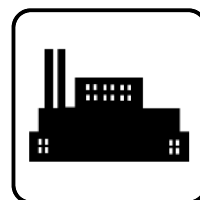


Service Parts

Industrial Generator Sets



Models:

600ROZM
900ROZM/1000ROZM
2000ROZM

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-6057 7/01c

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Introduction

This manual lists service replacement parts for 600, 900, 1000, 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.

x:in: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.

x:in: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.

x:in: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.

x:in: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.

x:in:004:006

Specification Number Index

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

600ROZM								
GM13277-GA1	*	*	1	GR1	*	*	†	156
GM16981-GA1	*	*	2	GR1	*	*	†	156
900ROZM								
PA-111001	*	*	3	GR1	*	*	†	149
PA-111002	*	*	4	GR1	*	*	†	149
GM16982-GA1	*	*	5	GR1	*	*	†	149
GM16982-GA2	*	*	6	GR1	*	*	†	149
1000ROZM								
PA-111003	*	*	4	GR1	*	*	†	147
PA-111004	*	*	3	GR1	*	*	†	147
GM16983-GA1	*	*	5	GR1	*	*	†	149
GM16983-GA2	*	*	6	GR1	*	*	†	149
2000ROZM								
GM16647-GA1	*	*	7	GR1	*	*	†	161
GM16647-GA2	*	*	8	GR1	*	*	†	161

- * 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.

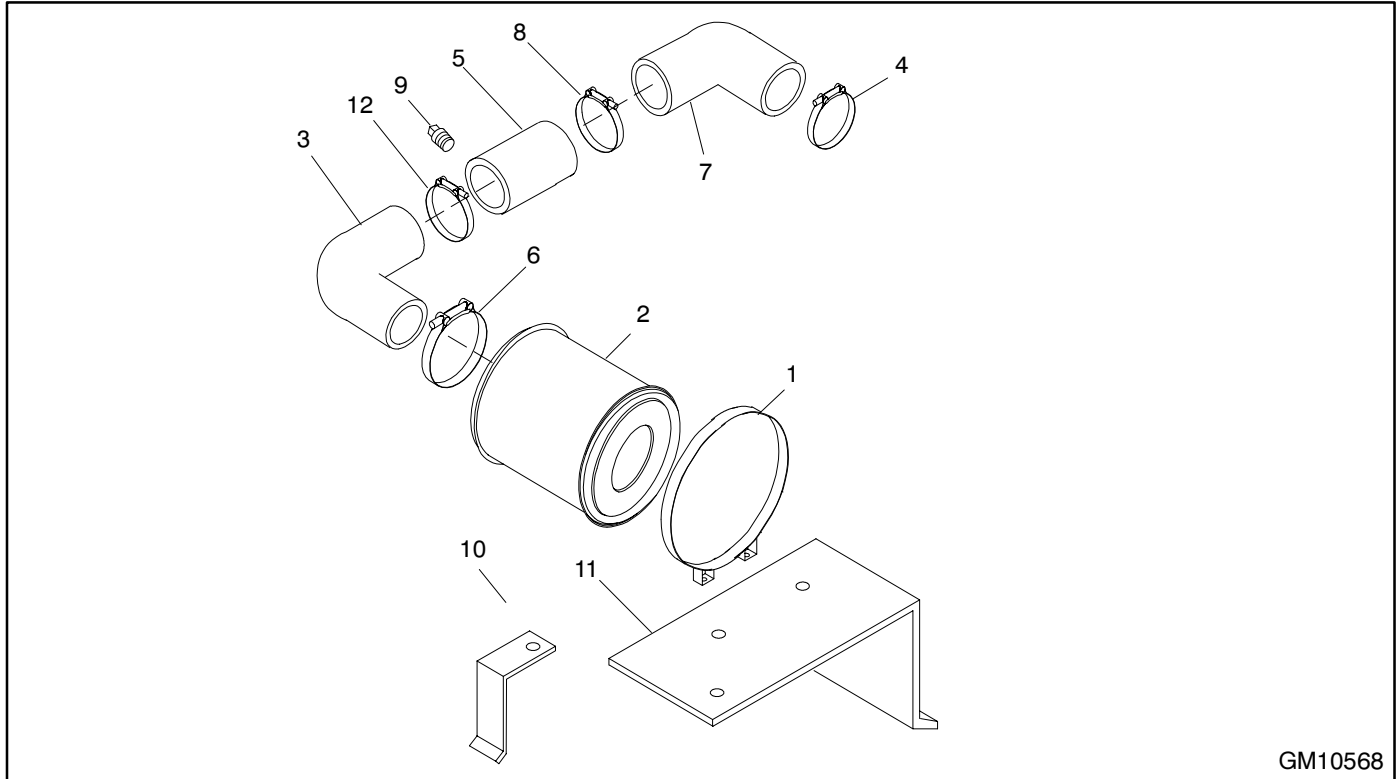
Recommended Spare Parts

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

Item	Part Number	Description	Quantity 900/1000 kW
1	291207	Fuse, 1.5 A, 250 V	5
2	A-336415	PC board, main controller	1
3	291740	Lamp, 125 V, .33 W	5
4	328725	Voltage regulator, Marathon DVR2000	1
5	A-336432	PC board, indicator controller	1
6	283420	Lamp, 28 V, 4.8 W	5
7	X-507-7	Hose, radiator, straight, 3 in. ID	1
8	X-6014-92	Hose, radiator, straight, 4 in. ID	1
9	GM13948	Belt	2
10	GM13944	Thermostat	1
11	GM13942	Element, oil filter	26
12	GM13945	Gasket, thermostat	4
13	272981	Air cleaner, industrial	12
14	GM13947	Filter, fuel	12
15	GM13943	Element, bypass oil	40
16	GM13946	Tip, injector	12
17	254832	Sensor, low fluid	1

Group 101: Air Intake

600/900/1000 kW

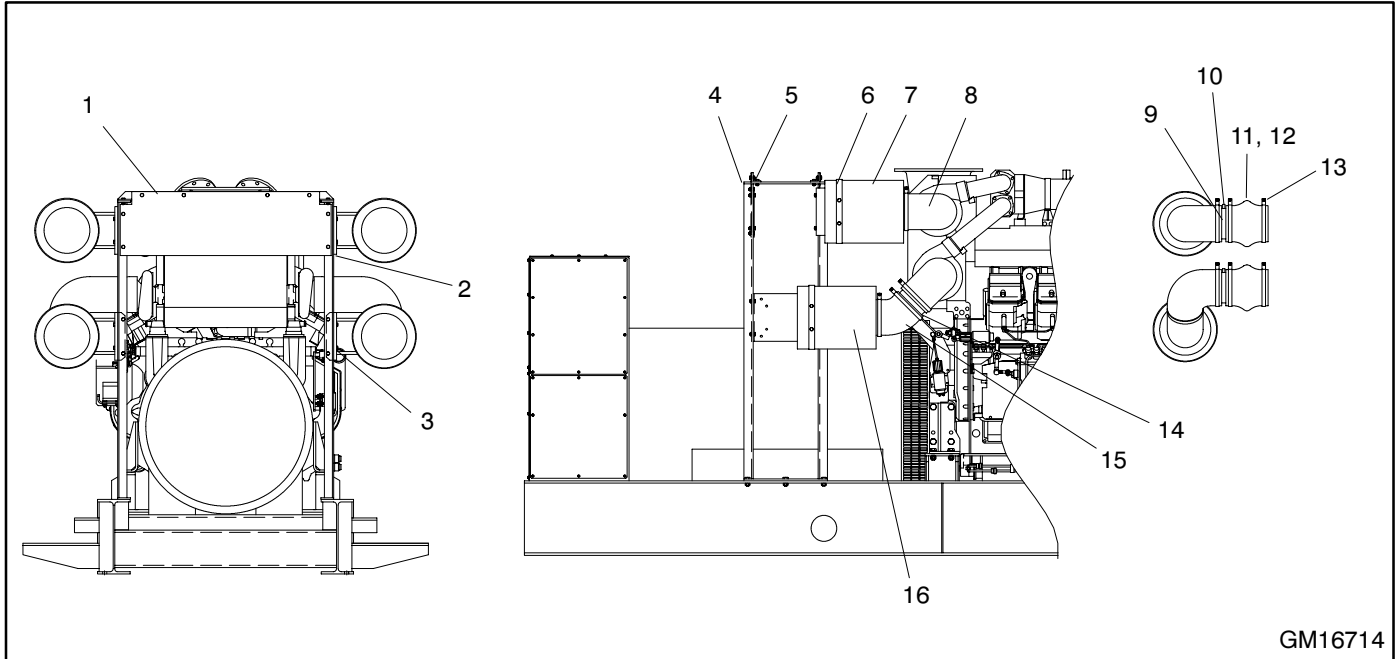


GM10568

Item	Part Number	Description	Quantity			
			Module Number			
			GM12004-MA1	GM10568-MA1	GM10655-MA1	GM12052-MA1
1	272983	Clamp	1	2		
1	279715	Bracket, air cleaner			4	2
2	354842	Air cleaner, industrial	1			
2	272981	Air cleaner, industrial		2		
2	A-361366	Air cleaner			2	
2	A-279714	Air cleaner				1
2	279738	Element, air cleaner (heavy-duty air cleaner)			2	1
2	279722	Cap, rain (not shown)			2	1
3	272663	Hose, elbow, 90°, molded, 7 in. ID		2	2	
3	279716	Hose, elbow, 90°, 8 x 7 in. ID				1
3	X-522-95	Tube, steel, 177.8 OD x 165 long (not shown)			2	
3	279720	Hose, hump, straight, 7 in. ID (not shown)			2	
3	361847	Hose, hump (not shown)	1			
3	279743	Clamp, hose, 8.38/8.69 in. (not shown)			2	
3	343587	Clamp, hose, 7.38/7.69 in. (not shown)	1		2	
4	272960	Clamp, hose, 6.56/6.87 in.	1	2	2	1
5	274623	Tube assembly		2		
5	GM10757	Tube assembly			2	
5	X-522-96	Tube, steel				1
6	280998	Clamp, hose, 7.5/7.81 in.		2	2	
6	279717	Clamp, hose, 8.63/8.94 in.				1
7	272627	Fitting, elbow, 90°		2	2	
7	361847	Hose, hump				1
8	254013	Clamp, hose, 6.25/6.56 in.		2	2	
8	343587	Clamp, hose, 7.38/7.69 in.				1
9	X-268-7	Cap, pipe		2	2	
10	GM10519	Bracket, air cleaner		2		
10	GM10651	Bracket, air cleaner, heavy-duty (not shown)			2	
10	GM10652	Bracket, air cleaner, heavy-duty (not shown)			2	
10	GM10518	Bracket, air cleaner		2		
11	GM11994	Bracket, air cleaner	1			
11	GM10654	Bracket, air cleaner, heavy-duty (not shown)			2	
11	GM10653	Bracket, air cleaner, heavy-duty			2	
11	GM12034	Bracket, air cleaner, heavy-duty				1
12	272960	Clamp, hose, 6.56/6.87 in.		2	2	
12	280998	Clamp, hose, 67.5/7.81 in.				1

Group 101: Air Intake

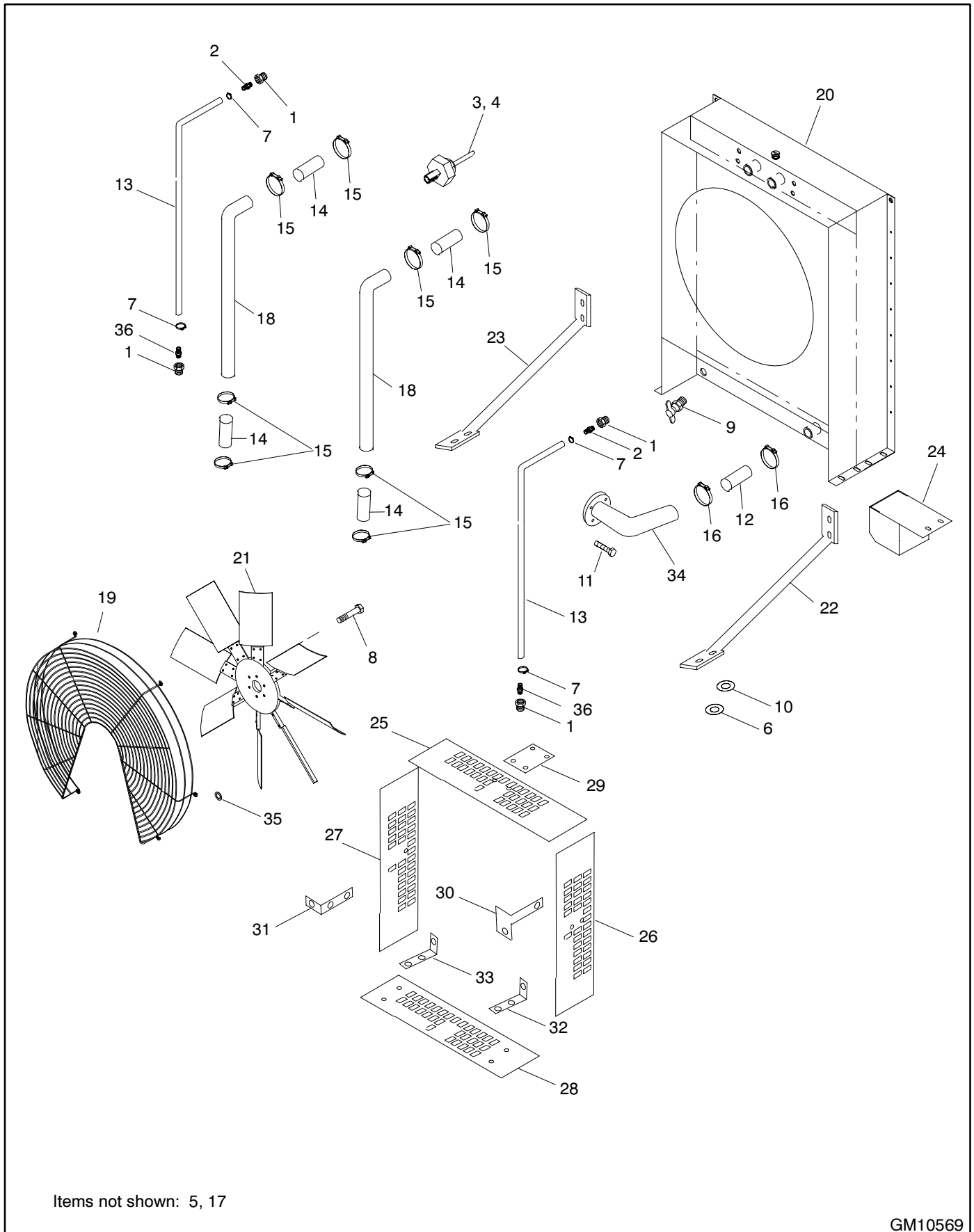
1600/2000 kW



GM16714

Item	Part Number	Description	Quantity	
			Module Number	
			GM16714-MA1	GM16761-MA1
1	GM16694	Plate, air cleaner support	2	2
2	GM18403	Bracket, air cleaner	2	
3	GM16693	Bracket, air cleaner	2	2
4	GM16709	Support, air cleaner	2	2
5	GM16712	Support, air cleaner, top	2	2
6	272983	Clamp	4	
6	291666	Bracket, air cleaner		8
7	272981	Air cleaner, industrial	2	
7	A-279713	Air cleaner		2
7	279736	Element, air cleaner		2
7	272674	Cap, rain		2
8	291678	Hose, 90° elbow, 7 in. x 7 in. ID	4	
8	GM16760	Hose, hump, 152.4 mm ID		2
8	272627	Hose, 90° elbow, 6 in. x 6 in. ID		4
8	X-522-59	Tube, steel		2
9	274664	Tube assembly	4	
9	274623	Tube assembly		4
10	X-268-7	Cap, pipe, 1/8 in. NPT	4	4
11	291679	Hose, hump, 7 in. ID	4	
11	279744	Hose, hump, 7 in. to 6 in. ID		4
12	GM16748	Hose, reducer insert	4	4
13	280998	Clamp, hose, 7.5/7.81 in.	20	4
13	254013	Clamp, hose, 6.25/6.56 in.		20
14	X-522-66	Tube, steel	2	
14	X-522-86	Tube, steel, 6 in. OD x 12 in.		2
15	347958	Hose, elbow, molded, 7 in. ID	2	
15	347806	Hose, elbow, molded, 6 in. ID		2
16	272981	Air cleaner, industrial	2	
16	A-354106	Air cleaner		2
16	279736	Element, air cleaner		2
16	272674	Cap, rain		2

Group 104: Cooling System



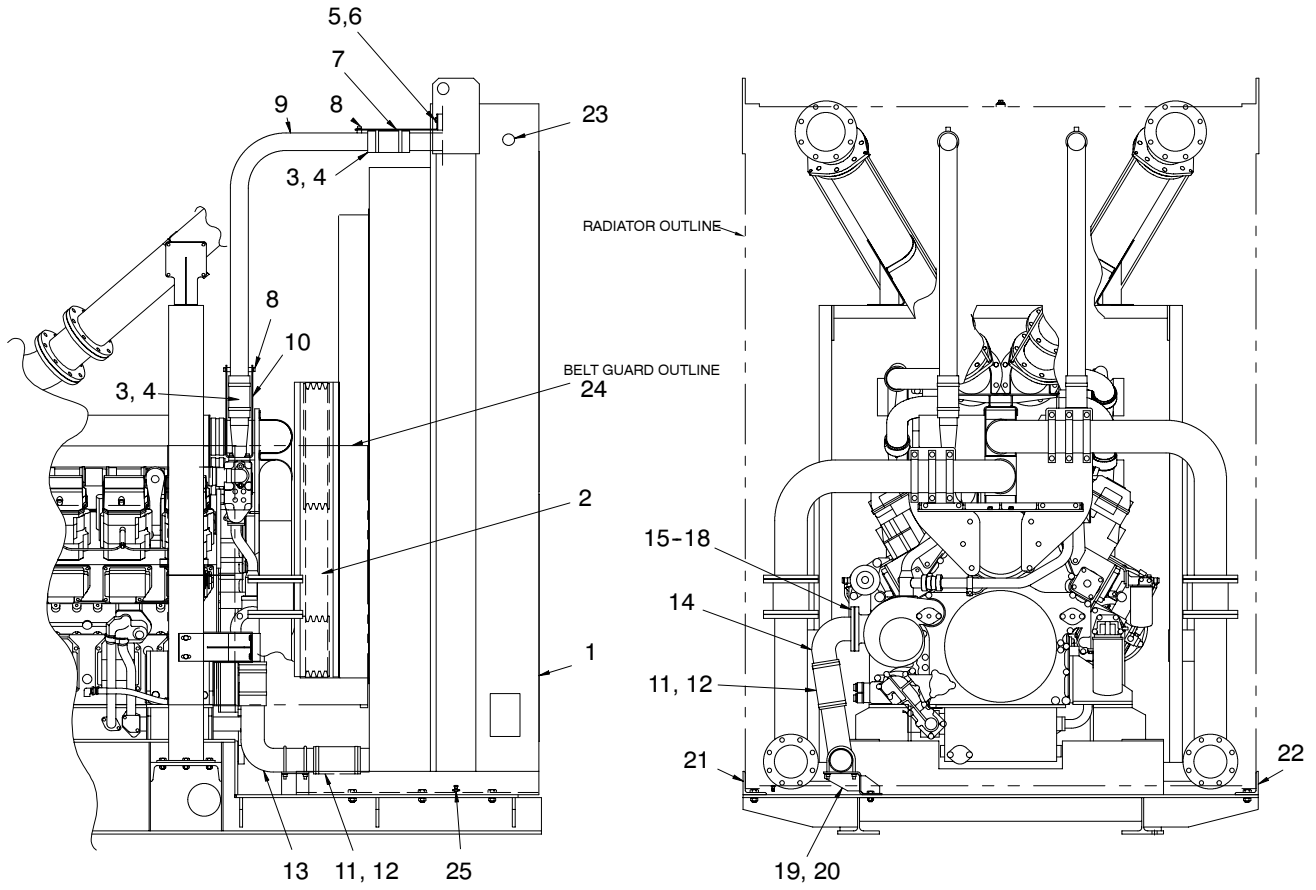
Group 104: Cooling System

600/900/1000 kW

Item	Part Number	Description	Quantity	
			Module Number	
			GM12013-MA1 600 kW	GM-10569-MA1 900/1000 kW
1	X-202-30	Bushing, reducing, 1/4 x 3/8 in. NPT		4
2	X-652-3	Connector, hose		2
3	254832	Sensor, low fluid	1	1
4	X-6003-8	Conduit, convoluted	1	1
5	X-468-7	Cable tie		6
6	X-801-9	Washer, hardened, .688 ID x 1.373 in. OD		8
7	X-426-9	Clamp, hose, .25/.70 in., GM-NRP		4
8	M961-12040-82	Screw, HC		8
9	X-256-5	Valve, drain	1	1
10	X-6011-3	Washer, beveled, .68 ID x 1.5 in. OD	4	4
11	M961-16040-60	Screw, hex cap		4
12	X-6014-31	Hose, radiator, straight, 4 in. ID		1
13	X-6359-9	Hose, rubber, straight, .25 in. ID		2
14	X-507-7	Hose, radiator, straight, 3 in. ID		4
15	275527	Clamp, hose, 2.81/3.12 in.	1	
15	291542	Clamp, hose, 3.25/3.56 in.	1	8
16	291537	Clamp, hose, 3.75/4.06 in.	2	
16	291590	Clamp, hose, 4/4.31 in.		2
17	225127	Bushing, adapter, 3/8-18 x M16 x 1.5 in.		2
18	GM11965	Hose, upper radiator	1	
18	GM11962	Flange, water connection outlet	1	
18	M961-10030-60	Screw, hex cap	4	
18	GM10396	Tube, upper radiator		2
19	GM10379	Guard, wire fan		1
20	GM11938	Radiator assembly	1	
20	GM10376	Radiator assembly		1
21	GM11890	Fan, pusher	1	
21	GM10378	Fan, pusher		1
22	354532	Support, radiator, RS	1	
22	GM10384	Support, radiator, RS		1
23	354533	Support, radiator, LS	1	
23	GM10385	Support, radiator, LS		1
24	GM11966	Support, radiator	2	
24	GM10383	Support, radiator		4
25	GM12347	Guard, belt, top	1	
25	GM10539	Guard, belt, top		1
26	GM12350	Guard, belt, RS	1	
26	GM10540	Guard, belt, RS		1
27	GM12348	Guard, belt, LS	1	
27	GM10541	Guard, belt, LS		1
28	GM12349	Guard, belt, bottom	1	
28	GM10542	Guard, belt, bottom		1
29	GM12352	Bracket, belt guard mounting	1	
29	GM10543	Bracket, belt guard mounting		1
30	GM12351	Bracket, belt guard mounting	1	
30	GM12355	Bracket, belt guard mounting	1	
30	GM10544	Bracket, belt guard mounting		1
31	GM12353	Bracket, belt guard mounting	1	
31	GM10545	Bracket, belt guard mounting		1
32	GM10546	Bracket, belt guard mounting		1
32	GM12354	Bracket, belt guard mounting	2	
33	GM10547	Bracket, belt guard mounting		1
34	GM13749	Flange, water connection inlet	1	
34	M961-12030-60	Screw, hex cap	3	
34	GM11964	Hose, lower radiator	1	
34	GM10382	Tube, lower radiator		1
35	X-25-75	Washer, plain, .344 ID x .875 in. OD		12
36	X-391-20	Connector, 90°, 1/4 in. ID hose		2

Group 104: Cooling System, continued

2000 kW Water Piping



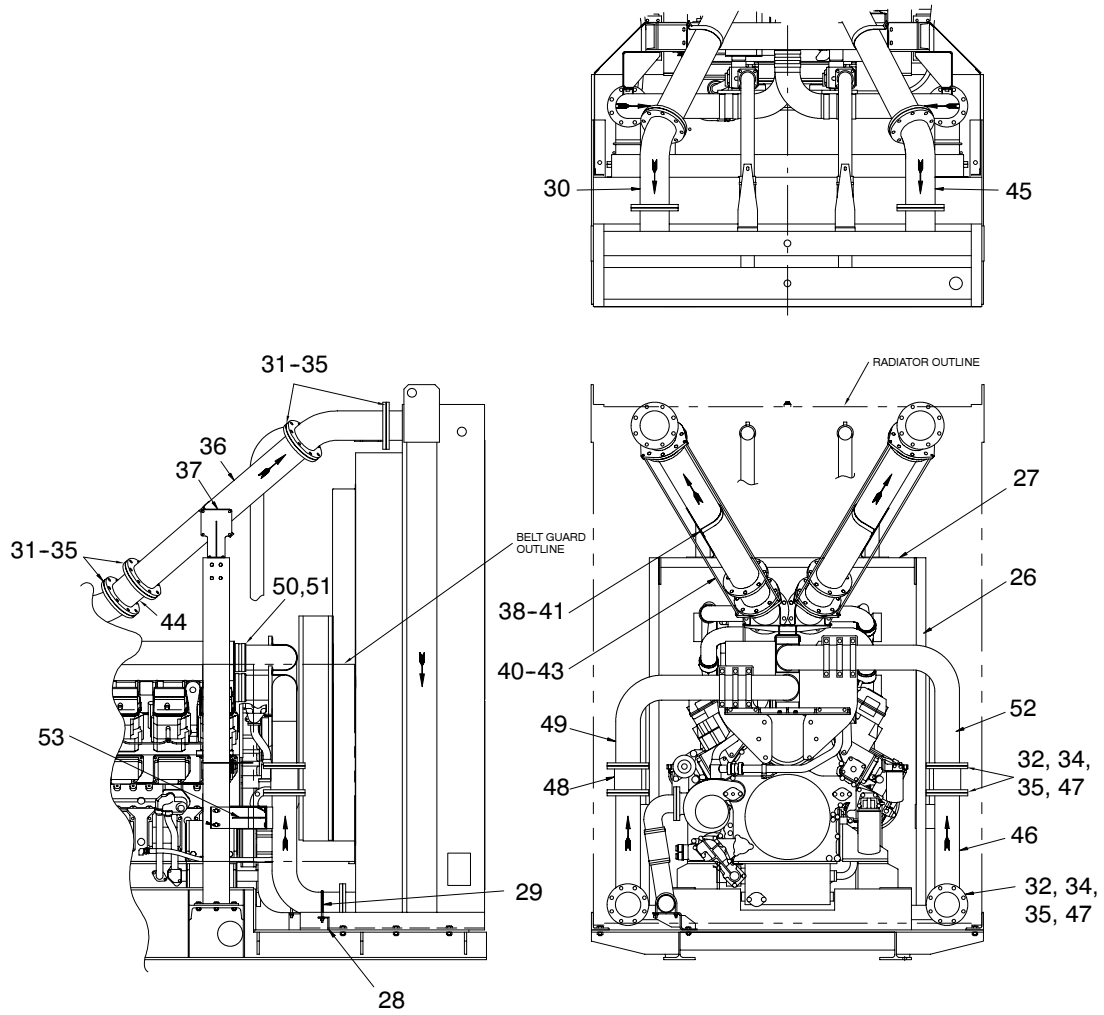
Group 104: Cooling System, continued

2000 kW

Item	Part Number	Description	Quantity
			Module Number GM17019-MA1
1	GM16929	Radiator, 60 Hz, S16R-PTAA2	1
2	GM21122	V-belt	1
3	GM21150	Hose, rubber	4
4	GM21136	Clamp	8
5	GM15180	Washer, spring	4
6	GM15111	Bolt	4
7	GM21144	Stay, pipe	2
8	GM15153	Bolt with washer	6
9	GM21132	Pipe, water	2
10	GM21143	Stay, pipe	4
11	GM21142	Hose, rubber	2
12	GM21135	Clamp	8
13	GM21131	Pipe, water	1
14	GM21130	Pipe, water	1
15	GM21133	Gasket	1
16	GM15963	Bolt	4
17	GM21149	Washer	4
18	GM15182	Washer, spring	4
19	GM17018	Support, tube	1
20	X-397-11	Bolt, 1/2-13 x 6 in.	2
21	GM17403	Bracket, radiator mounting, RS	1
22	GM17402	Bracket, radiator mounting, LS	1
23	254832	Sensor, low fluid	1
24	GM17660	Belt guard subassembly	1
25	X-256-5	Valve, drain, 1/2 in. NPT	1
26	GM16833	Support, radiator tube	2
27	GM16834	Support, radiator tube top	1
28	GM16942	Support, tube	2
29	X-722-11	Clamp, muffler, 5.62 in.	2
30	GM21124	Duct, air	1
31	GM21146	Gasket	8
32	GM21148	Bolt	112
33	GM21149	Washer	112
34	GM15182	Washer, spring	112
35	GM15984	Nut	112
36	GM21123	Duct, air	2
37	GM21139	Stay, air duct	2
38	GM21137	Clamp, air duct	2
39	GM21147	Bolt	4
40	GM15174	Washer	64
41	GM15164	Nut	54
42	GM21128	Turnbuckle	6
43	GM15179	Washer, spring	64
44	GM21141	Joint, flexible	2
45	GM21125	Duct, air	1
46	GM21129	Duct, air	2
47	GM21145	Gasket	6
48	GM21138	Joint, flexible	2
49	GM21126	Duct, air	1
50	GM21140	Hose, rubber	4
51	GM21134	Clamp	8
52	GM21127	Duct, air	1
53	GM19871	Bracket, air tube	2

Group 104: Cooling System, continued

2000 kW Air Piping



Group 104: Cooling System, continued

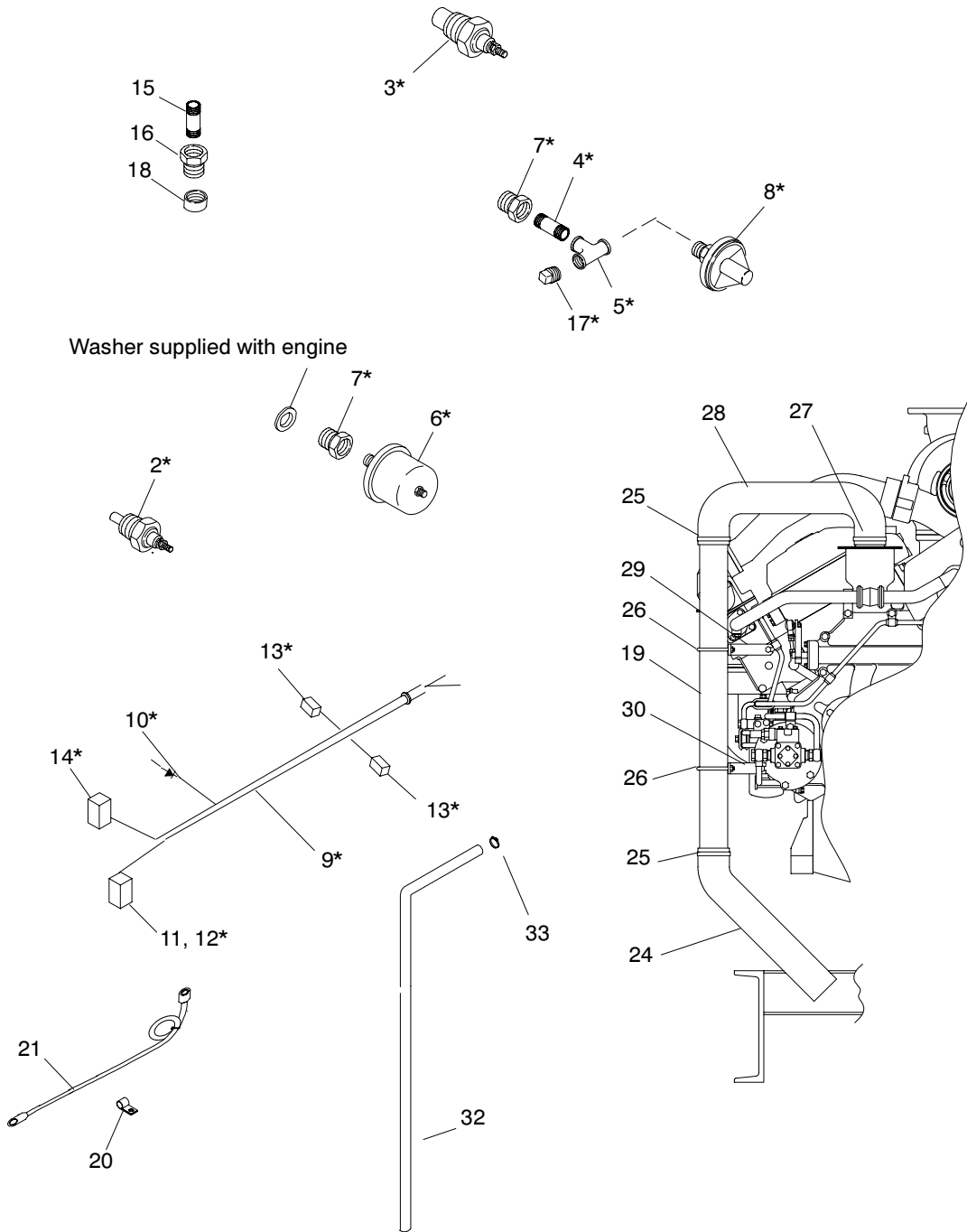
2000 kW

Item	Part Number	Description	Quantity
			Module Number GM17019-MA1
1	GM16929	Radiator, 60 Hz, S16R-PTAA2	1
2	GM21122	V-belt	1
3	GM21150	Hose, rubber	4
4	GM21136	Clamp	8
5	GM15180	Washer, spring	4
6	GM15111	Bolt	4
7	GM21144	Stay, pipe	2
8	GM15153	Bolt with washer	6
9	GM21132	Pipe, water	2
10	GM21143	Stay, pipe	4
11	GM21142	Hose, rubber	2
12	GM21135	Clamp	8
13	GM21131	Pipe, water	1
14	GM21130	Pipe, water	1
15	GM21133	Gasket	1
16	GM15963	Bolt	4
17	GM21149	Washer	4
18	GM15182	Washer, spring	4
19	GM17018	Support, tube	1
20	X-397-11	Bolt, 1/2-13 x 6 in.	2
21	GM17403	Bracket, radiator mounting, RS	1
22	GM17402	Bracket, radiator mounting, LS	1
23	254832	Sensor, low fluid	1
24	GM17660	Belt guard subassembly	1
25	X-256-5	Valve, drain, 1/2 in. NPT	1
26	GM16833	Support, radiator tube	2
27	GM16834	Support, radiator tube top	1
28	GM16942	Support, tube	2
29	X-722-11	Clamp, muffler, 5.62 in.	2
30	GM21124	Duct, air	1
31	GM21146	Gasket	8
32	TBD	Bolt	112
33	GM21149	Washer	112
34	GM15182	Washer, spring	112
35	GM15984	Nut	112
36	GM21123	Duct, air	2
37	GM21139	Stay, air duct	2
38	GM21137	Clamp, air duct	2
39	TBD	Bolt	4
40	GM15174	Washer	64
41	GM15164	Nut	54
42	GM21128	Turnbuckle	6
43	GM15179	Washer, spring	64
44	GM21141	Joint, flexible	2
45	GM21125	Duct, air	1
46	GM21129	Duct, air	2
47	GM21145	Gasket	6
48	GM21138	Joint, flexible	2
49	GM21126	Duct, air	1
50	GM21140	Hose, rubber	4
51	GM21134	Clamp	8
52	GM21127	Duct, air	1
53	GM19871	Bracket, air tube	2

Group 105: Engine

Items not shown: 1, 22, 23, 31

* See Control and Harness group for part number.



6057_105

Group 105: Engine

Item	Part Number	Description	Quantity									
			Variation Number									
			1	2	3	4	5	6	7	8		
1	GM10524	Engine assembly, Mitsubishi			1		1					
1	GM10523	Engine assembly, Mitsubishi				1			1			
1	GM11874	Engine assembly, Mitsubishi	1	1								
1	GM16631	Engine assembly, Mitsubishi								1		
1	GM17888	Engine assembly, Mitsubishi										1
2	*	Sender, water temperature	1		1	1						
3	*	Switch, high temperature shutoff	1		1	1						
4	*	Nipple, pipe, 1/8 x 3/4 in.	1		1	1						
5	*	Fitting, pipe tee, 1/8 x 1/8 x 1/8 in.	1		1	1						
6	*	Sender, oil pressure	1		1	1						
7	*	Adapter bushing			2	2						
7	*	Adapter bushing	2									
7	*	Fitting, 45° street elbow	2									
8	*	Switch pressure assembly	1		1	1						
9	*	Harness, engine			1	1						
9	*	Harness, engine	1									
10	*	Diode, 6 A	4		5	5						
11	*	Connector, cable	1		1	1						
12	*	Connector, 24-position	1		1	1						
13	*	Connector	2		3	3						
14	*	Connector	1		1	1						
15	X-209-5	Nipple, pipe, 1/2 x 1 1/2 in.			2	2	2	2	2			
15	X-206-9	Nipple, pipe	2							2		2
15	X-204-9	Pipe, 3/8 in. NPT x 1 in.		2								
16	168848	Bushing, reducing, 1/2 x 1 in. NPT			2	2	2	2	2			
16	X-202-23	Bushing, reducing, 3/8 x 3/4 in. NPT	2	2								
16	GM10841	Adapter bushing	2	2								
17	*	Plug, pipe, 1/8	1		1	1						
18	X-268-4	Cap, pipe			2	2	2	2	2			
18	X-268-1	Cap, pipe, 3/4 in.	2							2		2
19	GM10579	Tube, breather			1	1	1	1	1			
20	X-672-32	Clamp, insulated			4	4	4	4	4			
20	X-672-3	Clamp, insulated			2	2	2	2	2			
20	X-672-13	Clamp, insulated, .88 in.	1	1								
20	X-672-37	Clamp	4	4								
21	X-545-145	Cable, battery, 1575mm, No. 2/0 wire, type 5			1	1	1	1	1			
22	X-22-15	Washer, lock, .456 ID x 1.058 in. OD			3	3						
23	226917	Decal, negative battery connection			1	1	1	1	1			
24	X-6014-57	Hose, radiator, straight, 3 in. ID			1	1	1	1	1			
25	291542	Clamp, hose, 3.25/3.56 in.			2	2	2	2	2			
26	286283	Clamp, muffler, 3.12 in.			2	2	2	2	2			
27	324342	Clamp, hose, 3.43/3.75 in.			1	1	1	1	1			
28	GM10964	Hose, breather			1	1	1	1	1			
29	GM10965	Bracket, breather tube			1	1	1	1	1			
30	GM10966	Bracket, breather tube			1	1	1	1	1			
31	X-6214-4	Cap			1	1	1	1	1			
32	X-6014-97	Hose, straight, 1 in. ID								2		2
33	X-426-8	Clamp, hose, .81/1.75 in.								2		2

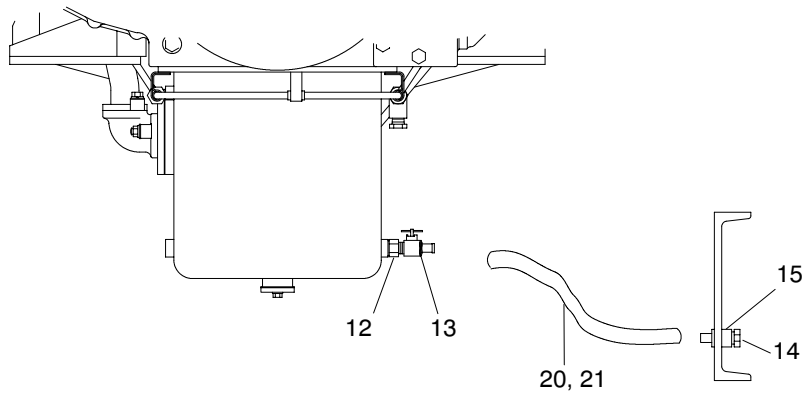
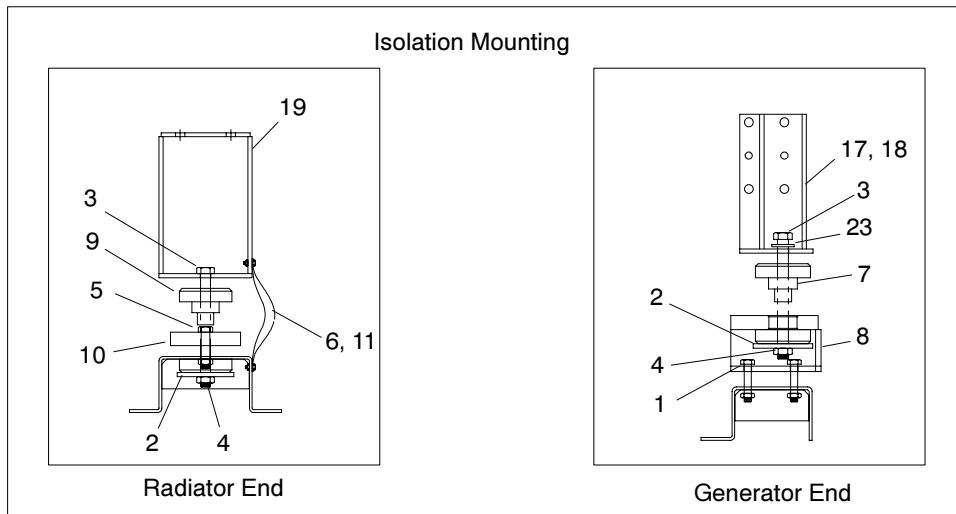
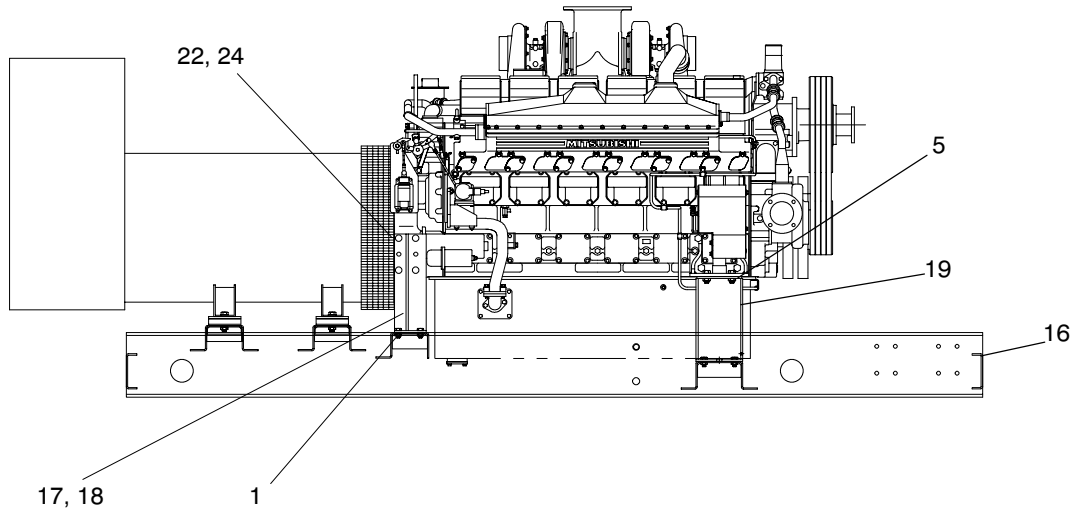
* See Control and Harness group for part number.

Group 107: Nameplates and Decals

Item	Part Number	Description	Quantity
			Variation Number 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	226917	Decal, negative battery connection	1
6	238402	Decal, caution positive terminal only	2
7	249808	Decal, warning rotating parts	1
8	249809	Decal, caution hot engine	1
9	249810	Decal, warning hot coolant	1
10	255882	Decal, caution standby service connect	1
11	257438	Decal, danger moving rotor	2
12	294520	Decal, danger high voltage	1
13	327004	Nameplate, model/ratings, Kohler	1
14	347166	Decal, electrical equipment	1
15	347272	Decal, Power	2
16	347273	Decal, System	2
17	GM13227	Decal, warning generator fan force	1
18	GM13228	Decal, warning lifting support	1

Notes

Group 109: Skid and Plant Mounting



Group 109: Skid and Plant Mounting

Item	Part Number	Description	Quantity						
			Module Number						
			A	B	C	D	E	F	G
1	X-6011-3	Washer, beveled, .68 ID x 1.5 in. OD	4	4	4	4			
2	X-25-152	Washer, plain, 1.06 ID x 5.25 in. OD	4		4				
2	X-25-155	Washer, plain					4	4	
3	M931-24160-60	Screw, hex cap	4		4				
3	M931-20120-60	Screw, hex cap					4	4	
3	M982-20-80	Nut, hex elastic stop					4	4	
4	M982-24-80	Nut, hex elastic stop	4		4				
5	M934-20-80	Nut, hex	12	8	12	8			
5	M125A-18-80	Washer, plain					12	12	12
5	M6797A-18-80	Washer, lock					12	12	
5	X-26-10	Washer, lock							12
5	M933-18050-60	Screw, hex cap					12	12	
5	M933-18060-60	Screw, hex cap							12
5	M934-18-80	Nut, hex					12	12	12
6	X-22-16	Washer, lock, .326 ID x .883 in. OD	3		3		3	3	
7	361919	Vibromount	2		2				
7	365190	Vibromount					2	2	
8	361024	Mount, engine	2		2				
9	361179	Vibromount	2		2				
9	361734	Vibromount					2	2	
10	361039	Plate, generator mounting	2		2				
10	361733	Plate, engine mounting					4	4	
11	290418	Strap, ground	1		1		1	1	
12	X-202-41	Bushing, reducing, 1/2 x 3/4 in. NPT	1	1	1	1	1	1	1
12	GM10577	Adapter bushing					1	1	1
12	X-6278-4	Washer, nylon							1
12	X-274-2	Fitting, 45° street elbow					1	1	
12	X-211-1	Elbow, street, 90° x 1/2 in. NPT							1
13	272701	Valve, oil drain	1	1	1	1	1	1	1
14	241062	Plug, drain	1	1	1	1			
14	X-582-1	Coupling, hose					1	1	1
14	X-75-28	Plug, pipe, 1/2 in.					1	1	1
15	276552	Washer, nylon, .878 ID x 1.132 in. OD	1	1	1	1			
16	GM10658	Skid			1	1			
16	GM10427	Skid	1	1					
16	GM11967	Skid					1		
16	GM12024	Skid						1	
16	GM16624	Skid							1
17	GM10458	Support, rear engine, RS	1		1				
17	GM10521	Support, rear engine, RS		1		1			
18	GM10459	Support, rear engine, LS	1		1				
18	GM10522	Support, rear engine, LS		1		1			
19	GM10457	Support, front engine	2		2				
19	GM10520	Support, front engine		2		2			
19	GM11972	Mount, engine, front					4	4	
20	X-426-3	Clamp, hose, .56/1.06 in.	2	2	2	2	2	2	2
21	X-577-28	Hose, rubber, straight, .62 in. ID	1	1	1	1			
21	X-577-47	Hose, rubber, straight, .62 in. ID					1	1	1
22	M933-18035-60	Screw, hex cap	8	8	8	8			
23	X-801-10	Washer, hardened, 1.062 ID x 2 in. OD	2		2				
24	M6797A-18-80	Washer, lock	1	1	1	1			

Module Number to Key Cross-Reference

Use the module number of your skid and mounting from the generator set nameplate to determine the key.

Key	Module Number
A	GM10566-MA1
B	GM10567-MA1
C	GM10659-MA1
D	GM10660-MA1
E	GM12012-MA1
F	GM12012-MA2
G	GM16648-MA1

Group 201: Generator and Mounting

600 kW

Item	Part Number	Description	Qty.
1	See chart	Alternator assembly	1
2	M931-20140-60	Screw, hex cap	2
3	M934-20-80	Nut, hex	8
4	M982-20-80	Nut, hex elastic stop, 600 kW	2
5	X-25-152	Washer, plain, 1.06 ID x 5.25 in.	8
6	M961-16030-82	Screw, hex cap	6
7	X-801-5	Washer, hardened, .656 ID x 1.06"	6
8	328903	Screen	1
9	361733	Plate, generator mounting	2
10	X-400-241	Spacer	4
11	M960-12050-82	Screw, hex cap	16
12	361734	Vibromount	2
13	X-400-239	Spacer	4
14	365410	Shim	4
15	365411	Shim	4
16	365412	Shim	4
17	*	Screw, hex flange machine	12
18	*	Panel, junction box, front	1
19	*	Cover, louvered	1
20	X-22-12	Washer, lock, .262 ID x .743 in.	8
21	X-22-14	Washer, lock, .391 ID x .975 in.	4
22	X-25-118	Washer, plain, .406 ID x 1 in. OD	4
23	X-468-9	Cable tie, NRP	2
24	X-6086-6	Washer, spring, .39 ID x .81 in. OD	2
25	X-6217-10	Screw, hex flange machine	25
26	X-634-23	Bushing, 1.968 x 2.50 in. NPT	2
27	X-83-7	Nut, hex, zinc, 3/8-16	2
28	229353	Mount, controller	4
29	295009	Retainer	2
30	320828	Insert, threaded, 1/4-20 in.	4
31	361190	Cover, access	1
32	361191	Cover, DVR access	1
33	361271	Bus, ground	1
34	361478	Retainer, inner panel	2
35	GM10640	Guard, alternator	1
36	X-634-16	Bushing, 1.312 x 1.50 in. NPT	1
37	X-634-23	Bushing, 1.968 x 2.50 in. NPT	1
38	X-67-43	Screw, thread-cutting	27
39	272684	Relay	1
40	*	Terminal block	1
41	361186	Panel, junction box, inner	1
42	272684	Relay	1
43	361518	Door, junction box	1
44	365476	Bracket, inner panel	1
45	GM10429	Bracket, governor mounting	1
46	282829	Vibromount	4
47	X-22-18	Washer, lock, .172 ID x .595 in. OD	20
48	347841	Controller, governor	1

Item	Part Number	Description	Qty.
49	X-6274-7	Rod, threaded	3
50	X-6086-6	Washer, spring, .39 ID x .81 in. OD	6
51	X-25-118	Washer, plain, .406 ID x 1 in. OD	9
52	X-83-7	Nut, hex, 3/8-16, zinc	6
53	X-6128-29	Insulator, standoff, 3/8-16 x 2 in.	3
54	328725	Voltage regulator, DVR2000	1
55	347071	Exciter rectifier assembly	1
56	279772	Diode, standard polarity	1
57	279774	Diode, reversing polarity	1
58	279776	Surge suppressor	1
59	347160	Capacitor	1
60	279778	Fuse, 5 amp	1
61	279779	Fuse cap	1
62	GM13563	Panel, inner door	1
63	282829	Vibromount	6
64	GM13562	Bracket, door panel mounting, top	2
65	GM13564	Door, junction box	1
66	GM13565	Cover, access	1
67	X-50-2	Screw, slotted pan head machine	6
68	GM13561	Bracket, door panel mounting, bottom	1
69	GM15336	Bracket, inner panel mounting	1

* See Control and Harness group for part number.

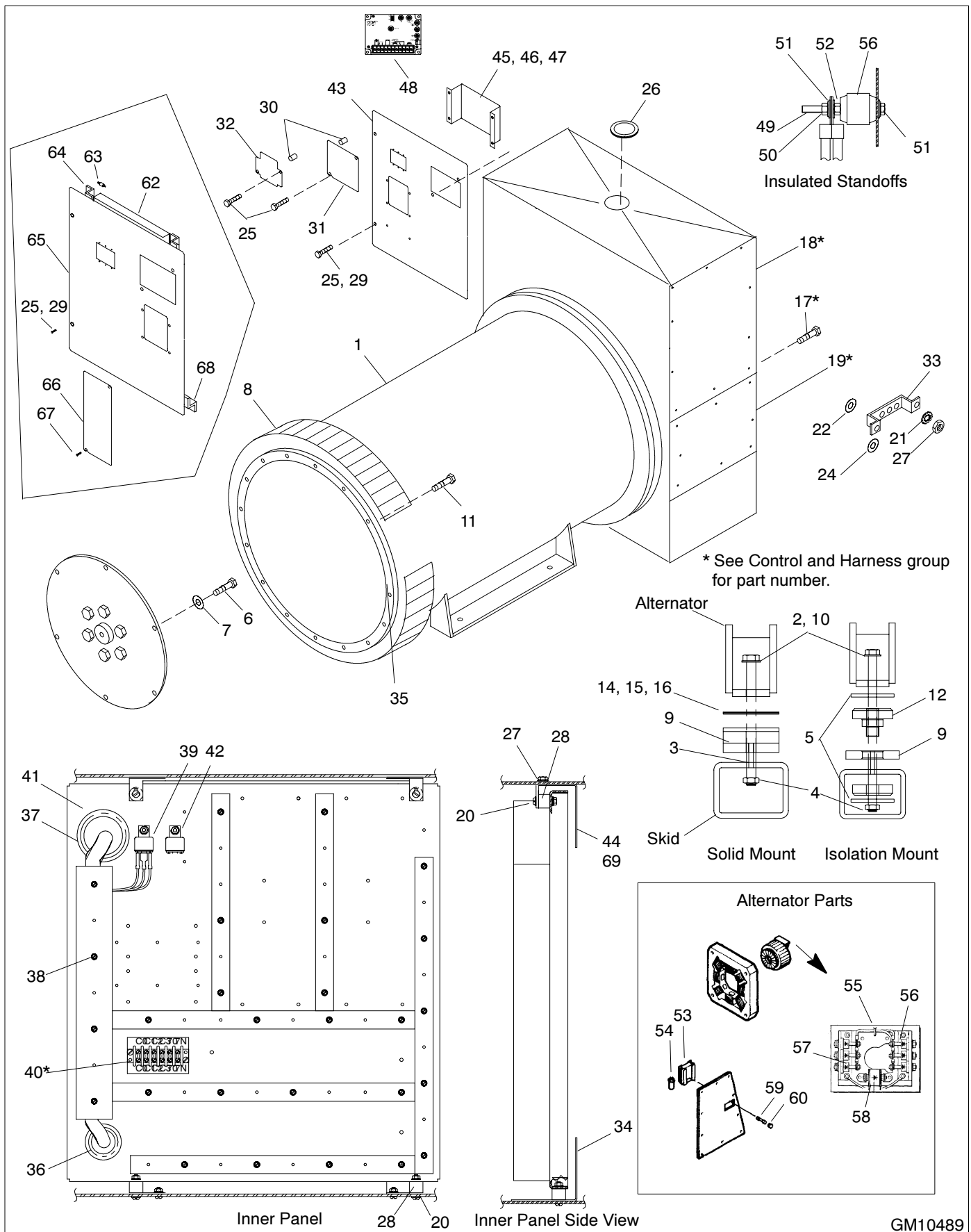
Alternator Part Number and Mount Type

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

Module Number	Alternator Part Number	Mount Type
GM12001-MA1	GM11976	Isolation
GM12001-MA2	GM12021	Isolation
GM12001-MA3	A-361756	Isolation
GM12001-MA4	GM12022	Isolation
GM12001-MA5	GM12023	Isolation
GM12001-MA6	A-361760	Isolation
GM17023-MA1†	GM12021	Isolation
GM17023-MA2†	GM11976	Isolation
GM17023-MA3†	A-361756	Isolation
GM17023-MA4†	GM12022	Isolation
GM17023-MA5†	GM12023	Isolation
GM17023-MA6†	A-361760	Isolation

† Module uses vibration isolate door-mounted component items 62–69.

Group 201: Generator and Mounting, continued



Group 201: Generator and Mounting, continued

900/1000/2000 kW

Item	Part Number	Description	Qty.
1	See chart	Alternator assembly	1
2	M931-20120-60	Screw, hex cap, 5M frames, solid mount	4
2	M931-20160-60	Screw, hex cap, 5M frames, isolation mount	4
2	M931-24160-60	Screw, hex cap, 7M frames, isolation mount	4
2	M931-24120-60	Screw, hex cap, 7M frames, solid mount	4
2	M933-24065-60	Screw, hex cap, 2000 kW	4
3	M934-20-80	Nut, hex, 900/1000 kW	8
4	M982-20-80	Nut, hex elastic stop, 5M frames, isolation mount	4
4	M934-20-80	Nut, hex, 5M frames, solid mount	4
4	M982-24-60	Nut, hex, 7M frames, isolation mount	4
4	M934-24-80	Nut, hex, 7M frames, solid mount	4
5	X-25-152	Washer, plain, 1.06 ID x 5.25 in. OD	8
6	M933-16030-82	Screw, hex cap, 5M frames	6
6	M933-16050-82	Screw, hex cap, 7M frames	6
6	M961-16045-82	Screw, hex cap, 2000 kW	12
7	X-801-5	Washer, hardened, .656 ID x 1.06 in. OD	6
8	GM10562	Screen, 7M frames	1
8	328903	Screen, 5M frames	1
8	328904	Screen, 2000 kW	1
9	361039	Plate, generator mounting, isolation mount	4
9	361061	Plate, generator mounting, 900/1000 kW, solid mount	4
10	X-400-241	Spacer, 900/1000 kW, solid mount	4
11	M960-12050-82	Screw, hex cap, 5M frames	16
11	M961-12040-82	Screw, hex cap, 7M frames	16
11	M961-14050-82	Screw, hex cap, 2000 kW	16
12	361919	Vibromount, isolation mount	4
13	X-400-239	Spacer	4
14	365410	Shim	4
15	365411	Shim	4
16	365412	Shim	4
17	*	Screw, hex flange machine	12
18	*	Panel, junction box, front	1
19	*	Cover, louvered	1
20	X-22-12	Washer, lock, .262 ID x .743 in. OD	8

Common hardware. Procure locally.

* See Control and Harness group for part number.

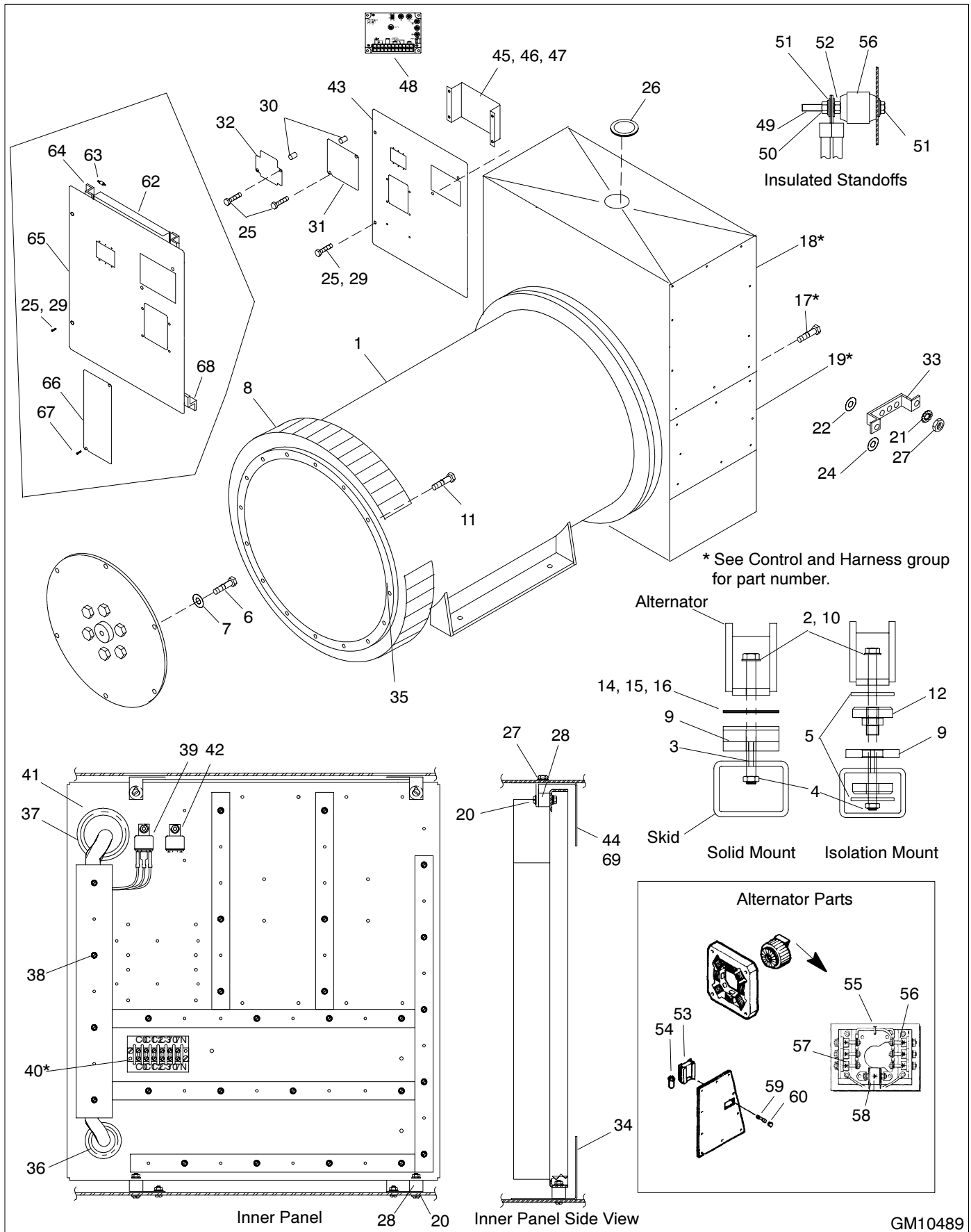
Alternator Part Number and Mount Type

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

Module Number	Alternator Part Number	Mount Type
GM10443-MA1	A-361758	Isolation
GM10443-MA2	A-361762	Isolation
GM10443-MA3	A-361758	Solid
GM10443-MA4	A-361762	Solid
GM10443-MA5	A-361765	Isolation
GM10443-MA6	A-361765	Solid
GM10443-MA7	GM10490	Isolation
GM10443-MA8	GM10490	Solid
GM10443-MA9	A-361763	Isolation
GM10443-MA10	A-361763	Solid
GM10443-MA11	A-361764	Isolation
GM10443-MA12	A-361764	Solid
GM10443-MA13	GM10549	Isolation
GM10443-MA14	GM10549	Solid
GM10443-MA15	GM10550	Isolation
GM10443-MA16	GM10550	Solid
GM10443-MA17	GM10551	Isolation
GM10443-MA18	GM10551	Solid
GM17024-MA1†	A-361758	Isolation
GM17024-MA2†	A-361758	Solid
GM17024-MA3†	A-361762	Isolation
GM17024-MA4†	A-361762	Solid
GM17024-MA5†	A-361765	Isolation
GM17024-MA6†	A-361765	Solid
GM17024-MA7†	GM10490	Isolation
GM17024-MA8†	GM10490	Solid
GM17024-MA9†	A-361763	Isolation
GM17024-MA10†	A-361763	Solid
GM17024-MA11†	GM10549	Isolation
GM17024-MA12†	GM10549	Solid
GM17024-MA13†	A-361764	Isolation
GM17024-MA14†	A-361764	Solid
GM17024-MA15†	GM10550	Isolation
GM17024-MA16†	GM10550	Solid
GM17024-MA17†	GM10551	Isolation
GM17024-MA18†	GM10551	Solid
GM16900-MA1	F-361007	Solid
GM16900-MA2	F-361008	Solid
GM16900-MA3	F-361011	Solid
GM16900-MA4	F-361014	Solid
GM16900-MA5	F-361018	Solid

† Module uses vibration isolate door-mounted components items 62-69.

Group 201: Generator and Mounting, continued



GM10489

Group 201: Generator and Mounting, continued

900/1000/2000 kW

Item	Part Number	Description	Qty.
21	X-22-14	Washer, lock, .391 ID x .975 in. OD	4
22	X-25-118	Washer, plain, .406 ID x 1 in. OD	4
23	X-468-9	Cable tie	2
24	X-6086-6	Washer, spring, .39 ID x .81 in. OD	2
25	X-6214-10	Screw, hex flange machine	25
26	X-634-23	Bushing, 1.968 x 2.50 in. NPT	2
27	X-83-7	Nut, hex, 3/8-16, zinc	2
28	229353	Mount, controller	4
29	295009	Retainer	2
30	320828	Insert, threaded, 1/4-20 in.	4
31	361190	Cover, access	1
32	361191	Cover, DVR access	1
33	361271	Bus, ground	1
34	361478	Retainer, inner panel	2
35	GM10640	Guard, alternator	1
36	X-634-16	Bushing, 1.312 x 1.50 in. NPT	1
37	X-634-23	Bushing, 1.968 x 2.50 in. NPT	1
38	X-67-43	Screw, slotted hex washer, thread-cutting	27
39	272684	Relay	1
40	*	Terminal block	1
41	361186	Panel, junction box, inner	1
42	272684	Relay	1
43	361518	Door, junction box	1
44	365476	Bracket, inner panel	1
45	GM10429	Bracket, gov. mounting	1
46	282829	Vibromount	4
47	X-22-20	Washer, lock, .172 ID x .373 in. OD	8
48	347841	Controller, governor, 900/1000 kW	1
49	X-6274-7	Rod, threaded	3
50	X-6086-6	Washer, spring, .39 ID x .81 in. OD	6
51	X-25-118	Washer, plain, .406 ID x 1 in. OD	9
52	X-83-7	Nut, hex, 3/8-16, zinc	6
53	X-6128-29	Standoff insulator, 3/8-16 x 2 in.	3
54	328725	Voltage regulator, DVR2000	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	347160	Capacitor	1
60	279778	Fuse, 5 amp	1
61	279779	Fuse cap	1
62	GM13563	Panel, inner door	1
63	282829	Vibromount	6
64	GM13562	Bracket, door panel mounting, top	2
65	GM13564	Door, junction box	1
66	GM13565	Cover, access	1
67	X-50-2	Screw, slotted pan head machine	6
68	GM13561	Bracket, door panel mounting, bottom	1
69	GM15336	Bracket, inner panel mounting	1

* See Control and Harness group for part number.

Alternator Part Number and Mount Type

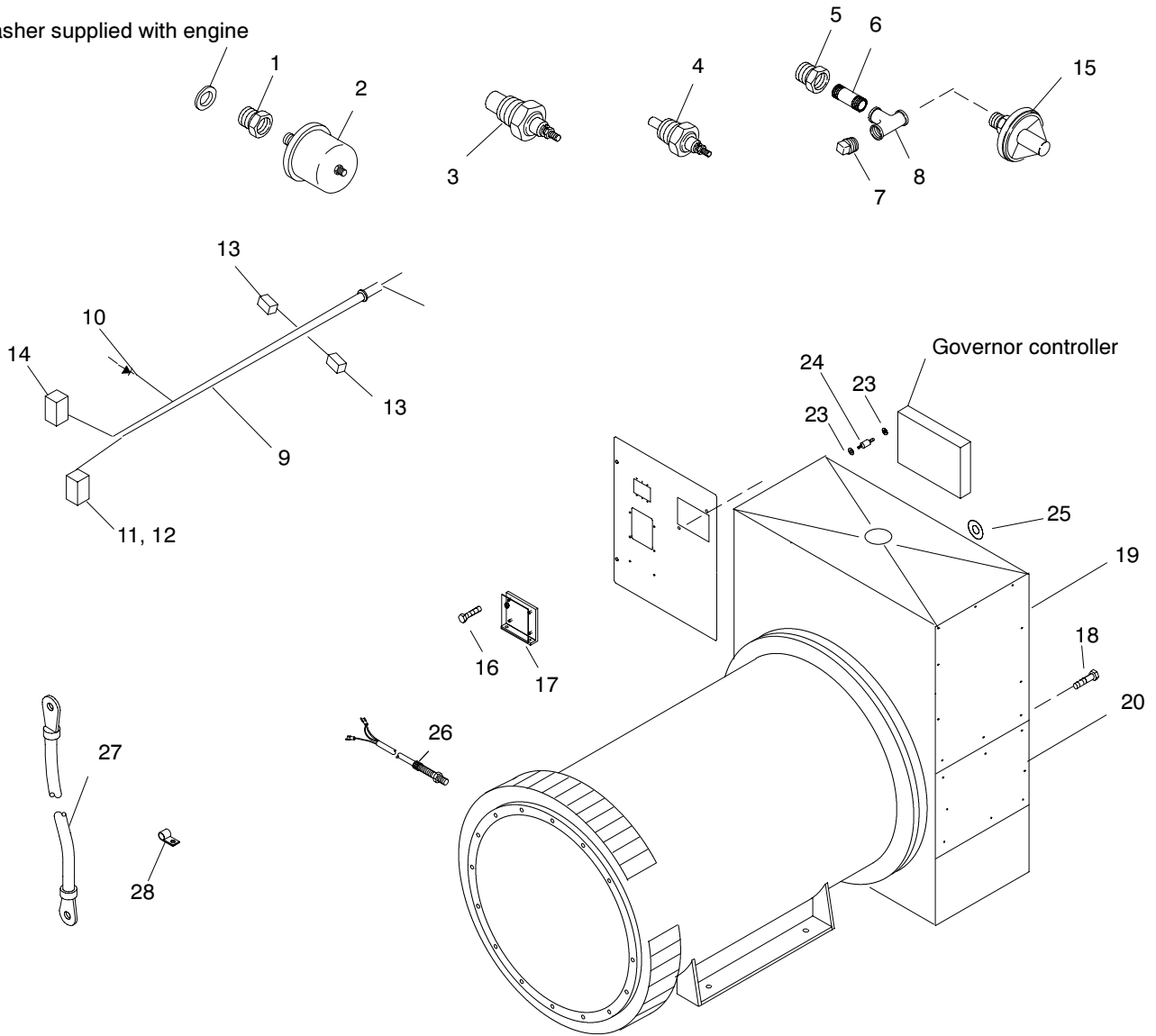
Use this table to identify the kit/module number's alternator part number (item 1) and mount type.

Module Number	Alternator Part Number	Mount Type
GM10443-MA1	A-361758	Isolation
GM10443-MA2	A-361762	Isolation
GM10443-MA3	A-361758	Solid
GM10443-MA4	A-361762	Solid
GM10443-MA5	A-361765	Isolation
GM10443-MA6	A-361765	Solid
GM10443-MA7	GM10490	Isolation
GM10443-MA8	GM10490	Solid
GM10443-MA9	A-361763	Isolation
GM10443-MA10	A-361763	Solid
GM10443-MA11	A-361764	Isolation
GM10443-MA12	A-361764	Solid
GM10443-MA13	GM10549	Isolation
GM10443-MA14	GM10549	Solid
GM10443-MA15	GM10550	Isolation
GM10443-MA16	GM10550	Solid
GM10443-MA17	GM10551	Isolation
GM10443-MA18	GM10551	Solid
GM17024-MA1†	A-361758	Isolation
GM17024-MA2†	A-361758	Solid
GM17024-MA3†	A-361762	Isolation
GM17024-MA4†	A-361762	Solid
GM17024-MA5†	A-361765	Isolation
GM17024-MA6†	A-361765	Solid
GM17024-MA7†	GM10490	Isolation
GM17024-MA8†	GM10490	Solid
GM17024-MA9†	A-361763	Isolation
GM17024-MA10†	A-361763	Solid
GM17024-MA11†	GM10549	Isolation
GM17024-MA12†	GM10549	Solid
GM17024-MA13†	A-361764	Isolation
GM17024-MA14†	A-361764	Solid
GM17024-MA15†	GM10550	Isolation
GM17024-MA16†	GM10550	Solid
GM17024-MA17†	GM10551	Isolation
GM17024-MA18†	GM10551	Solid
GM16900-MA1	F-361007	Solid
GM16900-MA2	F-361008	Solid
GM16900-MA3	F-361011	Solid
GM16900-MA4	F-361014	Solid
GM16900-MA5	F-361018	Solid

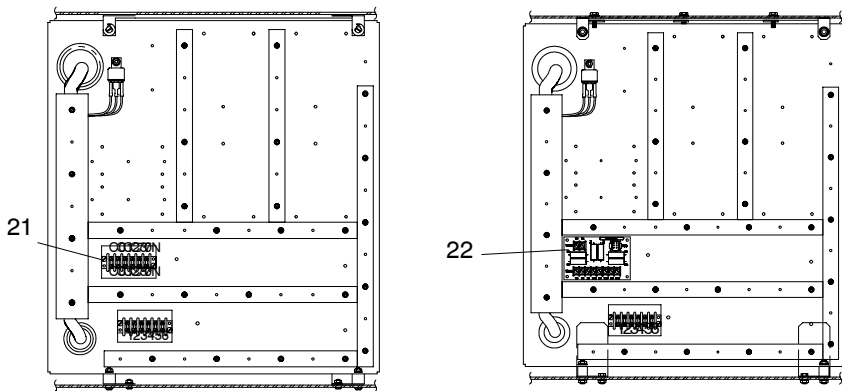
† Module uses vibration isolate door-mounted components items 62-69.

Control and Harness

Washer supplied with engine



Inner panels



Decision-Maker 550, 600 volt maximum

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	Quantity															
			Module Number								Group 105 Engine Variation Number							
			A	B	C	D	E	F	G	H	1	3	4					
1	GM10576	Adapter bushing		1	1			1	1									
1	267428	Fitting, 45° street elbow	1			1						2		1				
1	GM12035	Adapter bushing	1			1					1	1	1					
2	343474	Sender, oil pressure	1	2	2							1	1	1				
2	GM16788	Sender, oil pressure				1	1	1	1	1								
3	241481	Switch, high temperature shutoff	1	1	1							1	1	1				
4	268298	Sender, water temperature	1	1	1							1	1	1				
4	GM16787	Sender, water temperature				1	1	1	1	1								
5	GM12035	Adapter bushing	1									1						
5	GM12576	Adapter bushing		1	1											1	1	1
6	X-217-6	Nipple, pipe, 1/8 x 3/4 in.	1	1	1							1	1	1				
7	X-75-1	Plug, pipe 1/8	1	1	1							1	1	1				
8	X-203-16	Fitting, tee, 1/8 x 1/8 x 1/8 in., Pipe	1	1	1							1	1	1				
9	GM10613	Harness, engine		1	1											1	1	1
9	GM12551	Harness, engine	1									1						
9	GM15495	Harness, engine				1												
9	GM15496	Harness, engine						1	1									
9	GM17434	Harness, engine								1	1							
10	233959	Diode, 6 A	4	5	5	5	7	7				4	5	5				
11	292800	Connector, cable	1	1	1	1	1	1				1	1	1				
12	295145	Connector, 24-position	1	1	1	1	1	1				1	1	1				
13	GM11422	Connector	2	3	3	2	3	3				2	3	3				
14	GM11423	Connector	1	1	1	1	1	1				1	1	1				
15	GM10574	Switch, pressure, LOP	1	1	1							1	1	1				
16	M965A-06012-20	Screw, pan head machine				4	4	4	4	4								
17	GM11718	PCB assembly, Marathon excitation interface				1	1	1	1	1								
18	X-6217-10	Screw, hex flange machine	22	22	24	22	22	24	24	24		22	24	24				
19	361184	Panel, junction box, front	1	1	1	1	1	1	1	1		1	1	1				
20	361826	Panel, junction box, 5M and 7M4046 alt.	1	1		1	1					1	1	1				
20	328901	Panel, junction box, 7M alt. except 7M4046			1			1	1	1				1	1			
21	X-49-6	Screw, cross recess pan head machine	2	2	2							2						
21	255080	Marker, strip	1	1	1													
21	254127	Marker, strip										1						
21	295314	Terminal block	1	1	1													
21	X-405-2	Terminal block												1				
22	GM13980	PCB assembly, CT burden resistor				1	1	1	1									
22	X-70-12	Nut, hex machine screw, 8-32				4	4	4	4									
22	X-712-9	Spacer, .25 OD, .5 in.				4	4	4	4									
23	X-22-18	Washer, lock										8	8					
24	282829	Vibromount										4	4					
25	243488	Grommet, round										2	2					
26	255749	Pickup, magnetic										1	1					
27	X-545-149	Cable, battery (not shown)										1	1					

Module Number to Key Cross-Reference

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

Key	Kit Number	kW/Alternator	Controllers
A	GM16967-MA1	600	Engine Gauge Box and 16-Light
B	GM16968-MA1	900/1000, 5M and 7M4046 alternators	Engine Gauge Box and 16-Light
C	GM16968-MA2	900/1000, 7M alternators except 7M4046	Engine Gauge Box and 16-Light
D	GM16972-MA1	600	Decision-Maker 550
E	GM16973-MA1	900/1000, 5M and 7M4046 alternators	Decision-Maker 550
F	GM16973-MA2	900/1000, 7M alternators except 7M4046	Decision-Maker 550
G	GM17232-MA1	2000, 600 V	Decision-Maker 550
H	GM17232-MA2	2000, medium voltage	Decision-Maker 550

Group 701: Literature

Item	Part Number	Description	Quantity			
			Variation Number			
			147	149	156	161
1	TP-5583	S/M 350-1600ROZD	1	1	1	1
2	TP-5700	I/M Industrial	1	1	1	1
2	TP-5700-CS	I/M Industrial, Chinese Simplified	1	1	1	1
2	TP-5700-CT	I/M Industrial, Chinese Traditional	1	1	1	1
2	TP-5700-F	I/M Industrial, French	1	1	1	1
2	TP-5700-G	I/M Industrial, German	1	1	1	1
2	TP-5700-S	I/M Industrial, Spanish	1	1	1	1
3	TP-6117	P/C Accessories, 230-2000 kW, Diesel	1	1	1	
4	TP-5750	O/M, 20-2000 kW	1	1	1	
4	TP-5750-F	O/M, 20-2000 kW, French	1	1	1	
4	TP-5750-G	O/M, 20-2000 kW, German	1	1	1	
4	TP-5750-S	O/M, 20-2000 kW, Spanish	1	1	1	
5	TP-5829	O/M, Decision-Maker 550 Controller	1	1	1	1
5	TP-6083	O/M, Decision-Maker 550 Controller	1	1	1	1
6	TP-6009	P/C Controllers	1	1	1	1
7	TP-6057	P/C 600/900/1000/2000ROZM	1	1	1	1
8	TP-6058	W/D 600-2000ROZM, Industrial	1	1	1	
9	TP-6094	O/M, Mitsubishi S6R/S6R2, 600 kW			1	
9	TP-6063	O/M, Mitsubishi S12H	1	1		
9	TP-6132	O/M, Mitsubishi S16R, 2000 kW				1
10	TP-6064	P/C Mitsubishi S12H, 900/1000 kW	1	1		
10	TP-6089	P/C Mitsubishi S6R, 600 kW			1	
10	TP-6131	P/C Mitsubishi S16R, 2000 kW				1
11	TP-6065	S/M Mitsubishi S12H	1	1		
11	TP-6095	S/M Mitsubishi S6R/S6R2, 600 kW			1	
11	TP-6133	S/M Mitsubishi S16R, 2000 kW				1
12	TP-5578	O/I/S/M Marathon alternator MagnaMAX DVR	1	1	1	1
12	TP-5578-F	O/I/S/M Marathon alternator MagnaMAX DVR, French	1	1	1	1
12	TP-5578-S	O/I/S/M Marathon alternator MagnaMAX DVR, Spanish	1	1	1	1
13	TP-5579	O/I/S/M Marathon alternator voltage regulator DVR	1	1	1	1
13	TP-5579-F	O/I/S/M Marathon alternator voltage regulator DVR	1	1	1	1
13	TP-5579-S	O/I/S/M Marathon alternator voltage regulator DVR	1	1	1	1

Kit List

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

	600 kW	900/1000 kW	2000 kW
Controllers			
See Parts Catalog TP-6009 for parts lists.			
Cooling Systems			
Remote radiator	GM13541-MA1	GM10977-MA1	—
Remote radiator flex kit	—	GM10976-KP1	—
Heater, block			
208-480 V, 1-Phase	GM12080-KA1	GM10699-KA1	GM17215-KA1
240 V, 3-Phase	—	GM10699-KA4	GM17215-KA2
280 V, 3-Phase	—	GM10699-KA3	—
380 V, 3-Phase	—	—	GM17215-KA3
480 V, 3-Phase	—	GM10699-KA2	GM17215-KA4
480 V, 1-Phase	—	—	GM17215-KA5
Block heater isolation valves	GM12529-KA1	PA-365308	—
Duct flange, radiator	365204	GM10991-KA1	GM17216-KA1
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.
Remote Radiator Setup		
GM10977-MA1		
1	Bracket, belt guard	GM10546
1	Bracket, belt guard	GM10544
1	Bracket, belt guard	GM10545
1	Bracket, belt guard	GM10547
1	Guard, pulley right side	GM10952
1	Guard, pulley bottom	GM10951
1	Guard, pulley front	GM10955
1	Guard, pulley left side	GM10950
1	Guard, pulley top	GM10949
1	Bracket, guard	GM10948
1	Tube, water inlet	GM10953
1	Tube, outlet	GM10954
4	Clamp, hose, 3.43/3.75 in.	324342
2	Hose, radiator, straight, 3 in. ID	X-507-4
12	Screw, hex washer head, drill	X-794-1
1	Plug, pipe, 1/2	X-75-3
1	Ball, bearing	GM10996
Remote Radiator Setup		
GM13541-MA1		
1	Clamp, hose, 2.81/3.12 in.	275527
1	Clamp, hose, 3.88/4.19 in.	336229
1	Flange, water connection, outlet	GM11962
1	Flange, water connection, inlet	GM11963
1	Guard, belt guard mounting	GM12351
1	Guard, belt guard mounting	GM12352
1	Guard, belt guard mounting	GM12353
2	Guard, belt guard mounting	GM12354
1	Guard, belt guard mounting	GM12355
1	Guard, pulley, top	GM13510
1	Guard, pulley, LS	GM13511
1	Guard, pulley, bottom	GM13512
1	Guard, pulley, RS	GM13513
1	Cover, pulley	GM13514
4	Screw, hex cap	M961-10030-60
1	Hose, radiator, straight, 2.5 in. ID	X-424-10
1	Hose, radiator, straight, 3.5 in. ID	X-6014-70
Remote Radiator Flex Kit		
32	Screw, hex head machine	X-6021-1
32	Nut, hex, 5/8-11, zinc	X-85-3
2	Adapter, flexible, radiator	354044
Block Heater, 208/240/480 V, 1-Phase		
GM10699-KA1		
1	Heater, block (includes items marked *)	347686
1	*Element, block heater	GM19305
1	*Pump	328148
1	*Contactor	328217
1	*Transformer	328218
1	*Thermostat, high limit	GM19494
1	Box, controller	347276
1	Fitting, elbow, street 1/2 in.	X-211-1
1	Coupling, hose	X-582-7
2	Coupling, hose	X-582-15
1	Fitting, tee, pipe, 1 x 1 x 1 in.	X-203-2
1	Plug, pipe	X-75-13
1	Nipple, pipe, 1 x 1 1/2 in.	X-218-24
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
1	Hose, coolant 3/4 in. ID x 56.0 long	X-6367-5
4	Clamp, hose, .69/1.25 in.	X-426-12
1	Hose, coolant	X-6367-3
1	Tag, instruction	299896
2	Clamp, insulated, 1.06 in.	X-672-32
1	Coupling, hose	X-582-8
1	Bushing, adapter	GM10577
1	Thermostat	347742
1	Track, mounting, 1 in.	347278
1	Relay	291309
1	Socket	X-6124-4
2	Screw, hex washer head, drill	X-794-2
1	Washer, nylon, .878 ID x .132 in OD	276552
1	Bushing, reducing, 1/2 x 3/4 in. NPT	X-202-41

Qty.	Description	Part No.
Block Heater, 480 V, 3-Phase		
GM10699-KA2		
1	Heater, block, 450 V (includes items marked *)	GM10700
1	*Element, block heater	GM19496
1	*Pump	328148
1	*Contactor	328217
1	*Transformer	328218
1	*Thermostat, high limit	GM19494
1	Fitting, elbow, street, 1/2 in.	X-211-1
1	Coupling, hose	X-582-7
2	Coupling, hose	X-582-15
1	Fitting, tee, pipe, 1 x 1 x 1 in.	X-203-2
1	Plug, pipe	X-75-13
1	Nipple, pipe, 1 x 1 1/2 in.	X-218-24
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
1	Hose, coolant, 3/4 in. ID x 56.0 long	X-6367-5
4	Clamp, hose, .69/1.25 in.	X-426-12
1	Hose, coolant	X-6367-3
1	Tag, instruction	299896
2	Clamp, insulated, 1.06 in.	X-672-32
1	Coupling, hose	X-582-8
1	Bushing, adapter	GM10577
1	Thermostat	347742
1	Track, mounting, 1 in.	347278
1	Relay	291309
1	Socket	X-6124-4
2	Screw, hex washer head, drill	X-794-2
1	Washer, nylon, .878 ID x .132 in OD	276552
1	Wiring harness, FRIL relay circuit board	279956
1	Bushing, reducing, 1/2 x 3/4 in. NPT	X-202-41
Block Heater, 380 V, 3-Phase		
GM10699-KA3		
1	Heater, block, 380 V (includes items marked *)	GM10701
1	*Element, block heater	GM19497
1	*Pump	328148
1	*Contactor	GM19498
1	*Transformer	GM19499
1	*Thermostat, high limit	GM19494
1	Fitting, elbow, street, 1/2 in.	X-211-1
1	Fitting, elbow, street, 1/2 in.	X-211-1
1	Coupling, hose	X-582-7
2	Coupling, hose	X-582-15
1	Fitting, tee, pipe, 1 x 1 x 1 in.	X-203-2
1	Plug, pipe	X-75-13
1	Nipple, pipe, 1 x 1 1/2 in.	X-218-24
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
1	Hose, coolant, 3/4 in. ID x 56.0 long	X-6367-5
4	Clamp, hose, .69/1.25 in.	X-426-12
1	Hose, coolant	X-6367-3
1	Tag, instruction	299896
2	Clamp, insulated, 1.06 in.	X-672-32
1	Coupling, hose	X-582-8
1	Bushing, adapter	GM10577
1	Thermostat	347742
1	Track, mounting, 1 in.	347278
1	Relay	291309
1	Socket	X-6124-4
2	Screw, hex washer head, drill	X-794-2
1	Washer, nylon, .878 ID x .132 in OD	276552
1	Wiring harness, FRIL relay circuit board	279956
1	Bushing, reducing, 1/2 x 3/4 in. NPT	X-202-41

Cooling System Kits, continued

Qty.	Description	Part No.
Block Heater, 240 V, 3-Phase		
GM10699-KA4		
1	Heater, block, 240 V (includes items marked *)	GM10702
1	*Element, block heater	GM19500
1	*Pump	328148
1	*Contactor	328217
1	*Transformer	328218
1	*Thermostat, high limit	GM19494
1	Fitting, elbow, street, 1/2 in.	X-211-1
1	Fitting, elbow, street, 1/2 in.	X-211-1
1	Coupling, hose	X-582-7
2	Coupling, hose	X-582-15
1	Fitting, tee, pipe, 1 x 1 x 1 in.	X-203-2
1	Plug, pipe	X-75-13
1	Nipple, pipe, 1 x 1 1/2 in.	X-218-24
2	Washer, beveled, .44 ID x 1.25 in. OD	X-6011-4
1	Hose, coolant, 3/4 in. ID x 56.0 long	X-6367-5
4	Clamp, hose, .69/1.25 in.	X-426-12
1	Hose, coolant	X-6367-3
1	Tag, instruction	299896
2	Clamp, insulated, 1.06 in.	X-672-32
1	Coupling, hose	X-582-8
1	Bushing, adapter	GM10577
1	Thermostat	347742
1	Track, mounting, 1 in.	347278
1	Relay	291309
1	Socket	X-6124-4
2	Screw, hex washer head, drill	X-794-2
1	Washer, nylon, .878 ID x .132 in OD	276552
1	Wiring harness, FRIL relay circuit board	279956
1	Bushing, reducing, 1/2 x 3/4 in. NPT	X-202-41
Block Heater, Single		
GM12080-KA1		
1	Bushing, reducing, 1/2 x 3/4 in. NPT	153659
1	Strap, ground	223033
4	Bumper	259632
1	Tag, hang	279047
1	Thermostat, block heater	279813
1	Heater, block	279816
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	Bushing, adapter	GM10577
1	Fitting, tee, pipe, 1/2 in.	X-203-13
1	Nipple, pipe, 1/2 x 1 3/16 in.	X-209-2
1	Pipe, 1/2 in. NPT	X-209-21
1	Fitting, elbow, pipe, 1/2 in.	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	Valve, drain	X-256-5
3	Fitting, 45° street elbow	X-274-13
1	Fitting, 45° street elbow	X-274-15
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Coupling, hose	X-582-7
2	Hose, coolant, 40 in.	X-6367-7
4	Screw, slotted hex washer head machine	X-97-13

Qty.	Description	Part No.
Block Heater, Single		
GM17215-KA1		
1	Heater, block	361246
1	Valve, shutoff	255612
1	Tag, hang	279047
1	Wiring harness	279956
1	Tag, instruction	299896
1	Tee, pipe, 1 x 1 x 1 in. NPT	X-203-3
2	Pipe, 1/2 in. NPT x 1.5 in.	X-209-5
1	Elbow, pipe, 90° x 1/2 in. NPT	X-215-1
1	Pipe, 1 in. NPT x 1.5 in.	X-218-24
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Connector, hose	X-582-15
2	Connector, hose	X-582-7
1	Hose, coolant	X-6367-3
1	Hose, oil proof	X-691-30
1	Plug, pipe, 1 in. NPT	X-75-13
Block Heater, Single		
GM17215-KA2		
1	Heater, block	361248
1	Valve, shutoff	255612
1	Tag, hang	279047
1	Wiring harness	279956
1	Tag, instruction	299896
1	Tee, pipe, 1 x 1 x 1 in. NPT	X-203-3
2	Pipe, 1/2 in. NPT x 1.5 in.	X-209-5
1	Elbow, pipe, 90° x 1/2 in. NPT	X-215-1
1	Pipe, 1 in. NPT x 1.5 in.	X-218-24
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Connector, hose	X-582-15
2	Connector, hose	X-582-7
1	Hose, coolant	X-6367-3
1	Hose, oil proof	X-691-30
1	Plug, pipe, 1 in. NPT	X-75-13
Block Heater, Single		
GM17215-KA3		
1	Heater, block	361249
1	Valve, shutoff	255612
1	Tag, hang	279047
1	Wiring harness	279956
1	Tag, instruction	299896
1	Tee, pipe, 1 x 1 x 1 in. NPT	X-203-3
2	Pipe, 1/2 in. NPT x 1.5 in.	X-209-5
1	Elbow, pipe, 90° x 1/2 in. NPT	X-215-1
1	Pipe, 1 in. NPT x 1.5 in.	X-218-24
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Connector, hose	X-582-15
2	Connector, hose	X-582-7
1	Hose, coolant	X-6367-3
1	Hose, oil proof	X-691-30
1	Plug, pipe, 1 in. NPT	X-75-13

Cooling System Kits, continued

Qty.	Description	Part No.
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Block Heater, Single		GM17215-KA4
1	Heater, block	361240
1	Valve, shutoff	255612
1	Tag, hang	279047
1	Wiring harness	279956
1	Tag, instruction	299896
1	Tee, pipe, 1 x 1 x 1 in. NPT	X-203-3
2	Pipe, 1/2 in. NPT x 1.5 in.	X-209-5
1	Elbow, pipe, 90° x 1/2 in. NPT	X-215-1
1	Pipe, 1 in. NPT x 1.5 in.	X-218-24
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Connector, hose	X-582-15
2	Connector, hose	X-582-7
1	Hose, coolant	X-6367-3
1	Hose, oil proof	X-691-30
1	Plug, pipe, 1 in. NPT	X-75-13

Block Heater, Single		GM17215-KA5
1	Heater, block	361247
1	Valve, shutoff	255612
1	Tag, hang	279047
1	Wiring harness	279956
1	Tag, instruction	299896
1	Tee, pipe, 1 x 1 x 1 in. NPT	X-203-3
2	Pipe, 1/2 in. NPT x 1.5 in.	X-209-5
1	Elbow, pipe, 90° x 1/2 in. NPT	X-215-1
1	Pipe, 1 in. NPT x 1.5 in.	X-218-24
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Connector, hose	X-582-15
2	Connector, hose	X-582-7
1	Hose, coolant	X-6367-3
1	Hose, oil proof	X-691-30
1	Plug, pipe, 1 in. NPT	X-75-13

Qty.	Description	Part No.
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Block Heater Isolation		PA-365308
1	Nipple, pipe	X-206-9
1	Nipple, pipe, 1/2 x 1 3/16 in.	X-209-2
1	Valve, shutoff	255612
1	Valve	255632

Block Heater Isolation		GM12529-KA1
1	Nipple, pipe, 1/2 x 2 in.	X-209-6
1	Nipple, pipe, 1/2 x 1 3/16 in.	X-209-2
1	Fitting, elbow, street, 1/2 in.	X-211-1
2	Valve, shutoff	255612

Radiator Duct Flange		365204
8	Rivet, pop, .187 in.	X-781-10
2	Frame, air duct	365210
2	Frame, air duct	365211

Radiator Duct Flange		GM10991-KA1
8	Rivet, pop, .187 in.	X-781-10
2	Frame, air duct	GM10992
2	Frame, air duct	GM10993

Radiator Duct Flange		GM17216-KA1
12	Rivet, pop, .187 in.	X-781-10
2	Frame, air duct, LS and RS	GM17661
2	Frame, air duct, top and bottom	GM17662

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
AO	anticipatory only	CSA	Canadian Standards Association	genset	generator set
API	American Petroleum Institute	CT	current transformer	GFI	ground fault interrupter
approx.	approximate, approximately	Cu	copper	GND, ⊕	ground
AR	as required, as requested	cu. in.	cubic inch	gov.	governor
AS	as supplied, as stated, as suggested	cw.	clockwise	gph	gallons per hour
ASE	American Society of Engineers	CWC	city water-cooled	gpm	gallons per minute
ASME	American Society of Mechanical Engineers	cyl.	cylinder	gr.	grade, gross
assy.	assembly	D/A	digital to analog	GRD	equipment ground
ASTM	American Society for Testing Materials	DAC	digital to analog converter	gr. wt.	gross weight
ATDC	after top dead center	dB	decibel	H x W x D	height by width by depth
ATS	automatic transfer switch	dBA	decibel (A weighted)	HC	hex cap
auto.	automatic	DC	direct current	HCHT	high cylinder head temperature
aux.	auxiliary	DCR	direct current resistance	HD	heavy duty
A/V	audiovisual	deg., °	degree	HET	high exhaust temperature
avg.	average	dept.	department	hex	hexagon
AVR	automatic voltage regulator	dia.	diameter	Hg	mercury (element)
AWG	American Wire Gauge	DI/EO	dual inlet/end outlet	HH	hex head
AWM	appliance wiring material	DIN	Deutsches Institut fur Normung e. V. (also Deutsche Industrie Normenausschuss)	HHC	hex head cap
bat.	battery	DIP	dual inline package	HP	horsepower
BBDC	before bottom dead center	DPDT	double-pole, double-throw	hr.	hour
BC	battery charger, battery charging	DPST	double-pole, single-throw	HS	heat shrink
BCA	battery charging alternator	DS	disconnect switch	hsg.	housing
BCI	Battery Council International	DVR	digital voltage regulator	HVAC	heating, ventilation, and air conditioning
BDC	before dead center	E, emer.	emergency (power source)	HWT	high water temperature
BHP	brake horsepower	EDI	electronic data interchange	Hz	hertz (cycles per second)
blk.	black (paint color), block (engine)	EFR	emergency frequency relay	IC	integrated circuit
blk. htr.	block heater	e.g.	for example (<i>exempli gratia</i>)	ID	inside diameter, identification
BMEP	brake mean effective pressure	EG	electronic governor	IEC	International Electrotechnical Commission
bps	bits per second	EGSA	Electrical Generating Systems Association	IEEE	Institute of Electrical and Electronics Engineers
br.	brass	EIA	Electronic Industries Association	IMS	improved motor starting
BTDC	before top dead center	EI/EO	end inlet/end outlet	in.	inch
Btu	British thermal unit	EMI	electromagnetic interference	in. H ₂ O	inches of water
Btu/min.	British thermal units per minute	emiss.	emission	in. Hg	inches of mercury
C	Celsius, centigrade	eng.	engine	in. lbs.	inch pounds
cal.	calorie	EPA	Environmental Protection Agency	Inc.	incorporated
CARB	California Air Resources Board	EPS	emergency power system	ind.	industrial
CB	circuit breaker	ER	emergency relay	int.	internal
cc	cubic centimeter	ES	engineering special, engineered special	int./ext.	internal/external
CCA	cold cranking amps	ESD	electrostatic discharge	I/O	input/output
ccw.	counterclockwise	est.	estimated	IP	iron pipe
CEC	Canadian Electrical Code	E-Stop	emergency stop	ISO	International Organization for Standardization
cfh	cubic feet per hour	etc.	et cetera (and so forth)	J	joule
cfm	cubic feet per minute	exh.	exhaust	JIS	Japanese Industry Standard
		ext.	external	k	kilo (1000)
		F	Fahrenheit, female	K	kelvin
				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 Appendix C, General Torque Specifications, and other torque specifications in the service literature.

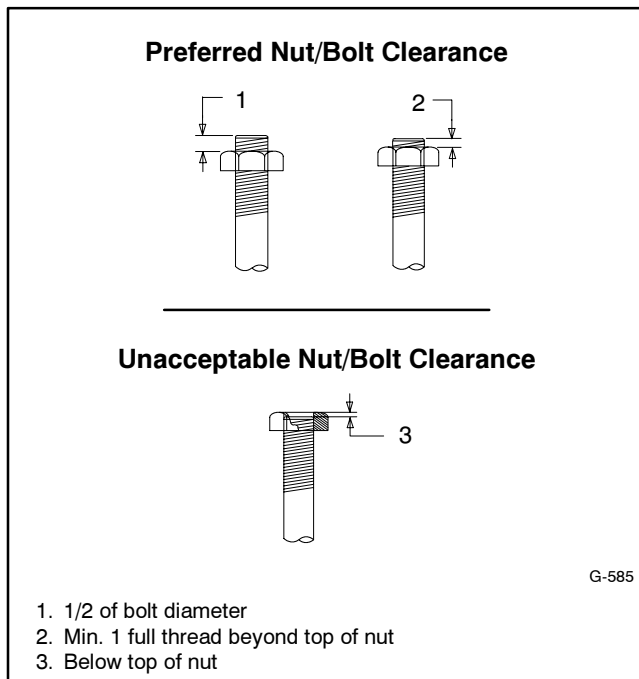


Figure 1 Acceptable Bolt Lengths

1. 1/2 of bolt diameter
2. Min. 1 full thread beyond top of nut
3. Below top of nut

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.

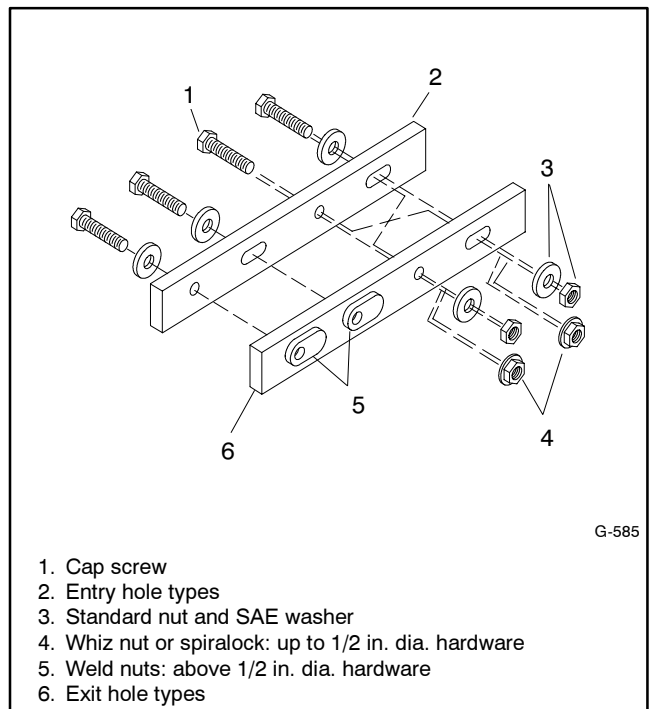


Figure 2 Acceptable Hardware Combinations

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

Appendix C General Torque Specifications















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












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






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

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

Appendix D Common Hardware Identification

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

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

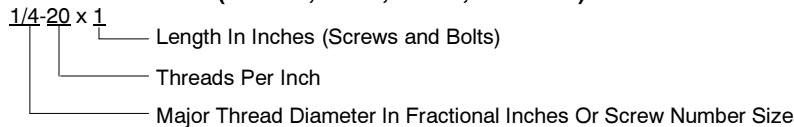
Hardness Grades	
American Standard	
Grade 2	
Grade 5	
Grade 8	
Grade 8/9 (Hex Socket Head)	
Metric	
Number stamped on hardware; 5.8 shown	

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

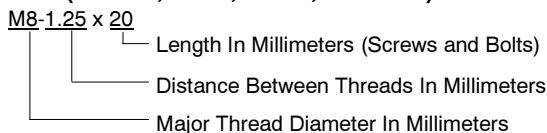
Phillips® screw is a registered trademark of Phillips Screw Company.

Sample Dimensions

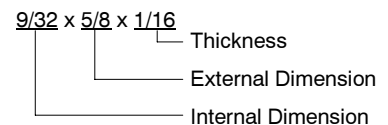
American Standard (Screws, Bolts, Studs, and Nuts)



Metric (Screws, Bolts, Studs, and Nuts)



Plain Washers



Lock Washers



Appendix E Common Hardware List

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

American Standard

Part No.	Dimensions	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-6024-5	7/16-14 x .75	X-6009-1	1-8	Standard
X-465-6	1/4-20 x .50	X-6024-2	7/16-14 x 1.00	X-6210-3	6-32	Whiz
X-465-2	1/4-20 x .62	X-6024-8	7/16-14 x 1.25	X-6210-4	8-32	Whiz
X-465-16	1/4-20 x .75	X-6024-3	7/16-14 x 1.50	X-6210-5	10-24	Whiz
X-465-18	1/4-20 x .88	X-6024-4	7/16-14 x 2.00	X-6210-1	10-32	Whiz
X-465-7	1/4-20 x 1.00	X-6024-11	7/16-14 x 2.75	X-6210-2	1/4-20	Spiralock
X-465-8	1/4-20 x 1.25	X-6024-12	7/16-14 x 6.50	X-6210-6	1/4-28	Spiralock
X-465-9	1/4-20 x 1.50	X-129-15	1/2-13 x .75	X-6210-7	5/16-18	Spiralock
X-465-10	1/4-20 x 1.75	X-129-17	1/2-13 x 1.00	X-6210-8	5/16-24	Spiralock
X-465-11	1/4-20 x 2.00	X-129-18	1/2-13 x 1.25	X-6210-9	3/8-16	Spiralock
X-465-12	1/4-20 x 2.25	X-129-19	1/2-13 x 1.50	X-6210-10	3/8-24	Spiralock
X-465-14	1/4-20 x 2.75	X-129-20	1/2-13 x 1.75	X-6210-11	7/16-14	Spiralock
X-465-21	1/4-20 x 5.00	X-129-21	1/2-13 x 2.00	X-6210-12	1/2-13	Spiralock
X-465-25	1/4-28 x .38	X-129-22	1/2-13 x 2.25	X-6210-15	7/16-20	Spiralock
X-465-20	1/4-28 x 1.00	X-129-23	1/2-13 x 2.50	X-6210-14	1/2-20	Spiralock
X-125-33	5/16-18 x .50	X-129-24	1/2-13 x 2.75	X-85-3	5/8-11	Standard
X-125-23	5/16-18 x .62	X-129-25	1/2-13 x 3.00	X-88-12	3/4-10	Standard
X-125-3	5/16-18 x .75	X-129-27	1/2-13 x 3.50	X-89-2	1/2-20	Standard
X-125-31	5/16-18 x .88	X-129-29	1/2-13 x 4.00			
X-125-5	5/16-18 x 1.00	X-129-30	1/2-13 x 4.50			
X-125-24	5/16-18 x 1.25	X-463-9	1/2-13 x 5.50			
X-125-34	5/16-18 x 1.50	X-129-44	1/2-13 x 6.00			
X-125-25	5/16-18 x 1.75	X-129-51	1/2-20 x .75			
X-125-26	5/16-18 x 2.00	X-129-45	1/2-20 x 1.25			
230578	5/16-18 x 2.25	X-129-52	1/2-20 x 1.50			
X-125-29	5/16-18 x 2.50	X-6021-3	5/8-11 x 1.00			
X-125-27	5/16-18 x 2.75	X-6021-4	5/8-11 x 1.25			
X-125-28	5/16-18 x 3.00	X-6021-2	5/8-11 x 1.50			
X-125-22	5/16-18 x 4.50	X-6021-1	5/8-11 x 1.75			
X-125-32	5/16-18 x 5.00	273049	5/8-11 x 2.00			
X-125-35	5/16-18 x 5.50	X-6021-5	5/8-11 x 2.25			
X-125-36	5/16-18 x 6.00	X-6021-6	5/8-11 x 2.50			
X-125-40	5/16-18 x 6.50	X-6021-7	5/8-11 x 2.75			
X-125-43	5/16-24 x 1.75	X-6021-12	5/8-11 x 3.75			
X-125-44	5/16-24 x 2.50	X-6021-11	5/8-11 x 4.50			
X-125-30	5/16-24 x .75	X-6021-10	5/8-11 x 6.00			
X-125-39	5/16-24 x 2.00	X-6021-9	5/8-18 x 2.50			
X-125-38	5/16-24 x 2.75	X-6239-1	3/4-10 x 1.00			
X-6238-2	3/8-16 x .62	X-6239-8	3/4-10 x 1.25			
X-6238-10	3/8-16 x .75	X-6239-2	3/4-10 x 1.50			
X-6238-3	3/8-16 x .88	X-6239-3	3/4-10 x 2.00			
X-6238-11	3/8-16 x 1.00	X-6239-4	3/4-10 x 2.50			
X-6238-4	3/8-16 x 1.25	X-6239-5	3/4-10 x 3.00			
X-6238-5	3/8-16 x 1.50	X-6239-6	3/4-10 x 3.50			
X-6238-1	3/8-16 x 1.75	X-792-1	1-8 x 2.25			
X-6238-6	3/8-16 x 2.00	X-792-5	1-8 x 3.00			
X-6238-17	3/8-16 x 2.25	X-792-8	1-8 x 5.00			
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					

Washers

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

Metric

Hex head bolts are hardness grade 8.8 unless noted.

Part No.	Dimensions	Part No.	Dimensions	Part No.	Dimensions	Type
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					
M931-06070-60	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					
M931-06150-60	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					
M931-08120-60	M8-1.25 x 120					
M931-08130-60	M8-1.25 x 130					
M931-08140-60	M8-1.25 x 140					
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					
M931-10055-60	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					
M931-10090-60	M10-1.50 x 90					
M931-10090-82	M10-1.50 x 90*					
M931-10100-60	M10-1.50 x 100					
M931-10110-60	M10-1.50 x 110					
M931-10120-60	M10-1.50 x 120					
M931-10130-60	M10-1.50 x 130					
M931-10140-60	M10-1.50 x 140					
M931-10180-60	M10-1.50 x 180					
M931-12045-60	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					
M931-12055-60	M12-1.75 x 55					
M931-12060-60	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					
M960-16090-60	M16-1.50 x 90					
M931-16090-60	M16-2.00 x 90					
M931-16100-60	M16-2.00 x 100					
M931-20065-60	M20-2.50 x 65					
M931-20120-60	M20-2.50 x 120					
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					
M933-05035-60	M5-0.80 x 35					
M933-05050-60	M5-0.80 x 50					
M933-06010-60	M6-1.00 x 10					
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					
M933-08012-60	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					
M961-10030-60	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					
M933-12016-60	M12-1.75 x 16					
M933-12020-60	M12-1.75 x 20					
M933-12025-60	M12-1.75 x 25					
M933-12025-82	M12-1.75 x 25*					
M961-12030-60	M12-1.25 x 30					
M933-12030-60	M12-1.75 x 30					
M933-12035-60	M12-1.75 x 35					
M961-12040-82	M12-1.25 x 40*					
M933-12040-60	M12-1.75 x 40					
M933-12040-82	M12-1.75 x 40*					
M961-14025-60	M14-1.50 x 25					
M933-14025-60	M14-2.00 x 25					
M961-16025-60	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					
M933-16050-60	M16-2.00 x 50					
M933-16050-82	M16-2.00 x 50*					
M933-16060-60	M16-2.00 x 60					
M933-18035-60	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					
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-04020-20	M4-0.70 x 20					
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-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					
Hex Nuts						
M934-03-50	M3-0.50	Standard				
M934-035-50	M3.5-0.50	Standard				
M934-04-50	M4-0.70	Standard				
M934-05-50	M5-0.80	Standard				
M982-05-80	M5-0.80	Elastic Stop				
M934-06-60	M6-1.00	Standard				
M934-06-64	M6-1.00	Std. (green)				
M6923-06-80	M6-1.00	Spirallock				
M982-06-80	M6-1.00	Elastic Stop				
M934-08-60	M8-1.25	Standard				
M6923-08-80	M8-1.25	Spirallock				
M982-08-80	M8-1.25	Elastic Stop				
M934-10-60	M10-1.50	Standard				
M934-10-60F	M10-1.25	Standard				
M6923-10-80	M10-1.50	Spirallock				
M6923-10-62	M10-1.50	Spirallock†				
M982-10-80	M10-1.50	Elastic Stop				
M934-12-60	M12-1.75	Standard				
M934-12-60F	M12-1.25	Standard				
M6923-12-80	M12-1.75	Spirallock				
M982-12-80	M12-1.75	Elastic Stop				
M982-14-80	M14-2.00	Elastic Stop				
M6923-16-80	M16-2.00	Spirallock				
M982-16-80	M16-2.00	Elastic Stop				
M934-18-80	M18-2.5	Standard				
M982-18-80	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				
M982-24-80	M24-3.00	Elastic Stop				
M934-30-80	M30-3.50	Standard				
Washers						
Part No.	ID	OD	Bolt/ Thick.	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 bolt's hardness is grade 10.9.

† This metric hex nut's hardness is grade 8.

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