

Service Parts

Marine Generator Sets



Models:

5E/4EF
7.3E/6EF

KOHLER[®]
POWER SYSTEMS

9001
KOHLER
POWER SYSTEMS
NATIONALLY REGISTERED

TP-5987 4/03c

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Introduction

This manual lists service replacement parts for 5E/7.3E 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.

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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.

xin:004:002

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.

xin:004:003

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.

xin:004:004a

How to Find Part Numbers

Use the following steps to locate a service replacement part.

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

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Hardware References

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

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

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

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Specification Number Index

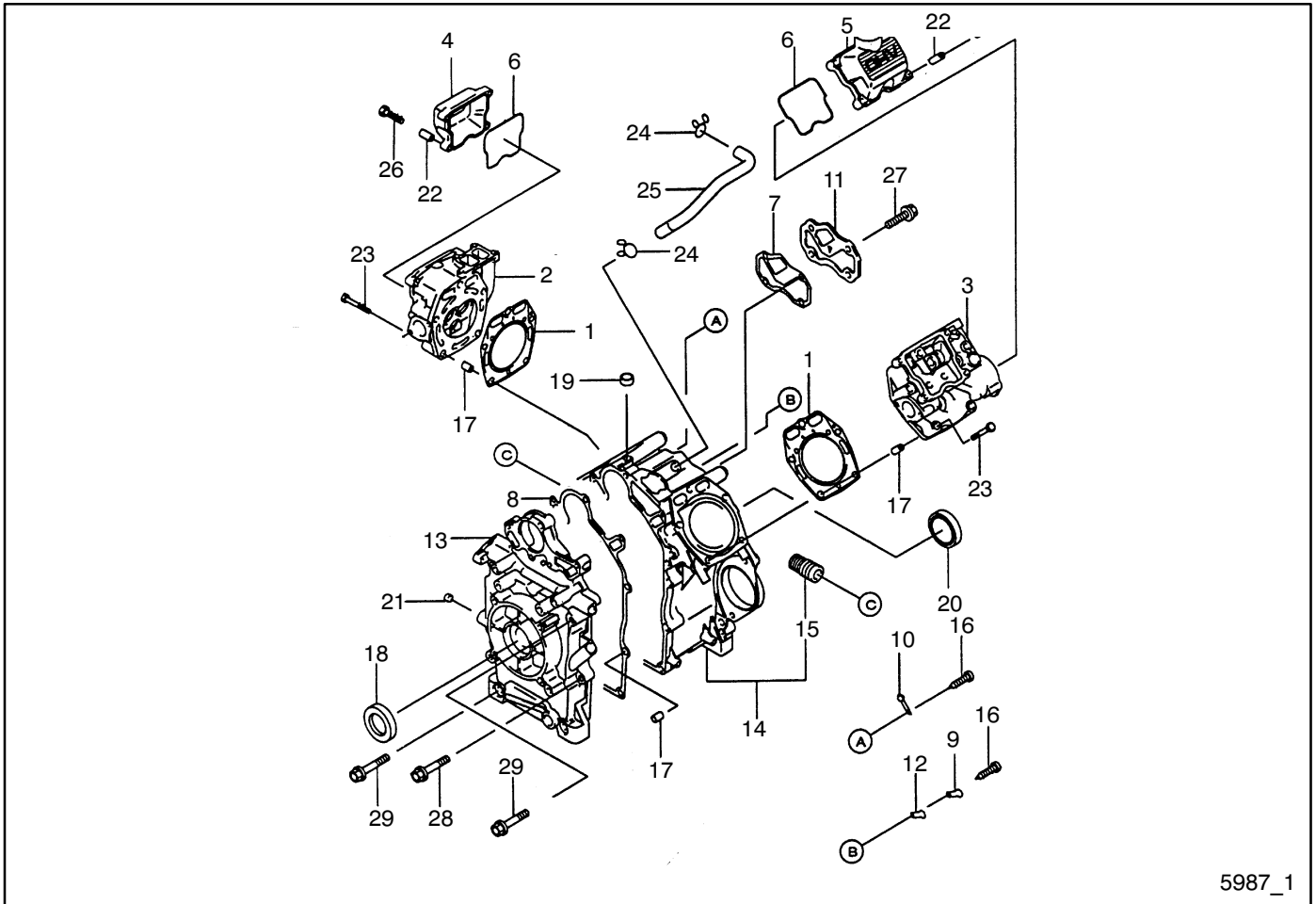
Group Title	<i>Cylinder and Crankcase</i>	<i>Piston and Crankshaft</i>	<i>Valves and Camshaft</i>	<i>Lubrication and Oil Filter</i>	<i>Ignition</i>	<i>Governor</i>	<i>Carburetor</i>	<i>Starter</i>	<i>Engine Cooling</i>
Group No.	1	2	3	4	5	6	7	9	10
Spec No.	Variation Number								

5E										
PA-19903	1	1	1	1	1	1	1	1	1	1
PA-19904	1	1	1	1	1	1	1	1	1	1
PA-19905	1	1	1	1	1	1	1	1	1	1
GM29235-GA1	1	2	2	2	1	2	1	1	1	2
7.3E										
PA-19901	1	1	1	1	1	1	1	1	1	1
PA-19902	1	1	1	1	1	1	1	1	1	1
PA-19906	1	1	1	1	1	1	1	1	1	1
GM29235-GA2	1	2	2	2	1	2	1	1	1	2

Group Title	<i>Air Intake</i>	<i>Fuel System</i>	<i>Cooling System</i>	<i>Engine</i>	<i>Nameplates and Decals</i>	<i>Skid and Plant Mounting</i>	<i>Exhaust System</i>	<i>Generator and Mounting</i>	<i>Controller and Mounting</i>	<i>Literature</i>
Group No.	101	103	104	105	107	109	116	201	301	701
Spec No.	Variation Number									

5E										
PA-19903	1	1	1	1	3	1	1	1	3	1
PA-19904	1	1	1	2	1	1	1	1	4	1
PA-19905	1	1	1	2	3	1	1	1	7	1
GM29235-GA1	1	1	1	GR1	3	1	1	1	7	1
7.3E										
PA-19901	1	1	1	1	3	1	1	1	1	2
PA-19902	1	1	1	2	1	1	1	1	2	2
PA-19906	1	1	1	2	3	1	1	1	7	2
GM29235-GA2	1	1	1	GR1	3	1	1	1	7	2

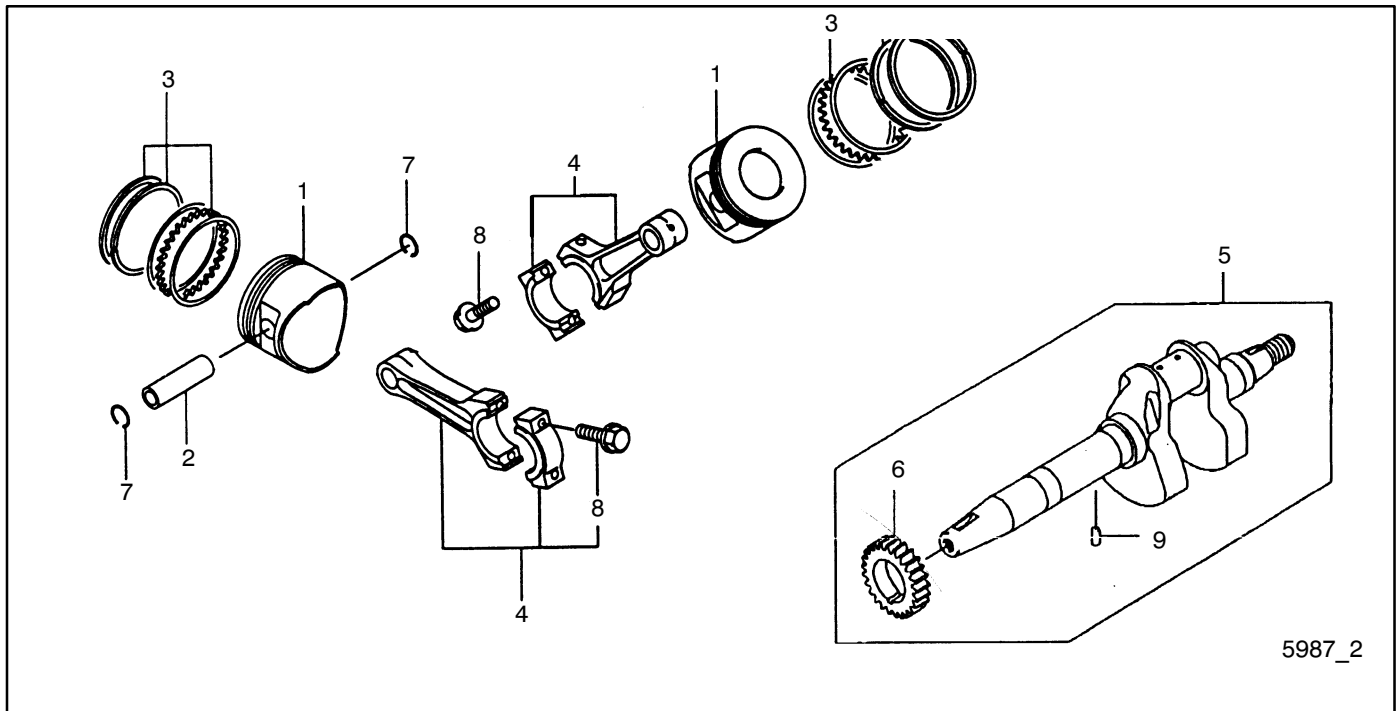
Group 1: Cylinder and Crankcase



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Item	Part No.	Description	Qty.	Var.
1	359701	Gasket, head	2	1
2	359702	Complete Cylinder Head (for engine model AS 04)	1	
2	359981	Complete Cylinder Head	1	
3	359703	Complete Cylinder Head (for engine model AS 04)	1	
3	359982	Complete Cylinder Head	1	
4	359704	Case, rocker	1	
5	359705	Case, rocker (includes oil fill spout)	1	
6	359706	Gasket, rocker case	2	
7	359707	Gasket	1	
8	359708	Gasket, crankcase cover	1	
9	359709	Plate	1	
10	359710	Plate	1	
11	359711	Cover	1	
12	359712	Valve	1	
13	359714	Cover, crankcase	1	
14	359715	Complete Crankcase	1	
15	359716	Joint	1	
16	359719	Screw	2	
17	359720	Pin	6	
18	359721	Seal, oil	1	
19	359722	Seal, oil	1	
20	359723	Seal, oil	1	
21	359724	Plug	2	
22	359725	Collar	8	
23	359726	Bolt	10	
24	359727	Clamp	2	
25	359728	Tube	1	
26	359729	Bolt, flanged	8	
27	359730	Bolt, flanged	4	
28	359731	Bolt, flanged	3	
29	359732	Bolt, flanged	3	

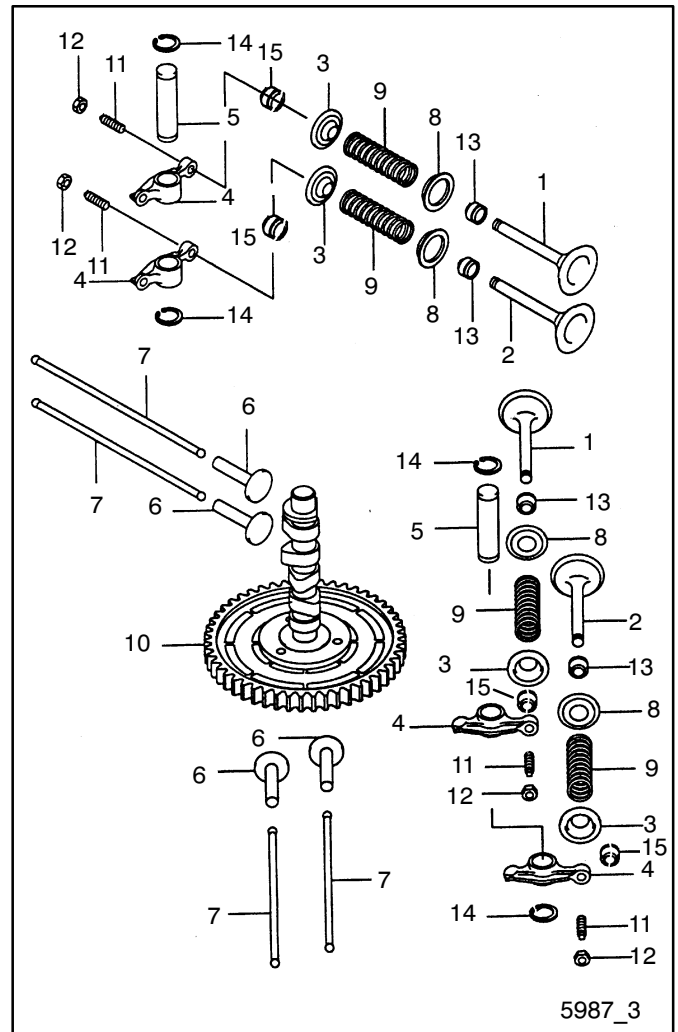
Group 2: Piston and Crankshaft



Item	Part No.	Description	Qty.	
			1	2
1	359734	Piston (generator set serial numbers before 758309)	2	
1	GM29868	Piston (engine model ES04; generator set serial numbers 758309 and after)	2	
1	GM29868	Piston		2
1	359739	Piston, 0.25 OS	AR	
1	359740	Piston, 0.50 OS (generator set serial numbers before 758309)	AR	
1	GM29871	Piston, 0.50 OS (engine model ES04; generator set serial numbers 758309 and after)	AR	
1	GM29871	Piston, 0.50 OS		AR
2	359735	Pin, piston	2	2
3	359736	Ring set, piston (generator set serial numbers before 758309)	2	
3	GM29869	Ring set, piston (engine model ES04; generator set serial numbers 758309 and after)	2	
3	GM29869	Ring set, piston		2
3	359737	Ring set, piston, 0.025 OS	AR	
3	359738	Ring set, piston, 0.50 OS (generator set serial numbers before 758309)	AR	
3	GM29870	Ring set, piston, 0.50 OS (engine model ES04; generator set serial numbers 758309 and after)	AR	
3	GM29870	Ring set, piston, 0.50 OS		AR
4	359741	Connecting rod assembly	2	2
5	359742	Crankshaft assembly (generator set serial numbers before 758309)	1	
5	GM29872	Crankshaft assembly (engine model ES04; generator set serial numbers 758309 and after)	1	
5	GM29872	Crankshaft assembly		1
6	359743	Gear spur (generator set serial numbers before 758309)	1	
6	GM29873	Gear spur (engine model ES04; generator set serial numbers 758309 and after)	1	
6	GM29873	Gear spur		1
7	359746	Ring, snap	4	4
8	359748	Bolt, connecting rod	4	4
9	359749	Pin, dowel	1	1

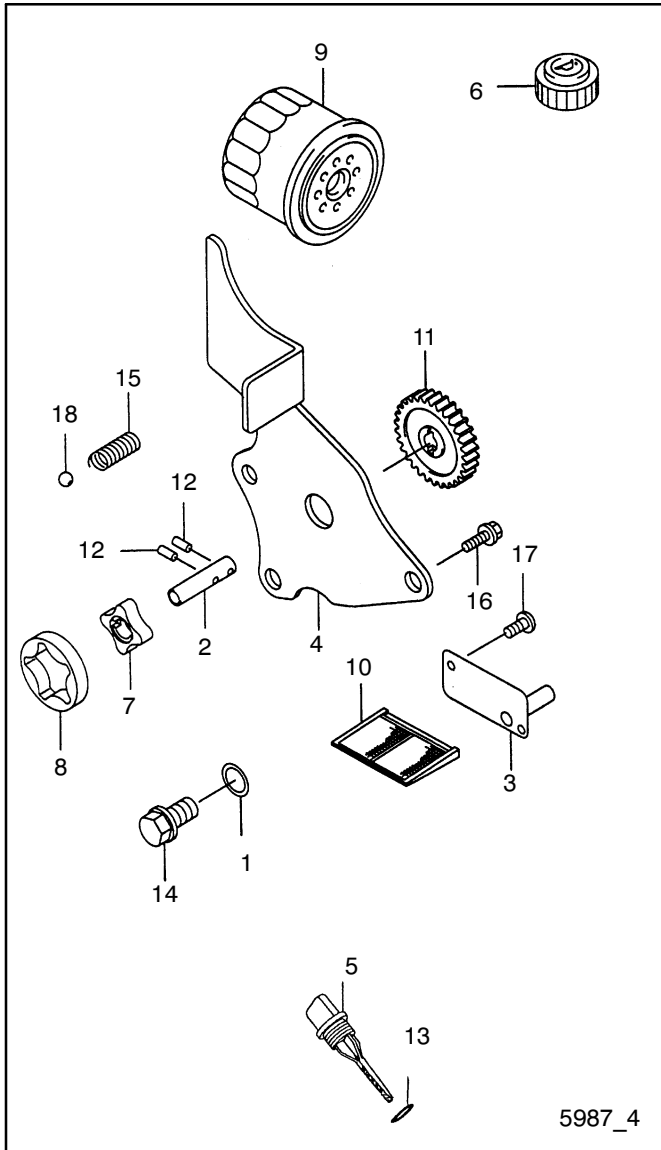
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Group 3: Valves and Camshaft



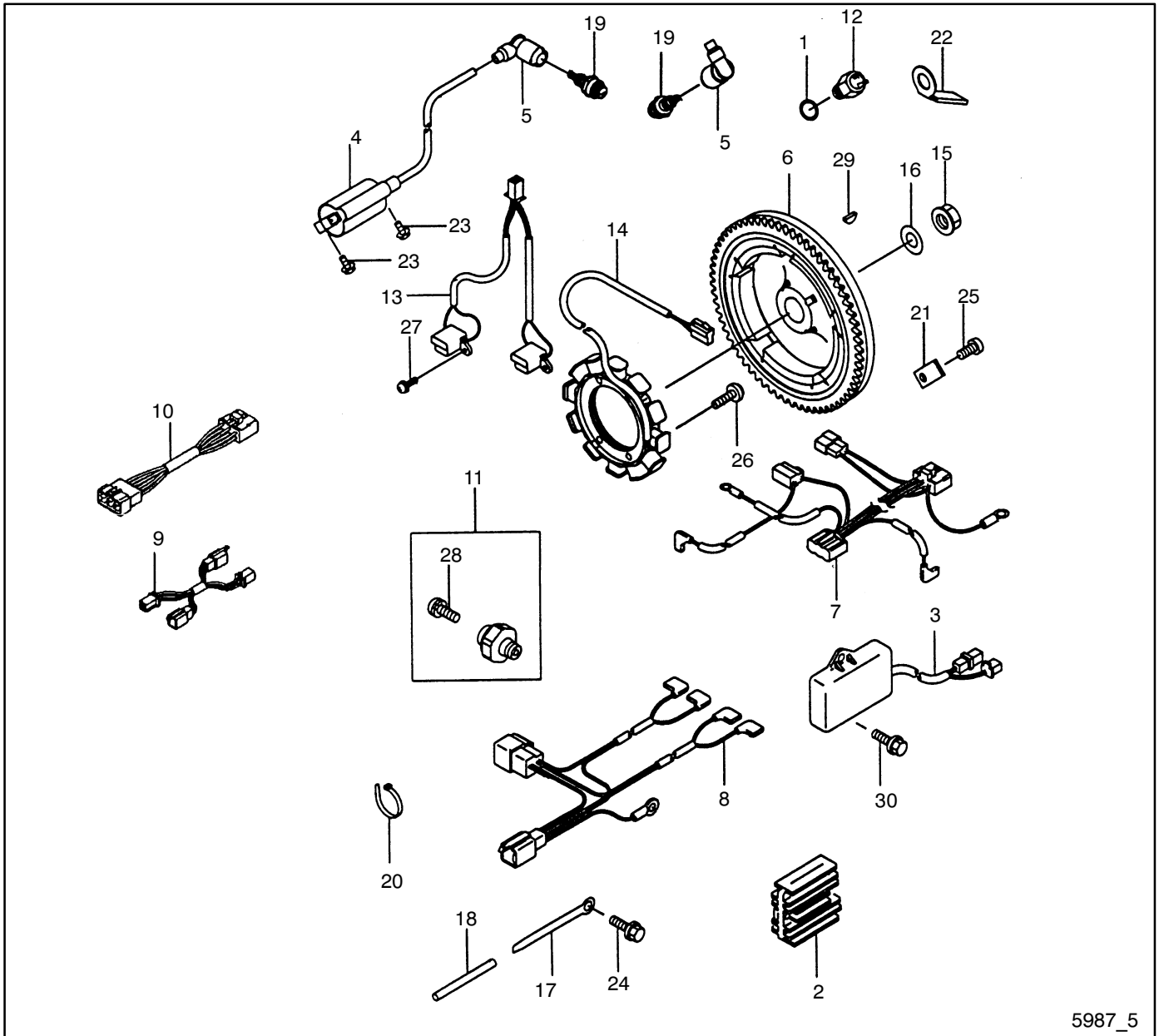
Item	Part No.	Description	Qty.	
			1	2
1	359750	Valve, intake (for engine model AS 04 and BS 04)	2	2
1	359983	Valve, intake	2	2
2	359751	Valve, exhaust (for engine model AS 04 and BS 04)	2	2
2	359984	Valve, exhaust	2	2
3	359752	Retainer, valve spring (for engine model AS 04 and BS 04)	4	4
3	359985	Retainer, valve spring	4	4
4	359753	Arm, rocker	4	4
5	359754	Shaft, rocker	2	2
6	359755	Tappet	4	4
7	359756	Rod, push	4	4
8	359757	Seat, spring	4	4
9	359758	Spring, engine valve (for engine model AS 04 and BS 04)	4	4
9	359986	Spring, engine valve	4	4
10	359759	Complete Camshaft (generator set serial numbers before 758309)	1	
10	GM29874	Complete Camshaft (engine model ES04; generator set serial numbers 758309 and after)	1	
10	GM29874	Complete Camshaft		1
11	359760	Screw	4	4
12	359761	Nut	4	4
13	359762	Seal, oil	4	4
14	359763	Circlip	4	4
15	359987	Collet	8	8

Group 4: Lubrication and Oil Filter



Item	Part No.	Description	Qty.	
			1	2
1	359764	Gasket, drain plug	1	1
2	359765	Shaft, oil pump	1	1
3	359766	Plate	1	1
4	359767	Cover	1	1
5	359773	Dipstick	1	1
6	359768	Cap, oil fill	1	1
7	359769	Rotor, oil pump (in)	1	1
8	359770	Rotor, oil pump (out)	1	1
9	359771	Oil filter	1	1
10	359772	Oil filter screen	1	1
11	359774	Gear spur (generator set serial numbers before 758309)	1	
11	GM29875	Gear spur (engine model ES04; generator set serial numbers 758309 and after)	1	
11	GM29875	Gear spur		1
12	359775	Pin	2	2
13	359902	Ring, 0.20 mm	1	1
14	359776	Plug, drain	1	1
15	359777	Spring	1	1
16	359778	Bolt, flanged	3	3
17	359779	Screw, pan	2	2
18	359780	Ball, steel	1	1

Group 5: Ignition

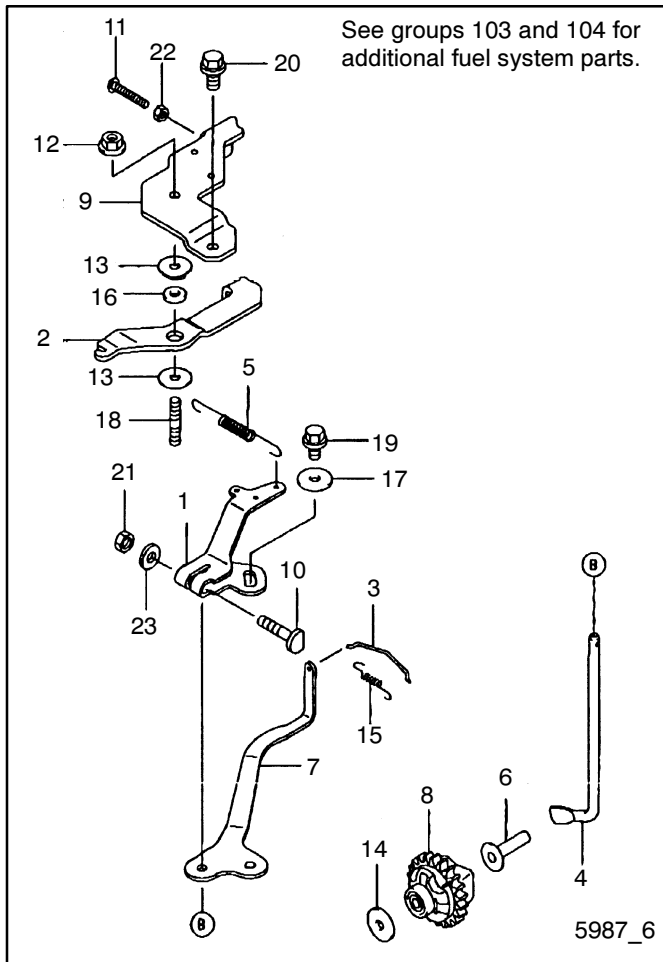


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Item	Part No.	Description	Qty.	Var.
1	359781	Gasket	1	
2	359782	Voltage regulator	1	
3	359783	Igniter	1	
4	359784	Coil, ignitio	2	
5	359785	Cap, spark plug	2	
6	359786	Flywheel assembly	1	
7	359787	Harness	1	
8	359788	Harness	1	
9	359903	Harness	1	
10	359904	Harness	1	
11	359789	Switch, oil pressure	1	
12	359790	Switch, temperature	1	
13	359791	Coil, pulsing	1	
14	359792	Coil, charging	1	
15	359807	Nut, hex	1	

Item	Part No.	Description	Qty.	Var.
16	359793	Washer	1	
17	359794	Clamp	2	
18	359795	Tube	2	
19	359796	Spark plug (for engine model AS 04)	2	
19	359979	Spark plug	2	
20	359797	Band	3	
21	359798	Clamp	1	
22	359799	Clamp	2	
23	359800	Bolt, flanged	4	
24	359801	Bolt, flanged	2	
25	359803	Screw, pan	1	
26	359804	Screw, pan	4	
27	359805	Screw, pan	4	
28	359806	Screw, pan	1	
29	359808	Key, woodruff	1	
30	X-67-116	Screw, hex washer, thread-forming	2	

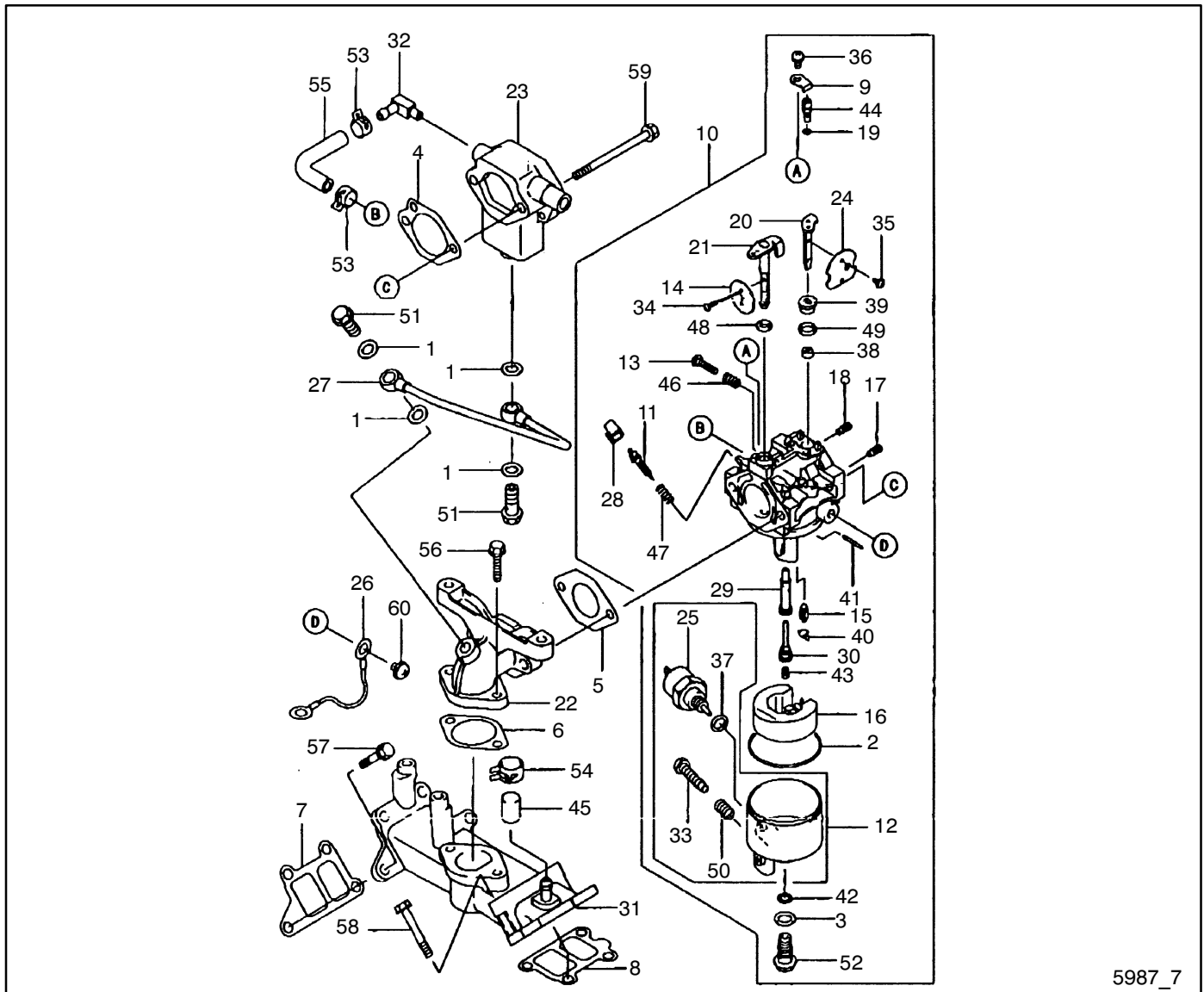
Group 6: Governor



Item	Part No.	Description	Qty.	
			1	2
1	359809	Bracket	1	1
2	359810	Lever	1	1
3	359813	Link	1	1
4	359814	Pivot arm	1	1
5	359815	Spring, governor	1	1
6	359816	Sleeve	1	1
7	359817	Arm, governor (for engine model AS 04 and BS 04)	1	1
7	359988	Arm, governor	1	1
8	359818	Governor assembly (generator set serial numbers before 758309)	1	1
8	GM29878	Governor assembly (engine model ES04; generator set serial numbers 758309 and after)	1	
8	GM29878	Governor assembly		1
9	359819	Panel, control	1	1
10	359820	Bolt	1	1
11	359821	Screw	2	2
12	359822	Nut	1	1
13	359823	Washer	3	3
14	359905	Spacer	1	1
15	359825	Spring	1	1
16	359826	Collar	1	1
17	359832	Washer	1	1
18	359833	Stud	1	1
19	359834	Bolt (for engine model AS 04 and BS 04)	1	1
19	359989	Bolt	1	1
20	359835	Bolt	2	2
21	359836	Nut, hex	1	1
22	359837	Nut, hex	2	2
23	359838	Washer	1	1

Notes

Group 7: Carburetor



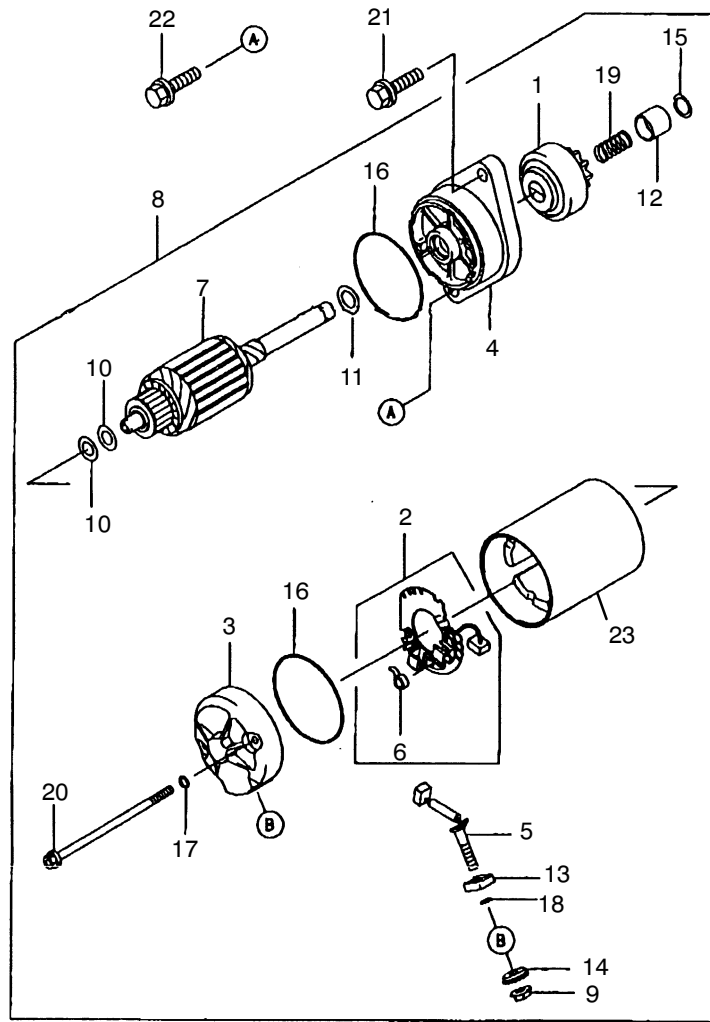
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Group 7: Carburetor

Item	Part No.	Description	Qty.
			Var.
			1
1	359906	Gasket	4
2	359839	Gasket	1
3	359840	Gasket	1
4	359841	Gasket, air filter	1
5	359842	Gasket, carburetor	1
6	359843	Gasket, intake pipe	1
7	359844	Gasket, intake manifold	1
8	359845	Gasket, intake manifold	1
9	359846	Plate	1
10	359847	Carburetor assembly	1
10	GM24510	Carburetor repair kit	1
11	359848	Screw, pilot air	1
12	359849	Float chamber	1
13	359850	Screw, throttle stop	1
14	359851	Valve, throttle	1
15	359852	Float valve	1
16	359853	Float	1
17	359854	Air Jet 1.2	1
18	359855	Air Jet 0.8	1
19	359856	Gasket	1
20	359857	Shaft, carburetor choke	1
21	359858	Shaft, carburetor	1
22	359859	Pipe, intake	1
23	359860	Pipe, intake	1
24	359861	Valve, choke	1
25	359862	Solenoid	1
26	359907	Wire lead	1
27	359908	Pipe	1
28	359863	Limiter	1
29	359864	Nozzle, main	1
30	359865	Holder, main jet	1

Item	Part No.	Description	Qty.
			Var.
			1
31	359866	Intake manifold	1
32	359909	Fitting	1
33	359867	Screw	1
34	359868	Screw	2
35	359869	Screw	2
36	359870	Screw	1
37	359871	Washer	1
38	359872	Collar	1
39	359873	Collar	1
40	359874	Ring, snap	1
41	359876	Pin	1
42	359877	O-ring	1
43	359879	Main jet	1
44	359880	Pilot jet	1
45	359911	Plug	1
46	359881	Spring	1
47	359882	Spring	1
48	359883	Seal	1
49	359884	Seal	1
50	359885	Spring	1
51	359886	Bolt	1
52	359912	Bolt	1
53	359913	Clamp	1
54	359914	Clamp	1
55	359887	Tube	1
56	359888	Bolt, flanged	2
57	359889	Bolt, flanged	5
58	359890	Bolt, flanged	3
59	359891	Bolt, flanged	2
60	359915	Screw	1

Group 9: Starter

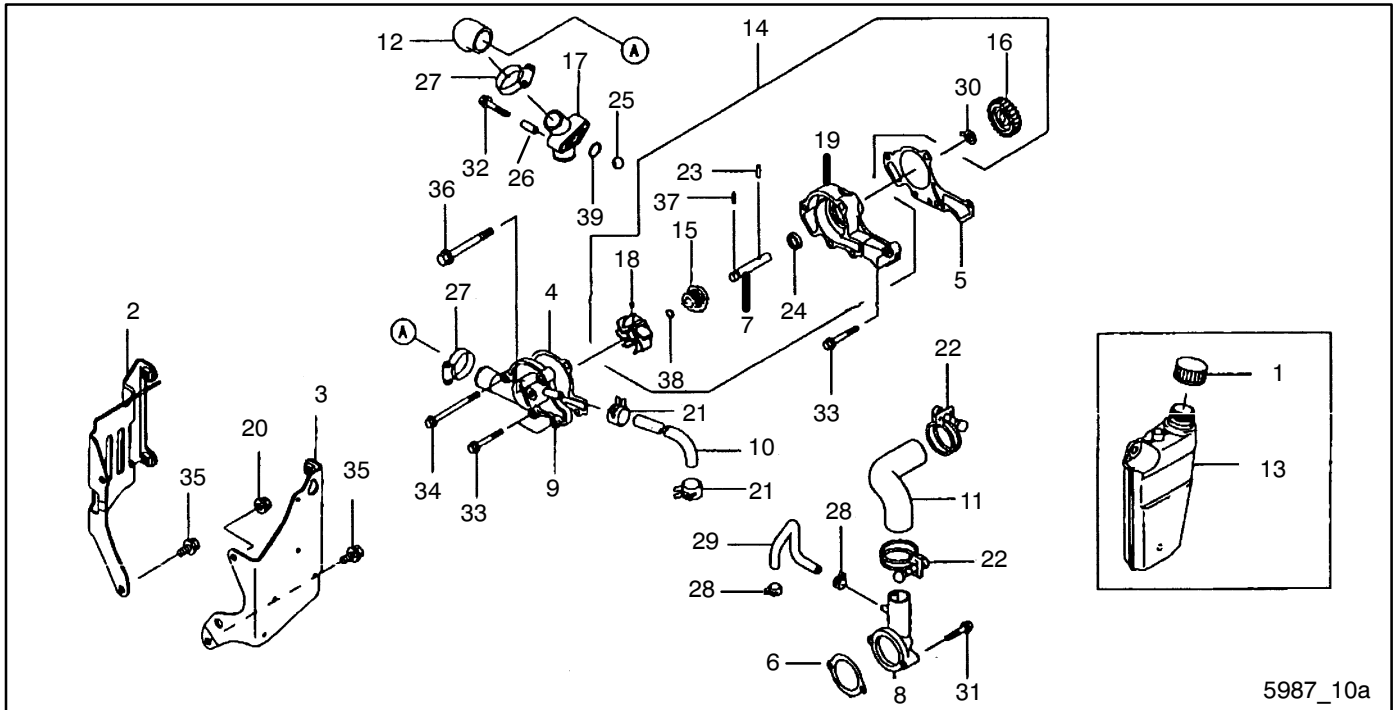


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Item	Part No.	Description	Qty. Var.
1	359917	Clutch assembly	1
2	359918	Holder assembly	1
3	359919	Cover assembly	1
4	359920	Cover assembly	1
5	359921	Brush	1
6	359922	Spring, brush	2
7	359923	Armature	1
8	359924	Starter	1
9	359925	Nut	1
10	359926	Washer	2

Item	Part No.	Description	Qty. Var.
11	359927	Washer	1
12	359928	Collar	1
13	359929	Bushing	1
14	359930	Bushing	1
15	359931	Ring, snap	1
16	359932	O-ring	2
17	359933	O-ring	2
18	359934	O-ring	1
19	359935	Spring	1
20	359936	Bolt	2
21	359937	Bolt	1
22	359938	Bolt, flanged	1
23	-	Not sold separately	1

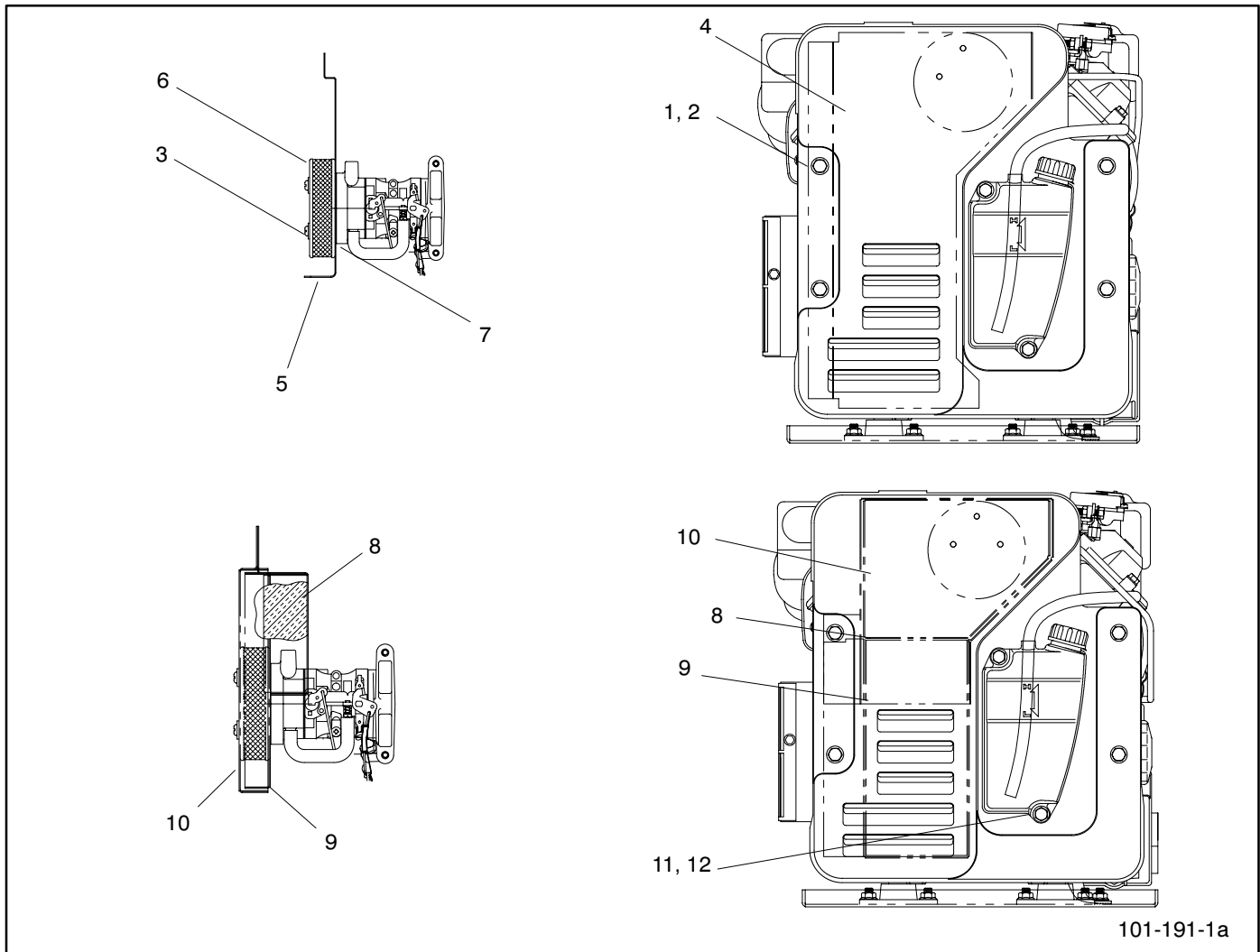
Group 10: Engine Cooling



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Item	Part No.	Description	Qty.	
			1	2
1	359939	Cap	1	1
2	359940	Bracket	1	1
3	359941	Bracket	1	1
4	359942	Gasket, water pump	1	1
5	359943	Gasket, water pump	1	1
6	359944	Gasket, thermostat cover	1	1
7	359945	Shaft, impeller	1	1
8	359946	Cover, thermostat	1	1
9	359947	Cover, pump	1	1
10	359948	Hose, cooling	1	1
11	359949	Hose, cooling	1	1
12	359950	Hose, cooling	1	1
13	359951	Reservoir	1	1
14	359952	Water pump (generator set serial numbers before 758309)	1	
14	GM29876	Water pump (engine model ES04; generator set serial numbers 758309 and after)	1	
14	GM29876	Water pump		1
15	359953	Mechanical seal	1	1
16	359954	Spur gear (generator set serial numbers before 758309)	1	
16	GM29877	Spur gear (engine model ES04; generator set serial numbers 758309 and after)	1	
16	GM29877	Spur gear		1
17	359955	Joint	1	1
18	359956	Impeller	1	1
19	359957	Pump case	1	1
20	359958	Nut	1	1
21	359959	Clamp	2	2
22	359960	Clamp	2	2
23	359961	Pin	1	1
24	359962	Seal, oil	1	1
25	359963	Ball	1	1
26	359964	Collar	2	2
27	359965	Clamp	2	2
28	359966	Clamp	2	2
29	359967	Tube	1	1
30	359968	Washer	1	1
31	359969	Bolt, flanged	2	2
32	359970	Bolt, flanged	2	2
33	359971	Bolt, flanged	3	3
34	359972	Bolt, flanged	1	1
35	359973	Bolt, flanged	3	3
36	359974	Bolt, flanged	1	1
37	359975	Pin, dowel	1	1
38	359976	O-ring	1	1
39	359977	O-ring	1	1

Group 101: Air Intake



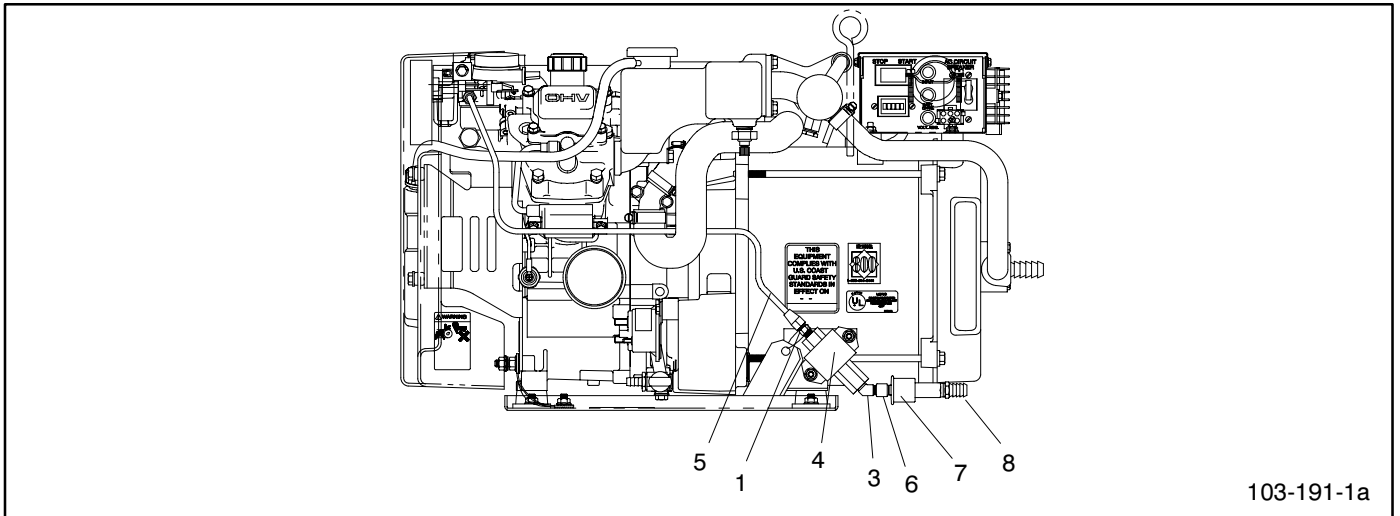
Item	Part No.	Description	Qty.
			Var.
1	X-284-39	Grommet	4
2	X-6050-4	Screw, hex head cap	4
3	X-6284-6	Screw, pan head machine	3
4	359294	Guard, flywheel	1
5	359339	Duct, air inlet	1
6	359340	Arrester, flame	1
7	359353	Gasket, air intake	1
8	359577	Insulation, acoustic foam*	1
9	359575	Duct, air intake*	1
10	359576	Cover, air intake*	1
11	229353	Mount	2
12	X-22-12	Washer, lock, .262 ID x .743 ID	2

* Item is included in service kit GM11698.

See the table below for a list of generator set serial numbers for which installation of kit GM11698 Air Intake Duct will improve the engine air/fuel mixture ratio and decreases the air intake noise level.

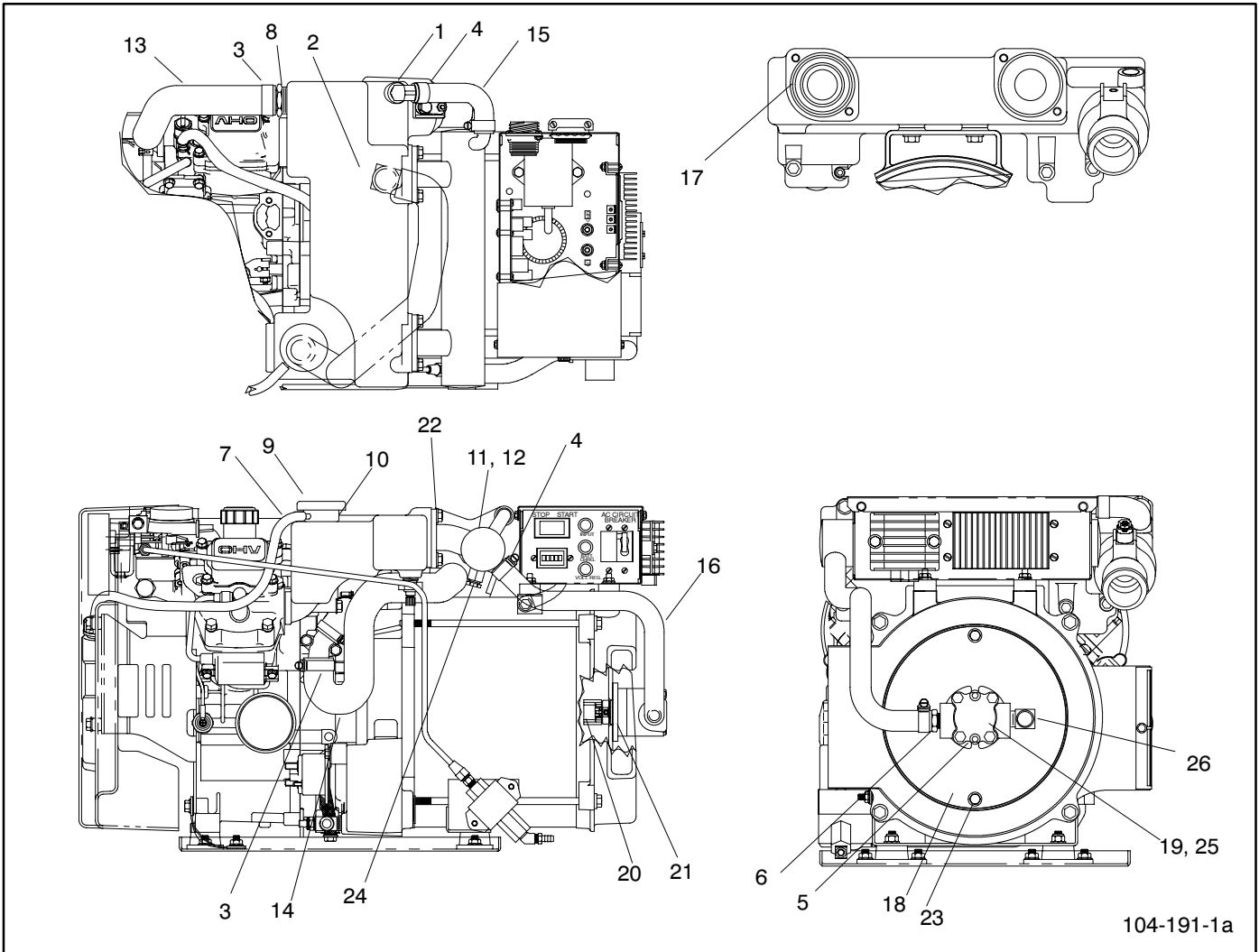
Serial Numbers	
Note: A dash (-) indicates a range of serial numbers.	
0623502-0623506	0631425-0631503
0624407-0624410	0633287-0633291
0625632-0625646	0633302-0633387
0625691-0625693	0633389-0633441
0626132-0626135	0633452-0633458
0626821	0634787-0634803
0626826	0634805-0634916
0626827	0634918-0635001
0626829	0638222-0638226
0626831	0638230-0638232
0628165-0628172	0638234
0628194-0628197	0638236-0638249
0628199	0638251-0638259
0629268-0629292	0638261-0638310
0629328-0629335	0639032
0629337	484952
0629344-0629353	486106
0630437-0630461	

Group 103: Fuel System



Item	Part No.	Description	Qty.
			Var.
1	X-296-1	Connector, 7/16-20 x 1/8 in.	1
3	267428	Elbow, 45° street	1
4	278490	Pump, fuel	1
5	359338	Line, fuel	1
6	278470	Adapter, pipe	1
7	267987	Filter, fuel, 1/4 in. NPT	1
8	X-652-3	Fitting, hose	1

Group 104: Cooling System

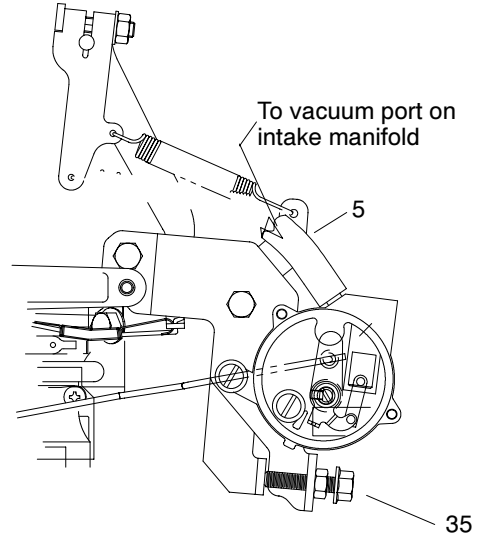
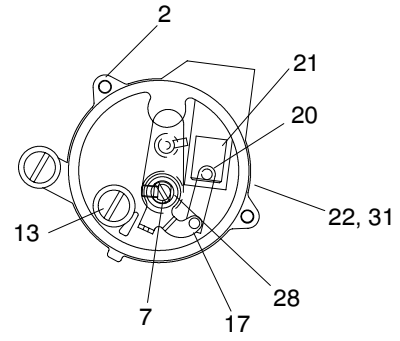
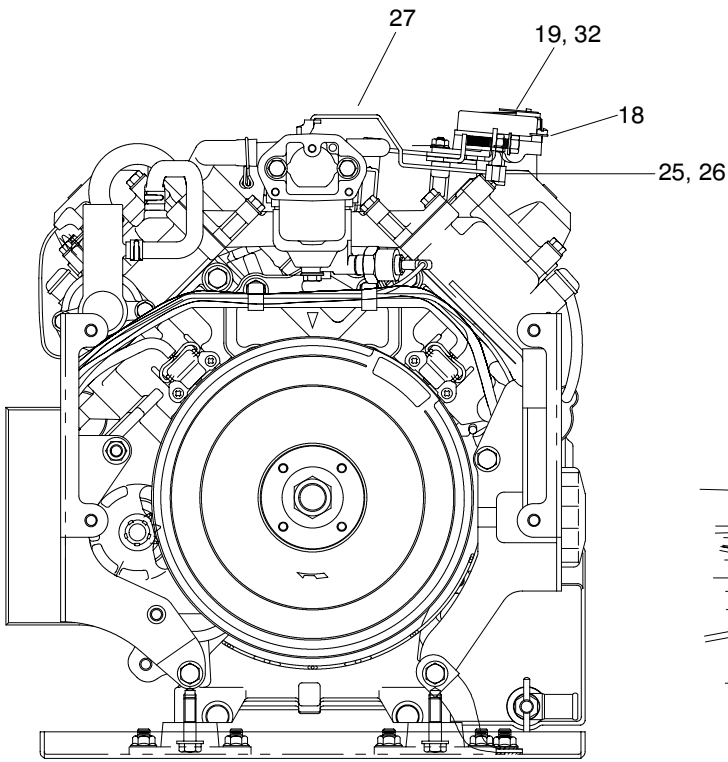


Group 104: Cooling System

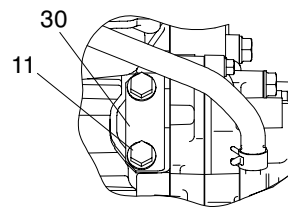
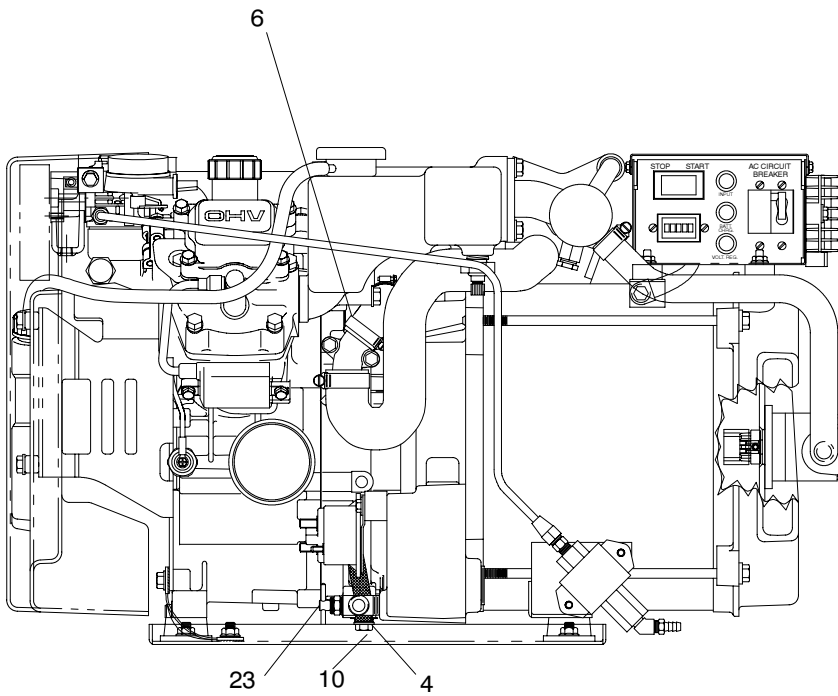
Item	Part No.	Description	Qty.
			Var.
1	X-391-2	Connector, 90° hose (5/8 in. ID hose)	1
2	X-391-32	Elbow, hose (on bottom of exh. manifold)	1
3	X-426-15	Clamp, hose	4
4	X-426-3	Clamp, hose, 1/2-1 13/32	4
5	X-55-47	Screw, hex head, 5/16-24 x 0.50	2
6	X-582-2	Connector, hose	1
7	X-6371-1	Hose, rubber	1
8	X-751-1	Adapter, hose, 1 in. x 1 in.	1
9	229980	Cap, manifold	1
10	241311	Neck (50 440 01)	1
11	249930	Thermostat	1
12	359301	Exchanger, heat	1
13	359305	Hose, molded coolant	1
14	359306	Hose, molded coolant	1
15	359307	Hose, molded seawater	1
16	359308	Hose, molded seawater	1
17	359319	O-ring	2
18	359324	Plate, seawater pump mounting	1
19	GM28487	Pump, seawater includes item 25	1
20	359448	Sleeve, drive	1
21	359449	Fitting, end drive	1
22	X-125-3	Screw	4
23	X-465-16	Screw	2
24	260085	Zinc Anode Kit	1
25	359978	Impeller Kit, seawater	1
25	GM20716	Cover, back	1
26	X-391-43	Connector, 90° hose (3/4 in. ID hose)	1

25 GM35379 Seal,seat assembly

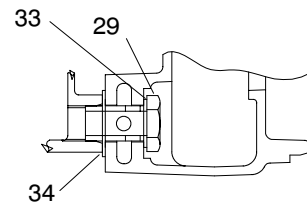
Group 105: Engine



Choke Housing Assembly

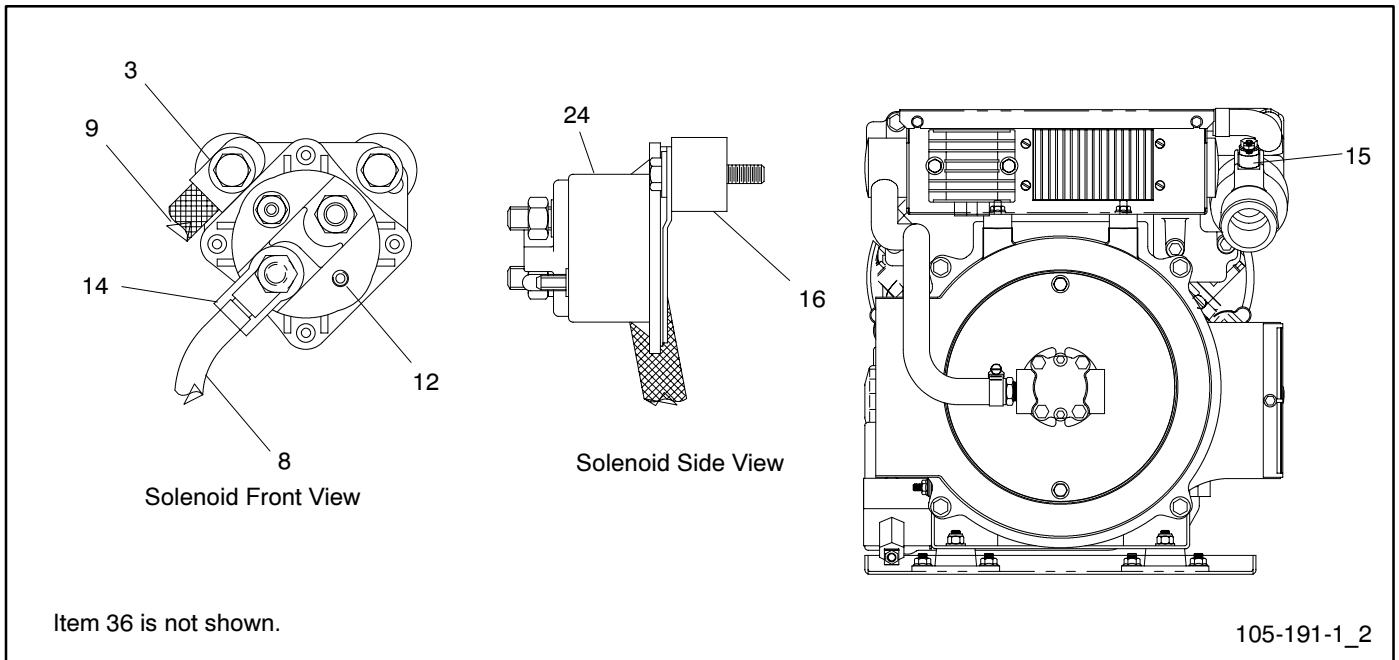


Lifting Eye View



105-191-1_1

Group 105: Engine



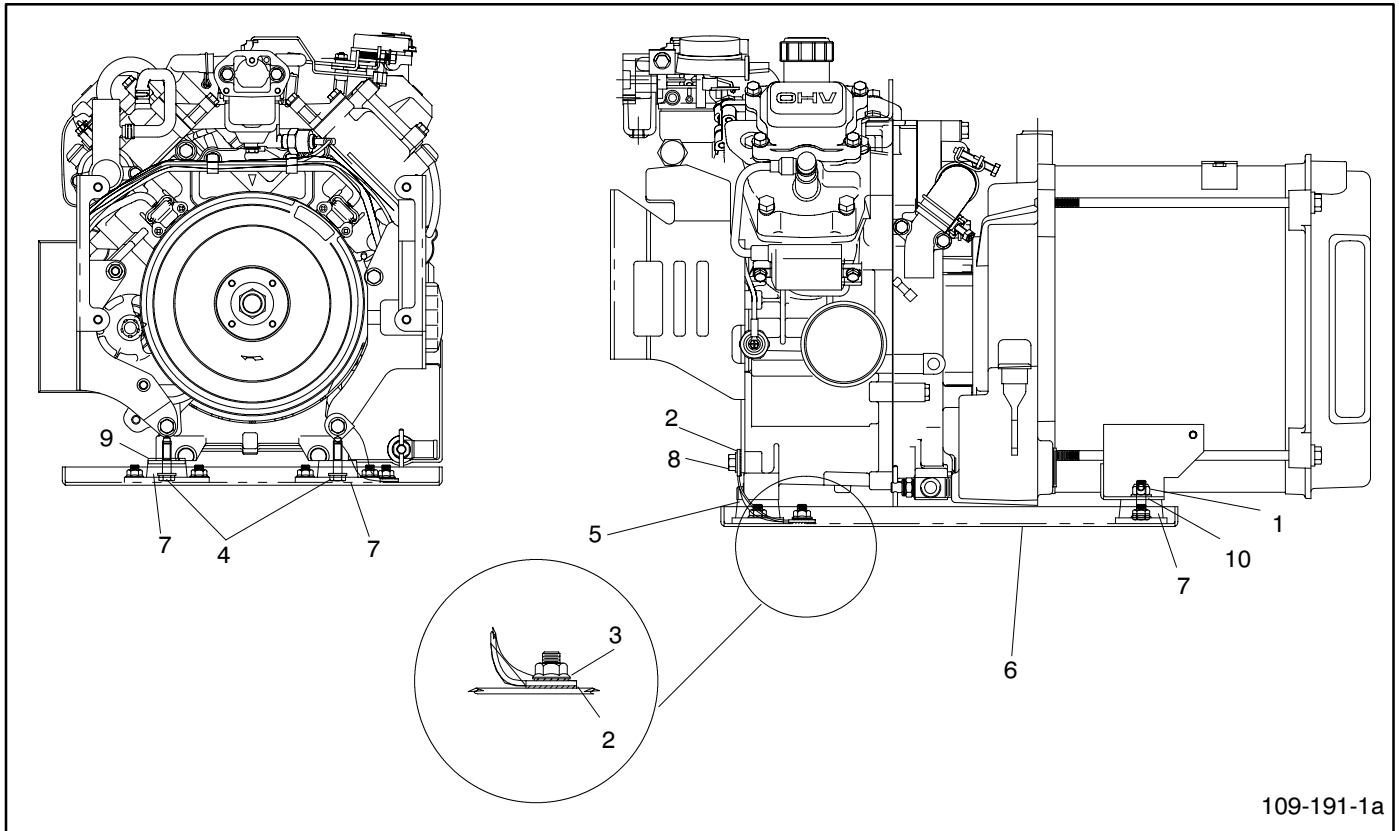
Item	Part No.	Description	Qty. Var.		
			1	2	GR1
1	B-359285	Engine Assembly (see Groups 1-9 for parts)	1	1	
1	C-359285	Engine Assembly (see Groups 1-9 for parts)			1
2	X-14-6	Screw, f.h.m., 8-32 x 0.25	2	2	2
3	X-22-12	Washer, lock, 1/4 in. int.-ext. tooth	1	1	1
4	X-22-16	Washer, lock, 5/16 in. int.-ext. tooth	1	1	1
5	X-386-14	Line, flexible fuel, 1/4 in. x 9 in.	1	1	1
6	X-426-20	Clamp, hose	2	2	2
7	X-49-25	Screw, p.h.m., 6-32 x 0.25 in. slot	1	1	1
8	X-545-25	Cable, battery	1	1	1
9	X-6046-3	Strap, ground	1	1	1
10	M933-08016-60	Screw, hex head cap	1	1	1
11	M933-08016-60	Screw, hex head cap	2	2	2
12	X-6214-2	Cap, plastic	1	1	1
13	X-6284-1	Screw, pan head metric	2	2	2
14	238915	Boot	1	1	1
15	249872	Switch, high temperature cutout	1	1	1
16	259632	Bumper	2	2	2
17	277272	Lever Assembly, choke	1	1	1
18	277275	Retainer, thermostat coil	2	2	2
19	277281	Gasket	1	1	1
20	277285	Pin	1	1	1
21	277288	Piston, choke	1	1	1
22	277297	Plate, baffle	1	1	1
23	359653	Valve, shutoff	1	1	1
24	291891	Solenoid, starter	1	1	1
25	358358	Coupling, stepper motor	1	1	1
26	25 158 08	Bushing	1	1	1
27	359311	Linkage, choke	1	1	1
28	359312	Shaft, choke	1	1	1
29	359333	Bolt, banjo	1	1	1
30	359354	Strap, lifting	1	1	1
31	52 081 05	Housing assembly, choke	1	1	1
32	359356	Heater assembly, choke	1	1	1
33	359421	Washer, pressure sealing	1	1	1
34	359422	Washer, pressure sealing	1	1	1
35	359821	Bolt, M5 x 30	1	1	1
36	X-6003-107	Conduit (not shown)		1	1

Choke repair assembly GM12236 includes items 2,7,17-22,25-28,31,32

Group 107: Nameplate and Decals

Item	Part No.	Description	Qty.	
			Var.	
			1	3
1	X-6348-6	Decal, Kohler Power Systems	1	1
2	224233	Decal, 1-800 number	1	1
3	229831	Decal, reconnection	1	1
4	238162	Decal, positive battery connection	1	1
5	239796	Decal, warning carbon monoxide	1	1
6	249808	Decal, warning rotating parts	1	1
7	249809	Decal, warning hot engine and exhaust	1	1
8	249810	Decal, warning hot coolant and steam	1	1
9	294520	Decal, danger high voltage	1	1
10	344282	Decal, check zinc anode	1	1
11	GM14167	Decal, drain	1	1
12	344295	Decal, equipment ground	1	1
13	359282	Tag, hang	1	1
14	241812	Decal, UL	1	1
15	249494	Decal, warning explosion	1	1
16	344588	Decal, CE	1	1
17	226917	Decal, negative battery connection	1	1

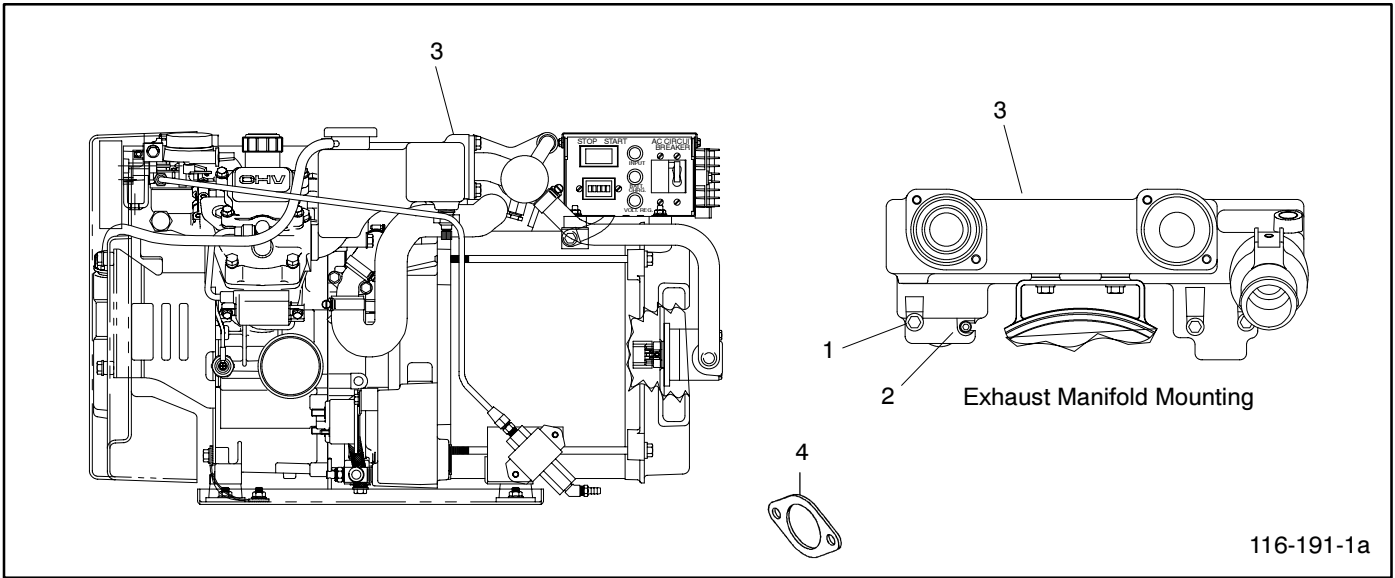
Group 109: Skid and Plant Mounting



109-191-1a

Item	Part No.	Description	Qty.
			Var.
1	X-101-16	Nut, elastic stop, 5/16-18 in.	2
2	X-22-16	Washer, lock, 5/16 in. int.-ext. tooth	2
3	X-22-5	Washer, lock, 5/16 in. int. tooth	1
4	M933-08016-60	Screw, hex head cap	2
5	245297	Strap, ground	1
6	359325	Tray, drip	1
7	GM28419	Kit, vibromount*	1
8	X-6054-17	Stud	1
9	X-25-164	Washer, plain	2
10	X-25-85	Washer, plain	2
* Vibromount kit GM28419 includes:			
1	X-101-16	Nut, elastic stop, 5/16-18 in.	2
4	M933-08016-60	Screw, hex head cap	2
9	X-25-164	Washer, plain	2
10	X-25-85	Washer, plain	2
-	GM25335	Mount, vibromount, green (not shown)	2
-	GM25336	Mount, vibromount, yellow (not shown)	2
-	X-125-3	Bolt, hex cap (5/16-18 x 0.75 in.) (not shown)	2
-	X-6210-7	Nut, flange spirallock (5/16-18 in.) (not shown)	8
-	M125A-08-80	Washer, plain #8 (not shown)	2

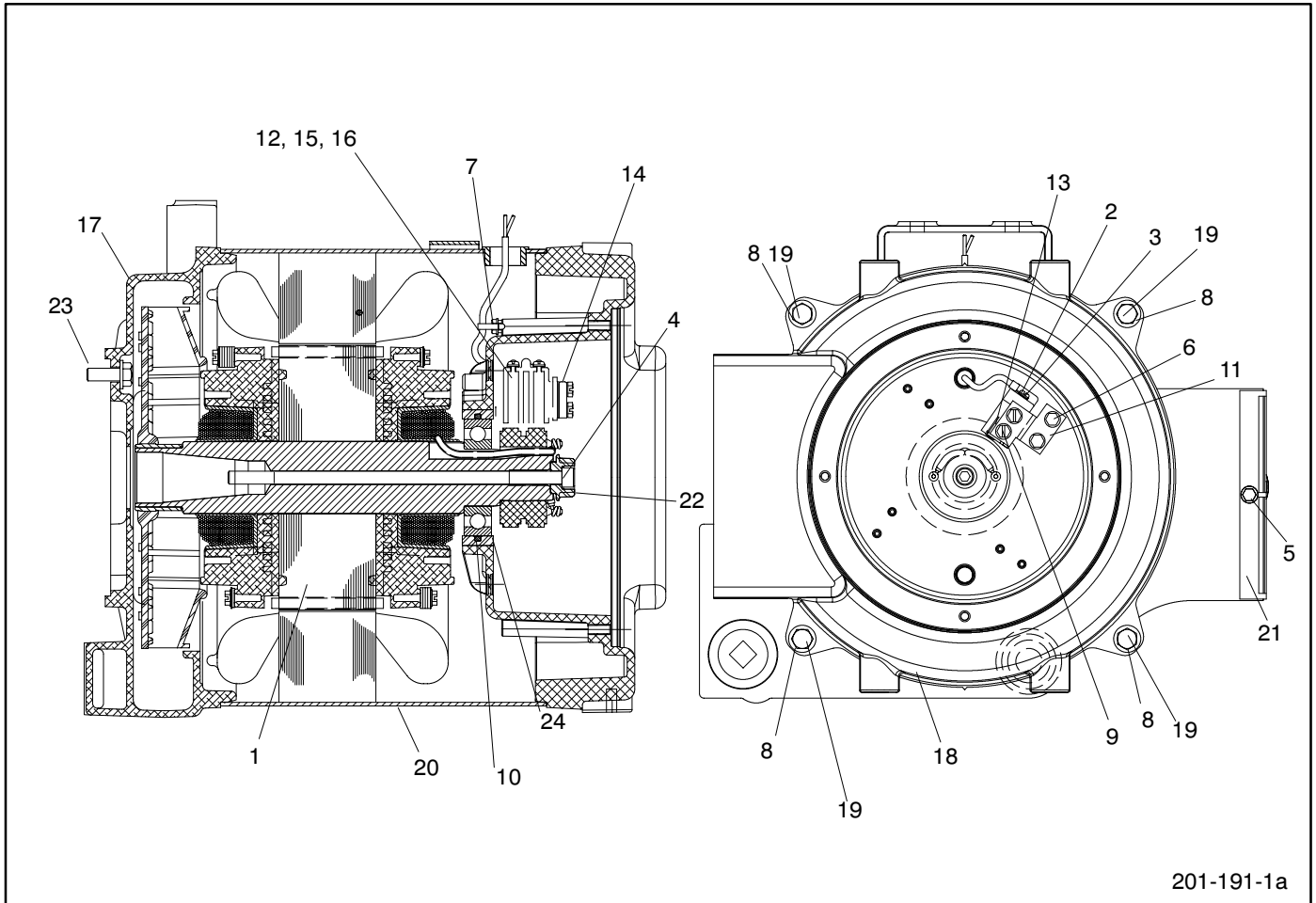
Group 116: Exhaust



116-191-1a

Item	Part No.	Description	Qty.	Var.
1	M931-06075-60	Screw, h.c.	3	1
2	254765	Screw, socket hex cap	1	
3	GM10105	Manifold, exhaust	1	
4	359897	Gasket	2	

Group 201: Generator and Mounting

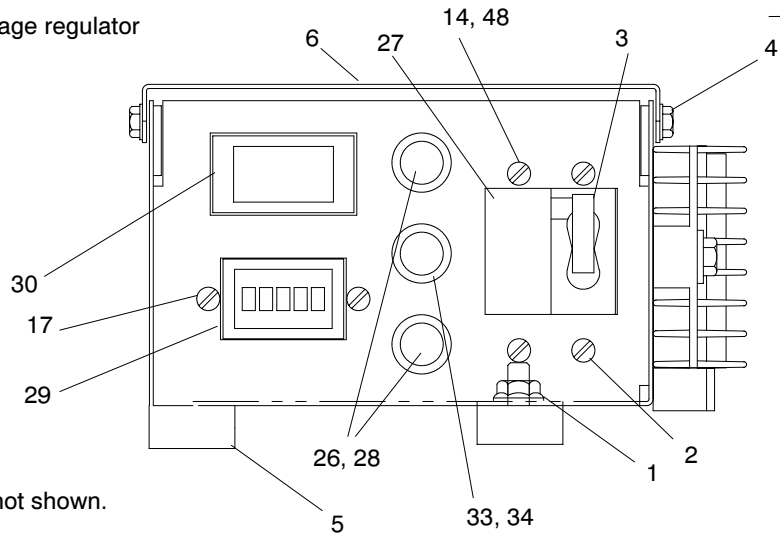


201-191-1a

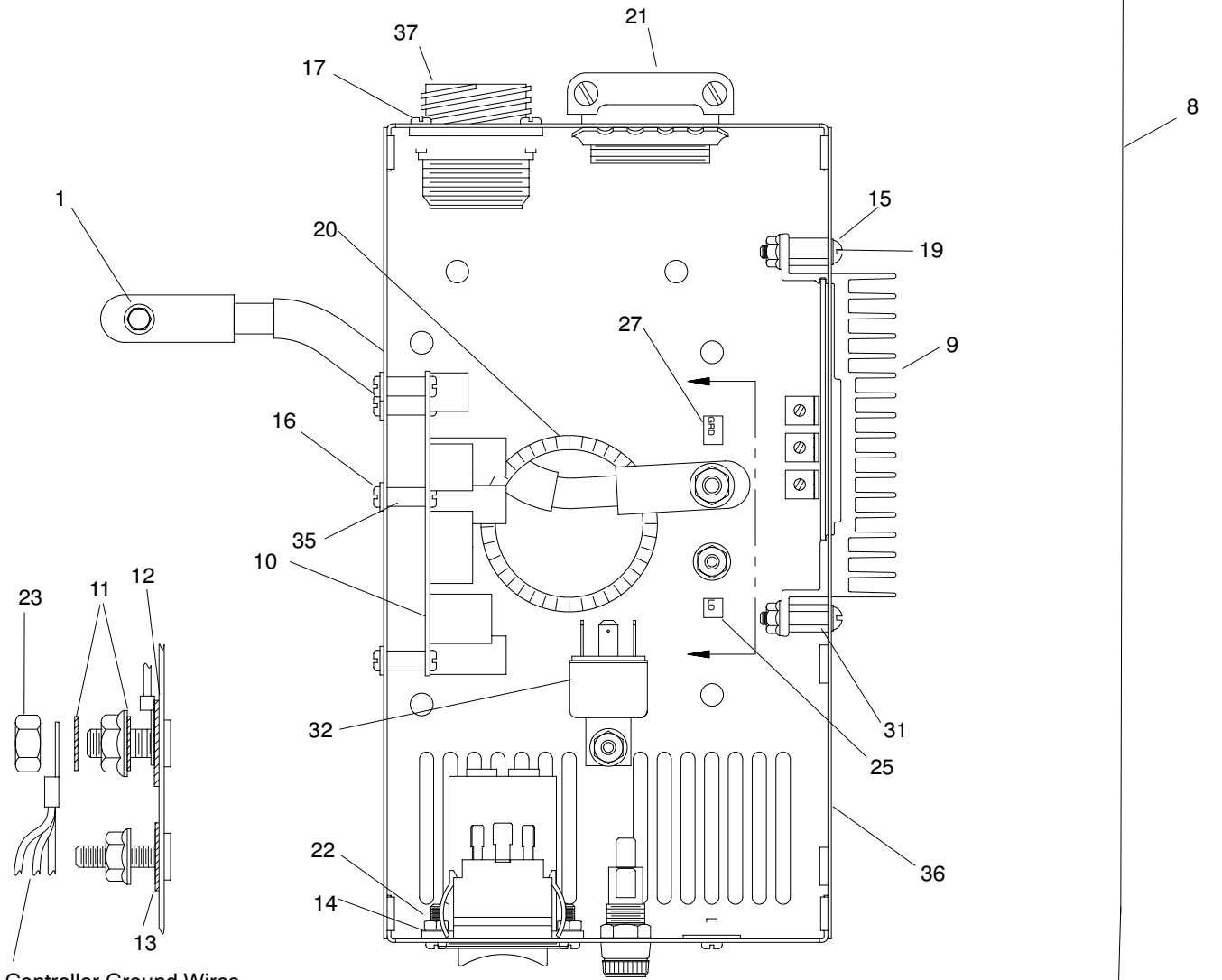
Item	Part No.	Description	Qty.
1	A-359441	Rotor Assembly (includes item 24)	1
2	X-22-6	Washer, lock #6 int. star	2
3	X-49-1	Screw, r.h.m. 6-32 x .312 slot	2
4	X-55-48	Screw, hex head 5/16-24	1
5	X-6216-1	Screw, hex head	2
6	X-67-113	Screw, self-tapping	2
7	X-67-52	Screw, self-tapping	1
8	X-801-4	Washer, hardened	4
9	X-97-13	Screw, hex head machine	2
10	229110	O-ring	1
11	229178	Bracket, brush holder	1
12	238150	Spring	2
13	238247	Retainer, wire	1
14	238248	Shim, brush holder	2
15	239247	Holder, brush	1
16	239282	Brush	2
17	359292	Adapter, generator	1
18	GM11876	Bracket, end	1
19	359310	Overbolt	4
20	359327	Stator Assembly	1
21	359403	Guard, fan	1
22	359453	Fitting, end drive	1
23	X-125-47	Screw	4
24	X-758-15	Bearing, ball	1

Group 301: Controller and Mounting

See Group 2 for voltage regulator



Items 7 and 49 not shown.



Controller Ground Wires

A359337a

Group 301: Controller and Mounting

Item	Part No.	Description	Quantity				
			Variation				
			1	2	3	4	7
1	X-22-12	Washer, lock, 1/4 in. int.-ext. tooth	5	5	5	5	5
2	X-49-21	Screw, r.h.m., 6-32-3/16	2	2			
3	X-506-51	Breaker, circuit	1				
3	X-506-58	Breaker, circuit		1			
3	X-506-60	Breaker, circuit			1		
3	X-506-68	Breaker, circuit				1	
3	—	Breaker, circuit (see accessories)					1
4	X-67-52	Screw, hex head 10-24	4	4	4	4	4
5	241769	Mount, controller	4	4	4	4	4
6	359336	Cover, controller	1	1	1	1	1
7	359344	Harness, engine wiring (includes items 38-41)	1	1	1	1	1
8	A-359337	Controller Assembly (includes items 9-48)	1	1	1	1	1
9	G-278598	PCB Assembly (PBIII E)	1	1	1	1	1
10	GM10516	PCB Assembly	1	1	1	1	1
11	X-22-11	Washer, lock, 1/4 in. int. tooth	2	2	2	2	2
12	X-22-12	Washer, lock, 1/4 in. int.-ext. tooth	1	1	1	1	1
13	X-22-13	Washer, lock, #10, int.-ext. tooth	1	1	1	1	1
14	X-22-6	Washer, lock, #6, int.	6	6	6	6	6
15	X-22-7	Washer, lock, #8, int. tooth	4	4	4	4	4
16	X-49-25	Screw, p.h.m., 6-32 x 0.25 slot	10	10	10	10	10
17	X-49-26	Screw, p.h.m., 6-32 x 0.50 slot	6	6	6	6	6
18	X-67-133	Screw, hex washer, thread-forming	4	4	4	4	4
19	X-51-5	Screw, r.h.m., 8-32 x 7/16	4	4	4	4	4
20	X-634-18	Bushing	1	1	1	1	1
21	X-6266-1	Connector, cable	1	1	1	1	1
22	X-71-2	Nut, hex, 6-32 zinc	2	2	2	2	2
23	X-81-8	Nut, hex, 1/4-20 green	1	1	1	1	1
24	201620-152	Tab, id "grd in.	1	1	1	1	1
25	201620-94	Tab, ident	1	1	1	1	1
26	223316	Fuse, 10 A, 250 V	2	2	2	2	2
27	245264-BLK	Plate, cover	1	1	1	1	1
28	238426	Holder, fuse 0.25 x 1.25	2	2	2	2	2
29	238736	Hourmeter	1	1	1	1	1
30	249406	Switch, rocker, 1 pole	1	1	1	1	1
31	249986	Spacer	4	4	4	4	4
32	259391	Relay tab, 20 A 12 VDC 1A/2B	1	1	1	1	1
33	262389	Fuse, 25A, 125 V	1	1	1	1	1
34	263156	Holder, fuse	1	1	1	1	1
35	GM10530	Spacer	5	5	5	5	5
36	359335	Box, silkscreened	1	1	1	1	1
37	359366	Harness, controller (includes items 42-47)	1	1	1	1	1
38	239493	Connector Plug, 22-position	1	1	1	1	1
39	292370	Connector Plug, 2-position	1	1	1	1	1
40	233959	Diode, 6 A, 100 V	1	1	1	1	1
41	359404	Connector, receptacle	1	1	1	1	1
42	239496	Connector Panel, 22-position	1	1	1	1	1
43	241616	Connector Plug, 6-position	1	1	1	1	1
44	259689	Connector Plug, 9-position	1	1	1	1	1
45	269366	Connector Plug, 15-position	1	1	1	1	1
46	239411	Connector Plug, 4-position	1	1	1	1	1
47	233959	Diode, 6 A, 100 V	1	1	1	1	1
48	X-49-1	Screw, slotted pan head machine	4	4	4	4	4
49	X-6003-121	Conduit, convoluted (not shown)					1

Group 701: Literature

Item	Part No.	Description	Qty.	
			Var.	
			1	2
1	TP-5982	Installation Manual, Gasoline Marine	1	1
2	TP-5985	Operation Manual, 5/7.3E and 4/6EF	1	1
3	TP-5986	Service Manual, 5/7.3E and 4/6EF	1	1
4	TP-5987	Parts Catalog, 5/7.3E and 4/6EF	1	1
5	TP-6001	Operation Manual, Kawasaki FD501D	1	1
6	TP-6002	Service Manual, Kawasaki FD501D	1	1
7	TP-6008	Service Manual Supplement, Kawasaki FD501D	1	1

Accessories

Qty.	Description	Part No.
Circuit Breaker Kits		
Circuit Breaker PA-225640		
1	Instructions, installation	TT-875
4	Screw, r.h.m., 6-32-3/16	X-49-21
1	Breaker, circuit, 40 A	X-506-50
1	Plate, cover	229183
1	Decal, notice	246242
Circuit Breaker PA-225641		
1	Instructions, installation	TT-875
4	Screw, r.h.m., 6-32-3/16	X-49-21
1	Breaker, circuit, 60 A	X-506-51
1	Plate, cover	229183
1	Decal, notice	246242
Circuit Breaker PA-229185		
1	Instructions, installation	TT-875
4	Screw, r.h.m., 6-32-3/16	X-49-21
1	Breaker, circuit, 55 A	X-506-47
1	Plate, cover	229183
1	Decal, notice	246242
Circuit Breaker PA-229391		
1	Instructions, installation	TT-875
4	Screw, r.h.m., 6-32-3/16	X-49-21
1	Breaker, circuit, 18 A	X-506-41
1	Decal, notice	246242
1	Terminal, jumper	249956
Circuit Breaker PA-229394		
1	Instructions, installation	TT-875
4	Screw, r.h.m., 6-32-3/16	X-49-21
1	Breaker, circuit, 30 A	X-506-36
1	Decal, notice	246242
1	Terminal, jumper	249956
Circuit Breaker PA-344051		
1	Instructions, installation	TT-875
4	Screw, r.h.m., 6-32-3/16	X-49-21
1	Breaker, circuit, 18 A	X-506-41
1	Decal, notice	246242
Circuit Breaker PA-344052		
1	Instructions, installation	TT-875
4	Screw, r.h.m., 6-32-3/16	X-49-21
1	Breaker, circuit, 30 A	X-506-36
1	Decal, notice	246242
Circuit Breaker PA-344106		
1	Instructions, installation	TT-875
4	Screw, r.h.m., 6-32-3/16	X-49-21
1	Breaker, circuit, 22 A	X-506-57
1	Decal, notice	246242
1	Terminal, jumper	249956
Circuit Breaker PA-344309		
1	Instructions, installation	TT-875
4	Screw, r.h.m., 6-32-3/16	X-49-21
1	Breaker, circuit, A	X-506-57
1	Decal, notice	246242

Qty.	Description	Part No.
Circuit Breaker PA-359286		
1	Instructions, installation	TT-875
4	Screw, r.h.m., 6-32-3/16	X-49-21
1	Breaker, circuit, 42 A	X-506-60
1	Plate, cover	229183
1	Decal, notice	246242
Circuit Breaker PA-359617		
1	Instructions, installation	TT-875
4	Screw, r.h.m., 6-32-3/16	X-49-21
1	Breaker, circuit, 18 A	X-506-68
1	Plate, cover	229183
1	Decal, notice	246242
Circuit Breaker PA-359618		
1	Instructions, installation	TT-875
4	Screw, r.h.m., 6-32-3/16	X-49-21
1	Breaker, circuit, 27 A	X-506-58
1	Plate, cover	229183
1	Decal, notice	246242
Harness Kits		
Harness, Fire System Interface PA-229833		
1	Harness, wiring	229832
1	Instructions, installation	TT-930
Harness, Remote 12" Pigtail PA-249941		
1	Harness, extension	249935
Harness for Remote Panel (15') PA-249334		
1	Strap, wire, 5/8"	X-526-3
1	Harness, extension	249334
Harness for Remote Panel (25') PA-249336		
1	Strap, wire, 5/8"	X-526-3
1	Harness, extension	249336
Harness, Fuel Solenoid Wiring GM16829-KP1		
1	Harness, wiring	GM16829
Panel and Meter Kits		
Panel, Remote Start PA-250797		
1	Instructions, installation	TT-642
1	Decal, warning	249494
1	Panel Assembly (includes the following)	A-250795
1	Connector Plug, 6 position	241617
1	Panel, remote	250796
1	Switch, rocker	269296
Panel, Remote Start PA-359581		
1	Decal, warning	249494
1	Panel Assembly (includes the following)	A-226965
1	Panel, control	226964
1	Harness, wiring	226979
1	Meter, run time	238736
1	Switch, rocker, 1 pole	249406

Accessories, continued

Qty.	Description	Part No.
	Paint, White (1 gallon can)	221334
	Paint, White (aerosol can)	221335
	Paint, White (touch-up bottle)	GM19490
	Panel, Remote Start and 2 Meter (12 V)	PA-344040
1	Instructions, installation	TT-1072
1	Decal, warning	249494
1	Panel Assembly (includes the following)	A-344033
1	Panel	344029
1	Harness, wiring	344031
1	Gauge, water temperature	344035
1	Gauge, oil pressure	344036
1	Switch, rocker	344039
	Panel, Remote Start and 4 Meter (12 V)	PA-344041
1	Instructions, installation	TT-1073
1	Decal, warning	249494
1	Panel Assembly (includes the following)	A-344034
1	Panel	344030
1	Harness, wiring	344032
1	Gauge, water temperature	344035
1	Gauge, oil pressure	344036
1	Voltmeter	344037
1	Switch, rocker	344039
1	Gauge, hourmeter	GM28392
1	Bezel, gauge	GM28393
1	Bulb, light	GM28394
1	Nut, hex	M934-04-B

Filters

	Sea Water Strainer	PA-359579
1	Filter, water, 1/2 in.	X-661-1
	Fuel Filter	GM14314-KP1
1	Filter, fuel, 1/4 in. NPT	267987
1	Adapter, pipe	278470
1	Connector, hose	X-652-3

Sender Kits

	Sender Kit	PA-359411
1	Sender, water temperature	249348
1	Sender, oil pressure	344305
1	Adapter, sender	359461
1	Instructions, installation	TT-1230

Ship-To-Shore Switch Kits

	Transfer Switch Kit	PAA-246614
1	Switch, transfer	344490
1	Instructions, installation	TT-535
	Transfer Switch Kit	PAA-246617
1	Switch, transfer	A-246617
1	Instructions, installation	TT-535

Qty.	Description	Part No.
	Siphon Break Kits	
	Siphon Break (genset without sound shield)	PA-229928
1	Instructions, installation	TT-1268
1	Valve, siphon break	229928
	Siphon Break (genset with sound shield)	PA-359413
1	Instructions, installation	TT-1184
2	Grommet, 7/8	X-284-7
1	Hose, .62 ID	X-312-42
2	Clamp, hose, 1.2-1 13/32	X-426-3
1	Valve, siphon break	229928
2	Connector, hose	344934
1	Hose, molded seawater	359414

Accessories, continued

Qty.	Description	Part No.
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Sound Shield Kits

Sound Shield Kit		359345
5	Screw, hex head, 10-24 x 5/8	X-117-5
5	Washer, plain	X-25-36
4	Washer, plain	X-25-37
5	Washer, plain	X-25-40
2	Clamp, hose	X-426-18
6	Screw	X-465-6
1	Channel, U	X-6047-27
1	Nut, whiz	X-6210-2
1	Hose	X-6251-2
1	Channel, U, 25.75"	X-6373-2
7	Rivet, pop	X-781-13
5	Screw, slotted h.c.	X-97-18
5	Washer, fiber	222889
1	Hose, connector, 1/4" x 2"	359250
1	Base, sound shield	359369
1	Duct, air outlet	359376
1	Foam, acoustical (kit)	359380
1	Insulation, acoustic	359389
1	Roof Subassembly, sound shield	359423
1	Decal, caution not-a-step	343165
3	Insert, threaded	344484
1	Roof, sound shield	359374
1	Insulation, acoustic	359383
4	Corner, sound shield	359394
3	Pin, threaded	359395
1	Insulation, acoustic	359424
1	Door Subassembly (LH)	359425
4	Washer, plain	X-25-6
4	Screw, flat head machine	X-31-9
4	Nut, hex	X-6234-8
1	Port, fire extinguisher	344147
1	Decal, warning	344435
1	Decal, warning	344436
2	Insert, threaded	344484
1	Door, sound shield	359372
1	Insulation, acoustic	359388
1	Latch	359393
2	Pin, threaded	359395
1	Door Subassembly, sound shield (front)	359426
2	Insert, threaded	344484
1	Door, sound shield	359373
1	Insulation, acoustic	359386
1	Latch	359393
2	Pin, threaded	359395
1	Insulation, acoustic	359397
1	Door Subassembly, sound shield (RH)	359427
2	Insert, threaded, 10-24	346258
1	Door, sound shield	359371
1	Insulation, acoustic	359387
1	Roof Subassembly, sound shield	359428
1	Grommet	X-6033-12
4	Rivet, pop	X-781-7
4	Insert, threaded	344484
1	Roof, sound shield	359377
1	Insulation, acoustic	359390
2	Corner, sound shield	359394
1	Support Subassembly	359429

Qty.	Description	Part No.
------	-------------	----------

Sound Shield Kit

Sound Shield Kit		359345
1	Grommet	X-284-44
2	Seal, push on trim	X-6422-6
1	Insert, threaded, 10-24	346258
1	Support, sound shield	359370
1	Insulation, acoustic	359381
1	Insulation, acoustic	359382
1	Housing Subassembly, alternate	359433
2	Grommet	D-1128
1	Channel, U	X-6047-27
1	Channel, U	X-6047-7
1	Decal	X-6348-6
1	Grommet	200705
3	Insert, threaded, 10-24	346258
1	Housing, alternator	359378
1	Insulation, acoustic	359384
1	Insulation, acoustic	359385
1	Insulation, acoustic	359391
1	Insulation, acoustic	359396
1	Panel Subassembly, access	359434
4	Rivet, pop	X-781-13
4	Clip, spring	344146
1	Panel, seawater pump access	359430
1	Insulation, acoustic foam	359432
4	Bracket Subassembly, sound	359435
1	Insert, threaded, 10-24	346258
1	Bracket, sound shield	359379


Accessories, continued

Qty.	Description	Part No.
Sound Shield Kit GM10056-KA1		
9	Screw, hex head (#10-24 x 0.625)	X-117-5
9	Washer, plain (0.219 x 0.5 x 0.049)	X-25-36
4	Washer, plain (0.406 x 0.812 x 0.065)	X-25-37
6	Washer, plain (0.281 x 0.625 x 0.065)	X-25-40
7	Bolt (1/4-20 x 0.50)	X-465-6
1	Nut, whiz (1/4-20)	X-6210-2
4	Bolt (3/8-16 x 0.62)	X-6238-2
3	Rivet, pop	X-781-13
5	Screw (#10-24 x 2.750)	X-97-18
7	Washer, plain (0.203 in. ID x 0.438 in. OD)	X-25-115
1	Duct, air outlet (15.38 x 7.83 in.)	GM21386
1	Roof, engine (23.98 x 18.10 in.)	GM22726
	Roof, engine (serial numbers before 722479)	359423
1	Door, service side (23.99 x 15.50 in.)	359425
1	Door, nonservice side (23.99 x 15.60 in.)	359427
1	Roof, alternator (18.10 x 6.46 in.)	359428
1	Support (15.62 x 15.70 in.)	359429
5	Bracket (1.06 x 0.81 in.)	359435
1	Panel, access (5.38 x 3.25 in.)	GM21384
1	Panel, access (3.61 x 1.94 in.)	GM21385
1	Housing, alternator (18.10 x 6.68 in.)	359627
1	Panel, seawater pump access (8.72 x 8.80 in.)	359628
1	Door, engine end (15.61 x 15.50 in.)	GM22724
	Door, engine end (includes latch) (serial numbers before 722479)	GM10062
1	Base (18.10 x 30.44 in.)	GM10290
2	Screw, hex head (#10-24 x 2.0)	X-97-14
1	Kit, Acoustic foam (include the following)	GM10055
1	Insulation, acoustic, 8.5 x 1.72 in.	359381
1	Insulation, acoustic, 10.88 x 2.5 in.	359382
1	Insulation	359383
1	Insulation, acoustic, 5.44 x 2.38 in.	359384
1	Insulation, acoustic, 10.38 x 5.44 in.	359385
1	Insulation	359387
1	Insulation, acoustic, 22.75 x 14.25 in.	359388
1	Insulation, acoustic, 7.08 x 3.34 in.	359389
1	Insulation	359390
1	Insulation	359391
1	Insulation	359396
1	Insulation, Acoustic Foam	359424
1	Insulation, Acoustic Foam	359432
1	Insulation, Acoustic Foam	359574
1	Insulation, Acoustic Foam	359626
2	Insulation, Acoustic Foam	GM10002
1	Insulation, Acoustic Foam	GM10053
1	Insulation, Acoustic Foam	GM10054
1	Insulation, Acoustic Foam	GM10289

Qty.	Description	Part No.
Miscellaneous Kits		
Lifting Eye Tool		PA-359572
1	Eye, lifting	359572
Oil Drain Extension Kit		GM10102-KA1
1	Panel, oil hose	GM10101
1	Hose, rubber, straight, .375 in.	X-651-15
1	Clamp, hose, .25/.70 in	X-426-9
1	Coupling, hose	X-582-9
1	Decal, drain	GM14167
1	Plug, pipe, 3/8 in. white nylon	X-75-55
Corrosion Protection Kit		GM29572-KP1
2	Spacer	X-400-255
2	Screw, slotted round head machine	X-51-41
2	Washer, plain, .154 ID x .31 in. OD	X-25-120
1	Cover, choke	GM29564
1	Cover, generator air inlet	GM29550
1	Tray, drip	GM29571

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 fur 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 ₂ 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 ¹⁰ bytes)	MW	megawatt	rnd.	round
kg	kilogram	mW	milliwatt	ROM	read only memory
kg/cm ²	kilograms per square centimeter	μF	microfarad	rot.	rotate, rotating
kgm	kilogram-meter	N, norm.	normal (power source)	rpm	revolutions per minute
kg/m ³	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 ³	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 _{wa}	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 ⁶ when used with SI units), male	PHH	Phillips hex head (screw)	tol.	tolerance
m ³	cubic meter	PHM	pan head machine (screw)	turbo.	turbocharger
m ³ /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 ²⁰ 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.

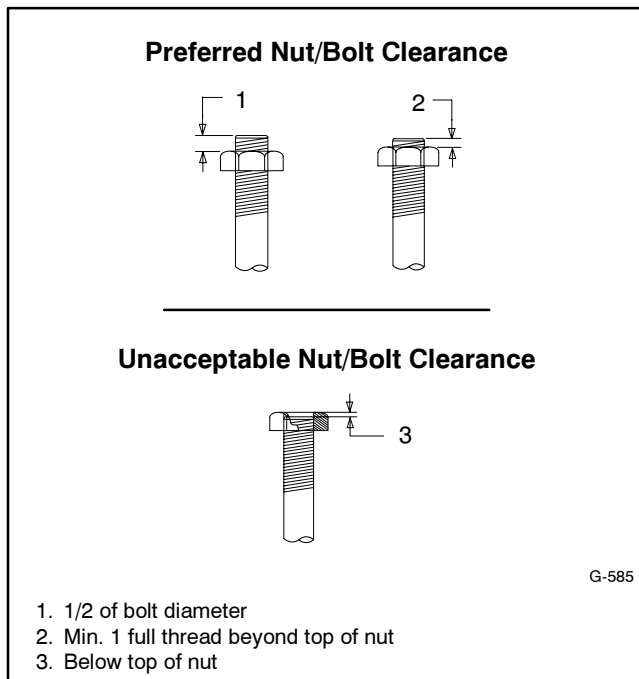


Figure 1 Acceptable Bolt Lengths

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.

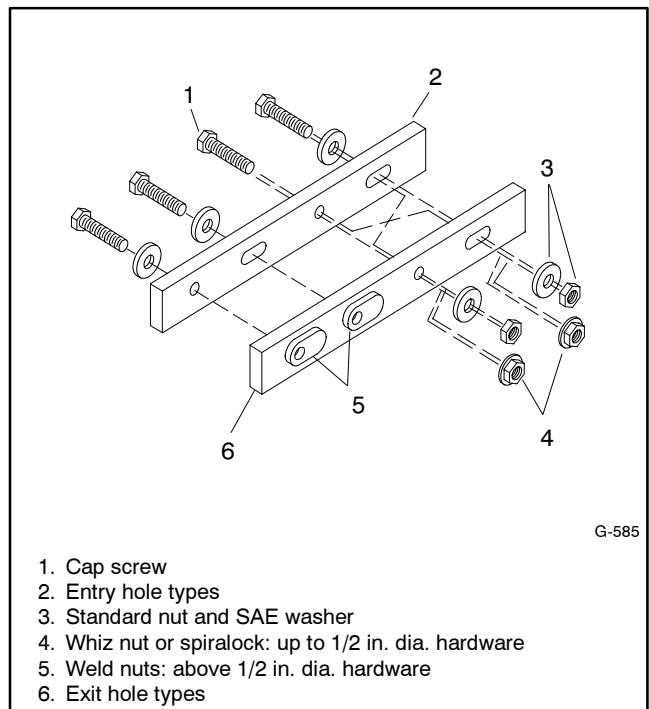


Figure 2 Acceptable Hardware Combinations

Appendix C General Torque Specifications















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%.





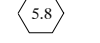
American Standard Fasteners Torque Specifications					
Size	Torque Measurement	Assembled into Cast Iron or Steel			Assembled into Aluminum Grade 2 or 5
		Grade 2	Grade 5	Grade 8	
8-32	Nm (in. lb.)	1.8 (16)	2.3 (20)	—	1.8 (16)
10-24	Nm (in. lb.)	2.9 (26)	3.6 (32)	—	2.9 (26)
10-32	Nm (in. lb.)	2.9 (26)	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	

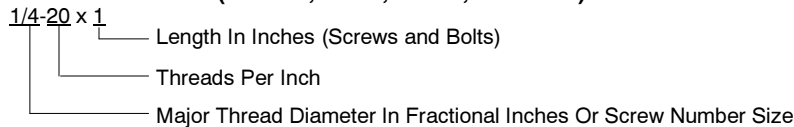
Hardness Grades	
American Standard	
Grade 2	
Grade 5	
Grade 8	
Grade 8/9 (Hex Socket Head)	
Metric	
Number stamped on hardware; 5.8 shown	

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

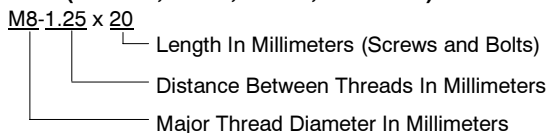
Phillips® screw is a registered trademark of Phillips Screw Company.

Sample Dimensions

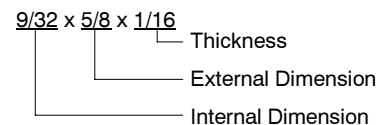
American Standard (Screws, Bolts, Studs, and Nuts)



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 Hex Head Bolts (Grade 5)

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

Part No. Dimensions Hex Head Bolts, cont.

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

Part No. Dimensions Type

Hex Nuts

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

Washers

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

Metric

Hex head bolts are hardness grade 8.8 unless noted.

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

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

Metric, continued

Part No.	Dimensions	Type
Hex Nuts		
M934-03-50	M3-0.50	Standard
M934-04-50	M4-0.70	Standard
M934-05-50	M5-0.80	Standard
M982-05-60	M5-0.80	Elastic Stop
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-5987 4/03c

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