

Service Parts



Generator Sets

Models:

450DSE-4
500-1000DS-4

See Group 701: Literature, inside this manual 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 450–1000 kW generator sets.

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

Information in this publication represents data available at the time of print. 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. 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.

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Illustrations

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

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How to Find Part Numbers

Use the following steps to locate a service replacement part.

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

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Hardware References

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

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

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

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Specification Number Index

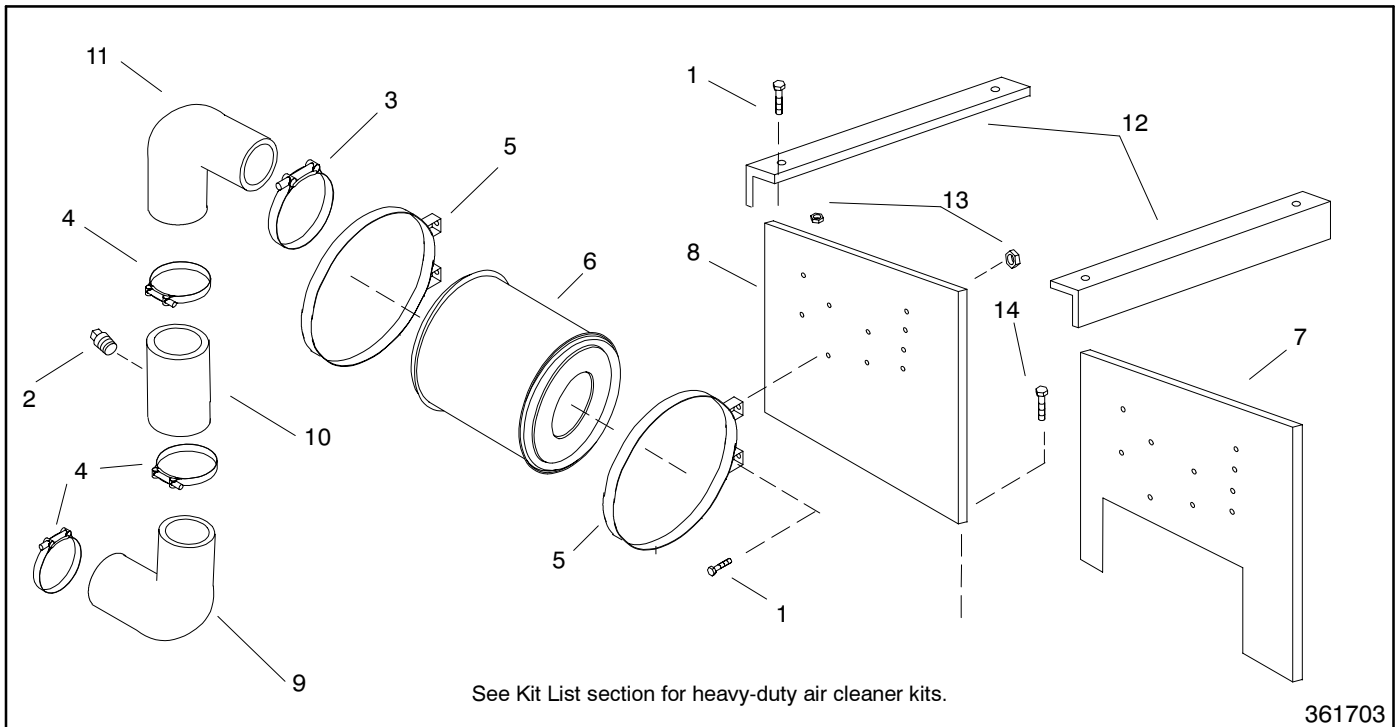
Group Title	Air Intake	Cooling System	Engine	Nameplates and Decals	Skid and Plant Mounting	Generator and Mounting	Controller and Mounting	Literature
Group No.	101	104	105	107	109	201	301	701
Spec No.	Variation Number							

Model								
450DSE-4								
PA-191458	*	*	102	94	*	*	†	125
PA-191459	*	*	103	94	*	*	†	125
GM16974-GA1S	*	*	1	GR1S	*	*	†	125
GM16974-GA2S	*	*	2	GR1S	*	*	†	125
GM28476-GA1S	*	*	17	GR1S	*	*	†	125
500DS-4								
PA-191460	*	*	104	94	*	*	†	126
PA-197004	*	*	116	93	*	*	†	127
GM16975-GA1S	*	*	3	GR1S	*	*	†	126
GM16975-GA2S	*	*	4	GR1S	*	*	†	127
600DS-4								
PA-197005	*	*	113	93	*	*	†	128
PA-197006	*	*	114	93	*	*	†	128
GM16976-GA1S	*	*	5	GR1S	*	*	†	128
GM16976-GA2S	*	*	6	GR1S	*	*	†	128
750DS-4								
PA-197007	*	*	115	95	*	*	†	129
PA-197008	*	*	110	95	*	*	†	130
PA-197039	*	*	119	GR1S	*	*	†	129
GM16977-GA1S	*	*	7	GR1S	*	*	†	129
GM16977-GA2S	*	*	8	GR1S	*	*	†	129
GM16977-GA3S	*	*	9	GR1S	*	*	†	130
800DS-4								
PA-197009	*	*	105	95	*	*	†	109
PA-197010	*	*	106	95	*	*	†	109
GM16978-GA1S	*	*	10	GR1S	*	*	†	109
GM16978-GA2S	*	*	11	GR1S	*	*	†	109
900DS-4								
PA-197011	*	*	107	95	*	*	†	132
PA-197012	*	*	108	95	*	*	†	132
GM16979-GA1S	*	*	12	GR1S	*	*	†	132
GM16979-GA2S	*	*	13	GR1S	*	*	†	132
GM17864-GA1S	*	*	14	GR1S	*	*	†	132
1000DS-4								
PA-197013	*	*	109	95	*	*	†	139
GM16980-GA1S	*	*	15	GR1S	*	*	†	139
GM17865-GA1S	*	*	16	GR1S	*	*	†	139

* 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 MP-6009 P/C Controllers, Industrial for controller parts lists.

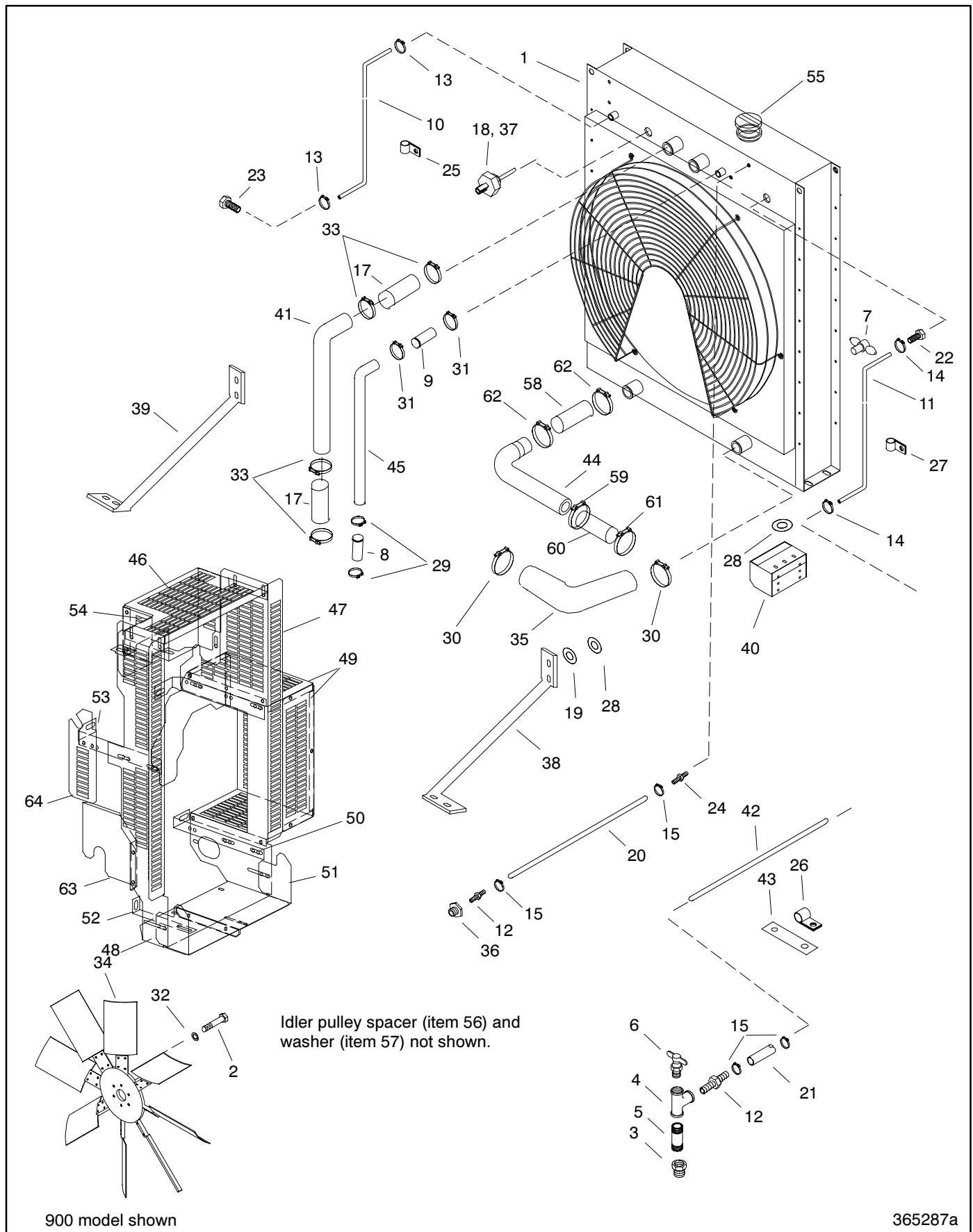
Group 101: Air Intake



Item	Part Number	Description	Quantity				
			Module Number				
			361703	361704	361911	365223	365274
1	M933-08025-60	Screw, hex cap				4	
1	M933-10020-60	Screw, hex cap	4	4	4	4	
1	M933-08020-60	Screw, hex cap	13	13	3		
2	X-75-1	Plug, pipe, 1/8 in.	2	2			
2	X-75-4	Plug, pipe, 1/8 in.			2	2	
3	254013	Clamp, hose, 6.25/6.56 in.	2	2	2		2
3	280998	Clamp, hose, 7.5/7.81 in.					4
3	343287	Clamp, hose, 4.14/4.44 in.		2			
3	343175	Clamp, hose, 3.06/3.38 in.				4	
3	343587	Clamp, hose, 7.38/7.69 in.				4	
4	254344	Clamp, hose, 5.43/5.74 in.				2	
4	254087	Clamp, hose, 4.44/4.75 in.	6	4			
4	291559	Clamp, hose, 7.25/7.56 in.			2		
5	274242	Mount, air cleaner					2
5	343218	Mount, air cleaner	4	4			
5	343530	Clamp, air cleaner			2	2	
6	272981	Air cleaner					2
6	343219	Air cleaner	2	2			
6	272982	Air cleaner			2	2	
7	365383	Bracket, air cleaner					1
8	361692	Bracket, air cleaner, LS	1	1			
8	361777	Bracket, AC			1		
8	365194	Bracket, air cleaner mounting, LS				1	
8	365382	Bracket, air cleaner					1
8	X-400-104	Spacer, .344 x .750 x .500 (not shown)			2		2
9	361694	Hose, air intake	2				
9	GM17742	Hose, air intake		2			
10	328609	Reducer, hose insert				2	
10	361696	Tube assembly	2	2			
11	361737	Hose, air intake	2	2			
11	361695	Hose, air intake	2				
11	361847	Hose, hump			2		
11	365200	Hose, offset				2	2
12	365463	Bracket, AC support	2	2			
13	M6923-8-80	Nut, hex (expense)	12	12			
13	M982-10-80	Nut, hex, elastic stop	4	4	4	4	
14	M933-8020-60	Screw, hex cap	4				3
14	M933-8030-60	Screw, hex cap			1		1

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

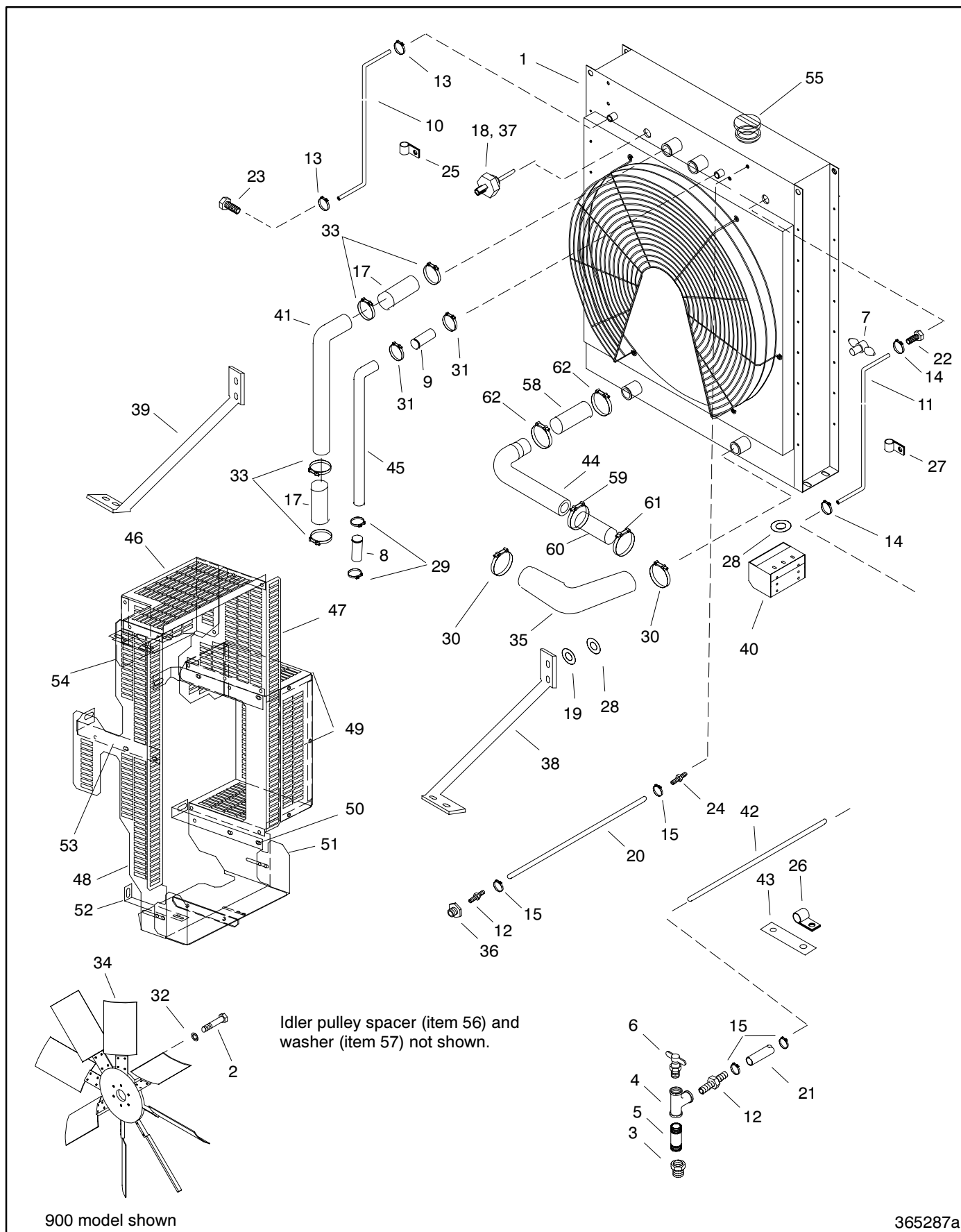
Group 104: Cooling System



Group 104: Cooling System

Item	Part Number	Description	Quantity																		
			Module																		
			361705	361706	361747	361772	361912	365016	365047	365233	365287	GM11660-MA1	GM22234-MA1	GM22235-MA1	GM22236-MA1	GM22237-MA1	GM22238-MA1	GM22239-MA1	GM22239-MA2	GM22240-MA1	GM22242-MA1
1	A-361529	Radiator assembly			1																
1	A-361593	Radiator assembly	1										1								
1	GM28935	Gasket, water jacket (not shown)	1										1								
1	GM28936	Gasket, intercooler (not shown)	1										1								
1	A-361595	Radiator assembly		1										1							
1	A-361697	Radiator assembly					1														
1	A-361684	Radiator assembly				1									1						
1	A-361857	Radiator assembly						1								1					
1	A-365020	Radiator assembly								1								1	1		
1	A-365020	Radiator assembly							1								1				
1	A-365286	Radiator assembly									1	1								1	1
2	X-129-57	Bolt, hex cap	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6		6	6
2	X-129-53	Bolt, hex cap																	6		
3	X-202-29	Bushing, reducer, 1/8 in.			1		1	1	1	1	1	1				1	1	1	1	1	1
4	X-203-10	Tee, pipe			1		1	1	1	1	1	1				1	1	1	1	1	1
4	X-296-18	Connector, half union	1	1		1							1	1	1						
5	X-217-6	Nipple, pipe, 1/8 x 3/4 in.			1		1	1	1	1	1	1				1	1	1	1	1	1
6	X-256-2	Valve, drain, 1/8			1		1	1	1	1	1	1				1	1	1	1	1	1
7	X-256-5	Valve, drain	2	2	1	2	1	3	1	1	1	2	2	2	2	3	1	1	1	2	1
8	X-281-31	Hose, radiator							1		1	1				1	1			1	1
8	X-311-11	Hose, radiator (D)						1	1	1						1	1	1	1		
9	X-281-31	Hose, radiator						1		1						1		1	1		
9	X-311-12	Hose, radiator									1	1								1	1
10	X-312-49	Hose		1		1															
10	X-312-58	Hose, .62 ID						1								1					
10	X-312-59	Hose, .62 ID							1	1	1	1				1	1	1	1	1	1
11	X-356-33	Hose						1								1					
11	X-356-35	Hose, radiator							1								1				
11	X-356-37	Hose, radiator								1	1	1						1	1	1	1
11	X-356-38	Hose, radiator (JW fill)	1	1	1	1							1	1	1						
11	X-356-39	Hose, coolant					1														
12	25 326 03	Connector, hose			2		2	2	2	2	1	2				2	2	2	2	2	1
12	X-426-9	Clamp, hose			6																
12	X-6370-3	Connector, hose	1	1		1							1	1	1						
13	X-426-18	Clamp, hose							2		2	2					2			2	2
13	X-426-20	Clamp, hose	2	2		2							2	2	2						
13	X-426-3	Clamp, hose						2		2						2		2	2	2	2
14	X-426-8	Clamp, hose	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
15	X-426-9	Clamp, hose	4	4		4	6	6	6	6	6	6	4	4	4	6	6	6	6	6	6
16	X-468-7	Tie, cable			4		4	7	4	4	4	4				7	4	4	4	4	4
17	X-507-6	Hose, radiator			4		4	4	4	4	4	4				4	4	4	4	4	4
18	X-6003-120	Conduit, convoluted	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	X-6011-3	Washer, beveled					4		4		4	4				4				4	4
20	X-386-103	Hose (5 ft.) (JW vent)	1	1		1															
20	X-6359-10	Hose (5.25 ft.) (JW vent)											1	1	1						
20	X-386-133	Hose (7.5 ft.) (SCCC vent)	1	1		1															
20	X-6359-14	Hose (7.75 ft.) (SCCC vent)											1	1	1						
20	X-6359-10	Hose, rubber			1		1	1	2	1	2	2				1	2	1	1	2	2
20	X-6359-8	Hose, rubber					1														
20	X-6359-6	Hose, rubber			1			1								1					
20	X-6359-9	Hose, rubber								1								1	1		
21	X-6359-12	Hose, rubber			1		1	1	1	1	1	1				1	1	1	1	1	1
22	X-6370-2	Connector, hose	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	X-6370-5	Connector, swivel					1									1					
23	X-6370-5	Connector, swivel	1	1		1			1	1	1	1	1	1	1		1	1	1	1	1
24	X-652-1	Fitting, hose		1		1															
24	X-652-3	Fitting, hose	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
25	X-672-13	Clamp, insulated						1	2	2	2	2				1	2	2	2	2	2
26	X-672-15	Clamp, insulator	1	1	1	1	2	1	2	1	2	2	1	1	1	1	2	1	1	2	2
27	X-672-4	Clamp, insulating			1		2	1	2	2	1	1				1	2	2	2	1	1
28	X-801-9	Washer, hardened					14		16		16	16					16			16	16
29	249887	Clamp, hose, 2.25/2.56 in.							2		2	2					2			2	2
29	GM11993	Clamp, hose, 2.06/2.24 in.	1	1		1							1	1	1						
29	276319	Clamp, hose, 2.13/2.44 in.						1		1						1		1			
30	274545	Clamp, hose, 4.31/4.62 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Group 104: Cooling System, continued

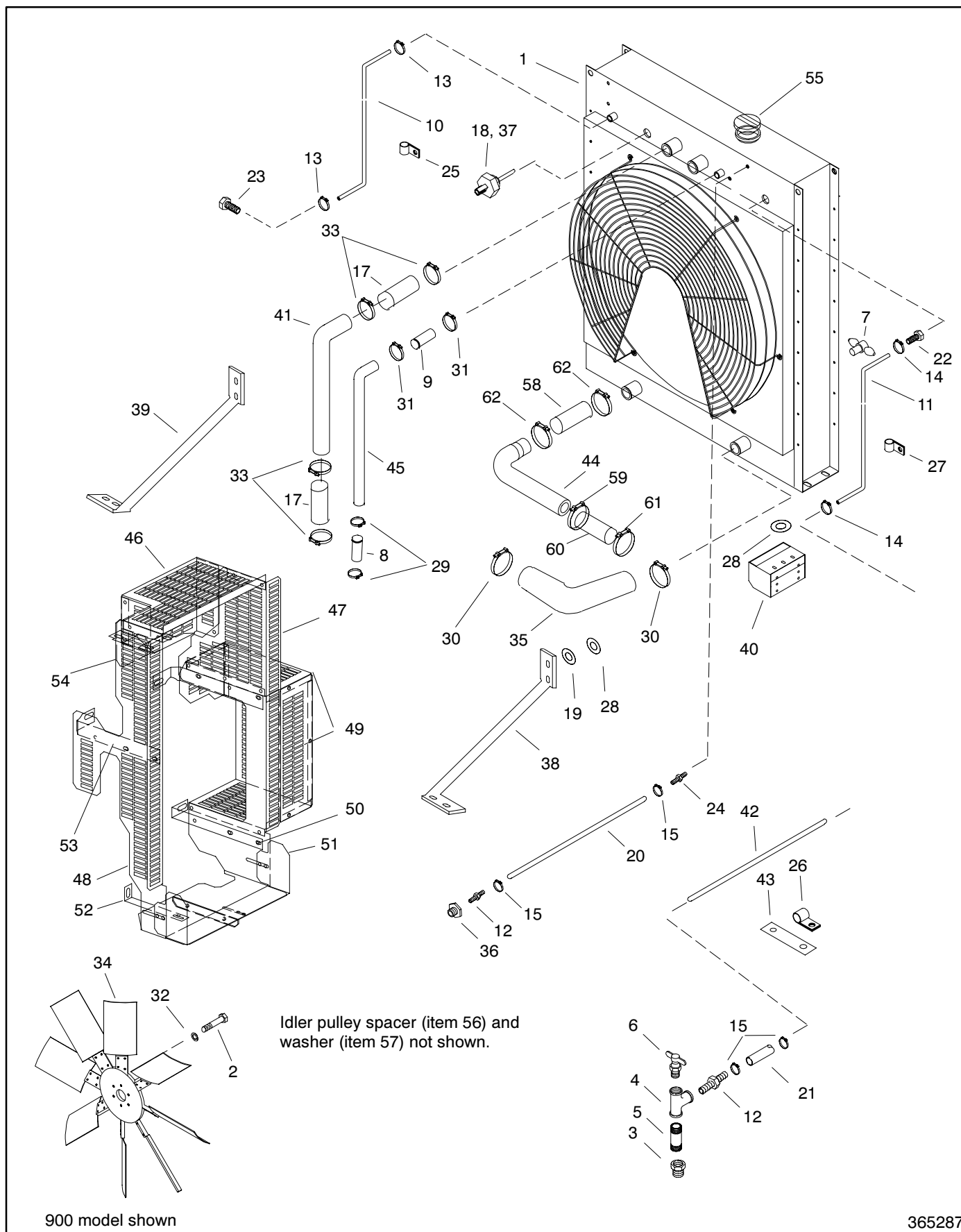


Group 104: Cooling System, continued

Item	Part Number	Description	Quantity																		
			Module																		
			361705	361706	361747	361772	361912	365016	365047	365233	365287	GM11660-MA1	GM22234-MA1	GM22235-MA1	GM22236-MA1	GM22237-MA1	GM22238-MA1	GM22239-MA1	GM22239-MA2	GM22240-MA1	GM22242-MA1
31	276319	Clamp, hose, 2.13/2.44 in.						2		2	2	2					2		2	2	2
31	324452	Clamp, hose, 2.19/2.5 in.						2		2			1	1	1						
31	GM11993	Clamp, hose, 2.06/2.24 in.	1	1		1															
32	290945	Washer, hardened	1	6	6	6	6	6	6	6	1	1	1	1	1	6	6	6	6	1	1
33	291542	Clamp, hose, 3.25/3.56 in.	2	2		2	8		8		8	8	2	2	2		8			8	8
33	324342	Clamp, hose, 3.43/3.75 in.			8			8		8						8		8	8		
34	274757	Fan							1	1							1	1	1		
34	279863	Fan, pusher			1		1	1								1					
34	299892	Fan, pusher									1	1								1	1
34	361934	Fan	1	1									1	1							
34	361935	Fan, pusher				1									1						
35	361556	Hose, lower radiator			1			1								1					
35	361688	Hose, lower radiator (4 in. ID)	1	1									1	1							
35	365650	Hose, lower radiator (4 in. ID)				1									1						
35	361736	Hose, lower radiator					1		1	1	1	1					1	1	1	1	1
36	365220	Bushing, adapter	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
36	365498	O-ring	1	1	1	1		1		1			1	1	1	1	1	1	1	1	1
37	365289	Sensor assembly, low fluid	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
38	354531	Support, radiator, LS							1	1							1	1	1		
38	354532	Support, radiator, RS					1														
38	361559	Support, radiator, RS			1			1								1					
38	365312	Support, radiator, RS								1	1									1	1
39	354530	Support, radiator, RS							1	1							1	1	1		
39	354533	Support, radiator, RS					1														
39	361558	Support, radiator, LS			1			1								1					
39	365313	Support, radiator, LS									1	1								1	1
40	361561	Support, radiator			2																
40	361723	Support, radiator					2														
40	365043	Support, radiator						4	4	4						4	4	4	4		
40	365396	Support, radiator									4	4								4	4
41	361522	Tube, radiator					2														
41	361560	Tube, upper radiator			2			2								2					
41	361687	Hose, upper radiator (3 in. ID)	1	1									1	1							
41	365651	Hose, upper radiator (3 in. ID)				1									1						
41	365031	Tube, upper radiator							2	2							2	2	2		
41	365399	Tube, upper radiator									2	2								2	2
42	361933	Line, vent	1	1		1							1	1	1						
42	365481	Tube, radiator vent					1		1		1						1				1
42	365482	Tube, radiator vent			1			1		1		1				1		1	1	1	
43	365483	Bracket, support					2				2						2				2
43	X-400-214	Spacer	1	1		1							1	1	1						
44	GM20168	Hose replacement kit (includes tube, clamps, and item 58)																			
44	GM19484	Tube, lower radiator, SCC*	1	1		1															
44	GM21233	Tube, lower radiator, SCC*											1	1	1						
44	365611	Hose, lower radiator (44.5 mm ID)*						1													
44	GM21232	Hose, lower radiator (2 in. ID)*														1					
44	365612	Hose, lower radiator*							1	1											
44	GM21229	Hose, lower radiator (2 in. ID)*															1	1	1		
44	365613	Hose, lower radiator*									1	1									
44	GM21230	Hose, lower radiator (2 in. ID)*																		1	1
45	361689	Hose, upper radiator (1.75 in. ID)	1	1									1	1							
45	365649	Hose, upper radiator (1.75 in. ID)				1									1						
45	361745	Guard, belt, top						1								1					
45	365549	Tube, upper						1								1					
45	365614	Tube, upper (SCCC)							1	1	1	1	1	1	1		1	1	1	1	1
46	GM14326	Guard, top	1	1		1							1	1	1						
46	GM14335	Guard, top			1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
47	GM14328	Guard, belt, LS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
48	GM25390	Guard, belt, RS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
49	GM14331	Guard, belt charging alternator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
49	GM19427	Guard, battery charging alternator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
50	GM14333	Bracket, support	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

* See note on page 9.

Group 104: Cooling System, continued



Group 104: Cooling System, continued

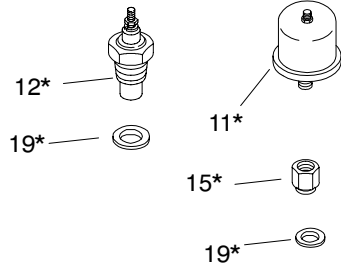
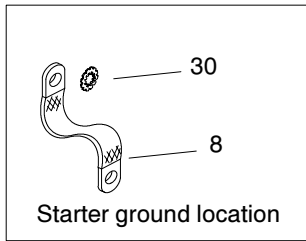
Item	Part Number	Description	Quantity																		
			Module																		
			361705	361706	361747	361772	361912	365016	365047	365233	365287	GM11660-MA1	GM22234-MA1	GM22235-MA1	GM22236-MA1	GM22237-MA1	GM22238-MA1	GM22239-MA1	GM22239-MA2	GM22240-MA1	GM22242-MA1
51	GM17574	Guard, belt, bottom	1	1		1							1	1	1						
51	GM17575	Guard, belt, bottom			1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
52	GM14334	Bracket, support	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
53	GM14332	Bracket, support	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
54	GM14329	Guard, belt, top, LS and RS	1	1	2	1	2	2	2	2	2	2	1	1	1	2	2	2	2	2	2
55	GM16641	Cap, radiator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
56	X-400-210	Spacer, .406 ID x .625 OD x 2.344	3	3		3							3	3	3						
57	X-801-11	Washer, hardened, .406 ID x 1.375	3	3		3							3	3	3						
58	X-6014-27	Hose, radiator, straight, 1.75	1	1		1															
58	X-311-7	Hose, radiator, straight, 1.75											1	1	1						
59	GM11993	Clamp, hose, 2.06/2.24 in.	1	1		1			1	1	1	1									
59	328800	Clamp, hose, 2.5/2.81 in.											1	1	1	1	1	1	1	1	1
59	249417	Clamp, hose, 1.86/2.13 in.						1													
60	X-6014-27	Hose, radiator, straight, 1.75	1	1		1															
60	X-281-8	Hose, radiator, straight, 2.25											1	1	1						
61	GM11993	Clamp, hose, 2.06/2.24 in.	1	1		1							1	1	1						
61	336228	Clamp, hose, 2.63/2.94 in.											1	1	1						
62	249887	Clamp, hose, 2.25/2.56							1	1	1	1				1	1	1	1	1	1
62	GM11993	Clamp, hose, 2.06/2.24 in.	2	2		2							2	2	2						
62	276320	Clamp, hose, 2.38/2.69 in.						1													
63	GM22693	Guard, belt, lower RS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
64	GM25391	Guard, belt, RS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Cooling Module Change Serial Number Break

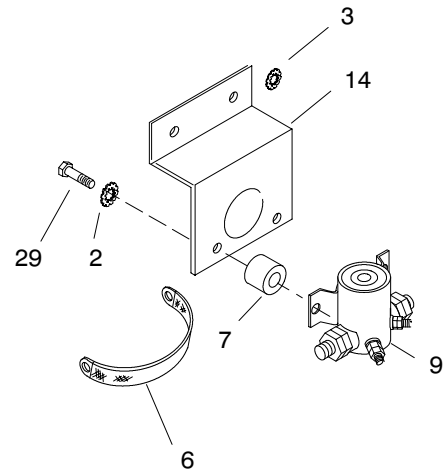
DDC changed the diameter of the separate circuit charged cooled (SCCC) pump inlet from 1.75 in. to 2.25 inches at the engine serial number breaks listed in the table below. New module numbers were created to adapt to the change. Confirm your cooling module number before ordering a lower radiator hose.

Engine Model	Engine Serial Number	Cooling Module Numbers with 2.25 in. Inlet
8V2000	5312001545	GM22234-MA1 GM22235-MA1 GM22236-MA1
12V2000	5352001700	GM22237-MA1 GM22238-MA1 GM22239-MA1
16V2000	5362001742	GM22240-MA1 GM22242-MA1

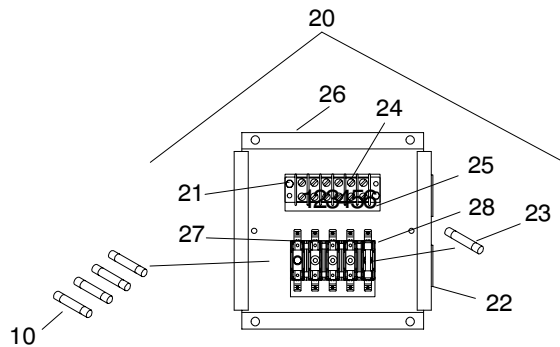
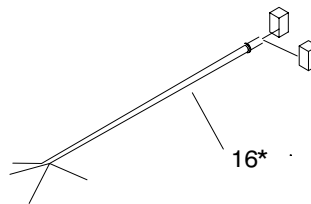
Group 105: Engine



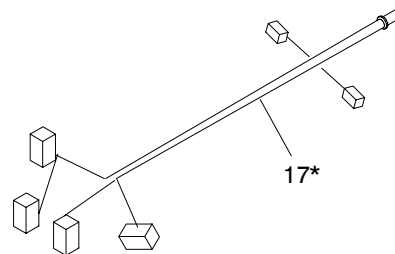
* See Control and Harness group
for part number.



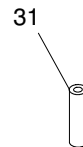
Crankcase hose (supplied by DDC)



Top view of fuse holder box
(item 13, cover removed)



Items not shown: 1, 4, 18



105-70-109

Group 105: Engine

Item	Part Number	Description	Qty.
1	See chart	Engine assembly (not shown)	1
2	X-22-12	Washer, lock, 1/4 int.-ext. tooth	8
3	X-22-30	Washer, lock, 5/8 ext. tooth	4
4	X-468-4	Tie, cable (not shown)	2
5	X-672-6†	Clamp, insulating	1
6	223033	Strap, ground, 3/8 x 5 in.	1
7	259632	Bumper	2
8	GM10772	Strap, ground, 8V engine	1
8	266581	Strap, ground, 12V & 16V engine	1
9	272713	Solenoid, cranking	1
10	292937†	Fuse, 20 A, 250 volt	4
10	283645†	Fuse, 15 A, 250 volt	4
11	*	Sender, oil pressure	1
12	*	Sender, temperature	1
13	361242†	Cover, fuse box (not shown)	1
13	X-67-142†	Screw, cross recess (not shown)	6
14	361773	Bracket, C-relay	1
15	*	Adapter, bushing	1
16	*	Harness, engine power	1
17	*	Harness, engine	1
18	365404†	Plate, fuse box mount (not shown)	1
19	*	O-ring	2
20	A-361308†	Box assembly, fuse holder	1
21	X-49-26†	Screw, PHM, 6-32 x .50	4
22	X-634-15†	Bushing, nylon, 1.0 ID	2
23	239298†	Fuse, 5 A, 250 V, .25 x 1.25	1
24	295314†	Block, terminal	1
25	299090†	Marker, strip	1
26	361241†	Box, fuse holder	1
27	361265†	Holder, fuse, 5 pole	1
28	361326†	Strip, marker, 5 fuse	1
29	X-465-6	Screw, hex cap	2
30	X-22-26	Washer, lock, .521 x 1.24 in.	1
30	X-22-30	Washer, lock, 5/8 ext. tooth, 8V engine	1
31	X-400-161	Spacer, .531 ID x 1 OD x .75 in.	4
31	X-400-214	Spacer, .282 ID x .5 OD x 1.9 in.	2
31	X-400-224	Spacer, .282 ID x .5 OD x 1.438 in.	2

* See Control and Harness group for part number.

† Item is not used on 8V series engines.

Engine Part Number

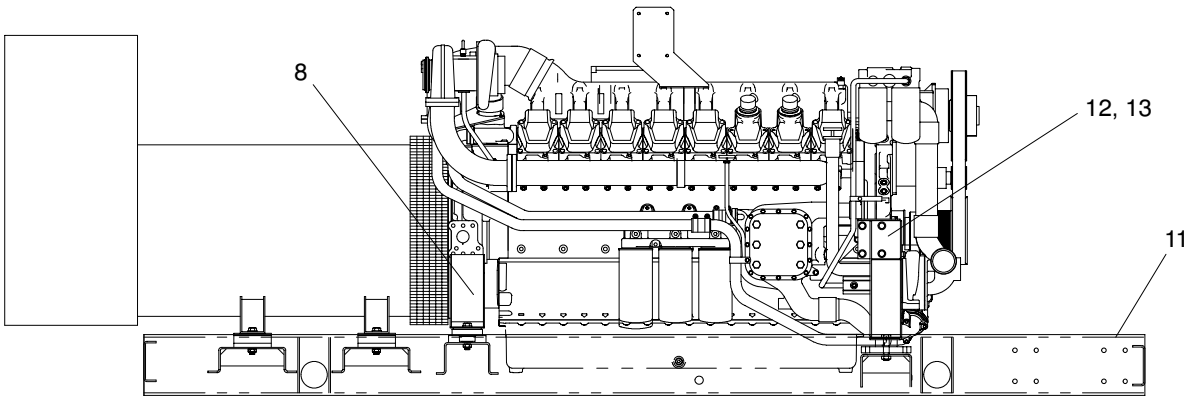
Use this table to identify the generator set engine part number (item 1).

Variation Number	Engine Assembly Part Number	Engine Model Description
1, 102	A-361677	Series 8V, 450 kW, 60 Hz
2, 103	A-361676	Series 8V, 450 kW, 50 Hz
3, 104	A-361564	Series 8V, 500 kW, 60 Hz
10, 105	A-361566	Series 16V, 800 kW, 60 Hz
11, 106	A-361679	Series 16V, 800 kW, 50 Hz
13, 107	A-361830	Series 16V, 900 kW, 50 Hz
12, 108	A-361831	Series 16V, 900 kW, 60 Hz
15, 109	A-361681	Series 16V, 1000 kW, 60 Hz
9, 110	A-361828	Series 16V, 750 kW, 50 Hz
5, 113	A-361565	Series 12V, 600 kW, 60 Hz
6, 114	A-361678	Series 12V, 600 kW, 50 Hz
7, 115	A-361680	Series 12V, 750 kW, 60 Hz
4, 116	A-361827	Series 12V, 500 kW, 50 Hz
8, 119	GM11865	Series 12V, 750 kW, 60 Hz
14	GM17862	Series 16V, 900/1000 kW, 60 Hz
16	B-361677	Series 8V, 450 kW, 60 Hz

Group 107: Nameplate and Decals

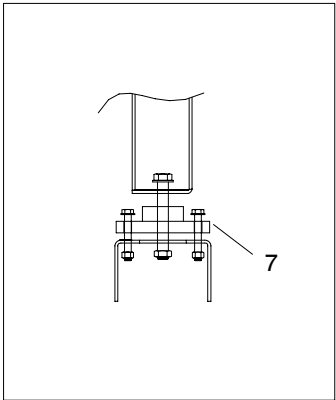
Item	Part Number	Description	Quantity
			Variation Number GR1S
1	238402	Decal, caution positive term. only	1
2	249809	Decal, caution hot engine	2
3	249808	Decal, warning rotating parts	1
4	249810	Decal, warning hot coolant	1
5	255882	Decal, caution stdby svc connect	1
6	257438	Decal, danger moving rotor	2
7	294520	Decal, danger	2
8	347166	Decal, electrical equipment	2
9	GM13227	Decal, warning fan force	1
10	GM13228	Decal, warning lifting support	2
11	364116	Decal, caution welding disconnect	1
12	324069	Nameplate, model/ratings, DDC/MTU logo	1
13	X-6301-2	Decal, DDC/MTU logo	2
14	GM15300	Decal, exhaust piping	1
15	GM19296	Decal, fuel type	1

Group 109: Skid and Plant Mounting

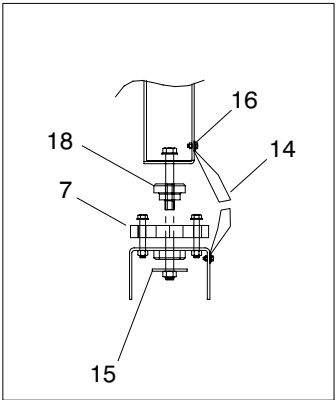


Detailed Mounting Views

Radiator end

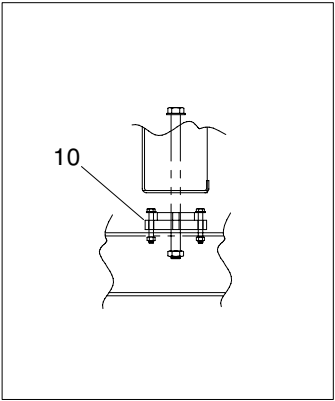


Solid mounting

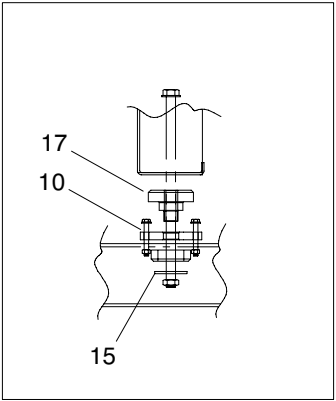


Isolation mounting

Generator end

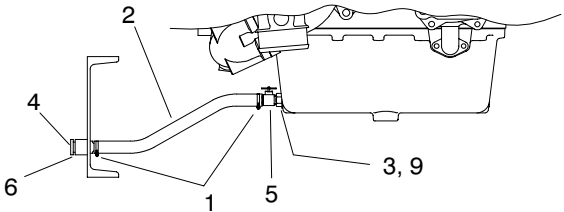


Solid mounting



Isolation mounting

Oil Pan View



365046

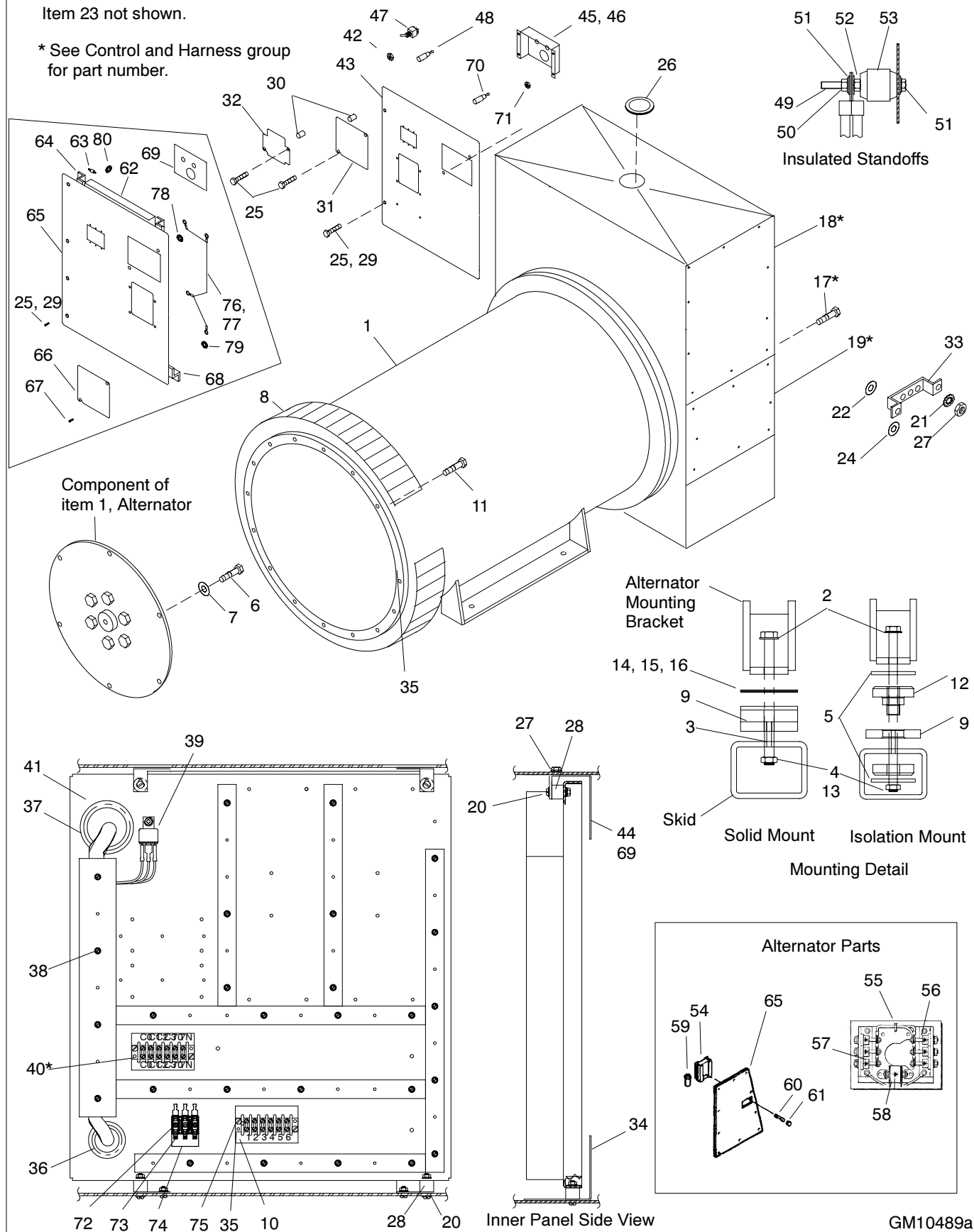
Group 109: Skid and Plant Mounting

Item	Part Number	Description	Quantity												
			Module												
			361707	361708	361846	361913	361914	365046	365192	365225	365228	365254	365256	365257	365259
1	X-426-3	Clamp, hose			2	2	2	2	2	2	2	2	2	2	2
1	X-426-10	Clamp, hose	1	1											
2	X-577-28	Hose .625 in. x 17 in.			1	1	1	1	1	1	1	1	1	1	1
2	X-577-44	Hose, rubber, straight, .62 in. ID	1	1											
3	X-6427-2	Washer, copper			1	1	1	1	1	1	1	1	1	1	1
3	365500	O-ring	1	1											
4	241062	Plug, drain	1	1	1	1	1	1	1	1	1	1	1	1	1
5	272701	Valve, oil drain	1	1	1	1	1	1	1	1	1	1	1	1	1
6	276552	Washer, nylon (not shown)	1	1	1	1	1	1	1	1	1	1	1	1	1
6	273729	Adapter, hose	1	1											
6	X-80-1	Nut, hex jam, 1 1/4 (not shown)	1	1											
7	361668	Plate, engine spacer				2		2						2	2
7	361039	Plate, generator mounting					2		2			2	2		
7	361733	Plate, engine mounting			2					2	2				
8	361731	Foot, mounting				2	2	2	2	2			2		2
8	365395	Foot, mounting										2		2	
9	361735	Adapter, bushing			1	1	1	1	1	1	1	1	1	1	1
9	361917	Adapter, bushing	1	1											
9	X-202-41	Bushing, reducing, 1/2 x 3/4 in. NPT	1	1											
9	X-211-1	Fitting, street elbow, 1/2 in.	1	1											
10	361924	Plate, engine mounting				2		2						2	2
10	361039	Plate, generator mounting					2		2			2	2		
10	361733	Plate, engine mounting								2					
11	365030	Skid						1	1	2					
11	365253	Skid											1		1
11	365251	Skid										1		1	
11	365191	Skid								1					
11	361660	Skid									1				
11	361850	Skid				1	1								
11	365449	Skid			1										
11	361685	Skid	1												
11	361686	Skid		1											
12	365466	Mounting, foot, RS	1	1	1	1	1	1	1	1	1	1	1	1	1
13	365475	Mounting, foot, LS	1	1	1	1	1	1	1	1	1	1	1	1	1
14	X-22-16	Washer, lock, .326 ID x .883 in. OD	2	2	3		4		4	4	3	4	4		
15	X-25-152	Washer, plain, 1.06 ID x 5.25 in. OD					4		4			4	4		
15	X-25-155	Washer, plain			4					4	4				
15	X-25-151	Washer, plain, .8 ID x 3 in. OD	2	2											
16	GM21085	Strap, ground	2	2	2	2	2	2	2	2	2	2	2	2	2
17	361054	Vibromount					2		2						
17	365190	Vibromount								2					
18	361919	Vibromount					2		2			4	4		
18	361734	Vibromount			2					2	2				
18	324393	Vibromount	2	2											

Group 201: Generator and Mounting

Item 23 not shown.

* See Control and Harness group for part number.



Group 201: Generator and Mounting

Item	Part Number	Description	Qty.	Item	Part Number	Description	Qty.
1	See chart page 17	Alternator assembly	1	28	229353	Mount, controller	4
2	M931-20160-60	Screw, hex cap, 2-point mounting	2	29	295009	Retainer	2
2	M931-20160-60	Screw, hex cap, 3-pt. mtg., isolation, 16V engine	2	30	320828	Insert, threaded, 1/4-20 in.	4
2	M931-20140-60	Screw, hex cap, 3-pt. mtg., isolation, 12V engine	2	31	361190	Cover, access	1
2	M931-20120-60	Screw, hex cap, 3-pt. mtg., solid, 16V engine	2	32	361191	Cover, DVR access	1
2	M931-20120-60	Screw, hex cap, 4-pt. mtg., solid, 5M alternator	4	33	361271	Bus, ground	1
2	M931-20160-60	Screw, hex cap, 4-pt. mtg., isolation, 5M alternator	4	34	361478	Retainer, inner panel	2
2	M931-24160-60	Screw, hex cap, 4-pt. mtg., isolation, 7M alternator	4	35	295314	Block, terminal	1
3	M934-20-80	Nut, hex, isolation	8	36	X-634-16	Bushing, 1.312 x 1.50 in. NPT	1
4	M982-20-80	Nut, hex elastic stop	2	37	X-634-23	Bushing, 1.968 x 2.50 in. NPT	1
4	M934-20-80	Nut, hex elastic stop, 4-pt. mtg., solid, 5M alternator	2	38	X-67-43	Screw, thread-cutting	27
4	M934-20-80	Nut, hex elastic stop, 3-pt. mtg., solid, 5M alternator	4	39	272684	Relay	1
4	M934-24-80	Nut, hex elastic stop, 4-pt. mtg., solid, 7M alternator	4	40	*	Terminal block	1
4	M982-24-60	Nut, hex elastic stop, 4-pt. mtg., isolation, 7M alternator	4	41	361186	Panel, junction box, inner	1
5	X-25-152	Washer, plain, 1.06 ID x 5.25 in.	8	42	151511	Ring, lock	1
6	X-129-54	Screw, hex cap, 450-600 kW	8	43	361518	Door, junction box	1
6	X-6021-14	Screw, hex cap, 750-1000 kW	6	44	365476	Bracket, inner panel	1
6	X-6021-13	Screw, HC, 1000 kW, 380/600 volt	6	45	361188	Bracket, diagnostics mounting	1
7	290945	Washer, hardened, 450-600 kW	8	46	361517	Plate, diagnostic silkscreen	1
7	X-801-5	Washer, hardened, .656 ID x 1.06	6	47	354151	Switch, toggle, 8V series engine	1
8	328903	Screen, 5M alternator	1	47	297680	Switch, toggle, 12/16V series	1
8	GM10557	Screen, 7M alternator	1	48	343684	Lamp, yellow	1
9	361039	Plate, generator mounting	2	49	X-6274-7	Rod, threaded	3
10	299090	Marker, strip	1	50	X-6086-6	Washer, spring, .39 ID x .81 in. OD	6
11	M931-10080-82	Screw, hex cap, 450-600 kW	12	51	X-25-118	Washer, plain, .406 ID x 1 in. OD	9
11	M931-12050-82	Screw, hex cap, 750-1000 kW	16	52	X-83-7	Nut, hex, 3/8-16, zinc	6
11	M931-12040-82	Screw, HC, 1000 kW, 380/600 volt	16	53	X-6128-29	Insulator, standoff, 3/8-16 x 2 in.	3
12	361179	Vibromount, 2-pt. mtg., 12V series	2	54	328725	Voltage regulator, DVR2000	1
12	361054	Vibromount, 2-pt. mtg., 8V series	2	55	347071	Exciter rectifier assembly	1
12	361919	Vibromount, 3-pt. mtg., 16V series	2	55	347070	Exciter rectifier assembly, 7M alt.	1
12	365190	Vibromount, 3-pt. mtg., 12V series	2	56	279772	Diode, standard polarity	1
12	361919	Vibromount, 4-pt. mtg., 12V series	4	56	279773	Diode, standard polarity, 7M alt.	1
13	X-400-239	Spacer, 5M alternator, isolation	2	57	279774	Diode, reversing polarity	1
13	X-400-241	Spacer, 5M alternator, solid	2	57	279775	Diode, reversing polarity, 7M alt.	1
14	290743	Shim	4	58	279776	Surge suppressor	1
15	290744	Shim	4	58	279777	Surge suppressor, 7M alt.	1
16	291191	Shim	4	59	347160	Capacitor	1
17	*	Screw, hex flange machine	12	60	279778	Fuse, 5 A	1
18	*	Panel, junction box, front	1	61	279779	Cap, fuse	1
19	*	Cover, louvered	1	62	GM13563	Panel, inner door	1
20	X-22-12	Washer, lock, .262 ID x .743 in.	8	63	282829	Vibromount	6
21	X-22-14	Washer, lock, .391 ID x .975 in.	4	64	GM13562	Bracket, door panel mounting, top	2
22	X-25-118	Washer, plain, .406 ID x 1 in. OD	4	65	GM13564	Door, junction box	1
23	X-468-9	Cable tie (not shown)	2	66	GM17571	Cover, access	1
24	X-6086-6	Washer, spring, .39 ID x .81 in. OD	2	67	X-50-2	Screw, slotted pan head machine	4
25	X-6217-10	Screw, hex flange machine	25	68	GM13561	Bracket, dr panel mounting, bottom	1
26	X-634-23	Bushing, 1.968 x 2.50 in. NPT	2	69	GM17570	Plate, diagnostic silkscreen	1
27	X-83-7	Nut, hex, zinc, 3/8-16	2	70	343685	Lamp, red	1
				71	X-74-6	Nut, hex	4
				72	X-49-2	Screw, cross recess PHM	2
				73	292821	Fuse holder	1
				74	GM28784	Strip, marker	1
				75	X-49-36	Screw, RHM	4
				76	GM21264	Harness, inner panel ground	1
				77	361567	Base, tie wrap (not shown)	2
				78	X-22-12	Washer, lock, .262 ID x .743 in. OD	2
				79	X-22-13	Washer, lock, .20 ID x .595 in. OD	1
				80	X-22-18	Washer, lock, .172 ID x .595 in. OD	12

* See Control and Harness group for part number.

Alternator Part Number and Mount Type

Use this table to identify the module number's alternator part number (item 1, page 15) and mount type.

Module Number	Alternator Description	Alternator Part Number	Mount Type
350374	5M4025, 10-Lead	A-361851	Isolation
350375	5M4027, 12-Lead	A-361852	Isolation
350376	5M4028, 10-Lead	A-361749	Isolation
350377	5M4030, 10-Lead	A-361750	Isolation
350378	5M4160, 4-Lead	A-361855	Isolation
350379	5M4162, 4-Lead	A-361856	Isolation
350380	5M4164, 4-Lead	A-361752	Isolation
350381	5M4270, 4-Lead	A-361854	Isolation
350382	5M4272, 4-Lead	A-361753	Isolation
350390	5M4028, 10-Lead	A-361749	Isolation
350391	5M4030, 10-Lead	A-361750	Isolation
350392	5M4032, 10-Lead	A-361751	Isolation
350393	5M4164, 4-Lead	A-361752	Isolation
350394	5M4272, 4-Lead	A-361753	Isolation
350395	5M4276, 4-Lead	A-361754	Isolation
350398	5M4034, 10-Lead	A-361757	Solid
350399	5M4036, 10-Lead	A-361758	Solid
350400	5M4166, 4-Lead	A-361759	Solid
350402	5M4278, 4-Lead	A-361761	Solid
350403	5M4038, 4-Lead	A-361762	Solid
350404	5M4168, 4-Lead	A-361763	Solid
350405	5M4280, 4-Lead	A-361764	Solid
350406	5M4032, 10-Lead	A-361756	Isolation
350407	5M4034, 10-Lead	A-361757	Isolation
350408	5M4036, 10-Lead	A-361758	Isolation
350409	5M4166, 4-Lead	A-361759	Isolation
350410	5M4276, 4-Lead	A-361760	Isolation
350411	5M4278, 4-Lead	A-361761	Isolation
350412	5M4038, 4-Lead	A-361762	Isolation
350413	5M4168, 4-Lead	A-361763	Isolation
350414	5M4280, 4-Lead	A-361764	Isolation
350415	5M4044, 4-bus	A-361765	Solid
350416	7M4046, 4-bus	A-361766	Solid
350417	7M4170, 4-bus	A-361767	Solid
350418	7M4282, 4-bus	A-361768	Solid
350419	7M4284, 4-bus	A-361769	Solid
350420	5M4044, 4-bus	A-361765	Isolation
350421	7M4046, 4-bus	A-361766	Isolation
350422	7M4170, 4-bus	A-361767	Isolation
350423	7M4282, 4-bus	A-361768	Isolation
350424	7M4284, 4-bus	A-361769	Isolation
350427	5M4034, 10-Lead	A-361757	Isolation
350428	5M4036, 10-Lead	A-361758	Isolation
350429	5M4276, 4-Lead	A-361760	Isolation
350430	5M4278, 4-Lead	A-361761	Isolation
350435	5M4032, 10-Lead	A-361756	Solid
350436	5M4032, 10-Lead	A-361756	Isolation
350437	5M4025, 10-Lead	A-361851	Isolation
350439	5M4027, 12-Lead	A-361852	Isolation

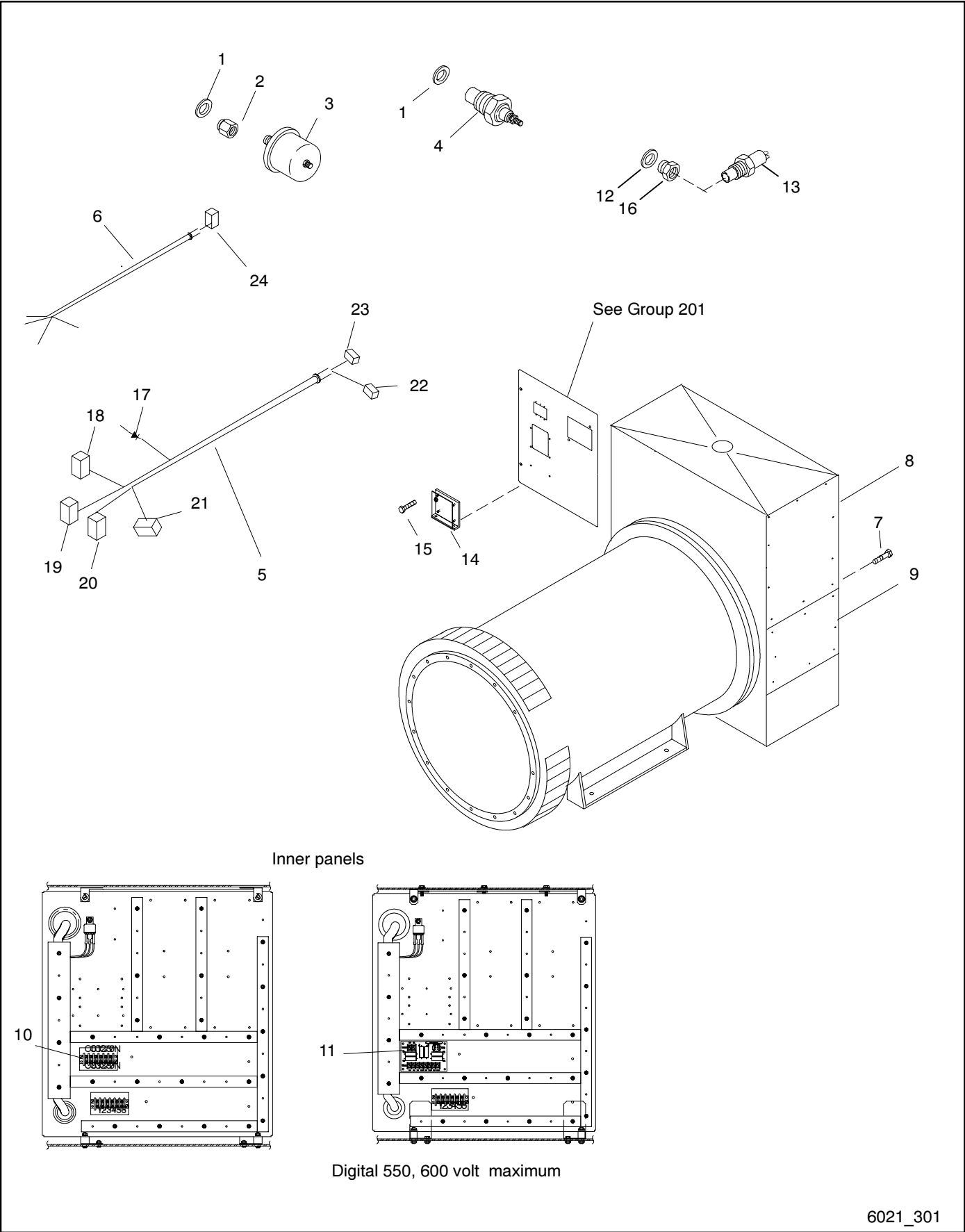
Alternator Part Number and Mount Type

Use this table to identify the module number's alternator part number (item 1, page 15) and mount type.

Module Number	Alternator Description	Alternator Part Number	Mount Type
GM17020-MA1*	5M4025, 10-Lead	A-361851	Isolation
GM17020-MA2*	5M4027, 12-Lead	A-361852	Isolation
GM17020-MA3*	5M4028, 10-Lead	A-361749	Isolation
GM17020-MA4*	5M4030, 10-Lead	A-361750	Isolation
GM17020-MA5*	5M4160, 4-Lead	A-361855	Isolation
GM17020-MA6*	5M4162, 4-Lead	A-361856	Isolation
GM17020-MA7*	5M4164, 4-Lead	A-361752	Isolation
GM17020-MA8*	5M4270, 4-Lead	A-361854	Isolation
GM17020-MA9*	5M4272, 4-Lead	A-361753	Isolation
GM17020-MA10*	5M4025, 10-Lead	A-361851	Isolation
GM17020-MA11*	5M4027, 12-Lead	A-361852	Isolation
GM17020-MA12*	5M4028, 10-Lead	A-361749	Isolation
GM17020-MA13*	5M4030, 10-Lead	A-361750	Isolation
GM17020-MA14*	5M4032, 10-Lead	A-361751	Isolation
GM17020-MA15*	5M4164, 4-Lead	A-361752	Isolation
GM17020-MA16*	5M4272, 4-Lead	A-361753	Isolation
GM17020-MA17*	5M4276, 4-Lead	A-361754	Isolation
GM17021-MA1*	5M4032, 10-Lead	A-361756	Isolation
GM17021-MA2*	5M4034, 10-Lead	A-361757	Isolation
GM17021-MA3*	5M4036, 10-Lead	A-361758	Isolation
GM17021-MA4*	5M4166, 4-Lead	A-361759	Isolation
GM17021-MA5*	5M4276, 4-Lead	A-361760	Isolation
GM17021-MA6*	5M4278, 4-Lead	A-361761	Isolation
GM17021-MA7*	5M4032, 10-Lead	A-361756	Isolation
GM17021-MA8*	5M4032, 10-Lead	A-361756	Solid
GM17021-MA9*	5M4034, 10-Lead	A-361757	Isolation
GM17021-MA10*	5M4034, 10-Lead	A-361757	Solid
GM17021-MA11*	5M4036, 10-Lead	A-361758	Isolation
GM17021-MA12*	5M4036, 10-Lead	A-361758	Solid
GM17021-MA13*	5M4038, 4-Lead	A-361762	Isolation
GM17021-MA14*	5M4038, 4-Lead	A-361762	Solid
GM17021-MA15*	5M4166, 4-Lead	A-361759	Isolation
GM17021-MA16*	5M4166, 4-Lead	A-361759	Solid
GM17021-MA17*	5M4168, 4-Lead	A-361763	Isolation
GM17021-MA18*	5M4168, 4-Lead	A-361763	Solid
GM17021-MA19*	5M4278, 4-Lead	A-361761	Isolation
GM17021-MA20*	5M4278, 4-Lead	A-361761	Solid
GM17021-MA21*	5M4280, 4-Lead	A-361764	Isolation
GM17021-MA22*	5M4280, 4-Lead	A-361764	Solid
GM17022-MA1*	5M4044, 4-bus	A-361765	Isolation
GM17022-MA2*	5M4044, 4-bus	A-361765	Solid
GM17022-MA3*	7M4046, 4-bus	A-361766	Isolation
GM17022-MA4*	7M4046, 4-bus	A-361766	Solid
GM17022-MA5*	7M4170, 4-bus	A-361767	Isolation
GM17022-MA6*	7M4170, 4-bus	A-361767	Solid
GM17022-MA7*	7M4282, 4-bus	A-361768	Isolation
GM17022-MA8*	7M4282, 4-bus	A-361768	Solid
GM17022-MA9*	7M4284, 4-bus	A-361769	Isolation
GM17022-MA10*	7M4284, 4-bus	A-361769	Solid

* Module uses vibration-isolated door-mounted component items 62-69, 79-80 on pages 14-15.

Control and Harness



6021_301

Control and Harness

			Quantity											
			Module											
Item	Part Number	Description	GM16964-MA1	GM16965-MA1	GM16965-MA2	GM16966-MA1	GM16966-MA2	GM16966-MA3	GM16969-MA1	GM16970-MA1	GM16970-MA2	GM16971-MA1	GM16971-MA2	GM16971-MA3
1	365499	O-ring	2	2	2	2	2	2						
2	361916	Adapter, bushing	1	1	1	1	1	1						
3	365624	Sender, oil pressure	1	1	1	1	1	1						
4	GM10166	Sender, temperature	1	1	1	1	1	1						
5	365907	Harness, engine	1											
5	361775	Harness, engine		1										
5	365310	Harness, engine			1									
5	365426	Harness, engine				1								
5	361942	Harness, engine					1	1						
5	GM16932	Harness, engine (includes items 17-23)							1					
5	GM16948	Harness, engine (includes items 17-23)								1				
5	GM16951	Harness, engine (includes items 17-23)									1			
5	GM16949	Harness, engine (includes items 17-23)										1		
5	GM16950	Harness, engine (includes items 17-23)											1	1
6	365908	Harness, power (includes item 24)	1						1					
6	361774	Harness, power (includes item 24)		1						1				
6	365309	Harness, power (includes item 24)			1						1			
6	365425	Harness, power (includes item 24)				1						1		
6	361941	Harness, power (includes item 24)					1	1					1	1
7	X-6217-10	Screw, hex flange machine	22	22	22	22	24	24	22	22	22	22	22	24
8	361184	Panel, junction box top	1	1	1	1	1	1	1	1	1	1	1	1
9	361826	Panel, junction box bottom	1	1	1	1	1	1	1	1	1	1	1	1
9	328901	Panel, junction box bottom												
10	295314	Block, terminal	1	1	1	1	1	1						1
10	255080	Marker, strip	1	1	1	1	1	1						
10	X-49-6	Screw, cross recess pan head	2	2	2	2	2	2						
11	GM13980	PCB assembly, CT burden resistor							1	1	1	1	1	1
11	X-70-12	Nut, hex machine screw, 8-32							4	4	4	4	4	4
11	X-712-9	Spacer, .25 OD, .5 in.							4	4	4	4	4	4
12	365615	O-ring, ISO 6149							1	1	1	1	1	1
13	GM10061	Switch, temperature							1	1	1	1	1	1
14	GM11718	PCB assembly, Marathon excitation interface							1	1	1	1	1	1
15	M965A-06012-20	Screw, pan head machine							4	4	4	4	4	4
16	GM24458	Adapter, bushing							1	1	1	1	1	1
17	233959	Diode, 6 A							4	4	4	4	4	4
18	337131	Connector, plug, 6-position							1	1	1	1	1	1
19	GM11496	Connector, plug, 3-position							1	1	1	1	1	1
20	295145	Connector, 24-position							1	1	1	1	1	1
21	343131	Connector, weathertight, 6-position							1	1	1	1	1	1
22	GM11497	Connector, weathertight, 6-position							1	1	1	1	1	1
23	343129	Connector, plug, 6-position							1	2	2	2	2	2
24	343130	Connector, weathertight, 5-position							1	2	2	2	2	2

Engine Group to Module Number Cross-Reference

Use the engine group variation from the Specification Number Index at the front of this book to determine module number.

Engine Group Variation No.	Module Number	kW	Controllers
102, 103, 104	GM16964-MA1S	450 50/60 Hz, 500 60 Hz	Engine Gauge Box and 16-Light
113, 114, 116	GM16965-MA1S	500 50 Hz, 600 50/60 Hz	Engine Gauge Box and 16-Light
115	GM16965-MA2S	750 60 Hz	Engine Gauge Box and 16-Light
105, 106, 108, 110	GM16966-MA1S	750 50 Hz, 800, 900 60 Hz	Engine Gauge Box and 16-Light
107, 109	GM16966-MA2S	900 50 Hz, 1000 60 Hz	Engine Gauge Box and 16-Light
	GM16966-MA3S	1000 50 Hz	Engine Gauge Box and 16-Light
	GM16969-MA1S	450 50/60 Hz, 500 60 Hz	Digital 550
	GM16970-MA1S	500 50 Hz, 600 50/60 Hz	Digital 550
	GM16970-MA2S	750 60 Hz	Digital 550
	GM16971-MA1S	750 50 Hz, 800, 900 60 Hz	Digital 550
	GM16971-MA2S	900 50 Hz, 1000 60 Hz	Digital 550
	GM16971-MA3S	1000 50 Hz	Digital 550

Group 701: Literature

Item	Part Number	Description	Quantity								
			Variation Number								
			109	125	126	127	128	129	130	132	139
1	MP-5374	Warranty 1-Year Limited Industrial	1	1	1	1	1	1	1	1	1
2	MP-5583	S/M 350-1600DS	1	1	1	1	1	1	1	1	1
3	MP-5700	I/M Stationary Duty	1	1	1	1	1	1	1	1	1
4	MP-6117	P/C Accessories, 230-2000 kW diesel	1	1	1	1	1	1	1	1	1
5	MP-5750	O/M 20-2000kW	1	1	1	1	1	1	1	1	1
6	MP-5829	O/M Digital Controller	1	1	1	1	1	1	1	1	1
7	MP-6004	W/D 450DSE-4, 500-2000DS-4	1	1	1	1	1	1	1	1	1
8	MP-6009	P/C Controllers Indus	1	1	1	1	1	1	1	1	1
9	MP-6021	P/C 450-1000DS-4	1	1	1	1	1	1	1	1	1
10	TP-5578	O/I/S/M Marathon Alt. Magna DVR	1	1	1	1	1	1	1	1	1
11	TP-5579	O/I/S/M Marathon Voltage Regulator DVR	1	1	1	1	1	1	1	1	1
12	TP-6022	O/M DDC 2000 Series 450-500 kW	1	1	1	1	1	1	1	1	1
13	TP-6025	S/M DDC 2000 Series 500(50Hz)-1000 kW	1	1	1	1	1	1	1	1	1
14	TP-6026	P/C 450 kW 50-60Hz, 500kW, DDC 16V2000		1	1						
14	TP-6027	P/C 500-600 50Hz, 600-750 60Hz DDC				1	1	1			
14	TP-6028	P/C 750-900 50Hz, 800-1000 60Hz DDC	1						1	1	1

Kit List

This section lists the part numbers of air intake and cooling system modules/kits not listed earlier in this manual in the groups 101 and 104. 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.

	450 kW	500 kW	600 kW	750 kW	800 kW	900 kW	1000 kW
Controller Kits							
Cooling System Kits							
Block Heater with Isolation Valve							
Single Heater							
60 Hz, 190/208 V	GM19403-KA1	GM19403-KA1	GM19404-KA1	GM19404-KA4	GM19406-KA1	GM19406-KA4	GM19406-KA4
60 Hz, 210/240 V	GM19403-KA2	GM19403-KA2	GM19404-KA2	GM19404-KA5	GM19406-KA2	GM19406-KA5	GM19406-KA5
60 Hz, 380/480 V	GM19403-KA3	GM19403-KA3	GM19404-KA3	GM19404-KA6	GM19406-KA3	GM19406-KA6	GM19406-KA6
50 Hz, 190/208 V	GM19403-KA1	GM19404-KA1	GM19404-KA1	GM19406-KA1	GM19406-KA4	GM19406-KA4	N/A
50 Hz, 210/240 V	GM19403-KA2	GM19404-KA2	GM19404-KA2	GM19406-KA2	GM19406-KA5	GM19406-KA5	N/A
50 Hz, 380/480 V	GM19403-KA3	GM19404-KA3	GM19404-KA3	GM19406-KA3	GM19406-KA6	GM19406-KA6	N/A
Dual Heater							
60 Hz, 190/208 V	N/A	N/A	GM19405-KA1	GM19405-KA4	GM19407-KA1	GM19407-KA4	GM19407-KA4
60 Hz, 210/260 V	N/A	N/A	GM19405-KA2	GM19405-KA5	GM19407-KA2	GM19407-KA5	GM19407-KA5
60 Hz, 380/480 V	N/A	N/A	GM19405-KA3	GM19405-KA6	GM19407-KA3	GM19407-KA6	GM19407-KA6
50 Hz, 190/208 V	N/A	GM19405-KA1	GM19405-KA1	GM19407-KA1	GM19407-KA4	GM19407-KA4	N/A
50 Hz, 210/240 V	N/A	GM19405-KA2	GM19405-KA2	GM19407-KA2	GM19407-KA5	GM19407-KA5	N/A
50 Hz, 380/480 V	N/A	GM19405-KA3	GM19405-KA3	GM19407-KA3	GM19407-KA6	GM19407-KA6	N/A
Block Heater without Isolation Valve							
60 Hz, Single Heater	361943	361943	GM10026-KA1	GM10026-KA2	GM10028-KA1	GM10028-KA2	GM10028-KA2
60 Hz, Dual Heater	N/A	N/A	GM10027-KA1	GM10027-KA2	GM10030-KA1	GM10030-KA2	GM10030-KA2
50 Hz, Single Heater	361943	GM10026-KA1	GM10026-KA1	GM10028-KA1	GM10028-KA2	GM10028-KA2	GM10028-KA2
50 Hz, Dual Heater	N/A	GM10027-KA1	GM10027-KA1	GM10030-KA1	GM10030-KA2	GM10030-KA2	GM10030-KA2
Isolation Valve, Block Heater							
60 Hz, Single Heater	365308	365308	GM10322-KA1	GM10322-KA1	GM10324-KA1	GM10326-KA1	GM10326-KA1
60 Hz, Dual Heater	N/A	N/A	GM10323-KA1	GM10323-KA1	GM10325-KA1	GM10327-KA1	GM10327-KA1
50 Hz, Single Heater	N/A	GM10322-KA1	GM10322-KA1	GM10324-KA1	GM10326-KA1	GM10326-KA1	GM10326-KA1
50 Hz, Dual Heater	N/A	GM10323-KA1	GM10323-KA1	GM10325-KA1	GM10327-KA1	GM10327-KA1	GM10327-KA1
Radiator Duct Flange							
60 Hz	GM10790-KA1	365202	365203	365205	365204	N/A	365296
50 Hz	365202	365203	365203	365204	365205	365296	365296
Radiator							
60 Hz	GM14348-MA1	GM14348-MA1	GM14348-MA3	GM14348-MA2	GM14348-MA3	GM14348-MA2	GM14348-MA2
50 Hz	GM14348-MA1	GM14348-MA3	GM14348-MA2	GM14348-MA3	GM14348-MA2	GM14348-MA2	GM14348-MA2
Air Intake Kits							
Heavy-Duty, 60 Hz	361770	361770	365265	365265	365268	365272	365272
Heavy-Duty, 50 Hz	361771	365266	365266	365268	365268	365268	N/A

Optional Kits

See Parts Catalog MP-6117 for parts lists.

Paint and Miscellaneous Parts

Paint, gray

All models use 221331 spray can, 221332 gallon, GM19491 touch up

N/A Not Applicable

Cooling System Kit Breakdowns

Block Heater Kits: GM10026-KA1 and GM10026-KA2

Qty.	Description	Common Parts	Unique Parts	
			GM10026-KA1	GM10026-KA2
2	Elbow, street (90 deg. x 3/4 in. NPT)			SA-472
1	Strap, ground (5 in.)	223033		
4	Bumper	259632		
1	Tag, hang	279047		
1	Heater, block (includes item marked *)	279816		
1	*Element, replacement	GM19503		
4	Gasket, washer	297001		
1	Box, block heater control	354316		
1	Cover, block heater control	354317		
1	Gasket, control box	354318		
1	Decal, warning	354325		
1	Label, wiring diagram	354328		
1	Adapter, bushing	361918		
1	Thermostat, block heater	361944		
1	O-ring, ISO 6149 (11.3 mm ID)	365499		
1	O-ring, ISO 6149 (29.6 mm ID)	365501		
1	Flange	GM10023		
1	Bracket, block heater	GM10024		
1	Gasket	GM10065		
1	Shield, heat (32 mm ID x 305 mm length)	GM10669		
1	Elbow, street (90 deg. x 3/4 in. NPT)	X-211-5		
10	Washer, lock, .262 ID x .743 in. OD	X-22-12		
2	Washer, lock, .391 ID x .975 in. OD	X-22-14		
4	Clamp, hose, .69/1.25 in.	X-426-12		
2	Cable tie	X-468-9		
2	Connector, hose + vibra seal	X-582-8		
1	Hose, coolant 15 in.	X-6367-4		
1	Hose, coolant 40 in.	X-6367-7		
4	Screw, slotted hex washer head, machine	X-97-13		

Block Heater Kits: GM10027-KA1 and GM10027-KA2

Qty.	Description	Common Parts	Unique Parts	
			GM10027-KA1	GM10027-KA2
1	Hose			X-691-23
2	Elbow, street (90 deg. x 3/4 in. NPT)			SA-472
1	Strap, ground (5 in.)	223033		
1	Fitting, 45 deg. street elbow + vibra seal	227521		
4	Bumper	259632		
2	Tag, hang	279047		
2	Heater, block (includes item marked *)	279816		
1	*Element, replacement	GM19503		
4	Gasket, washer	297001		
1	Box, block heater control	354316		
1	Cover, block heater control	354317		
1	Gasket, control box	354318		
1	Decal, warning	354325		
1	Label, wiring diagram	354328		
1	Bracket, block heater	354687		
1	Adapter, bushing	361917		
1	Adapter, bushing	361918		
1	Thermostat, block heater	361944		
1	O-ring, ISO 6149 (11.3 mm ID)	365499		
1	O-ring, ISO 6149 (23.6 mm ID)	365500		
1	O-ring, ISO 6149 (29.6 mm ID)	365501		
1	Flange	GM10023		
1	Bracket, block heater	GM10024		
1	Plug, freeze	GM10025		
1	Gasket	GM10065		
1	Shield, heat (32 mm ID x 305 mm length)	GM10669		
1	Pipe (3/4 in. NPT x 6.00 in.)	X-206-15		
1	Pipe (3/4 in. NPT x 1.38 in.)	X-206-9		
1	Elbow, street (90 deg. x 3/4 in. NPT)	X-211-5		
1	Coupling, pipe (3/4 in.)	X-216-13		
10	Washer, lock, .262 ID x .743 in. OD	X-22-12		
4	Washer, lock, .391 ID x .975 in. OD	X-22-14		
1	Elbow, pipe (45 deg. x 3/4 in. NPT)	X-225-8		
1	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-2		
12	Clamp, hose, .69/1.25 in.	X-426-12		
4	Connector, hose + vibra seal	X-582-8		
1	Hose, coolant 15 in.	X-6367-4		
1	Hose, coolant 40 in.	X-6367-7		
4	Screw, slotted hex washer head, machine	X-97-13		

Cooling System Kits Breakdowns

Block Heater Kits: GM10028-KA1 and GM10028-KA2

Qty.	Description	Common Parts	Unique Parts	
			GM10028-KA1	GM10028-KA2
1	Elbow, street (45 deg. x 3/4 in. NPT)		X-274-15	
1	Elbow, street (90 deg. x 3/4 in. NPT)			X-211-5
1	Strap, ground (5 in.)	223033		
4	Bumper	259632		
1	Tag, hang	279047		
1	Heater, block (includes item marked *)	279816		
1	*Element, replacement	GM19503		
4	Gasket, washer	297001		
1	Box, block heater control	354316		
1	Cover, block heater control	354317		
1	Gasket, control box	354318		
1	Decal, warning	354325		
1	Label, wiring diagram	354328		
1	Bracket, block heater	354687		
1	Adapter, bushing	361918		
1	Thermostat, block heater	361944		
1	O-ring, ISO 6149 (11.3 mm ID)	365499		
1	O-ring, ISO 6149 (29.6 mm ID)	365501		
1	Flange	GM10023		
1	Gasket	GM10065		
1	Shield, heat (32 mm ID x 305 mm length)	GM10669		
10	Washer, lock, .262 ID x .743 in. OD	X-22-12		
2	Washer, lock, .391 ID x .975 in. OD	X-22-14		
1	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-15		
4	Clamp, hose, .69/1.25 in.	X-426-12		
2	Cable tie	X-468-9		
2	Connector, hose + vibra seal	X-582-8		
1	Hose, coolant 26 in.	X-6367-6		
1	Hose, coolant 40 in.	X-6367-7		
4	Screw, slotted hex washer head, machine	X-97-13		

Block Heater Kits: GM10030-KA1 and GM10030-KA2

Qty.	Description	Common Parts	Unique Parts	
			GM10030-KA1	GM10030-KA2
1	Elbow, street (45 deg. x 3/4 in. NPT)		X-274-15	
1	Elbow, street (90 deg. x 3/4 in. NPT)			X-211-5
1	Strap, ground (5 in.)	223033		
1	Fitting, 45 deg. street elbow + vibra seal	227521		
4	Bumper	259632		
2	Tag, hang	279047		
2	Heater, block (includes item marked *)	279816		
1	*Element, replacement	GM19503		
4	Gasket, washer	297001		
1	Box, block heater control	354316		
1	Cover, block heater control	354317		
1	Gasket, control box	354318		
1	Decal, warning	354325		
1	Label, wiring diagram	354328		
2	Bracket, block heater	354687		
1	Adapter, bushing	361917		
1	Adapter, bushing	361918		
1	Thermostat, block heater	361944		
1	O-ring, ISO 6149 (11.3 mm ID)	365499		
1	O-ring, ISO 6149 (23.6 mm ID)	365500		
1	O-ring, ISO 6149 (29.6 mm ID)	365501		
1	Flange	GM10023		
1	Plug, freeze	GM10025		
1	Gasket	GM10065		
2	Shield, heat (32 mm ID x 305 mm length)	GM10669		
10	Washer, lock, .262 ID x .743 in. OD	X-22-12		
2	Washer, lock, .391 ID x .975 in. OD	X-22-14		
3	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-15		
8	Clamp, hose, .69/1.25 in.	X-426-12		
2	Cable tie	X-468-9		
4	Connector, hose + vibra seal	X-582-8		
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4		
2	Hose, coolant 52 in.	X-6367-2		
1	Hose, coolant 26 in.	X-6367-6		
1	Hose, coolant 40 in.	X-6367-7		
4	Screw, slotted hex washer head, machine	X-97-13		

Cooling System Kit Breakdowns, continued

Block Heater Kits: GM19403-KA1, GM19403-KA2, and GM19403-KA3

Qty.	Description	Common Parts	Unique Parts		
			GM19403-KA1	GM19403-KA2	GM19403-KA3
1	Heater, block (includes items marked *)		GM19667	GM19668	GM19669
1	*Block heater service element		GM29480	GM29481	GM29482
1	*Thermostat		GM29529	GM29529	
1	Strap, ground (5 in.)	223033			
1	Elbow, street (45 deg. x 1/2 in. NPT)	227642			
4	Bumper	259632			
1	Tag, hang	279047			
4	Gasket, washer	297001			
1	Box, block heater control	354316			
1	Cover, block heater control	354317			
1	Gasket, control box	354318			
1	Decal, warning	354325			
1	Label, wiring diagram	354328			
1	Bracket, block heater	354687			
1	Thermostat, block heater	361944			
1	Adapter, bushing	361955			
1	O-ring, ISO 6149 (11.3 mm ID)	365499			
1	O-ring, ISO 6149 (29.6 mm ID)	365501			
1	Plug, freeze	GM10025			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Valve, Shutoff (1/2-14npt)	GM19670			
1	Pipe (3/4 in. NPT x 6.00 in.)	X-206-15			
1	Pipe (3/4 in. NPT x 1.38 in.)	X-206-9			
1	Pipe (1/2 in. NPT x 3.00 in.)	X-209-11			
1	Pipe (1/2 in. NPT x 1.19 in.)	X-209-2			
1	Elbow, pipe (90 deg. x 1/2 in. NPT)	X-215-1			
10	Washer, lock, .262 ID x .743 in. OD	X-22-12			
2	Washer, lock, .391 ID x .975 in. OD	X-22-14			
1	Elbow, pipe (45 deg. x 3/4 in. NPT)	X-225-8			
1	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-2			
4	Clamp, hose, .69/1.25 in.	X-426-12			
1	Connector, hose + vibra seal	X-582-7			
1	Connector, hose + vibra seal	X-582-8			
1	Hose, coolant 44 in.	X-6367-1			
1	Hose, coolant 26 in.	X-6367-6			
4	Screw, slotted hex washer head, machine	X-97-13			

Cooling System Kit Breakdowns, continued

Block Heater Kits: GM19404-KA1, GM19404-KA2, and GM19404-KA3

Qty.	Description	Common Parts	Unique Parts		
			GM19404-KA1	GM19404-KA2	GM19404-KA3
1	Heater, block (includes items marked *)		GM19667	GM19668	GM19669
1	*Block heater service element		GM29480	GM29481	GM29482
1	*Thermostat		GM29529	GM29529	
1	Strap, ground (5 in.)	223033			
4	Bumper	259632			
1	Tag, hang	279047			
4	Gasket, washer	297001			
1	Box, block heater control	354316			
1	Cover, block heater control	354317			
1	Gasket, control box	354318			
1	Decal, warning	354325			
1	Label, wiring diagram	354328			
1	Adapter, bushing	361918			
1	Thermostat, block heater	361944			
1	O-ring, ISO 6149 (11.3 mm ID)	365499			
1	O-ring, ISO 6149 (29.6 mm ID)	365501			
1	Bracket, block heater	GM10024			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Pipe (3/4 in. NPT x 2.00 in.)	X-206-2			
1	Elbow, street (90 deg. x 3/4 in. NPT)	X-211-5			
10	Washer, lock, .262 ID x .743 in. OD	X-22-12			
2	Washer, lock, .391 ID x .975 in. OD	X-22-14			
4	Clamp, hose, .69/1.25 in.	X-426-12			
2	Cable tie	X-468-9			
1	Connector, hose + vibra seal	X-582-8			
1	Hose, coolant 15 in.	X-6367-4			
1	Hose, coolant 40 in.	X-6367-7			
4	Screw, slotted hex washer head, machine	X-97-13			
1	Flange	GM10023			
1	Gasket	GM10065			
1	Shield, heat (32 mm ID x 305 mm L)	GM10669			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Pipe (3/4 in. NPT x 1.38 in.)	X-206-9			
1	Connector, hose + vibra seal	X-582-8			

Cooling System Kit Breakdowns, continued

Block Heater Kits: GM19404-KA4, GM19404-KA5, and GM19404-KA6

Qty.	Description	Common Parts	Unique Parts		
			GM19404-KA4	GM19404-KA5	GM19404-KA6
1	Heater, block (includes items marked *)		GM19667	GM19668	GM19669
1	*Block heater service element		GM29480	GM29481	GM29482
1	*Thermostat		GM29529	GM29529	
2	Elbow, street (90 deg. x 3/4 in. NPT)	X-215-2			
1	Strap, ground (5 in.)	223033			
4	Bumper	259632			
1	Tag, hang	279047			
4	Gasket, washer	297001			
1	Box, block heater control	354316			
1	Cover, block heater control	354317			
1	Gasket, control box	354318			
1	Decal, warning	354325			
1	Label, wiring diagram	354328			
1	Adapter, bushing	361918			
1	Thermostat, block heater	361944			
1	O-ring, ISO 6149 (11.3 mm ID)	365499			
1	O-ring, ISO 6149 (29.6 mm ID)	365501			
1	Bracket, block heater	GM10024			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Pipe (3/4 in. NPT x 2.00 in.)	X-206-2			
1	Elbow, street (90 deg. x 3/4 in. NPT)	X-211-5			
10	Washer, lock, .262 ID x .743 in. OD	X-22-12			
2	Washer, lock, .391 ID x .975 in. OD	X-22-14			
4	Clamp, hose, .69/1.25 in.	X-426-12			
2	Cable tie	X-468-9			
1	Connector, hose + vibra seal	X-582-8			
1	Hose, coolant 15 in.	X-6367-4			
1	Hose, coolant 40 in.	X-6367-7			
4	Screw, slotted hex washer head, machine	X-97-13			
1	Flange	GM10023			
1	Gasket	GM10065			
1	Shield, heat (32 mm ID x 305 mm L)	GM10669			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
3	Pipe (3/4 in. NPT x 1.38 in.)	X-206-9			
1	Connector, hose + vibra seal	X-582-8			

Cooling System Kit Breakdowns, continued

Block Heater Kits: GM19405-KA1, GM19405-KA2, and GM19405-KA3

Qty.	Description	Common Parts	Unique Parts		
			GM19405-KA1	GM19405-KA2	GM19405-KA3
2	Heater, block (includes items marked *)		GM19667	GM19668	GM19669
1	*Block heater service element		GM29480	GM29481	GM29482
1	*Thermostat		GM29529	GM29529	
1	Strap, ground (5 in.)	223033			
1	Fitting, 45 deg. street elbow + vibra seal	227521			
4	Bumper	259632			
2	Tag, hang	279047			
4	Gasket, washer	297001			
1	Box, block heater control	354316			
1	Cover, block heater control	354317			
1	Gasket, control box	354318			
1	Decal, warning	354325			
1	Label, wiring diagram	354328			
1	Bracket, block heater	354687			
1	Adapter, bushing	361917			
1	Adapter, bushing	361918			
1	Thermostat, block heater	361944			
1	O-ring, ISO 6149 (11.3 mm ID)	365499			
1	O-ring, ISO 6149 (23.6 mm ID)	365500			
1	O-ring, ISO 6149 (29.6 mm ID)	365501			
1	Bracket, block heater	GM10024			
1	Plug, freeze	GM10025			
3	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Pipe (3/4 in. NPT x 6.00 in.)	X-206-15			
2	Pipe (3/4 in. NPT x 2.00 in.)	X-206-2			
1	Pipe (3/4 in. NPT x 1.38 in.)	X-206-9			
1	Elbow, street (90 deg. x 3/4 in. NPT)	X-211-5			
10	Washer, lock, .262 ID x .743 in. OD	X-22-12			
4	Washer, lock, .391 ID x .975 in. OD	X-22-14			
1	Elbow, pipe (45 deg. x 3/4 in. NPT)	X-225-8			
1	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-2			
8	Clamp, hose, .69/1.25 in.	X-426-12			
2	Cable tie	X-468-9			
3	Connector, hose + vibra seal	X-582-8			
1	Hose, coolant 15 in.	X-6367-4			
1	Hose, coolant 40 in.	X-6367-7			
4	Screw, slotted hex washer head, machine	X-97-13			
1	Flange	GM10023			
1	Gasket	GM10065			
1	Shield, heat (32 mm ID x 305 mm L)	GM10669			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Pipe (3/4 in. NPT x 1.38 in.)	X-206-9			
1	Connector, hose + vibra seal	X-582-8			

Cooling System Kit Breakdowns, continued

Block Heater Kits: GM19405-KA4, GM19405-KA5, and GM19405-KA6

Qty.	Description	Common Parts	Unique Parts		
			GM19405-KA4	GM19405-KA5	GM19405-KA6
2	Heater, block (includes items marked *)		GM19667	GM19668	GM19669
1	*Block heater service element		GM29480	GM29481	GM29482
1	*Thermostat		GM29529	GM29529	
2	Elbow, pipe (90 deg. x 3/4 in. NPT)	X-215-2			
1	Strap, ground (5 in.)	223033			
1	Fitting, 45 deg. street elbow + vibra seal	227521			
4	Bumper	259632			
2	Tag, hang	279047			
4	Gasket, washer	297001			
1	Box, block heater control	354316			
1	Cover, block heater control	354317			
1	Gasket, control box	354318			
1	Decal, warning	354325			
1	Label, wiring diagram	354328			
1	Bracket, block heater	354687			
1	Adapter, bushing	361917			
1	Adapter, bushing	361918			
1	Thermostat, block heater	361944			
1	O-ring, ISO 6149 (11.3 mm ID)	365499			
1	O-ring, ISO 6149 (23.6 mm ID)	365500			
1	O-ring, ISO 6149 (29.6 mm ID)	365501			
1	Bracket, block heater	GM10024			
1	Plug, freeze	GM10025			
3	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Pipe (3/4 in. NPT x 6.00 in.)	X-206-15			
2	Pipe (3/4 in. NPT x 2.00 in.)	X-206-2			
3	Pipe (3/4 in. NPT x 1.38 in.)	X-206-9			
1	Elbow, street (90 deg. x 3/4 in. NPT)	X-211-5			
10	Washer, lock, .262 ID x .743 in. OD	X-22-12			
4	Washer, lock, .391 ID x .975 in. OD	X-22-14			
1	Elbow, pipe (45 deg. x 3/4 in. NPT)	X-225-8			
1	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-2			
8	Clamp, hose, .69/1.25 in.	X-426-12			
2	Cable tie	X-468-9			
3	Connector, hose + vibra seal	X-582-8			
1	Hose, coolant 15 in.	X-6367-4			
1	Hose, coolant 40 in.	X-6367-7			
4	Screw, slotted hex washer head, machine	X-97-13			
1	Flange	GM10023			
1	Gasket	GM10065			
1	Shield, heat (32 mm ID x 305 mm L)	GM10669			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Pipe (3/4 in. NPT x 1.38 in.)	X-206-9			
1	Connector, hose + vibra seal	X-582-8			

Cooling System Kit Breakdowns, continued

Block Heater Kits: GM19406-KA1, GM19406-KA2, and GM19406-KA3

Qty.	Description	Common Parts	Unique Parts		
			GM19406-KA1	GM19406-KA2	GM19406-KA3
1	Heater, block (includes items marked *)		GM19667	GM19668	GM19669
1	*Block heater service element		GM29480	GM29481	GM29482
1	*Thermostat		GM29529	GM29529	
1	Pipe (3/4 in. NPT x 1.38 in.)	X-206-9			
2	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-15			
1	Strap, ground (5 in.)	223033			
4	Bumper	259632			
1	Tag, hang	279047			
4	Gasket, washer	297001			
1	Box, block heater control	354316			
1	Cover, block heater control	354317			
1	Gasket, control box	354318			
1	Decal, warning	354325			
1	Label, wiring diagram	354328			
1	Bracket, block heater	354687			
1	Adapter, bushing	361918			
1	Thermostat, block heater	361944			
1	O-ring, ISO 6149 (11.3 mm ID)	365499			
1	O-ring, ISO 6149 (29.6 mm ID)	365501			
1	Flange	GM10023			
1	Gasket	GM10065			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Pipe (3/4 in. NPT x 2.00 in.)	X-206-2			
10	Washer, lock, .262 ID x .743 in. OD	X-22-12			
2	Washer, lock, .391 ID x .975 in. OD	X-22-14			
1	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-15			
4	Clamp, hose, .69/1.25 in.	X-426-12			
1	Connector, hose + vibra seal	X-582-8			
1	Hose, coolant 26 in.	X-6367-6			
1	Hose, coolant 40 in.	X-6367-7			
4	Screw, slotted hex washer head, machine	X-97-13			
1	Shield, heat (32 mm ID x 305 mm L)	GM10669			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Connector, hose + vibra seal	X-582-8			

Block Heater Kits: GM19406-KA4, GM19406-KA5, and GM19406-KA6

Qty.	Description	Common Parts	Unique Parts		
			GM19406-KA4	GM19406-KA5	GM19406-KA6
1	Heater, block (includes items marked *)		GM19667	GM19668	GM19669
1	*Block heater service element		GM29480	GM29481	GM29482
1	*Thermostat		GM29529	GM29529	
3	Pipe (3/4 in. NPT x 1.38 in.)	X-206-9			
2	Elbow, pipe (90 deg. x 3/4 in. NPT)	X-215-2			
1	Strap, ground (5 in.)	223033			
4	Bumper	259632			
1	Tag, hang	279047			
4	Gasket, washer	297001			
1	Box, block heater control	354316			
1	Cover, block heater control	354317			
1	Gasket, control box	354318			
1	Decal, warning	354325			
1	Label, wiring diagram	354328			
1	Bracket, block heater	354687			
1	Adapter, bushing	361918			
1	Thermostat, block heater	361944			
1	O-ring, ISO 6149 (11.3 mm ID)	365499			
1	O-ring, ISO 6149 (29.6 mm ID)	365501			
1	Flange	GM10023			
1	Gasket	GM10065			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Pipe (3/4 in. NPT x 2.00 in.)	X-206-2			
10	Washer, lock, .262 ID x .743 in. OD	X-22-12			
2	Washer, lock, .391 ID x .975 in. OD	X-22-14			
1	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-15			
4	Clamp, hose, .69/1.25 in.	X-426-12			
1	Connector, hose + vibra seal	X-582-8			
1	Hose, coolant 26 in.	X-6367-6			
1	Hose, coolant 40 in.	X-6367-7			
4	Screw, slotted hex washer head, machine	X-97-13			
1	Shield, heat (32 mm ID x 305 mm L)	GM10669			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Connector, hose + vibra seal	X-582-8			

Cooling System Kit Breakdowns, continued

Block Heater Kits: GM19407-KA1, GM19407-KA2, and GM19407-KA3

Qty.	Description	Common Parts	Unique Parts		
			GM19407-KA1	GM19407-KA2	GM19407-KA3
2	Heater, block (includes items marked *)		GM19667	GM19668	GM19669
1	*Block heater service element		GM29480	GM29481	GM29482
1	*Thermostat		GM29529	GM29529	
1	Pipe (3/4 in. NPT x 1.38 in.)	X-206-9			
2	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-15			
1	Strap, ground (5 in.)	223033			
1	Fitting, 45 deg. street elbow + vibra seal	227521			
4	Bumper	259632			
2	Tag, hang	279047			
4	Gasket, washer	297001			
1	Box, block heater control	354316			
1	Cover, block heater control	354317			
1	Gasket, control box	354318			
1	Decal, warning	354325			
1	Label, wiring diagram	354328			
2	Bracket, block heater	354687			
1	Adapter, bushing	361917			
1	Adapter, bushing	361918			
1	Thermostat, block heater	361944			
1	O-ring, ISO 6149 (11.3 mm ID)	365499			
1	O-ring, ISO 6149 (23.6 mm ID)	365500			
1	O-ring, ISO 6149 (29.6 mm ID)	365501			
1	Flange	GM10023			
1	Plug, freeze	GM10025			
1	Gasket	GM10065			
1	Shield, heat (32 mm ID x 305 mm length)	GM10669			
3	Valve, shutoff (3/4-14 NPT)	GM19666			
2	Pipe (3/4 in. NPT x 2.00 in.)	X-206-2			
1	Pipe (3/4 in. NPT x 3.50 in.)	X-206-6			
10	Washer, lock, .262 ID x .743 in. OD	X-22-12			
4	Washer, lock, .391 ID x .975 in. OD	X-22-14			
1	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-15			
2	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-2			
8	Clamp, hose, .69/1.25 in.	X-426-12			
2	Cable tie	X-468-9			
4	Connector, hose + vibra seal	X-582-8			
2	Hose, coolant 52 in.	X-6367-2			
1	Hose, coolant 26 in.	X-6367-6			
1	Hose, coolant 40 in.	X-6367-7			
4	Screw, slotted hex washer head, machine	X-97-13			
1	Shield, heat (32 mm ID x 305 mm L)	GM10669			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Connector, hose + vibra seal	X-582-8			

Cooling System Kit Breakdowns, continued

Block Heater Kits: GM19407-KA4, GM19407-KA5, and GM19407-KA6

Qty.	Description	Common Parts	Unique Parts		
			GM19407-KA4	GM19407-KA5	GM19407-KA6
2	Heater, block (includes items marked *)		GM19667	GM19668	GM19669
1	*Block heater service element		GM29480	GM29481	GM29482
1	*Thermostat		GM29529	GM29529	
3	Pipe (3/4 in. NPT x 1.38 in.)	X-206-9			
2	Elbow, pipe (90 deg. x 3/4 in. NPT)	X-215-2			
1	Strap, ground (5 in.)	223033			
1	Fitting, 45 deg. street elbow + vibra seal	227521			
4	Bumper	259632			
2	Tag, hang	279047			
4	Gasket, washer	297001			
1	Box, block heater control	354316			
1	Cover, block heater control	354317			
1	Gasket, control box	354318			
1	Decal, warning	354325			
1	Label, wiring diagram	354328			
2	Bracket, block heater	354687			
1	Adapter, bushing	361917			
1	Adapter, bushing	361918			
1	Thermostat, block heater	361944			
1	O-ring, ISO 6149 (11.3 mm ID)	365499			
1	O-ring, ISO 6149 (23.6 mm ID)	365500			
1	O-ring, ISO 6149 (29.6 mm ID)	365501			
1	Flange	GM10023			
1	Plug, freeze	GM10025			
1	Gasket	GM10065			
1	Shield, heat (32 mm ID x 305 mm length)	GM10669			
3	Valve, shutoff (3/4-14 NPT)	GM19666			
2	Pipe (3/4 in. NPT x 2.00 in.)	X-206-2			
1	Pipe (3/4 in. NPT x 3.50 in.)	X-206-6			
10	Washer, lock, .262 ID x .743 in. OD	X-22-12			
4	Washer, lock, .391 ID x .975 in. OD	X-22-14			
1	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-15			
2	Elbow, street (45 deg. x 3/4 in. NPT)	X-274-2			
8	Clamp, hose, .69/1.25 in.	X-426-12			
2	Cable tie	X-468-9			
4	Connector, hose + vibra seal	X-582-8			
2	Hose, coolant 52 in.	X-6367-2			
1	Hose, coolant 26 in.	X-6367-6			
1	Hose, coolant 40 in.	X-6367-7			
4	Screw, slotted hex washer head, machine	X-97-13			
1	Shield, heat (32 mm ID x 305 mm L)	GM10669			
1	Valve, shutoff (3/4-14 NPT)	GM19666			
1	Connector, hose + vibra seal	X-582-8			

Cooling System Kit Breakdowns, continued

Qty.	Description	Part No.
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Block Heater, 480 Volt

361943

1	Strap, ground	223033
1	Fitting, elbow, 45 degree, street	227642
4	Bumper	259632
1	Tag, hang	279047
1	Heater, block (includes item marked *)	279816
1	*Element, replacement	GM19503
4	Gasket, washer	297001
1	Box, block heater control	354316
1	Cover, block heater control	354317
1	Gasket, control box	354318
1	Decal, warning	354325
1	Label, wiring diagram	354328
1	Bracket, block heater	354687
1	Adapter, bushing	361917
1	Thermostat, block heater	361944
1	Adapter, bushing	361955
1	O-ring	365499
1	O-ring, ISO 6149	365501
10	Washer, lock, .262 ID x .743 in. OD	X-22-12
2	Washer, lock, .391 ID x .974 in. OD	X-22-14
4	Clamp, hose, .69/1.25 in.	X-426-12
1	Screw, cross recess pan head machine	X-51-15
1	Coupling, hose	X-582-7
1	Coupling, hose	X-582-8
1	Fuse block	X-6129-8
1	Fuse, 10 A, 600 V	X-6135-6
1	Hose, 44 in.	X-6367-1
1	Hose, coolant	X-6367-3
4	Screw, slotted hex washer head, machine	X-97-13
1	Plug, freeze	GM10025
1	Fitting, 45 degree, street elbow	227521

Block Heater Isolation Valve

365308

1	Valve, shutoff	255612
1	Valve	255632
1	Nipple, pipe	X-206-9
1	Nipple, pipe, 1/2 x 2 1/2 in.	X-209-3

Block Heater Isolation, Single Heater

GM10322-KA1

2	Valve	GM10328
1	Fitting, 45 degree, street elbow	X-274-15
2	Nipple, pipe, 1/2 x 2 1/2 in.	X-206-2

Block Heater Isolation, Dual Heater

GM10323-KA1

4	Valve	GM10328
1	Fitting, 45 degree, street elbow	X-274-15
1	Nipple, pipe, 1/2 x 2 1/2 in.	X-206-2

Block Heater Isolation, Single Heater

GM10324-KA1

4	Valve	GM10324
2	Nipple, pipe, 1/2 x 2 1/2 in.	X-206-2
1	Fitting, 45 degree, street elbow	X-206-46
1	Fitting, 45 degree, street elbow	X-274-15

Qty.	Description	Part No.
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Block Heater Isolation, Dual Heater

GM10325-KA1

4	Valve	GM10325
2	Nipple, pipe, 3/4 in. NPT x 2.50 in.	X-206-4
1	Nipple, pipe, 3/4 in. NPT x 3.50 in.	X-206-6
1	Fitting, 45 degree, street elbow	X-274-2
1	Fitting, 45 degree, street elbow	X-274-15

Block Heater Isolation, Single Heater

GM10326-KA1

4	Valve	GM10326
1	Nipple, pipe, 3/4 x 2 in.	X-206-2
1	Fitting, elbow	SA-472

Block Heater Isolation, Dual Heater

GM10327-KA1

4	Valve	GM10328
1	Pipe, 3/4 in. NPT x 1.38 in.	X-206-9
1	Pipe, 3/4 in. NPT x 2.50 in.	X-206-4
1	Pipe, 3/4 in. NPT x 2 in.	X-206-2
2	Elbow, street, 45 degree x 3/4 in. NPT	X-274-2

Radiator Duct Flange

365202

2	Frame, air duct	365206
2	Frame, air duct	365207
8	Rivet, pop, .187 in.	X-781-10

Radiator Duct Flange

365203

2	Frame, air duct	365208
2	Frame, air duct	365209
8	Rivet, pop, .187 in.	X-781-10

Radiator Duct Flange

365204

2	Frame, air duct	365210
2	Frame, air duct	365211
8	Rivet, pop, .187 in.	X-781-10

Radiator Duct Flange

365205

2	Frame, air duct	365212
2	Frame, air duct	365213
8	Rivet, pop, .187 in.	X-781-10

Radiator Duct Flange

365296

2	Frame, air duct	365212
2	Frame, air duct	365214
8	Rivet, pop, .187 in.	X-781-10

Radiator Duct Flange

GM10790-KA1

2	Frame, air duct	GM10789
2	Frame, air duct	365207
8	Rivet, pop, .187 in.	X-781-10

Cooling System Kit Breakdowns, continued

Qty.	Description	Part No.
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Remote Radiator Setup

GM14348-MA1

1	Clamp, hose, 4.31/4.62 in.	274545
1	Washer, hardened, .531 ID x 1.06 in.OD	290945
1	Clamp, hose, 3.43/3.75 in.	324342
1	Clamp, hose, 2.5/2.81 in.	328800
1	Hose, lower radiator (4.00 in. ID)	361556
1	Adapter, bushing	365220
1	O-ring, ISO 6149 (9.3 mm ID)	365498
1	Clamp, hose	GM11993
1	Guard, belt (charging alternator)	GM14331
2	Bracket, support	GM14332
1	Bracket, support	GM14333
1	Bracket, support	GM14334
1	Guard, belt (top)	GM14336
1	Guard, belt (LS)	GM14338
1	Guard, belt (front panel)	GM14339
1	Guard, belt (top)	GM19580
1	Guard, belt (lower RS)	GM22693
1	Guard, belt (RS)	GM24955
1	Guard, belt (RS)	GM25337
1	Hose, radiator, straight, 2.25 in. ID	X-281-8
1	Hose, radiator, straight, 1.75 in. ID	X-311-7
1	Hose, straight coolant, 3.00 in. ID	X-507-6
1	Plug, pipe (1/8 in. NPT)	X-75-4

Remote Radiator Setup

GM14348-MA2

1	Clamp, hose, 4.31/4.62 in.	274545
1	Washer, hardened, .531 ID x 1.06 in.OD	290945
2	Clamp, hose, 3.43/3.75 in.	324342
1	Clamp, hose, 2.5/2.81 in.	328800
1	Hose, lower radiator (4.00 in. ID)	361556
1	Adapter, bushing	365220
1	O-ring, ISO 6149 (9.3 mm ID)	365498
1	Clamp, hose	GM11993
1	Guard, belt (charging alternator)	GM14331
2	Bracket, support	GM14332
1	Bracket, support	GM14333
1	Bracket, support	GM14334
1	Guard, belt (top)	GM14336
1	Guard, belt (LS)	GM14338
1	Guard, belt (front panel)	GM14339
1	Guard, belt (top)	GM19580
1	Guard, belt (lower RS)	GM22693
1	Guard, belt (RS)	GM24955
1	Guard, belt (RS)	GM25337
1	Hose, radiator, straight, 2.25 in. ID	X-281-8
1	Hose, radiator, straight, 1.75 in. ID	X-311-7
2	Hose, straight coolant, 3.00 in. ID	X-507-6
1	Plug, pipe (1/8 in. NPT)	X-75-4

Qty.	Description	Part No.
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Remote Radiator Setup

GM14348-MA3

1	Clamp, hose, 4.31/4.62 in.	274545
1	Washer, hardened, .531 ID x 1.06 in.OD	290945
2	Clamp, hose, 3.43/3.75 in.	324342
1	Hose, lower radiator (4.00 in. ID)	361556
1	Adapter, bushing	365220
1	O-ring, ISO 6149 (9.3 mm ID)	365498
1	Guard, belt (charging alternator)	GM14331
2	Bracket, support	GM14332
1	Bracket, support	GM14333
1	Bracket, support	GM14334
1	Guard, belt (top)	GM14336
1	Guard, belt (LS)	GM14338
1	Guard, belt (front panel)	GM14339
1	Guard, belt (top)	GM19580
1	Guard, belt (lower RS)	GM22693
1	Guard, belt (RS)	GM24955
1	Guard, belt (RS)	GM25337
2	Hose, straight coolant, 3.00 in. ID	X-507-6
1	Plug, pipe (1/8 in. NPT)	X-75-4
1	Bushing, reducant (1/8 x 1/2 in. NPT)	X-202-29
1	Valve, drain (1/8 in. NPT)	X-256-2
1	Guard, belt (bottom)	GM22694

Air Intake Kit Breakdowns

Qty.	Description	Part No.
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Heavy-Duty Air Cleaner

365265

1	Air cleaner, DDC	A-279713
2	Element, air cleaner	279736
1	Air cleaner, DDC	A-354106
2	Element, air cleaner	279736
6	Clamp, hose, 6.25/6.56 in.	254013
2	Clamp, hose, 5.43/5.74 in.	254344
2	Hose, elbow, 90 degree, 6 x 6 in. ID	272627
2	Cap, rain	272674
2	Tube assembly	274623
4	Bracket, air cleaner	291666
2	Hose, elbow, 90 degree, molded, 6 in. ID	343217
2	Support	365446
2	Plate, head air cleaner	365473
2	Cap, pipe, 1/8 in. NPT	X-268-7

Heavy-Duty Air Cleaner

365266

1	Air cleaner	A-343258
2	Element, air cleaner	343259
1	Air cleaner	A-365525
2	Element, air cleaner	343259
2	Cap, rain	254010
4	Band, mounting	254012
4	Clamp, hose, 6.25/6.56 in.	254013
2	Hose, elbow, 90 degree, molded, 6 in. ID	273105
2	Tube assembly	274623
2	Clamp, hose, 5.94/6.25 in.	274976
4	Hose, elbow, 90 degree, molded, 6 in. ID	279741
2	Clamp, hose, 5.81/6.12 in.	291504
2	Support	365446
2	Plate, head air cleaner	365473
2	Cap, pipe, 1/8 in. NPT	X-268-7

Heavy-Duty Air Cleaner

365268

1	Air cleaner, DDC	A-279713
1	Element, air cleaner	279736
1	Air cleaner	A-354106
1	Element, air cleaner	279736
8	Clamp, hose, 6.25/6.56 in.	254013
4	Hose, elbow, 90 degree	272627
2	Cap, rain	272674
2	Tube assembly	274623
4	Bracket, air cleaner	291666
2	Plate, head air cleaner	365445
1	Support	365446
1	Support, head air cleaner	365447
2	Cap, pipe, 1/8 in. NPT	X-268-7
1	Spacer, .375 ID x .75 OD x .5 in.	X-400-104

Qty.	Description	Part No.
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Heavy-Duty Air Cleaner

365270

1	Air cleaner assembly	A-365216
1	Element, air cleaner	365529
1	Air cleaner assembly	A-365524
1	Element, air cleaner	365529
2	Cap, rain	254010
4	Band, mounting	254012
6	Clamp, hose, 6.25/6.56 in.	254013
2	Fitting, elbow, 90 degree	272627
2	Tube assembly	274623
2	Hose, elbow, 90 degree, molded, 6 in. ID	279741
2	Clamp, hose, 5.81/6.12 in.	291504
1	Support	365446
1	Support, head air cleaner	365447
2	Plate, head air cleaner	365472
2	Pipe, 1/8 NPT	X-217-14
1	Spacer, .375 ID x .75 OD x .5 in.	X-400-104
2	Plug, pipe, 1/8	X-75-4

Heavy-Duty Air Cleaner

365272

1	Air cleaner	A-279714
1	Element, air cleaner	279738
1	Element, inner	GM28622
1	Air cleaner	A-361366
1	Element, air cleaner	279738
1	Element, inner	GM28622
2	Hose, elbow, 90 degree, molded, 7 in. ID	272663
2	Clamp, hose, 6.56/6.87 in.	272960
2	Tube assembly	274664
4	Bracket, air cleaner	279715
2	Hose, elbow, 90 degree, molded, 7 in. ID	279716
2	Clamp, hose, 8.63/8.94 in.	279717
2	Cap, rain	279722
4	Clamp, hose, 7.38/7.69 in.	280998
1	Support	365446
1	Support, head air cleaner	365447
2	Plate	365448
2	Cap, pipe, 1/8 in. NPT	X-268-7
1	Spacer, .375 ID x .75 OD x .5 in.	X-400-104

Air Intake Kit Breakdowns

Qty.	Description	Part No.
Heavy-Duty Air Cleaner		361770
1	Air cleaner assembly	A-361741
1	Element, air cleaner	361693
1	Air cleaner assembly	A-361742
1	Element, air cleaner	361693
2	Cap, rain	254010
4	Band, mounting	254012
6	Clamp, hose, 4.31/4.62 in.	274545
2	Clamp, hose, 5.81/6.12 in.	291504
1	Bracket, air cleaner, RS	361691
1	Bracket, air cleaner, LS	361692
2	Hose, air intake	361694
2	Tube assembly	361696
2	Hose, air intake, HDAC	361738
2	Bracket, AC support	365463
1	Bracket, HDAC, RS	365464
1	Bracket, HDAC, LS	365465
2	Coupling, half	X-511-12
2	Tube, steel	X-522-87
2	Plug, pipe, 1/8 in.	X-75-1

Qty.	Description	Part No.
Heavy-Duty Air Cleaner		361771
1	Air cleaner assembly	A-361741
1	Element, air cleaner	361693
1	Air cleaner assembly	A-361742
1	Element, air cleaner	361693
2	Cap, rain	254010
4	Band, mounting	254012
4	Clamp, hose, 4.31/4.62 in.	274545
2	Clamp, hose, 5.81/6.12 in.	291504
2	Clamp, hose, 3.06/3.38 in.	343175
1	Bracket, air cleaner, RS	361691
1	Bracket, air cleaner, LS	361692
2	Hose, air intake	361695
2	Tube assembly	361696
2	Hose, air intake HDAC	361738
2	Bracket, AC support	365463
1	Bracket, HDAC, RH	365464
1	Bracket, HDAC, LH	365465
2	Plug, pipe, 1/8 in.	X-75-1

Appendix A Abbreviations

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

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

k	kilo (1000)	MTBF	mean time between failure	RHM	round head machine (screw)
K	kelvin	MTBO	mean time between overhauls	rly.	relay
kA	kiloampere	mtg.	mounting	rms	root mean square
KB	kilobyte (2 ¹⁰ bytes)	MW	megawatt	rnd.	round
kg	kilogram	mW	milliwatt	ROM	read only memory
kg/cm ²	kilograms per square centimeter	μF	microfarad	rot.	rotate, rotating
kgm	kilogram-meter	N, norm.	normal (power source)	rpm	revolutions per minute
kg/m ³	kilograms per cubic meter	NA	not available, not applicable	RS	right side
kHz	kilohertz	nat. gas	natural gas	RTV	room temperature vulcanization
kJ	kilojoule	NBS	National Bureau of Standards	SAE	Society of Automotive Engineers
km	kilometer	NC	normally closed	scfm	standard cubic feet per minute
kOhm, kΩ	kilo-ohm	NEC	National Electrical Code	SCR	silicon controlled rectifier
kPa	kilopascal	NEMA	National Electrical Manufacturers Association	s, sec.	second
kph	kilometers per hour	NFPA	National Fire Protection Association	SI	<i>Système international d'unités</i> , International System of Units
kV	kilovolt	Nm	newton meter	SI/EO	side in/end out
kVA	kilovolt ampere	NO	normally open	sil.	silencer
kVAR	kilovolt ampere reactive	no., nos.	number, numbers	SN	serial number
kW	kilowatt	NPS	National Pipe, Straight	SPDT	single-pole, double-throw
kWh	kilowatt-hour	NPSC	National Pipe, Straight-coupling	SPST	single-pole, single-throw
kWm	kilowatt mechanical	NPT	National Standard taper pipe thread per general use	spec, specs	specification(s)
L	liter	NPTF	National Pipe, Taper-Fine	sq.	square
LAN	local area network	NR	not required, normal relay	sq. cm	square centimeter
L x W x H	length by width by height	ns	nanosecond	sq. in.	square inch
lb.	pound, pounds	OC	overcrank	SS	stainless steel
lbm/ft ³	pounds mass per cubic feet	OD	outside diameter	std.	standard
LCB	line circuit breaker	OEM	original equipment manufacturer	stl.	steel
LCD	liquid crystal display	OF	overfrequency	tach.	tachometer
ld. shd.	load shed	opt.	option, optional	TD	time delay
LED	light emitting diode	OS	oversize, overspeed	TDC	top dead center
Lph	liters per hour	OSHA	Occupational Safety and Health Administration	TDEC	time delay engine cooldown
Lpm	liters per minute	OV	overvoltage	TDEN	time delay emergency to normal
LOP	low oil pressure	oz.	ounce	TDES	time delay engine start
LP	liquefied petroleum	p., pp.	page, pages	TDNE	time delay normal to emergency
LPG	liquefied petroleum gas	PC	personal computer	TDOE	time delay off to emergency
LS	left side	PCB	printed circuit board	TDON	time delay off to normal
L _{wa}	sound power level, A weighted	pF	picofarad	temp.	temperature
LWL	low water level	PF	power factor	term.	terminal
LWT	low water temperature	ph., ∅	phase	TIF	telephone influence factor
m	meter, milli (1/1000)	PHC	Phillips head crimplite (screw)	TIR	total indicator reading
M	mega (10 ⁶ when used with SI units), male	PHH	Phillips hex head (screw)	tol.	tolerance
m ³	cubic meter	PHM	pan head machine (screw)	turbo.	turbocharger
m ³ /min.	cubic meters per minute	PLC	programmable logic control	typ.	typical (same in multiple locations)
mA	milliampere	PMG	permanent-magnet generator	UF	underfrequency
man.	manual	pot	potentiometer, potential	UHF	ultrahigh frequency
max.	maximum	ppm	parts per million	UL	Underwriter's Laboratories, Inc.
MB	megabyte (2 ²⁰ bytes)	PROM	programmable read-only memory	UNC	unified coarse thread (was NC)
MCM	one thousand circular mils	psi	pounds per square inch	UNF	unified fine thread (was NF)
MCCB	molded-case circuit breaker	pt.	pint	univ.	universal
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			xfmr	transformer
MS	military standard				
m/sec.	meters per second				

Appendix B Common Hardware Application Guidelines

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

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

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

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

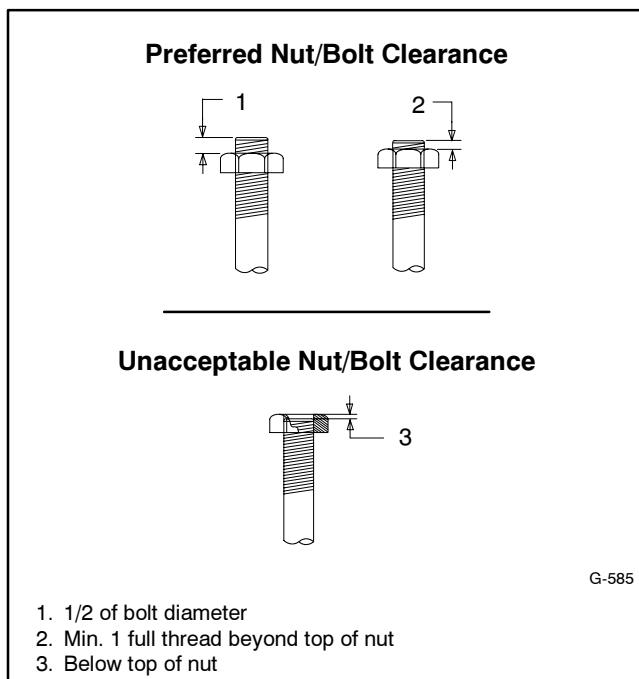


Figure 1 Acceptable Bolt Lengths

Steps for common hardware application:

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

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

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

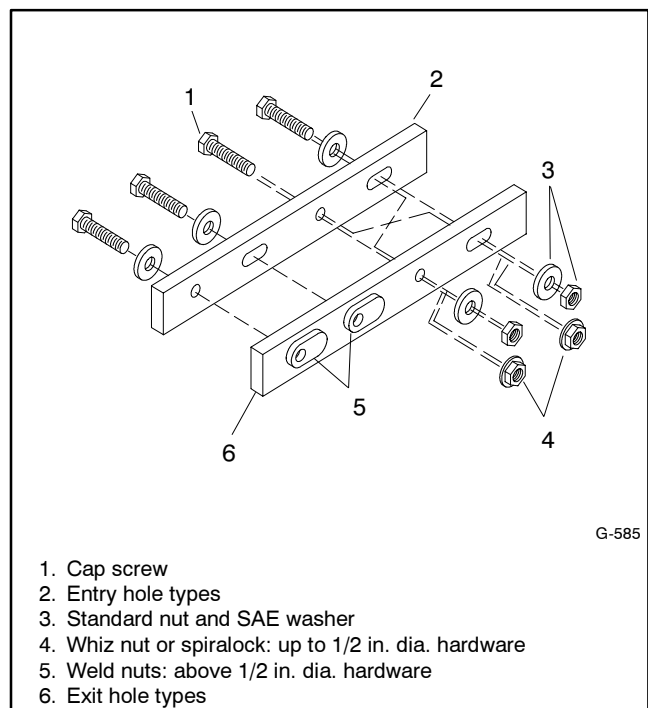


Figure 2 Acceptable Hardware Combinations

Appendix C General Torque Specifications

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

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

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

Metric Fasteners Torque Specifications, Measured in Nm (ft. lb.)				
Size (mm)	Assembled into Cast Iron or Steel			Assembled into Aluminum Grade 5.8 or 8.8
	Grade 5.8	Grade 8.8	Grade 10.9	
M6 x 1.00	5.6 (4)	9.9 (7)	14.0 (10)	5.6 (4)
M8 x 1.25	13.6 (10)	25.0 (18)	35.0 (26)	13.6 (10)
M8 x 1.00	21.0 (16)	25.0 (18)	35.0 (26)	21.0 (16)
M10 x 1.50	27.0 (20)	49.0 (35)	68.0 (50)	27.0 (20)
M10 x 1.25	39.0 (29)	49.0 (35)	68.0 (50)	39.0 (29)
M12 x 1.75	47.0 (35)	83.0 (61)	117.0 (86)	—
M12 x 1.50	65.0 (48)	88.0 (65)	125.0 (92)	—
M14 x 2.00	74.0 (55)	132.0 (97)	185.0 (136)	—
M14 x 1.50	100.0 (74)	140.0 (103)	192.0 (142)	—
M16 x 2.00	115.0 (85)	200.0 (148)	285.0 (210)	—
M16 x 1.50	141.0 (104)	210.0 (155)	295.0 (218)	—
M18 x 2.50	155.0 (114)	275.0 (203)	390.0 (288)	—
M18 x 1.50	196.0 (145)	305.0 (225)	425.0 (315)	—

Appendix D Common Hardware Identification

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

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

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

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

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

Sample Dimensions

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

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-129-19	1/2-13 x 1.50	X-6210-14	1/2-20	Spiralock		
X-125-33	5/16-18 x .50	X-129-20	1/2-13 x 1.75					
X-125-23	5/16-18 x .62	X-129-21	1/2-13 x 2.00	X-85-3	5/8-11	Standard		
X-125-3	5/16-18 x .75	X-129-22	1/2-13 x 2.25	X-88-12	3/4-10	Standard		
X-125-31	5/16-18 x .88	X-129-23	1/2-13 x 2.50	X-89-2	1/2-20	Standard		
X-125-5	5/16-18 x 1.00	X-129-24	1/2-13 x 2.75					
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
M931-08040-82	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
M931-10040-82	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
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
M931-16120-60	M16-2.00 x 120
M931-16150-60	M16-2.00 x 150
M931-20065-60	M20-2.50 x 65
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

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
M933-06040-60	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
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
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*

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

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
M934-05-50	M5-0.80	Standard
M982-05-60	M5-0.80	Elastic Stop
M934-06-60	M6-1.00	Standard
M934-06-64	M6-1.00	Std. (green)
M6923-06-80	M6-1.00	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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