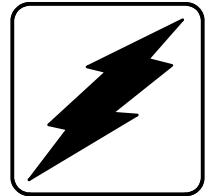


Service Parts

Industrial Generator Sets



Models:

1250-2000ROZD-4

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

See TP-6009 Parts Catalog Industrial Controller for controller parts

ISO 9001
KOHLER
GENERATORS
INTERNATIONALLY REGISTERED

KOHLER[®]
POWER SYSTEMS

TP-6013 4/01a

Table of Contents

Introduction	1
Numbering System Significance	1
Illustrations	1
How to Find Part Numbers	1
Hardware References	1
Specification Number Index	2
Recommended Spare Parts	3
Group 101: Air Intake	4
Group 104: Cooling System	6
Group 105: Engine	18
Group 107: Nameplate and Decals	21
Group 109: Skid and Plant Mounting	22
Group 201: Generator and Mounting	24
Control and Harness	26
Group 701: Literature	28
Kit List	29
Cooling System Kits	30
Air Cleaner Kits	37
Appendix A Abbreviations	A-1
Appendix B Common Hardware Application Guidelines	A-3
Appendix C General Torque Specifications	A-4
Appendix D Common Hardware Identification	A-5
Appendix E Common Hardware List	A-6

Introduction

This manual lists service replacement parts for 1250–2000 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. Kohler Co. reserves the right to change this publication and the products represented without notice and without any obligation or liability whatsoever.

This manual includes the following main sections:

Table of Contents. Lists the sections of the manual.

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

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

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

Kit Sections. List modules and accessories and their parts.

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

xin:004:002

Numbering System Significance

This manual uses the following numbering systems:

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

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

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

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

xin:004:003:a

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 instructions.

xin:004:004

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.

xin:004:005

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.

xin:004:006

Specification Number Index

Group Title														
	<i>Air Intake</i>	<i>Fuel System</i>	<i>Cooling System</i>	<i>Engine</i>	<i>Nameplates and Decals</i>	<i>Oil Pressure Switch</i>	<i>Skid and Plant Mounting</i>	<i>Generator and Mounting</i>	<i>Controller and Mounting</i>	<i>Literature</i>				
Group No.	101	103	104	105	107	108	109	201	301	701				
Spec No.	VARIATION NUMBER													

Model														
1250ROZD-4														
PA-132998	*	—	*	97	GR1	—	*	*	†	119				
PA-132999	*	—	*	98	GR1	—	*	*	†	119				
GM16797-GA1	*	—	*	121	GR1	—	*	*	†	119				
GM16797-GA2	*	—	*	122	GR1	—	*	*	†	119				
1500ROZD-4														
PA-132847	*	—	*	94	GR1	—	*	*	†	115				
PA-132848	*	—	*	99	GR1	—	*	*	†	115				
GM16798-GA1	*	—	*	124	GR1	—	*	*	†	115				
GM16798-GA2	*	—	*	123	GR1	—	*	*	†	115				
1750ROZD-4														
PA-132887	*	—	*	100	GR1	—	*	*	†	96				
PA-132888	*	—	*	111	GR1	—	*	*	†	96				
GM16799-GA1	*	—	*	125	GR1	—	*	*	†	96				
GM16799-GA2	*	—	*	126	GR1	—	*	*	†	96				
2000ROZD-4														
PA-132834	*	—	*	93	GR1	—	*	*	†	120				
PA-132835	*	—	*	112	GR1	—	*	*	†	120				
GM16800-GA1	*	—	*	127	GR1	—	*	*	†	120				
GM16800-GA2	*	—	*	128	GR1	—	*	*	†	120				

* 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 controller parts catalog TP-6009 for controller parts lists.

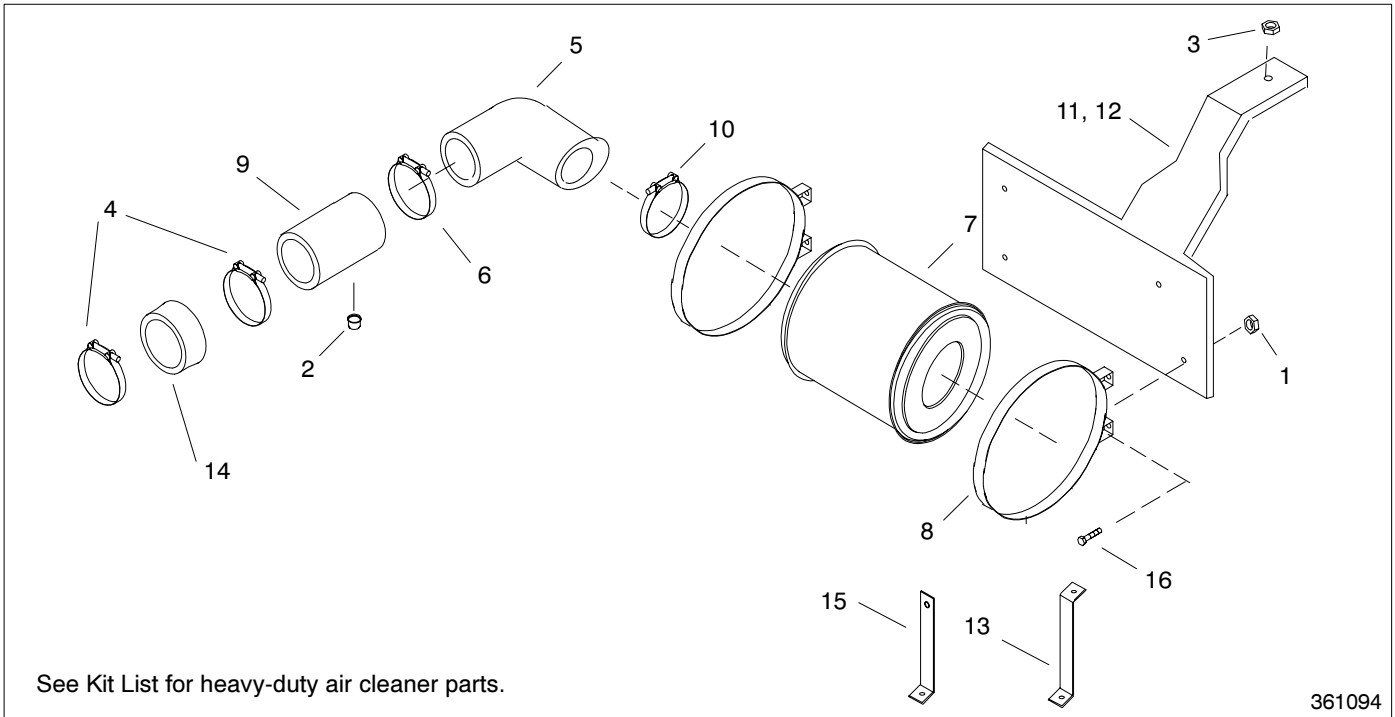
— Not applicable.

Recommended Spare Parts

Description	Part Number	Quantity			
		Model			
		1250 kW	1500 kW	1750 kW	2000 kW
Fuse, 1.5 A, 250 V	291207	5	5	5	5
Fuse, 3 A, 250 V	243273	5	5	5	5
Fuse, 15 A, 250 V	283645	5	5	5	5
Circuit board, main	A-336415	1	1	1	1
PCB assembly, pulse counter, DDEC	B-354647	1	1		
Voltage regulator, Marathon DVR2000	328725	1	1	1	1
Circuit board, indicator	A-336432	1	1	1	1
Lamp, 28 V, 4.8 W	283420	5	5	5	5
Hose, radiator (upper)	X-424-10	1		1	
Hose, radiator (lower)	X-6014-69		1	1	1
Hose, radiator	X-6014-95	1			
Hose, radiator	X-6014-91		1	1	2
Hose	X-6014-96	1			
Hose, radiator hose (lower)	X-6014-92		1	1	
Hose	X-6014-94			1	2
Belt, poly V, 91.5 in.	361201			1	
Belt	361261				1
Belt, poly V, 82.5 in.	GM14186	1	1		
Hose	X-6350-2	1			
Air cleaner, industrial	272981	20	40	52	52
Filter, secondary fuel	365014	28	21	13	13
Filter, oil	365012	40	40	52	52
Lamp, 125 V, .33 W	291740	5	5	5	5
Sensor, low fluid	365289	1	1	1	1
Sensor, liquid level	354113			1	1
Sender, oil pressure	365624	1	1	1	1
Sender, temperature	GM10166	1	1	1	1
Thermostat	GM16808	1	1	1	1

The recommended spares are for 60 Hz modular specs with the Dec3/Dec3+ controllers and unit-mounted radiator. To obtain a recommended spares list for modular options not listed, contact your Service Parts Department.

Group 101: Air Intake

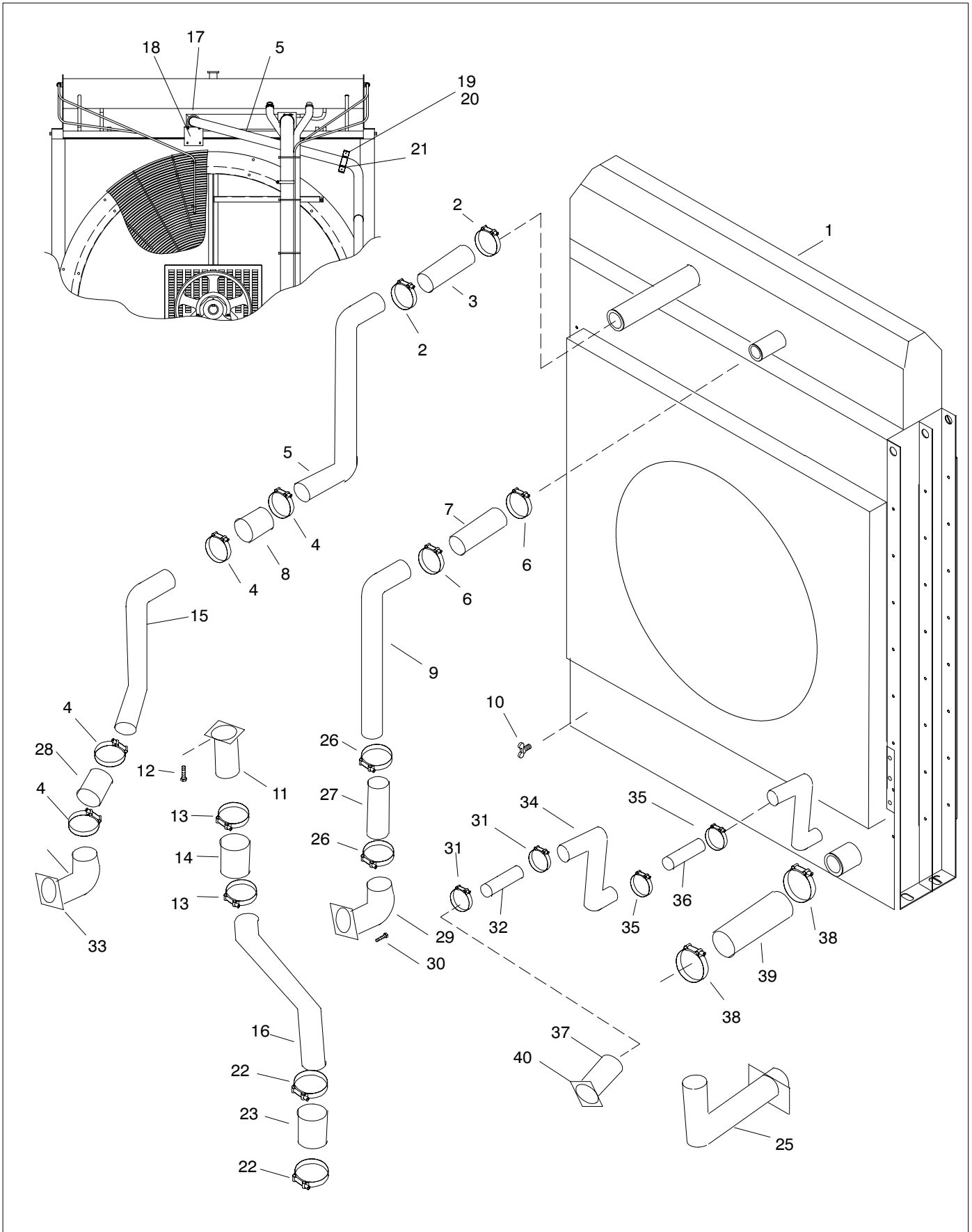


Item	Part Number	Description	Quantity		
			361094	Module Number	
1	X-101-13	Nut, lock	16		
2	X-268-7	Cap, pipe	4		
3	M934-10-60	Nut, hex, 10 mm	4		
4	254013	Clamp	8		
5	272663	Hose, 90° elbow	4		
6	272960	Clamp, hose	4		
7	272981	Element, air cleaner	4		
8	272983	Clamp	8		
9	279754	Tube assembly	4		
10	280998	Clamp	4		
11	354988	Plate, air cleaner mounting	2		
12	354990	Plate, air cleaner mounting	2		
13	361290	Bracket, support	6		
14	361277	Hose, straight air	4		
15	361290	Bracket, support	2		
16	#	Bolt, 3/8-16	16		

Common hardware. Procure locally.

Notes

Group 104: Cooling System



Group 104: Cooling System

Cross-reference the module number of your cooling system to the letter key in the Model Number to Key Cross-Reference table below. Refer to the key column in the following table.

Item	Part No.	Description	Quantity															
			Module Key															
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	A-354957	Radiator assembly	1	1	1	1												
1	A-354965	Radiator assembly					1		1									
1	GM10333	Radiator assembly						1		1								
1	A-361041	Radiator assembly									1	1	1	1				
2	A-361530	Radiator assembly													1	1	1	1
1	275527	Clamp, hose, 2.81/3.12 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	X-424-10	Hose, straight radiator, 2.5 in. ID	1	1	1	1	1	1	1	1	1	1	1	1			1	1
3	X-424-6	Hose, radiator													1	1		
4	275527	Clamp, hose, 2.81/3.12 in.				4	4			4	4	4	4				4	4
5	354974	Tube, intercooler return, 2.5 in. OD	1	1	1	1												
5	365506	Tube, intercooler return					1	1							1	1		
5	365507	Tube, intercooler return											1	1				
5	GM16097	Tube, radiator intercooler									1	1						
5	GM16098	Tube, radiator intercooler							1	1								
5	GM16099	Tube, radiator intercooler															1	1
5	GM16100	Tube, radiator intercooler			1	1												
6	274545	Clamp, hose, 4.31/4.62 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7	X-6350-2	Hose, straight radiator, 4 in. ID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	X-424-10	Hose, straight radiator 2.5 in. ID			1	1			1	1	1	1					1	1
9	361359	Tube, radiator, upper, steel, 4 in. OD	1	1	1	1												
9	365503	Tube, upper radiator					1	1	1	1								
9	365504	Tube, upper radiator									1	1	1	1				
9	365505	Tube, upper radiator													1	1	1	1
10	X-256-1	Valve, drain, 3/8 in. NPTF	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11	361363	Flange, water connection	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	M933-10025-60	Screw, hex cap	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
13	343287	Clamp, hose, 4.14/4.44 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
14	X-6014-91	Hose, straight radiator, 4 in. ID	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1
15	GM16108	Tube, intercooler return			1	1			1	1	1	1					1	1
16	361361	Tube, lower steel radiator, 4 in. OD	1	1	1	1												
16	361482	Tube, lower steel radiator, 4 in. OD					1	1	1	1	1	1	1	1				
16	361536	Tube, lower steel radiator, 4 in. OD													1	1	1	1
17	286283	Clamp, muffler			1	1			1	1	1	1					1	1
18	GM16090	Bracket, tube support			1	1			1	1								
18	GM16091	Bracket, tube support															1	1
18	GM16092	Bracket, tube support									1	1						
19	GM16093	Bracket, tube clamping			1	1			1	1	1	1					1	1
20	GM16094	Bracket, radiator tube			1	1			1	1	1	1					1	1
21	X-794-1	Screw, hex washer head, drill			2	2			2	2	2	2					2	2

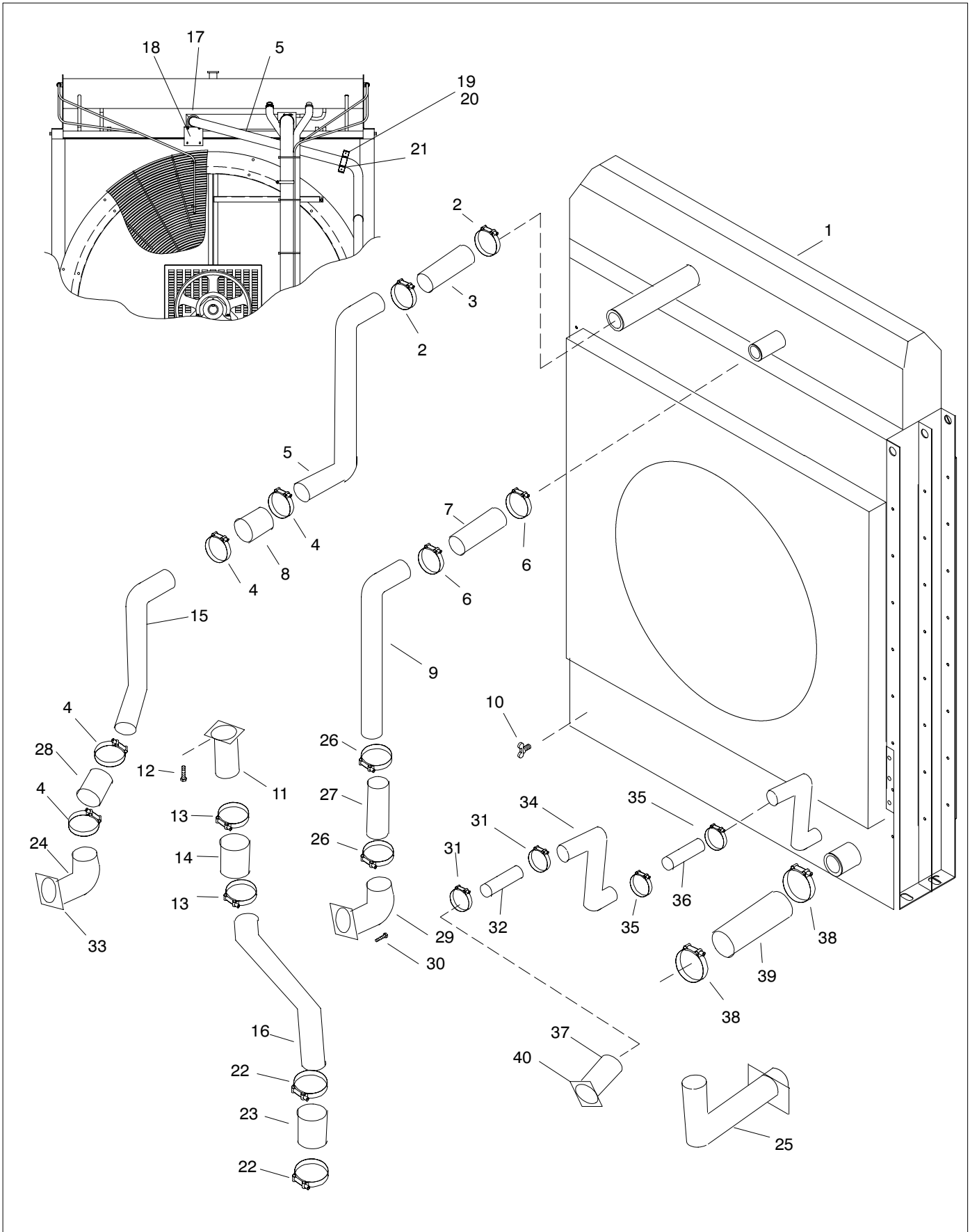
Parts list continued on next page

Module Number to Key Cross-Reference

Use the module number of your cooling system from the genset nameplate to determine the key.

Module Number to Key Cross-Reference							
Module Number	Key	Module Number	Key	Module Number	Key	Module Number	Key
361095	A	365510	E	GM16231-MA1	I	365508	M
361235	B	365511	F	GM16231-MA2	J	365509	M
GM162232-MA1	C	GM16230-MA1	G	365512	K	GM16229-MA1	O
GM162232-MA2	D	GM16230-MA2	H	365513	L	GM16229-MA2	P

Group 104: Cooling System, continued



Group 104: Cooling System, continued

Cross-reference the module number of your cooling system to the letter key in the Model Number to Key Cross-Reference table below. Refer to the key column in the following table.

Item	Part No.	Description	Quantity															
			Module Key															
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
22	343287	Clamp, hose, 4.14/4.44 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
23	X-6014-91	Hose, straight radiator, 4 in. ID	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
24	GM16104	Flange, water connect, outlet			1	1												
24	GM16105	Flange, water connect, outlet							1	1	1	1				1	1	
25	361360	Tube, skid, steel, 4 in. OD	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
26	274545	Clamp, hose, 4.31/4.62 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
27	X-6350-2	Hose, straight radiator, 4 in. ID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
28	X-424-10	Hose, straight radiator 2.5 in. ID			1	1			1	1	1	1				1	1	
29	361362	Flange, water connection	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
30	M993-10025-60	Screw, hex cap	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
31	336228	Clamp, hose, 2.63/2.94 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
32	X-6014-69	Hose, straight radiator, 2.5 in. ID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
33	GM16101	Gasket, water connection			1	1			1	1	1	1				1	1	
34	354976	Tube, intercooler supply, 2.5 in. OD	1	1			1	1				1	1	1	1			
34	GM16106	Tube, intercooler inlet			1	1			1	1	1	1				1	1	
35	336228	Clamp, hose, 2.63/2.94 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
36	X-6014-69	Hose, straight radiator, 2.5 in. ID	1	1	1	1	1	1	1	1		1	1	1	1			
36	X-6014-64	Hose, straight radiator, 2.5 in. ID									1	1				1	1	
37	GM16103	Flange, water connect, inlet			1	1			1	1	1	1				1	1	
38	343287	Clamp, hose, 4.14/4.44 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
39	X-6350-3	Hose, radiator	1	1														
39	X-6014-92	Hose, radiator			1	1	1	1	1	1	1	1	1	1	1	1	1	
40	GM16102	Gasket, intercooler inlet			1	1			1	1	1	1				1	1	

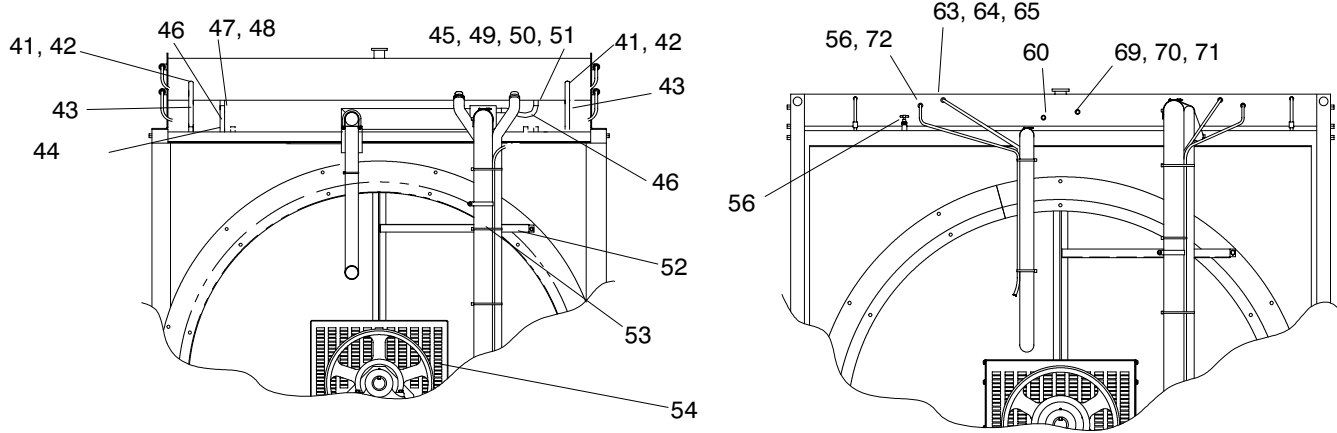
Parts list continued on next page

Module Number to Key Cross-Reference

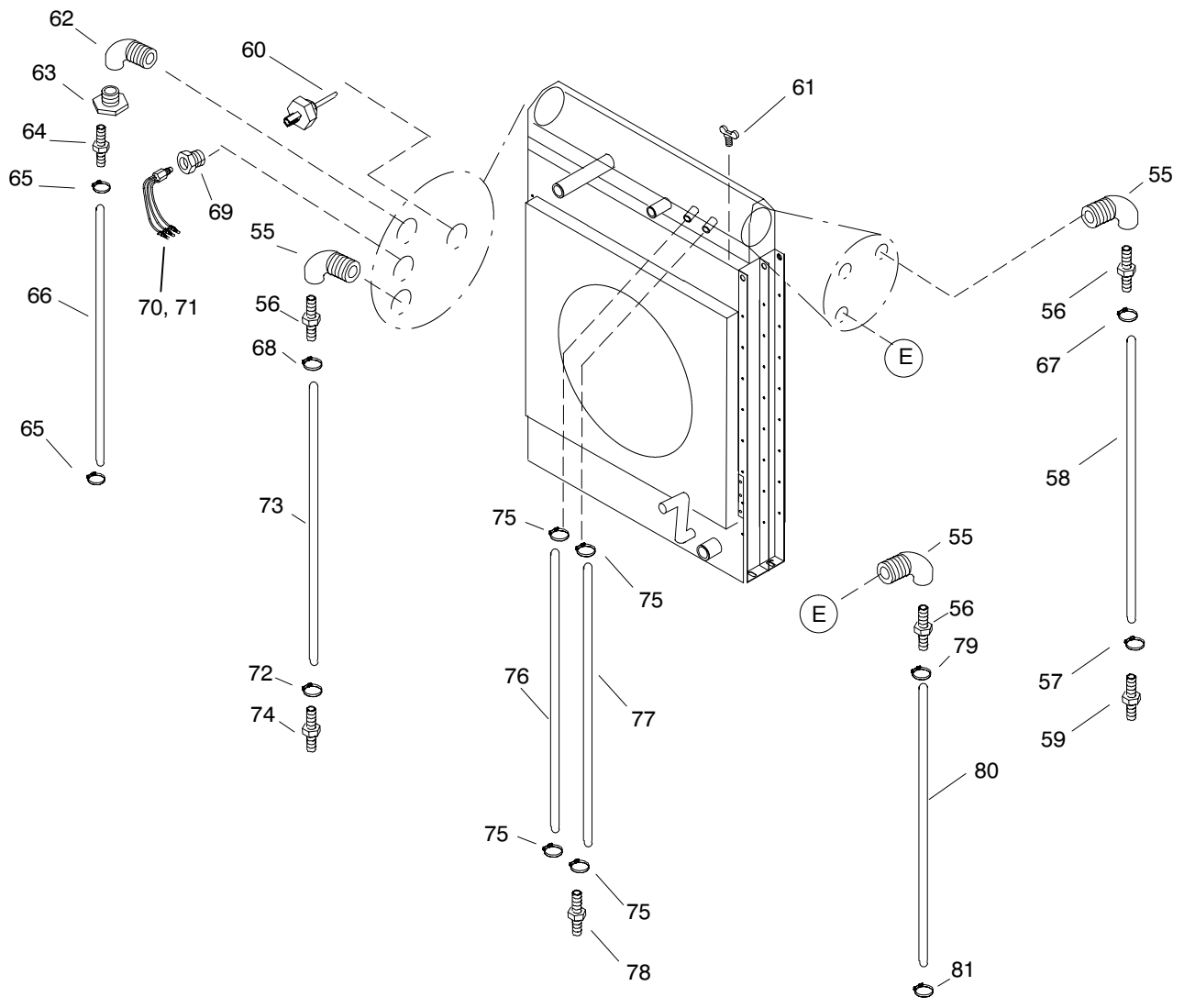
Use the module number of your cooling system from the genset nameplate to determine the key.

Module Number to Key Cross-Reference							
Module Number	Key	Module Number	Key	Module Number	Key	Module Number	Key
361095	A	365510	E	GM16231-MA1	I	365508	M
361235	B	365511	F	GM16231-MA2	J	365509	M
GM162232-MA1	C	GM16230-MA1	G	365512	K	GM16229-MA1	O
GM162232-MA2	D	GM16230-MA2	H	365513	L	GM16229-MA2	P

Group 104: Cooling System, continued



Radiator connections



Group 104: Cooling System, continued

Cross-reference the module number of your cooling system to the letter key in the Model Number to Key Cross-Reference table below. Refer to the key column in the following table.

Item	Part No.	Description	Quantity																
			Module Key																
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
41	X-6359-11	Hose, rubber										2	2	2	2				
42	X-426-9	Clamp, hose, .25/.70 in.										4	4	4	4				
43	X-652-3	Connector, hose + vibra seal										4	4	4	4				
44	X-426-9	Clamp, hose, .25/.70 in.										2	2	2	2				
45	X-582-9	Connector, hose + vibra seal										2	2	2	2				
46	X-386-127	Line, flex fuel										2	2	2	2				
47	X-582-9	Connector, hose + vibra seal										2	2	2	2				
48	X-202-28	Bushing, reducing, 3/8 x 1/2 in. NPT										2	2	2	2				
49	X-211-3	Elbow, street, 90° x 1/2 in. NPTF										1	1	1	1				
50	X-426-9	Clamp, hose, .25/.70 in.										2	2	2	2				
51	X-202-28	Bushing, reducing, 3/8 x 1/2 in. NPT										2	2	2	2				
52	361523	Brace, radiator	1	1	1	1													
52	365493	Brace, radiator tube					1	1	1	1	1	1	1	1	1				
53	324555	Clamp, hose, 4.63/4.94 in.	1	1	1	1													
53	291590	Clamp, hose, 4/4.31 in.					1	1	1	1									
53	324555	Clamp, hose, 4.63/4.94 in.									1	1	1	1					
54	361050	Guard, belt, top					1	1	1	1									
54	361058	Guard, belt, top	1	1	1	1					1	1	1	1	1	1	1	1	1
55	X-211-3	Elbow, street, 90° x 1/2 in. NPTF										2	2	2	2				
56	X-582-25	Connector, hose + vibra seal	3	3	3	3	3	3	3	3	2	2	2	2	3	3	3	3	3
57	X-426-9	Clamp, hose, .25/.70 in.					1	1	1	1	1	1	1	1	1	1	1	1	1
58	X-6359-3	Hose, rubber straight, .25 in. ID	1	1	1	1					1	1	1	1					
58	X-6359-5	Hose, rubber straight, .25 in. ID														1	1	1	1
58	X-6359-7	Hose, rubber straight, .25 in. ID					1	1	1	1									
59	X-6370-1	Connector, swivel, hose, 1/4 in. ID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
60	354113	Sensor, liquid level	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
61	X-256-5	Valve, drain, 1/2 in. NPTF	1	1	1	1	1	1	1	1	1	1	1	1					
61	X-215-5	Elbow, pipe, 90° x 1/4 in. NPT														1	1	1	1
61	X-220-14	Pipe, 1/4 in. NPT x 2.50 in.														1	1	1	1
61	X-256-3	Valve, drain, 1/4 in. NPTF														1	1	1	1
62	S-404	Elbow, street, 90° x 3/8 in. NPTF + vibra										1	1	1	1				
63	X-202-28	Bushing, reducing, 3/8 x 1/2 in. NPT	2	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2
63	X-582-9	Connector, hose + vibra seal	1	1	1	1	2	2	2	2	2	1	1	1	1				

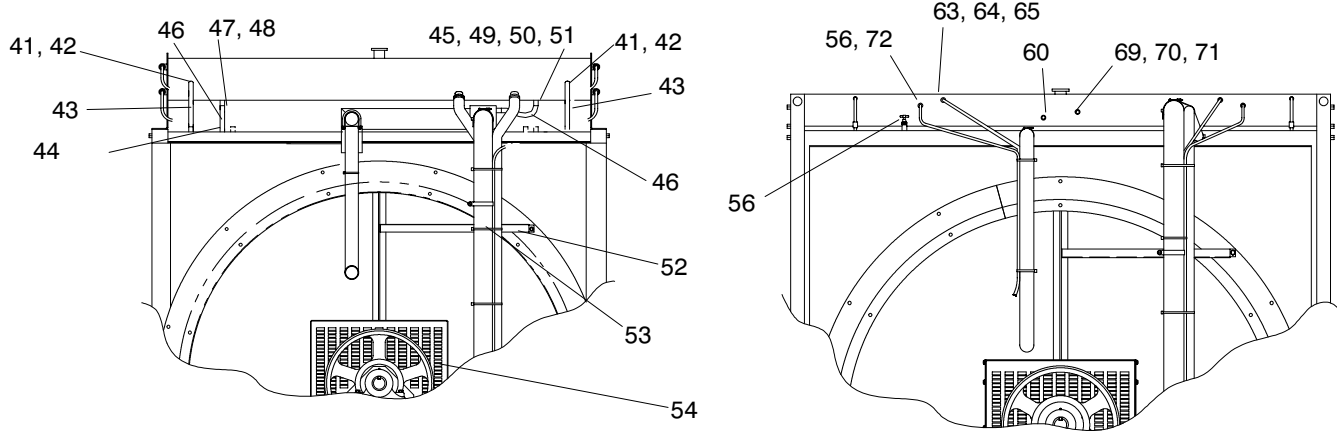
Parts list continued on next page

Module Number to Key Cross-Reference

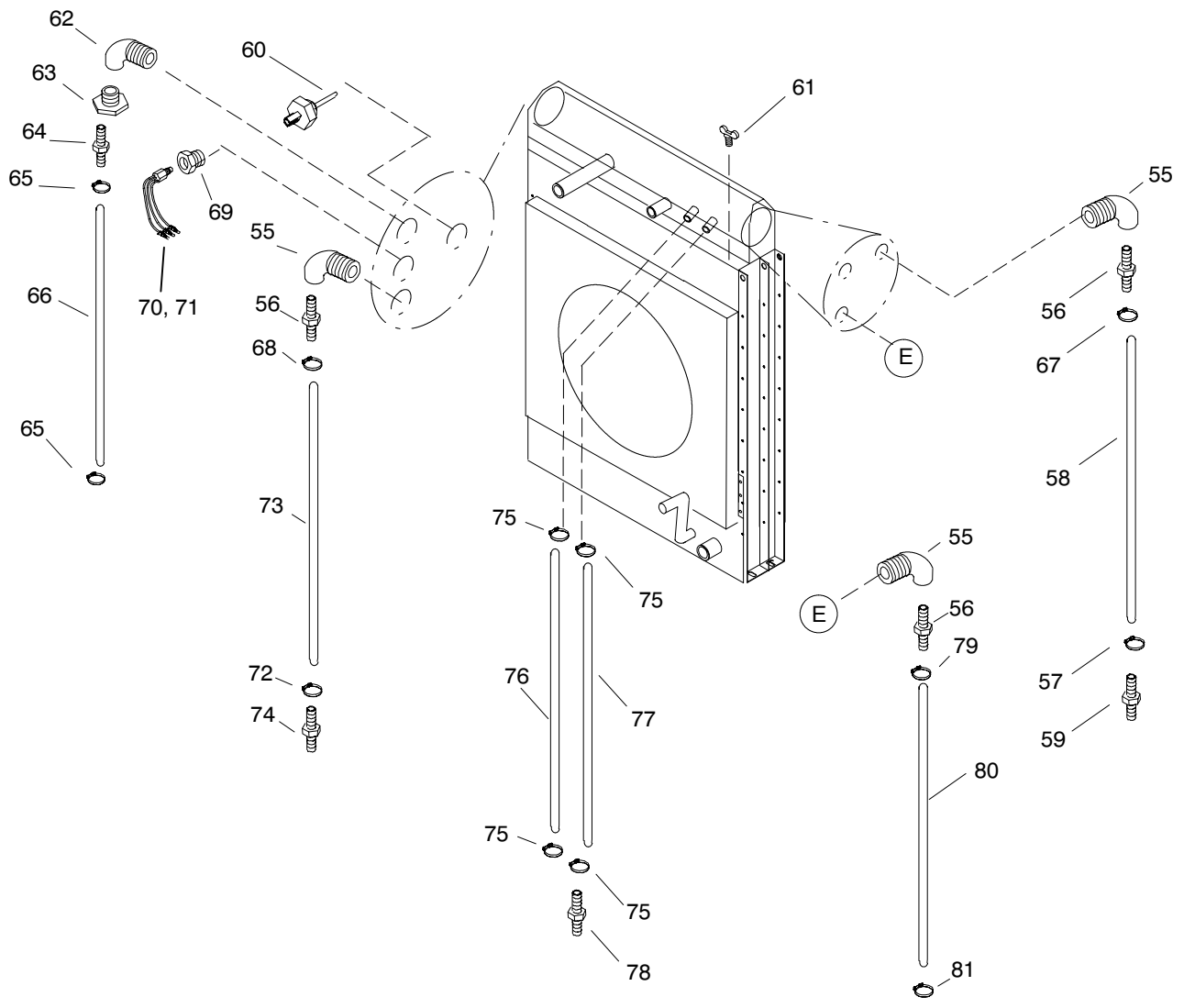
Use the module number of your cooling system from the genset nameplate to determine the key.

Module Number to Key Cross-Reference							
Module Number	Key	Module Number	Key	Module Number	Key	Module Number	Key
361095	A	365510	E	GM16231-MA1	I	365508	M
361235	B	365511	F	GM16231-MA2	J	365509	M
GM162232-MA1	C	GM16230-MA1	G	365512	K	GM16229-MA1	O
GM162232-MA2	D	GM16230-MA2	H	365513	L	GM16229-MA2	P

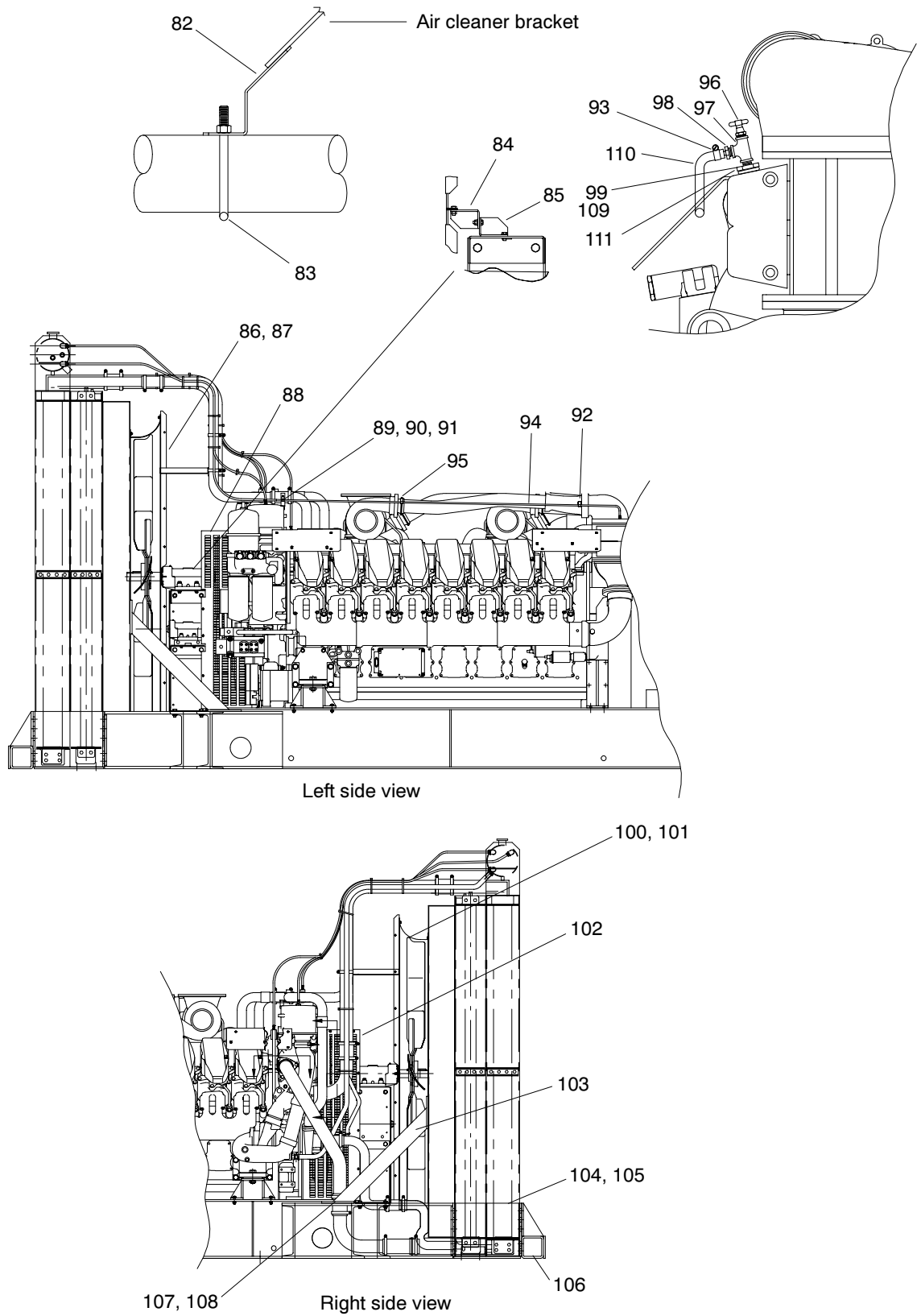
Group 104: Cooling System, continued



Radiator connections



Group 104: Cooling System, continued



Group 104: Cooling System, continued

Cross-reference the module number of your cooling system to the letter key in the Model Number to Key Cross-Reference table below. Refer to the key column in the following table.

Item	Part No.	Description	Quantity															
			Module Key															
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
82	361281	Bracket, coolant intake	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
83	289372	Clamp, muffler, 4.12 in.	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
83	X-397-11	Bolt, 1/2-13 x 6 in.												1	1	1	1	
84	365645	Support, fan guard	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
84	GM10395	Guard, shaft						1	1	1	1	1	1	1	1	1	1	
85	365644	Support, fan guard	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
86	X-801-6	Washer, hardened, .469 ID x .922 in. OD	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
87	328249	Guard, flat fan					4	4	4	4	4	4	4	4	4	4	4	
87	354959	Guard, flat fan	4	4	4	4												
87	361216	Guard, flat fan												4	4	4	4	
87	GM17890	Plate, support							12	12	12	12				12	12	
88	361060	Guard, belt, LS	1	1	1	1												
88	361051	Guard, belt, LS						1	1	1	1							
88	361199	Guard, belt, LS									1	1	1	1				
88	GM11074	Guard, belt, LS												1	1	1	1	
89	X-25-37	Washer, plain, .406 ID x .812 in OD	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
90	X-672-36	Clamp	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
91	361331	Bracket, mounting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
92	X-426-9	Clamp, hose, .25/.70 in.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
93	X-426-9	Clamp, hose, .25/.70 in.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
94	361324	Tube, vent, steel, .375 in. OD	1	1	1	1					1	1	1	1				
94	361368	Tube, vent, steel, .375 in. OD					1	1	1	1					1	1	1	1
95	X-672-36	Clamp	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
96	X-256-2	Valve, drain, 1/8 in. NPTF	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
97	X-203-10	Tee, pipe, 1/8 x 1/8 x 1/8 NPT	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
98	X-391-12	Connector, 90°, 3/8 in. ID hose	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
99	X-217-6	Pipe, 1/8 in. NPT x .75 in.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
100	X-101-23	Nut, hex elastic stop, 1/2-13	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
101	354195	Shroud, venturi fan					3	3	3	3	3	3	3					
101	354958	Shroud, venturi	3	3	3	3												
101	361210	Shroud, venturi fan												3	3	3	3	
102	361052	Guard, belt, RS					1	1										
102	361059	Guard, belt, RS	1	1														
102	361198	Guard, belt, RS										1	1	1	1			
102	GM16109	Guard, belt, RS			1	1												
102	GM16110	Guard, belt, RS								1	1					1	1	
102	GM16111	Guard, belt, RS							1	1								
103	354960	Brace, radiator	2	2	2	2												
103	354969	Brace, radiator					2	2	2	2	2	2	2	2	2	2	2	
104	X-801-10	Washer, hardened, 1.062 ID x 2 in. OD	20	20	20	20	20	20	20	20	20	20	20	10	10	10	10	
105	354999	Bracket, radiator mounting	2	2	2	2	2	2	2	2	2	2	2					
105	361588	Frame, radiator												1	1	1	1	
106	354962	Guard, radiator	1	1	1	1												
106	361046	Guard, radiator					1	1	1	1	1	1	1					
106	328726	Guard, radiator core												4	4	4	4	
107	X-801-9	Washer, hardened, .688 ID x 1.373 in. OD	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
108	X-6011-3	Washer, beveled, .68 ID x 1.5 in. OD	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
109	361916	Adapter, bushing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
110	X-651-24	Hose, rubber straight, .375 in. ID	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
111	365499	O-ring, ISO 6149, 11.3mm ID	1	1	1	1												

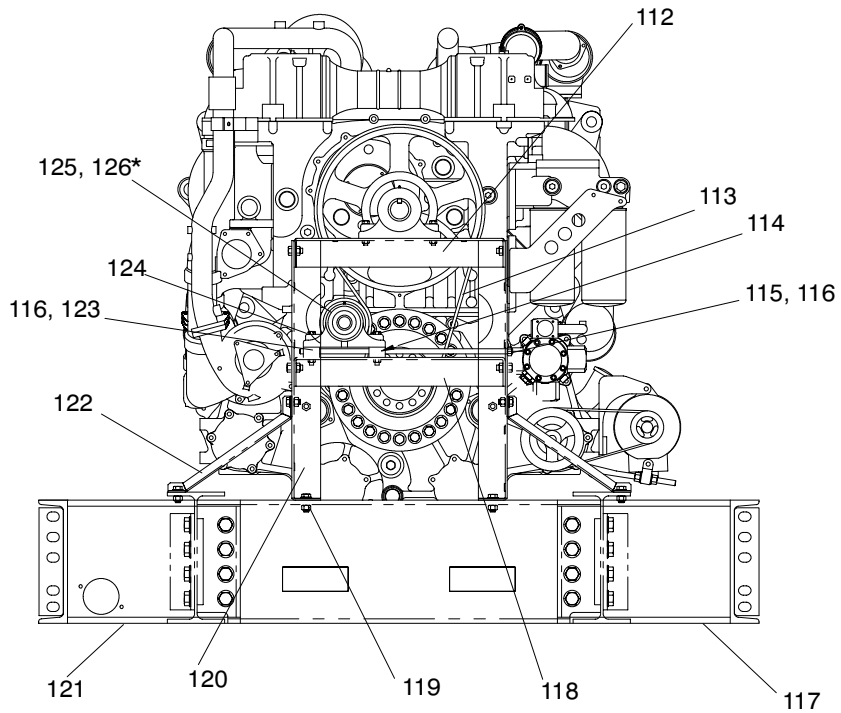
Parts list continued on next page

Module Number to Key Cross-Reference

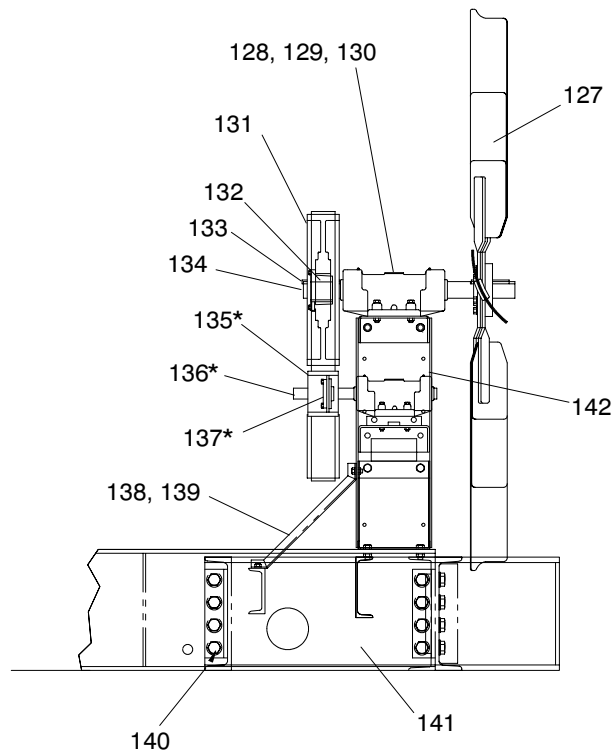
Use the module number of your cooling system from the genset nameplate to determine the key.

Module Number to Key Cross-Reference							
Module Number	Key	Module Number	Key	Module Number	Key	Module Number	Key
361095	A	365510	E	GM16231-MA1	I	365508	M
361235	B	365511	F	GM16231-MA2	J	365509	O
GM162232-MA1	C	GM16230-MA1	G	365512	K	GM16229-MA1	O
GM162232-MA2	D	GM16230-MA2	H	365513	L	GM16229-MA2	P

Group 104: Cooling System, continued



Front view



Right side view

Group 104: Cooling System, continued

Item	Part No.	Description	Quantity																
			Module Key																
			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
112	279748	Decal, caution														1	1	1	1
112	328263	Support, fan bearing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
113	354982	Belt, poly V, 106.5 in.	1		1														
113	361201	Belt, poly V, 91.5 in.									1		1						
113	361218	Belt, poly V, 84 in.										1		1			1		1
113	361261	Belt, poly V, 112 in.		1		1													
113	GM14186	Belt, poly V, 82.5 in.						1		1					1			1	
113	GM14187	Belt, poly V, 85 in.							1		1								
114	328261	Block, idler slide	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
115	328283	Bolt, 5/8-11 UNC-2A x 26 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
115	X-24-1	Washer, lock, .645 ID x 1.079 in. OD	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
116	X-801-9	Washer, hardened, .688 ID x 1.373 in. OD	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
117	361509	Frame, radiator	1	1	1	1													
117	365495	Frame, radiator					1	1	1	1	1	1	1	1	1	1	1	1	1
118	328264	Support, idler bearing	1	1	1	1													
118	361042	Support, idler bearing					1	1	1	1									
118	361217	Support, idler bearing									1	1	1	1	1	1	1	1	1
119	X-6011-3	Washer, beveled, .68 ID x 1.5 in. OD	4	4	4	4													
120	361019	Support, fan bearing	2	2	2	2													
120	361020	Support, fan bearing					2	2	2	2									
120	361196	Support, fan									2	2	2	2	2	2	2	2	2
121	361508	Frame, radiator	1	1	1	1													
121	365494	Frame, radiator					1	1	1	1	1	1	1	1	1	1	1	1	1
122	354996	Support, frame	2	2	2	2													
122	361002	Support, frame					2	2	2	2	2	2	2	2	2	2	2	2	2
123	328262	Block, idler slide	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
124	X-801-15	Washer, hardened	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
125	290945	Washer, hardened, .531 ID x 1.06 in. OD	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
126	347444*	Block, pillow*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
127	328246	Fan, pusher					1	1	1	1	1	1	1	1	1	1	1	1	1
127	354961	Fan, pusher	1	1	1	1													
127	361219	Fan, pusher													1	1	1	1	1
128	328254	Block, pillow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
129	X-801-8	Washer, hardened, .812 ID x 2 in. OD	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
130	361204	Shim, fan and support	6	6	6	6	4	4	4	4	4	4	4	4	4	4	4	4	4
131	328253	Pulley										1		1					
131	354984	Pulley	1	1	1	1					1		1						
131	354986	Pulley					1	1	1	1	1	1	1	1	1	1	1	1	1
132	274905	Bushing, pulley, 3.998 in.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
133	328256	Key	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
134	328258	Shaft, fan	1	1	1	1													
134	365496	Shaft, fan					1	1	1	1	1	1	1	1	1	1	1	1	1
135	GM14260*	Pulley, idler (1.75 in)*					1	1	1	1	1	1	1	1	1	1	1	1	1
135	GM14261*	Pulley, idler (1.75 in)*	1	1	1	1													
136	GM14262*	Shaft, idler*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
137	347443*	Bushing, idler, 2.678 in. *	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
138	361043	Support, radiator	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
139	X-6011-4	Washer, beveled, .44 ID x 1.25 in. OD	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
140	X-801-10	Washer, hardened, 1.062 ID x 2 in. OD	44	44	44	44	24	24	24	24	24	24	24	24	24	24	24	24	24
141	361555	Plate, bolting	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
142	GM11777	Fitting, grease	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

* The factory improved the fan belt idler system on generator sets with serial numbers above 0680000 by using a larger diameter (44.45 mm (1.75 in.)) idler shaft. If your generator set's serial number is 0680000 or below, update the system by replacing items 121, 130, 131, and 132.

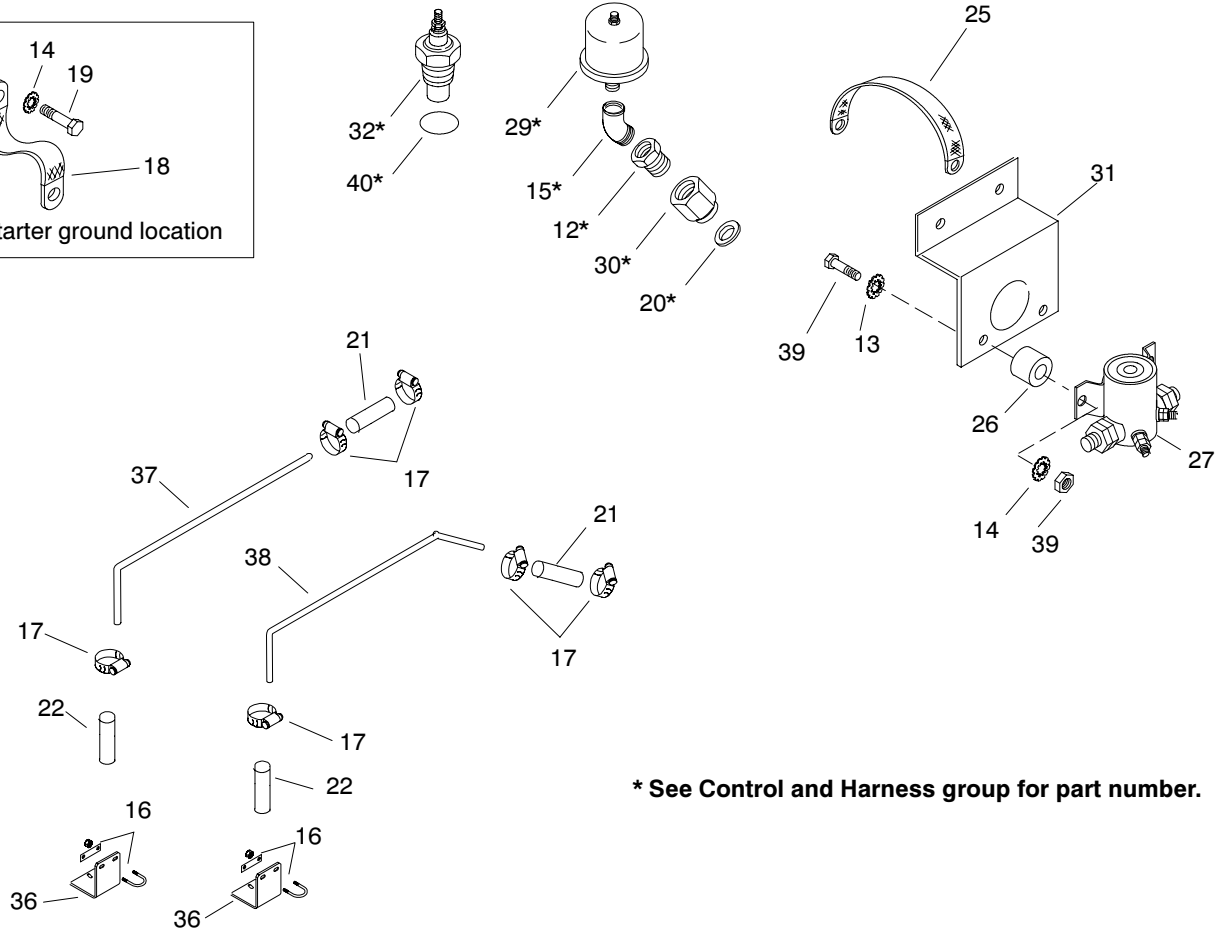
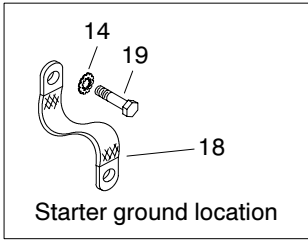
Additionally, regardless of your generator set's serial number, you should measure the diameter of the idler shaft to either confirm that the updated system has been installed or to determine that four new parts are needed. If the shaft's diameter is 36.50 mm (1.427 in.), you will need to replace items 126, 135, 136, and 137.

Module Number to Key Cross-Reference

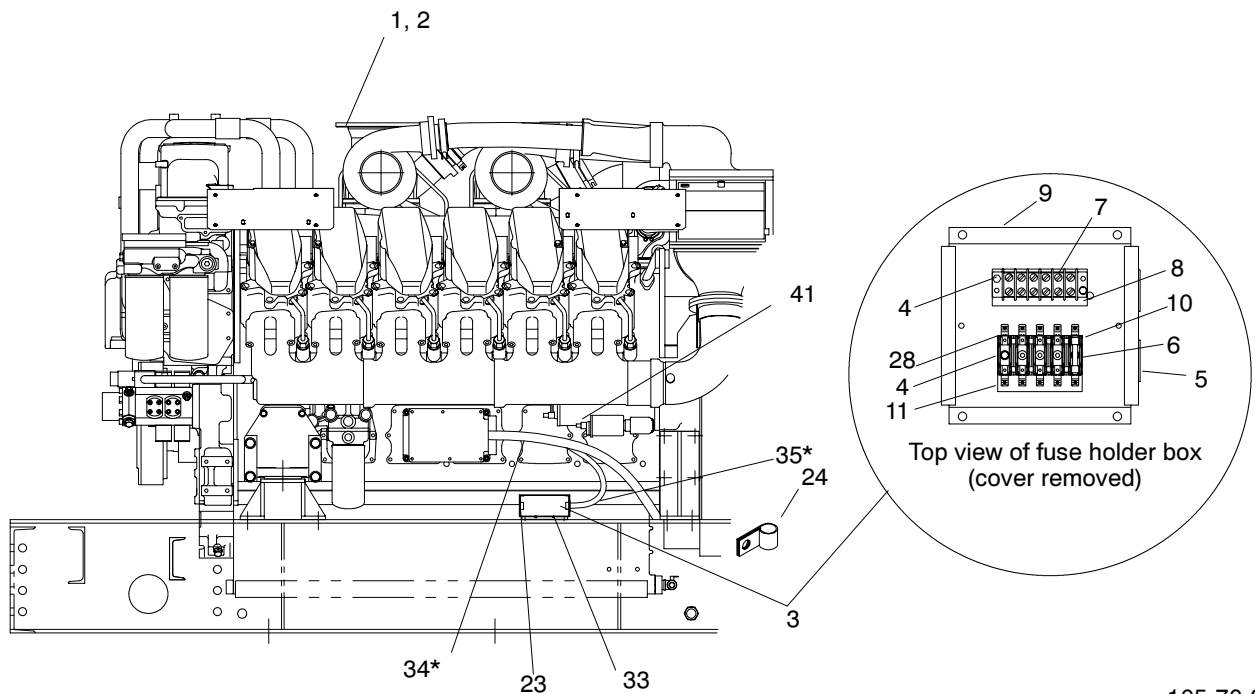
Use the module number of your cooling system from the genset nameplate to determine the key.

Module Number to Key Cross-Reference							
Module Number	Key	Module Number	Key	Module Number	Key	Module Number	Key
361095	A	365510	E	GM16231-MA1	I	365508	M
361235	B	365511	F	GM16231-MA2	J	365509	M
GM162232-MA1	C	GM16230-MA1	G	365512	K	GM16229-MA1	O
GM162232-MA2	D	GM16230-MA2	H	365513	L	GM16229-MA2	P

Group 105: Engine



* See Control and Harness group for part number.



105-70-93

Group 105: Engine

Item	Part Number	Description	Quantity															
			Variation Number															
			93	94	97	98	99	100	111	112	121	122	123	124	125	126	127	128
1	See Table	Engine assembly	1	1	1	1	1	1	1	1	1							
2	C-361223	Engine assembly																
2	C-361224	Engine assembly																
2	C-361224	Engine assembly																
2	C-361176	Engine assembly																
2	C-361222	Engine assembly																
2	C-361163	Engine assembly																
2	C-361233	Engine assembly																
2	C-361234	Engine assembly																
3	A-361308	Box assembly, fuse holder	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
4	X-49-26	Screw, PHM, 6-32 x .50 in.	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
5	X-634-15	Bushing, nylon, 1.0 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
6	239298	Fuse, 5 A, 250 V	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
7	295314	Block, terminal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
8	299090	Marker, strip	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
9	361241	Box, fuse holder	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
10	361265	Holder, fuse, 5 pole	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
11	361326	Strip, marker, 5 fuse	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
12	*	Bushing, reducer, 1/8 in.	1	1	1	1	1	1	1	1								
13	X-22-12	Washer, lock, tooth, 1/4 in. int./ext.	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
14	X-22-14	Washer, lock, int./ext. tooth, 3/8 in.	12	4	8	8	4	12	12	12	4	4	4	4	12	12	12	
14	X-22-43	Washer, lock, tooth, 5/8 in. int.		8	8	8	8				8	8	8	8				
15	*	Elbow, street, 45°	1	1	1	1	1	1	1	1								
16	X-397-6	Bolt, U, 1/4-2 x 1-1/4 in.	2	2	2	2	2	2	2	2								
17	X-426-8	Clamp, hose	6	6	6	6	6	6	6	6								
18	X-6046-5	Strap, ground, LS	1					1	1	1	1	1	1	1	1	1	1	
18	287363	Strap, ground	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	
19	X-6051-2	Screw, hex head cap	2	2	2	2	2	2	2	2								
20	*	Washer, nylon	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
21	X-356-9	Hose, exhaust	2	2	2	2	2	2	2	2								
22	X-356-32	Hose, rubber	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
23	X-67-142	Screw, thread-forming	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	
24	X-672-6	Clamp, insulating	1					1	1	1	1	1	1	1	1	1	1	
25	223033	Strap, ground, 3/8 x 5 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
26	259632	Bumper	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
27	272713	Solenoid, cranking	1	1	2	2	1	1	1	1	2	2	1	1	1	1	1	
28	292937	Fuse, 20 A, 250 V	4	4	4	4	4	4	4	4								
28	283645	Fuse, 15 A, 250 V									4	4	4	4	4	4	4	
29	*	Sender, oil pressure	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
30	*	Adapter, bushing	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
31	361103	Bracket, relay mounting	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
32	*	Sender, temperature	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
33	361242	Cover, fuse box	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
34	*	Harness, wiring, engine	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
35	*	Harness, wiring, power	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
36	361512	Bracket, breather tube	1	2	2	2	2	1	1	1								
37	361513	Tube, breather	1	1	1	1	1	1	1	1								
38	361514	Tube, breather	1	1	1	1	1	1	1	1								
39	#	Hardware, 1/4-20	4	4	4	4	4	4	4	4								
40	*	O-ring	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
41	X-545-138	Cable, battery, red +	1	1	1													

Common hardware. Procure locally.
 * See Control and Harness group for part number.

Engine Assembly Part Numbers

Variation Number	Early	Later
93	A-361163	B-361163
94	A-361176	B-361176
97	A-361223	B-361223
98	A-361224	B-361224
99	A-361225	B-361225
100	A-361222	B-361222
111	A-361233	B-361233
112	A-361234	B-361234

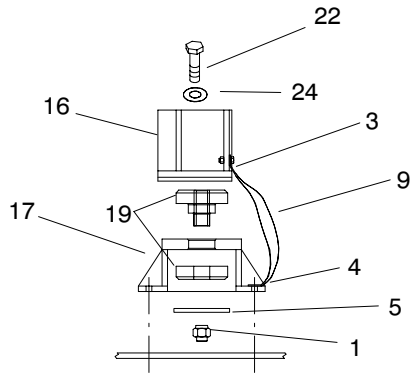
Locate the engine part number on the engine nameplate. Generator sets with early engines (see Engine Assembly Part Numbers table below) used factory-installed breather tube items 16, 17, 21, 22, 36, 37, 28. Later engines used engine-supplied breather tubes. See the Engine Parts Catalog for engine-supplied breather tube part numbers.

Notes

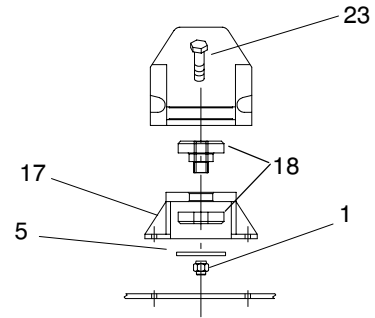
Group 107: Nameplates and Decals

Item	Part Number	Description	Quantity
			Variation/Module Number GM14289-GR1
1	X-6232-3	Decal, stripes	1
2	X-6246-1	Decal, Kohler Power System	1
3	X-6275-7	Logo, Kohler	2
4	224233	Decal, 1-800 number	1
5	238402	Decal	2
6	249809	Decal, caution hot engine	2
7	249810	Decal, warning	1
8	255882	Decal	1
9	257438	Decal, danger	2
10	279748	Decal, caution	1
11	327004	Nameplate	1
12	343165	Decal, caution—not a step	1
13	347166	Nameplate, CSA	1
14	347272	Decal, Power	2
15	347273	Decal, System	2
16	249808	Decal, warning	1
17	364116	Decal, caution	2
18	294520	Decal, danger	1
19	GM13228	Decal, warning	1
20	GM13227	Decal, warning	1

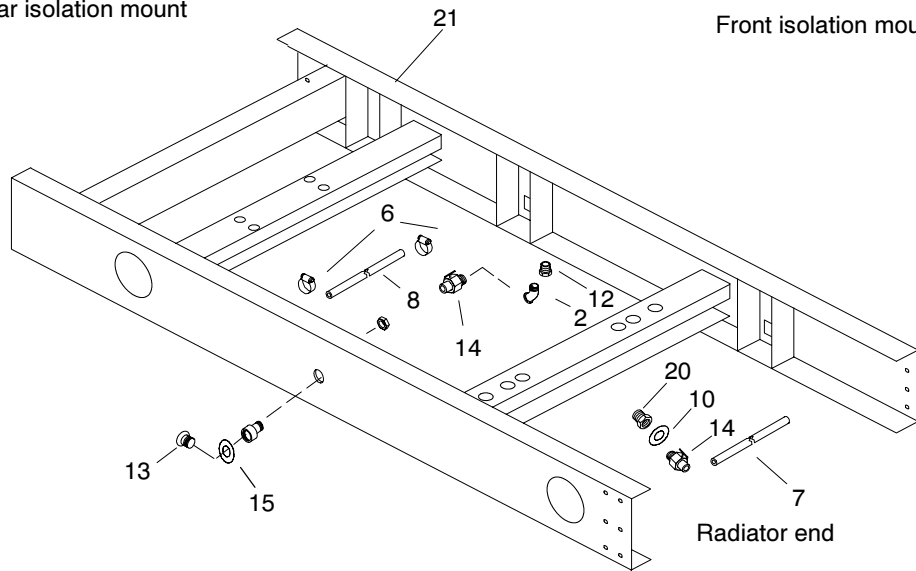
Group 109: Skid and Plant Mounting



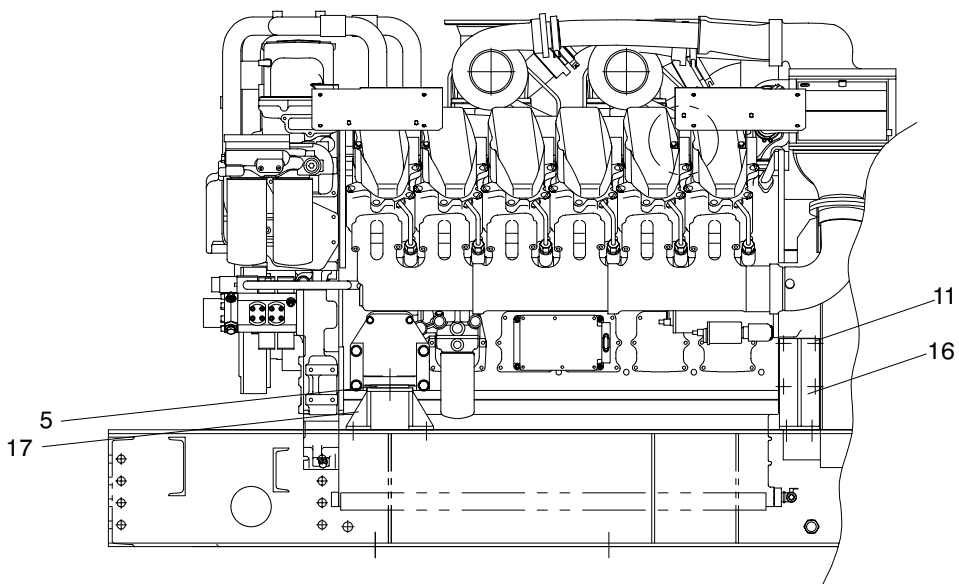
Rear isolation mount



Front isolation mount



Radiator end



Solid engine mount

361096

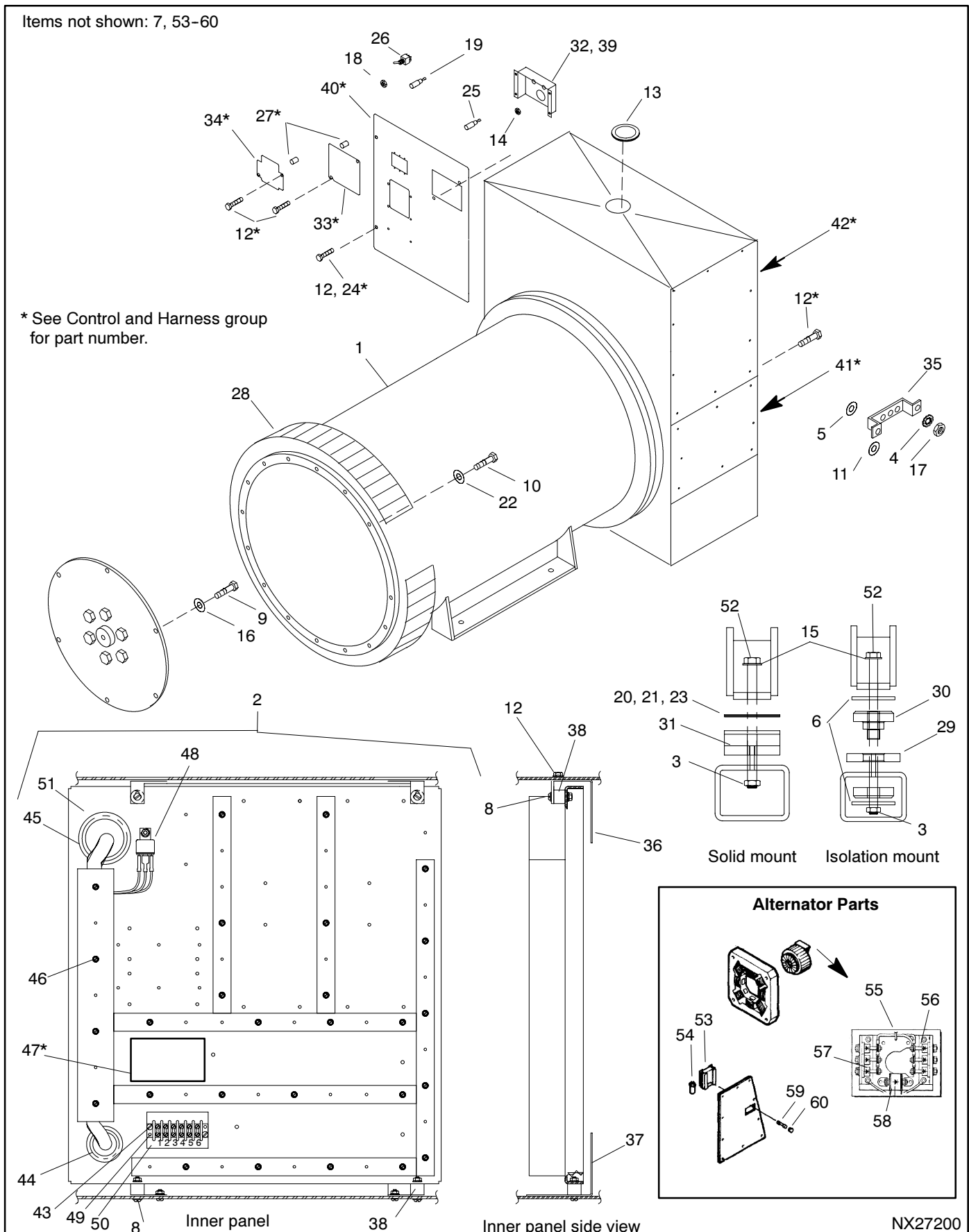
Group 109: Skid and Plant Mounting

Item	Part Number	Description	Quantity					
			Variation/Kit Number					
			361096	361175	361220	361227	361228	361229
1	X-101-27	Nut, hex, elastic stop	4	4			4	
2	X-211-1	Elbow, street, 1/2 in.	1	1	1	1	1	1
3	X-22-16	Washer, lock, int./ext. tooth, 5/16 in.	2	2			2	
4	X-22-26	Washer, lock, int./ext. tooth, 1/2 in.	2	2			2	
5	X-25-152	Washer, plain	4	4	2	2	4	2
6	X-426-10	Clamp, hose	4	4	4	4	4	4
7	X-577-28	Hose, .625 x 17 in.	1	1	1	1	1	1
8	X-577-34	Hose, oil-proof	1	1	1	1	1	1
9	X-6046-5	Strap, ground	1	1			1	
10	X-6427-3	Washer, copper	1	1	1	1	1	1
11	X-801-5	Washer, hardened	8	8	8	8	8	8
12	168848	Bushing, reducer, 1/2 x 1 in.	1	1	1	1	1	1
13	241062	Plug, drain	2	2	2	2	2	2
14	272701	Valve, oil drain	2	2	2	2	2	2
15	276552	Washer, nylon	2	2	2	2	2	2
16	361021	Support, rear engine			2	2		2
16	361022	Support, rear engine, RS	1	1			1	
16	361023	Support, rear engine, LS	1	1			1	
17	361024	Engine mount	4	4			4	
17	361037	Engine mount			2	2		2
18	361053	Vibromount	2	2			2	
19	361179	Vibromount	2	2			2	
20	361358	Adapter, bushing	1	1	1	1	1	1
21	361507	Skid	1		1			
21	361519	Skid		1		1		
21	361520	Skid					1	1
22	X-792-10	Bolt, hex cap	4	4				
23	X-792-7	Screw, 1/8 x 4 in.			2	2		2
24	X-801-10	Washer, hardened, 1.062 x ID x 2 in. OD	2	2			2	

Group 201: Generator and Mounting

Items not shown: 7, 53-60

* See Control and Harness group for part number.



Group 201: Generator and Mounting

Item	Part Number	Description	Qty.
1	See chart	Alternator assembly	1
2	361480-1	Panel assembly, inner junction box	1
3	X-101-27	Nut, hex, elastic stop	4
3	#	Nut, 1-8	4
4	X-22-14	Washer, lock, int./ext. tooth, 3/8 in.	4
5	X-25-118	Washer, plain	2
6	X-25-152	Washer, plain	8
7	X-468-9	Tie, cable (not shown)	2
8	X-22-12	Washer, lock, .262 ID x .743 in. OD	8
9	X-6021-13	Screw, hex cap with 10 drive disc	12
9	X-6021-14	Screw, hex cap with 5 drive disc	12
10	X-6052-14	Screw, hex head cap	16
11	X-6086-6	Washer, spring	2
12	X-6217-10	Screw, hex flange	15
13	X-634-23	Bushing, nylon, 1.968 in.	2
14	X-74-6	Nut, hex, 4-40 zinc-plated	4
15	X-801-12	Washer, hardened	4
16	X-801-5	Washer, hardened	12
17	X-83-7	Nut, hex	2
18	151511	Ring, lock switch	1
19	343684	Lamp assembly, 28 VDC, yellow LED	1
20	290743	Shim	4
21	290744	Shim	4
22	290945	Washer, hardened	16
23	291191	Shim	4
24	*	Retainer	2
25	343685	Lamp assembly, 28 VDC, red LED	1
26	297680	Switch, toggle	1
27	*	Insert, threaded	4
28	328904	Screen	1
29	361039	Plate, generator mounting	4
30	361054	Vibromount	4
31	361061	Plate, generator mounting	4
32	361188	Bracket, diagnostics	1
33	*	Cover, access	1
34	*	Cover, DVR access	1
35	361271	Bus, ground	1
36	365476	Bracket, inner panel	3
37	361478	Retainer, inner panel	2
38	229353	Mount, controller	4
39	361517	Plate, diagnostic silk	1
40	*	Door, junction box	1
41	*	Cover, louvered	1
42	*	Panel, junction box, front	1
43	X-49-36	Screw, RHM	4
44	X-634-16	Bushing, nylon, 1.312 in. ID	1
45	X-634-23	Bushing, nylon, 1.968 in. ID	1
46	X-67-43	Screw, hex slotted	27
47	*	Marker, strip	1
48	272684	Relay	1
49	295314	Block, terminal	2
50	299090	Marker, strip	1
51	361186	Panel, J-box inner	1
52	X-792-10	Bolt, hex cap	4
53	328725	DVR regulator	1
54	347160	Capacitor	1
55	347070	Exciter rectifier assembly	1
56	279773	Diode, standard polarity	1
57	279775	Diode, reversing polarity	1
58	279777	Surge suppressor	1
59	249778	Fuse, 5 A	1
60	279779	Fuse cap	1

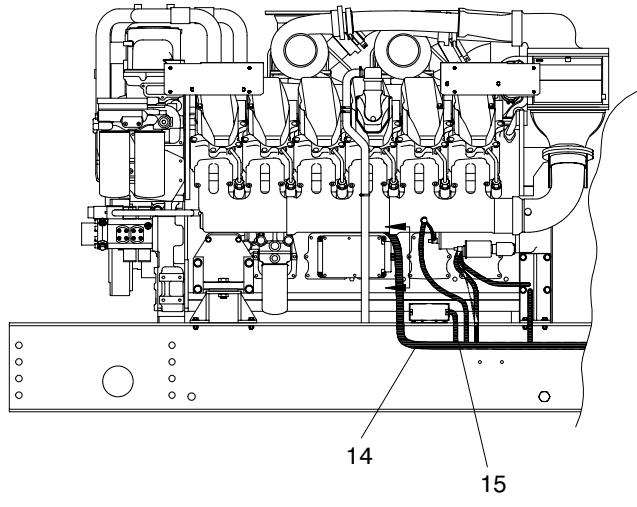
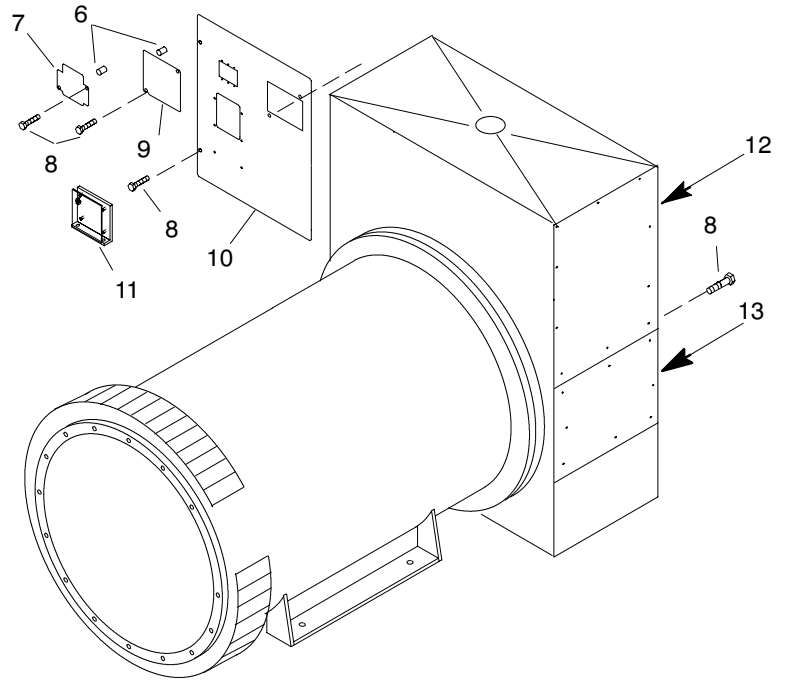
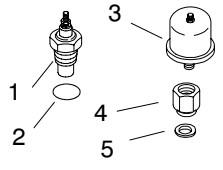
Common hardware. Procure locally.

* See Control and Harness group for part number.

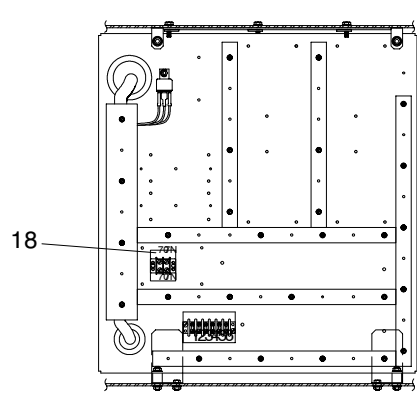
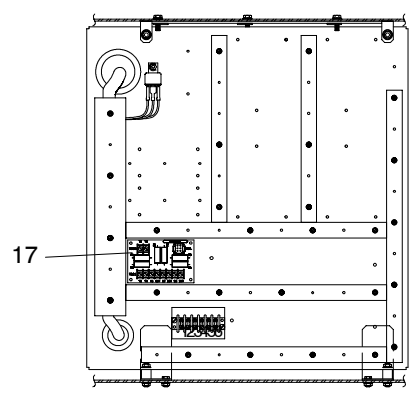
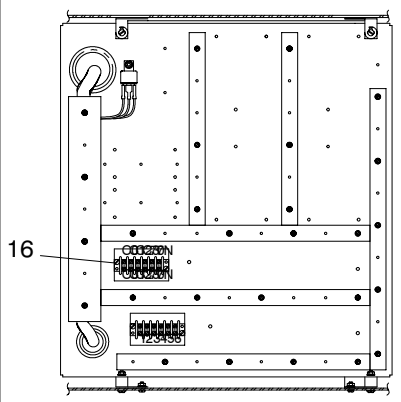
Alternator Part Number and Mount Type
Use this table to identify the kit/module number's alternator part number (item 1) and mount type.

Kit/Module Number	Alternator Part Number	Mount Type
361062	A-361003	Isolation
361063	A-361004	Isolation
361064	A-361005	Isolation
361065	A-361006	Isolation
361066	E-361007	Isolation
361067	E-361008	Isolation
361068	A-361009	Isolation
361069	A-361010	Isolation
361070	E-361011	Isolation
361071	A-361012	Isolation
361072	A-361013	Isolation
361073	E-361014	Isolation
361074	A-361015	Isolation
361075	A-361016	Isolation
361076	E-361017	Isolation
361077	E-361018	Isolation
361078	A-361003	Solid
361079	A-361004	Solid
361080	A-361005	Solid
361081	A-361006	Solid
361082	E-361007	Solid
361083	E-361008	Solid
361084	A-361009	Solid
361085	A-361010	Solid
361086	E-361011	Solid
361087	A-361012	Solid
361088	A-361013	Solid
361089	E-361014	Solid
361090	A-361015	Solid
361091	E-361016	Solid
361092	E-361017	Solid
361093	E-361018	Solid
GM16777-MA1	A-361003	Isolation
GM16777-MA2	A-361003	Solid
GM16777-MA3	A-361004	Isolation
GM16777-MA4	A-361004	Solid
GM16777-MA5	A-361005	Isolation
GM16777-MA6	A-361005	Solid
GM16777-MA7	A-361006	Isolation
GM16777-MA8	A-361006	Solid
GM16777-MA9	E-361007	Isolation
GM16777-MA10	E-361007	Solid
GM16777-MA11	E-361008	Isolation
GM16777-MA12	E-361008	Solid
GM16777-MA13	A-361009	Isolation
GM16777-MA14	A-361009	Solid
GM16777-MA15	A-361010	Isolation
GM16777-MA16	A-361010	Solid
GM16777-MA17	E-361011	Isolation
GM16777-MA18	E-361011	Solid
GM16777-MA19	A-361012	Isolation
GM16777-MA20	A-361012	Solid
GM16777-MA21	A-361013	Isolation
GM16777-MA22	A-361013	Solid
GM16777-MA24	E-361014	Solid
GM16777-MA25	A-361015	Isolation
GM16777-MA26	A-361015	Solid
GM16777-MA27	E-361016	Isolation
GM16777-MA28	E-361016	Solid
GM16777-MA29	E-361017	Isolation
GM16777-MA30	E-361017	Solid
GM16777-MA31	E-361018	Isolation
GM16777-MA32	E-361018	Solid

Control and Harness



Inner panels



DEC 550,
600 volt max.

DEC 550, medium voltage

Control and Harness

Cross-reference the module number of your control and harness to the letter key in the Model Number to Key Cross-Reference table below. Refer to the key column in the following table.

Item	Part Number	Description	Module Key						Group 105 Engine Variation Number							
			A	B	C	D	E	F	93	94	97	98	99	100	111	112
1	GM10166	Sender, temperature	1	1					1	1	1	1	1	1	1	1
1	290090	Switch, temperature			1	1	1	1								
1	361286	Adaptor, bushing			1	1	1	1								
2	365499	O-ring, ISO 6149, 11.3mm ID)	1	1					1	1	1	1	1	1	1	1
2	X-6427-1	Washer, copper, 1.188 ID x 1.732 in. OD			1	1	1	1								
3	365624	Sender, oil pressure	1	1					1	1	1	1	1	1	1	1
4	364350	Adaptor, bushing	1	1					1	1	1	1	1	1	1	1
5	GM11694	O-ring, ISO 6149, 15.3mm ID	1	1					1	1	1	1	1	1	1	1
6	320828	Insert, threaded, 1/4-20 in.	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7	361191	Cover, DVR access	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	X-6217-10	Screw, hex flange machine	8	8	8	8	8	8	8	8	8	8	8	8	8	8
9	361190	Cover, access	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	361518	Door, junction box	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	GM11718	PCB assembly, Marathon excitation interface			1	1	1	1								
12	361184	Panel, junction box, front	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	328901	Cover, louvered	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	GM17351	Harness, eng., DDC Series 4000 (includes 19-28)	1													
14	GM17352	Harness, eng., DDC Series 4000 (includes 19-28)		1												
14	GM17074	Harness, eng., DDC Series 4000 (includes 19-28)			1		1									
14	GM17026	Harness, eng., DDC Series 4000 (includes 19-28)				1		1								
14	361263	Wiring harness, eng. power, DDC (includes 19-28)							1					1	1	1
14	361355	Wiring harness, eng. power, DDC (includes 19-28)								1	1	1	1			
15	GM17125	Wiring harness, eng. power, DDC (includes 29)	1		1		1									
15	GM17027	Wiring harness, eng. power, DDC (includes 29)		1		1		1								
15	361285	Wiring harness, potential transformers (includes 29)							1	1	1	1	1	1	1	1
16	295314	Terminal block	1	1					1	1	1	1	1	1	1	1
16	255080	Marker, strip	1	1					1	1	1	1	1	1	1	1
16	X-49-6	Screw, cross recess pan head machine	2	2					2	2	2	2	2	2	2	2
17	GM13980	PCB assembly CT burden resistor			1	1										
17	X-70-12	Nut, hex machine screw, 8-32			1	1										
17	X-712-9	Spacer, .25 OD, .5 in.			1	1										
18	X-405-2	Terminal block						1	1							
18	254127	Marker, strip						1	1							
18	X-49-6	Screw, cross recess pan head machine						1	1							
19	343129	Connector, weathertight, 30-position (not shown)	2	2	2	2	2	2	2	2	2	2	2	2	2	2
20	343128	Connector, weathertight, 2-position (not shown)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	361470	Connector, 5-position (not shown)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	343131	Connector, weathertight, 6-position (not shown)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
23	295145	Connector, 24-position (not shown)	1	1	1	1	1	1	1	1	1	1	1	1	1	1
24	259689	Connector, plug, 9-position (not shown)	1	1					1	1	1	1	1	1	1	1
25	269190	Connector, plug, 6-position (not shown)	1	1					1	1	1	1	1	1	1	1
26	233959	Diode, 6 A (not shown)	7	7	7	7	7	7	7	7	7	7	7	7	7	7
27	GM11496	Connector, plug, 3-position (not shown)			1	1	1	1								
28	GM11497	Connector, weathertight, 6-position (not shown)			1	1	1	1								
29	343130	Connector, weathertight, 5-position (not shown)	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Module Number to Key Cross-Reference

Use the module number of your control and harness from the genset nameplate to determine the key.

Module Number to Key Cross Reference			
Key	Kit Number	kW	Controllers
A	GM16780-MA1	1250/1500	Engine Gauge Box, 16-Light, and Decision-Maker 340
B	GM16780-MA2	1750/2000	Engine Gauge Box, 16-Light, and Decision-Maker 340
C	GM16796-MA1	1250/1500	Decision-Maker 550
D	GM16796-MA2	1750/2000	Decision-Maker 550
E	GM16796-MA3	1250/1500, medium voltage	Decision-Maker 550
F	GM16796-MA4	1750/2000, medium voltage	Decision-Maker 550

Group 701: Literature

Item	Part Number	Description	Quantity		
			Variation Number		
			96	115	119
1	TP-5374	Warranty	1	1	1
2	TP-5578	O/I/M Alternator Marathon	1	1	1
3	TP-5579	O/M DVR Marathon	1	1	1
4	TP-5583	S/M 350–1600ROZD	1	1	1
5	TP-5700	I/M Industrial	1	1	1
6	TP-6117	P/C Accessories, 230–2000. kW Diesel Ind	1	1	1
7	TP-5750	O/M 20–2000 kW	1	1	1
8	TP-6004	W/D 1250–2000ROZD-4	1	1	1
9	TP-6006	P/C DDC 4000 1250–1500 kW		1	1
9	TP-6016	P/C DDC 4000 1750–2000 kW	1		
10	TP-6011	O/M DDC 4000 1250–1500 kW		1	1
10	TP-6012	O/M DDC 4000 1750–2000 kW	1		
11	TP-6013	P/C 1250–2000ROZD-4	1	1	1
12	TP-6015	S/M DDC 4000 Series	1	1	1

Kit List

This section lists the part numbers of modules/kits not listed in the Group Parts Lists. Refer to the generator set nameplate or the list below to identify the module/kit

number installed on your generator set. See the sections following this page for the parts list of the module/kit.

	1250 kW	1500 kW	1750 kW	2000 kW
Air Intake Systems				
Heavy-duty air cleaner	361367	361230	361230	361230
Controllers				
See Parts Catalog TP-6009 for parts lists.				
Cooling Systems				
Block heater, 208/240/480 V, 1 ph. 9000 watt	365317	365317	365311	365311
Block heater, 240 V, 3 ph, 9000 watt	365320	365320	365316	365316
Block heater, 380 V, 3 ph, 9000 watt	365319	365319	365315	365315
Block heater, 480 V, 3 ph, 9000 watt	365318	365318	365314	365314
Block heater, isolation valve	361665	361665	361665	361665
Cooling, remote radiator setup	GM16233-MA1	GM16233-MA1	GM16233-MA1	GM16233-MA1
Radiator duct flange	328227	361168	361238	361165

Optional Kits

See Parts Catalog TP-6117 for parts lists.

Paint and Miscellaneous Parts

Paint, Kohler Cream Beige

All models use 221338 Spray Can, 221337 Gallon, GM19489 Touch-Up

Cooling System Kits

Qty.	Description	Part No.
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Block Heater, Isolation Valve

1	Bushing, reducing, 1/2 x 3/4 in. NPT	X-202-41
1	Nipple, pipe	X-206-4
1	Nipple, pipe	X-206-9
1	Nipple, pipe, 1/2 x 1 1/2 in.	X-209-1
1	Fitting, elbow, 3/4 in., pipe	X-215-2
1	Fitting, elbow	X-274-2
2	Coupling, hose	X-582-8
1	Fitting, elbow, 90°, street	X-211-5
1	Coupling, hose	X-6370-4
2	Valve	255632
1	Fitting, swivel connector, 37°	361598

Block Heater

Qty.	Description	Part No.
1	Diode, 6 A	233959
1	Tag, hang	279047
1	Wiring harness, FRIL relay circuit board	279956
1	Relay, 24 VDC, 10 A	291309
1	Tag, instruction	299896
1	Track, mounting, 1 in.	347278
1	Fitting, swivel, 37°	361596
1	Fitting, elbow, 90°	361597
1	Fitting, tee, 1 x 1 x 1 in., pipe	X-203-2
1	Nipple, pipe, 1 x 1 1/2 in.	X-218-24
2	Terminal, spade, 12-10 AWG	X-285-1
1	Terminal, spade, 16-14 AWG	X-285-5
1	Terminal, spade, 16-14 AWG	X-285-5
1	Coupling, half-union	X-296-17
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Terminal, fast-on, female, 14-16 AWG	X-431-30
2	Coupling, hose	X-582-15
1	Coupling, hose	X-582-7
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
1	Socket	X-6124-4
1	Coupling, hose	X-6370-4
1	Hose	X-691-19
1	Hose, oil-proof	X-691-30
1	Plug, pipe	X-75-13
2	Screw, hex washer head, drill	X-794-2
1	Heater, block (includes items marked *)	365300
1	*Element, replacement	GM19500
1	*Pump	328148
1	*Thermostat, high limit	GM19494
1	*Contactor	328217
1	*Transformer	328218
1	*Thermostat assembly, remote	GM19495
1	*Sensor, thermostat	224341

Qty.	Description	Part No.
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Block Heater

1	Fitting, tee, 1 x 1 x 1 in., pipe	X-203-2
1	Nipple, pipe, 1 x 1 1/2 in.	X-218-24
2	Terminal, spade, 12-10 AWG	X-285-11
1	Terminal, spade, 16-14 AWG	X-285-5
1	Terminal, spade, 16-14 AWG	X-285-5
1	Coupling, half-union	X-296-17
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Terminal, fast-on, female, 14-16 AWG	X-431-30
2	Coupling, hose	X-582-15
1	Coupling, hose	X-582-7
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
1	Socket	X-6124-4
1	Coupling, hose	X-6370-4
1	Hose	X-691-19
1	Hose, oil-proof	X-691-30
1	Plug, pipe	X-75-13
2	Screw, hex washer head, drill	X-794-2
1	Diode, 6 A	233959
1	Tag, hang	279047
1	Wiring harness, FRIL relay circuit board	279956
1	Relay, 24 VDC, 10 A	291309
1	Tag, instruction	299896
1	Track, mounting, 1 in.	347278
1	Fitting, swivel, 37°	361596
1	Fitting, elbow, 90°	361597
1	Heater, block (includes items marked *)	365298
1	*Element, replacement	GM19496
1	*Pump	328148
1	*Thermostat, high limit	GM19494
1	*Contactor	328217
1	*Transformer	328218
1	*Thermostat assembly, remote	GM19495
1	*Sensor, thermostat	224341

Block Heater

Qty.	Description	Part No.
1	Fitting, tee, 1 x 1 x 1 in., pipe	X-203-2
1	Nipple, pipe, 1 x 1 1/2 in.	X-218-24
2	Terminal, spade, 12-10 AWG	X-285-11
1	Terminal, spade, 16-14 AWG	X-285-5
1	Terminal, spade, 16-14 AWG	X-285-5
1	Coupling, half-union	X-296-17
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Terminal, fast-on, female, 14-16 AWG	X-431-30
2	Coupling, hose	X-582-15
1	Coupling, hose	X-582-7
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
1	Socket	X-6124-4
1	Coupling, hose	X-6370-4
1	Hose	X-691-19
1	Hose, oil-proof	X-691-30
1	Plug, pipe	X-75-13
2	Screw, hex washer head, drill	X-794-2
1	Diode, 6 A	233959
1	Tag, hang	279047
1	Wiring harness, FRIL relay circuit board	279956
1	Relay, 24 VDC, 10 A	291309
1	Tag, instruction	299896
1	Track, mounting, 1 in.	347278
1	Fitting, swivel, 37°	361596
1	Fitting, elbow, 90°	361597
1	Heater, block (includes items marked *)	365299
1	*Element, replacement	GM19497
1	*Pump	328148
1	*Thermostat, high limit	GM19494
1	*Contactor	GM19498
1	*Transformer	GM19499
1	*Thermostat assembly, remote	GM19495
1	*Sensor, thermostat	224341

Cooling System Kits

Qty.	Description	Part No.
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Block Heater

		365316
1	Fitting, tee, 1 x 1 x 1 in., pipe	X-203-2
1	Nipple, pipe, 1 x 1 1/2 in.	X-218-24
2	Terminal, spade, 12-10 AWG	X-285-11
1	Terminal, spade, 16-14 AWG	X-285-5
1	Terminal, spade, 16-14 AWG	X-285-5
1	Coupling, half-union	X-296-17
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Terminal, fast-on, female, 14-16 AWG	X-431-30
2	Coupling, hose	X-582-15
1	Coupling, hose	X-582-7
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
1	Socket	X-6124-4
1	Coupling, hose	X-6370-4
1	Hose	X-691-15
1	Hose, oil-proof	X-691-30
1	Plug, pipe	X-75-13
2	Screw, hex washer head, drill	X-794-2
1	Diode, 6 A	233959
1	Tag, hang	279047
1	Wiring harness, FRIL relay circuit board	279956
1	Relay, 24 VDC, 10 A	291309
1	Tag, instruction	299896
1	Track, mounting, 1 in.	347278
1	Fitting, swivel, 37°	361596
1	Fitting, elbow, 90°	361597
1	Heater, block (includes items marked *)	365300
1	*Element, replacement	GM19500
1	*Pump	328148
1	*Thermostat, high limit	GM19494
1	*Contactor	328217
1	*Transformer	328218
1	*Thermostat assembly, remote	GM19495
1	*Sensor, thermostat	224341

Block Heater

		365317
1	Fitting, tee, 1 x 1 x 1 in., pipe	X-203-2
1	Nipple, pipe, 1 x 1 1/2 in.	X-218-24
2	Terminal, spade, 12-10 AWG	X-285-11
1	Terminal, spade, 16-14 AWG	X-285-5
1	Terminal, spade, 16-14 AWG	X-285-5
1	Coupling, half-union	X-296-17
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Terminal, fast-on, female, 14-16 AWG	X-431-30
2	Coupling, hose	X-582-15
1	Coupling, hose	X-582-7
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
1	Socket	X-6124-4
1	Coupling, hose	X-6370-4
1	Hose	X-691-15
1	Hose, oil-proof	X-691-30
1	Plug, pipe	X-75-13
2	Screw, hex washer head, drill	X-794-2
1	Diode, 6 A	233959
1	Tag, hang	279047
1	Wiring harness, FRIL relay circuit board	279956
1	Relay, 24 VDC, 10 A	291309
1	Tag, instruction	299896
1	Track, mounting, 1 in.	347278
1	Fitting, swivel, 37°	361596
1	Fitting, elbow, 90°	361597
1	Heater, block (includes items marked *)	365297
1	*Element, block heater	GM19305
1	*Pump	328148
1	*Thermostat, high limit	GM19494
1	*Contactor	328217
1	*Transformer	328218

Qty.	Description	Part No.
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Block Heater

		365318
1	Fitting, tee, 1 x 1 x 1 in., pipe	X-203-2
1	Nipple, pipe, 1 x 1 1/2 in.	X-218-24
2	Terminal, spade, 12-10 AWG	X-285-11
1	Terminal, spade, 16-14 AWG	X-285-5
1	Terminal, spade, 16-14 AWG	X-285-5
1	Coupling, half-union	X-296-17
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Terminal, fast-on, female, 14-16 AWG	X-431-30
2	Coupling, hose	X-582-15
1	Coupling, hose	X-582-7
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
1	Socket	X-6124-4
1	Coupling, hose	X-6370-4
1	Hose	X-691-15
1	Hose, oil-proof	X-691-30
1	Plug, pipe	X-75-13
2	Screw, hex washer head, drill	X-794-2
1	Diode, 6 A	233959
1	Tag, hang	279047
1	Wiring harness, FRIL relay circuit board	279956
1	Relay, 24 VDC, 10 A	291309
1	Tag, instruction	299896
1	Track, mounting, 1 in.	347278
1	Fitting, swivel, 37°	361596
1	Fitting, elbow, 90°	361597
1	Heater, block (includes items marked *)	365298
1	*Element, replacement	GM19496
1	*Pump	328148
1	*Thermostat, high limit	GM19494
1	*Contactor	328217
1	*Transformer	328218
1	*Thermostat assembly, remote	GM19495
1	*Sensor, thermostat	224341

Block Heater

		365319
1	Fitting, tee, 1 x 1 x 1 in., pipe	X-203-2
1	Nipple, pipe, 1 x 1 1/2 in.	X-218-24
2	Terminal, spade, 12-10 AWG	X-285-11
1	Terminal, spade, 16-14 AWG	X-285-5
1	Terminal, spade, 16-14 AWG	X-285-5
1	Coupling, half-union	X-296-17
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Terminal, fast-on, female, 14-16 AWG	X-431-30
2	Coupling, hose	X-582-15
1	Coupling, hose	X-582-7
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
1	Socket	X-6124-4
1	Coupling, hose	X-6370-4
1	Hose	X-691-15
1	Hose, oil-proof	X-691-30
1	Plug, pipe	X-75-13
2	Screw, hex washer head, drill	X-794-2
1	Diode, 6 A	233959
1	Tag, hang	279047
1	Wiring harness, FRIL relay circuit board	279956
1	Relay, 24 VDC, 10 A	291309
1	Tag, instruction	299896
1	Track, mounting, 1 in.	347278
1	Fitting, swivel, 37°	361596
1	Fitting, elbow, 90°	361597
1	Heater, block (includes items marked *)	365299
1	*Element, replacement	GM19497
1	*Pump	328148
1	*Thermostat, high limit	GM19494
1	*Contactor	GM19498
1	*Transformer	GM19499
1	*Thermostat assembly, remote	GM19495
1	*Sensor, thermostat	224341

Cooling System Kits, continued

Qty.	Description	Part No.
Block Heater 365320		
1	Fitting, tee, 1 x 1 x 1 in., pipe	X-203-2
1	Nipple, pipe, 1 x 1 1/2 in.	X-218-24
2	Terminal, spade, 12-10 AWG	X-285-11
1	Terminal, spade, 16-14 AWG	X-285-5
1	Terminal, spade, 16-14 AWG	X-285-5
1	Coupling, half-union	X-296-17
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Terminal, fast-on, female, 14-16 AWG	X-431-30
2	Coupling, hose	X-582-15
1	Coupling, hose	X-582-7
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
1	Socket	X-6124-4
1	Coupling, hose	X-6370-4
1	Hose	X-691-15
1	Hose, oil-proof	X-691-30
1	Plug, pipe	X-75-13
2	Screw, hex washer head, drill	X-794-2
1	Diode, 6 A	233959
1	Tag, hang	279047
1	Wiring harness, FRII relay circuit board	279956
1	Relay, 24 VDC, 10 A	291309
1	Tag, instruction	299896
1	Track, mounting, 1 in.	347278
1	Fitting, swivel, 37°	361596
1	Fitting, elbow, 90°	361597
1	Heater, block (includes items marked *)	365300
1	*Element, replacement	GM19500
1	*Pump	328148
1	*Thermostat, high limit	GM19494
1	*Contactor	328217
1	*Transformer	328218
1	*Thermostat assembly, remote	GM19495
1	*Sensor, thermostat	224341

Qty.	Description	Part No.
Cooling, remote radiator setup GM16233-MA1		
1	Clamp, muffler, 4.12 in.	289372
1	Tube, water inlet, steel, 4 in. OD	361299
1	Tube, water outlet, steel, 4 in. OD	361300
1	Bracket, water inlet	361303
1	Guard, pulley, RS	361305
1	Guard, pulley, LS	361306
1	Guard, pulley, front	361307
1	Tube, intercooler inlet	GM16095
1	Tube, intercooler return	GM16096
1	Gasket, water connection	GM16101
1	Gasket, intercooler inlet	GM16102
2	Washer, beveled, .68 ID x 1.5 in. OD	X-6011-3
4	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
4	Cap, 37° flared end, 7/16-20	X-6372-1
1	Cap, 37° flared end, 9/16-18	X-6372-2

Qty.	Description	Part No.
Duct Flange, radiator 328227		
8	Rivet, pop	X-781-10
2	Frame, air duct	328224
2	Bracket, duct flange	328225
2	Frame, air duct	328226
Duct Flange, radiator 361165		
8	Rivet, pop	X-781-10
4	Frame, air duct, RH	361170
2	Frame, air duct, LH	361171
2	Frame, air duct	361772
2	Bracket, duct flange	361173
Duct Flange, radiator 361168		
12	Rivet, pop	X-781-10
2	Frame, air duct	328031
2	Bracket, duct flange	328233
1	Frame, air duct	361166
1	Frame, air duct	361167
Duct Flange, radiator 361238		
12	Rivet, pop	X-781-10
2	Frame, air duct	328031
1	Frame, air duct, RH	361243
1	Frame, air duct, LH	361244
2	Bracket, duct flange	361245

Air Cleaner Kits

Qty.	Description	Part No.
Heavy-Duty Air Cleaner		361230
2	Cleaner assembly, air	A-279714
2	Cleaner assembly, air	A-361366
1	Element, air cleaner	279738
16	Nut, lock	X-101-13
4	Cap, pipe	X-268-7
8	Nut, hex	X-6053-3
8	Clamp	254013
4	Clamp, hose	279482
8	Bracket, air	279715
4	Hose, elbow	279716
4	Clamp, hose	279717
4	Hose, insert	279718
4	Cap, rain	279722
2	Plate, air cleaner	361275
2	Plate, air cleaner	361276
4	Hose, straight	361277
4	Tube assembly	361278
8	Bracket, support	361290
Heavy-Duty Air Cleaner		361367
2	Cleaner assembly, air	A-279713
2	Cleaner assembly, air	A-354106
1	Element, air cleaner	279736
16	Nut, lock	X-101-13
4	Cap, pipe	X-268-7
8	Nut, hex	X-6053-3
16	Clamp	254013
4	Elbow, 90°	272627
4	Bracket, air	272674
8	Clamp, hose	291666
2	Hose, insert	361275
2	Cap, rain	361276
4	Plate, air cleaner	361277
4	Plate, air cleaner	361278
8	Hose, straight	361290

Notes

Appendix A Abbreviations

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

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

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

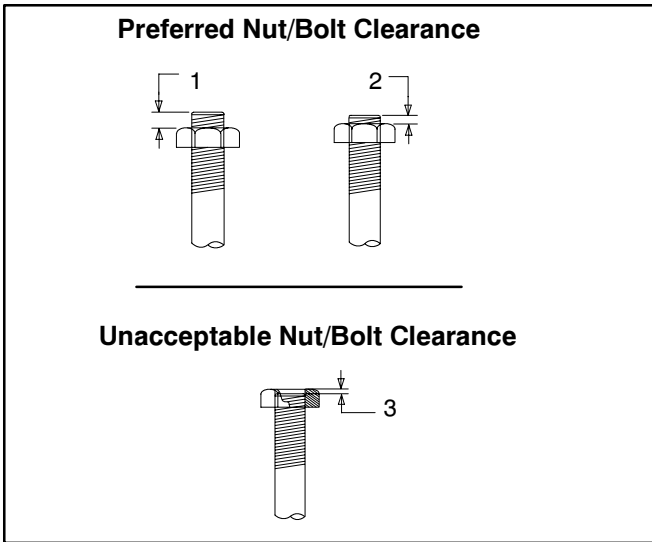
Appendix B. Common Hardware Application Guidelines

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 General Torque Specifications and other torque specifications in the service literature.

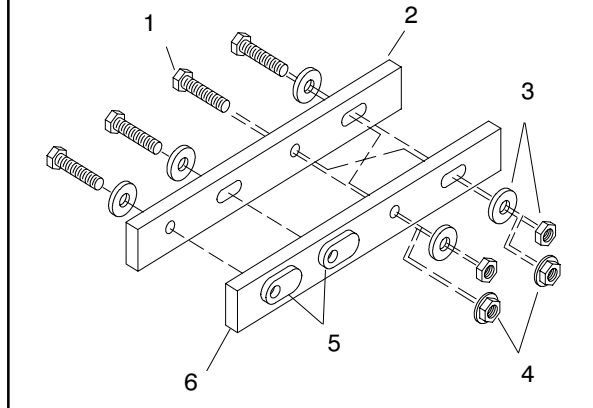


1. 1/2 of Bolt Diameter
2. Min. 1 Full Thread Beyond Top of Nut
3. Below Top of Nut

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 the diagram below.
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 the diagram below, which depicts the preceding hardware configuration possibilities.



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

Figure 2. Acceptable Hardware Combinations

Appendix C. General Torque Specifications

American Standard Fasteners

Use the following specifications for American Standard fasteners when no torque values are given elsewhere in this or the service manual for a specified bolt.

The values given are based on new plated threads. Increase values by 20% if nonplated threads are used.

Size	Torque Measurement	Assembled into Cast Iron or Steel			Assembled into
		Grade 2	Grade 5	Grade 8	Aluminum Grade 2 or 5
8-32	in. lbs. (Nm)	16 (1.8)	20 (2.3)	-	16 (1.8)
10-24	in. lbs. (Nm)	26 (2.9)	32 (3.6)	-	26 (2.9)
10-32	in. lbs. (Nm)	26 (2.9)	32 (3.6)	-	26 (2.9)
1/4-20	in. lbs. (Nm)	60 (6.8)	96 (10.8)	132 (14.9)	60 (6.8)
1/4-28	in. lbs. (Nm)	72 (8.1)	108 (12.2)	144 (16.3)	72 (8.1)
5/16-18	in. lbs. (Nm)	120 (13.6)	192 (21.7)	264 (29.8)	120 (13.6)
5/16-24	in. lbs. (Nm)	132 (14.9)	204 (23.1)	288 (32.5)	132 (14.9)
3/8-16	in. lbs. (Nm)	18 (24)	28 (38)	39 (53)	18 (24)
3/8-24	ft. lbs. (Nm)	20 (27)	31 (42)	44 (60)	20 (27)
7/16-14	ft. lbs. (Nm)	29 (39)	44 (60)	63 (85)	
7/16-20	ft. lbs. (Nm)	32 (43)	50 (68)	70 (95)	
1/2-13	ft. lbs. (Nm)	44 (60)	68 (92)	96 (130)	
1/2-20	ft. lbs. (Nm)	49 (66)	76 (103)	108 (146)	
9/16-12	ft. lbs. (Nm)	60 (81)	98 (133)	138 (187)	
9/16-18	ft. lbs. (Nm)	67 (91)	109 (148)	154 (209)	
5/8-11	ft. lbs. (Nm)	83 (113)	135 (183)	191 (259)	
5/8-18	ft. lbs. (Nm)	94 (128)	153 (208)	216 (293)	
3/4-10	ft. lbs. (Nm)	147 (199)	240 (325)	338 (458)	
3/4-16	ft. lbs. (Nm)	164 (222)	268 (363)	378 (513)	
1-8	ft. lbs. (Nm)	191 (259)	532 (721)	818 (1109)	
1-12	ft. lbs. (Nm)	209 (283)	582 (789)	895 (1214)	

Metric Fasteners

Use the following specifications for metric fasteners when no torque values are given elsewhere in this manual for a specified bolt. These values are based on new plated threads.

Increase values by 20% if nonplated threads are used. Screws threaded into aluminum must have two diameters of threads engaged and may require 30% or more reduction in the torque.

Size (mm)	Torque ft-lb (Nm)			
	5.8	6.8	10.9	Fasteners Assembled Into Aluminum
6 x 1.00	5 (7)	6 (9)	9 (12)	5 (7)
8 x 1.25	14 (19)	14 (20)	20 (37)	14 (19)
8 x 1.00	16 (21)	17 (24)	23 (31)	16 (21)
10 x 1.50	25 (35)	27 (37)	38 (51)	25 (35)
10 x 1.25	29 (39)	34 (46)	45 (61)	29 (39)
12 x 1.75	42 (57)	45 (61)	65 (89)	
12 x 1.50	48 (65)	55 (75)	78 (106)	
14 x 2.00	64 (86)	69 (94)	101 (137)	
14 x 1.50	74 (100)	81 (110)	116 (157)	
16 x 2.00	98 (133)	104 (141)	150 (204)	
16 x 1.50	104 (141)	116 (157)	168 (228)	
18 x 2.50	133 (181)	145 (196)	208 (283)	
18 x 1.50	145 (196)	156 (212)	226 (306)	

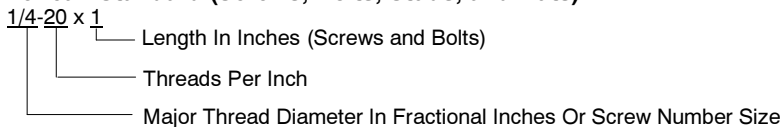
Appendix D. Common Hardware Identification

Screws/Bolts/Studs Head Styles	
Hex. Head or Machine Head	
Hex. Head or Machine Head with Washer	
Flat Head (f.h.m.)	
Round Head (r.h.m.)	
Pan Head	
Socket Head Cap or Allen Head Cap	
Socket Head or Allen Head Shoulder Bolt	
Sheet Metal Screw	
Stud	
Drive Styles	
Hex.	
Hex. and Slotted	
Phillips	
Slotted	
Hex. Socket	
Hardness Grade	
American Standard	
Grade 2	
Grade 5	
Grade 8	
Grade 8/9	
Metric	
Number stamped on hardware; 5.8 shown	

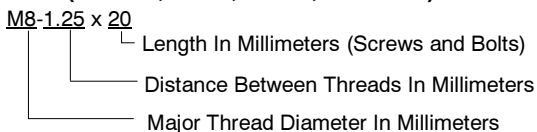
Nuts Nut Styles	
Hex. Head	
Lock Nut or Nylock Nut	
Square Nut	
Cap Nut or Acorn Nut	
Wing Nut	
Nut Hardness Grades	
American Standard	
Grade 2	
Grade 5	
Metric	
Number stamped on hardware	
Washers	
Washer Styles	
Plain	
Split Lock or Spring	
Spring or Wave	
External Tooth Lock	
Internal Tooth Lock	
Internal-External Tooth Lock	

Sample Dimensions

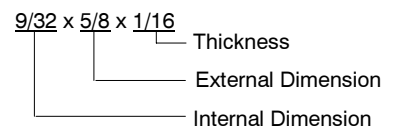
American Standard (Screws, Bolts, Studs, and Nuts)



Metric (Screws, Bolts, Studs, and Nuts)



Plain Washers



Lock Washers



Appendix E. Common Hardware List

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

HEX BOLTS (GRADE 5)

Part No.	Dimensions
X-465-17	1/4-20 x .38
X-465-6	1/4-20 x .50
X-465-2	1/4-20 x .62
X-465-16	1/4-20 x .75
X-465-18	1/4-20 x .88
X-465-7	1/4-20 x 1.00
X-465-8	1/4-20 x 1.25
X-465-9	1/4-20 x 1.50
X-465-10	1/4-20 x 1.75
X-465-11	1/4-20 x 2.00
X-465-12	1/4-20 x 2.25
X-465-14	1/4-20 x 2.75
X-465-21	1/4-20 x 5.00
X-465-25	1/4-28 x .38
X-465-20	1/4-28 x 1.00
X-125-33	5/16-18 x .50
X-125-23	5/16-18 x .62
X-125-3	5/16-18 x .75
X-125-31	5/16-18 x .88
X-125-5	5/16-18 x 1.00
X-125-24	5/16-18 x 1.25
X-125-34	5/16-18 x 1.50
X-125-25	5/16-18 x 1.75
X-125-26	5/16-18 x 2.00
230578	5/16-18 x 2.25
X-125-29	5/16-18 x 2.50
X-125-27	5/16-18 x 2.75
X-125-28	5/16-18 x 3.00
X-125-22	5/16-18 x 4.50
X-125-32	5/16-18 x 5.00
X-125-35	5/16-18 x 5.50
X-125-36	5/16-18 x 6.00
X-125-40	5/16-18 x 6.50
X-125-43	5/16-24 x 1.75
X-125-44	5/16-24 x 2.50
X-125-30	5/16-24 x .75
X-125-39	5/16-24 x 2.00
X-125-38	5/16-24 x 2.75
X-6238-2	3/8-16 x .62
X-6238-10	3/8-16 x .75
X-6238-3	3/8-16 x .88
X-6238-11	3/8-16 x 1.00
X-6238-4	3/8-16 x 1.25
X-6238-5	3/8-16 x 1.50
X-6238-1	3/8-16 x 1.75
X-6238-6	3/8-16 x 2.00
X-6238-17	3/8-16 x 2.25
X-6238-7	3/8-16 x 2.50
X-6238-8	3/8-16 x 2.75
X-6238-9	3/8-16 x 3.00
X-6238-19	3/8-16 x 3.25
X-6238-12	3/8-16 x 3.50
X-6238-20	3/8-16 x 3.75
X-6238-13	3/8-16 x 4.50
X-6238-18	3/8-16 x 5.50
X-6238-25	3/8-16 x 6.50

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

NUTS

Part No.	Dimensions	Type
X-6009-1	1-8	Std. Nut
X-6210-3	6-32	Whiz Nut
X-6210-4	8-32	Whiz Nut
X-6210-5	10-24	Whiz Nut
X-6210-1	10-32	Whiz Nut
X-6210-2	1/4-20	Spirallock Nut
X-6210-6	1/4-28	Spirallock Nut
X-6210-7	5/16-18	Spirallock Nut
X-6210-8	5/16-24	Spirallock Nut
X-6210-9	3/8-16	Spirallock Nut
X-6210-10	3/8-24	Spirallock Nut
X-6210-11	7/16-14	Spirallock Nut
X-6210-12	1/2-13	Spirallock Nut
X-6210-15	7/16-20	Spirallock Nut
X-6210-14		Spirallock Nut
X-85-3	5/8-11	Std. Nut
X-88-12	3/4-10	Std. Nut
X-89-2	1/2-20	Std. Nut

WASHERS

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

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