

Service Parts



Generator Sets

Models:

230-300DSE
230-300DSEB

See Group 701: Literature, inside this catalog for
part numbers of engine and accessory parts catalogs

See MP-6009 Parts Catalog Industrial Controllers
for controller parts

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Introduction

This manual lists service replacement parts for 230–300 kW generator sets.

Information in this publication represents data available at the time of print. The manufacturer of DDC/MTU Power Generation products 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.

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Numbering System Significance

This manual uses the following numbering systems:

Specification Number. The product identification number located on the generator set nameplate. 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 a 60 Hz generator alternator both perform the same function; however, with different parts. Each difference requires a group variation or module number.

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

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Illustrations

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

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How to Find Part Numbers

Use the following steps to locate a service replacement part.

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

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Hardware References

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

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

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

Specification Number Index

Group Title	Air Intake	Cooling System	Engine	Nameplates and Decals	Skid and Plant Mounting	Generator and Mounting	Controller and Mounting	Literature
Group No..	101	104	105	107	109	201	301	701
Spec No.	Variation Number							

230DSE								
PA-194324	8	20	26	2	14	27	†	11
PA-194325	8	20	26	2	14	28	†	11
PA-194328	*	*	26	2	*	*	†	11
PA-194329	8	20	27	2	14	27	†	11
PA-194331	*	*	27	2	*	*	†	11
GM13659-GA7S	*	*	GR2	GR1S	*	*	†	11
GM13659-GA8S	*	*	GR1	GR1S	*	*	†	11
250DSE								
PA-194340	8	20	26	2	14	29	†	20
PA-194341	8	20	26	2	14	30	†	20
PA-194342	8	20	26	2	14	31	†	20
PA-194343	8	20	26	2	14	32	†	20
PA-194344	*	*	26	2	*	*	†	20
PA-194345	8	20	27	2	14	29	†	20
PA-194346	8	20	27	2	14	31	†	20
PA-194347	*	*	27	2	*	*	†	20
GM13659-GA5S	*	*	GR2	GR1S	*	*	†	20
GM13659-GA6S	*	*	GR1	GR1S	*	*	†	20
275DSE								
PA-194356	8	26	28	2	14	29	†	22
PA-194357	8	26	28	2	14	30	†	22
PA-194360	*	*	28	2	*	*	†	22
PA-194361	8	26	29	2	14	29	†	22
PA-194363	*	*	29	2	*	*	†	22
GM13659-GA3S	*	*	GR4	GR1S	*	*	†	22
GM13659-GA4S	*	*	GR3	GR1S	*	*	†	22
300DSE								
PA-194369	8	26	30	2	14	31	†	13
PA-194370	8	26	30	2	14	32	†	13
PA-194371	*	*	30	2	*	*	†	13
PA-194372	8	26	31	2	14	31	†	13
PA-194373	*	*	31	2	*	*	†	13
GM13659-GA1S	*	*	GR6	GR1S	*	*	†	13
GM13659-GA2S	*	*	GR5	GR1S	*	*	†	13

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

† Configured group. Refer to the generator set nameplate for the module number. See parts catalog MP-6009 P/C Controllers for controller parts lists.

Specification Number Index

Group Title	Air Intake	Cooling System	Engine	Nameplates and Decals	Skid and Plant Mounting	Generator and Mounting	Controller and Mounting	Literature
Group No..	101	104	105	107	109	201	301	701
Spec No.	Variation Number							

230DSEB								
GM13659-GA7S	*	*	GR2	GR1S	*	*	†	48
GM13659-GA8S	*	*	GR1	GR1S	*	*	†	48
250DSEB								
GM13659-GA5S	*	*	GR2	GR1S	*	*	†	50
GM13659-GA6S	*	*	GR1	GR1S	*	*	†	50
275DSEB								
GM13659-GA3S	*	*	GR4	GR1S	*	*	†	52
GM13659-GA4S	*	*	GR3	GR1S	*	*	†	52
300DSEB								
GM13659-GA1S	*	*	GR6	GR1S	*	*	†	54
GM13659-GA2S	*	*	GR5	GR1S	*	*	†	54

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

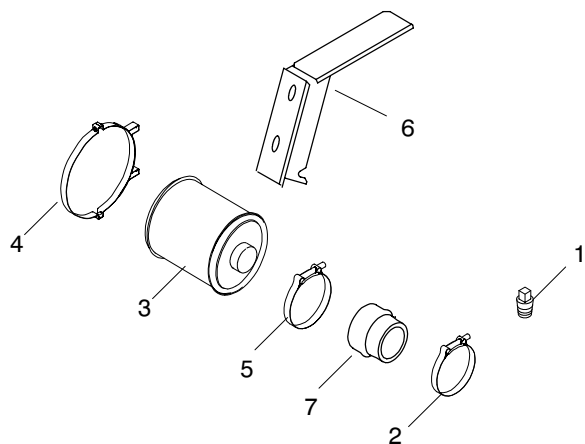
† Configured group. Refer to the generator set nameplate for the module number. See parts catalog MP-6009 P/C Controllers for controller parts lists.

Recommended Spare Parts

This table provides recommended spare part numbers for modular specs with a 16-light controller, a unit-mounted radiator, and an FRII alternator.

Item	Part Number	Description	Quantity 230-300 kW
	291207	Fuse, 1.5 A, 250 V	5
	A-336415	PC board, controller (main)	1
	GM34505	Photo board (non-wound alternators)	1
	A-354299	FR activator (non-wound alternators)	1
	B-257099	LED board (non-wound alternators)	1
	A-354653	Voltage regulator (non-wound alternators)	1
	A-336432	PC board, controller (indicator)	1
	283420	Bulb	5
	X-6014-88	Hose, radiator	1
	343289	Hose, radiator	1
	343430	Hose	1
	343623	Belt	1
	272982	Cleaner, air (engine uses a qty. 1)	7
	343446	Filter, primary fuel (engine uses a qty. 1)	7
	343445	Filter, oil (engine uses qty. 2)	14
	365289	Sensor, low fluid	1

Group 101: Air Intake

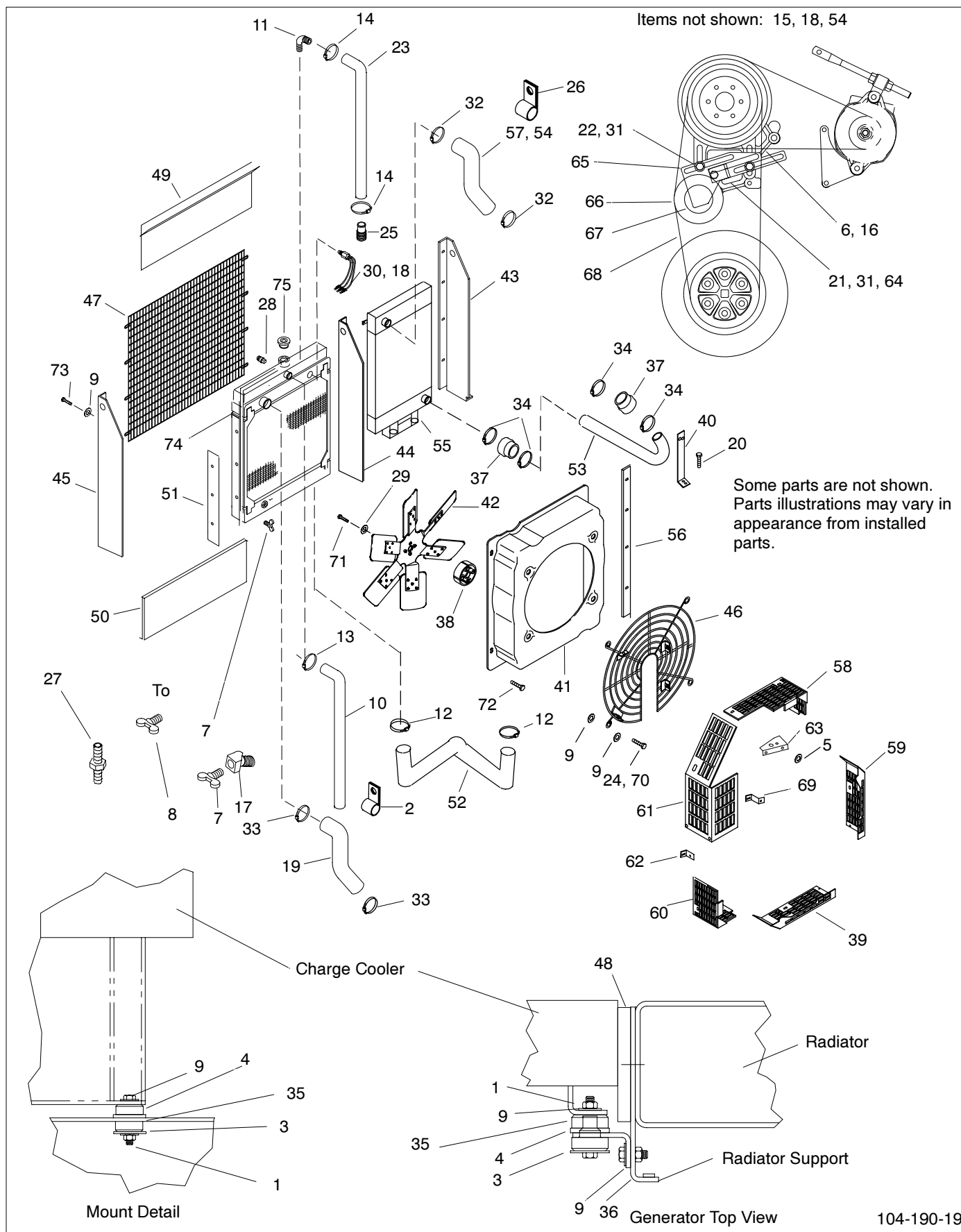


101-190-8

Item	Part Number	Description	Quantity				
			Variation/Kit Number				
			8	343479	GM13281-MA1	GM13281-MA5	343508*
1	X-75-4	Plug, pipe, 1/8 in.	1	1			
2	254344	Clamp, hose	1	1	1	1	
3	272982	Cleaner, air	1	1	1	1	
4	343530	Clamp, air cleaner	1	1	1	1	
5	343587	Clamp, hose	1	1	1	1	
6	343531	Bracket, AC support			1		
6	343588	Bracket, AC support	1	1		1	
7	354441	Hose, hump	1	1	1	1	

* See Kit List section for heavy-duty air cleaner kits.

Group 104: Cooling System

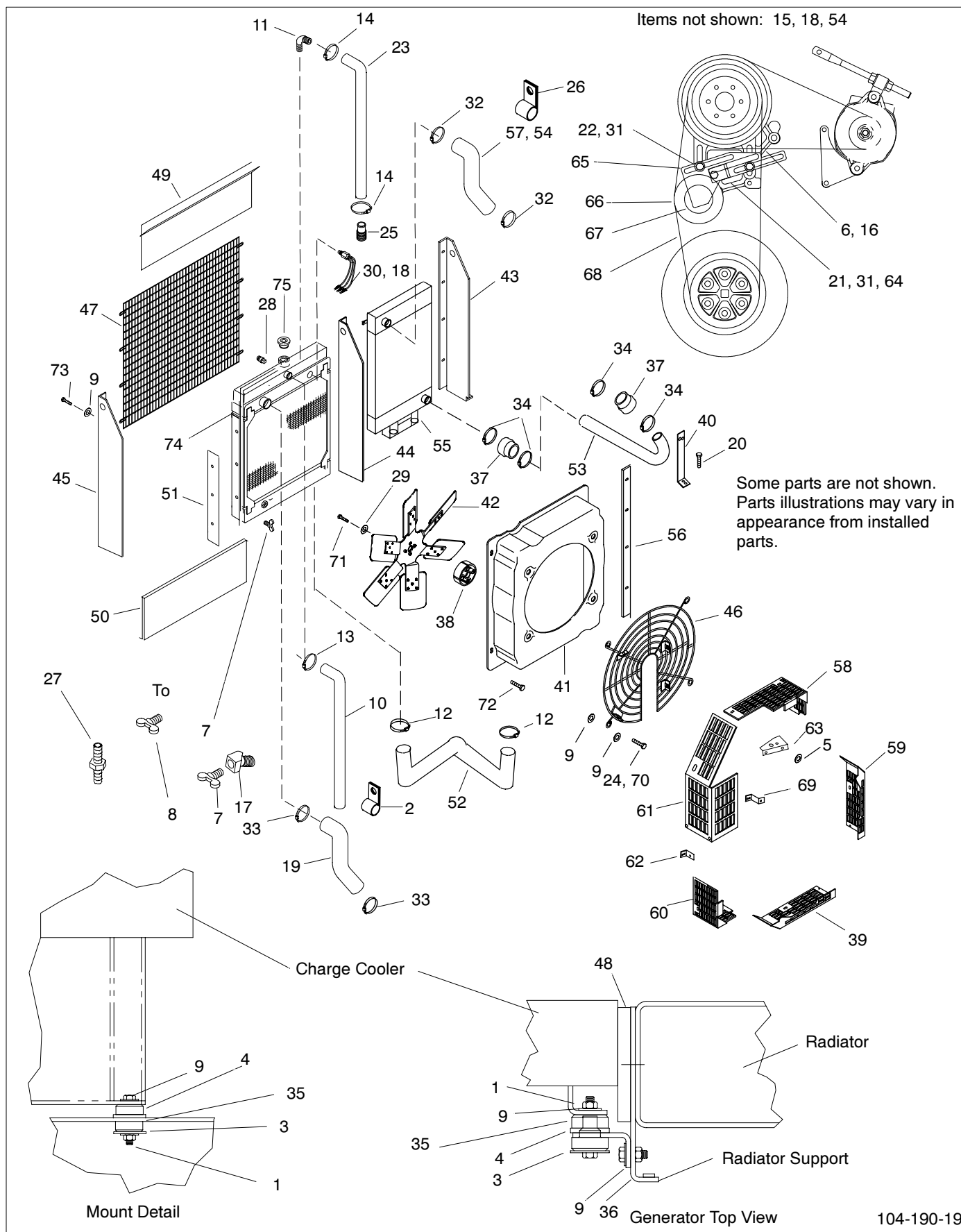


Group 104: Cooling System

Item	Part Number	Description	Quantity				
			Variation/Kit Number				
			19	25	350425	343993	354994
1	X-101-16	Nut, elastic stop, 5/16-18	4	4	4	4	4
2	X-672-4	Clamp, insulating	1	1	1	1	1
3	X-25-143	Washer, plain, .32 ID x 1.5 in. OD	4	4	4	4	4
4	X-25-144	Washer, plain, .781 ID x 1.5 in. OD	4	4	4	4	4
5	X-25-30	Washer, plain, .562 ID x 1.25 in. OD (not shown)	2	4	4	2	2
6	X-25-44	Washer, plain, .328 ID x .562 OD	1	1	1	4	1
7	X-256-3	Valve, drain, 1/4 in.	3	3	3	3	3
8	X-256-5	Valve, drain, 1/2 in.	1	1	1	1	1
9	X-25-75	Washer, plain, .344 ID x .875 in. OD	16	24	24	16	16
10	X-356-38	Hose, radiator	1	1	1	1	1
11	X-391-20	Connector, hose elbow	1	1	1	1	1
12	X-426-2	Clamp, hose, 1 7/8-3 5/32 in.	2	2	2	2	2
13	X-426-8	Clamp, hose	2	2	2	2	2
14	X-426-9	Clamp, hose	2	2	2	2	2
15	X-468-7	Tie, cable (not shown)	1	1	1	1	1
16	X-55-46	Screw, HC slotted, 5/16 in.	1	1	1	1	1
17	X-555-1	Elbow, street (not shown)	1	1	1	1	1
18	X-6003-120	Conduit, convoluted (not shown)	1	1	1	1	1
19	X-6014-88	Hose, radiator	1	1	1	1	1
20	X-6050-8	Screw, hex head machine	2	2	2	2	2
21	X-6052-1	Screw, hex head machine	2	2	2	2	2
22	X-6052-15	Screw, hex head machine	2	2	2	2	2
23	X-6359-9	Hose, rubber	1	1	1	1	1
24	X-6365-2	Insert, threaded	8	8	8	8	8
25	X-652-3	Fitting, hose	1	1	1	1	1
26	X-672-19	Clamp, insulated	1	1	1	1	1
27	X-751-1	Adapter, hose, 1 x 1 in.	1	1	1	1	1
28	X-75-53	Plug, pipe, 3/8 in.	1			1	1
29	X-801-3	Washer, hardened	6	6	6	6	6
30	365289	Sensor, low fluid	1	1	1	1	1
31	257951	Washer, special	3	3	3	3	3
32	274545	Clamp, hose	2	2	2	2	2
33	275527	Clamp, hose	2	2	2	2	2
34	291590	Clamp, hose	4	4	4	4	4
35	324433	Vibromount	4	4	4	4	4
36	324451	Bracket, charge cooler	2	2	2	2	2
37	324473	Hose, hump	2	2	2	2	2
38	343067	Spacer, fan	1	1	1	1	1
39	343097	Guard, belt, bottom	1	1	1	1	1
40	343136	Bracket, mounting	1	1	1	1	1

Parts lists continues on page 9

Group 104: Cooling System, continued



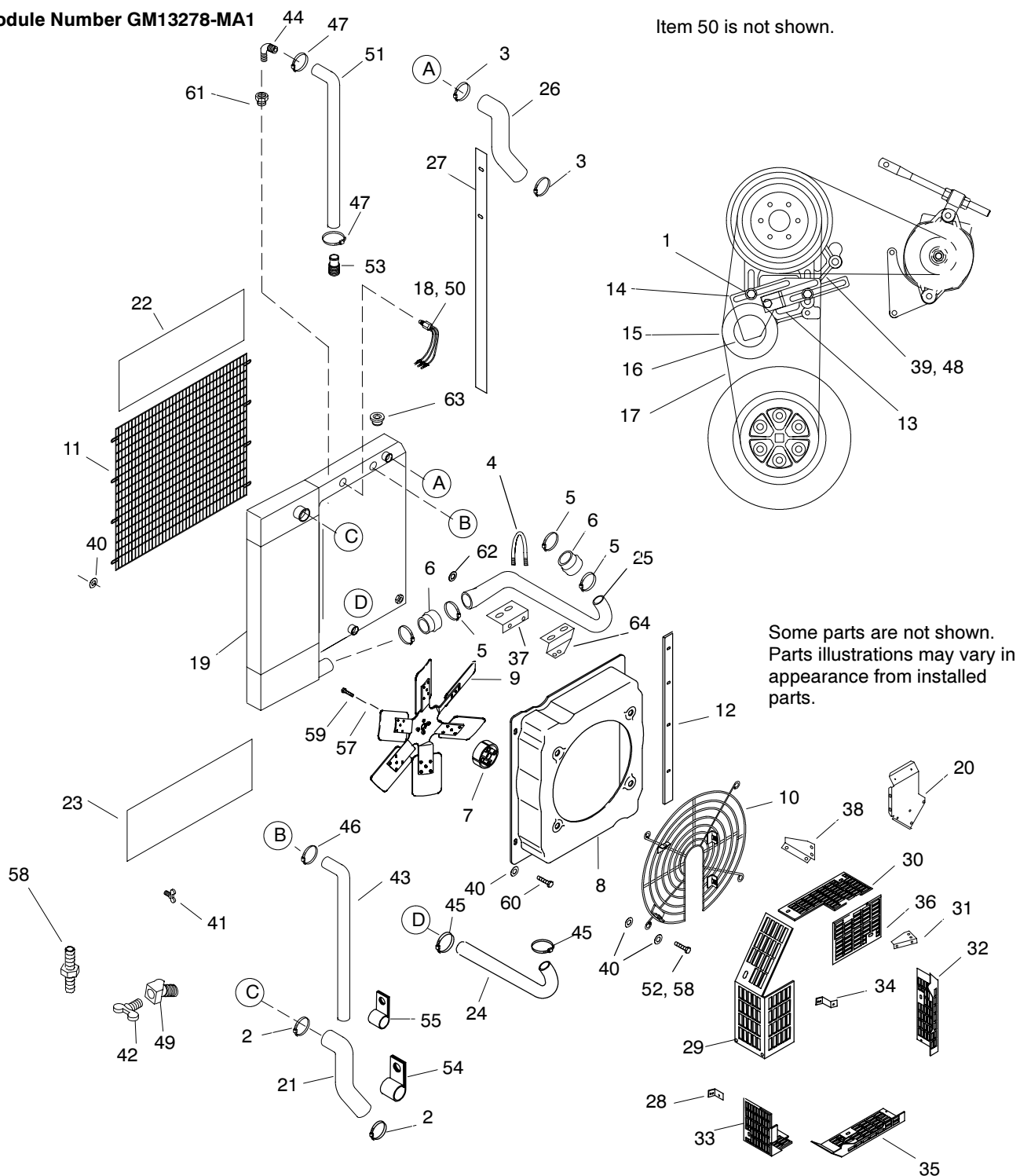
Group 104: Cooling System, continued

Item	Part Number	Description	Quantity				
			Variation/Kit Number				
			19	25	350425	354993	354994
41	343176	Shroud, fan	1	1	1	1	1
42	GM22971	Kit, pusher fan	1	1	1	1	1
43	343182	Support, cooler	1	1	1	1	1
44	343183	Support, radiator	1	1	1	1	1
45	343184	Support, radiator	1	1	1	1	1
46	343185	Guard, fan	1	1	1	1	1
47	343186	Guard, radiator	1	1	1	1	1
48	343193	Insulation, foam	1	1	1	1	1
49	343214	Guard, radiator, top	1	1	1	1	1
50	343215	Guard, radiator, bottom	1	1	1	1	1
51	343288	Spacer, radiator	2	2	2	2	2
52	343289	Hose, radiator, bottom	1	1	1	1	1
53	GM16637	Tube, charge cooler	1	1	1	1	1
54	343351	Bracket, charge tube mounting (not shown)	1	1	1	1	1
55	343592	Cooler, charge air 343526	1	1	1	1	1
55	343592	Cooler, charge air	1			1	1 343994
56	343424	Bracket, fan shroud	2	2	2	2	2
57	343430	Hose, charge cooler, top	1	1	1	1	1
58	343434	Guard, top belt	1	1	1	1	1
59	343435	Guard, belt, RS	1	1	1	1	1
60	343436	Guard, belt, LS	1	1	1	1	1
61	343437	Guard, alternator belt	1	1	1	1	1
62	343439	Bracket, support	1	1	1	1	1
63	343586	Support, belt guard	1	1	1	1	1
64	343619	Bracket, pulley tensioner	1	1	1	1	1
65	343620	Bracket, pulley tensioner	1	1	1	1	1
66	343621	Pulley, idler	1	1	1	1	1
67	343622	Bushing, idler	1	1	1	1	1
68	343623	V-belt	3	3	3	3	3
69	343682	Bracket, belt guard	1	1	1	1	1
70	X-125-5	Bolt, hex head	8	8	8	8	8
71	X-6238-36	Bolt, hex head	6	6	6	6	6
72	X-125-3	Bolt, hex head	8	8	8	8	8
73	X-125-24	Bolt, hex head	10	10	10	10	10
74	A-343177	Radiator assembly	1			1	1
74	A-343525	Radiator assembly		1	1		
75	GM23825	Cap, radiator	1	1	1	1	1

Group 104: Cooling System, continued

Module Number GM13278-MA1

Item 50 is not shown.



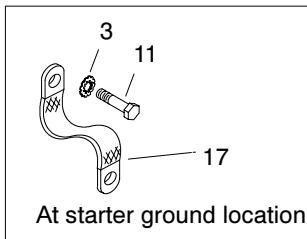
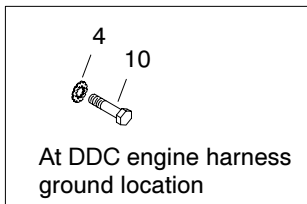
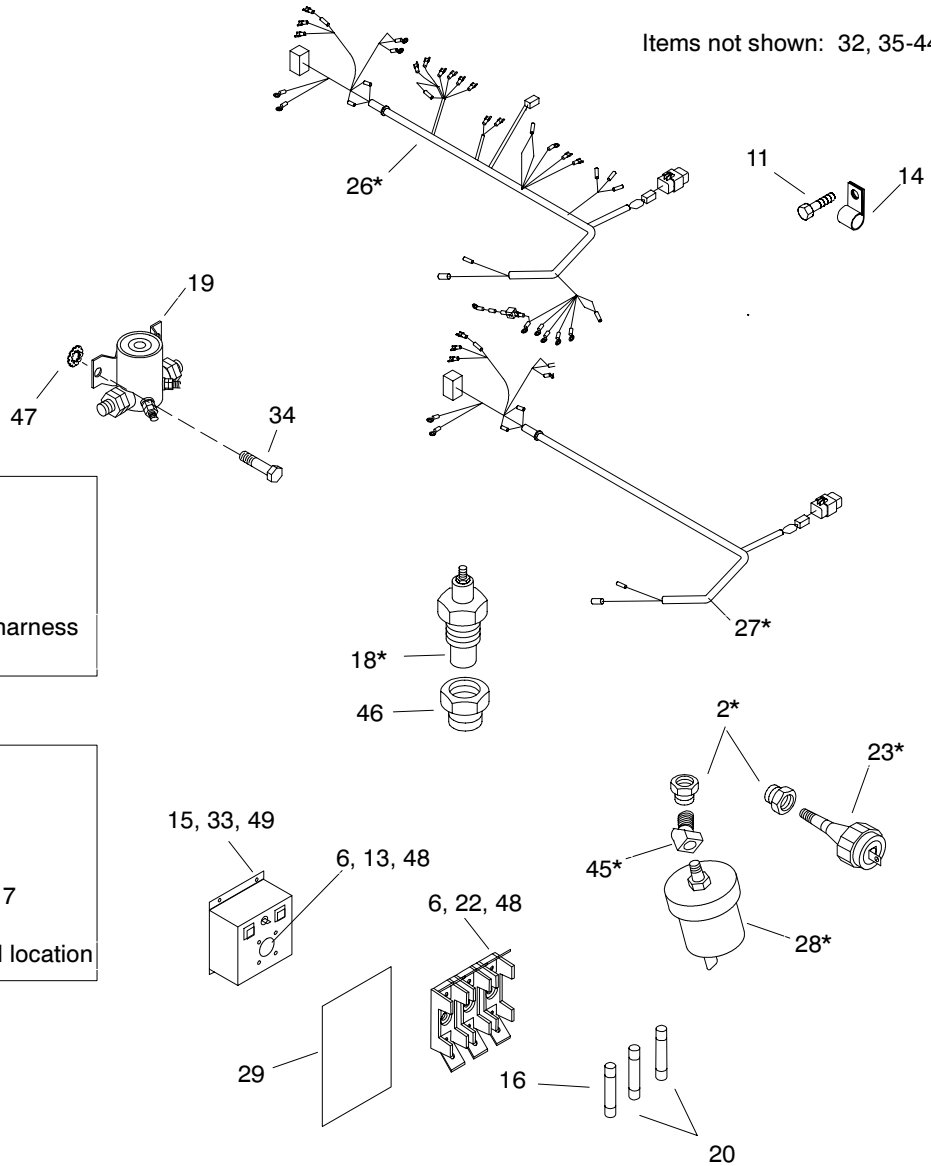
GM13278

Group 104: Cooling System, continued

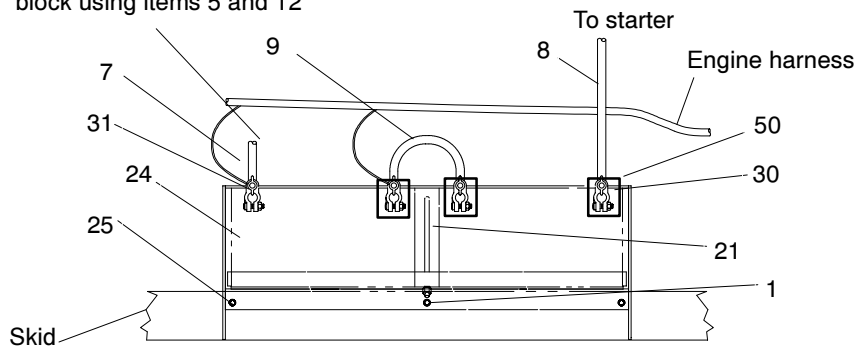
Item	Part Number	Description	Quantity
			Module Number GM13278-MA1
1	257951	Washer, special, .562 ID x 1.13 in. OD	2
2	274545	Clamp, hose, 4.31/4.62 in.	2
3	275527	Clamp, hose, 2.81/3.12 in.	2
4	289372	Clamp, muffler, 4.12 in.	2
5	291590	Clamp, hose, 4/4.31 in.	4
6	324473	Hose, hump, straight, 4 in. ID	2
7	343067	Spacer, fan, 5.12 in.	1
8	343176	Shroud, fan	1
9	GM22971	Kit, pusher fan	1
10	343185	Guard, fan	1
11	343186	Guard, radiator	1
12	343424	Bracket, fan shroud	2
13	343619	Bracket, pulley tensioner	1
14	343620	Bracket, pulley tensioner	1
15	343621	Pulley, idler	1
16	343622	Bushing, idler, 1.938 in. NPT	1
17	343623	Belt, V, 65.2 in.	3
18	365289	Sensor, low fluid	1
19	GM11650	Radiator	1
19	GM28454	Valve, plastic (not shown)	1
20	GM12036	Bracket, charge tube mounting, upper	1
21	GM12037	Hose, charge cooler, upper	1
22	GM12038	Guard, upper radiator	1
23	GM12041	Guard, lower radiator	1
24	GM12042	Hose, lower radiator	1
25	GM12043	Tube, charge cooler	1
26	GM12045	Hose, upper radiator	1
27	GM12046	Bracket, upper radiator hose	1
28	GM12211	Bracket, support	1
29	GM12212	Guard, belt top, LS	1
30	GM12213	Guard, belt top	1
31	GM12214	Support, belt guard, top	1
32	GM12215	Guard, belt, RS	1
33	GM12216	Guard, belt, LH	1
34	GM12217	Bracket, belt guard	1
35	GM12218	Guard, bottom belt	1
36	GM12219	Guard, rear, LH	1
37	GM13725	Bracket, charge cooler tube support	1
38	GM13807	Bracket, belt guard	1
39	X-25-44	Washer, plain, .328 ID x .562 in. OD	1
40	X-25-75	Washer, plain, .344 ID x .875 in. OD	26
41	X-256-3	Valve, drain, 1/4 in. NPT	2
42	X-256-5	Valve, drain	1
43	X-356-38	Hose, radiator, straight, 1 in. ID	1
44	X-391-1	Connector, 90°, 1/4 in. ID hose	1
45	X-426-2	Clamp, hose, 2.31/3.25 in.	2
46	X-426-8	Clamp, hose, .81/1.75 in.	2
47	X-426-9	Clamp, hose, .25/.70 in.	2
48	X-55-46	Screw, hex socket head machine	1
49	X-555-1	Fitting, elbow, 1/4 x 1/4 in. street	1
50	X-6003-120	Conduit, convoluted (not shown)	1
51	X-6359-9	Hose, rubber, straight, .25 in. ID	1
52	X-6365-2	Insert, threaded, 5/16-18 in. (not shown)	8
53	X-652-3	Fitting, hose	1
54	X-672-19	Clamp, insulated, 3.12 in.	1
55	X-672-4	Clamp, insulated, 1.25 in.	1
56	X-751-1	Adapter, hose, 1 x 1 in.	1
57	X-400-75	Spacer, .406 ID x .625 OD x .297 in.	6
58	X-125-5	Bolt, hex head	8
59	X-6238-36	Bolt, hex head	6
60	X-125-3	Bolt, hex head	8
61	X-202-27	Bushing, reducer, 1/8 x 1/4 in. NPT	1
62	X-400-28	Spacer, .282 ID x .5 OD x .531 in.	2
63	352327	Cap, radiator	1
64	GM22996	Bracket, lower charge cooler tube	1

Group 105: Engine

Items not shown: 32, 35-44



Attach item 7 to engine block using items 5 and 12



* See Control and Harness group for part number.

Top view of battery rack

105-190-26

Group 105: Engine

Item	Part Number	Description	Quantity											
			Variation Number											
			26	27	28	29	30	31	GR1	GR2	GR3	GR4	GR5	GR6
1	M982-08-80	Nut, hex elastic stop	1	1	1	1	1	1	1	1	1	1	1	1
2	*	Bushing, reducer, 1/8 x 1/4 in.	2	2	2	2	2	2	2	2	2	2	2	2
3	X-22-14	Washer, lock, 3/8, interior/exterior tooth	1	1	1	1	1	1	1	1	1	1	1	1
4	X-22-16	Washer, lock, 5/16, interior/exterior tooth	2	2	2	2	2	2	2	2	2	2	2	2
5	X-22-26	Washer, lock, 1/2, interior/exterior tooth	1	1	1	1	1	1						
6	M7985A-03012-20	Screw, pan head, M3 x 12	8	8	8	8	8	8	8	8	8	8	8	8
7	X-545-112	Cable, battery	1	1	1	1	1	1						
7	X-545-165	Cable, battery							1	1	1	1	1	1
8	X-545-129	Cable, battery	1	1	1	1	1	1	1	1	1	1	1	1
9	X-545-73	Cable, battery	1	1	1	1	1	1	1	1	1	1	1	1
10	M933-08016-60	Screw, HC	1	1	1	1	1	1	1	1	1	1	1	1
11	M933-10020-60	Screw, HC	1	1	1	1	1	1	1	1	1	1	1	1
12	M933-12020-60	Screw, HC	1	1	1	1	1	1	1	1	1	1	1	1
13	X-6214-6	Cap, plastic	1	1	1	1	1	1	1	1	1	1	1	1
14	X-672-32	Clamp, insulated	1	1	1	1	1	1	1	1	1	1	1	1
15	M934-04-50	Nut, hex, 4 mm	4	4	4	4	4	4	4	4	4	4	4	4
16	239298	Fuse, 5 A, 250 V, .25 x 1.25 in.	1	1	1	1	1	1	1	1	1	1	1	1
17	266581	Strap, ground	1	1	1	1	1	1	1	1	1	1	1	1
18	*	Sender, water temperature	1	1	1	1	1	1	1	1	1	1	1	1
19	268371	Relay	1	1	1	1	1	1	1	1	1	1	1	1
20	283645	Fuse 15 A, 250 V, .25 x 1.25 in.	2	2	2	2	2	2	2	2	2	2	2	2
21	286316	Bolt, angle	1	1	1	1	1	1						
21	GM13268	Bolt, angle							1	1	1	1	1	1
22	292821	Holder, fuse	1	1	1	1	1	1	1	1	1	1	1	1
23	*	Switch, assembly pressure	1	1	1	1	1	1	1	1	1	1	1	1
24	343220	Rack, battery	1	1	1	1	1	1	1	1	1	1	1	1
25	343221	Clamp, battery	1	1	1	1	1	1	1	1	1	1	1	1
26	*	Harness, wiring (includes items 35–41)	1	1	1	1	1	1	1	1	1	1	1	1
27	*	Harness, wiring DDEC (includes items 42–44)	1	1	1	1	1	1	1	1	1	1	1	1
28	*	Sender, oil pressure	1	1	1	1	1	1	1	1	1	1	1	1
29	343601	Strip, marker, 3-fuse	1	1	1	1	1	1	1	1	1	1	1	1
30	345039	Terminal, battery	2	2	2	2	2	2						
31	345056	Terminal, battery	2	2	2	2	2	2						
32	B-343448	Engine assembly (not shown)	1							1				
32	B-343449	Engine assembly (not shown)		1					1					
32	B-343454	Engine assembly (not shown)			1							1		
32	B-343456	Engine assembly (not shown)				1					1			
32	B-343450	Engine assembly (not shown)					1							1
32	B-343451	Engine assembly (not shown)						1					1	
33	A-343591	Box assembly, engine light	1	1	1	1	1	1	1	1	1	1	1	1
34	#	Hardware, 1/4-20	2	2	2	2	2	2	2	2	2	2	2	2
35	*	Diode, 6 A, 100 V (not shown)	3	3	3	3	3	3	3	3	3	3	3	3
36	*	Connector, jack, 4-position (P2) (not shown)	1	1	1	1	1	1	1	1	1	1	1	1
37	*	Connector, plug, 9-position (P4) (not shown)	1	1	1	1	1	1	1	1	1	1	1	1
38	*	Connector, plug, 6-position (not shown)	1	1	1	1	1	1	1	1	1	1	1	1
39	*	Boot (not shown)	1	1	1	1	1	1	1	1	1	1	1	1
40	*	Connector, cable (not shown)	1	1	1	1	1	1	1	1	1	1	1	1
41	*	Connector, 24-position (not shown)	1	1	1	1	1	1	1	1	1	1	1	1
42	*	Connector, 30-pin (P5) (not shown)	1	1	1	1	1	1	1	1	1	1	1	1
43	*	Connector, 5-pin (P3) (not shown)	1	1	1	1	1	1	1	1	1	1	1	1
44	*	Connector, 6-pin (P6) (not shown)	1	1	1	1	1	1	1	1	1	1	1	1
45	*	Elbow, 45° street	1	1	1	1	1	1	1	1	1	1	1	1
46	153659	Bushing, reducing, 1/2 x 3/4 in. NPT	1	1	1	1	1	1	1	1	1	1	1	1
47	X-22-12	Washer, lock, .262 ID x .743 in. OD	4	4	4	4	4	4	4	4	4	4	4	4
48	M934-03-04	Nut, hex, 3mm	8	8	8	8	8	8	8	8	8	8	8	8
49	M7985A-04020-20	Washer, lock, .262 ID x .743 in. OD	4	4	4	4	4	4	4	4	4	4	4	4
50	GM20745	Boot, battery lug							3	3	3	3	3	3

Common hardware. Procure locally.

* See Control and Harness group for part number.

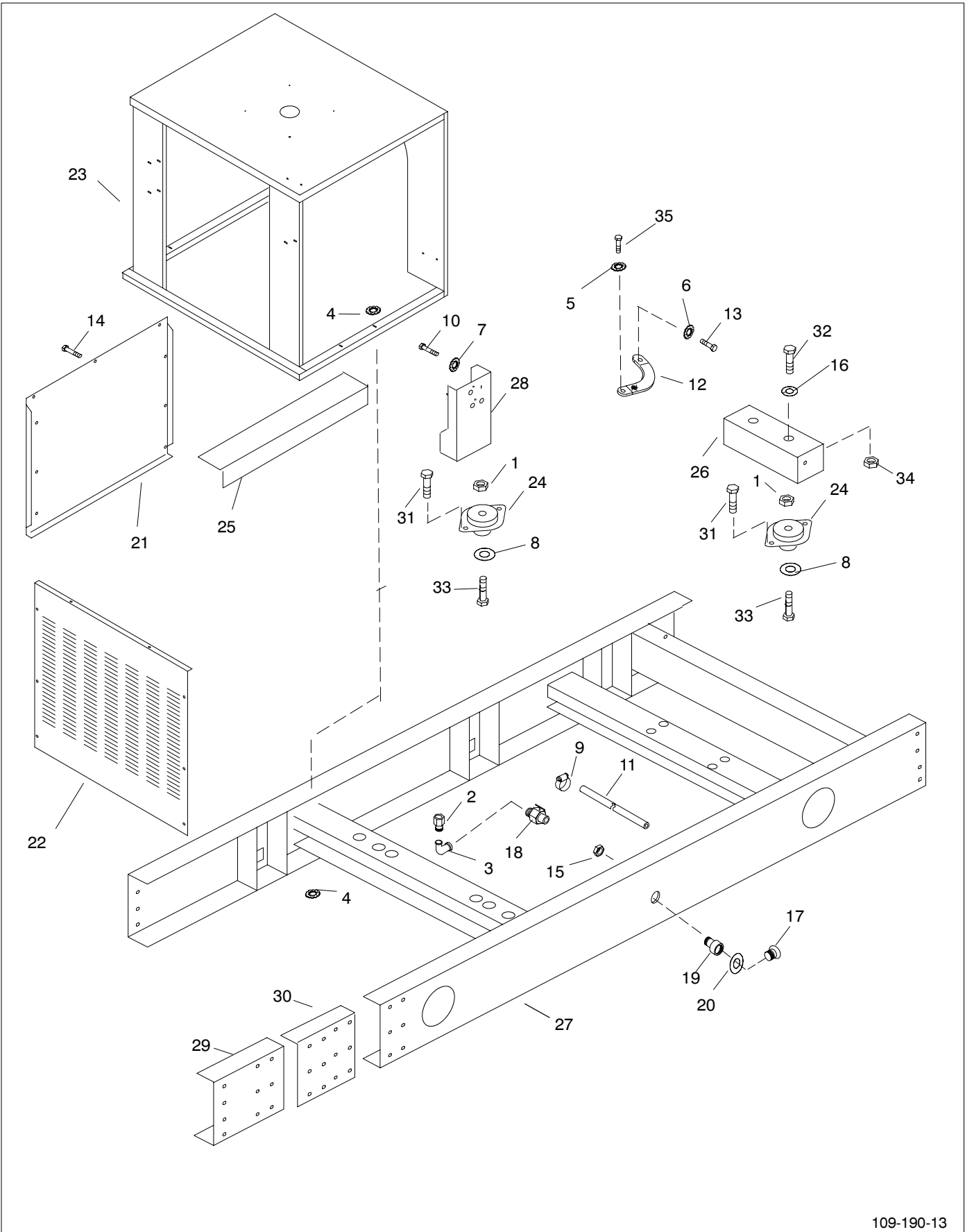
Notes

Group 107: Nameplate and Decals

Item	Part Number	Description	Quantity	
			Variation Number	
			2	GR1S
1	X-6301-3	Decal, DDC/MTU logo		1
2	X-6302-1	Decal, DDC/MTU logo		1
3	238402	Decal, caution positive terminal only	1	1
4	249808	Decal, warning rotating parts	1	1
5	249809	Decal, caution hot engine	1	1
6	249810	Decal, warning hot coolant	1	1
7	GM13776	Decal, reconnection		1
8	257438	Decal, danger moving rotor	3	3
9	257441	Decal, warning lifting eye	1	1
10	258815	Decal, warning voltage backfeed	1	1
11	259365	Decal	1	1
12	273780	Decal, warning explosion	1	1
13	324069	Nameplate	1	1
14	343165	Decal, caution—not a step	1	1
15	364116	Decal, caution welding disconnect	2	2
16	GM15300	Decal, exhaust piping		1
17	GM19290	Decal, fuel type		1
18	GM20171	Decal, warning fan		1

Nameplate and Decals not illustrated

Group 109: Skid and Plant Mounting



109-190-13

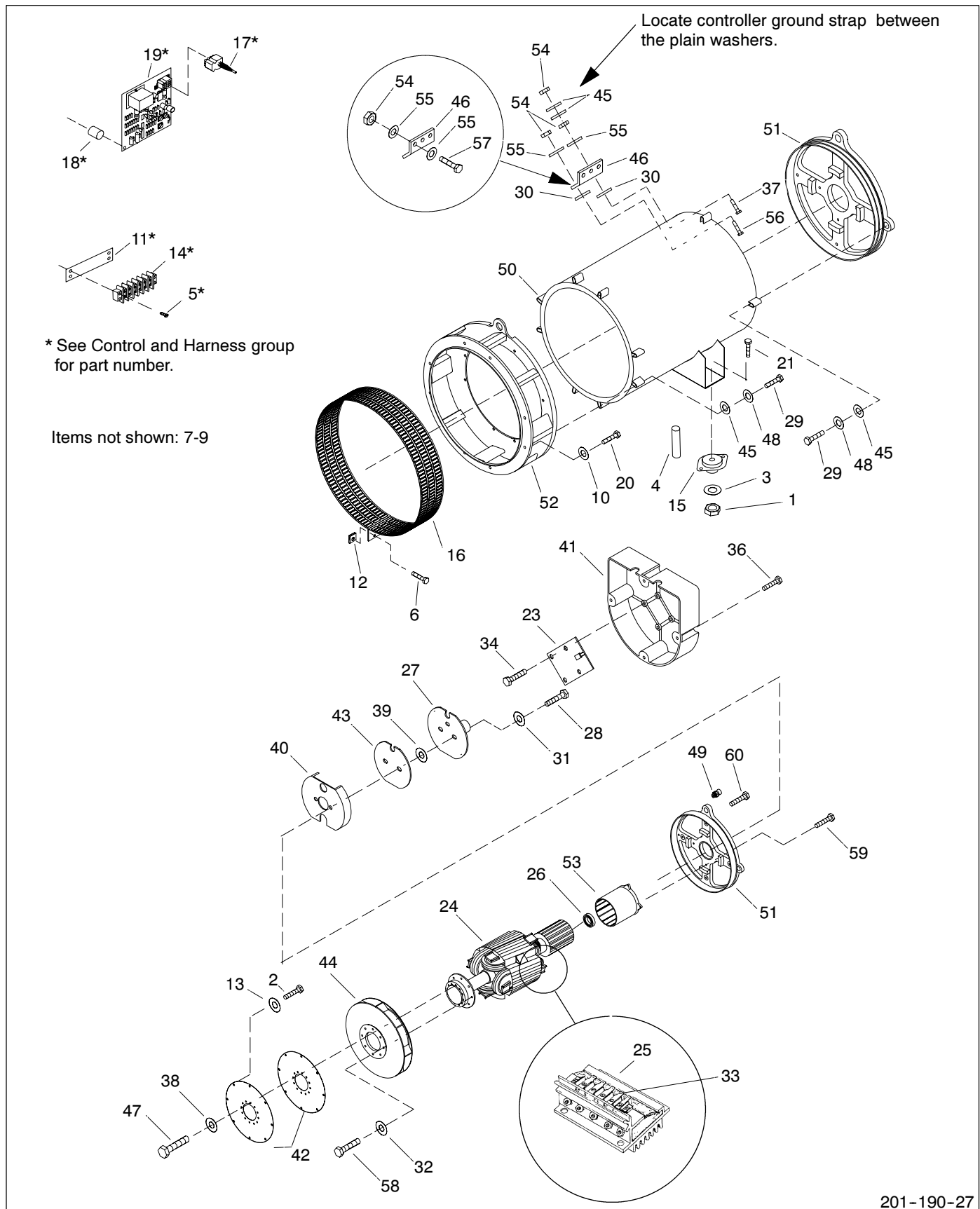
Group 109: Skid and Plant Mounting

Item	Part Number	Description	Quantity			
			Variation/Kit Number			
			13	343477	GM13658-MA1 S	GM34408-MA1
1	X-101-15	Nut, elastic stop, 5/8-11	4	4		
1	M982-16-80	Nut, hex elastic stop			4	4
2	X-202-41	Bushing, reducer	1	1	1	1
3	X-211-1	Elbow, street, 1/2 in.	1	1	1	1
4	X-22-14	Washer, lock, .391 ID x .975 in. OD	4	4	4	
5	X-22-16	Washer, lock, .326 ID x .883 in. OD	1	1	3	8
6	X-22-26	Washer, lock, .521 ID x 1.24 in. OD	1	1		
7	X-22-30	Washer, lock, .652 ID x 1.058 in. OD	8	8	8	8
8	X-25-112	Washer, plain	4	4	4	4
9	X-426-10	Clamp, hose	2	2	2	2
10	X-55-25	Screw, socket head	8	8	8	8
11	X-577-27	Hose	1	1	1	1
12	X-6046-5	Strap, ground	1	1	1	1
13	X-6052-1	Screw, HC	1	1		
13	M933-12030-60	Screw, HC			1	1
14	X-6216-1	Screw, PHC	12	12	12	12
15	X-80-1	Nut, hex	1	1		
16	M125A-20-80	Washer	2	2	2	2
16	X-801-8	Washer, hardened			2	2
17	241062	Plug, drain	1	1		
17	X-75-3	Plug, pipe 1/2 in. NPT			1	1
18	272701	Valve, oil drain	1	1	1	1
19	273729	Adapter, hose	1	1		
19	X-582-1	Connector, hose			1	1
20	276552	Washer, nylon	1	1		
21	336001-BLK	Cover, side	2	2	2	2
22	336005-BLK	Cover, rear	1	1	1	
22	336004-BLK	Cover, rear				1
23	336021	Box, junction	1	1	1	
23	GM10555	Box, junction				1
24	336024	Vibromount	4	4	4	4
25	336085	Bracket, junction box	2	2	2	
25	GM32571	Bracket, junction box				4
26	GM28345	Support, engine, front	1	1	1	1
27	343102	Skid	1	1		
27	GM23239	Skid			1	1
28	343103	Bracket, engine mounting	2	2	2	2
29	343105	Extension, skid	2	2		
29	GM23238	Extension, skid			2	2
30	343107	Bracket, connection	2	2		
30	GM23237	Bracket, connection			2	2
31	#	Hardware, 3/8-16	4	4		
31	M931-161120-60	Screw, HC			4	4
32	M933-20050-60	Screw, HC	2	2		
32	M933-20050-60	Screw, HC	2	2		
32	M933-16050-60	Screw, HC			2	2
33	X-6021-12	Screw, HC	2	2		
33	M931-16100-60	Screw, HC			2	2
34	M982-20-80	Nut, elastic stop	2	2	2	2
35	X-125-24	Screw, HC	1	1	1	1

Common hardware. Procure locally.

Group 201: Generator and Mounting

Permanent Magnet-Excited Alternators



201-190-27

Group 201: Generator and Mounting

Permanent Magnet-Excited Alternators

Item	Part Number	Description	Qty. All Models
1	M982-12-80	Nut, hex stop	2
2	X-129-59	Screw, HC	8
3	X-25-103	Washer, plain	2
4	X-400-197	Spacer	2
5	*	Screw, RHM, 8-32 x 3/4 in.	2
6	X-67-125	Screw, self-tapping	4
7	X-750-14	Marker, wire tab no. L1 (not shown)	1
8	X-750-15	Marker, wire tab no. L2 (not shown)	1
9	X-750-16	Marker, wire tab no. L3 (not shown)	1
10	X-801-6	Washer, hardened	8
11	*	Marker, strip	1
12	257442	Clip, speed	4
13	290945	Washer, hardened	8
14	*	Block, terminal	1
15	324392	Vibromount	2
16	347268	Guard, generator fan	2
17	*	Harness, wiring	1
18	*	Standoff, circuit board	5
19	*	Circuit board assembly	1
20	X-6024-14	Screw	8
21	M931-12110-60	Screw	2
22	See chart below	Alternator assembly (includes the following)	1
23	B-257099	LED board	1
24	See chart below	Rotor assembly (includes items 25 & 26)	1
25	A-354299	Split activator	1
26	X-758-9	Ball bearing	1
27	GM34505	Photo board	1
28	X-117-5	Screw, hex head, 10-24 x 5/8 in.	2

Item	Part Number	Description	Qty. All Models
29	X-129-25	Screw, HC expense	12
30	X-22-46	Washer lock, #6 interior	2
31	X-22-9	Washer lock, #10 interior tooth	2
32	X-25-93	Washer, plain	8
33	X-431-25	Terminal, push-on	4
34	X-6071-1	Screw, thread-forming, #10 PHH	4
35	X-6093-8	Sleeving (not shown)	2
36	X-67-133	Screw, self-tapping	3
37	X-791-6	Screw, hex head	1
38	X-801-3	Washer, hardened	16
39	243321	Washer, insulating	2
40	257077	Actuator, magnetic cup	1
41	257258	Cover, LED PCB	1
42	257581	Disc, armature drive	4
43	257850	Insulator, PCB split activator	1
44	257855	Fan, generator	1
45	257951	Washer, special	12
46	257978	Connector, bus	1
47	270158	Screw, cylinder head	12
48	290945	Washer, hardened	12
49	347119	Fitting, grease	1
50	See chart below	Stator assembly	
51	347236	Bracket, end	1
52	347240	Adapter, generator	1
53	347707	Exciter, assembly field	1
54	#	Nut, 3/8-16	6
55	#	Washer, 3/8 in.	10
56	X-6238-11	Screw	1
57	X-6238-5	Screw	3
58	X-6238-11	Screw	8
59	X-6238-17	Screw	4
60	X-465-25	Screw	1

Common hardware. Procure locally.

* See Control and Harness group for part number.

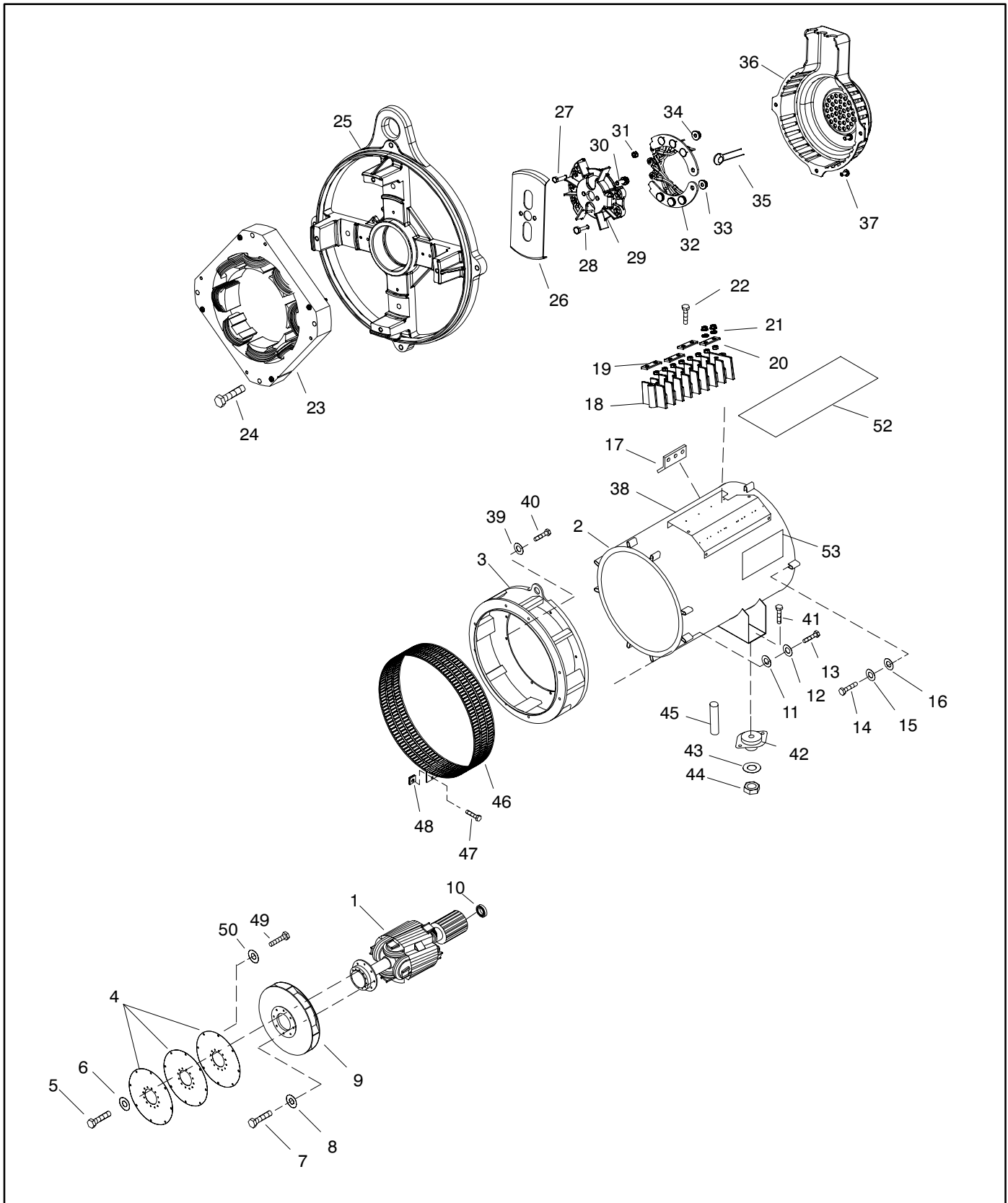
Alternator Part Number and Type

Use this table to identify the kit/module number's alternator, rotor, and stator part numbers.

Variation/ Module No.	Alternator Description	Item 22, Alternator assembly	Item 24, Rotor assembly	Item 50, Stator assembly
27	4UA9	A-347209	A-347187	347197
28	4UA9, 600 V	A-347213	A-347187	347203
29	4UA10	A-347210	A-347188	347198
30	4UA10, 600 V	A-347214	A-347188	347204
31	4UA13	A-347211	A-347189	347199
32	4UA13, 600 V	A-347215	A-347189	347205
GM13657-MA1	4UA9	A-347209	A-347187	347197
GM13657-MA2	4UA10	A-347210	A-347188	347198
GM13657-MA3	4UA13	A-347211	A-347189	347199
GM13657-MA4	4UA9, 600 V	A-347213	A-347187	347203
GM13657-MA5	4UA10, 600 V	A-347214	A-347188	347204
GM13657-MA6	4UA13, 600 V	A-347215	A-347189	347205
GM16947-MA1	4UA9	B-347209	A-347187	347197
GM16947-MA2	4UA9, 600 V	A-347213	A-347187	347203
GM16947-MA3	4UA10	B-347210	A-347188	347198
GM16947-MA4	4UA10, 600 V	B-347214	A-347188	347204
GM16947-MA5	4UA13	B-347211	A-347189	347199
GM16947-MA6	4UA13, 600 V	B-347215	A-347189	347205
GM19673-MA32	4UA9 (LS leads)	GM24411-3	A-347187	GM24409-2
GM19673-MA33	4UA9, 600 V (LS leads)	GM24411-4	A-347187	GM24410-2
GM19673-MA34	4UA10 (LS leads)	GM24411-5	A-347188	GM24409-3
GM19673-MA35	4UA10, 600 V (LS leads)	GM24411-6	A-347188	GM24410-3
GM19673-MA36	4UA13 (LS leads)	GM24411-7	A-347189	GM24409-4
GM19673-MA37	4UA13, 600 V (LS leads)	GM24411-8	A-347189	GM24410-4

Group 201: Generator and Mounting, continued

Wound Field Alternators



Group 201: Generator and Mounting, continued

Wound Field Alternators

Item	Part No.	Description	Qty.
1	See chart below	Rotor assembly	1
2	See chart below	Stator assembly	1
3	GM32011	Adapter, generator	1
4	GM31972	Disc, drive	4
5	M933-12040-82	Screw, hex cap	12
6	290945	Washer, .531 ID x 1.06 in. OD	12
7	M933-10025-60	Screw, hex cap	8
8	X-25-93	Washer, .406 ID x .75 in. OD	8
9	257855	Fan, generator	1
10	X-758-9	Bearing, ball	1
11	257951	Washer, .562 ID x 1.13 in. OD	8
12	290945	Washer, .531 ID x 1.06 in. OD	8
13	M931-12095-60	Screw, hex cap	8
14	M931-12095-60	Screw, hex cap	4
15	290945	Washer, .531 ID x 1.06 in. OD	4
16	257951	Washer, .562 ID x 1.13 in. OD	4
17	257978	Bus	1
18	GM31969	Block, terminal	1
19	See chart below	Bus	
20	See chart below	Nut, hex, 10 mm	
21	See chart below	Washer, plain	
22	M7500D-06020-81	Screw	2
23	GM32518-1	Exciter field	1
23	GM32518-2	Exciter field (4UA13W alternators)	1
24	M931-08060-60	Screw, hex head	4
24	M931-08085-60	Screw, hex head (4UA13W alternators)	4

Item	Part No.	Description	Qty.
25	GM31973	Bracket, end	1
26	GM31967	Actuator, magnetic	1
27	M933-05020-60	Screw, hex cap	3
28	M933-06020-60	Screw, hex cap	2
29	GM31960	Hub, rotating diode assembly	1
30	M933-06016-60	Screw, hex cap	2
31	M934-05-50	Nut, hex, 5 mm	3
32	GM31963	Plates, diode assembly	1
33	M982-06-80	Nut, hex, elastic stop	2
34	M982-05-60	Nut, hex, elastic stop	3
35	228061	Varistor, 250 V	1
36	GM31968	Cover, rotating diode assembly	1
37	M7500D-05010-81	Screw, thread forming metric	3
38	344295	Decal, equipment ground	1
39	X-801-6	Washer, .469 ID x .922 in. OD	8
40	X-6024-14	Screw, hex head	8
41	M931-16120-60	Screw, hex cap	2
42	324392	Vibromount	2
43	X-25-168	Washer, plain	2
44	M982-16-80	Nut, hex, elastic stop	2
45	X-400-265	Spacer	2
46	347268	Guard, generator fan	2
47	X-67-125	Screw, hex washer, thread-forming	4
48	257442	Clip, speed	4
49	X-129-59	Bolt, hex cap	8
50	290945	Washer, hardened, .531 ID x 1.06 in. OD	8
51	See chart below	Alternator assembly (includes items 1-38, 52, 53)	1
52	See chart below	Decal, terminal board	1
53	See chart below	Decal, board reconnection	1

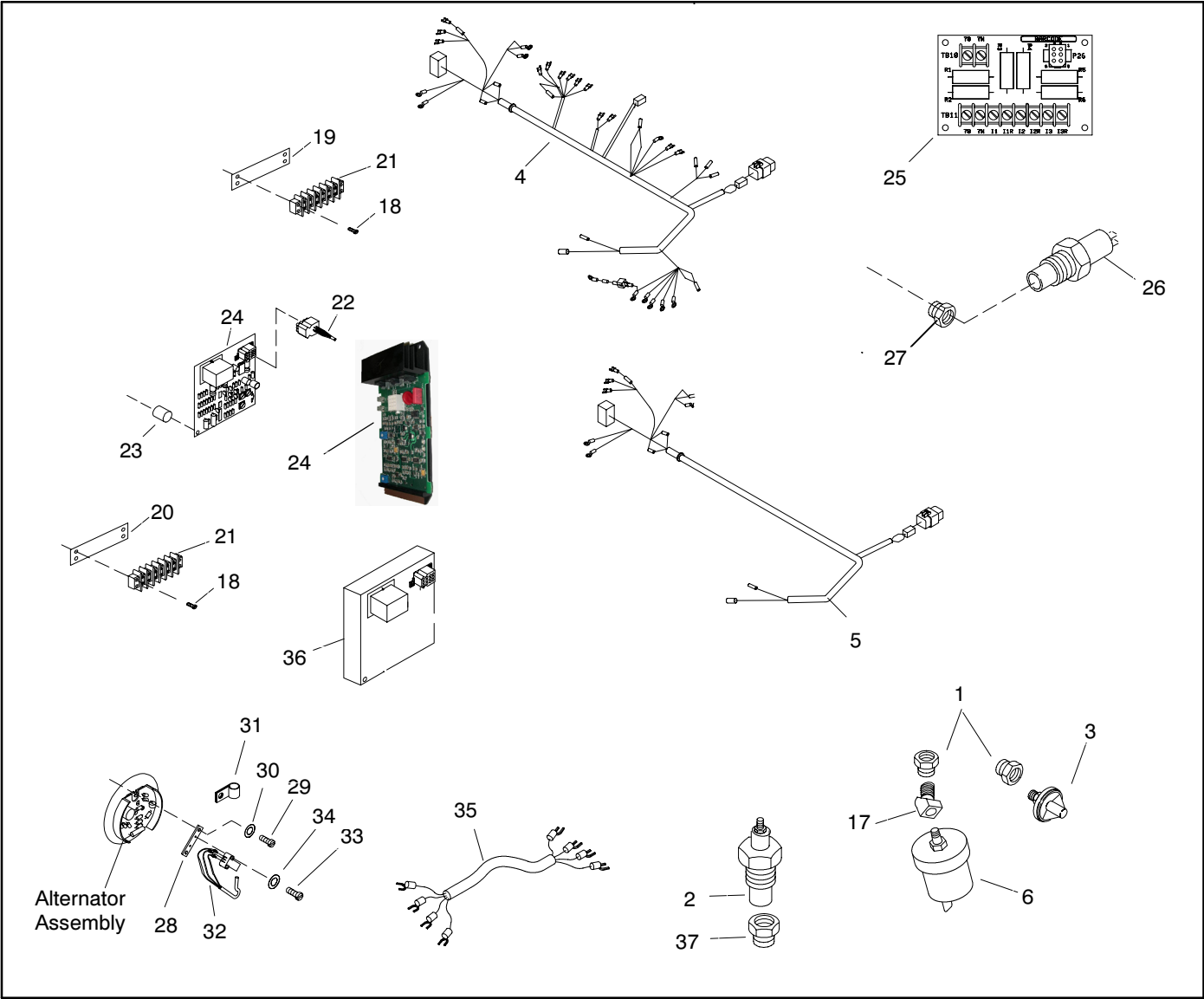
Alternator Part Number and Type

Use this table to identify the module number's alternator, rotor, and stator part numbers.

Module No.	Alternator Description	Item 51, Alternator assembly	Item 1, Rotor assembly	Item 2, Stator assembly	Items 19, Bus	Items 20, Nut	Items 21, Washer
GM19673-MA73	4UA9W	GM33000-6	GM32424-4	GM32996-2	GM31970	M6923-10-80	M125A-10-80
GM19673-MA74	4UA9W, 600 V	GM33000-8	GM32424-4	GM32997-2	GM31970	M6923-10-80	M125A-10-80
GM19673-MA75	4UA10W	GM33000-10	GM32424-6	GM32996-3	GM31970	M6923-10-80	M125A-10-80
GM19673-MA76	4UA10W, 600 V	GM33000-12	GM32424-6	GM32997-3	GM31970	M6923-10-80	M125A-10-80
GM19673-MA77	4UA13W	GM33000-14	GM32424-8	GM32996-4	GM31970	M6923-10-80	M125A-10-80
GM19673-MA78	4UA13W, 600 V	GM33000-16	GM32424-8	GM32997-4	GM31970	M6923-10-80	M125A-10-80
GM19673-MA138	4UA9W	GM39945-6	GM32424-4	GM32996-2	See Load Connection Kit for part number		
GM19673-MA139	4UA9W, 600 V	GM39945-8	GM32424-4	GM32997-2	See Load Connection Kit for part number		
GM19673-MA140	4UA10W	GM39945-10	GM32424-6	GM32996-3	See Load Connection Kit for part number		
GM19673-MA141	4UA10W, 600 V	GM39945-12	GM32424-6	GM32997-3	See Load Connection Kit for part number		
GM19673-MA142	4UA13W	GM39945-14	GM32424-8	GM32996-4	See Load Connection Kit for part number		
GM19673-MA143	4UA13W, 600 V	GM39945-16	GM32424-8	GM32997-4	See Load Connection Kit for part number		

Module No.	Item 52, Decal	Item 53, Decal
GM19673-MA73	GM38474	GM39793
GM19673-MA74	GM38474	GM39793
GM19673-MA75	GM38474	GM39793
GM19673-MA76	GM38474	GM39793
GM19673-MA77	GM38474	GM39793
GM19673-MA78	GM38474	GM39792
GM19673-MA138	GM38475	GM39792
GM19673-MA139	GM38475	GM39792
GM19673-MA140	GM38475	GM39792
GM19673-MA141	GM38475	GM39792
GM19673-MA142	GM38475	GM39792
GM19673-MA143	GM38475	GM39792

Control and Harness



Control and Harness

Item	Part Number	Description	Quantity Module			
			GM13669-MA1	GM13669-MA2	GM16945-MA1	GM16945-MA2
1	X-202-27	Bushing, reducer, 1/8 x 1/4 in.	2	2		
2	268298	Sender, water temperature	1	1		
3	328309	Switch, assembly pressure	1	1		
4	343464	Harness, wiring, diagnostics (includes items 7–13)	1	1		
4	GM11498	Harness, wiring (includes items 7, 11–16)			1	
4	GM35190	Harness, wiring				1
5	343465	Harness, wiring DDEC (includes items 14–16)	1	1		
6	343473	Sender, oil pressure	1	1		
7	233959	Diode, 6 A, 100 V (not shown)	3	3	4	
8	239411	Connector, jack, 4-position (P2) (not shown)	1	1		
9	259689	Connector, plug, 9-position (P4) (not shown)	1	1		
10	269190	Connector, plug, 6-position (not shown)	1	1		
11	290262	Boot (not shown)	1	1	1	
12	292800	Connector, cable (not shown)	1	1	1	
13	295145	Connector, 24-position (not shown)	1	1	1	
14	343129	Connector, 30-pin (P5) (not shown)	1	1	1	
15	343130	Connector, 5-pin (P3) (not shown)	1	1	1	
16	343131	Connector, 6-pin (P6) (not shown)	1	1	1	
17	267428	Elbow, 45° street	1	1		
18	M785A-04020-20	Screw, RHM, 8-32 x 3/4 in.	4	4	2	2
19	255080	Marker, strip	1	1		
20	299090	Marker, strip	1	1	1	1
21	295314	Block, terminal	2	2	1	1
22	354118	Harness, wiring	1			
22	GM34978	Harness, wiring		1		
23	360459	Standoff, circuit board	5			
23	#	Hardware, M4		4		
24	A-354653	PCB assembly (regulator)	1			
24	GM31850	PCB assembly (regulator)		1		
25	GM13980	PCB assembly, CT burden resistor			1	1
25	282829	Vibromount			4	4
26	290090	Switch, temperature			1	1
27	168848	Bushing, reducing, 1/2 x 1 in. NPT			1	1
28	257070	Bracket, sensor mounting	1			
29	X-117-5	Screw, hex head machine	2			
30	X-22-9	Washer, lock, .20 ID x .373 in. OD	2			
31	X-672-15	Clamp, insulated, .25 in.	1			
32	241623	Sensor, ferromagnetic	1	1		
33	X-49-35	Screw, pan head, 4-40 x 7/8	2			
33	M7985A-03020-20	Screw, pan head		2		
34	X-22-24	Washer, lock, .119 ID x 263 in. OD	2	2		
35	GM35357	Harness, wiring (AC harness)		1		1
36	GM11718	PCB assembly, excitation interface				1
37	153659	Bushing, reducing, 1/2 x 3/4 in. NPT	1	1		

Group 701: Literature

Item	Part Number	Description	Quantity				Quantity			
			Variation Number				Variation Number			
			11	13	20	22	48	50	52	54
1	MP-5700	I/M Stationary Duty	1	1	1	1	1	1	1	1
2	MP-5750	O/M 20-2000 kW	1	1	1	1	1	1	1	1
2	MP-6161	O/M Microprocessor-Plus w/Comm, Basic Controller					1	1	1	1
3	MP-5611	O/M DDC 71/92/149 Series	1	1	1	1	1	1	1	1
4	MP-5978	P/C 230-300DSE/DSEB	1	1	1	1	1	1	1	1
5	MP-5979	P/C DDC 60 Series Diesel	1		1	1	1		1	1
5	MP-5980	P/C DDC 60 Series Diesel 300-350 kW		1				1		
6	MP-6117	P/C Accessories, 230-2000 kW	1	1	1	1	1	1	1	1
7	MP-5353	S/M 20-300 kW	1	1	1	1	1	1	1	1
8	MP-5843	S/M DDC 60 Series	1	1	1	1	1	1	1	1
9	MP-5988	W/D 230-400DSE/200DSE	1	1	1	1				
9	MP-6338	W/D 200-300DSEB, 350/400DSE, 450DSEB					1	1	1	1
10	MP-6009	P/C Controllers	1	1	1	1	1	1	1	1
11	MP-6083	O/M Digital 550 Controller before Ver. 2.10	1	1	1	1	1	1	1	1
12	MP-6140	O/I/M Controller Setup and Application, 550	1	1	1	1	1	1	1	1
13	MP-6200	O/M 20-2000 kW, 550 Ver. 2.10	1	1	1	1	1	1	1	1

Kit List

This section lists the part numbers of modules/kits not listed in the Group Parts Lists. Refer to the generator set nameplate or the list below to identify the module/kit number installed on your generator set. See the sections following this page for the parts list of the module/kit.

	230 kW	250 kW	275 kW	300 kW
Air Intake Systems				
Air Cleaner, Heavy-Duty	343508	343508	343508	343508
Controllers				
See Parts Catalog MP-6009 for parts lists.				
Cooling Systems				
Heater, Block				
90-240V	354954	354954	354954	354954
90-240V	343584	343584	343584	343584
308-480V	354955	354955	354955	354955
308-480V	343585	343585	343585	343585
Heater, Block with Isolation Valves				
90-120 V	GM19402-KA1	GM19402-KA1	GM19402-KA1	GM19402-KA1
190-280 V	GM19402-KA2	GM19402-KA2	GM19402-KA2	GM19402-KA2
210-240 V	GM19402-KA3	GM19402-KA3	GM19402-KA3	GM19402-KA3
380-480 V	GM19402-KA4	GM19402-KA4	GM19402-KA4	GM19402-KA4
Duct Flange, Radiator	343246	343246	343246	343246
Optional Kits				
See Parts Catalog MP-6117 for parts lists.				
Paint and Miscellaneous Parts				
Paint	All models use 221331 Spray Can, 221332 Gallon, GM19491 Touch-Up			
Filter Kit	GM14107	GM14107	GM14107	GM14107
(includes oil and fuel filters)				

Cooling System Kits

Qty.	Description	Part No.
Block Heater 343584		
1	Pipe, 3/4 x 4 in.	A-107
4	Nut, elastic stop, 1/4-20	X-101-8
1	Bushing, reducer	X-202-41
1	Tee, pipe, 1/2 in.	X-203-13
1	Pipe	X-209-21
1	Nipple, pipe, 1/2 x 1 1/2 in.	X-209-5
1	Elbow, pipe, 3/4 in.	X-215-2
1	Coupling, pipe, 1/2 in.	X-216-20
9	Washer, lock, 1/4 in., interior/exterior tooth	X-22-12
2	Washer, lock, .391 ID x .975 in. OD	X-22-14
4	Clamp, hose, 1.25 in. max.	X-426-12
2	Connector, hose	X-582-7
1	Hose	X-691-21
1	Hose, oil proof	X-691-37
1	Plug, pipe, 1/2 in.	X-75-28
4	Screw, slotted hex washer head	X-97-13
1	Strap, ground, 3/8 x 5 in.	223033
4	Bumper	259632
1	Tag, hang	279047
1	Tag, instruction	279280
1	Block heater (includes items marked *)	279814
1	*Element, replacement	GM19501
4	Gasket, washer	297001
1	Plug, freeze	324094
1	Thermostat, block heater	343222
1	Box, block heater	354315
1	Cover, block heater	354317
1	Gasket, control box	354318
1	Decal, warning	354325
1	Label, wiring diagram	354327
1	Bracket, block heater	354687
Block Heater 343585		
1	Pipe, 3/4 x 4 in.	A-107
4	Nut, elastic stop, 1/4-20	X-101-8
1	Bushing, reducer	X-202-41
1	Tee, pipe, 1/2 in.	X-203-13
1	Pipe	X-209-21
1	Nipple, pipe, 1/2 x 1 1/2 in.	X-209-5
1	Elbow, pipe, 3/4 in.	X-215-2
1	Coupling, pipe, 1/2 in.	X-216-20
9	Washer, lock, 1/4 in., interior/exterior tooth	X-22-12
2	Washer, lock, .391 ID x .975 in. OD	X-22-14
4	Clamp, hose, 1.25 in. max.	X-426-12
2	Connector, hose	X-582-7
1	Hose	X-691-21
1	Hose, oil proof	X-691-37
1	Plug, pipe, 1/2 in.	X-75-28
4	Screw, slotted hex washer head	X-97-13
1	Strap, ground, 3/8 x 5 in.	223033
4	Bumper	259632
1	Tag, hang	279047
1	Tag, instruction	279280
1	Block heater (includes items marked *)	279815
1	*Element, replacement	GM19502
4	Gasket, washer	297001
1	Plug, freeze	324094
1	Thermostat, block heater	343222
1	Box, block heater	354316
1	Cover, block heater	354317
1	Gasket, control box	354318
1	Decal, warning	354325
1	Label, wiring diagram	354328
1	Bracket, block heater	354687

Qty.	Description	Part No.
Block Heater 354954		
1	Pipe, 3/4 x 4 in.	A-107
4	Nut, elastic stop, 1/4 in.	X-101-8
1	Bushing, reducer	X-202-41
1	Tee, pipe, 1/2 in.	X-203-13
1	Pipe	X-209-21
1	Nipple, pipe, 1/2 x 1-1/2 in.	X-209-5
1	Elbow, pipe, 3/4 in.	X-215-2
1	Coupling, pipe, 1/2 in.	X-216-20
9	Washer, lock, 1/4 in. interior/exterior tooth	X-22-12
4	Clamp, hose, 1.25 in. maximum	X-426-12
2	Connector, hose	X-582-7
1	Strap, ground	223033
4	Screw, PHC	X-6216-1
1	Hose, coolant, 44 in.	X-6367-1
1	Hose, coolant, 65 in.	X-6367-9
4	Bumper	259632
1	Bracket, support	274431
1	Tag, hang	279047
1	Tag, instruction	279280
1	Block heater	279814
4	Gasket, washer	297001
1	Plug, freeze	324094
1	Bracket, block heater	343100
1	Thermostat, block heater	343222
1	Box, block heater	354315
1	Cover, block heater	354317
1	Gasket, control box	354318
1	Decal, warning	354325
1	Label, wiring diagram	354327
Block Heater 354955		
1	Pipe, 3/4 x 4 in.	A-107
4	Nut, elastic stop, 1/4 in.	X-101-8
1	Bushing, reducer	X-202-41
1	Tee, pipe, 1/2 in.	X-203-13
1	Pipe	X-209-21
1	Nipple, pipe, 1/2 x 1-1/2 in.	X-209-5
1	Elbow, pipe, 3/4 in.	X-215-2
1	Coupling, pipe, 1/2 in.	X-216-20
9	Washer, lock, 1/4 in. interior/exterior tooth	X-22-12
4	Clamp, hose, 1.25 in. maximum	X-426-12
2	Connector, hose	X-582-7
1	Strap, ground	223033
4	Screw, PHC	X-6216-1
1	Hose, coolant, 44 in.	X-6367-1
1	Hose, coolant, 65 in.	X-6367-9
4	Bumper	259632
1	Bracket, support	274431
1	Tag, hang	279047
1	Tag, instruction	279280
1	Block heater	279815
4	Gasket, washer	297001
1	Plug, freeze	324094
1	Bracket, block heater	343100
1	Thermostat, block heater	343222
1	Box, block heater control	354316
1	Cover, block heater control box	354317
1	Gasket, control box	354318
1	Decal, warning	354325
1	Label, wiring diagram	354328

Cooling System Kits

Qty.	Description	Part No.
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Block Heater

GM19402-KA1

1	Box, block heater control	354315
1	Label, wiring diagram	354327
1	Block heater	GM20133
4	Bumper	259632
1	Strap, ground	223033
1	Tag, hang	279047
1	Tag, instruction	279280
4	Gasket, washer	297001
1	Plug, freeze	324094
1	Thermostat, block heater	343222
1	Cover, block heater control box	354317
1	Gasket, control box	354318
1	Decal, warning	354325
1	Bracket, block heater	354687
1	Pipe, 3/4 x 4 in.	A-107
2	Valve, shutoff	GM19670
4	Nut, elastic stop, 1/4 in.	M982-06-80
1	Bushing, reducer	X-202-41
1	Tee, pipe, 1/2 in.	X-203-13
1	Pipe	X-209-21
2	Pipe, 1/2 x 1 1/2 in.	X-209-5
1	Elbow, pipe, 3/4 in.	X-215-2
1	Coupling, pipe, 1/2 in.	X-216-20
10	Washer, lock, .262 ID x .743 in. OD	X-22-12
2	Washer, lock, .326 ID x .883 in. ID	X-22-16
4	Clamp, hose, 1.25 in. maximum	X-426-12
2	Connector, hose	X-582-7
1	Hose, coolant, 44 in.	X-6367-1
1	Hose, coolant, 55 in.	X-6367-10
4	Screw, slotted hex washer head, machine	X-97-13

Block Heater

GM19402-KA2

1	Box, block heater control	354315
1	Label, wiring diagram	354327
1	Block heater	GM20134
4	Bumper	259632
1	Strap, ground	223033
1	Tag, hang	279047
1	Tag, instruction	279280
4	Gasket, washer	297001
1	Plug, freeze	324094
1	Thermostat, block heater	343222
1	Cover, block heater control box	354317
1	Gasket, control box	354318
1	Decal, warning	354325
1	Bracket, block heater	354687
1	Pipe, 3/4 x 4 in.	A-107
2	Valve, shutoff	GM19670
4	Nut, elastic stop, 1/4 in.	M982-06-80
1	Bushing, reducer	X-202-41
1	Tee, pipe, 1/2 in.	X-203-13
1	Pipe	X-209-21
2	Pipe, 1/2 x 1 1/2 in.	X-209-5
1	Elbow, pipe, 3/4 in.	X-215-2
1	Coupling, pipe, 1/2 in.	X-216-20
10	Washer, lock, .262 ID x .743 in. OD	X-22-12
2	Washer, lock, .326 ID x .883 in. ID	X-22-16
4	Clamp, hose, 1.25 in. maximum	X-426-12
2	Connector, hose	X-582-7
1	Hose, coolant, 44 in.	X-6367-1
1	Hose, coolant, 55 in.	X-6367-10
4	Screw, slotted hex washer head, machine	X-97-13

Qty.	Description	Part No.
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Block Heater

GM19402-KA3

1	Box, block heater control	354315
1	Label, wiring diagram	354327
1	Block heater	GM20135
4	Bumper	259632
1	Strap, ground	223033
1	Tag, hang	279047
1	Tag, instruction	279280
4	Gasket, washer	297001
1	Plug, freeze	324094
1	Thermostat, block heater	343222
1	Cover, block heater control box	354317
1	Gasket, control box	354318
1	Decal, warning	354325
1	Bracket, block heater	354687
1	Pipe, 3/4 x 4 in.	A-107
2	Valve, shutoff	GM19670
4	Nut, elastic stop, 1/4 in.	M982-06-80
1	Bushing, reducer	X-202-41
1	Tee, pipe, 1/2 in.	X-203-13
1	Pipe	X-209-21
2	Pipe, 1/2 x 1 1/2 in.	X-209-5
1	Elbow, pipe, 3/4 in.	X-215-2
1	Coupling, pipe, 1/2 in.	X-216-20
10	Washer, lock, .262 ID x .743 in. OD	X-22-12
2	Washer, lock, .326 ID x .883 in. ID	X-22-16
4	Clamp, hose, 1.25 in. maximum	X-426-12
2	Connector, hose	X-582-7
1	Hose, coolant, 44 in.	X-6367-1
1	Hose, coolant, 55 in.	X-6367-10
4	Screw, slotted hex washer head, machine	X-97-13

Block Heater

GM19402-KA4

1	Box, block heater control	354316
1	Label, wiring diagram	354328
1	Block heater	GM20136
4	Bumper	259632
1	Strap, ground	223033
1	Tag, hang	279047
1	Tag, instruction	279280
4	Gasket, washer	297001
1	Plug, freeze	324094
1	Thermostat, block heater	343222
1	Cover, block heater control box	354317
1	Gasket, control box	354318
1	Decal, warning	354325
1	Bracket, block heater	354687
1	Pipe, 3/4 x 4 in.	A-107
2	Valve, shutoff	GM19670
4	Nut, elastic stop, 1/4 in.	M982-06-80
1	Bushing, reducer	X-202-41
1	Tee, pipe, 1/2 in.	X-203-13
1	Pipe	X-209-21
2	Pipe, 1/2 x 1 1/2 in.	X-209-5
1	Elbow, pipe, 3/4 in.	X-215-2
1	Coupling, pipe, 1/2 in.	X-216-20
10	Washer, lock, .262 ID x .743 in. OD	X-22-12
2	Washer, lock, .326 ID x .883 in. ID	X-22-16
4	Clamp, hose, 1.25 in. maximum	X-426-12
2	Connector, hose	X-582-7
1	Hose, coolant, 44 in.	X-6367-1
1	Hose, coolant, 55 in.	X-6367-10
4	Screw, slotted hex washer head, machine	X-97-13

Duct Flange, Radiator

343246

8	Rivet, pop	X-781-11
4	Screw, drill hex	X-794-1
2	Frame, air duct, top/bottom	343271
2	Frame, air duct, sides	343272

Air Intake Kits

Qty.	Description	Part No.
Heavy-Duty		343508
1	Cleaner assembly, air	A-279713
1	Element, air cleaner	279736
1	Tube, steel	X-522-60
1	Tube, steel	X-522-85
1	Plug, pipe, 1/8 in.	X-75-4
5	Clamp	254013
1	Clamp, hose	254344
2	Elbow, 90 degree	272627
1	Cap, rain	272674
2	Bracket, air cleaner	291666
1	Bracket, air cleaner support	343172
1	Bracket, mounting	343243
1	Hose, hump	343429

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. lb.	foot pounds (torque)
Al	aluminum	cont.	continued	ft./min.	feet per minute
ANSI	American National Standards Institute (formerly American Standards Association, ASA)	CPVC	chlorinated polyvinyl chloride	g	gram
AO	anticipatory only	crit.	critical	ga.	gauge (meters, wire size)
API	American Petroleum Institute	CRT	cathode ray tube	gal.	gallon
approx.	approximate, approximately	CSA	Canadian Standards Association	gen.	generator
AR	as required, as requested	CT	current transformer	genset	generator set
AS	as supplied, as stated, as suggested	Cu	copper	GFI	ground fault interrupter
ASE	American Society of Engineers	cu. in.	cubic inch	GND, ⊕	ground
ASME	American Society of Mechanical Engineers	cw.	clockwise	gov.	governor
assy.	assembly	CWC	city water-cooled	gph	gallons per hour
ASTM	American Society for Testing Materials	cyl.	cylinder	gpm	gallons per minute
ATDC	after top dead center	D/A	digital to analog	gr.	grade, gross
ATS	automatic transfer switch	DAC	digital to analog converter	GRD	equipment ground
auto.	automatic	dB	decibel	gr. wt.	gross weight
aux.	auxiliary	dBA	decibel (A weighted)	H x W x D	height by width by depth
A/V	audiovisual	DC	direct current	HC	hex cap
avg.	average	DCR	direct current resistance	HCHT	high cylinder head temperature
AVR	automatic voltage regulator	deg., °	degree	HD	heavy duty
AWG	American Wire Gauge	dept.	department	HET	high exhaust temperature, high engine temperature
AWM	appliance wiring material	dia.	diameter	hex	hexagon
bat.	battery	DI/EO	dual inlet/end outlet	Hg	mercury (element)
BBDC	before bottom dead center	DIN	Deutsches Institut für Normung e. V. (also Deutsche Industrie Normenausschuss)	HH	hex head
BC	battery charger, battery charging	DIP	dual inline package	HHC	hex head cap
BCA	battery charging alternator	DPDT	double-pole, double-throw	HP	horsepower
BCI	Battery Council International	DPST	double-pole, single-throw	hr.	hour
BDC	before dead center	DS	disconnect switch	HS	heat shrink
BHP	brake horsepower	DVR	digital voltage regulator	hsg.	housing
blk.	black (paint color), block (engine)	E, emer.	emergency (power source)	HVAC	heating, ventilation, and air conditioning
blk. htr.	block heater	EDI	electronic data interchange	HWT	high water temperature
BMEP	brake mean effective pressure	EFR	emergency frequency relay	Hz	hertz (cycles per second)
bps	bits per second	e.g.	for example (<i>exempli gratia</i>)	IC	integrated circuit
br.	brass	EG	electronic governor	ID	inside diameter, identification
BTDC	before top dead center	EGSA	Electrical Generating Systems Association	IEC	International Electrotechnical Commission
Btu	British thermal unit	EIA	Electronic Industries Association	IEEE	Institute of Electrical and Electronics Engineers
Btu/min.	British thermal units per minute	EI/EO	end inlet/end outlet	IMS	improved motor starting
C	Celsius, centigrade	EMI	electromagnetic interference	in.	inch
cal.	calorie	emiss.	emission	in. H 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. lb.	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	rlly.	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
meggar	megohmmeter	PTC	positive temperature coefficient	US	undersize, underspeed
MHz	megahertz	PTO	power takeoff	UV	ultraviolet, undervoltage
mi.	mile	PVC	polyvinyl chloride	V	volt
mil	one one-thousandth of an inch	qt.	quart, quarts	VAC	volts alternating current
min.	minimum, minute	qty.	quantity	VAR	voltampere reactive
misc.	miscellaneous	R	replacement (emergency) power source	VDC	volts direct current
MJ	megajoule	rad.	radiator, radius	VFD	vacuum fluorescent display
mJ	millijoule	RAM	random access memory	VGA	video graphics adapter
mm	millimeter	RDO	relay driver output	VHF	very high frequency
mOhm, mΩ	milliohm	ref.	reference	W	watt
MOhm, MΩ	megohm	rem.	remote	WCR	withstand and closing rating
MOV	metal oxide varistor	Res/Coml	Residential/Commercial	w/	with
MPa	megapascal	RFI	radio frequency interference	w/o	without
mpg	miles per gallon	RH	round head	wt.	weight
mph	miles per hour			xfrm	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.

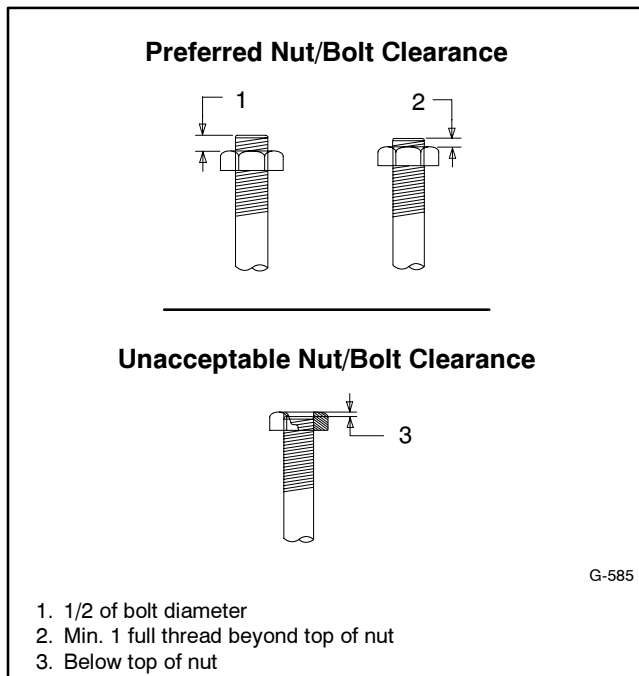


Figure 1 Acceptable Bolt Lengths

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.

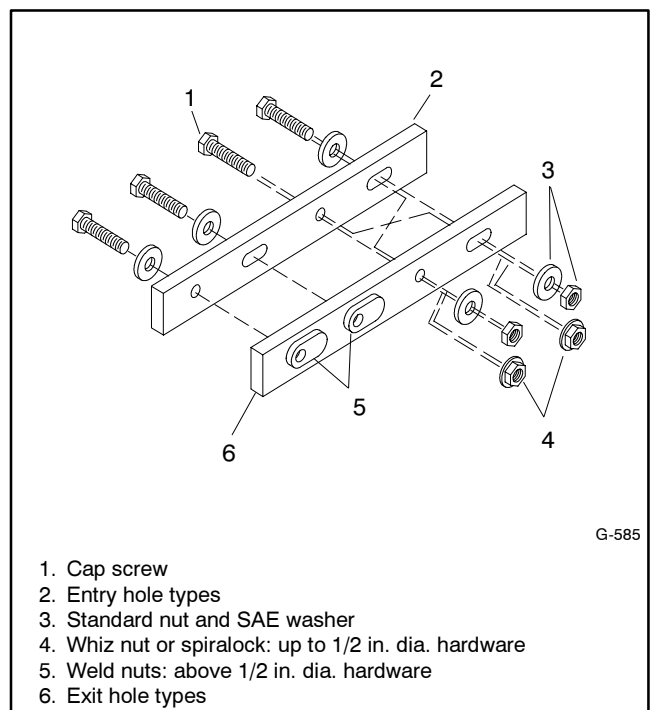


Figure 2 Acceptable Hardware Combinations

Appendix C General Torque Specifications

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. Do not use these values when the torque values are specified on the assembly drawing.
2. These values are based on new plates threads. Increase values by 15% if non-plated threads are used.
3. Hardware threaded into aluminum must have two diameters of thread engagement or may require 30% or more reduction in the torque.
4. Torques are calculated as equivalent stress loading to American hardware and approximately a preload of 90% of yield strength and 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-6009-1	1-8	Standard		
X-465-6	1/4-20 x .50	X-6238-16	3/8-24 x 1.25					
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-6210-10	3/8-24	Spiralock		
X-465-25	1/4-28 x .38	X-129-15	1/2-13 x .75	X-6210-11	7/16-14	Spiralock		
X-465-20	1/4-28 x 1.00	X-129-17	1/2-13 x 1.00	X-6210-12	1/2-13	Spiralock		
		X-129-18	1/2-13 x 1.25	X-6210-15	7/16-20	Spiralock		
X-125-33	5/16-18 x .50	X-129-19	1/2-13 x 1.50	X-6210-14	1/2-20	Spiralock		
X-125-23	5/16-18 x .62	X-129-20	1/2-13 x 1.75					
X-125-3	5/16-18 x .75	X-129-21	1/2-13 x 2.00	X-85-3	5/8-11	Standard		
X-125-31	5/16-18 x .88	X-129-22	1/2-13 x 2.25	X-88-12	3/4-10	Standard		
X-125-5	5/16-18 x 1.00	X-129-23	1/2-13 x 2.50	X-89-2	1/2-20	Standard		
X-125-24	5/16-18 x 1.25	X-129-24	1/2-13 x 2.75					
X-125-34	5/16-18 x 1.50	X-129-25	1/2-13 x 3.00					
X-125-25	5/16-18 x 1.75	X-129-27	1/2-13 x 3.50					
X-125-26	5/16-18 x 2.00	X-129-29	1/2-13 x 4.00					
230578	5/16-18 x 2.25	X-129-30	1/2-13 x 4.50					
X-125-29	5/16-18 x 2.50	X-463-9	1/2-13 x 5.50					
X-125-27	5/16-18 x 2.75	X-129-44	1/2-13 x 6.00					
X-125-28	5/16-18 x 3.00							
X-125-22	5/16-18 x 4.50	X-129-51	1/2-20 x .75	X-25-46	.125	.250	.022	#4
X-125-32	5/16-18 x 5.00	X-129-45	1/2-20 x 1.25	X-25-9	.156	.375	.049	#6
X-125-35	5/16-18 x 5.50	X-129-52	1/2-20 x 1.50	X-25-48	.188	.438	.049	#8
X-125-36	5/16-18 x 6.00			X-25-36	.219	.500	.049	#10
X-125-40	5/16-18 x 6.50	X-6021-3	5/8-11 x 1.00	X-25-40	.281	.625	.065	1/4
		X-6021-4	5/8-11 x 1.25	X-25-85	.344	.687	.065	5/16
X-125-43	5/16-24 x 1.75	X-6021-2	5/8-11 x 1.50	X-25-37	.406	.812	.065	3/8
X-125-44	5/16-24 x 2.50	X-6021-1	5/8-11 x 1.75	X-25-34	.469	.922	.065	7/16
X-125-30	5/16-24 x .75	273049	5/8-11 x 2.00	X-25-26	.531	1.062	.095	1/2
X-125-39	5/16-24 x 2.00	X-6021-5	5/8-11 x 2.25	X-25-15	.656	1.312	.095	5/8
X-125-38	5/16-24 x 2.75	X-6021-6	5/8-11 x 2.50	X-25-29	.812	1.469	.134	3/4
		X-6021-7	5/8-11 x 2.75	X-25-127	1.062	2.000	.134	1
X-6238-2	3/8-16 x .62	X-6021-12	5/8-11 x 3.75					
X-6238-10	3/8-16 x .75	X-6021-11	5/8-11 x 4.50					
X-6238-3	3/8-16 x .88	X-6021-10	5/8-11 x 6.00					
X-6238-11	3/8-16 x 1.00							
X-6238-4	3/8-16 x 1.25	X-6021-9	5/8-18 x 2.50					
X-6238-5	3/8-16 x 1.50							
X-6238-1	3/8-16 x 1.75	X-6239-1	3/4-10 x 1.00					
X-6238-6	3/8-16 x 2.00	X-6239-8	3/4-10 x 1.25					
X-6238-17	3/8-16 x 2.25	X-6239-2	3/4-10 x 1.50					
X-6238-7	3/8-16 x 2.50	X-6239-3	3/4-10 x 2.00					
X-6238-8	3/8-16 x 2.75	X-6239-4	3/4-10 x 2.50					
X-6238-9	3/8-16 x 3.00	X-6239-5	3/4-10 x 3.00					
X-6238-19	3/8-16 x 3.25	X-6239-6	3/4-10 x 3.50					
X-6238-12	3/8-16 x 3.50							
X-6238-20	3/8-16 x 3.75	X-792-1	1-8 x 2.25					
X-6238-13	3/8-16 x 4.50	X-792-5	1-8 x 3.00					
X-6238-18	3/8-16 x 5.50	X-792-8	1-8 x 5.00					
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.



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