

Service Parts

Residential/Commercial Generator Sets



Models:

12RESL/12RESM1

12RESNT

KOHLER®
POWER SYSTEMS

ISO 9001
KOHLER
POWER SYSTEMS
NATIONALLY REGISTERED

TP-6399 3/12c

Common Replacement Parts

Figure 1 identifies 2000-hour common replacement parts for your generator set. Refer to the groups on the following pages for a complete list of maintenance and service parts.

Description	Part Number	Quantity
Sensor, oil temperature	GM28823	1
Filter, oil	12 050 01-S	8
Switch, oil pressure	25 099 26-S	1
Spark plug	12 132 02-S	2
Kit, starter solenoid	25 435 06-S	1
Element, air filter	24 083 09-S	1
Fuse, 20 A, 250 V	292937	5
Fuse, 10 A, 250 V	223316	5
PCB Assy., relay board, 12 V	GM29671	1

Figure 1 2000-Hour Replacement Parts

Figure 2 identifies paint available from the factory.

Color Description	Part Number		
	Touch-up Bottle	Spray Can	Gallon
Cream Beige	N/A	GM71383	GM71387
Sage Green	GM50484	N/A	N/A
Textured KCB (Cream Beige)	GM83001	GM82834	GM82835
Textured Black	GM83002	GM82836	N/A
Textured Cashmere	GM84772	GM84771	N/A

Figure 2 Factory-Available Paint

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Introduction

This manual lists service replacement parts for 12RESL/RESM1/12RESNT generator sets.

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

This manual includes the following main sections:

Table of Contents. Lists the sections of the manual.

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

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

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

Kit Sections. List modules and accessories and their parts.

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

Numbering System Significance

This manual uses the following numbering systems:

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

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

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

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

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.

How to Find Part Numbers

Use the following steps to locate a service replacement part.

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

Hardware References

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

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

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

Specification Number Index

Group Title	<i>Crankshaft</i>	<i>Crankcase</i>	<i>Oil Pan/Lubrication</i>	<i>Cylinder Head/Valve/Breather</i>	<i>Ignition/Electrical</i>	<i>Blower Housing & Baffles</i>	<i>Starting System</i>	<i>Carburetor</i>	<i>Engine Controls</i>	<i>Air Intake/Filtration</i>	<i>Exhaust</i>	<i>Engine Decals</i>
Group No.	1	2	3	4	5	6	7	8	9	10	11	12
Spec No.	Variation Number											

12RESL/12RESM1												
GM39503-SA1	35	206	609	350	839	260	5	610	334	217	6	627
GM39503-SA2	35	206	609	350	839	260	5	610	334	2	6	627
GM39503-SA3	35	206	609	350	839	260	5	610	334	217	6	627
GM39503-SA4	35	206	609	350	839	260	5	610	334	2	6	627
GM39503-SA6	35	206	609	350	839	260	5	610	334	217	6	627
GM39503-SA7	35	206	609	350	839	260	5	610	334	2	6	627
GM39503-SA8	35	206	609	350	839	260	5	610	334	217	6	627
GM39503-SA9	35	206	609	350	839	260	5	610	334	2	6	627
GM39503-SA10	35	206	609	350	839	260	5	610	334	217	6	627
GM39503-SA11	35	206	609	350	839	260	5	610	334	2	6	627
GM39503-SA12	35	206	609	350	839	260	5	610	334	217	6	627
GM39503-SA13	35	206	609	350	839	260	5	610	334	2	6	627
GM39503-SA14	35	206	609	350	839	260	5	610	334	217	6	627
GM39503-SA15	35	206	609	350	839	260	5	610	334	2	6	627
GM39503-SA16	35	206	609	350	839	260	5	610	334	217	6	627
GM39503-SA17	35	206	609	350	839	260	5	610	334	2	6	627
12RESNT												
12RESNT-SA1	35	206	609	350	839	260	5	610	334	217	6	627
12RESNT-SA2	35	206	609	350	839	260	5	610	334	217	6	627

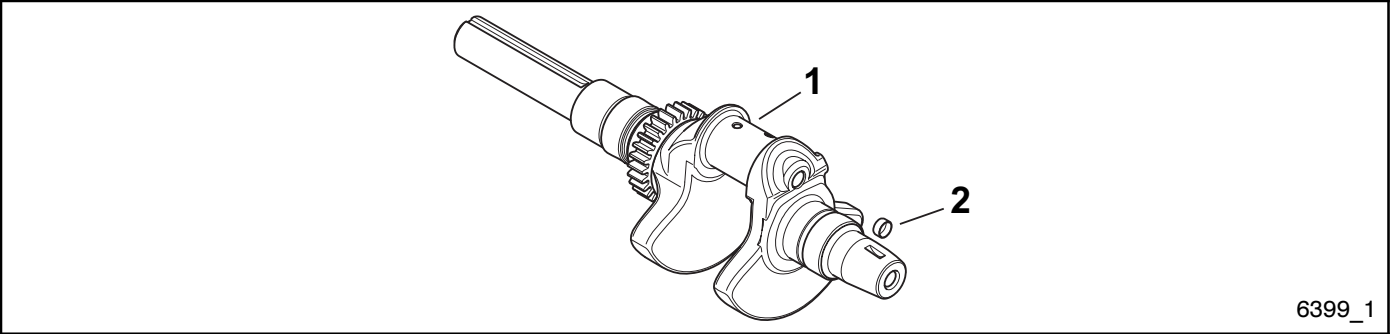
Specification Number Index

Group Title	Fuel System	Engine	Nameplate and Decals	Skid and Plant Mounting	Generator and Mounting	Controller and Mounting	Housing and Mounting	Prewire kit	Carburetor Heater	Literature
Group No.	103	105	107	109	201	301	501a	501b	501c	701
Spec No.	Variation Number									

12RESL/12RESM1										
GM39503-SA1	1	1	1	1	1	1	1	1	-	15
GM39503-SA2	1	1	1	1	1	1	1	1	1	15
GM39503-SA3	1	1	1	1	1	1	2	1	-	15
GM39503-SA4	1	1	1	1	1	1	2	1	1	15
GM39503-SA6	2	1	1	1	1	2	1	-	-	29
GM39503-SA7	2	1	1	1	1	2	1	-	1	29
GM39503-SA8	2	1	1	1	1	2	2	-	-	29
GM39503-SA9	2	1	1	1	1	2	2	-	1	29
GM39503-SA10	2	1	*	1	1	2	*	-	-	29
GM39503-SA11	2	1	*	1	1	2	*	-	1	29
GM39503-SA12	2	1	*	1	1	2	*	-	-	29
GM39503-SA13	2	1	*	1	1	2	*	-	1	29
GM39503-SA14	2	1	*	1	1	3	*	-	-	50
GM39503-SA15	2	1	*	1	1	3	*	-	1	50
GM39503-SA16	2	1	*	1	1	3	*	-	-	50
GM39503-SA17	2	1	*	1	1	3	*	-	1	50
12RESNT										
12RESNT-SA1	2	1	1	1	1	2	1	-	-	30
12RESNT-SA2	2	1	*	1	1	2	*	-	-	30

* Configured group. Refer to the generator set nameplate for the module number.
Turn to the respective group on the following pages for parts breakdowns.

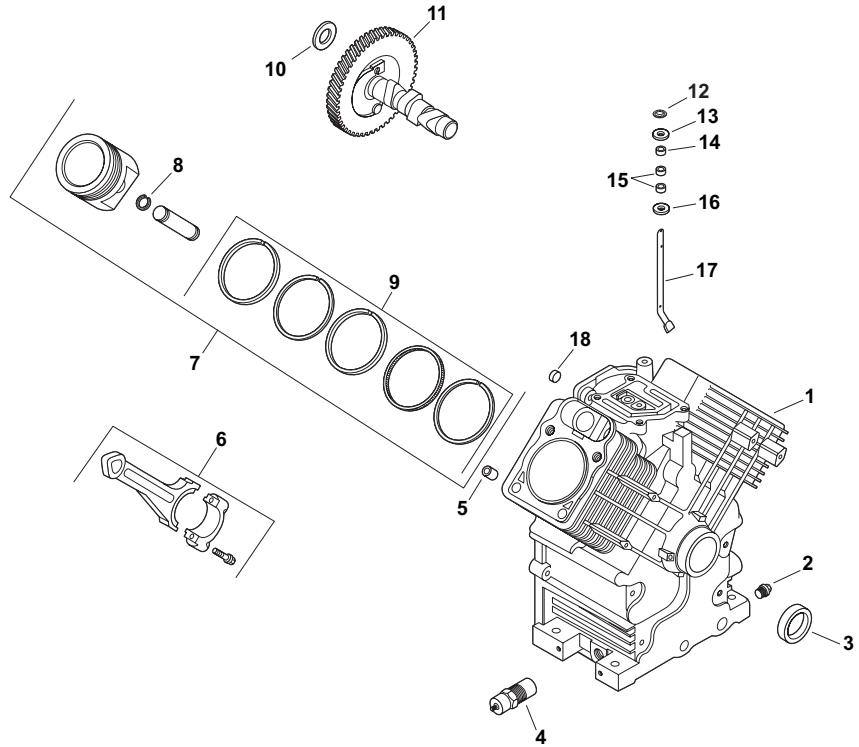
Group 1: Crankshaft



6399_1

Item	Part Number	Description	Quantity
			Variation
1	24 014 106-S	Crankshaft	35
2	52 139 09-S	Plug, cup	1

Group 2: Crankcase



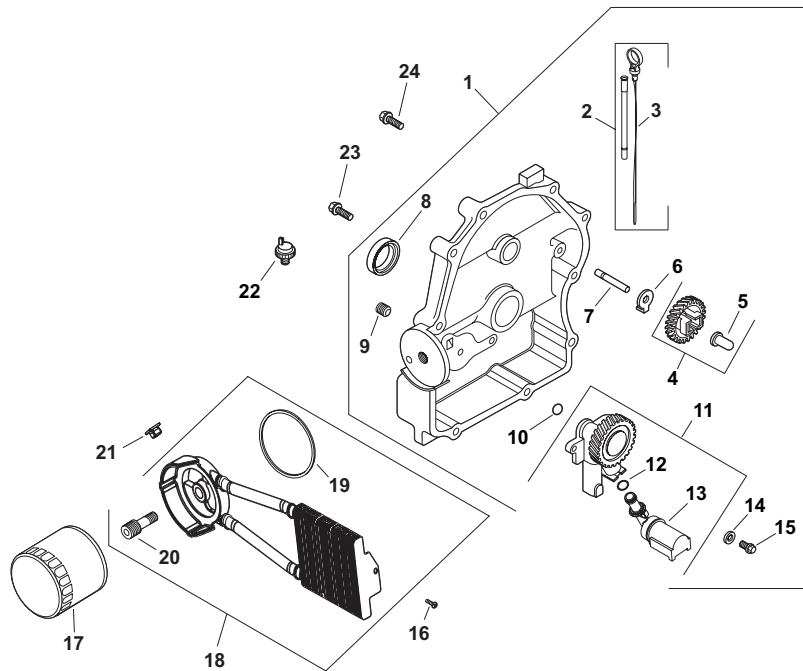
Illustrated parts without item reference numbers
(the piston, for example) are not sold separately.

Item 19 is not shown.

6399_2

Item	Part Number	Description	Quantity
			Variation 206
1	—	Crankcase (service with miniblock 24 782 34)	
2	25 139 57-S	Plug, square head solid, 3/8 in.	1
2	25 139 60-S	Plug, hex countersunk, 1/8 in.	1
3	24 032 01-S	Seal, oil	1
4	GM28823	Sensor, oil temperature	1
5	24 380 16-S	Pin, locating	6
6	24 067 16-S	Rod assembly, connecting, standard	2
6	24 067 14-S	Rod, connecting, 0.25 U/S	2
7	24 874 08-S	Piston w/ring set, standard	2
7	24 874 16-S	Piston w/ring set, 0.08	1
7	24 874 20-S	Kit, piston and rings, 0.25	1
7	24 874 21-S	Kit, piston and rings, 0.50	1
8	24 018 01-S	Retainer, piston pin	4
9	24 108 05-S	Ring set, standard and 0.08	2
9	24 108 06-S	Ring set, 0.25	2
9	24 108 07-S	Ring set, 0.50	2
10	12 422 07-S	Shim, camshaft, white	1
10	12 422 08-S	Shim, camshaft, blue	1
10	12 422 09-S	Shim, camshaft, red	1
10	12 422 10-S	Shim, camshaft, yellow	1
10	12 422 11-S	Shim, camshaft, green	1
10	12 422 12-S	Shim, camshaft, gray	1
10	12 422 13-S	Shim, camshaft, black	1
11	24 012 18-S	Kit, camshaft	1
12	24 018 09-S	Ring, retainer	1
13	M-931010-S	Washer, flat, 9 mm	1
14	28 032 09-S	Seal, governor cross shaft	1
15	28 030 05-S	Bearing, needle	2
16	24 468 15-S	Washer, flat, 11/32 in.	1
17	24 144 39-S	Shaft, governor cross	1
18	52 139 09-S	Plug, cup	1
19	25 158 18-S	Bushing, reducing (not shown)	1

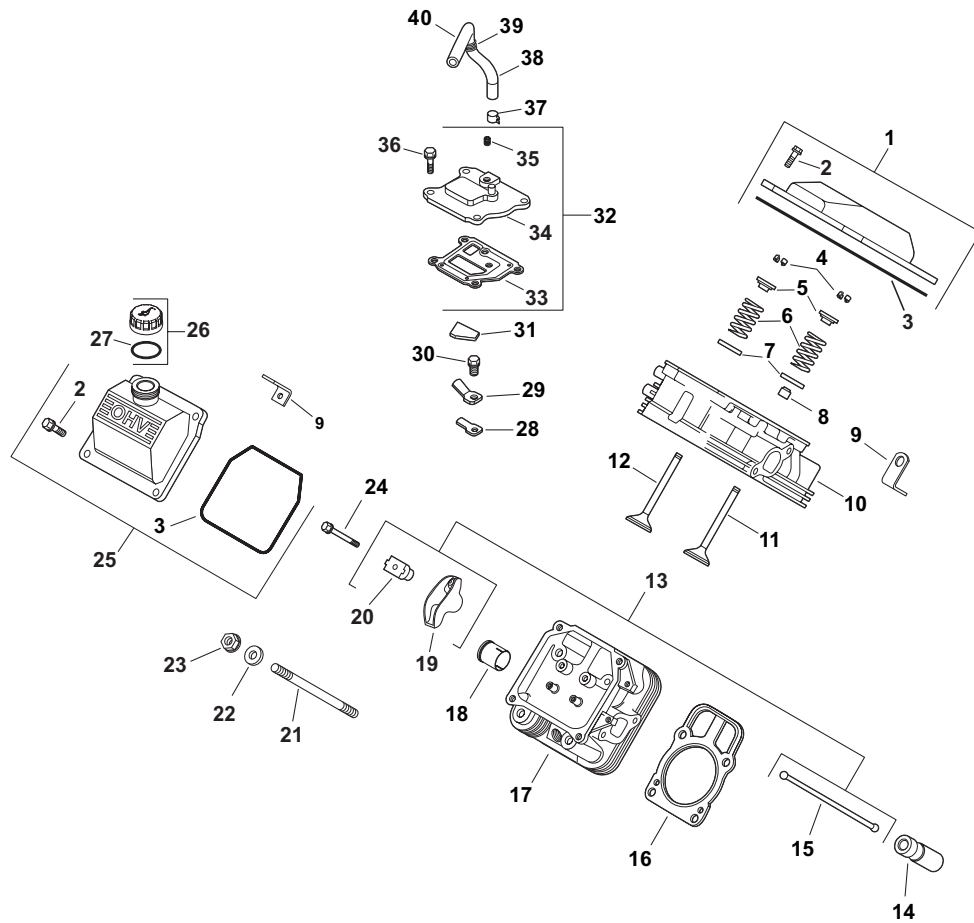
Group 3: Oil Pan/Lubrication



6399_3

Item	Part Number	Description	Quantity
			Variation 609
1	24 009 92-S	Kit, closure plate assembly	1
2	24 755 121-S	Kit, dipstick/dipstick tubes (includes item 3)	1
3	24 038 10-S	Dipstick	1
4	24 043 12-S	Kit, governor gear w/pin (includes item 5)	1
5	12 380 01-S	Pin, governor regulating	1
6	24 448 02-S	Tab, locking	1
7	12 144 02-S	Shaft, governor gear	1
8	52 032 08-S	Seal, oil (PTO end)	1
9	25 139 60-S	Plug, hex countersunk, 1/8 in.	1
10	24 153 08-S	O-ring	1
11	24 393 51-S	Kit, oil pump assembly (includes items 12, 13)	1
12	24 153 01-S	O-ring	1
13	24 381 04-S	Pickup, oil	1
14	M-631005-S	Washer, flat, 6 mm	2
15	M-645025-S	Screw, flange thread forming, M6 x 1.0 x 25	2
16	24 086 12-S	Screw, hex cap, M6 x 1.7 x 18	2
17	12 050 01-S	Filter, oil	1
18	54 755 21-S	Kit, alum base oil cool	1
19	24 153 21-S	O-ring, oil cooler	1
20	24 136 05-S	Nipple, oil filter	1
21	24 100 01-S	Nut, plastic	2
22	25 099 26-S	Switch, oil pressure	1
23	24 086 16-S	Screw, flange, M8 x 1.25 x 45	9
24	24 086 17-S	Screw, flange, M8 x 1.25 x 45	1

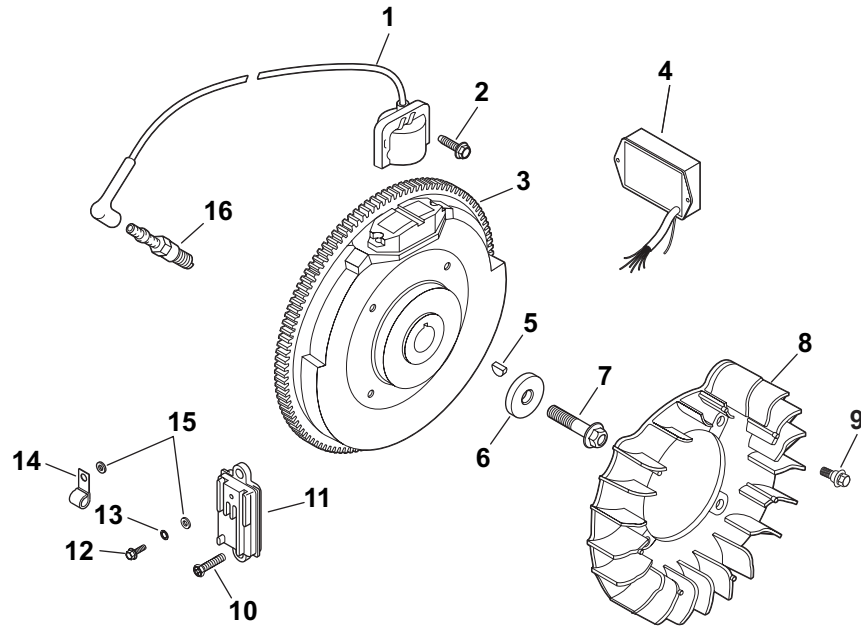
Group 4: Cylinder Head/Valve/Breather



6399_4

Item	Part Number	Description	Qty Var 350	Item	Part Number	Description	Qty Var 350
1	24 755 141-S	Kit, valve cover-plain (includes items 2, 3)	1	21	24 072 09-S	Stud	8
2	M-651030-S	Screw, flange, M6 x 1.0 x 30	4	22	24 468 16-S	Washer, flat	8
3	24 153 28-S	O-ring	2	23	24 100 10-S	Nut, hex flange	8
4	12 755 03-S	Kit, retainer	2	24	M-640034-S	Screw, flange, M6 x 1.0 x 34	2
5	12 173 01-S	Cap, valve spring	2	25	24 755 140-S	Kit, oil fill rocker cover	1
6	24 089 02-S	Spring, valve	2	26	24 755 46-S	Kit, oil fill cap (includes 26)	1
7	235011-S	Retainer, spring	2	27	25 153 02-S	O-ring	1
8	66 032 05-S	Seal, valve stem	2	28	24 402 03-S	Reed, breather	1
9	12 445 05-S	Strap	2	29	66 018 04-S	Retainer, reed	1
10	24 318 92-S	Kit, cylinder head assembly	1	30	M-545010-S	Screw, flange thread forming, M5 x 0.8 x 10	1
11	24 017 01-S	Valve, intake, standard	2	31	24 050 01-S	Filter, breather	1
12	24 016 01-S	Valve, exhaust, standard	2	32	24 033 01-S	Kit, breather w/plug (includes 33-35)	1
12	24 016 02-S	Valve, exhaust, 0.25	2	33	24 041 51-S	Gasket, breather	1
13	24 755 66-S	Kit, valve train	1	34	24 096 86-S	Cover, breather	1
14	25 351 04-S	Kit, hydraulic valve lifter	4	35	25 139 60-S	Plug, pipe, 1/8 NPTF hex countersunk	1
15	24 411 05-S	Rod, push	2	36	M-645020-S	Screw, thread forming, M6 x 1.0 x 20	4
16	24 841 03-S	Kit, cylinder head gasket (includes 22, 23)	2	37	25 237 14-S	Hose clamp	1
17	24 318 94-S	Kit, cylinder head assembly	1	38	24 326 24-S	Hose, breather	1
18	24 605 01-S	Liner, exhaust port	2	39	24 294 06-S	Fitting	1
19	25 186 01-S	Arm, rocker	2	40	24 326 13-S	Hose, breather	1
20	24 599 02-S	Pivot, rocker arm	2	—	24 755 147-S	Kit, cylinder head hardware (includes 4-8, 11, 12, 15, 19, 20, 23)	1

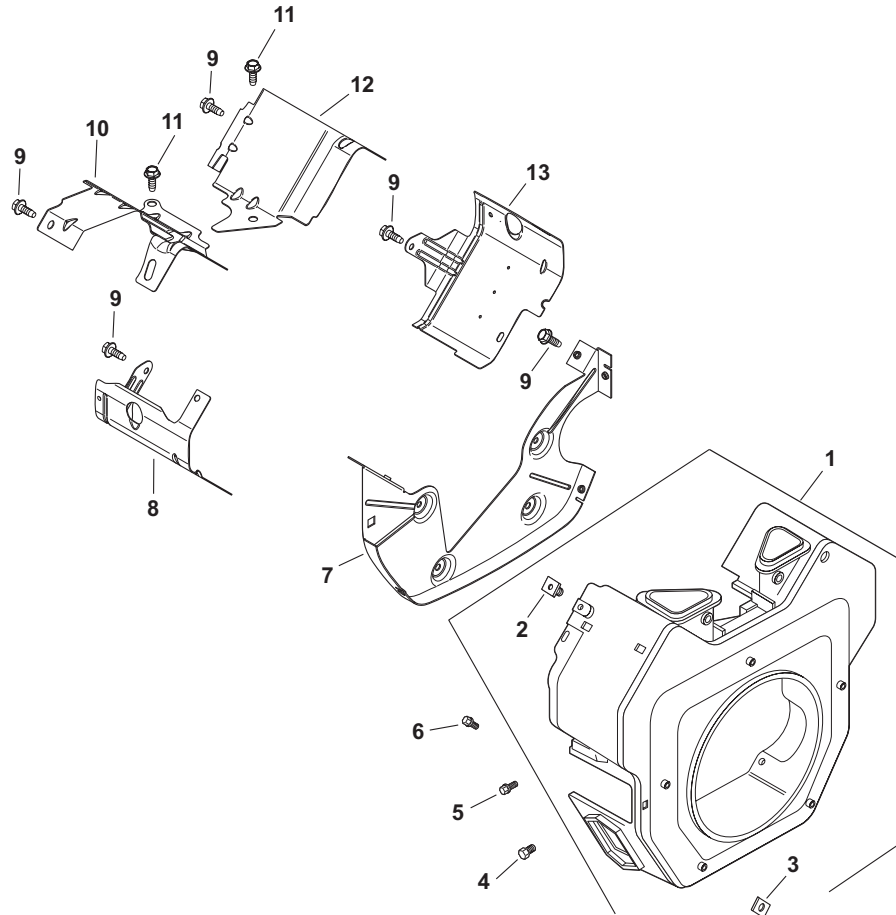
Group 5: Ignition Charging



6399_5

Item	Part Number	Description	Quantity
			Variation 839
1	24 584 36-S	Module, ignition	2
2	M-545020-S	Screw, flange thread forming, M5 x 0.8 x 20	4
3	24 025 15-S	Flywheel	1
4	24 584 34-S	Kit, module DSAM	1
5	X-42-15-S	Key	1
6	12 468 03-S	Washer, flat, 3/8 in.	1
7	12 086 14-S	Screw, flange, M10 x 1.5 x 45	1
8	24 157 07-S	Fan	1
9	25 086 47-S	Bolt, shoulder	4
10	24 086 18-S	Screw, phillips head, 11-16 x 7/8	2
11	25 096 04-S	Cover	1
12	M-551016-S	Screw, hvy flange, M5 x 0.8 x 16	1
13	X-22-11-S	Washer, int. tooth lock, 1/4 in.	1
14	47 154 01-S	Clip, cable	1
15	X-25-63-S	Washer, plain, 1/4 in.	2
16	12 132 02-S	Spark plug	2
—	12 454 03-S	Tie, cable (not shown)	1
—	24 176 90-S	Harness, wiring (not shown)	1
—	25 454 03-S	Tie, wire (not shown)	2

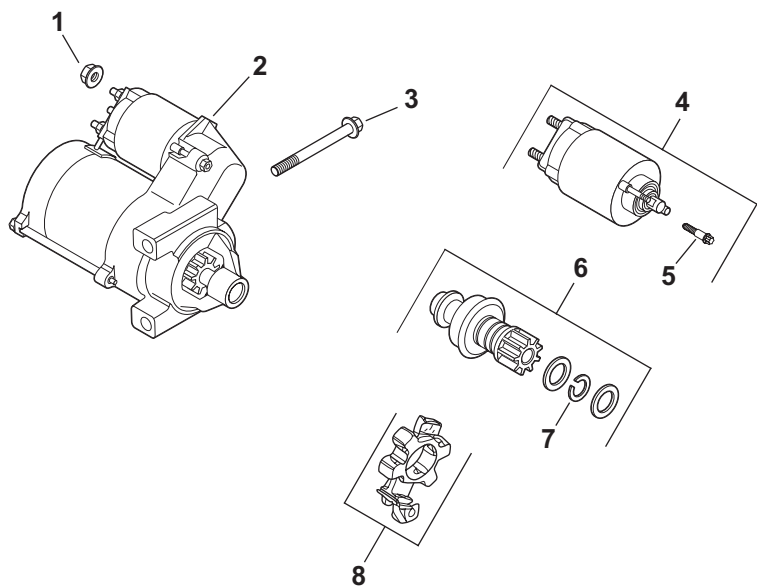
Group 6: Blower Housing and Baffles



6399_6

Item	Part Number	Description	Quantity
			Variation 260
1	24 027 195-S	Kit, blower housing assembly (includes items 2 and 3)	1
2	24 100 01-S	Nut, plastic	3
3	24 100 02-S	Nut, plastic	2
4	M-561016-S	Screw, flange thread forming, M5 x 0.8 x 16	1
5	M-545016-S	Screw, flange thread forming, M5 x 0.8 x 16	2
6	M-545020-S	Screw, flange thread forming, M5 x 0.8 x 20	4
7	24 146 53-S	Plate, backing	1
8	24 063 39-S	Baffle, left barrel	1
9	M-645016-S	Screw, flange thread forming, M6 x 1.0 x 16	6
10	24 063 70-S	Baffle, valley #2 side	1
11	M-545010-S	Screw, flange thread forming, M5 x 0.8 x 10	2
12	24 063 59-S	Baffle, valley #1	1
13	24 063 58-S	Baffle, right barrel	1
1	25 154 11-S	Clip, repair, U-bolt speed nut (not shown)	1
—	41 037 10-S	Nameplate, service (not shown)	1

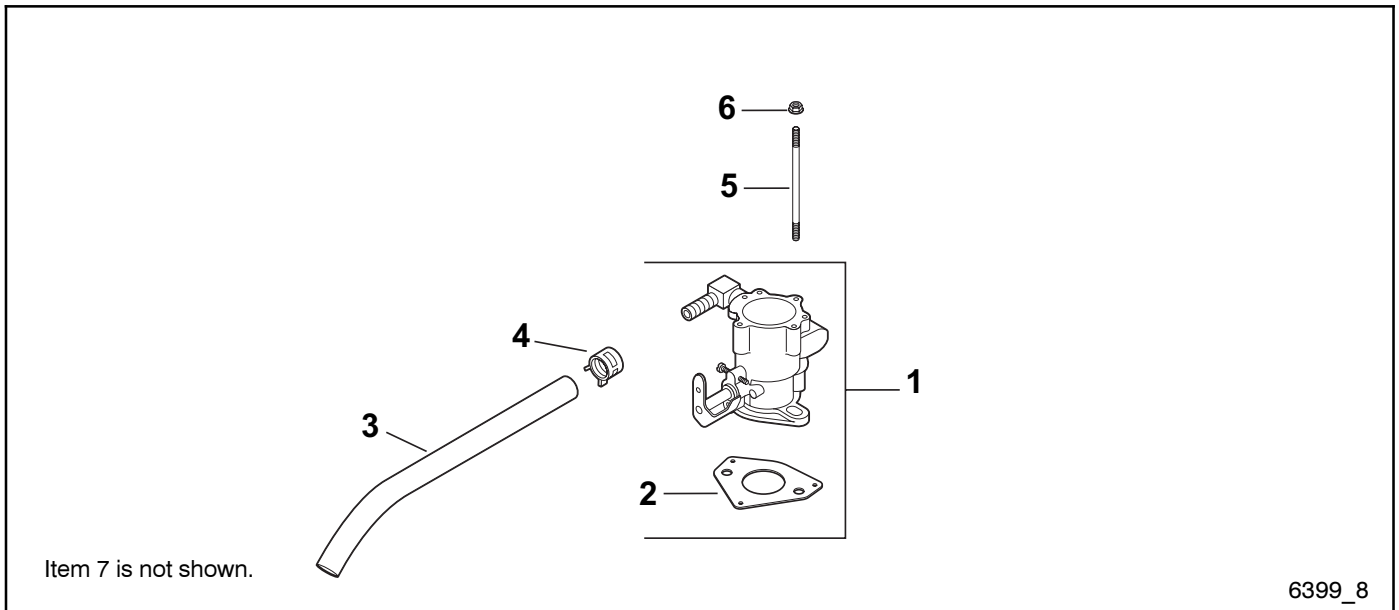
Group 7: Starter



6399_7

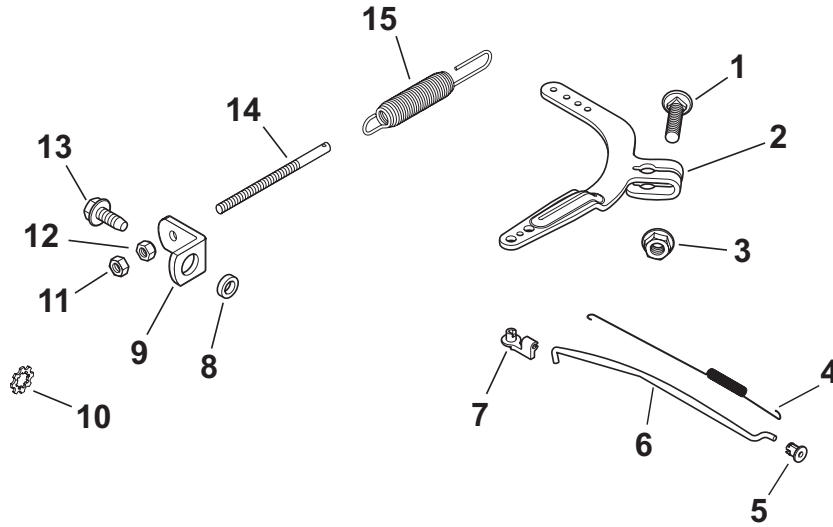
Item	Part Number	Description	Quantity
			Variation
1	M-841080-S	Nut, hex flange, M8 x 1.25	5
2	25 098 09-S	Starter, solenoid shift (includes items 4-8)	1
3	M-839080-S	Screw, flange, M8 x 1.25 x 80	2
4	25 435 06-S	Solenoid assembly	1
5	25 086 113-S	Screw, external torx head	3
6	25 755 33-S	Kit, starter pinion	1
7	25 141 05-S	Ring	1
8	25 221 01-S	Brush, holder	1

Group 8: Carburetor



Item	Part Number	Description	Quantity
			Variation 610
1	24 853 89-S	Kit, carburetor w/gaskets	1
2	24 041 52-S	Gasket, carburetor	1
3	24 353 40-S	Line, LP fuel, 29 in.	1
4	25 237 12-S	Clamp, hose	1
5	M-629105-S	Stud, M6 x 1 x 106	2
6	M-641060-S	Nut, hex flange, M6 x 1.0	2
7	25 431 15-S	Sleeve, anti-abrasion (not shown)	1

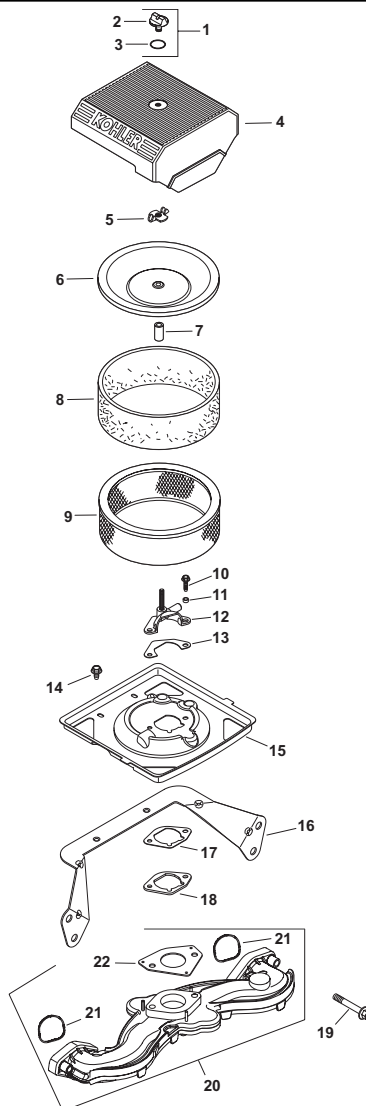
Group 9: Engine Controls



6399_9

Item	Part Number	Description	Quantity
			Variation 334
1	24 211 03-S	Bolt, round head, square neck, M6 x 1.0 x 25	1
2	24 090 33-S	Lever, governor	1
3	M-641060-S	Nut, hex flange, M6 x 1.0	1
4	24 089 01-S	Spring, linkage	1
5	25 158 08-S	Bushing, linkage retaining	1
6	24 079 04-S	Linkage, throttle	1
7	25 158 11-S	Bushing, throttle linkage	1
8	25 431 01-S	Spacer	1
9	47 126 32-S	Bracket	1
10	X-22-12-S	Washer	1
11	25 100 18-S	Nut, hex machine screw #10-32	1
12	25 100 06-S	Nut, adjusting	1
13	M-645016-S	Screw, flange thread forming, M6 x 1.0 x 16	1
14	24 411 03-S	Rod, speed control	1
15	24 089 44-S	Spring, governor	1

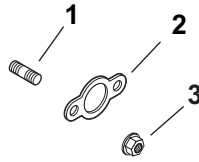
Group 10: Air Intake/Filtration



6399_10

Item	Part Number	Description	Quantity	
			Variation	
			217	2
1	54 755 01-S	Kit, knob w/seal	1	1
2	25 341 04-S	Knob, air cleaner cover	1	1
3	24 153 20-S	O-ring	1	1
4	24 096 67-S	Cover, air cleaner	1	1
5	12 100 01-S	Nut, wing	1	1
6	24 096 01-S	Cover, inner air cleaner	1	1
7	231032-S	Seal	1	1
8	24 083 02-S	Precleaner	1	1
9	24 083 09-S	Element, air filter	1	1
10	M-545020-S	Screw, flange thread forming, M5 x 0.8 x 20	2	
10	—	Screw (see Group 501c)		2
11	52 112 12-S	Spacer	2	
11	—	Spacer (see Group 501c)		2
12	24 109 25-S	Cup, fuel spitback w/nipple	1	1
13	24 041 13-S	Gasket, fuel spitback	1	1
14	M-545016-S	Screw, flange thread forming, M5 x 0.8 x 16	2	2
15	24 094 42-S	Base, air cleaner	1	1
16	24 126 130-S	Bracket, air cleaner	1	1
17	24 041 14-S	Gasket, air cleaner base	2	
18	24 112 11-S	Spacer, air cleaner base	1	
19	M-651040-S	Screw, flange, M6 x 1.0 x 40	4	4
20	24 164 51-S	Manifold, intake	1	1
21	24 153 27-S	O-ring, intake port	2	2
22	24 041 52-S	Gasket, carburetor	1	1

Group 11: Exhaust



6399_11

Item	Part Number	Description	Quantity
			Variation
			6
1	25 072 04-S	Stud, M8 x 1.25 x 33	4
2	24 041 49-S	Gasket, exhaust manifold	2
3	M-841080-S	Nut, hex flange, M8 x 1.25	4

Group 12: Engine Decals

Decals are not illustrated.

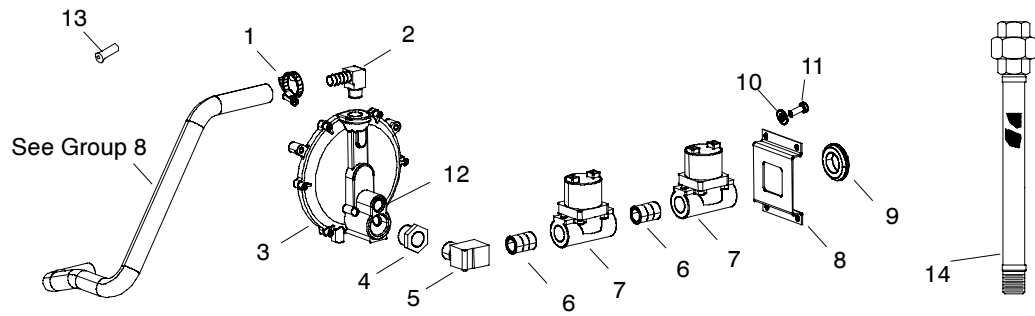
Item	Part Number	Description	Quantity
			Variation
			627
1	24 113 25-S	Decal, oil cooler maintenance	1
2	25 113 05-S	Decal, oil sentry	1
3	25 113 32-S	Label, CO warning	1
4	25 113 39-S	Decal, clear laminate	1

Group 13: Gasket Set

Gasket set not illustrated.

Item	Part Number	Description	Quantity
			Variation
			1
1	24 755 158-S	Kit, gasket set	1

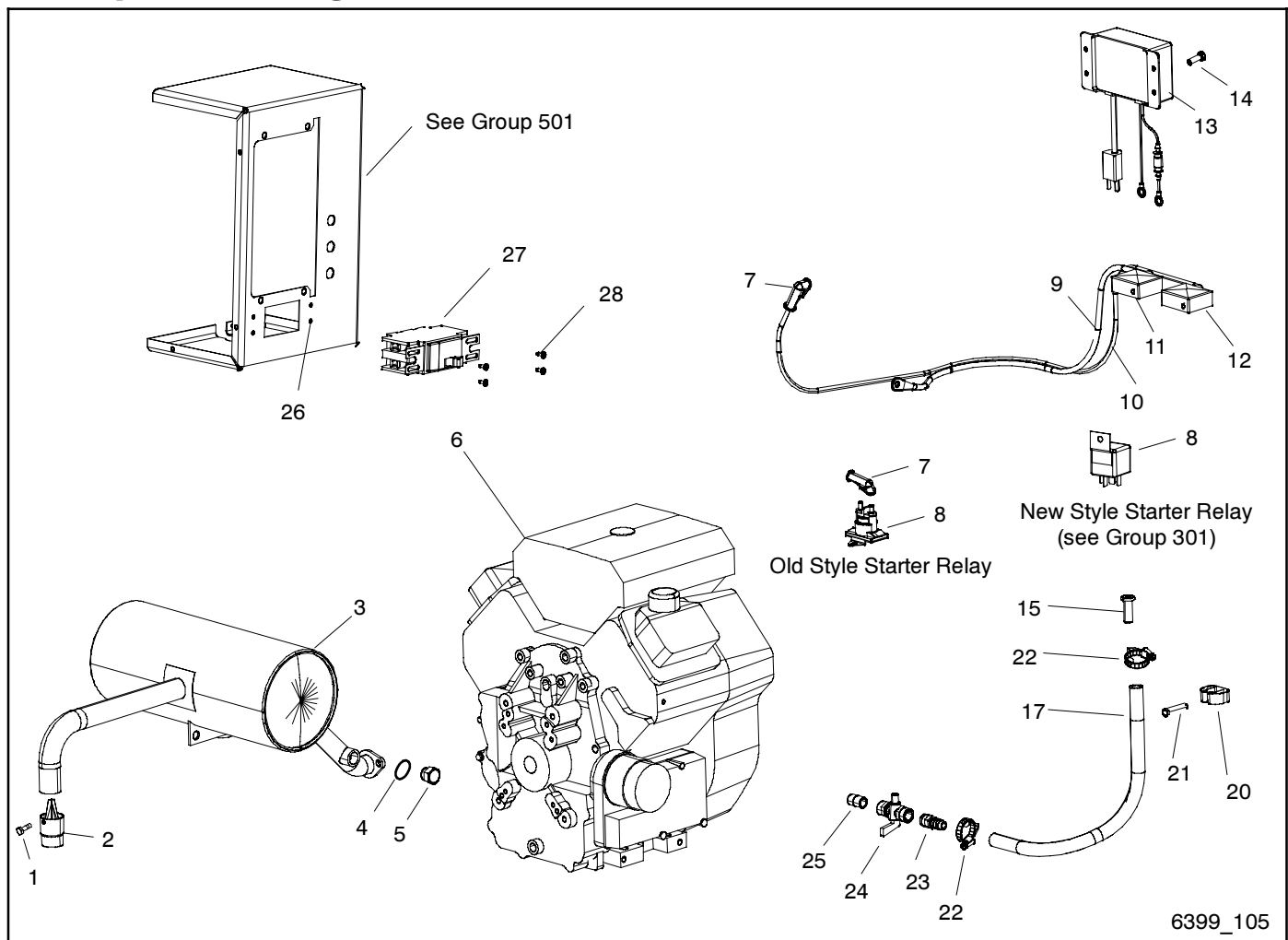
Group 103: Fuel System



6399_103

Item	Part Number	Description	Quantity	
			Variation 1	Variation 2
1	X-426-3	Clamp, hose, 0.56/1.06 in.	1	1
2	24 294 24-S	Fitting, elbow	1	1
3	GM58812	Regulator, gas	1	1
4	X-202-41	Bushing, reducing, 1/2 x 3/4 in. NPT	1	1
5	X-211-3	Elbow, street, 90 deg. x 1/2 in. NPTF	1	1
6	X-209-2	Pipe, 1/2 in. NPT x 1.19 in.	2	1
7	GM39554	Valve, gas shutoff	2	1
8	GM31888	Plate, gas solenoid retainer	1	1
9	X-284-3	Grommet, round	1	1
10	X-25-36	Washer, plain	4	4
11	X-50-15	Screw, pan head, 10-24 x 1/2	4	4
12	X-75-51	Plug, pipe, 1/4 in. NPTF	1	1
13	24 337 35-S	Jet, LP fuel	1	1
14	X-504-1	Fuel line, flexible, 0.50 in. ID x 12 in.	1	1

Group 105: Engine



Item	Part Number	Description	Qty. Var.
1	X-6216-1	Screw, tapping	1
2	GM39500	Arrester, spark	1
3	GM29353	Silencer, exhaust SISO	1
4	358306	Gasket	1
5	358224	Plug, water	1
6	GM39594	Engine, CH740EP (see Groups 1-12 for parts)	1
7	238915	Boot	3
8	GM50772	Relay service kit for 345079	1
8	—	Relay (new style) See Group 301	1
9	X-545-172	Cable, battery	1
10	X-545-134	Cable, battery, No.4 x 44 in., red +	1
11	GM20748	Boot, battery lug	1
12	GM33146	Boot, battery lug	1
13	GM28341	Charger, battery 12V-6A float equalizer	1
14	346258	Insert, threaded, #10-24	4

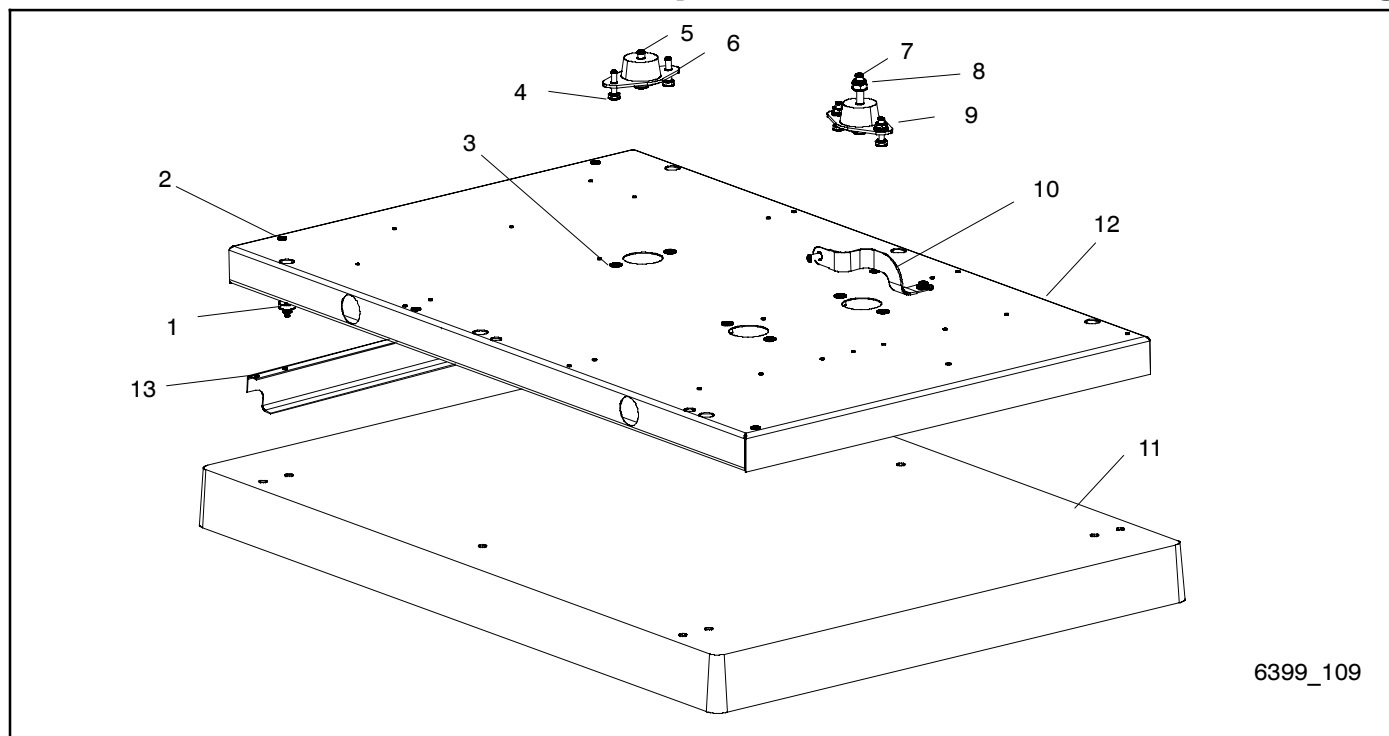
Item	Part Number	Description	Qty. Var.
14	X-50-15	Screw, pan head, 10-24 x 1/2	4
15	GM20547	Plug, hose, 3/8	1
16	X-309-11	Clamp, hose, 3/4	1
17	X-651-3	Hose, rubber	1
20	345045	Clip, hose	1
21	M933-06010-60	Bolt, hex head	1
22	X-426-9	Clamp, hose, 0.25/0.70 in.	2
23	X-216-23	Coupling, pipe	1
24	359653	Valve, oil drain	1
25	X-204-9	Pipe, 3/8 in. NPT x 1.00 in.	1
26	—	Clip, speed (see Group 301)	4
27	—	Breaker, circuit (see Group 301)	1
28	—	Screw (see Group 301)	4
—	GM28823	Sensor, temperature (see Group 2 for location)	1

Group 107: Nameplate and Decals

Nameplate and Decals are not illustrated.

Item	Part Number	Description	Quantity	
			Variation 1	Module GM60801-MA4
1	224233	Decal, 1-800 number	1	1
3	249808	Decal, warning rotating parts	1	1
4	249809	Decal, caution hot engine	2	2
5	GM12070	Nameplate, Kohler	1	1
6	239789	Decal, notice, neutral bonded to frame	1	1
7	255882	Decal, caution stdby svc connect	1	1
8	X-6348-8	Decal, Kohler Power Systems	1	1
9	GM47407	Decal, fuel type	1	1
10	294520	Decal, danger high voltage	1	
11	GM29924	Decal, notice fuel connection	1	1
12	GM15301	Decal, power breaker	1	
13	257438	Decal, danger moving rotor	1	1
14	GM15299	Decal, rainproof enclosure	1	1
15	GM39492	Decal, fuse panel	1	
16	GM15296	Decal, UL	1	
17	GM20172	Decal, unbalanced load	1	

Group 109: Skid and Plant Mounting

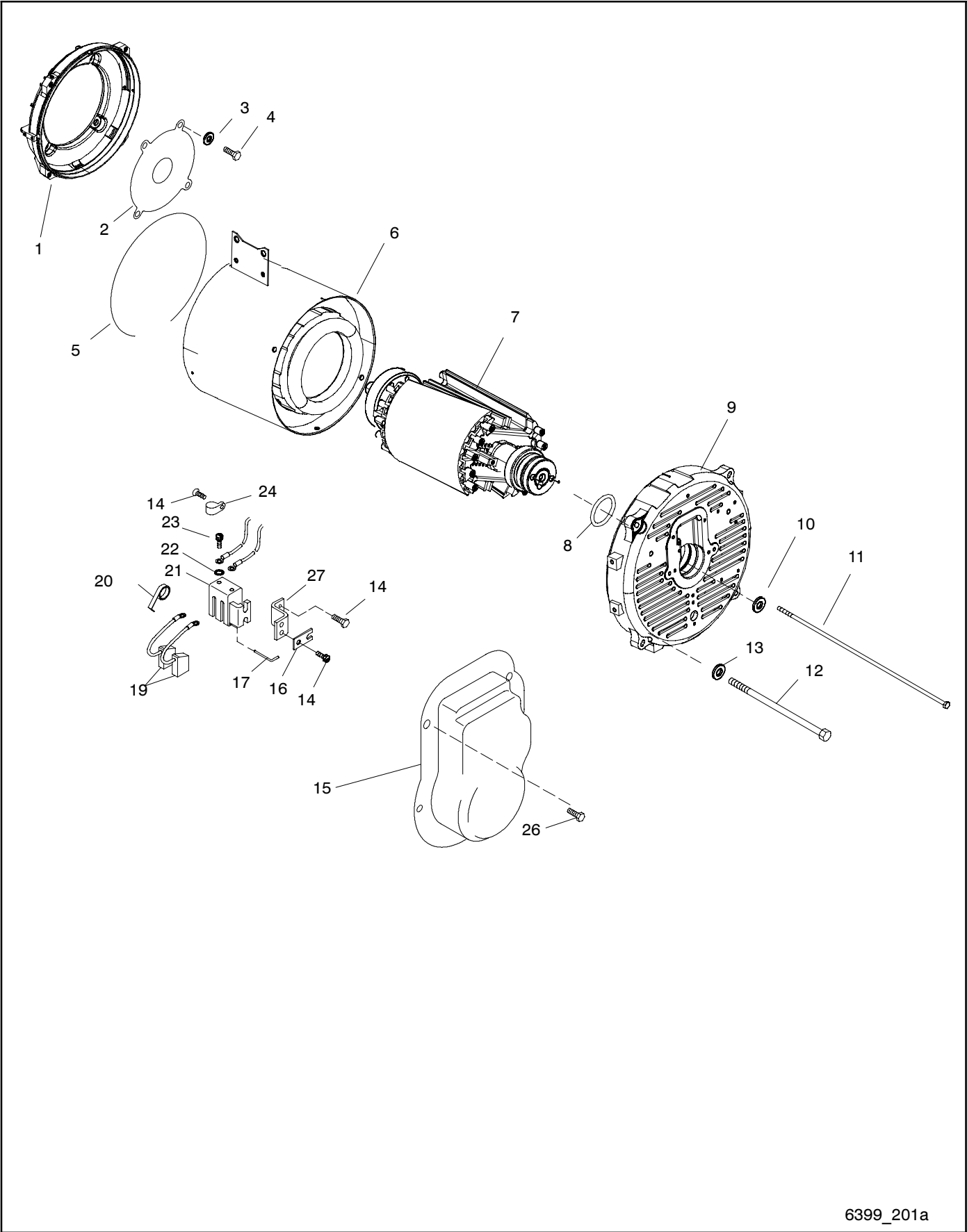


6399_109

Item	Part Number	Description	Quantity
			Variation 1
1	347176	Weight, balance (used with plastic base GM29255)	6
2	GM11040-2	Insert, threaded (metric), 6mm (used with plastic base GM29255)	12
3	GM11040-4	Insert, threaded (metric) (used with plastic base GM29255)	6
4	#	M8-1.25 hardware	6
5	M931-10040-60	Bolt, hex head	1
6	229127	Vibromount	1
7	M931-10070-60	Bolt, hex head	2
8	M982-10-80	Nut, hex	2
9	258659	Vibromount	2
10	GM50499	Strap, ground	1
11	GM29255	Base, plastic mtg.	1
11	GM42141	Base, plastic mtg. (effective 10/16/06; see note)	1
12	GM29256	Base, sub (used with plastic base GM29255)	1
13	GM29982	Channel, base (used with plastic base GM29255)	2

Effective 10/16/06, metal base GM29256 and plastic base GM29255 were replaced by one piece plastic base GM42141.

Group 201: Generator and Mounting

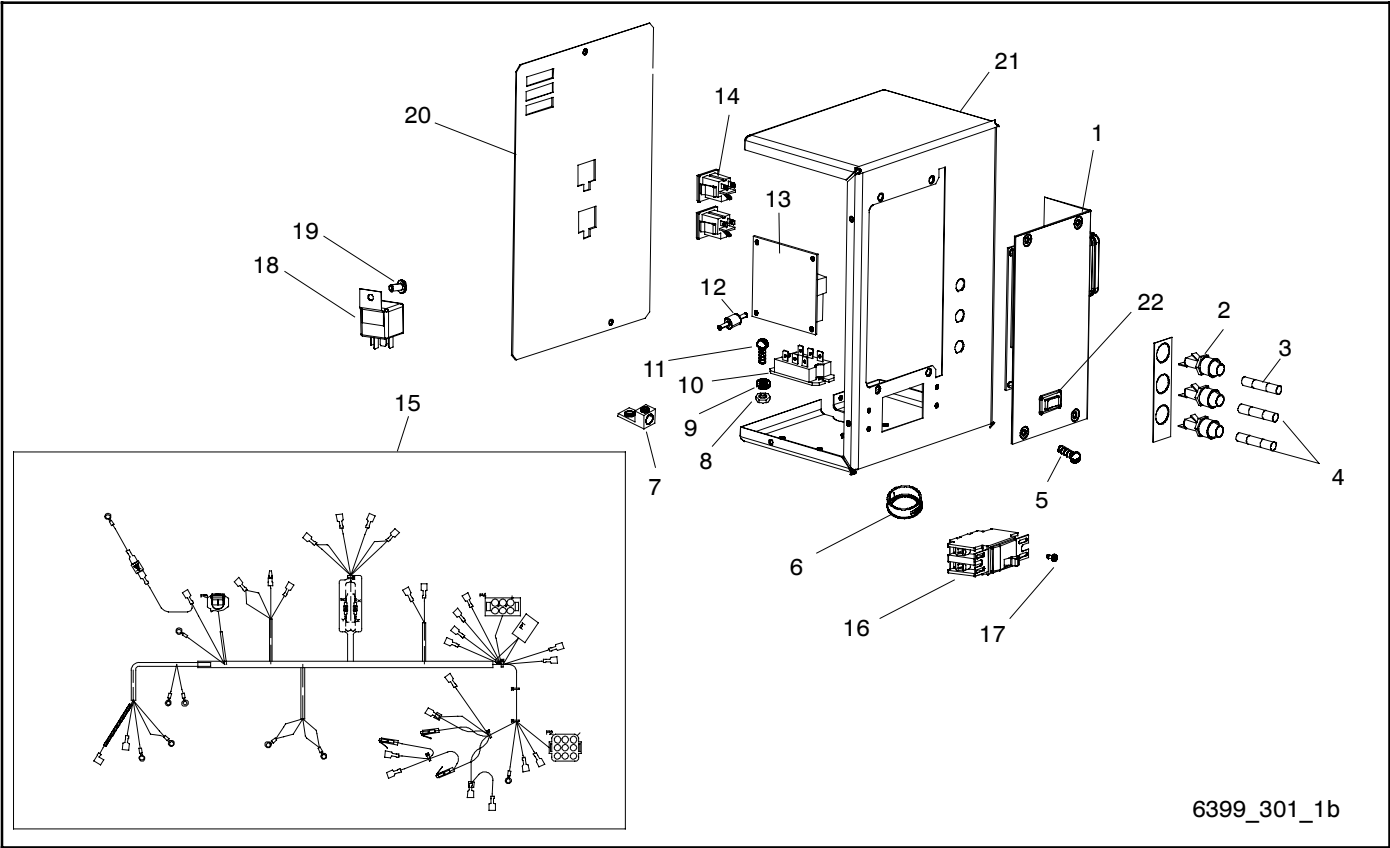


6399_201a

Group 201: Generator and Mounting

Item	Part Number	Description	Quantity
			Variation 1
1	359654	Adapter, generator	1
2	358067	Guard, alternator adapter	1
3	X-25-34	Washer, plain	4
4	X-6024-2	Bolt, hex head	4
5	238214	Guard, generator fan	1
6	GC29774	Stator assembly	1
7	GM46819	Rotor assembly	1
8	256466	O-ring, 2.050 in. ID	1
9	GM38291	Bracket, end	1
10	X-801-3	Washer, hardened	1
11	358072	Bolt, armature thru, 3/8-16 x 13.12 in.	1
12	358102	Bolt, over bolt, 1/4-20 x 10.50 in.	4
13	X-25-68	Washer, plain, .281 ID x .625 in. OD	4
14	X-67-64	Screw, self-tapping	5
15	GM29354	Cover, brush holder	1
16	238248	Shim, brush holder	3
17	238247	Retainer, wire	1
18	229335	Bracket, brush holder	1
19	239282	Brush	2
20	238150	Spring, stainless steel	2
21	239247	Holder, brush	1
22	X-22-6	Washer, lock.146 ID x 0.285 in. OD	2
23	X-49-1	Screw, pan head, 6-32 x 5/16	2
24	X-468-3	Cable tie, nylon	3
25	X-6003-126	Conduit, convoluted	1
26	X-67-133	Screw, hex washer thread forming	2
27	X-67-113	Screw, hex washer thread forming	2

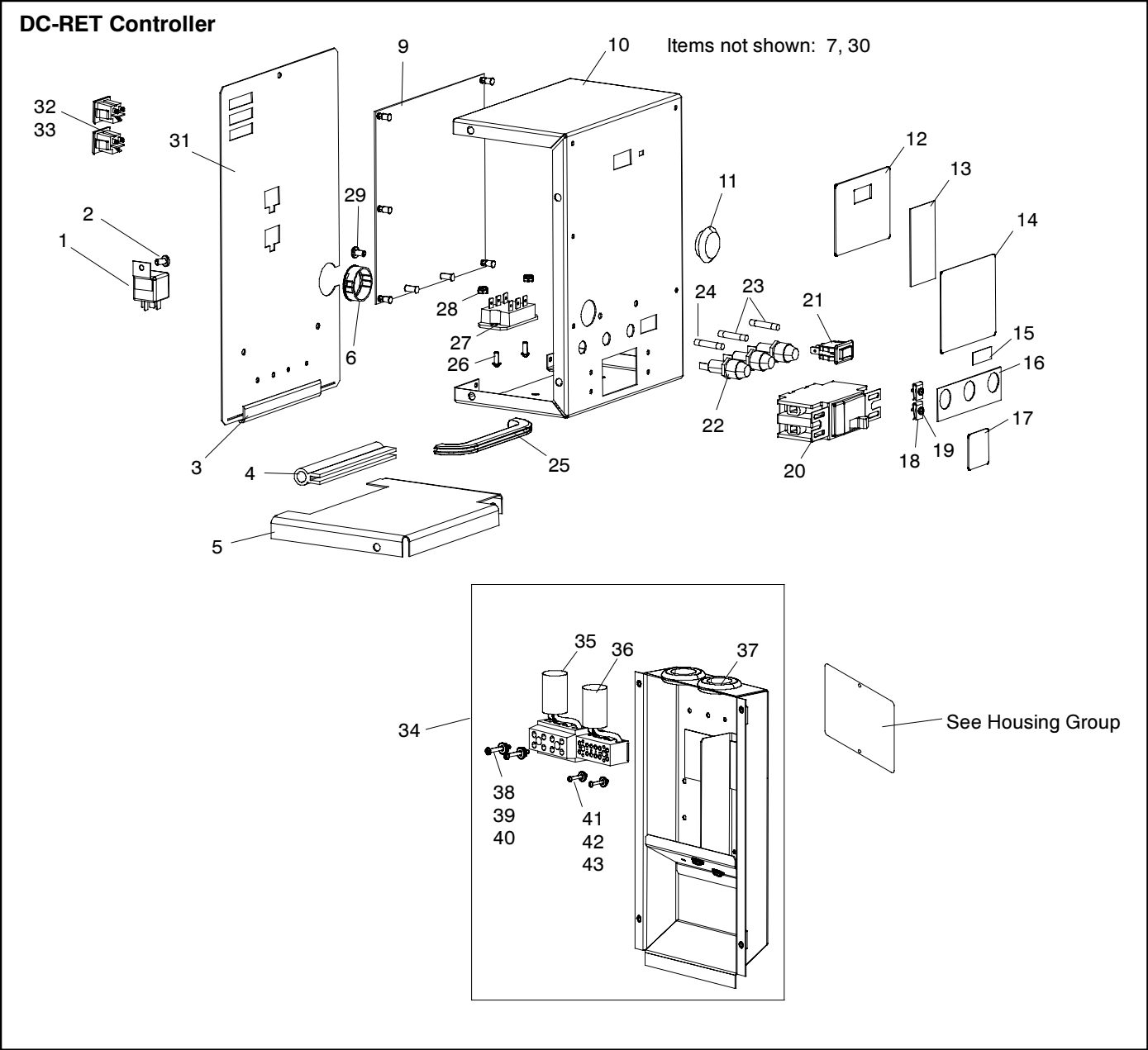
Group 301: Control and Harness



Group 301: Control and Harness

Item	Part Number	Description	Quantity
			Variation
1	GM39579	Controller assembly, DC-2200	1
2	238426	Fuse holder, 0.25 x 1.25 in.	3
3	292937	Fuse, 20 A, 250 V	1
4	223316	Fuse, 10 A, 250 V	2
5	X-50-77	Screw, pan head machine	4
6	X-634-27	Bushing, 1.25 in. dia.	2
6	X-634-28	Bushing, 1.50 in. dia.	2
7	X-6207-1	Lug, terminal	2
8	X-101-11	Nut, hex elastic stop, 8-32	2
9	X-25-118	Washer, plain, 0.406 ID x 1 in. OD	2
10	GM28483	SCR module	1
11	X-51-5	Screw, pan head, 8-32 x 7/16	2
12	360459	Standoff, circuit board	4
13	GM29671	PCB assembly, relay board, 12 V	1
14	GM48108	Harness, pigtail customer connection (includes receptacle)	2
14	GM47009	Receptacle, single	2
15	GM49760	Harness, engine, 9/12RESM1	1
16	358384	Breaker, circuit	1
17	239332	Clip, speed	4
17	X-67-143	Screw, cross recess, sheet metal	4
18	GM49746	Relay, 12 VDC	1
19	X-50-15	Screw, Machine	1
20	GM39551	Cover, controller	1
21	GM29265	Housing, controller mtg. panel	1
22	GM46103	Switch, rocker	1

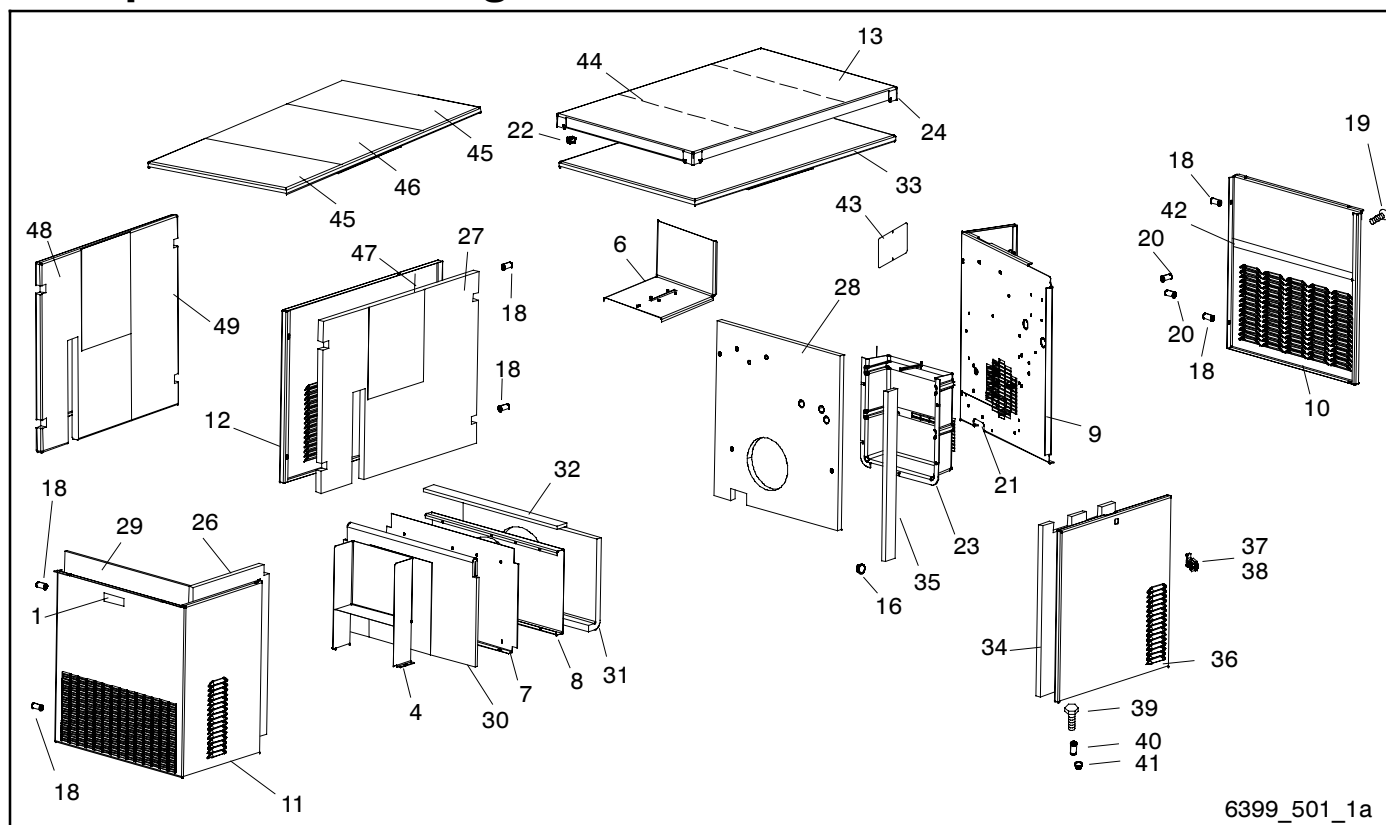
Group 301: Control and Harness, continued



Group 301: Control and Harness, continued

Item	Part Number	Description	Qty.	
			Variation No.	
			2	3
1	GM49746	Relay, 12 VDC	1	1
2	X-50-15	Screw, machine	5	5
3	X-6047-41	Channel, U	1	
4	X-6422-31	Seal, push-on trim	1	
5	GM60625	Panel, junction box	1	
6	X-634-27	Bushing	1	2
7	361567	Base, tie wrap snapin	3	3
8	GM57151	Controller assy (includes items 1-6, 9-32)	1	
8	GM78199	Controller assy (includes items 1, 2, 6, 9-32)		1
9	GM49104	PCB assy, Advanced Digital Control	1	1
10	GM51847	Panel, controller mounting	1	
10	GM78182	Panel, controller mounting		1
11	X-301-43	Plug, button	1	1
12	GM52276	Switch, membrane overlay 3-button	1	1
13	294520	Decal, danger, high voltage	1	1
14	GM53083	Decal, fault codes	1	1
15	GM53081	Decal, rocker switch	1	1
16	GM53080	Decal, fuse panel	1	1
17	GM53084	Decal, power breaker	1	1
18	239332	Clip, speed	4	4
19	X-67-143	Screw, cross recess, sheet metal	4	4
20	358384	Breaker, circuit	1	1
21	GM70494	Switch, rocker on-off-on	1	1
22	238426	Fuse holder, 0.25 x 1.25 in.	3	3
23	223316	Fuse, 10 A, 250 V	2	2
24	292937	Fuse, 20 A, 250 V	1	1
25	X-6047-41	Channel, U	1	
26	X-51-5	Screw, machine	2	2
27	GM28483	SCR module	1	1
28	X-101-11	Nut, hex elastic stop, 8-32	2	2
29	X-49-25	Screw, machine	2	2
30	GM52281	Harness, engine	1	1
31	GM51848	Cover, controller	1	
31	GM78181	Cover, controller		1
32	GM60175	Decal, Warning Non GFCI Outlet (not shown)	1	1
33	GM48108	Harness, pigtail customer connection (includes receptacle)	2	2
34	GM78202	Box, customer connection (includes items 35-43)		1
35	GM78217	Harness, terminal block		1
36	GM78218	Harness, terminal block		1
37	X-284-3	Grommet, round		2
38	X-25-48	Washer, plain, .188 ID x .438 in.OD		2
39	X-49-5	Screw, Machine		2
40	X-6210-3	Nut, flange whiz, 6-32		2
41	X-25-9	Washer, plain, .156 ID x .375 in.OD		2
42	X-49-35	Screw, Machine		2
43	X-74-6	Nut, hex machine screw, 4-40		2

Group 501a: Housing



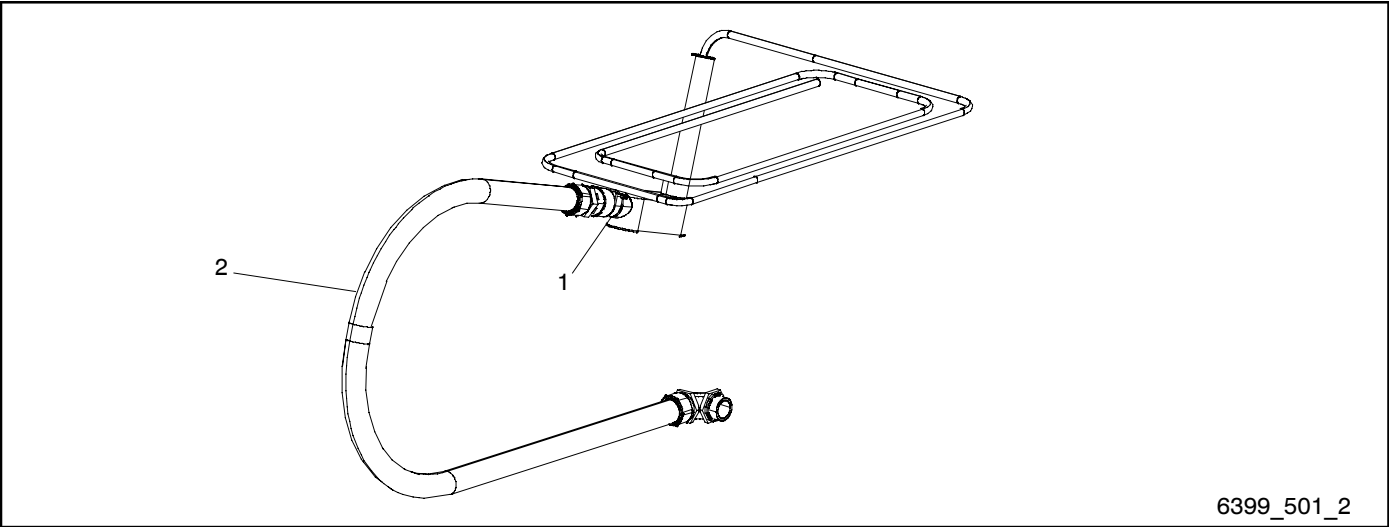
Group 501a: Housing

Item	Part Number	Description	Quantity				
			Variation		Module		
			1	2	GM60800-MA2	GM60800-MA9	GM84138-MA3**
1	GM15299	Decal, rainproof enclosure	1	1	1	1	1
4	GM29357	Shield, exhaust	1	1	1	1	1
6	GM29983	Shield, heat	1	1	1	1	1
7	GM62355	Duct, alternator air wall	1	1	1	1	
7	GM84033	Duct, alternator air wall					1
8	GM62358	Duct, alternator air inlet	1	1	1	1	
8	GM84032	Duct, alternator air inlet					1
9	GM55420	Housing, air intake duct	1	1	1		
9	GM78213	Housing, air intake duct				1	
9	GM84024**	Housing, air intake duct					1
10	GM55418	Housing, front panel	1	1	1		
10	GM78221	Housing, front panel				1	
10	GM84030**	Housing, front panel					1
11	GM39509	Housing, rear panel	1	1	1	1	
11	GM84026**	Housing, rear panel					1
11	GM84865**	Grill, Exhaust (not shown)					1
12	GM39510	Housing, side panel	1	1	1	1	
12	GM84025**	Housing, side panel					1
13	GM39511	Housing, roof	1	1	1	1	
13	GM84031**	Housing, roof					1
16	X-301-24	Plug, button	4	4	4	4	4
17	X-301-45	Plug, button	4	4	4	4	4
18	GM11040-2	Insert, threaded (metric), 6mm	6	6	6	6	6
19	X-50-15	Screw, pan head 10-24 x 1/2	3	3	3	3	3
20	346258	Insert, threaded, #10-24	6	6			
21	X-6033-8	Grommet, U-channel	1	1	1	1	1
22	X-6204-10	Retainer, nut	5	5	5	5	5
23	GM38809	Duct, engine air intake	1	1	1	1	1
24	GM47251	Corner, sound shield	4	4	4	4	
25	GM39587	Foam, sound housing kit, residential	1	1	1	1	1
26	GM29268	Insulation	1	1	1	1	1
27	GM29269	Insulation	1	1			
28	GM29270	Insulation	1	1	1	1	1
29	GM29271	Insulation	1	1	1	1	1
30	GM39591	Insulation	1	1	1	1	1
31	GM39592	Insulation	1	1	1	1	1
32	GM39593	Insulation	1	1	1	1	1
33	GM29350	Insulation	1	1			
34	GM29355	Insulation	1	1	1	1	1
35	GM30937	Insulation, door	1	1	1	1	1
36	GM45921-KA4	Door, housing, standard	1		1	1	
36	GM84139-KA2**	Door, housing, standard					1
36	GM45921-KA2	Door, housing, high wind		1	1	1	
36	GM84139-KA1**	Door, housing, high wind					1
37	294515	Latch, locking	1	1	1	1	1
38	362361	Key, latch	1	1	1	1	1
39	M933-06020-60	Screw, hex cap	2	2	2	2	2
40	GM11040-7	Insert, threaded (metric), 6mm	2	2	2	2	2
41	GM31074-1	Bushing, molded	2	2	2	2	2
42	GM58719	Support, side			2	2	2
43	GM78206	Cover, customer connection				1	1
44	GM78100	Support, roof			2	2	2
45	GM78104	Insulation			2	2	2
46	GM78105	Insulation			1	1	1
47	GM78101	Support, side			1	1	1
48	GM78106	Insulation			1	1	1
49	GM78107	Insulation			1	1	1

** Add a suffix to this color dependent part number before ordering.
See chart below to identify the color suffix.

Kit No.	Color Dependent Parts	
	Part Number Suffix	Part Number Example (item 9)
GM84138-MA3-CAS	-CAS	GM84024-CAS

Group 501b: Prewire Kit

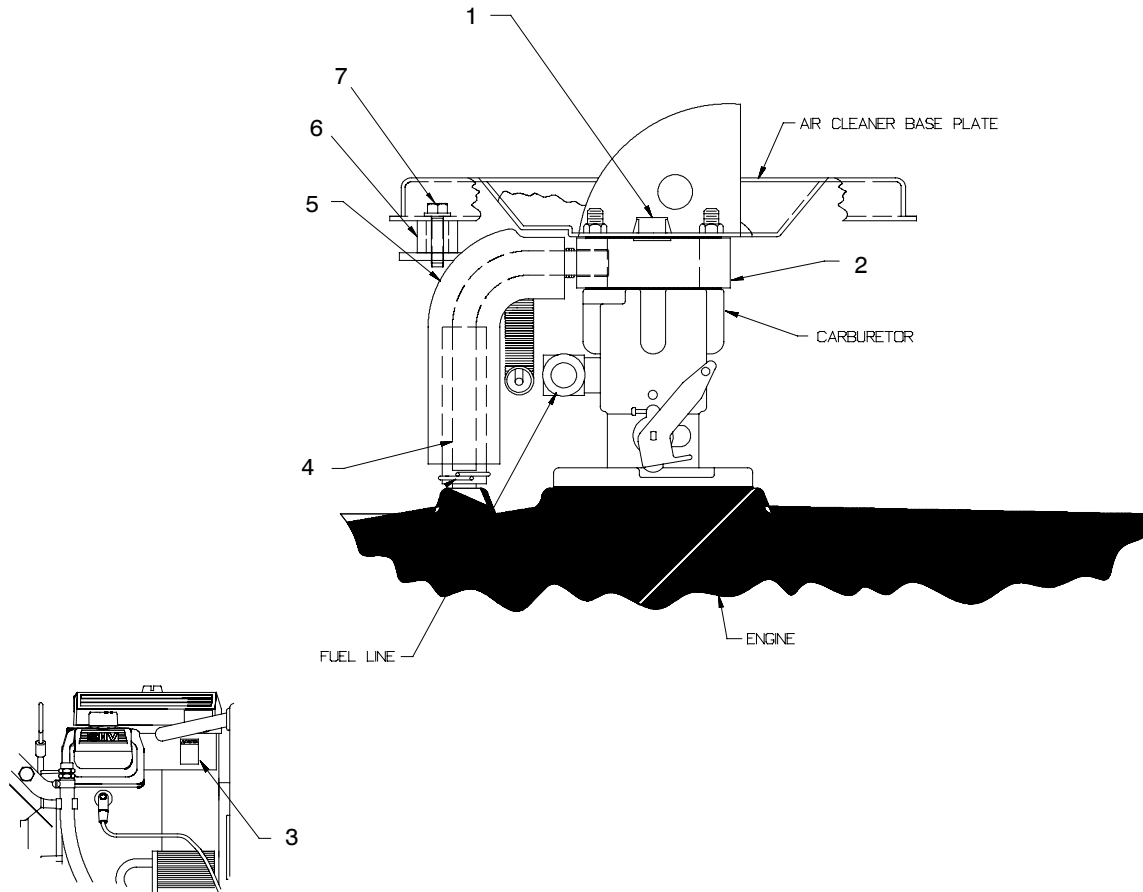


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Item	Part Number	Description	Quantity
			Variation
1	GM46978	Clamp, pipe	1
2	GM46984	Assembly, harness 12RESM1	1
3	TT-1428	Installation Instructions 12RESL/RESM1 Prewire	1

Group 501c: Carburetor Heater

See Group 8 for additional carburetor parts.



6399_501_3

Item	Part Number	Description	Quantity
			Variation
1	X-301-23	Plug, button	1
2	GM40129	Heater, carb 37 watt, 120 V	1
3	GM22387	Decal, caution hot carburetor heater	1
4	GM19464	Tube, breather, 0.375 in. OD, copper	1
5	GM19465	Insulator, breather line, 0.56 in. ID x 4 in.	1
6	X-400-207	Spacer, 0.344 ID x 0.625 OD x 0.5 in.	2
7	M7500D-05020-85	Screw, thread forming metric	2

Group 701: Literature

Item	Part Number	Description	Quantity			
			Variation			
			15	29	30	50
1	TP-2428-C	CH18-750 Service Manual	1	1	1	1
2	TP-6399	P/C 12RESL/12RESM1	1	1	1	1
3	TP-6168	Warranty, Federal/CA Emission	1	1		
3	TP-6535	Warranty, Emission Control, 17/18/20RES			1	
3	TP-6782	Warranty, 2011 Emissions, Residential				1
4	TP-6196	S/M 8.5/12RES, Residential	1	1	1	1
5	TP-6463	Warranty, 5-Year, RESL	1	1		1
5	TP-6479	Warranty, 5-Year, 8.5-30RES			1	
5	TP-6766	Warranty, Residential/Light Commercial			1	
5	TP-6782	Warranty, Residential/Light Commercial				1
6	TP-6397	I/M 12RESM1/12RESL	1			
6	TP-6516	I/M 12RESM1 & 12/17RESL/RESNT		1	1	
6	TP-6793	I/M 12RESM1, 12/18RESL				1
7	TP-6398	O/M 12RESM1/RESL	1			
7	TP-6517	O/M 12RESM1 & 12/17RESL/RESNT		1	1	1

Kit Parts List

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

Electrical System Kits

Terminal Block

GM58022-KA1

2	Harness, pigtail customer connection	GM48108
1	Decal, terminal block	GM54820
1	Harness, terminal block	
	(includes 4-position terminal block)	GM58421
1	Harness, terminal block	
	(includes 6-position terminal block)	GM60297

Appendix A Abbreviations

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

A, amp	ampere	cm	centimeter	ext.	external
ABDC	after bottom dead center	CMOS	complementary metal oxide substrate (semiconductor)	F	Fahrenheit, female
AC	alternating current			fglass.	fiberglass
A/D	analog to digital	cogen.	cogeneration	FHM	flat head machine (screw)
ADC	advanced digital control; analog to digital converter	com	communications (port)	fl. oz.	fluid ounce
adj.	adjust, adjustment	coml	commercial	flex.	flexible
ADV	advertising dimensional drawing	Coml/Rec	Commercial/Recreational	freq.	frequency
Ah	amp-hour	conn.	connection	FS	full scale
AHWT	anticipatory high water temperature	cont.	continued	ft.	foot, feet
AISI	American Iron and Steel Institute	CPVC	chlorinated polyvinyl chloride	ft. lb.	foot pounds (torque)
ALOP	anticipatory low oil pressure	crit.	critical	ft./min.	feet per minute
alt.	alternator	CRT	cathode ray tube	ftp	file transfer protocol
Al	aluminum	CSA	Canadian Standards Association	g	gram
ANSI	American National Standards Institute (formerly American Standards Association, ASA)	CT	current transformer	ga.	gauge (meters, wire size)
AO	anticipatory only	Cu	copper	gal.	gallon
APDC	Air Pollution Control District	cUL	Canadian Underwriter's Laboratories	gen.	generator
API	American Petroleum Institute	CUL	Canadian Underwriter's Laboratories	genset	generator set
approx.	approximate, approximately	cu. in.	cubic inch	GFI	ground fault interrupter
AQMD	Air Quality Management District	cw.	clockwise	GND, ⚡	ground
AR	as required, as requested	CWC	city water-cooled	gov.	governor
AS	as supplied, as stated, as suggested	cyl.	cylinder	gph	gallons per hour
ASE	American Society of Engineers	D/A	digital to analog	gpm	gallons per minute
ASME	American Society of Mechanical Engineers	DAC	digital to analog converter	gr.	grade, gross
assy.	assembly	dB	decibel	GRD	equipment ground
ASTM	American Society for Testing Materials	dB(A)	decibel (A weighted)	gr. wt.	gross weight
ATDC	after top dead center	DC	direct current	H x W x D	height by width by depth
ATS	automatic transfer switch	DCR	direct current resistance	HC	hex cap
auto.	automatic	deg., °	degree	HCHT	high cylinder head temperature
AWM	appliance wiring material	dept.	department	HD	heavy duty
bat.	battery	DFMEA	Design Failure Mode and Effects Analysis	HET	high exhaust temp., high engine temp.
BBDC	before bottom dead center	dia.	diameter	hex	hexagon
BC	battery charger, battery charging	DI/EO	dual inlet/end outlet	Hg	mercury (element)
BCA	battery charging alternator	DIN	Deutsches Institut für Normung e. V. (also Deutsche Industrie Normenausschuss)	HH	hex head
BCI	Battery Council International	DIP	dual inline package	HHC	hex head cap
BDC	before dead center	DPDT	double-pole, double-throw	HP	horsepower
BHP	brake horsepower	DS	disconnect switch	hr.	hour
blk.	black (paint color), block (engine)	DVR	digital voltage regulator	HS	heat shrink
blk. htr.	block heater	E, emer.	emergency (power source)	hsg.	housing
BMEP	brake mean effective pressure	ECM	electronic control module, engine control module	HVAC	heating, ventilation, and air conditioning
bps	bits per second	EDI	electronic data interchange	HWT	high water temperature
br.	brass	EFR	emergency frequency relay	Hz	hertz (cycles per second)
BTDC	before top dead center	e.g.	for example (<i>exempli gratia</i>)	IC	integrated circuit
Btu	British thermal unit	EG	electronic governor	ID	inside diameter, identification
Btu/min.	British thermal units per minute	EGSA	Electrical Generating Systems Association	IEC	International Electrotechnical Commission
C	Celsius, centigrade	EIA	Electronic Industries Association	IEEE	Institute of Electrical and Electronics Engineers
cal.	calorie	El/EO	end inlet/end outlet	IMS	improved motor starting
CAN	controller area network	EMI	electromagnetic interference	in.	inch
CARB	California Air Resources Board	emiss.	emission	in. H ₂ O	inches of water
CB	circuit breaker	eng.	engine	in. Hg	inches of mercury
cc	cubic centimeter	EPA	Environmental Protection Agency	in. lb.	inch pounds
CCA	cold cranking amps	EPS	emergency power system	Inc.	incorporated
ccw.	counterclockwise	ER	emergency relay	ind.	industrial
CEC	Canadian Electrical Code	ES	engineering special, engineered special	int.	internal
cert.	certificate, certification, certified	ESD	electrostatic discharge	int./ext.	internal/external
cfh	cubic feet per hour	est.	estimated	I/O	input/output
cfm	cubic feet per minute	E-Stop	emergency stop	IP	iron pipe
CG	center of gravity	etc.	et cetera (and so forth)	ISO	International Organization for Standardization
CID	cubic inch displacement	exh.	exhaust	J	joule
CL	centerline			JIS	Japanese Industry Standard
				k	kilo (1000)
				K	kelvin
				kA	kiloampere
				KB	kilobyte (2 ¹⁰ bytes)

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

Appendix B Common Hardware Application Guidelines

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

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

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

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

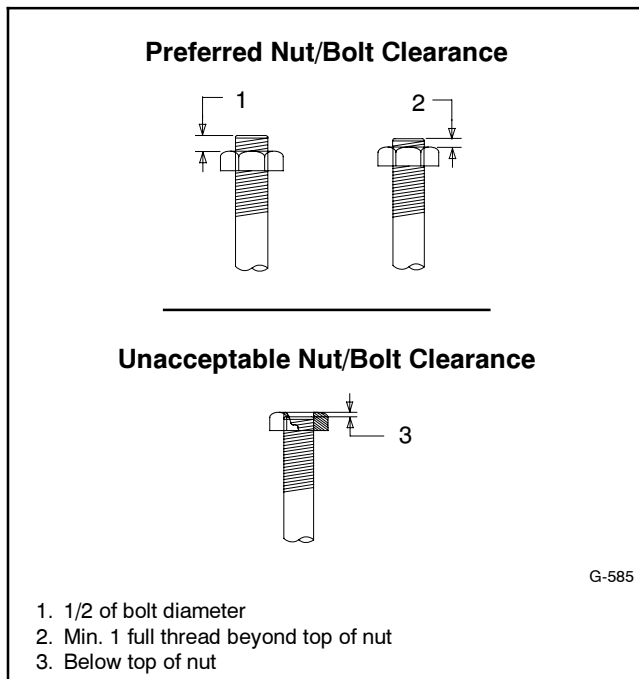


Figure 1 Acceptable Bolt Lengths

Steps for common hardware application:

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

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

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

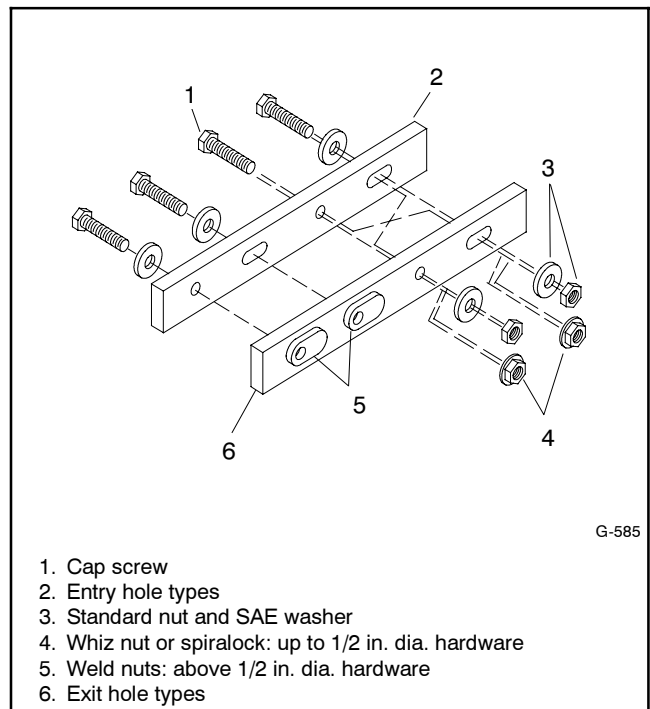


Figure 2 Acceptable Hardware Combinations

Appendix C General Torque Specifications

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

Metric Fasteners Torque Specifications, Measured in Nm (ft. lb.)				
Size (mm)	Assembled into Cast Iron or Steel			Assembled into Aluminum Grade 5.8 or 8.8
	Grade 5.8	Grade 8.8	Grade 10.9	
M6 x 1.00	6.2 (4.6)	9.5 (7)	13.6 (10)	See Note 3
M8 x 1.25	15.0 (11)	23.0 (17)	33.0 (24)	
M8 x 1.00	16.0 (11)	24.0 (18)	34.0 (25)	
M10 x 1.50	30.0 (22)	45.0 (34)	65.0 (48)	
M10 x 1.25	31.0 (23)	47.0 (35)	68.0 (50)	
M12 x 1.75	53.0 (39)	80.0 (59)	115.0 (85)	
M12 x 1.50	56.0 (41)	85.0 (63)	122.0 (90)	
M14 x 2.00	83.0 (61)	126.0 (93)	180.0 (133)	
M14 x 1.50	87.0 (64)	133.0 (98)	190.0 (140)	
M16 x 2.00	127.0 (94)	194.0 (143)	278.0 (205)	
M16 x 1.50	132.0 (97)	201.0 (148)	287.0 (212)	
M18 x 2.50	179.0 (132)	273.0 (201)	390.0 (288)	
M18 x 1.50	189.0 (140)	289.0 (213)	413.0 (305)	

Notes:

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

Appendix D Common Hardware Identification

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

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

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

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

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

Sample Dimensions

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

1/4-20 x 1
 ——— Length In Inches (Screws and Bolts)
 ——— Threads Per Inch
 ——— Major Thread Diameter In Fractional Inches Or Screw Number Size

Metric (Screws, Bolts, Studs, and Nuts)

M8-1.25 x 20
 ——— Length In Millimeters (Screws and Bolts)
 ——— Distance Between Threads In Millimeters
 ——— Major Thread Diameter In Millimeters

Plain Washers

9/32 x 5/8 x 1/16
 ——— Thickness
 ——— External Dimension
 ——— Internal Dimension

Lock Washers

5/8
 ——— Internal Dimension

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		
Hex Head Bolts (Grade 5)		Hex Head Bolts, cont.		Hex Nuts				
X-465-17	1/4-20 x .38	X-6238-14	3/8-24 x .75					
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					
X-125-25	5/16-18 x 1.75	X-129-29	1/2-13 x 4.00					
X-125-26	5/16-18 x 2.00	X-129-30	1/2-13 x 4.50					
230578	5/16-18 x 2.25	X-463-9	1/2-13 x 5.50					
X-125-29	5/16-18 x 2.50	X-129-44	1/2-13 x 6.00					
X-125-27	5/16-18 x 2.75							
X-125-28	5/16-18 x 3.00	X-129-51	1/2-20 x .75	X-25-46	.125	.250	.022	#4
X-125-22	5/16-18 x 4.50	X-129-45	1/2-20 x 1.25	X-25-9	.156	.375	.049	#6
X-125-32	5/16-18 x 5.00	X-129-52	1/2-20 x 1.50	X-25-48	.188	.438	.049	#8
X-125-35	5/16-18 x 5.50			X-25-36	.219	.500	.049	#10
X-125-36	5/16-18 x 6.00	X-6021-3	5/8-11 x 1.00	X-25-40	.281	.625	.065	1/4
X-125-40	5/16-18 x 6.50	X-6021-4	5/8-11 x 1.25	X-25-85	.344	.687	.065	5/16
		X-6021-2	5/8-11 x 1.50	X-25-37	.406	.812	.065	3/8
X-125-43	5/16-24 x 1.75	X-6021-1	5/8-11 x 1.75	X-25-34	.469	.922	.065	7/16
X-125-44	5/16-24 x 2.50	273049	5/8-11 x 2.00	X-25-26	.531	1.062	.095	1/2
X-125-30	5/16-24 x .75	X-6021-5	5/8-11 x 2.25	X-25-15	.656	1.312	.095	5/8
X-125-39	5/16-24 x 2.00	X-6021-6	5/8-11 x 2.50	X-25-29	.812	1.469	.134	3/4
X-125-38	5/16-24 x 2.75	X-6021-7	5/8-11 x 2.75	X-25-127	1.062	2.000	.134	1
		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
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
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

Flat Head Machine Screws

M965A-04012-SS	M4-0.70 x 12
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
Hex Nuts		
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	Spiralock
M982-06-80	M6-1.00	Elastic Stop
M934-08-60	M8-1.25	Standard
M6923-08-80	M8-1.25	Spiralock
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	Spiralock
M6923-10-62	M10-1.50	Spiralock†
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	Spiralock
M982-12-80	M12-1.75	Elastic Stop
M982-14-60	M14-2.00	Elastic Stop
M6923-16-80	M16-2.00	Spiralock
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-6399 3/12c

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