
1	Installation Instructions	TT-1394
1	Decal, notice	246242
1	Plate, cover	229183
1	Plate, circuit breaker	GM30022
4	Screw, pan head	X-49-2
1	Circuit breaker, 70 A	X-506-48
2	Nut, flange whiz, 6-32	X-6210-3

<b>Circuit Breaker Kit</b>		<b>GM30331-KA(KP)4</b>
1	Installation Instructions	TT-1394
1	Decal, notice	246242
1	Plate, circuit breaker	GM30022
4	Screw, pan head	X-49-25
1	Circuit breaker, 35 A	X-506-42

<b>Circuit Breaker Kit</b>		<b>GM30331-KA(KP)6</b>
1	Installation Instructions	TT-1394
1	Decal, notice	246242
1	Terminal, jumper	249956
1	Plate, circuit breaker	GM30022
4	Screw, pan head	X-49-25
1	Circuit breaker, 33 A	X-506-39

<b>Circuit Breaker Kit</b>		<b>GM30331-KA(KP)7</b>
1	Installation Instructions	TT-1394
1	Decal, notice	246242
1	Plate, circuit breaker	GM30022
4	Screw, pan head, 6-32 x 3/16 in.	X-49-25
1	Circuit breaker, 30 A	X-506-36

## Electrical System

<b>Harness, 12 in., Pigtail</b>		<b>GM32332-KP1</b>
1	Harness, pigtail	GM32324

<b>Harness, 15 in., Remote Panel</b>		<b>GM32333-KP1</b>
1	Harness, extension	GM30248

<b>Harness, 25 in., Remote Panel</b>		<b>GM32333-KP2</b>
1	Harness, extension	GM32323

<b>Harness, 100 ft., Remote Panel</b>		<b>GM32333-KP4</b>
1	Harness, extension	GM47391

<b>Oil Pressure Sender</b>		<b>GM32112-KA(KP)1</b>
1	Installation Instructions	TT-1438
1	Adapter, sender	229323
1	Sensor, pressure	GM70917-1

Qty.	Description	Part No.
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<b>Preheat Kit, 12 Volt</b>		<b>GM32117-KA(KP)1</b>
1	Installation Instructions	TT-1397
1	Wiring harness	229233
1	Relay	233442
1	Boot	238915
1	Bracket, mounting	GM32427
1	Washer, lock, .262 ID x .743 in. OD	X-22-12

<b>Remote Digital Gauge</b>		<b>GM32337-KP1</b>
1	Decal, warning	249494
1	Gauge, digital	GM30565
1	Harness, remote	GM32325
1	Installation instructions	TT-1379
1	Installation instructions	TT-1364

<b>Remote Start Panel (12 V)</b>		<b>GM32335-KP1</b>
1	Decal, warning	249494
1	Installation instructions	TT-1378
1	Panel assembly, control (includes *)	GM33848-1
1	*Meter, runtime	238736
1	*Panel, control	GM33847
1	*Switch, rocker	GM33849
1	*Harness, wiring	GM33851
2	*Screw, pan head M3 x 12	M7985A-03012-20
2	*Nut, hex 3 mm	M934-03-50
2	*Washer, lock, .146 ID x .285 in. OD	X-22-6

<b>Remote Start Panel (24 V)</b>		<b>GM32335-KP2</b>
1	Decal, warning	249494
1	Installation instructions	TT-1378
1	Panel assembly, control (includes *)	GM33848-2
1	*Meter, runtime	238736
1	*Panel, control	GM33847
1	*Switch, rocker	GM33850
1	*Harness, wiring	GM33851
2	*Screw, pan head M3 x 12	M7985A-03012-20
2	*Nut, hex 3 mm	M934-03-50
2	*Washer, lock, .146 ID x .285 in. OD	X-22-6

<b>Ship to Shore Switch</b>		<b>PAA-246617</b>
1	Switch, transfer, 3-pole	A-246617
1	Installation Instructions	TT-535

<b>Isolated Ground, 12V</b>		<b>GM31865-KP1</b>
1	Grommet, round	200705
1	Adapter, sender	229323
1	Bus, Isolated Ground	GM31868
1	Alternator, Battery Charging	GM31919
1	Bracket, Support	GM33029
1	Tag, Hang Battery Negative	GM35413
1	Relay, 12 VDC	GM49746
1	Transformer, High Impedence Iso.	GM51484
1	Relay, Cranking, 12V	GM52584
1	Harness, Engine 8-10EOZD Yanmar	GM55382
1	Sender, Pressure, 0-150psi, 1/8-27 NPTF	GM70917-1
1	TT Isolated Ground, 8-32EOZD/6.5-27EFOZD	TT-1407
4	Spacer, .209 ID x .375 OD x .406 in.	X-400-127
1	Spacer, .406 ID x .625 OD x .297 in.	X-400-75
1	Cable, Battery	X-545-161
1	Cable, Battery (Black)	X-545-178
2	Stud (Metric)	X-6054-23
5	Isulator, Standoff	X-6128-35

# Parts List: Accessories

Qty.	Description	Part No.
<b>Isolated Ground, 12V w/Sound Shield GM31865-KP3</b>		
1	Grommet, round	200705
1	Adapter, sender	229323
1	Switch, High Temp. Cut-Out	GM29289
1	Bus, Isolated Ground	GM31868
1	Alternator, Battery Charging	GM31919
1	Bracket, Support	GM33029
1	Relay, 12 VDC	GM49746
1	Transformer, High Impedence Iso.	GM51484
1	Relay, Cranking, 12V	GM52584
1	Harness, Engine 8-10EOZD Yanmar	GM55382
1	Sender, Pressure, 0-150psi, 1/8-27 NPTF	GM70917-1
1	TT Isolated Ground, 8-32EOZD/6.5-27EFOZD	TT-1407
4	Spacer, .209 ID x .375 OD x .406 in.	X-400-127
1	Spacer, .406 ID x .625 OD x .297 in.	X-400-75
1	Cable, Battery	X-545-161
1	Cable, Battery (Black)	X-545-178
1	Cable, Battery (Black)	X-545-179
2	Stud (Metric)	X-6054-23
5	Isulator, Standoff	X-6128-35

<b>Isolated Standoff GM38314-KA1</b>		
2	Nut, Hex 6mm	M934-06-60
2	Stud (Metric)	X-6054-23
1	Isulator, Standoff	X-6128-35

## Miscellaneous Accessories

<b>Fuel/Water Separator GM31994-KP1</b>		
1	Installation Instructions	TT-1375
1	Filter assembly, fuel/water separator	GM41013
1	Element, water separator	GM41014

<b>Keel Cooling Conversion GM32201-KA(KP)1</b>		
1	Installation Instructions	TT-1474
1	Gasket, exhaust	249905
1	Flange, exhaust outlet	254692

<b>Siphon Break PA-229928</b>		
1	Installation Instructions	TT-1268
1	Tubing, Clear Flexible Plastic	GM34883
1	Valve, Siphon Break Assy (.63" Hose)	GM32985
	Valve, duct	328666
	Cap, Siphon Valve	GM32984
	Loop, Siphon Valve Vent	GM32988

Qty.	Description	Part No.
<b>Sound Shield</b>		
<b>Siphon Break Hose Connection GM32339-KA(KP)1</b>		
1	Installation Instructions	TT-1390
2	Coupling, hose	344934
2	Grommet, round	X-284-42
1	Hose, .63 ID	X-312-16
2	Clamp, hose, .56/1.06 in.	X-426-3
1	Tubing, Clear Flexible Plastic	GM34883
1	Valve, Siphon Break Assy (.63" Hose)	GM32985
	Valve, duct	328666
	Cap, Siphon Valve	GM32984
	Loop, Siphon Valve Vent	GM32988

# Notes



# Appendix A Abbreviations

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

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

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

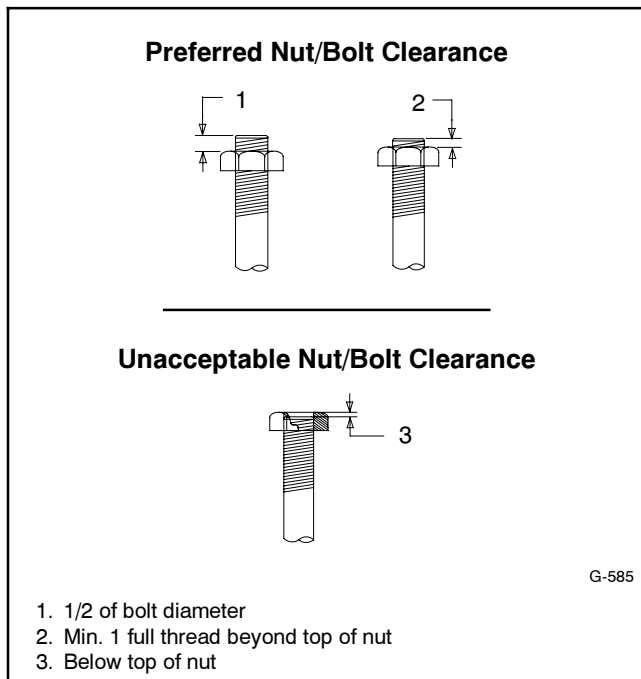
# Appendix B Common Hardware Application Guidelines

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

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

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

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



**Figure 1** Acceptable Bolt Lengths

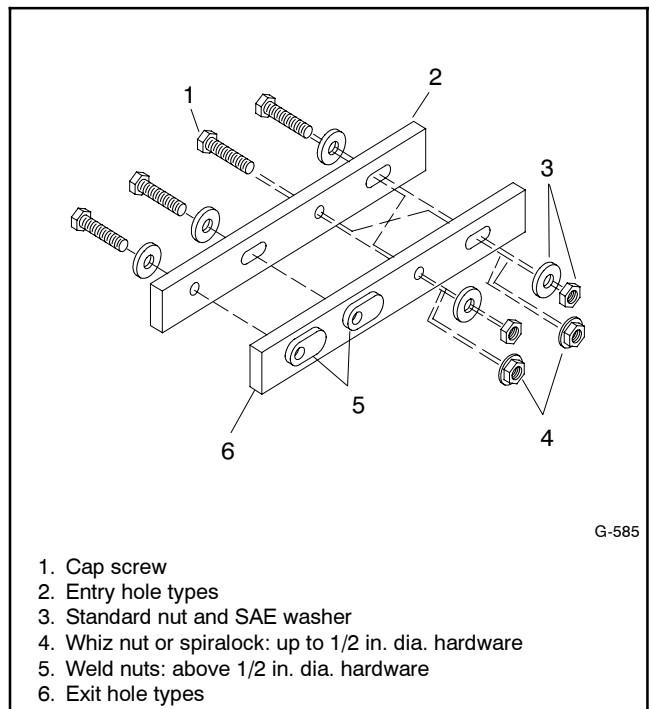
1. 1/2 of bolt diameter
2. Min. 1 full thread beyond top of nut
3. Below top of nut

Steps for common hardware application:

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

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

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



**Figure 2** Acceptable Hardware Combinations

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

# Appendix C General Torque Specifications















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












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






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

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	5.6 (4)	9.9 (7)	14.0 (10)	5.6 (4)	
M8 x 1.25	13.6 (10)	25.0 (18)	35.0 (26)	13.6 (10)	
M8 x 1.00	21.0 (16)	25.0 (18)	35.0 (26)	21.0 (16)	
M10 x 1.50	27.0 (20)	49.0 (35)	68.0 (50)	27.0 (20)	
M10 x 1.25	39.0 (29)	49.0 (35)	68.0 (50)	39.0 (29)	
M12 x 1.75	47.0 (35)	83.0 (61)	117.0 (86)	—	
M12 x 1.50	65.0 (48)	88.0 (65)	125.0 (92)	—	
M14 x 2.00	74.0 (55)	132.0 (97)	185.0 (136)	—	
M14 x 1.50	100.0 (74)	140.0 (103)	192.0 (142)	—	
M16 x 2.00	115.0 (85)	200.0 (148)	285.0 (210)	—	
M16 x 1.50	141.0 (104)	210.0 (155)	295.0 (218)	—	
M18 x 2.50	155.0 (114)	275.0 (203)	390.0 (288)	—	
M18 x 1.50	196.0 (145)	305.0 (225)	425.0 (315)	—	

# Appendix D Common Hardware Identification

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

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

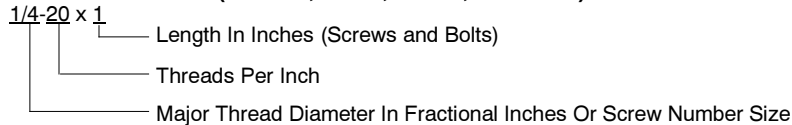
Hardness Grades	
American Standard	
Grade 2	
Grade 5	
Grade 8	
Grade 8/9 (Hex Socket Head)	
Metric	
Number stamped on hardware; 5.8 shown	

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

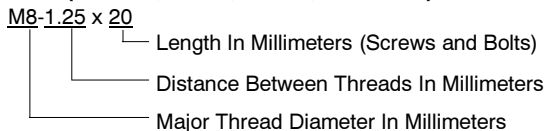
Phillips® screw is a registered trademark of Phillips Screw Company.

## Sample Dimensions

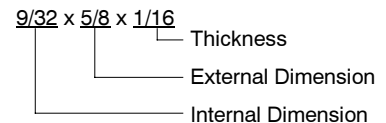
### American Standard (Screws, Bolts, Studs, and Nuts)



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



### Plain Washers



### Lock Washers



# Appendix E Common Hardware List

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

## American Standard

Part No.	Dimensions	Part No.	Dimensions	Part No.	Dimensions	Type		
<b>Hex Head Bolts (Grade 5)</b>								
X-465-17	1/4-20 x .38	X-6238-14	3/8-24 x .75	<b>Hex Nuts</b>				
X-465-6	1/4-20 x .50	X-6238-16	3/8-24 x 1.25	X-6009-1	1-8	Standard		
X-465-2	1/4-20 x .62	X-6238-21	3/8-24 x 4.00	X-6210-3	6-32	Whiz		
X-465-16	1/4-20 x .75	X-6238-22	3/8-24 x 4.50	X-6210-4	8-32	Whiz		
X-465-18	1/4-20 x .88			X-6210-5	10-24	Whiz		
X-465-7	1/4-20 x 1.00	X-6024-5	7/16-14 x .75	X-6210-1	10-32	Whiz		
X-465-8	1/4-20 x 1.25	X-6024-2	7/16-14 x 1.00					
X-465-9	1/4-20 x 1.50	X-6024-8	7/16-14 x 1.25	X-6210-2	1/4-20	Spiralock		
X-465-10	1/4-20 x 1.75	X-6024-3	7/16-14 x 1.50	X-6210-6	1/4-28	Spiralock		
X-465-11	1/4-20 x 2.00	X-6024-4	7/16-14 x 2.00	X-6210-7	5/16-18	Spiralock		
X-465-12	1/4-20 x 2.25	X-6024-11	7/16-14 x 2.75	X-6210-8	5/16-24	Spiralock		
X-465-14	1/4-20 x 2.75	X-6024-12	7/16-14 x 6.50	X-6210-9	3/8-16	Spiralock		
X-465-21	1/4-20 x 5.00	X-129-15	1/2-13 x .75	X-6210-10	3/8-24	Spiralock		
X-465-25	1/4-28 x .38	X-129-17	1/2-13 x 1.00	X-6210-11	7/16-14	Spiralock		
X-465-20	1/4-28 x 1.00	X-129-18	1/2-13 x 1.25	X-6210-12	1/2-13	Spiralock		
		X-129-19	1/2-13 x 1.50	X-6210-15	7/16-20	Spiralock		
X-125-33	5/16-18 x .50	X-129-20	1/2-13 x 1.75	X-6210-14	1/2-20	Spiralock		
X-125-23	5/16-18 x .62	X-129-21	1/2-13 x 2.00					
X-125-3	5/16-18 x .75	X-129-22	1/2-13 x 2.25	X-85-3	5/8-11	Standard		
X-125-31	5/16-18 x .88	X-129-23	1/2-13 x 2.50	X-88-12	3/4-10	Standard		
X-125-5	5/16-18 x 1.00	X-129-24	1/2-13 x 2.75	X-89-2	1/2-20	Standard		
X-125-24	5/16-18 x 1.25	X-129-25	1/2-13 x 3.00					
X-125-34	5/16-18 x 1.50	X-129-27	1/2-13 x 3.50	<b>Washers</b>				
X-125-25	5/16-18 x 1.75	X-129-29	1/2-13 x 4.00	<b>Part No.</b>	<b>ID</b>	<b>OD</b>	<b>Thick.</b>	<b>Bolt/ Screw</b>
X-125-26	5/16-18 x 2.00	X-129-30	1/2-13 x 4.50	X-25-46	.125	.250	.022	#4
230578	5/16-18 x 2.25	X-463-9	1/2-13 x 5.50	X-25-9	.156	.375	.049	#6
X-125-29	5/16-18 x 2.50	X-129-44	1/2-13 x 6.00	X-25-48	.188	.438	.049	#8
X-125-27	5/16-18 x 2.75			X-25-36	.219	.500	.049	#10
X-125-28	5/16-18 x 3.00	X-129-51	1/2-20 x .75	X-25-40	.281	.625	.065	1/4
X-125-22	5/16-18 x 4.50	X-129-45	1/2-20 x 1.25	X-25-85	.344	.687	.065	5/16
X-125-32	5/16-18 x 5.00	X-129-52	1/2-20 x 1.50	X-25-37	.406	.812	.065	3/8
X-125-35	5/16-18 x 5.50			X-25-34	.469	.922	.065	7/16
X-125-36	5/16-18 x 6.00	X-6021-3	5/8-11 x 1.00	X-25-26	.531	1.062	.095	1/2
X-125-40	5/16-18 x 6.50	X-6021-4	5/8-11 x 1.25	X-25-15	.656	1.312	.095	5/8
		X-6021-2	5/8-11 x 1.50	X-25-29	.812	1.469	.134	3/4
X-125-43	5/16-24 x 1.75	X-6021-1	5/8-11 x 1.75	X-25-127	1.062	2.000	.134	1
X-125-44	5/16-24 x 2.50	273049	5/8-11 x 2.00					
X-125-30	5/16-24 x .75	X-6021-5	5/8-11 x 2.25					
X-125-39	5/16-24 x 2.00	X-6021-6	5/8-11 x 2.50					
X-125-38	5/16-24 x 2.75	X-6021-7	5/8-11 x 2.75					
		X-6021-12	5/8-11 x 3.75					
X-6238-2	3/8-16 x .62	X-6021-11	5/8-11 x 4.50					
X-6238-10	3/8-16 x .75	X-6021-10	5/8-11 x 6.00					
X-6238-3	3/8-16 x .88							
X-6238-11	3/8-16 x 1.00	X-6021-9	5/8-18 x 2.50					
X-6238-4	3/8-16 x 1.25							
X-6238-5	3/8-16 x 1.50	X-6239-1	3/4-10 x 1.00					
X-6238-1	3/8-16 x 1.75	X-6239-8	3/4-10 x 1.25					
X-6238-6	3/8-16 x 2.00	X-6239-2	3/4-10 x 1.50					
X-6238-17	3/8-16 x 2.25	X-6239-3	3/4-10 x 2.00					
X-6238-7	3/8-16 x 2.50	X-6239-4	3/4-10 x 2.50					
X-6238-8	3/8-16 x 2.75	X-6239-5	3/4-10 x 3.00					
X-6238-9	3/8-16 x 3.00	X-6239-6	3/4-10 x 3.50					
X-6238-19	3/8-16 x 3.25							
X-6238-12	3/8-16 x 3.50	X-792-1	1-8 x 2.25					
X-6238-20	3/8-16 x 3.75	X-792-5	1-8 x 3.00					
X-6238-13	3/8-16 x 4.50	X-792-8	1-8 x 5.00					
X-6238-18	3/8-16 x 5.50							
X-6238-25	3/8-16 x 6.50							

## Metric

Hex head bolts are hardness grade 8.8 unless noted.

### Part No. Dimensions Hex Head Bolts (Partial Thread)

M931-05055-60	M5-0.80 x 55
M931-06040-60	M6-1.00 x 40
M931-06055-60	M6-1.00 x 55
M931-06060-60	M6-1.00 x 60
M931-06060-SS	M6-1.00 x 60
M931-06070-60	M6-1.00 x 70
M931-06070-SS	M6-1.00 x 70
M931-06075-60	M6-1.00 x 75
M931-06090-60	M6-1.00 x 90
M931-06145-60	M6-1.00 x 145
M931-06150-60	M6-1.00 x 150

M931-08035-60	M8-1.25 x 35
M931-08040-60	M8-1.25 x 40
M931-08045-60	M8-1.25 x 45
M931-08050-60	M8-1.25 x 50
M931-08055-60	M8-1.25 x 55
M931-08055-82	M8-1.25 x 55*
M931-08060-60	M8-1.25 x 60
M931-08070-60	M8-1.25 x 70
M931-08070-82	M8-1.25 x 70*
M931-08075-60	M8-1.25 x 75
M931-08080-60	M8-1.25 x 80
M931-08090-60	M8-1.25 x 90
M931-08095-60	M8-1.25 x 95
M931-08100-60	M8-1.25 x 100
M931-08110-60	M8-1.25 x 110
M931-08120-60	M8-1.25 x 120
M931-08130-60	M8-1.25 x 130
M931-08140-60	M8-1.25 x 140
M931-08150-60	M8-1.25 x 150
M931-08200-60	M8-1.25 x 200

M931-10040-82	M10-1.25 x 40*
M931-10040-60	M10-1.50 x 40
M931-10045-60	M10-1.50 x 45
M931-10050-60	M10-1.50 x 50
M931-10050-82	M10-1.25 x 50*
M931-10055-60	M10-1.50 x 55
M931-10060-60	M10-1.50 x 60
M931-10065-60	M10-1.50 x 65
M931-10070-60	M10-1.50 x 70
M931-10080-60	M10-1.50 x 80
M931-10080-82	M10-1.25 x 80*
M931-10090-60	M10-1.50 x 90
M931-10090-82	M10-1.50 x 90*
M931-10100-60	M10-1.50 x 100
M931-10110-60	M10-1.50 x 110
M931-10120-60	M10-1.50 x 120
M931-10130-60	M10-1.50 x 130
M931-10140-60	M10-1.50 x 140
M931-10180-60	M10-1.50 x 180
M931-10235-60	M10-1.50 x 235
M931-10260-60	M10-1.50 x 260
M960-10330-60	M10-1.25 x 330

M931-12045-60	M12-1.75 x 45
M960-12050-60	M12-1.25 x 50
M960-12050-82	M12-1.25 x 50*
M931-12050-60	M12-1.75 x 50
M931-12050-82	M12-1.75 x 50*
M931-12055-60	M12-1.75 x 55
M931-12060-60	M12-1.75 x 60
M931-12060-82	M12-1.75 x 60*
M931-12065-60	M12-1.75 x 65
M931-12075-60	M12-1.75 x 75
M931-12080-60	M12-1.75 x 80
M931-12090-60	M12-1.75 x 90
M931-12100-60	M12-1.75 x 100
M931-12110-60	M12-1.75 x 110

### Part No. Dimensions Hex Head Bolts (Partial Thread), continued

M960-16090-60	M16-1.50 x 90
M931-16090-60	M16-2.00 x 90
M931-16100-60	M16-2.00 x 100
M931-16100-82	M16-2.00 x 100*
M931-16120-60	M16-2.00 x 120
M931-16150-60	M16-2.00 x 150

M931-20065-60	M20-2.50 x 65
M931-20090-60	M20-2.50 x 90
M931-20100-60	M20-2.50 x 100
M931-20120-60	M20-2.50 x 120
M931-20140-60	M20-2.50 x 140
M931-20160-60	M20-2.50 x 160
M931-22090-60	M22-2.50 x 90
M931-22120-60	M22-2.50 x 120
M931-22160-60	M22-2.50 x 160

M931-24090-60	M24-3.00 x 90
M931-24120-60	M24-3.00 x 120
M931-24160-60	M24-3.00 x 160
M931-24200-60	M24-3.00 x 200

### Hex Head Bolts (Full Thread)

M933-04006-60	M4-0.70 x 6
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M933-05030-60	M5-0.80 x 30
M933-05035-60	M5-0.80 x 35
M933-05050-60	M5-0.80 x 50

M933-06010-60	M6-1.00 x 10
M933-06012-60	M6-1.00 x 12
M933-06014-60	M6-1.00 x 14
M933-06016-60	M6-1.00 x 16
M933-06020-60	M6-1.00 x 20
M933-06025-60	M6-1.00 x 25
M933-06030-60	M6-1.00 x 30
M933-06040-60	M6-1.00 x 40
M933-06050-60	M6-1.00 x 50

M933-07025-60	M7-1.00 x 25
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M933-08010-60	M8-1.25 x 10
M933-08012-60	M8-1.25 x 12
M933-08016-60	M8-1.25 x 16
M933-08020-60	M8-1.25 x 20
M933-08025-60	M8-1.25 x 25
M933-08030-60	M8-1.25 x 30
M933-08030-82	M8-1.25 x 30*

M933-10012-60	M10-1.50 x 12
M961-10020-60	M10-1.25 x 20
M933-10020-60	M10-1.50 x 20
M933-10025-60	M10-1.50 x 25
M961-10025-60	M10-1.25 x 25
M933-10025-82	M10-1.50 x 25*
M961-10030-60	M10-1.25 x 30
M933-10030-60	M10-1.50 x 30
M933-10030-82	M10-1.50 x 30*
M961-10035-60	M10-1.25 x 35
M933-10035-60	M10-1.50 x 35
M933-10035-82	M10-1.50 x 35*
M961-10040-60	M10-1.25 x 40

### Part No. Dimensions Hex Head Bolts (Full Thread), continued

M933-12016-60	M12-1.75 x 16
M933-12020-60	M12-1.75 x 20
M961-12020-60F	M12-1.50 x 20
M933-12025-60	M12-1.75 x 25
M933-12025-82	M12-1.75 x 25*
M961-12030-60	M12-1.25 x 30
M933-12030-82	M12-1.75 x 30*
M961-12030-82F	M12-1.50 x 30*
M933-12030-60	M12-1.75 x 30
M933-12035-60	M12-1.75 x 35
M961-12040-82	M12-1.25 x 40*
M933-12040-60	M12-1.75 x 40
M933-12040-82	M12-1.75 x 40*

M961-14025-60	M14-1.50 x 25
M933-14025-60	M14-2.00 x 25
M961-14050-82	M14-1.50 x 50*

M961-16025-60	M16-1.50 x 25
M933-16025-60	M16-2.00 x 25
M961-16030-82	M16-1.50 x 30*
M933-16030-82	M16-2.00 x 30*
M933-16035-60	M16-2.00 x 35
M961-16040-60	M16-1.50 x 40
M933-16040-60	M16-2.00 x 40
M961-16045-82	M16-1.50 x 45*
M933-16045-82	M16-2.00 x 45*
M933-16050-60	M16-2.00 x 50
M933-16050-82	M16-2.00 x 50*
M933-16060-60	M16-2.00 x 60
M933-16070-60	M16-2.00 x 70

M933-18035-60	M18-2.50 x 35
M933-18050-60	M18-2.50 x 50
M933-18060-60	M18-2.50 x 60

M933-20050-60	M20-2.50 x 50
M933-20055-60	M20-2.50 x 55

M933-24060-60	M24-3.00 x 60
M933-24065-60	M24-3.00 x 65
M933-24070-60	M24-3.00 x 70

### Pan Head Machine Screws

M7985A-03010-20	M3-0.50 x 10
M7985A-03012-20	M3-0.50 x 12

M7985A-04010-20	M4-0.70 x 10
M7985A-04016-20	M4-0.70 x 16
M7985A-04020-20	M4-0.70 x 20
M7985A-04050-20	M4-0.70 x 50
M7985A-04100-20	M4-0.70 x 100

M7985A-05010-20	M5-0.80 x 10
M7985A-05012-20	M5-0.80 x 12
M7985A-05016-20	M5-0.80 x 16
M7985A-05020-20	M5-0.80 x 20
M7985A-05025-20	M5-0.80 x 25
M7985A-05030-20	M5-0.80 x 30
M7985A-05080-20	M5-0.80 x 80
M7985A-05100-20	M5-0.80 x 100

M7985A-06100-20	M6-1.00 x 100
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### Flat Head Machine Screws

M965A-04012-SS	M4-0.70 x 12
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M965A-05012-SS	M5-0.80 x 12
M965A-05016-20	M5-0.80 x 16
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.









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