

Service Parts



Generator Sets

Models:

125-275DSEJD

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

See MP-6009 Parts Catalog Industrial Controllers
for controller parts



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Introduction

This manual lists service replacement parts for generator set models as listed on the front cover.

Information in this publication represents data available at the time of print. The manufacturer of DDC/MTU products reserves the right to change this publication and the products represented without notice and without any obligation or liability whatsoever.

This manual includes the following main sections:

Table of Contents. Lists the sections of the manual.

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

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

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

Kit Sections. List modules and accessories and their parts.

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

Numbering System Significance

This manual uses the following numbering systems:

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

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

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

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

Illustrations

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

How to Find Part Numbers

Use the following steps to locate a service replacement part.

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

Hardware References

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

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

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

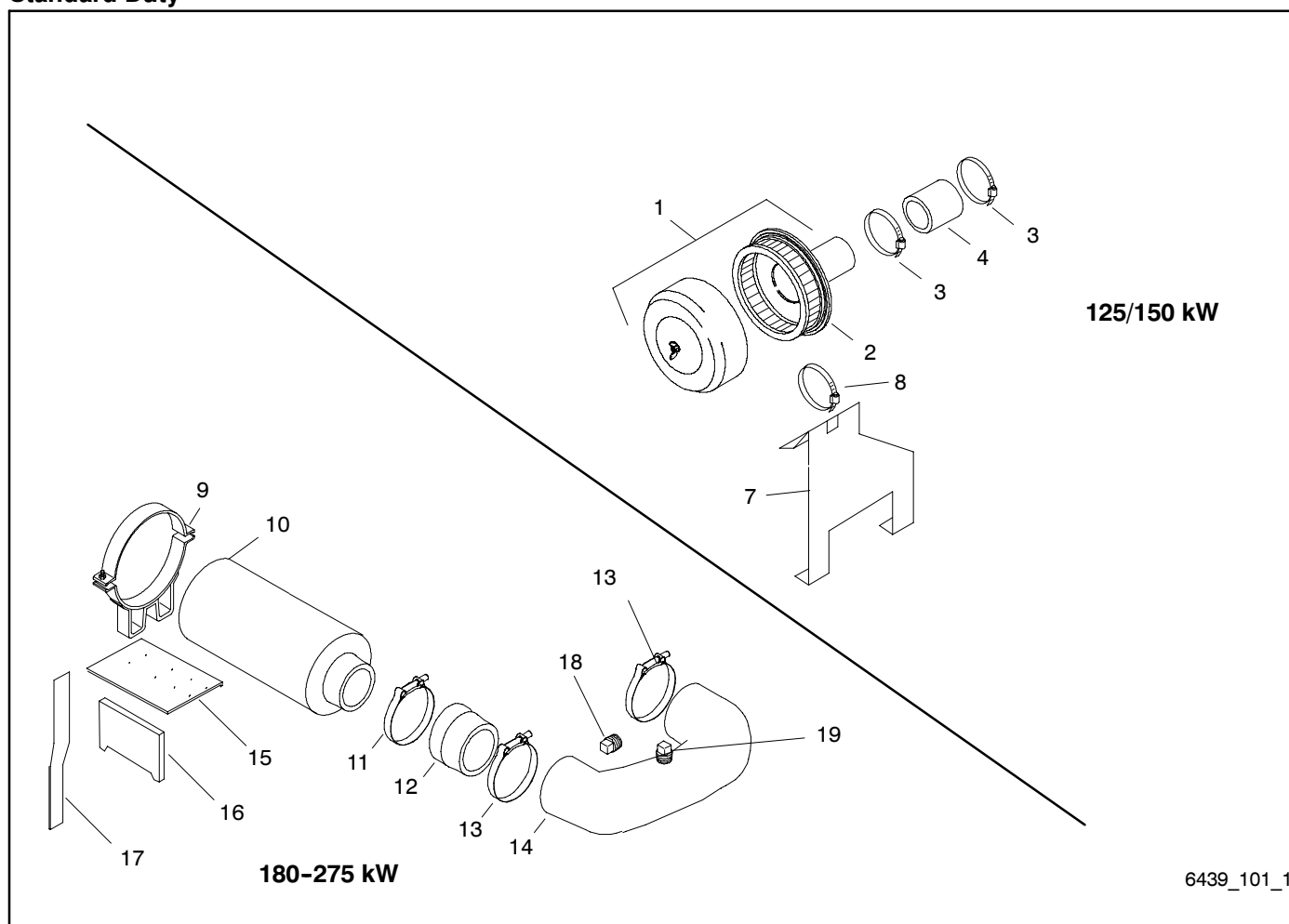
Specification Number Index

Group Title	Air Intake	Cooling System	Engine	Nameplates and Decals	Skid and Plant Mounting	Generator and Mounting	Controller and Mounting	Literature
Group No.	101	104	105	107	109	201	301	701
Spec No.	Variation Number							
125DSEJD								
GM48076-GA1S	*	*	1	GR1	*	*	†	272
GM48076-GA2S	*	*	2	GR1	*	*	†	272
150DSEJD								
GM48076-GA3S	*	*	3	GR1	*	*	†	274
GM48076-GA4S	*	*	4	GR1	*	*	†	274
180DSEJD								
GM39060-GA4S	*	*	5	GR4	*	*	†	261
200DSEJD								
GM39060-GA3S	*	*	5	GR5	*	*	†	262
230DSEJD								
GM46340-GA1S	*	*	6	GR2	*	*	†	263
250DSEJD								
GM46340-GA2S	*	*	6	GR2	*	*	†	264
275DSEJD								
GM46340-GA3S	*	*	6	GR2	*	*	†	265

- * Configured group. Refer to the generator set nameplate for the module number.
Turn to the respective group on the following pages for parts breakdowns.
- † Configured group. Refer to the generator set nameplate for the module number.
See MP-6009 P/C Controllers for controller parts lists.

Air Intake

Standard Duty

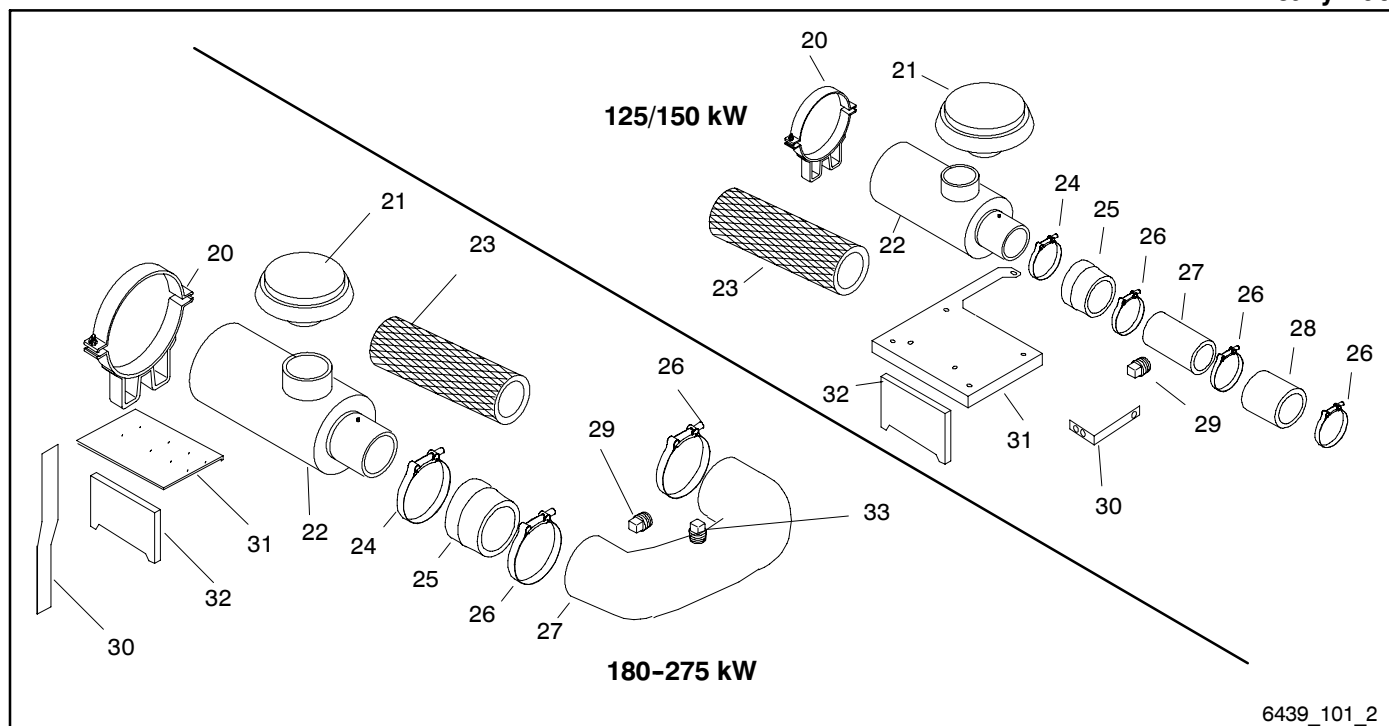


Find the installed module number on the generator set nameplate.

Item	Part Number	Description	Quantity			
			Module			
			GM48737-MA1	GM46988-MA1	GM46988-MA2	GM46346-MA1
1	A-273700	Air cleaner	1			
2	253108	Element, air cleaner	1			
3	274545	Clamp, hose, 4.31/4.62 in.	2			
4	X-6350-1	Hose, straight, 4 in. ID	1			
7	352336	Bracket, mounting	1			
8	X-426-5	Clamp, hose, 3.56/4.5 in.	1			
9	343218	Clamp, air cleaner, 9.8 in. ID		2	2	2
10	343219	Air cleaner, industrial		1	1	1
11	254013	Clamp, hose, 6.25/6.56 in.		1	1	1
12	272628	Hose, hump, reducer, 6 to 5 in. ID		1	1	1
13	291562	Clamp, hose, 5.25/5.56 in.		2	2	2
14	GM47064	Tube, steel		1	1	1
15	GM46944	Bracket, air cleaner		1	1	
15	GM46336	Bracket, air intake				1
16	GM46945	Support, air cleaner		1		
16	GM46946	Support, air cleaner			1	
17	GM46947	Support, air cleaner		2	2	
18	X-75-4	Plug, pipe, 1/8 in. NPTF				1
19	X-75-49	Plug, pipe, 3/4 in. NPTF, sq. key head				1

Air Intake

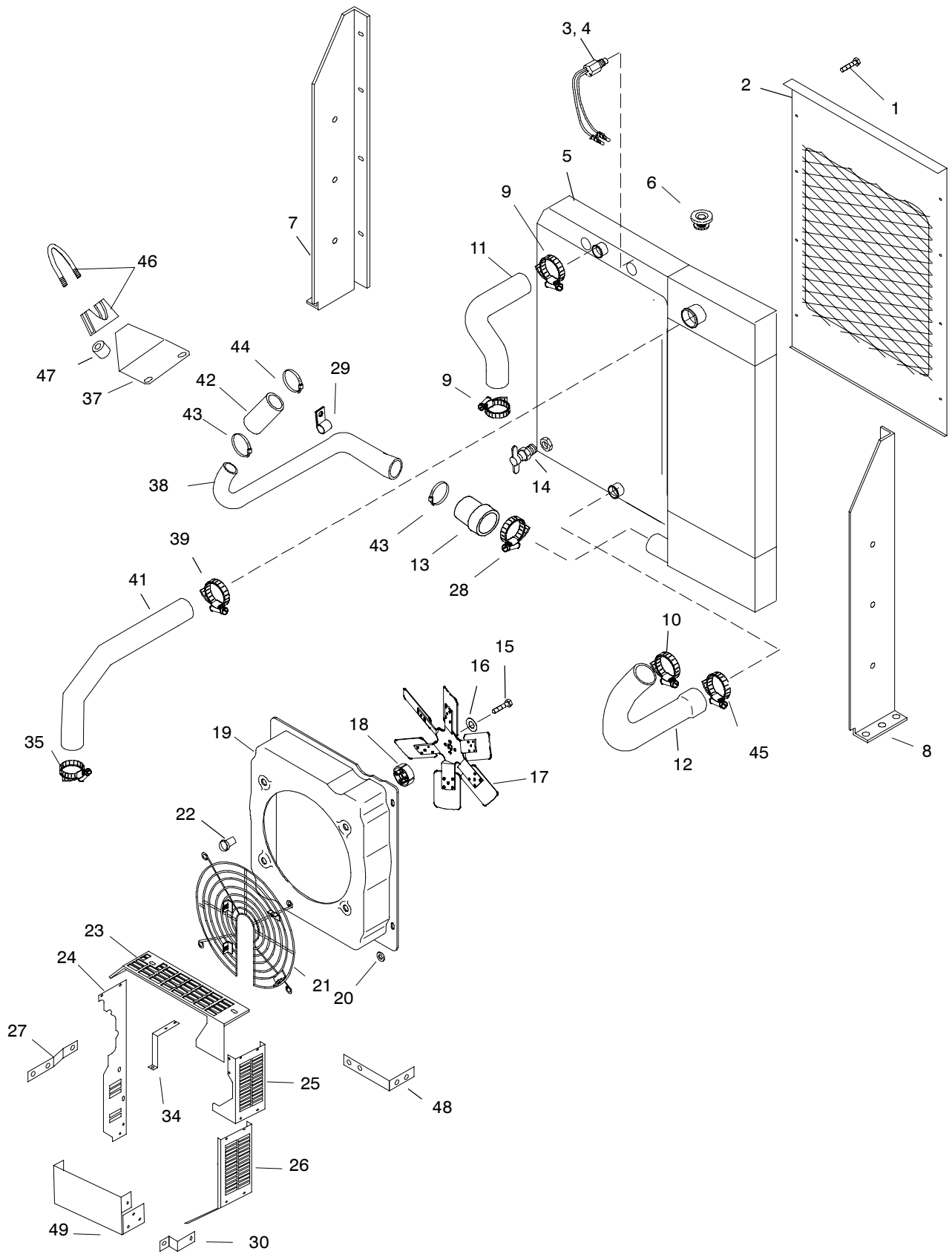
Heavy Duty



Find the installed module number on the generator set nameplate.

Item	Part Number	Description	Quantity			
			Module			
			GM48777-MA1	GM46989-MA1	GM46989-MA2	GM46347-MA1
20	290956	Mount, air cleaner/exhaust, 11.8 in. ID		2	2	
20	326911	Mount, air cleaner/exhaust, 12.1 in. ID	2			
20	254012	Mount, air cleaner/exhaust, 14.0 in. ID				2
21	254010	Cap, rain		1	1	1
21	254006	Cap, rain	1			
22	GM46952	Air cleaner assembly		1	1	
22	A-324360	Air cleaner assembly	1			
22	254004	Air cleaner assembly				1
23	274729	Element, air cleaner	1			
23	254477	Element, air cleaner				1
23	GM46953	Element, primary		1	1	
23	GM47969	Element, safety		1	1	
24	291562	Clamp, hose, 5.25/5.56 in.	1	1	1	
24	254013	Clamp, hose, 6.25/6.56 in.				1
25	GM48786	Hose, hump	1			
25	GM46948	Hose, hump		1	1	
25	272628	Hose, hump reducer, 6 to 5 in. ID				1
26	274545	Clamp, hose, 4.31/4.62 in.	3			
26	291562	Clamp, hose, 5.25/5.56 in.		2	2	2
27	X-522-87	Tube assembly	1			
27	GM47064	Tube, steel		1	1	1
28	X-6350-1	Hose, straight, 4 in. ID	1			
29	X-75-4	Plug, pipe, 1/8 in. NPTF				1
30	GM48790	Bracket, support HDAC	1			
30	GM46947	Support, air cleaner		2	2	
31	GM48788	Bracket, mounting HDAC	1			
31	GM46944	Bracket, air cleaner		1	1	
31	GM46336	Bracket, air intake				1
32	GM48789	Bracket, support HDAC	1			
32	GM46945	Support, air cleaner		1		
32	GM46946	Support, air cleaner			1	
33	X-75-49	Plug, pipe, 3/4 in. NPTF, sq. key head				1

Cooling System



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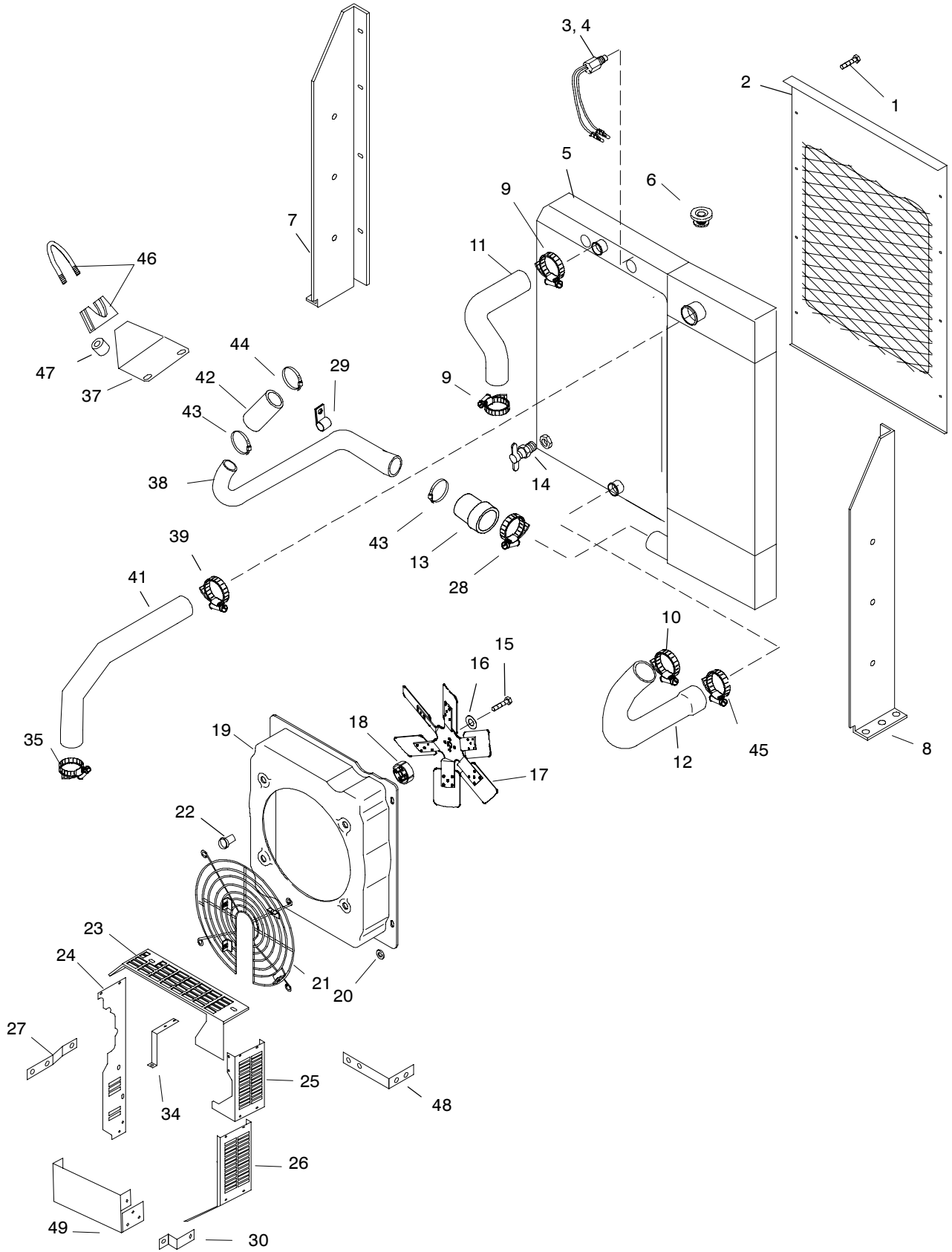
Cooling System, continued

Find the installed module number on the generator set nameplate.

Item	Part Number	Description	Quantity			
			Module			
			GM48078-MA1	GM48078-MA2	GM46987-MA1	GM46342-MA1
1	X-794-1	Screw, hex washer head, drill	10	10	10	10
2	GM32060	Guard, radiator	1	1		
2	GM38873	Guard, radiator			1	1
3	365289	Sensor, low fluid	1	1	1	1
4	X-6003-8	Conduit, convoluted	1	1	1	1
5	GM46335	Radiator/CAC assembly				1
5	GM31838	Radiator/CAC assembly	1			
5	GM31839	Radiator/CAC assembly		1		
5	GM39205	Radiator/CAC assembly			1	
6	GM22998	Cap, radiator	1	1	1	1
7	GM29990	Support, radiator, left side	1	1		
7	GM39280	Support, radiator, left side			1	1
8	GM29989	Support, radiator, right side	1	1		
8	GM39279	Support, radiator, right side			1	1
9	X-426-6	Clamp, hose, 1.56/2.5 in.	2	2	2	
9	324330	Clamp, hose, 2.94/3.25 in.				4
10	X-426-16	Clamp, hose	1	1	1	
10	X-426-2	Clamp, hose				1
11	GM32629	Hose, upper radiator	1			
11	GM32043	Hose, upper radiator		1		
11	GM46827	Hose, upper radiator			1	
11	GM46338	Tube, intake CAC				1
12	GM46337	Hose, lower radiator				1
12	GM32044	Hose, lower radiator	1	1		
12	GM39261	Hose, lower radiator			1	
13	GM24857	Hose, reducer, 3 to 2 in. ID	1	1	1	
13	X-6380-4	Hose				1
14	X-256-3	Valve, drain, 1/4 in. NPT	1	1	1	1
15	M931-08100-60	Screw, hex cap	4	4		
15	M931-08130-60	Screw, hex cap			4	
15	M931-10120-60	Screw, hex cap				6
16	X-801-4	Washer, hardened, .328 ID x .719 in. OD	4	4	4	
16	X-801-3	Washer, hardened, .406 ID x .812 in. OD				6
17	GM39048	Fan, pusher				1
17	GM19383	Fan, pusher	1	1		
17	GM39049	Fan, pusher			1	
18	GM20545	Spacer, fan	1	1		
18	GM39311	Spacer, fan			1	
18	336668	Spacer, fan				1
19	343003	Shroud, fan				1
19	222953	Shroud, fan	1	1		
19	343054	Shroud, fan			1	
19	343422	Bracket, fan shroud (not shown)			1	
19	343423	Bracket, fan shroud (not shown)				1
20	X-25-75	Washer, plain, .344 ID x .875 in. OD	8	8	6	
21	336888	Guard, wire fan	1	1		
21	343062	Guard, wire fan			1	
21	343004	Guard, wire fan				1
22	X-6365-2	Insert, threaded	6	6	6	6
23	GM48853	Guard, belt top	1	1		
23	GM46968	Guard, belt, top			1	
23	GM47049	Guard, belt, top				1
24	GM48856	Guard, belt, left side	1	1		
24	GM46967	Guard, belt, left side			1	
24	GM47048	Guard, belt, left side				1
25	GM48854	Guard, belt, right side upper	1	1		
25	GM46965	Guard, belt, right side upper			1	
25	GM47047	Guard, belt, right side				1
26	GM48855	Guard, belt, right side lower	1	1		
26	GM46966	Guard, belt, right side lower			1	

Parts list continues on next page.

Cooling System



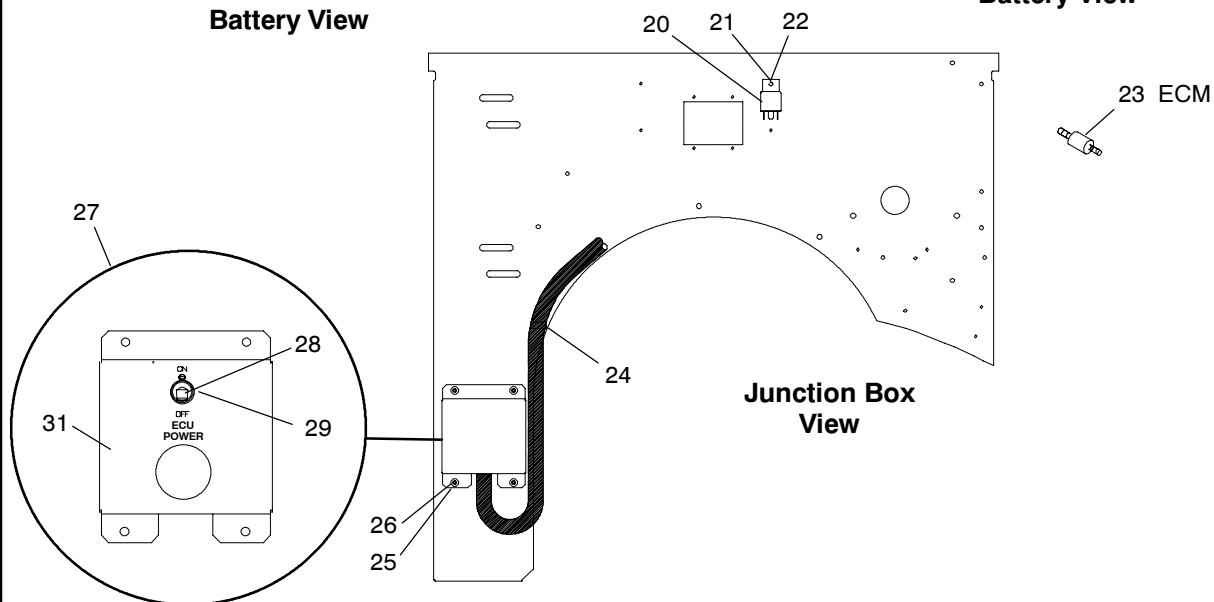
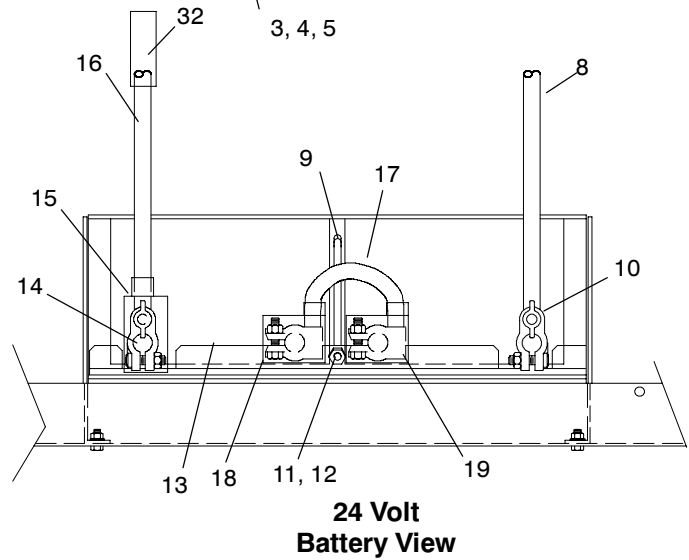
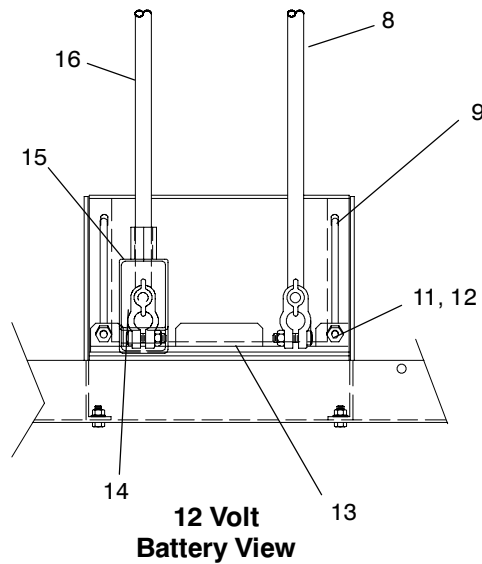
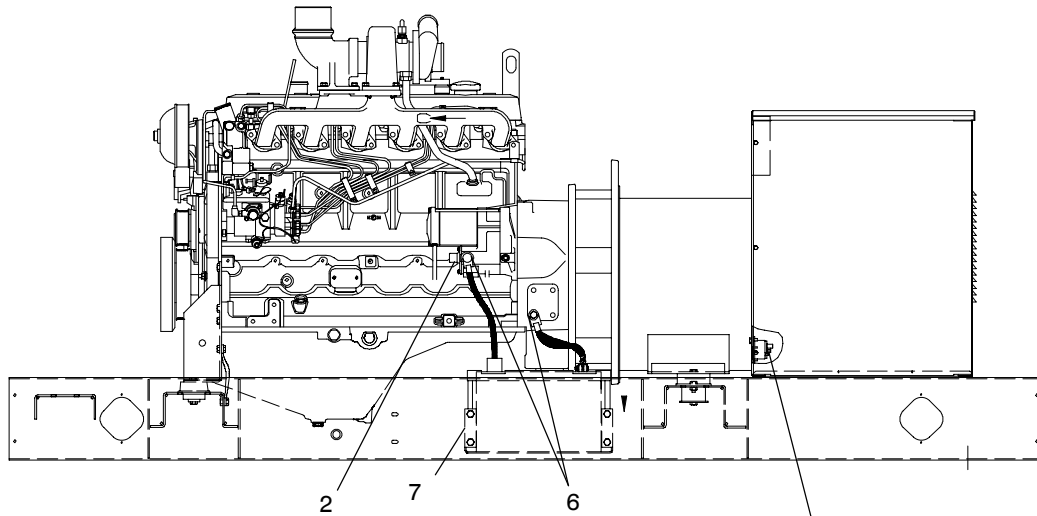
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Cooling System, continued

Find the installed module number on the generator set nameplate.

Item	Part Number	Description	Quantity			
			Module			
			GM48078-MA1	GM48078-MA2	GM46987-MA1	GM46342-MA1
27	GM48860	Bracket, support	1	1		
27	GM46970	Bracket, support			1	
27	GM47051	Bracket, belt guard mtg.				1
28	324330	Clamp, hose, 2.94/3.25 in.	1	1	1	1
29	X-722-5	Clamp	1	1	1	
29	X-414-11	Clamp, non-insulated				1
30	GM39484	Bracket, support	1	1	1	
30	GM47051	Bracket, belt guard mtg.				1
34	GM48858	Bracket, support	1	1		
34	GM46969	Bracket, support			1	
34	GM47053	Bracket, belt guard mtg.				1
35	X-426-16	Clamp, hose 1.81/2.75 in.	1	1		
35	X-426-1	Clamp, hose, 2.81/3.75 in.			1	
35	X-426-2	Clamp, hose, 2.31/3.25 in.				1
37	GM32630	Shield, heat				1
38	GM48736	Tube, turbo	1	1		
38	GM46943	Tube, turbo			1	
38	GM46339	Tube, turbo				1
38	GM39372	Bracket, tube support (not shown)				1
39	X-426-2	Clamp, hose, 2.31/3.25 in.				1
39	X-426-1	Clamp, hose, 2.81/3.75 in.	1	1	1	
40	249887	Clamp, hose, 2.25/2.56 in.	1	1	1	
40	324330	Clamp, hose, 2.94/3.25 in.				1
41	GM48079	Hose, intake	1	1		
41	GM39269	Hose, radiator upper				1
41	GM39263	Hose, intake			1	
42	X-6380-3	Hose	1	1	1	1
43	276319	Clamp, hose, 2.13/2.44	1	1		
43	249887	Clamp, hose, 2.25/2.56 in.			1	
43	324330	Clamp, hose, 2.94/3.25 in.				1
44	276319	Clamp, hose, 2.13/2.44	1	1		
44	249887	Clamp, hose, 2.25/2.56 in.			1	
44	324330	Clamp, hose, 2.94/3.25 in.				1
45	X-426-16	Clamp, hose	1	1	1	1
46	286283	Clamp, muffler, 3.12 in.				1
47	X-400-198	Spacer				2
48	GM48859	Bracket, support	1	1		
48	GM46971	Bracket, support			1	
49	GM39465	Guard, belt front				1
49	GM47050	Guard, belt bottom				1
49	GM36179	Guard, belt bottom	1	1		
49	GM39480	Guard, belt bottom			1	

Engine



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Engine

Item	Part Number	Description	Quantity					
			Var.					
1	2	3	4	5	6	7	8	9
1	—	Engine assembly (see chart below)	1	1	1	1	1	1
2	GM22350	Boot, starter terminal	1	1	1	1		
3	291891	Solenoid, 12 V	1		1			
3	268371	Solenoid, 24 V		1			1	1
4	X-6214-2	Cap	1	1	1	1	1	1
5	X-22-12	Washer, lock, .262 ID x .743 in. OD	2	3	2	3	3	3
6	X-22-26	Washer, lock, .521 ID x 1.24 in. OD	2	2	2	2	2	
6	X-22-30	Washer, lock, .652 ID x 1.058 in. OD						1
7	GM23203	Rack, battery	1		1			
7	GM19543	Rack, battery		1		1		
7	GM30631	Rack, battery					1	1
8	X-545-165	Cable, battery	1		1		1	
8	X-545-112	Cable, battery, No. 2, 16 in.		1		1		
8	X-545-194	Cable, battery						1
9	286316	Bolt, angle	2	1	2	1	1	1
10	345056	Terminal, battery		1		1		
11	X-101-4	Nut, hex elastic stop, 5/16-24	2	1	2	1	1	
12	X-25-85	Washer, plain	2	1	2	1		
12	X-25-44	Washer, plain					1	1
13	343221	Clamp, battery					1	1
13	336673	Clamp, battery	1		1			
13	343089	Clamp, battery		1		1		
14	345039	Terminal, battery		1		1		
15	GM20745	Boot, battery lug		1		1		1
15	GM20743	Boot, battery lug	1		1		1	
16	X-545-129	Cable, battery	1	1	1	1	1	1
17	280133	Lead, battery cable, 8.5 in.		1		1		
17	X-545-73	Cable, battery, No. 0, 8 in.					1	1
18	GM20748	Boot, battery, 90 deg. right		1		1		
18	GM20745	Boot, battery lug					1	1
19	GM20744	Boot, battery lug		1		1		
19	GM20745	Boot, battery lug					1	1
20	259391	Relay, 12 V	1		1			
20	272684	Relay, 24 V		1		1		1
21	M7985A-05012-20	Screw, pan head machine	1	1	1	1		1
22	M934-05-50	Washer, plain	1	1	1	1		1
23	—	ECM (see engine parts catalog for part number)	1	1	1	1	1	1
23	GM38784-3	Vibromount, controller (not shown)					4	
24	361567	Base, tie wrap	1	1	1	1		
25	M7985A-05012-20	Screw, pan head machine	4	4	4	4	4	4
26	M934-05-50	Washer, plain	4	4	4	4	4	4
27	GM42213	Box, assembly, diagnostic (includes items 28, 29, 31)	1	1	1	1	1	1
28	295030	Switch, toggle	1	1	1	1	1	1
29	151511	Ring, lock	1	1	1	1	1	1
31	GM42212	Box, engine diagnostic	1	1	1	1	1	1
32	GM22350	Boot, starter terminal					1	1

Engine Part Number

Use this table to identify the variation number's engine part number.

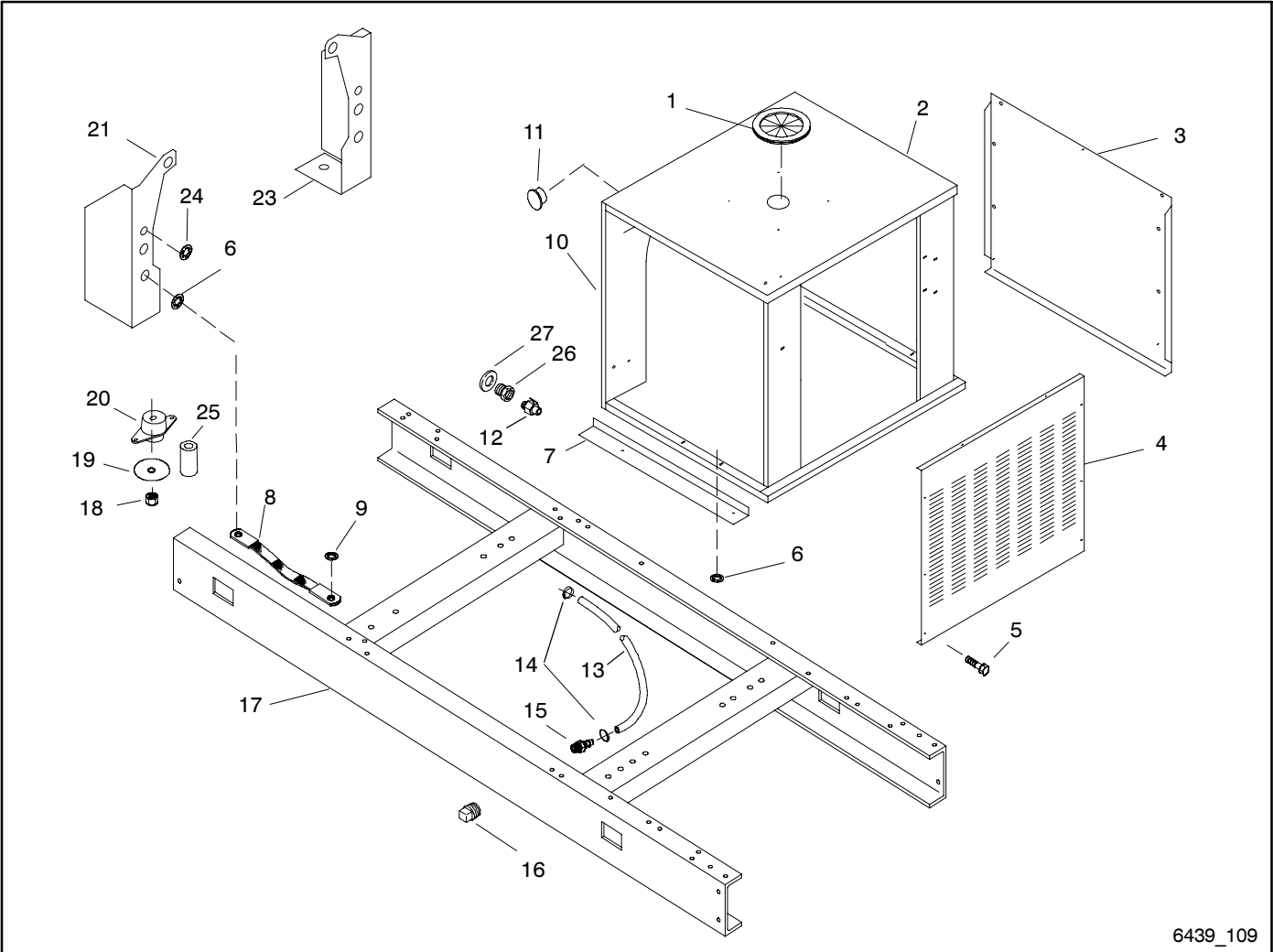
Variation No.	Module Number	Model	Engine Part Number	Engine Description
1	GM48077-GR1	125	GM40255-1	6068HF285, 12 V
2	GM48077-GR2	125	GM40255-2	6068HF285, 24 V
3	GM48077-GR3	150	GM40255-1	6068HF285, 12 V
4	GM48077-GR4	150	GM40255-2	6068HF285, 24 V
5	GM39061-GR4	180/200	GM40256-2	6068HF485, 24 V
6	GM46341-GR1	230/250/275	GM40257	6090HF485, 24 V

Notes

Nameplate and Decals

Item	Part Number	Description	Quantity			
			Module			
			GM14282-GR1S	GM14282-GR2S	GM14282-GR3S	GM14282-GR4S
1	238402	Decal, caution positive terminal only	1	1	1	1
2	249808	Decal, warning rotating parts	1	1	1	1
3	249809	Decal, caution hot engine	2	2	2	2
4	249810	Decal, warning hot coolant	1	1	1	1
5	273780	Decal, warning explosion	1	1	1	1
6	257438	Decal, danger moving rotor	3	3	3	3
7	257441	Decal, warning lifting eye	1	1	1	1
8	258815	Decal, warning voltage backfeed	1	1	1	1
9	GM13776	Decal, FRIL reconnection	1	1	1	1
10	324069	Nameplate, model/ratings	1	1	1	1
11	GM23477-4	Decal, DDC/MTU logo	2		2	2
11	GM23477-7	Decal, DDC/MTU logo		2		
12	GM15300	Decal, exhaust piping	1	1	1	1
13	GM19296	Decal, fuel type	1	1	1	1
14	343165	Decal, caution not a step				1
15	364116	Decal, caution welding disconnect				1

Skid and Plant Mounting



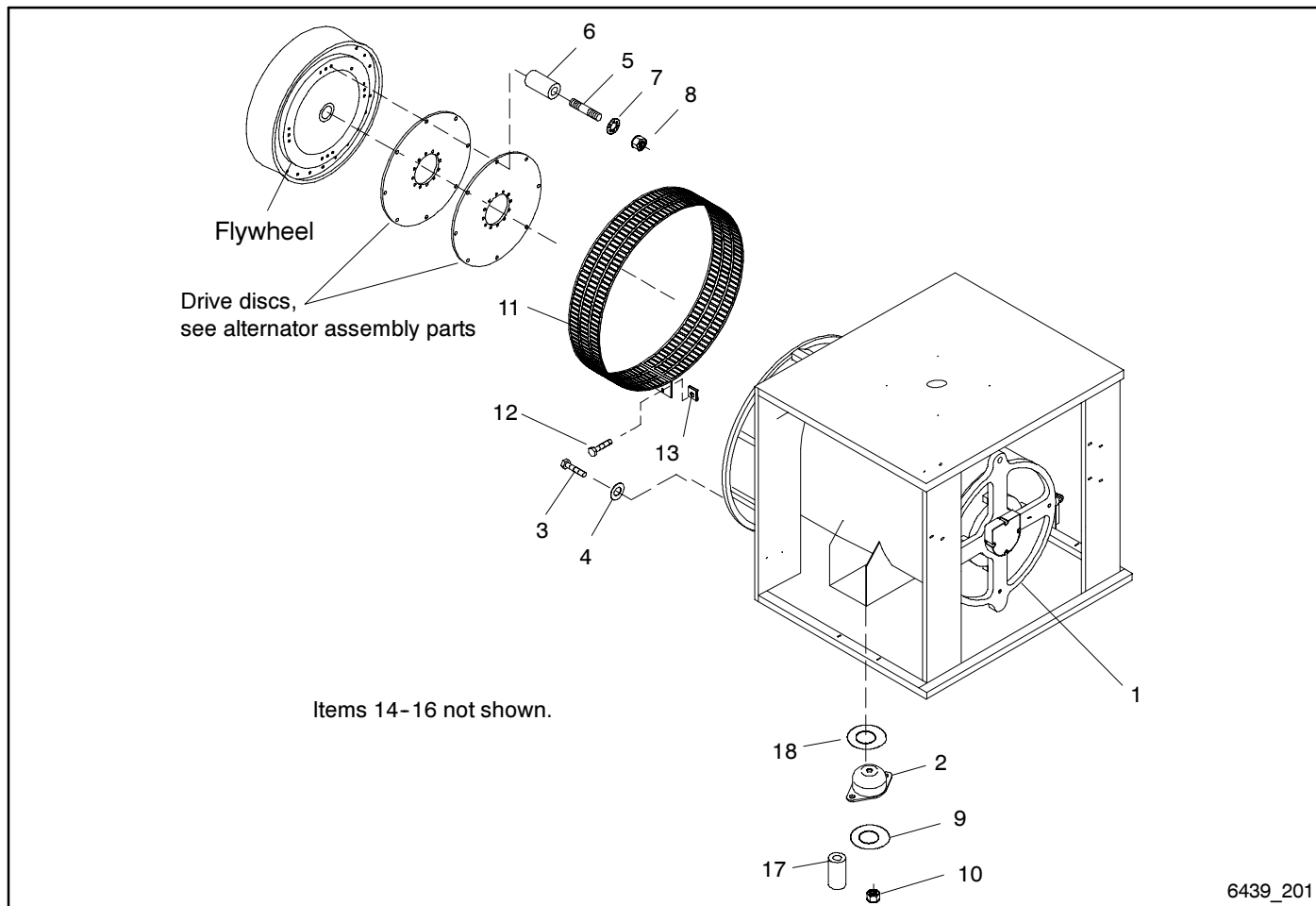
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Skid and Plant Mounting

Find the installed module number on the generator set nameplate.

Item	Part Number	Description	Quantity			
			Module			
			GM20497-MA2	GM39063-MA3	GM39063-MA4	GM46343-MA1
1	X-284-31	Grommet, round	1			
2	GM17623	Panel, junction box, front	1		1	
2	GM10555	Box, junction		1		1
2	324861	Plug, button (not shown)		4		4
3	GM17640-BLK	Cover, side	2		2	
3	336001-BLK	Cover, side		2		2
4	GM17625-BLK	Cover, rear	1		1	
4	336004-BLK	Cover, rear		1		1
5	X-6216-1	Screw, Phillips hex crimpite	12	12	12	12
6	X-22-16	Washer, lock, .326 ID x .883 in. OD	6	10	10	8
7	GM46949	Support, junction box			2	
7	GM17632	Support, junction box	2			
7	GM19557	Bracket, junction box mounting		4		4
8	266581	Strap, ground (8 in.)	3			
8	290418	Strap, ground		3	3	
8	GM21085	Strap, ground, 16 in.				1
9	X-22-16	Washer, lock, .326 ID x .883 in. OD				2
10	GM17624	Panel, junction box, rear	1			
11	X-301-45	Plug, button	1			
12	272701	Valve, oil drain	1	1	1	
12	X-582-3	Connector, hose + vibra seal				1
13	X-577-35	Hose, rubber, straight, .62 in. ID				1
13	X-577-24	Hose, rubber, straight, .62 in. ID	1	1	1	
14	X-426-10	Clamp, hose, .5/1 in.	2	2	2	2
15	X-582-1	Connector, hose + vibra seal	1	1	1	1
16	X-75-3	Plug, pipe, 1/2 in. NPT	1	1	1	1
17	GM41661	Skid				1
17	GM46939	Skid			1	
17	GM48069	Skid	1			
17	GM46822	Skid		1		
18	M982-12-80	Nut, hex elastic stop		2	2	
18	M982-16-80	Nut, hex elastic stop	2			2
19	X-25-112	Washer, plain				2
19	X-25-103	Washer, plain, .531 ID x 2.75 in.	2	2	2	
20	324389	Vibromount	2	2	2	
20	324391	Vibromount				2
21	GM19556	Bracket, engine mounting				1
21	GM22370	Support, engine, left side	1			
21	GM39285	Support, engine, left side		1	1	
23	GM19556	Bracket, engine mounting				1
23	GM22369	Support, engine, right side	1			
23	GM39284	Support, engine, right side		1	1	
24	X-22-26	Washer, lock, .521 ID x 1.24 in. OD	6	2	2	
24	X-22-30	Washer, lock, .652 ID x 1.058 in. OD				1
25	X-400-154	Spacer, .527 ID x .625 OD x 2.3 in.	2	2	2	
26	GM40116	Adapter, bushing	1	1	1	
27	GM42443	O-ring	1	1	1	

Alternator and Mounting



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Item	Part Number	Description	Qty.
1	See chart on following page	Alternator assembly	1
2	See chart on following page	Vibromount	2
3	M933-10035-82	Screw, hex cap (125-180 kW)	6
3	M931-10040-82	Screw, hex cap (200 kW)	12
3	M933-12040-82	Screw, hex cap (230-300 kW)	12
4	X-801-3	Washer, hardened, .406 ID x .812 OD (125-180 kW)	6
4	X-801-3	Washer, hardened, .406 ID x .812 OD (200 kW)	12
4	290945	Washer, hardened, .531 ID x 1.06 in. OD (230-300 kW)	12
5	X-6054-19	Stud, metric (125-150 kW)	8
5	X-352-63	Stud, 3/8-16 x 4 in. (180, 200 kW)	8
5	X-129-59	Bolt, hex cap (230-300 kW)	8
6	X-400-131	Spacer, .406 ID x .625 OD x 1.968 in. (125, 150 kW)	8
6	X-400-132	Spacer, .406 ID x .625 OD x 2.531 in. (180, 200 kW)	8
7	X-801-3	Washer, hardened, .406 ID x .812 OD (125-200 kW)	8
7	290945	Washer, hardened, .531 ID x 1.06 in. OD (230-300 kW)	8
8	X-6210-9	Nut, flange spiralock, 3/8-16 (180, 200 kW)	8
8	M6923-10-80	Nut, flange spiralock, M10 (125, 150 kW)	8
9	X-25-103	Washer, plain, .531 ID x 2.75 in. OD (125-180 kW)	2
9	X-25-112	Washer, plain (200-300 kW)	2
10	M982-12-80	Nut, hex elastic stop (125-180 kW)	2
10	M982-16-80	Nut, hex elastic stop (200-300 kW)	2
11	257179	Guard, generator fan (125-180 kW)	1
11	347268	Guard, generator fan (200-300 kW)	2
12	X-67-125	Screw, hex washer, thread-forming (125-180 kW)	2
12	X-67-125	Screw, hex washer, thread-forming (200-300 kW)	4
13	257442	Clip, speed (125-180 kW)	2
13	257442	Clip, speed (200-300 kW)	4
14	X-750-14	Marker, wire L1 (not shown)	1
15	X-750-15	Marker, wire L2 (not shown)	1
16	X-750-16	Marker, wire L3 (not shown)	1
17	X-400-251	Spacer (200-300 kW)	2
17	X-400-197	Spacer, .532 ID x .75 OD x 2.88 in. (125-180 kW)	2
18	X-25-150	Washer (180 kW)	2

Alternator and Mounting

Find the installed module number on the generator set nameplate.

Alternator Part Number and Mounting Parts

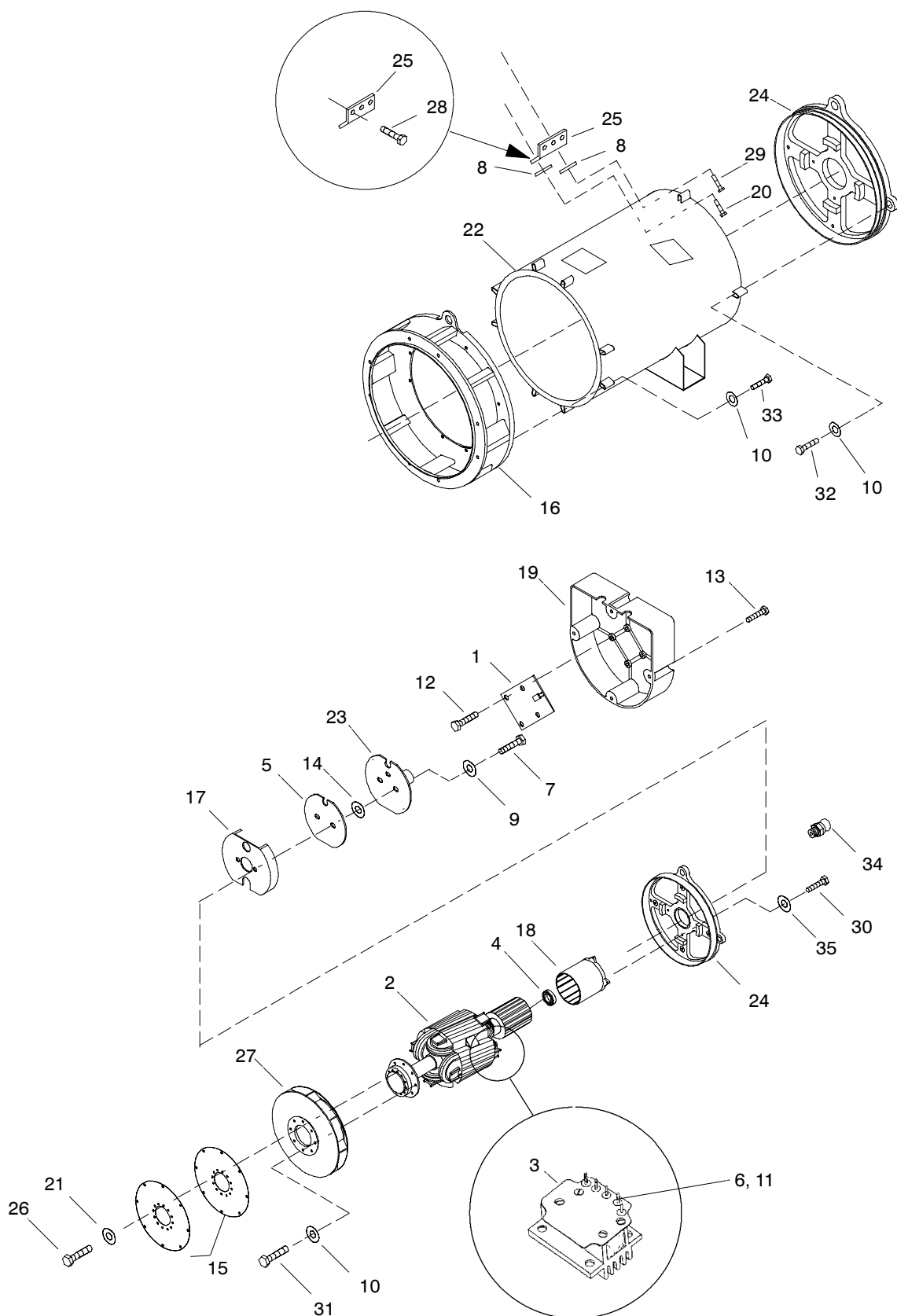
Use this table to identify the module number's alternator and mounting part numbers.

Module Number	Alternator Description	KW Range	Item 1, Alternator Assembly	Item 2, Vibromount
GM17672-MA136	4S15	180	GM17563-34	324393
GM17672-MA137	4S15, 600 V	180	GM17563-35	324393
GM17672-MA138	4S15W	180	GM39944-32	324393
GM17672-MA139	4S15W, 600 V	180	GM39944-34	324393
GM17672-MA141	4S11	125-150	GM17563-21	324392
GM17672-MA142	4S11, 600 V	125-150	GM17563-22	324392
GM17672-MA143	4S13	125-150	GM17563-11	324392
GM17672-MA144	4S13, 600 V	125-150	GM17563-12	324392
GM17672-MA145	4S15	125-150	GM17563-32	324393
GM17672-MA146	4S15, 600 V	125-150	GM17563-33	324393
GM17672-MA147	4S11W	125-150	GM39944-17	324392
GM17672-MA148	4S11W, 600 V	125-150	GM39944-19	324392
GM17672-MA149	4S13W	125-150	GM39944-26	324392
GM17672-MA150	4S13W, 600 V	125-150	GM39944-30	324392
GM17672-MA151	4S15W	125-150	GM39944-33	324393
GM17672-MA152	4S15W, 600 V	125-150	GM39944-35	324393
GM19673-MA172	4U9	230-300	GM24411-3	354622
GM19673-MA173	4U9, 600 V	230-300	GM24411-4	354622
GM19673-MA174	4U10	230-300	GM24411-5	354622
GM19673-MA175	4U10, 600 V	230-300	GM24411-6	354622
GM19673-MA176	4U13	230-300	GM24411-7	354622
GM19673-MA177	4U13, 600 V	230-300	GM24411-8	354622
GM19673-MA178	4U9W	230-300	GM39945-6	354622
GM19673-MA179	4U9W, 600 V	230-300	GM39945-8	354622
GM19673-MA180	4U10W	230-300	GM39945-10	354622
GM19673-MA181	4U10W, 600 V	230-300	GM39945-12	354622
GM19673-MA182	4U13W	230-300	GM39945-14	354622
GM19673-MA183	4U13W, 600 V	230-300	GM39945-16	354622
GM19673-MA184	4U9	200	GM24411-11	354634
GM19673-MA185	4U9, 600 V	200	GM24411-12	354634
GM19673-MA186	4U13	200	GM24411-15	354634
GM19673-MA187	4U13, 600 V	200	GM24411-16	354634
GM19673-MA188	4U9W	200	GM39945-5	354634
GM19673-MA189	4U9W, 600 V	200	GM39945-7	354634
GM19673-MA190	4U13W	200	GM39945-13	354634
GM19673-MA191	4U13W, 600 V	200	GM39945-15	354634

Alternator assembly includes items 1-35 on following page.

Alternator and Mounting, continued

Permanent Magnet-Excited Alternators (4S11, 4S13, 4S15, 4UA9, 4UA10, 4UA13)



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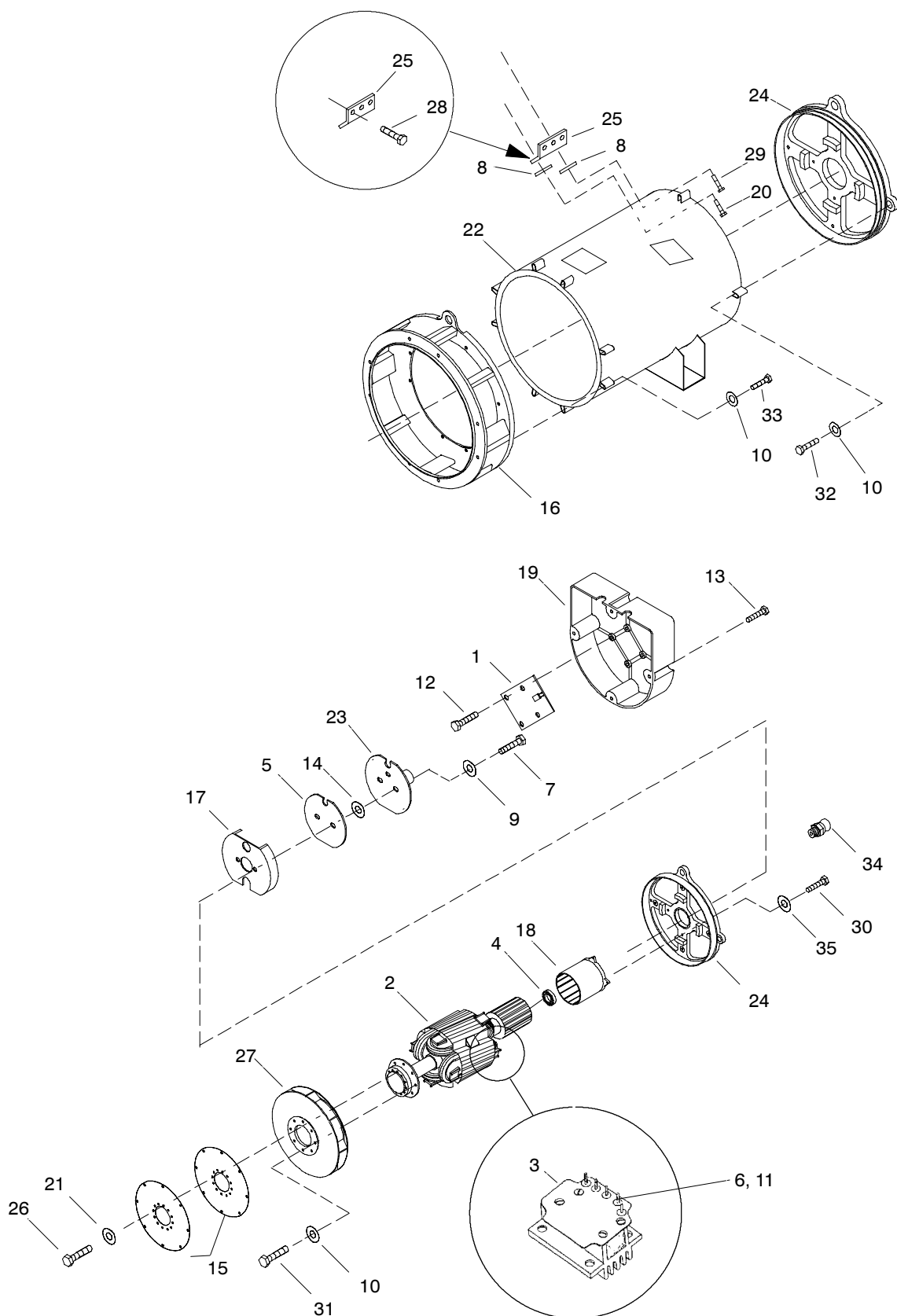
Alternator and Mounting, continued

Permanent Magnet-Excited Alternators (4S11, 4S13, 4S15, 4UA9, 4UA10, 4UA13)

Item	Part Number	Description	Qty.
1	B-257099	PCB assembly, LED, FRII	1
2	See chart on page 23	Rotor assembly	1
3	B-258549	Heatsink (4S alternators)	1
3	A-354299	Heatsink (4UA alternators)	1
4	X-758-6	Bearing, ball (4S alternators)	1
4	X-758-9	Bearing, ball (4UA alternators)	1
5	GM34505	PCB assembly, photo receiver	1
6	X-101-24	Nut, hex elastic stop, 6-32	5
7	X-117-5	Screw, hex head machine	2
8	X-22-45	Washer, lock, .338 ID x .884 in. OD (4S alternators)	2
8	X-22-46	Washer, lock, .391 ID x .975 in. OD (4UA alternators)	2
9	X-22-9	Washer, lock, .20 ID x .373 in. OD	2
10	X-25-93	Washer, plain, .406 ID x .75 in. OD	14
10	290945	Washer, hardened, .531 ID x 1.06 in. OD (4UA alternators)	12
10	257951	Washer, special, .562 ID x 1.13 in. OD (4UA alternators)	12
11	X-283-7	Terminal, ring, male, 22-16 AWG	4
11	X-431-25	Terminal, fast-on, female	4
12	X-6071-1	Screw, Phillips pan head	4
13	X-67-133	Screw, hex washer, thread-forming	3
14	243321	Washer, insulating, .195 ID x .5 in.	2
15	See chart on page 23	Disc, drive	3/4
16	See chart on page 23	Adapter, generator	1
17	257077	Actuator, magnetic cup	1
18	See chart on page 23	Exciter field assembly	1
19	257258	Cover, FR LED circuit board	1
20	X-791-7	Screw, hex head machine (4S 4V alternators)	1
20	X-791-6	Screw, hex head machine (4UA alternators)	1
21	X-801-3	Washer, hardened, .406 ID x .812 in.	12
22	See chart on page 23	Stator assembly	1
23	257850	Insulator	1
24	257983	Bracket, end (4S and alternators)	1
24	347236	Bracket, end (4UA alternators)	1
25	See chart on page 23	Connector, lead	1
26	270956	Screw, cylinder head, 3/8-16 x1 1/4 (4S alternators)	12
26	270158	Screw, cylinder head, 3/8-16 x1 1/4 (4UA alternators)	12
27	257173	Fan, alternator (4S and alternators)	1
27	257855	Fan, alternator (4UA alternators)	1
28	X-125-24	Screw, hex cap (4S alternators)	3
29	X-125-31	Screw, hex cap (4S alternators)	1
29	X-6238-11	Screw, hex cap (4UA alternators)	1
30	X-125-34	Screw, hex cap	4
30	X-6238-17	Screw, hex cap (4UA alternators)	4
31	X-6238-11	Screw, hex cap	4
31	X-6238-11	Screw, hex cap (4UA alternators)	8
32	X-6238-9	Screw, hex cap (4S alternators)	4
32	X-129-25	Screw, hex cap (4UA alternators)	4
33	X-6238-6	Screw, hex cap (4S alternators)	1
33	X-6238-9	Screw, hex cap (4S alternators)	5
33	X-129-25	Screw, hex cap (4UA alternators)	8
34	347119	Fitting, grease	1
35	X-801-3	Washer, hardened, .406 ID x .812 in. (4UA alternators)	4

Alternator and Mounting, continued

Permanent Magnet-Excited Alternators (4S11, 4S13, 4S15, 4UA9, 4UA10, 4UA13)



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Alternator and Mounting, continued

Find the installed module number on the generator set nameplate.

Permanent Magnet-Excited Alternators (4S11, 4S13, 4S15, 4UA9, 4UA10, 4UA13)

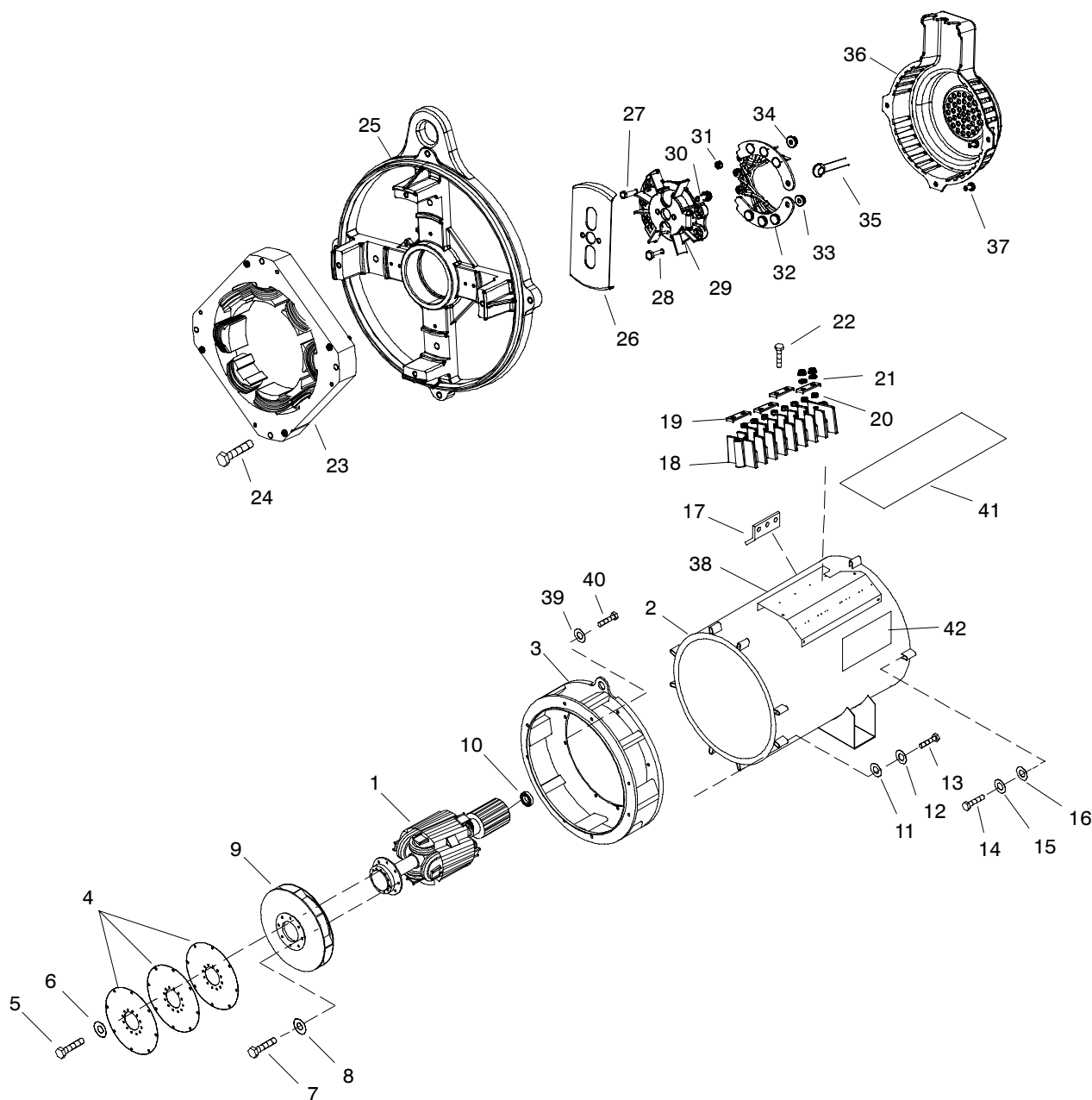
Alternator Part Number and Mount Type

Use this table to identify the part numbers of items 2, 15, 16, 18, 22, and 25.

Module Number	Alternator Description	Alternator Assembly	Item 2, Rotor Assembly	Item 15, Drive Disc	Item 16, Adapter	Item 18, Field Exciter	Item 22, Stator Assembly	Item 25, Lead Connector
GM17672-MA136	4S15	GM17563-34	A-364409	257103 (3)	257248	276657	GM17560	257985
GM17672-MA137	4S15, 600 V	GM17563-35	A-364409	257103 (3)	257248	276657	GM17561-5	257985
GM17672-MA141	4S11	GM17563-21	A-343443	257103 (3)	257175	276657	GM17559-4	257985
GM17672-MA142	4S11, 600 V	GM17563-22	A-343443	257103 (3)	257175	276657	GM17561-4	257985
GM17672-MA143	4S13	GM17563-11	A-276666	257103 (3)	257175	276657	GM17559-3	257985
GM17672-MA144	4S13, 600 V	GM17563-12	A-276666	257103 (3)	257175	276657	GM17561-3	257985
GM17672-MA145	4S15	GM17563-32	A-364409	257103 (3)	257175	276657	GM17560	257985
GM17672-MA146	4S15, 600 V	GM17563-33	A-364409	257103 (3)	257175	276657	GM17561-5	257985
GM19673-MA172	4UA9	GM24411-3	A-347187	257581 (4)	347240	347707	GM24409-2	257978
GM19673-MA173	4UA9, 600 V	GM24411-4	A-347187	257581 (4)	347240	347707	GM24410-2	257978
GM19673-MA174	4UA10	GM24411-5	A-347188	257581 (4)	347240	347707	GM24409-3	257978
GM19673-MA175	4UA10, 600 V	GM24411-6	A-347188	257581 (4)	347240	347707	GM24410-3	257978
GM19673-MA176	4UA13	GM24411-7	A-347189	257581 (4)	347240	347707	GM24409-4	257979
GM19673-MA177	4UA13, 600 V	GM24411-8	A-347189	257581 (4)	347240	347707	GM24410-4	257978
GM19673-MA184	4UA9	GM24411-11	A-347191	222881 (4)	347241	347707	GM24409-2	257978
GM19673-MA185	4UA9, 600 V	GM24411-12	A-347191	222881 (4)	347241	347707	GM24410-2	257978
GM19673-MA186	4UA13	GM24411-15	A-365222	222881 (4)	347241	347707	GM24409-4	257979
GM19673-MA187	4UA13, 600 V	GM24411-16	A-365222	222881 (4)	347241	347707	GM24410-4	257979

Alternator and Mounting, continued

Wound Field Alternators (4S11W, 4S13W, 4S15W, 4UA9W, 4UA10W, 4UA13W)



PB-115_3

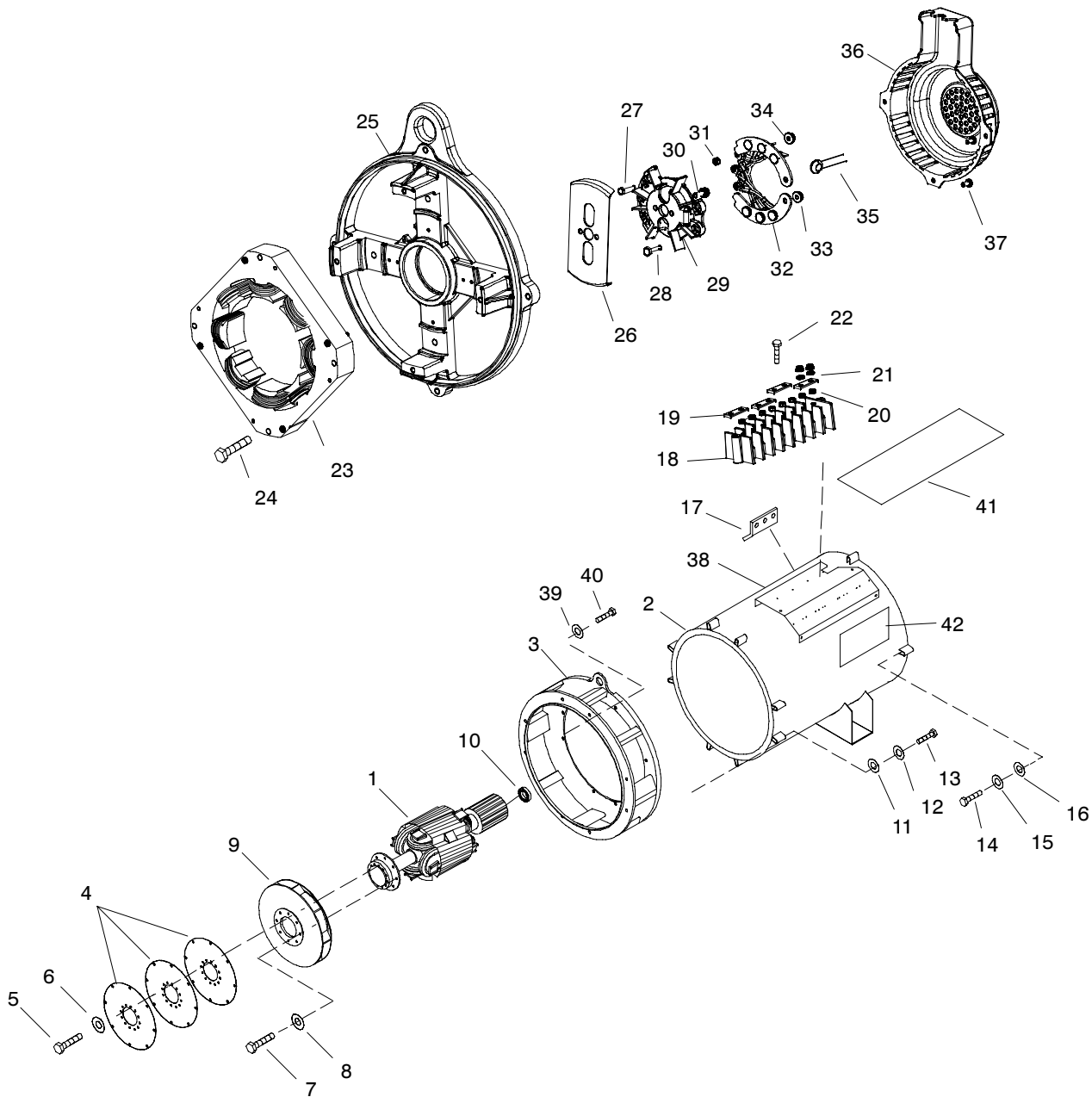
Alternator and Mounting, continued

Wound Field Alternators (4S11W, 4S13W, 4S15W, 4UA9W, 4UA10W, 4UA13W)

Item	Part No.	Description	Qty.
1	See chart on page 27	Rotor assembly	1
2	See chart on page 27	Stator assembly	1
3	See chart on page 27	Adapter, generator	1
4	See chart on page 27	Disc, drive	4
5	M933-10035-82	Screw, hex cap (4SW)	12
5	M933-12040-82	Screw, hex cap (4UAW)	12
6	X-801-3	Washer, hardened, .406 ID x .812 in. OD (4SW)	12
6	290945	Washer, .531 ID x 1.06 in. OD (4UAW)	12
7	M933-10025-60	Screw, hex cap (4SW)	4
7	M933-10025-60	Screw, hex cap (4UAW)	8
8	X-25-93	Washer, .406 ID x .75 in. OD (4SW)	4
8	X-25-93	Washer, .406 ID x .75 in. OD (4UAW)	8
9	257173	Fan, generator (4SW)	1
9	257855	Fan, generator (4UAW)	1
10	X-758-6	Bearing, ball (4SW)	1
10	X-758-9	Bearing, ball (4UAW)	1
11	257951	Washer, .562 ID x 1.13 in. OD (4UAW)	8
12	X-25-93	Washer, .406 ID x .75 in. OD (4SW)	6
12	290945	Washer, .531 ID x 1.06 in. OD (4UAW)	8
13	M931-10050-60	Screw, hex cap (4SW)	1
13	M931-10080-60	Screw, hex cap (4SW)	5
13	M931-12095-60	Screw, hex cap (4UAW)	8
14	M933-10100-60	Screw, hex cap (4SW)	4
14	M931-12095-60	Screw, hex cap (4UAW)	4
15	X-25-93	Washer, .406 ID x .75 in. OD (4SW)	4
15	290945	Washer, .531 ID x 1.06 in. OD (4UAW)	4
16	257951	Washer, .562 ID x 1.13 in. OD (4UAW)	4
17	257986	Bus (4SW)	1
17	257978	Bus (4UAW)	1
18	GM31969	Block, terminal	1
19	—	Link, terminal block (see Load Connection Kit for part number)	—
20	—	Nut, hex, 10 mm (see Load Connection Kit for part number)	—
21	—	Washer, plain (see Load Connection Kit for part number)	—
22	M7500D-06020-81	Screw	2
23	GM32516-2	Exciter field (4SW)	1
23	GM32518-3	Exciter field (4UAW)	1
23	GM32518-4	Exciter field (4UA13W)	1
24	M933-08100-60	Screw, hex head (4SW)	4
24	M931-08060-60	Screw, hex head (4UAW)	4
24	M931-08085-60	Screw, hex head (4UA13W)	4
25	GM28964	Bracket, end (4SW)	1
25	GM31973	Bracket, end (4UAW)	1
26	GM31967	Actuator, magnetic	1
27	M933-05020-60	Screw, hex cap	3
28	M933-06020-60	Screw, hex cap	2
29	GM31960	Hub, rotating diode assembly	1
30	M933-06016-60	Screw, hex cap	2
31	M934-05-50	Nut, hex, 5 mm	3
32	GM31963	Plates, diode assembly	1
33	M982-06-80	Nut, hex, elastic stop	2
34	M982-05-60	Nut, hex, elastic stop	3
35	228061	Varistor, 250 V	1
36	GM31968	Cover, rotating diode assembly	1
37	M7500D-05010-81	Screw, thread forming metric	3
38	344295	Decal, equipment ground	1
39	X-801-6	Washer, .469 ID x .922 in. OD (4UAW)	8
40	X-6024-18	Screw, hex head (4UAW)	8
41	GM39793	Decal, terminal board	1
42	GM39792	Decal, board reconnection	1

Alternator and Mounting, continued

Wound Field Alternators (4S11W, 4S13W, 4S15W, 4UA9W, 4UA10W, 4UA13W)



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Alternator and Mounting, continued

Find the installed module number on the generator set nameplate.

Wound Field Alternators (4S11W, 4S13W, 4S15W, 4UA9W, 4UA10W, 4UA13W)

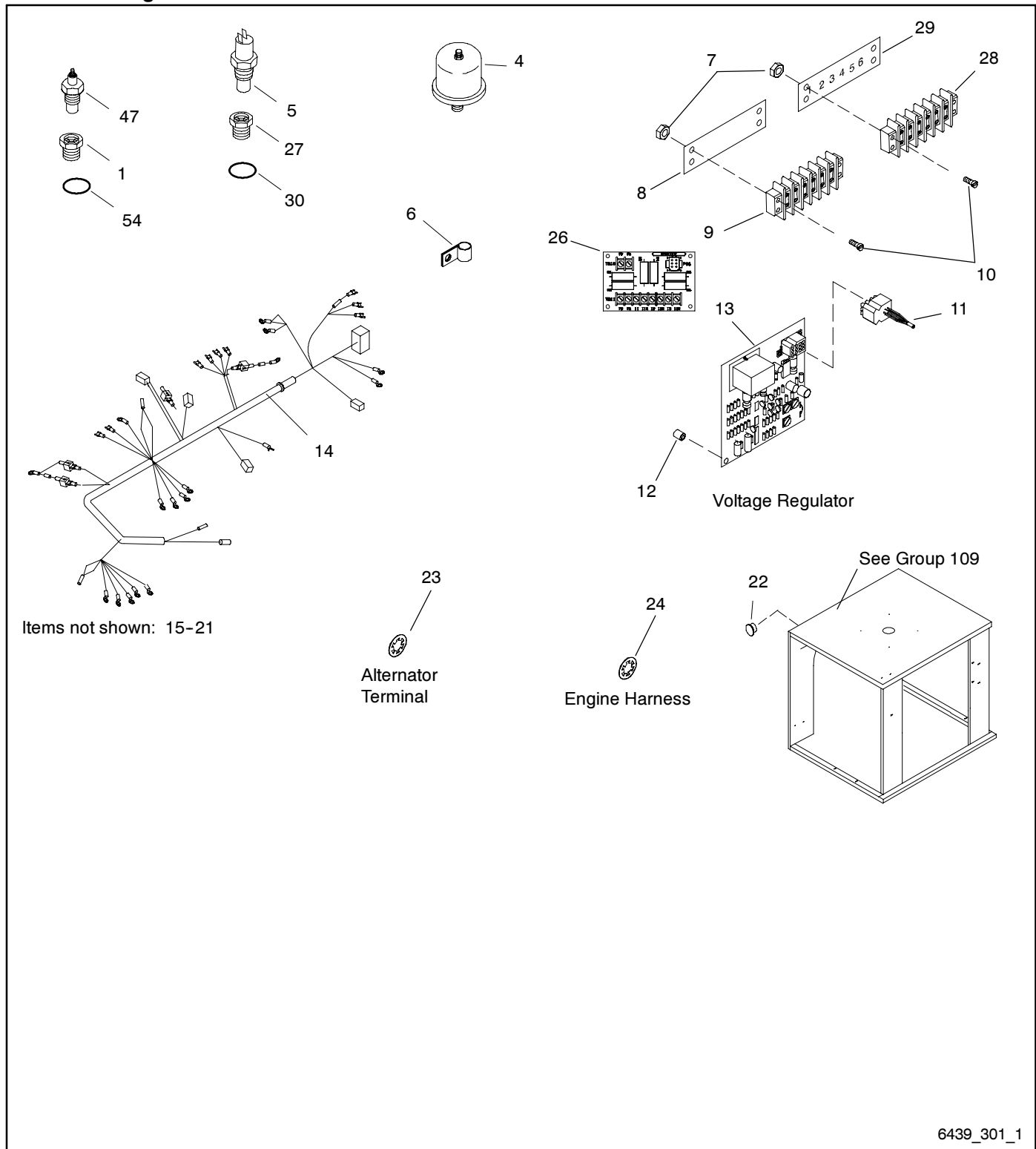
Alternator Part Number and Components

Use this table to identify the alternator rotor, stator, adapter, and drive disc part numbers (items 1-4).

Module Number	Alternator Description	Alternator Part No.	Item 1, Rotor	Item 2, Stator	Item 3, Adapter	Item 4, Drive Discs
GM17672-MA138	4S15W	GM39944-32	GM32407-11	GM39941	GM32009	257103
GM17672-MA139	4S15W, 600 V	GM39944-34	GM32407-11	GM39942-5	GM32009	257103
GM17672-MA148	4S11W, 600 V	GM39944-19	GM32407-6	GM39942-3	GM32008	257103
GM17672-MA149	4S13W	GM39944-26	GM32407-9	GM39940-4	GM32008	257103
GM17672-MA150	4S13W, 600 V	GM39944-30	GM32407-9	GM39942-4	GM32008	257103
GM17672-MA151	4S15W	GM39944-33	GM32407-11	GM39941	GM32008	257103
GM17672-MA152	4S15W, 600 V	GM39944-35	GM32407-11	GM39942-5	GM32008	257103
GM19673-MA178	4UA9W	GM39945-6	GM32424-4	GM32996-2	GM32011	GM31972
GM19673-MA179	4UA9W, 600 V	GM39945-8	GM32424-4	GM32997-2	GM32011	GM31972
GM19673-MA180	4UA10W	GM39945-10	GM32424-6	GM32996-3	GM32011	GM31972
GM19673-MA181	4UA10W, 600 V	GM39945-12	GM32424-6	GM32997-3	GM32011	GM31972
GM19673-MA182	4UA13W	GM39945-14	GM32424-8	GM39830	GM32011	GM31972
GM19673-MA183	4UA13W, 600 V	GM39945-16	GM32424-8	GM32997-4	GM32011	GM31972
GM19673-MA188	4UA9W	GM39945-5	GM32424-3	GM32996-2	GM32012	GM31971
GM19673-MA189	4UA9W, 600 V	GM39945-7	GM32424-3	GM32997-2	GM32012	GM31971
GM19673-MA190	4UA13W	GM39945-13	GM32424-7	GM39830	GM32012	GM31971
GM19673-MA191	4UA13W, 600 V	GM39945-15	GM32424-7	GM32997-4	GM32012	GM31971

Control and Harness

Permanent Magnet-Excited Alternators



Control and Harness

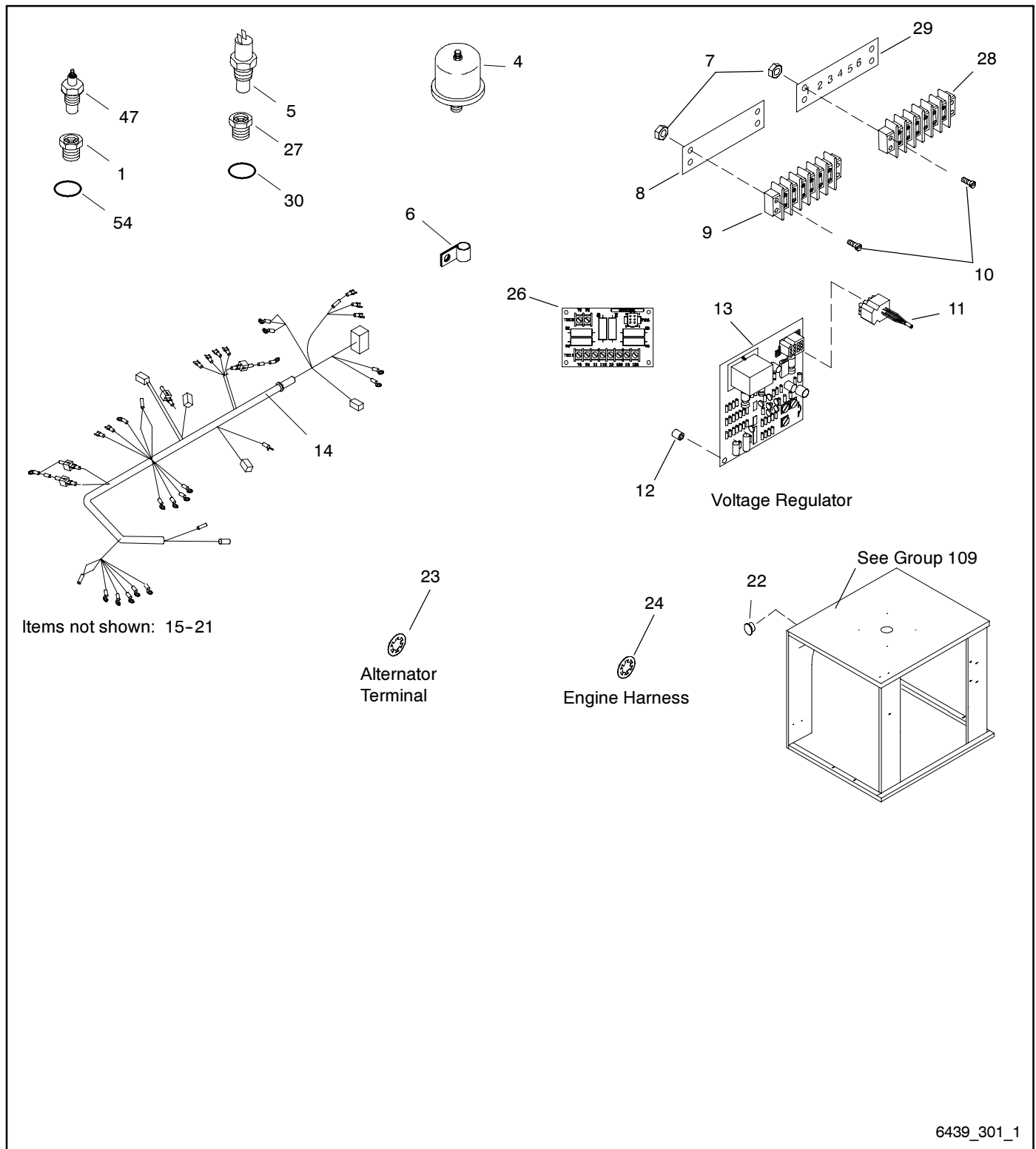
Find the installed module number on the generator set nameplate.

Permanent Magnet-Excited Alternators With Non-550 Controller

Item	Part Number	Description	Quantity Module		
			GM48081-MA1	GM47165-MA1	GM46344-MA1
1	153659	Bushing, reducing, 1/2 x 3/4 in NPT			1
1	361916	Adapter, bushing	1		
4	343473	Sender, oil pressure	1	1	1
5	290090	Switch, low water temp.	1		1
5	361956	Switch, low coolant temp.		1	
6	X-672-3	Clamp, insulating	1		
6	X-672-28	Clamp, insulating, .88 in.	2		
6	X-672-31	Clamp			1
6	X-672-37	Clamp		1	
6	X-672-38	Clamp			1
6	298776	Base, tie wrap		1	
6	361567	Base, tie wrap	2		
7	M934-04-50	Nut, hex, 4 mm	4	4	4
8	255080	Marker, strip	1	1	1
9	295314	Block, terminal	1	1	1
10	M7985A-04020-20	Screw, pan head machine	4	4	4
11	354118	Harness, wiring	1	1	1
12	360459	Standoff, circuit board	5	5	5
13	C-255670	PCB assembly, FRII voltage, Hz regulator	1		
13	A-354653	PCB assembly, FRII voltage, Hz regulator		1	1
14	GM48925	Harness, engine	1		
14	GM47232	Harness, engine		1	
14	GM47235	Harness, engine			1
15	295145	Connector (P1) (not shown)	1	1	1
16	GM11496	Connector (P2)	1	1	1
17	GM47227	Connector (P4)	1	1	1
18	GM47225	Connector (P6)	1	1	1
19	GM47224	Connector (P8)	1	1	1
20	GM47222	Connector (P9)	1	1	1
20	GM47427	Fuse	1	1	1
21	GM47699	Connector (P10)			1
22	X-301-45	Plug, button		1	1
23	X-22-12	Washer, lock, .262 ID x .743 in. OD			1
24	X-22-26	Washer, lock, .521 ID x 1.24 in. OD	1		
27	X-202-41	Bushing, reducing, 1/2 x 3/4 in. NPT			1
28	295314	Block, terminal	1	1	1
29	299090	Marker, strip	1	1	1
30	365499	O-ring		1	
47	GM10166	Sender, temperature		1	
47	274988	Sender, oil temperature	1		
47	GM39458	Sender, temperature			1
54	365499	O-ring	1	1	

* Harness includes items 15-21, not shown.

Control and Harness, continued



6439_301_1

Control and Harness, continued

Find the installed module number on the generator set nameplate.

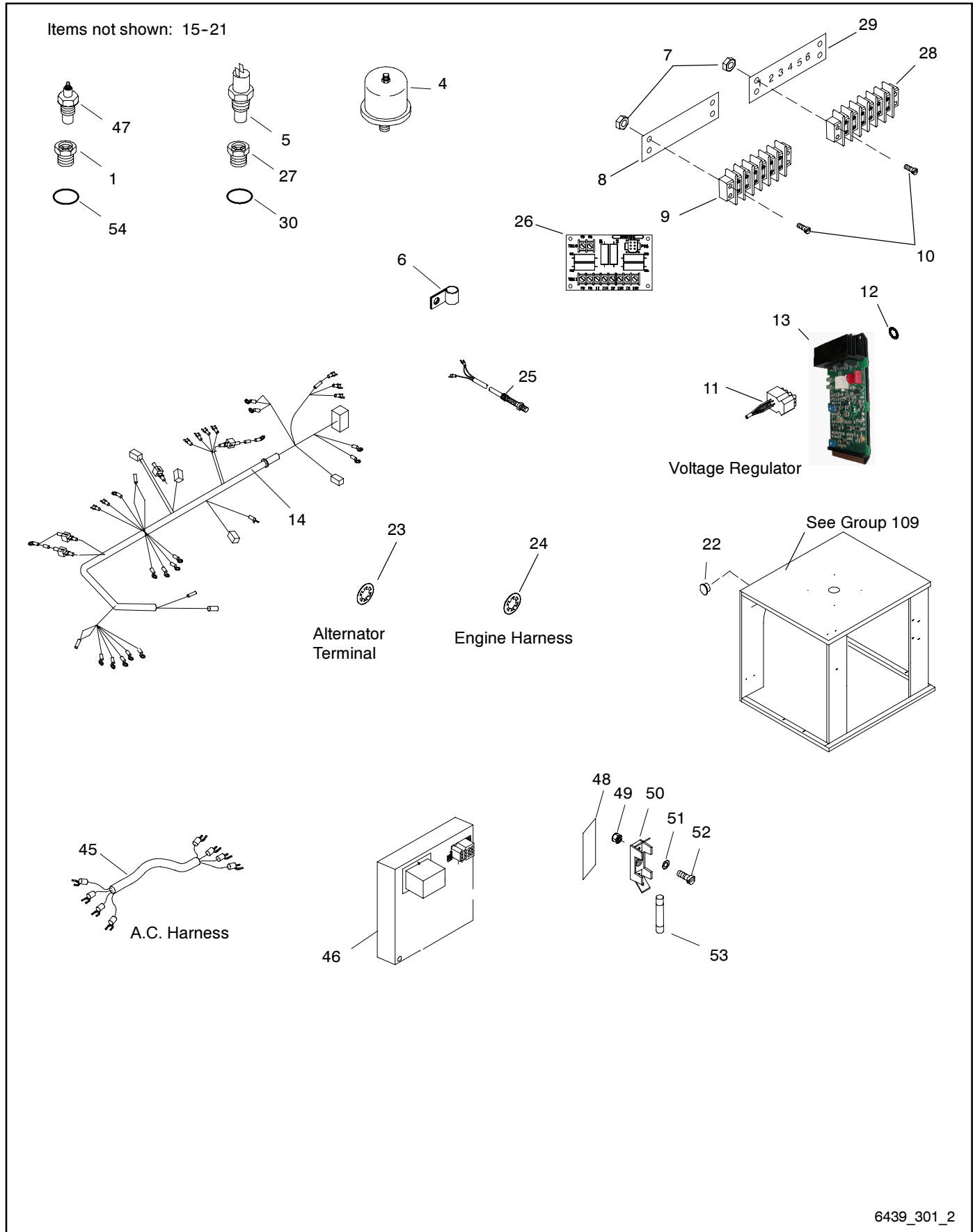
Permanent Magnet-Excited Alternators With 550 Controller

Item	Part Number	Description	Quantity Module		
			GM48082-MA1	GM47166-MA1	GM46345-MA1
5	290090	Switch, low water temp.	1		1
5	361956	Switch, low water temp.		1	
6	X-672-3	Clamp, insulating	1		
6	X-672-28	Clamp, insulated, .88 in.	2		
6	X-672-31	Clamp, insulated, .75 in.			1
6	X-672-37	Clamp		1	
6	X-672-38	Clamp			1
6	298776	Base, tie wrap		1	
6	361567	Base, tie wrap	2		
7	M934-04-50	Nut, hex, 4 mm	2	2	2
10	M7985A-04020-20	Screw, pan head machine	2	2	2
14	GM48926	Harness, engine	1		
14	GM47233	Harness, engine		1	
14	GM47236	Harness, engine			1
15	295145	Connector (P1) (not shown)	1	1	1
16	GM11496	Connector (P2)	1	1	1
16	337131	Connector (P3)		1	
16	257118	Connector (P3)			1
17	GM47227	Connector (P4)	1	1	1
18	GM47225	Connector (P6)	1	1	1
19	GM47224	Connector (P8)	1	1	1
20	GM47222	Connector (P9)	1	1	1
20	GM47427	Fuse	1	1	1
21	GM47699	Connector (P10)			1
22	X-301-45	Plug, button		1	1
23	X-22-12	Washer, lock, .262 ID x .743 in. OD			1
26	GM13980	PCB assembly, CT burden resistor		1	1
26	282829	Vibromount (not shown)		4	4
27	X-202-41	Bushing, reducing, 1/2 x 3/4 in. NPT			1
28	295314	Block, terminal	1	1	1
29	299090	Marker, strip	1	1	1
30	365499	O-ring, ISO 6149, 11.3 mm ID		1	

* Harness includes items 15–21, not shown.

Control and Harness, continued

Wound Field Alternators



6439_301_2

Control and Harness, continued

Find the installed module number on the generator set nameplate.

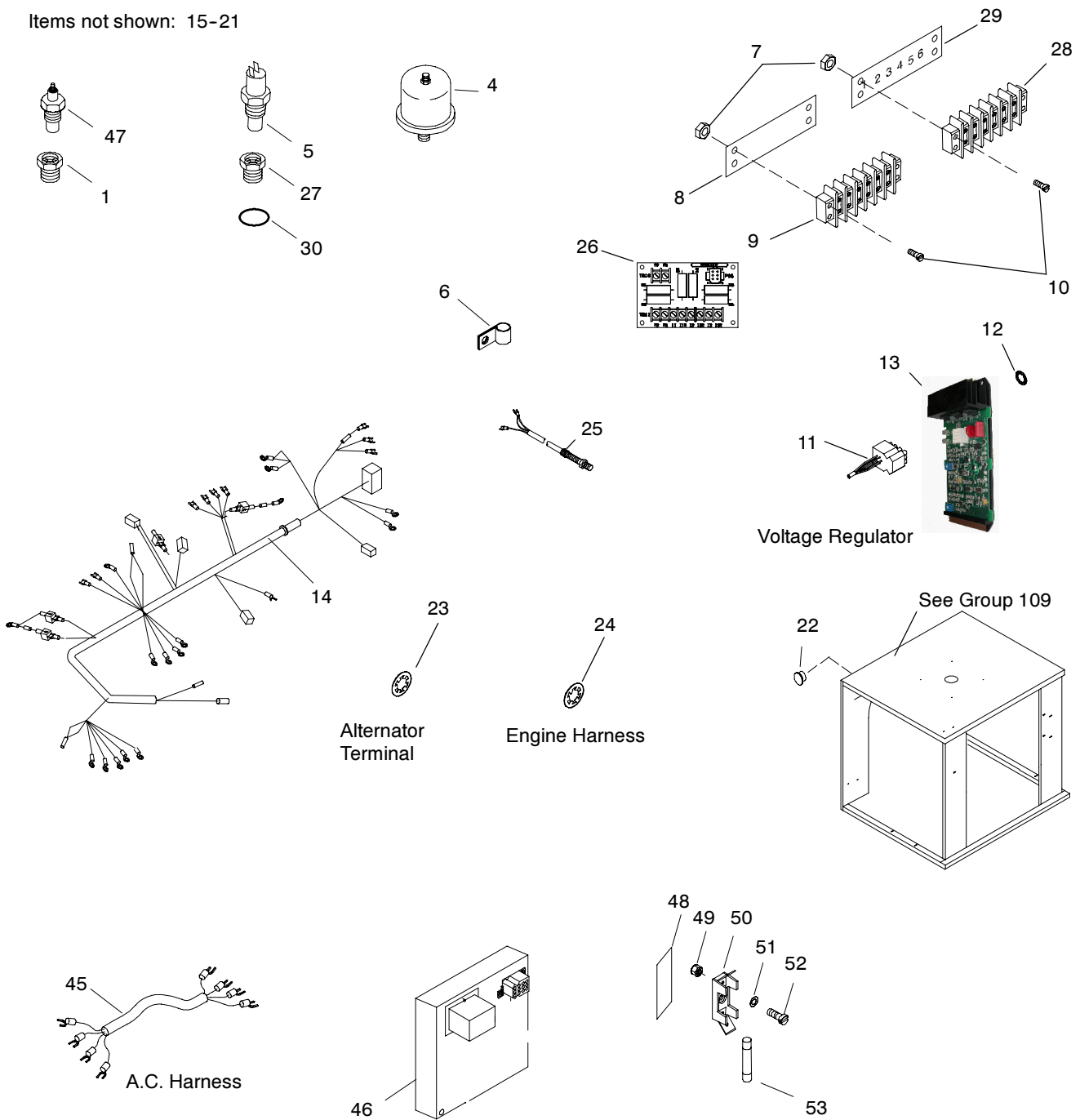
Wound Field Alternators With Non-550 Controller

Item	Part Number	Description	Quantity		
			Module		
			GM48081-MA2	GM47165-MA2	GM46344-MA2
1	153659	Bushing, reducing, 1/2 x 3/4 in. NPT	1		1
1	361916	Adapter, bushing	1		
4	343473	Sender, oil pressure	1	1	1
5	290090	Switch, low water temp.	1		1
5	361956	Switch, low water temp.		1	
6	X-672-3	Clamp, insulating	1		
6	X-672-28	Clamp, insulated, .88 in.	2		
6	X-672-31	Clamp, insulated, .75 in.			1
6	X-672-37	Clamp		1	
6	X-672-38	Clamp			1
6	298776	Base, tie wrap		1	
6	361567	Base, tie wrap	2		
7	M934-04-50	Nut, hex, 4 mm	4	4	4
8	255080	Marker, strip	1	1	1
9	295314	Block, terminal	1	1	1
10	M7985A-04020-20	Screw, pan head machine	4	4	4
11	GM39873	Harness, regulator	1	1	1
12	#	Hardware, M5	4	4	4
13	GM40179	PCB assembly, wound field regulator	1	1	1
14	GM48925	Harness, engine	1		
14	GM47232	Harness, engine		1	
14	GM47235	Harness, engine			1
15	295145	Connector (P1) (not shown)	1	1	1
16	GM11496	Connector (P2)	1	1	1
17	GM47227	Connector (P4)	1	1	1
18	GM47225	Connector (P6)	1	1	1
19	GM47224	Connector (P8)	1	1	1
20	GM47222	Connector (P9)	1	1	1
20	GM47427	Fuse	1	1	1
21	GM47699	Connector (P10)			1
22	X-301-45	Plug, button		1	1
23	X-22-12	Washer, lock, .262 ID x .743 in. OD			1
27	X-202-41	Bushing, reducing, 1/2 x 3/4 in. NPT			1
28	295314	Block, terminal	1	1	1
29	299090	Marker, strip	1	1	1
30	365499	O-ring		1	
45	GM35357	Harness, wiring (AC harness)	1	1	1
47	274988	Sender, oil temperature	1		
47	GM10166	Sender, temperature		1	
47	GM39458	Sender, temperature			1
48	GM39798	Strip, marker	1	1	1
49	M934-03-50	Nut, hex 3 mm	1	1	1
50	336634	Fuse holder	1	1	1
51	X-22-6	Washer, lock, .146 ID x .285 in. OD	1	1	1
52	M7985A-03010-20	Screw, pan head, M3 x 10	1	1	1
53	358337	Fuse, 10 A, 250 V	1	1	1
54	365499	O-ring	1	1	

* Harness includes items 15-21, not shown.

Control and Harness, continued

Items not shown: 15-21



6439_301_2

Control and Harness, continued

Find the installed module number on the generator set nameplate.

Wound Field Alternators With 550 Controller

Item	Part Number	Description	Quantity		
			Module		
			GM48082-MA2	GM47166-MA2	GM46345-MA2
5	290090	Switch, low water temperature	1		1
6	X-672-3	Clamp, insulating	1		
6	X-672-31	Clamp, insulated, .75 in.			1
6	X-672-37	Clamp		1	
6	X-672-38	Clamp			1
6	361567	Base, tie wrap	2		
7	M934-04-50	Nut, hex, 4 mm	2	2	2
10	M7985A-04020-20	Screw, pan head machine	2	2	2
14	GM48927	Harness, engine	1		
14	GM47234	Harness, engine		1	
14	GM47237	Harness, engine			1
15	295145	Connector (P1) (not shown)	1	1	1
16	GM11496	Connector (P2)	1	1	1
16	337131	Connector (P3)	1	1	1
17	GM47227	Connector (P4)	1	1	1
18	GM47225	Connector (P6)	1	1	1
19	GM47224	Connector (P8)	1	1	1
20	GM47222	Connector (P9)	1	1	1
20	GM47427	Fuse	1	1	1
21	GM47699	Connector (P10)			1
22	X-301-45	Plug, button		1	1
23	X-22-12	Washer, lock, .262 ID x .743 in. OD			1
24	X-22-26	Washer, lock, .521 ID x 1.24 in. OD	1		
26	GM13980	PCB assembly, CT burden resistor		1	1
26	282829	Vibromount		4	4
27	X-202-41	Bushing, reducing, 1/2 x 3/4 in. NPT			1
28	295314	Block, terminal	1	1	1
29	299090	Marker, strip	1	1	1
30	365499	O-ring, ISO 6149, 11.3 mm ID		1	
45	GM35357	Harness, wiring (AC harness)	1	1	1
46	GM11718	PCB assembly, excitation interface	1	1	1

* Harness includes items 15–21, not shown.

Literature

Item	Part Number	Description	Quantity						
			Variation Number						
			272	274	261	262	263	264	265
1	MP-6349	S/M Wound Field Alternator, 20-300 kW	1	1	1	1	1	1	1
1	MP-6353	S/M Permanent Magnet Alternator, 20-400 kW	1	1	1	1	1	1	1
2	MP-5374	Warranty, 1 Yr. Ltd.	1	1	1	1	1	1	1
3	MP-5700	I/M Industrial	1	1	1	1	1	1	1
4	MP-6161	O/M Microprocessor+ w/Comm, Basic Controller	1	1	1	1	1	1	1
5	TP-5889	O/M John Deere Engine Service Supplement	1	1	1	1	1	1	1
6	MP-6009	P/C Controllers	1	1	1	1	1	1	1
7	MP-6200	O/M Digital 550 Controller Version 2.10	1	1	1	1	1	1	1
8	MP-6116	P/C Accessories, 20-200 kW Diesel	1	1	1	1			
8	MP-6117	P/C Accessories, 230-2000 kW Diesel					1	1	1
9	TP-6291	P/C John Deere 6068HF275/475	1	1	1	1			
9	TP-6348	P/C John Deere 6068/6090, Tier 3					1	1	1
10	MP-6439	P/C 180-275DSEJD	1	1	1	1	1	1	1
11	TP-6453	O/M John Deere 6068HF285	1	1					
11	TP-6455	O/M John Deere 6068HF485			1	1			
11	TP-6457	O/M John Deere 6090HF485					1	1	1
12	TP-5854	S/M John Deere 4045/6068	1	1	1	1			
12	TP-5858	S/M John Deere 6090HF485					1	1	1
12	TP-6454	S/M John Deere 6068HF285, Fuel System	1	1					
12	TP-6456	S/M John Deere 6068HF485, Fuel System			1	1			
12	TP-6459	S/M John Deere 6090HF485, Fuel System					1	1	1
12	TP-6371	S/M Deere Alternators & Starting Motors			1	1	1	1	1
13	MP-6146	W/D 20DSJB/20-230DSEJB/80-275DSEJC	1	1	1	1	1	1	1
14	MP-6356	S/M Controllers 20-2800 kW	1	1	1	1	1	1	1
15	MP-6140	O/I/M Controller Setup & Appl. Digital 550	1	1	1	1	1	1	1

Kit List

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

	125/150 kW	180/200 kW	230-275 kW
Controllers			
See Parts Catalog MP-6009 for parts lists.			
Cooling Systems			
Heater, block			
90-120 V	-	-	GM38838-KA5
110-120 V	GM20968-KA5	GM20968-KA5	-
190-208 V	-	-	GM38838-KA6
190-240 V	GM20968-KA6	GM20968-KA6	-
208-240 V	-	-	GM38838-KA7
380-480 V	-	-	GM38838-KA8
Duct flange, radiator	GM13896-KA2	GM13896-KA4	GM13896-KA4
Optional Kits			
See Parts Catalog MP-6116 for parts lists.			
Paint and Miscellaneous Parts			
All models use 221331 spray can, 221332 gallon			

Cooling System Kits

Qty.	Description	Part No.
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Block Heater, 1800W, 120V

1	Heater, block	326234
1	Sensor, thermostat	224341
1	O-ring	GM11694
1	Bushing, adapter	GM22991
1	Elbow, street, 90 deg. x 1/2 in. NPT	X-211-1
1	Hose, .63 in. ID x 2.33 ft.	X-312-35
1	Hose, .63 in. ID x 3.75 ft.	X-312-36
1	Elbow, street, 45 deg. x 1/2 in. NPT	227642
2	Adapter, bushing	273692
2	O-ring	273693
1	Tag, hang	279047
1	Bracket, block heater mounting	326219
4	Clamp, hose, .5/1 in.	X-426-10
2	Connector, hose + vibraseal	X-582-1

Block Heater, 2000W, 240V

1	Heater, block	326235
1	O-ring	GM11694
1	Bushing, adapter	GM22991
1	Elbow, street, 90 deg. x 1/2 in. NPT	X-211-1
1	Hose, .63 in. ID x 2.33 ft.	X-312-35
1	Hose, .63 in. ID x 3.75 ft.	X-312-36
1	Elbow, street, 45 deg. x 1/2 in. NPT	227642
2	Adapter, bushing	273692
2	O-ring	273693
1	Tag, hang	279047
1	Bracket, block heater mounting	326219
4	Clamp, hose, .5/1 in.	X-426-10
2	Connector, hose + vibraseal	X-582-1

Block Heater, 2500W, 90/120V

1	Box, block heater control	354315
1	Label, wiring diagram	354327
1	Block heater (includes items marked *)	GM20133
1	*Block heater service element	GM29477
1	*Thermostat	GM29529
1	Bushing, reducing, 1/3 x 3/4 in. NPT	153659
1	Strap, ground	223033
1	Adapter, bushing	273692
1	O-Ring 1.475 in. ID	273693
1	Bracket, support	274431
1	Tag, hang	279047
1	Thermostat, block heater	279813
4	Gasket, washer	297001
1	Cover, block heater control box	354317
1	Gasket, control box	354318
1	Decal, warning	354325
2	Valve, shutoff	GM19670
4	Vibromount	GM38784-2
1	Bracket, block heater	GM38834
1	Tag, hang	GM39752
1	Pipe, 1/2 in. NPT x 3.00 in.	X-209-11
2	Pipe, 1/2 x 2.00 in.	X-209-6
2	Elbow, street, 90° x 1/2 in. NPTF	X-211-1
4	Washer, lock, .262 ID x .469 in. OD	X-22-11
8	Washer, lock, .262 ID x .743 in. OD	X-22-12
2	Washer, lock, .391 ID x .975 in. ID	X-22-14
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Connector, hose	X-582-7
2	Hose, coolant, 26 in.	X-6367-6
4	Screw, slotted hex washer head, machine	X-97-13

GM20968-KA5

GM20968-KA6

GM38859-KA5

Qty.	Description	Part No.
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Block Heater, 2500W, 190-208V

1	Box, block heater control	354315
1	Label, wiring diagram	354327
1	Block heater (includes items marked *)	GM20134
1	*Block heater service element	GM29478
1	*Thermostat	GM29529
1	Bushing, reducing, 1/3 x 3/4 in. NPT	153659
1	Strap, ground	223033
1	Adapter, bushing	273692
1	O-Ring 1.475 in. ID	273693
1	Bracket, support	274431
1	Tag, hang	279047
1	Thermostat, block heater	279813
4	Gasket, washer	297001
1	Cover, block heater control box	354317
1	Gasket, control box	354318
1	Decal, warning	354325
2	Valve, shutoff	GM19670
4	Vibromount	GM38784-2
1	Bracket, block heater	GM38834
1	Tag, hang	GM39752
1	Pipe, 1/2 in. NPT x 3.00 in.	X-209-11
2	Pipe, 1/2 x 2.00 in.	X-209-6
2	Elbow, street, 90° x 1/2 in. NPTF	X-211-1
4	Washer, lock, .262 ID x .469 in. OD	X-22-11
8	Washer, lock, .262 ID x .743 in. OD	X-22-12
2	Washer, lock, .391 ID x .975 in. ID	X-22-14
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Connector, hose	X-582-7
2	Hose, coolant, 26 in.	X-6367-6
4	Screw, slotted hex washer head, machine	X-97-13

GM38859-KA6

Block Heater, 2500W, 208-240V

1	Box, block heater control	354315
1	Label, wiring diagram	354327
1	Block heater (includes items marked *)	GM20135
1	*Block heater service element	GM29478
1	*Thermostat	GM29529
1	Bushing, reducing, 1/3 x 3/4 in. NPT	153659
1	Strap, ground	223033
1	Adapter, bushing	273692
1	O-Ring 1.475 in. ID	273693
1	Bracket, support	274431
1	Tag, hang	279047
1	Thermostat, block heater	279813
4	Gasket, washer	297001
1	Cover, block heater control box	354317
1	Gasket, control box	354318
1	Decal, warning	354325
2	Valve, shutoff	GM19670
4	Vibromount	GM38784-2
1	Bracket, block heater	GM38834
1	Tag, hang	GM39752
1	Pipe, 1/2 in. NPT x 3.00 in.	X-209-11
2	Pipe, 1/2 x 2.00 in.	X-209-6
2	Elbow, street, 90° x 1/2 in. NPTF	X-211-1
4	Washer, lock, .262 ID x .469 in. OD	X-22-11
8	Washer, lock, .262 ID x .743 in. OD	X-22-12
2	Washer, lock, .391 ID x .975 in. ID	X-22-14
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Connector, hose	X-582-7
2	Hose, coolant, 26 in.	X-6367-6
4	Screw, slotted hex washer head, machine	X-97-13

GM38859-KA7

Cooling System Kits

Qty.	Description	Part No.
Block Heater, 2500W, 380-480V		GM38859-KA8
1	Box, block heater control	354316
1	Label, wiring diagram	354328
1	Block heater (includes items marked *)	GM20136
1	*Block heater service element	GM29479
1	*Thermostat	GM29529
1	Bushing, reducing, 1/3 x 3/4 in. NPT	153659
1	Strap, ground	223033
1	Adapter, bushing	273692
1	O-Ring 1.475 in. ID	273693
1	Bracket, support	274431
1	Tag, hang	279047
1	Thermostat, block heater	279813
4	Gasket, washer	297001
1	Cover, block heater control box	354317
1	Gasket, control box	354318
1	Decal, warning	354325
2	Valve, shutoff	GM19670
4	Vibromount	GM38784-2
1	Bracket, block heater	GM38834
1	Tag, hang	GM39752
1	Pipe, 1/2 in. NPT x 3.00 in.	X-209-11
2	Pipe, 1/2 x 2.00 in.	X-209-6
2	Elbow, street, 90° x 1/2 in. NPTF	X-211-1
4	Washer, lock, .262 ID x .469 in. OD	X-22-11
8	Washer, lock, .262 ID x .743 in. OD	X-22-12
2	Washer, lock, .391 ID x .975 in. ID	X-22-14
4	Clamp, hose, .69/1.25 in.	X-426-12
2	Connector, hose	X-582-7
2	Hose, coolant, 26 in.	X-6367-6
4	Screw, slotted hex washer head, machine	X-97-13

Qty.	Description	Part No.
Duct Flange, Radiator		GM13896-KA2
2	Frame, air duct	GM31193
2	Frame, air duct	GM32061
8	Rivet, pop, .187 in.	X-781-11
Duct Flange, Radiator		GM13896-KA4
2	Frame, air duct horizontal	GM39281
2	Frame, air duct vertical	GM39282
8	Rivet, pop, .187 in.	X-781-11

Notes

Appendix A Abbreviations

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

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

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

Appendix B Common Hardware Application Guidelines

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

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

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

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

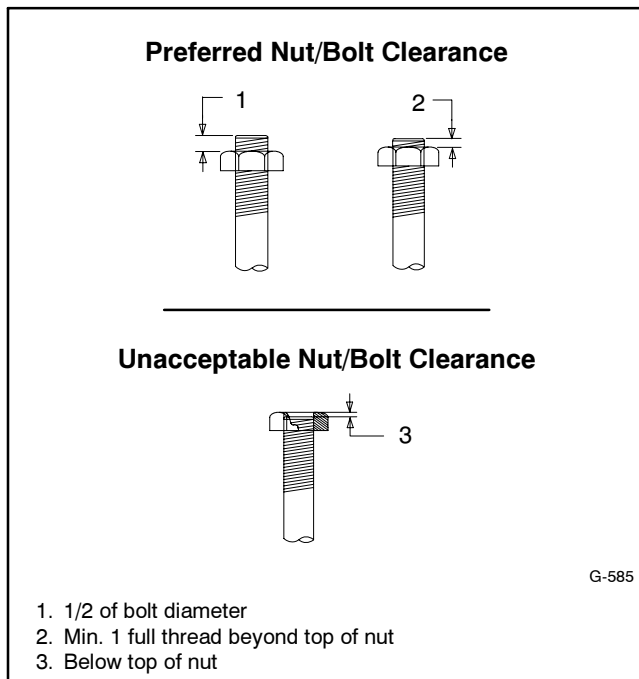


Figure 1 Acceptable Bolt Lengths

Steps for common hardware application:

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

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

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

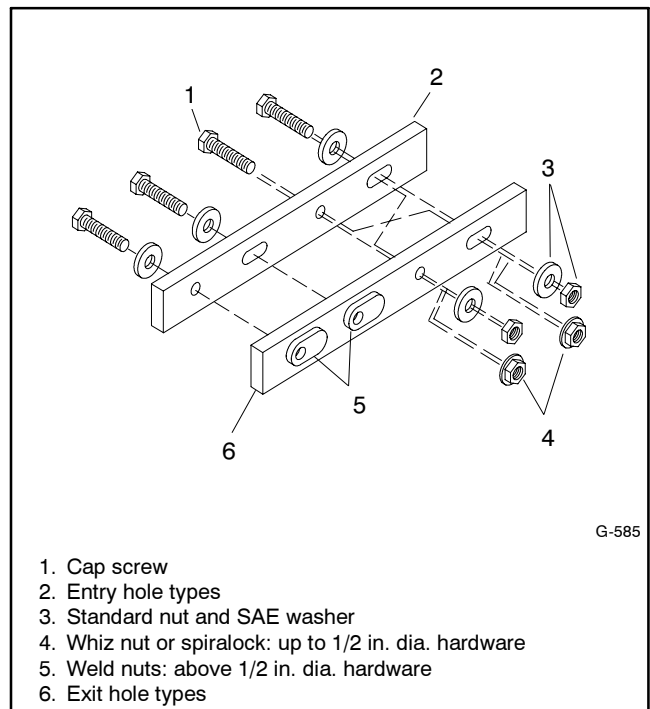


Figure 2 Acceptable Hardware Combinations

Appendix C General Torque Specifications

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

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

Notes:

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

Appendix D Common Hardware Identification

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

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

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

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

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

Sample Dimensions

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

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

Metric (Screws, Bolts, Studs, and Nuts)

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

Plain Washers

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

Lock Washers

5/8
 — Internal Dimension

Appendix E Common Hardware List

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

American Standard

Part No. Dimensions Hex Head Bolts (Grade 5)

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

Part No. Dimensions Hex Head Bolts, cont.

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

Part No. Dimensions Type

Hex Nuts

X-6009-1	1-8	Standard
X-6210-3	6-32	Whiz
X-6210-4	8-32	Whiz
X-6210-5	10-24	Whiz
X-6210-1	10-32	Whiz
X-6210-2	1/4-20	Spiralock
X-6210-6	1/4-28	Spiralock
X-6210-7	5/16-18	Spiralock
X-6210-8	5/16-24	Spiralock
X-6210-9	3/8-16	Spiralock
X-6210-10	3/8-24	Spiralock
X-6210-11	7/16-14	Spiralock
X-6210-12	1/2-13	Spiralock
X-6210-15	7/16-20	Spiralock
X-6210-14	1/2-20	Spiralock
X-85-3	5/8-11	Standard
X-88-12	3/4-10	Standard
X-89-2	1/2-20	Standard

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 Hex Head Bolts (Partial Thread)

M931-05055-60	M5-0.80 x 55
M931-06040-60	M6-1.00 x 40
M931-06055-60	M6-1.00 x 55
M931-06060-60	M6-1.00 x 60
M931-06060-SS	M6-1.00 x 60
M931-06070-60	M6-1.00 x 70
M931-06070-SS	M6-1.00 x 70
M931-06075-60	M6-1.00 x 75
M931-06090-60	M6-1.00 x 90
M931-06145-60	M6-1.00 x 145
M931-06150-60	M6-1.00 x 150
M931-08035-60	M8-1.25 x 35
M931-08040-60	M8-1.25 x 40
M931-08045-60	M8-1.25 x 45
M931-08050-60	M8-1.25 x 50
M931-08055-60	M8-1.25 x 55
M931-08055-82	M8-1.25 x 55*
M931-08060-60	M8-1.25 x 60
M931-08070-60	M8-1.25 x 70
M931-08070-82	M8-1.25 x 70*
M931-08075-60	M8-1.25 x 75
M931-08080-60	M8-1.25 x 80
M931-08090-60	M8-1.25 x 90
M931-08095-60	M8-1.25 x 95
M931-08100-60	M8-1.25 x 100
M931-08110-60	M8-1.25 x 110
M931-08120-60	M8-1.25 x 120
M931-08130-60	M8-1.25 x 130
M931-08140-60	M8-1.25 x 140
M931-08150-60	M8-1.25 x 150
M931-08200-60	M8-1.25 x 200
M931-10040-82	M10-1.25 x 40*
M931-10040-60	M10-1.50 x 40
M931-10045-60	M10-1.50 x 45
M931-10050-60	M10-1.50 x 50
M931-10050-82	M10-1.25 x 50*
M931-10055-60	M10-1.50 x 55
M931-10060-60	M10-1.50 x 60
M931-10065-60	M10-1.50 x 65
M931-10070-60	M10-1.50 x 70
M931-10080-60	M10-1.50 x 80
M931-10080-82	M10-1.25 x 80*
M931-10090-60	M10-1.50 x 90
M931-10090-82	M10-1.50 x 90*
M931-10100-60	M10-1.50 x 100
M931-10110-60	M10-1.50 x 110
M931-10120-60	M10-1.50 x 120
M931-10130-60	M10-1.50 x 130
M931-10140-60	M10-1.50 x 140
M931-10180-60	M10-1.50 x 180
M931-10235-60	M10-1.50 x 235
M931-10260-60	M10-1.50 x 260
M960-10330-60	M10-1.25 x 330
M931-12045-60	M12-1.75 x 45
M960-12050-60	M12-1.25 x 50
M960-12050-82	M12-1.25 x 50*
M931-12050-60	M12-1.75 x 50
M931-12050-82	M12-1.75 x 50*
M931-12055-60	M12-1.75 x 55
M931-12060-60	M12-1.75 x 60
M931-12060-82	M12-1.75 x 60*
M931-12065-60	M12-1.75 x 65
M931-12075-60	M12-1.75 x 75
M931-12080-60	M12-1.75 x 80
M931-12090-60	M12-1.75 x 90
M931-12100-60	M12-1.75 x 100
M931-12110-60	M12-1.75 x 110

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

M960-16090-60	M16-1.50 x 90
M931-16090-60	M16-2.00 x 90
M931-16100-60	M16-2.00 x 100
M931-16100-82	M16-2.00 x 100*
M931-16120-60	M16-2.00 x 120
M931-16150-60	M16-2.00 x 150
M931-20065-60	M20-2.50 x 65
M931-20090-60	M20-2.50 x 90
M931-20100-60	M20-2.50 x 100
M931-20120-60	M20-2.50 x 120
M931-20140-60	M20-2.50 x 140
M931-20160-60	M20-2.50 x 160
M931-22090-60	M22-2.50 x 90
M931-22120-60	M22-2.50 x 120
M931-22160-60	M22-2.50 x 160
M931-24090-60	M24-3.00 x 90
M931-24120-60	M24-3.00 x 120
M931-24160-60	M24-3.00 x 160
M931-24200-60	M24-3.00 x 200

Hex Head Bolts (Full Thread)

M933-04006-60	M4-0.70 x 6
M933-05030-60	M5-0.80 x 30
M933-05035-60	M5-0.80 x 35
M933-05050-60	M5-0.80 x 50
M933-06010-60	M6-1.00 x 10
M933-06012-60	M6-1.00 x 12
M933-06014-60	M6-1.00 x 14
M933-06016-60	M6-1.00 x 16
M933-06020-60	M6-1.00 x 20
M933-06025-60	M6-1.00 x 25
M933-06030-60	M6-1.00 x 30
M933-06040-60	M6-1.00 x 40
M933-06050-60	M6-1.00 x 50
M933-07025-60	M7-1.00 x 25
M933-08010-60	M8-1.25 x 10
M933-08012-60	M8-1.25 x 12
M933-08016-60	M8-1.25 x 16
M933-08020-60	M8-1.25 x 20
M933-08025-60	M8-1.25 x 25
M933-08030-60	M8-1.25 x 30
M933-08030-82	M8-1.25 x 30*
M933-10012-60	M10-1.50 x 12
M961-10020-60	M10-1.25 x 20
M933-10020-60	M10-1.50 x 20
M933-10025-60	M10-1.50 x 25
M961-10025-60	M10-1.25 x 25
M933-10025-82	M10-1.50 x 25*
M961-10030-60	M10-1.25 x 30
M933-10030-60	M10-1.50 x 30
M933-10030-82	M10-1.50 x 30*
M961-10035-60	M10-1.25 x 35
M933-10035-60	M10-1.50 x 35
M933-10035-82	M10-1.50 x 35*
M961-10040-60	M10-1.25 x 40

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

M933-12016-60	M12-1.75 x 16
M933-12020-60	M12-1.75 x 20
M961-12020-60F	M12-1.50 x 20
M933-12025-60	M12-1.75 x 25
M933-12025-82	M12-1.75 x 25*
M961-12030-60	M12-1.25 x 30
M933-12030-82	M12-1.75 x 30*
M961-12030-82F	M12-1.50 x 30*
M933-12030-60	M12-1.75 x 30
M933-12035-60	M12-1.75 x 35
M961-12040-82	M12-1.25 x 40*
M933-12040-60	M12-1.75 x 40
M933-12040-82	M12-1.75 x 40*
M961-14025-60	M14-1.50 x 25
M933-14025-60	M14-2.00 x 25
M961-14050-82	M14-1.50 x 50*
M961-16025-60	M16-1.50 x 25
M933-16025-60	M16-2.00 x 25
M961-16030-82	M16-1.50 x 30*
M933-16030-82	M16-2.00 x 30*
M933-16035-60	M16-2.00 x 35
M961-16040-60	M16-1.50 x 40
M933-16040-60	M16-2.00 x 40
M961-16045-82	M16-1.50 x 45*
M933-16045-82	M16-2.00 x 45*
M933-16050-60	M16-2.00 x 50
M933-16050-82	M16-2.00 x 50*
M933-16060-60	M16-2.00 x 60
M933-16070-60	M16-2.00 x 70
M933-18035-60	M18-2.50 x 35
M933-18050-60	M18-2.50 x 50
M933-18060-60	M18-2.50 x 60
M933-20050-60	M20-2.50 x 50
M933-20055-60	M20-2.50 x 55
M933-24060-60	M24-3.00 x 60
M933-24065-60	M24-3.00 x 65
M933-24070-60	M24-3.00 x 70

Pan Head Machine Screws

M7985A-03010-20	M3-0.50 x 10
M7985A-03012-20	M3-0.50 x 12
M7985A-04010-20	M4-0.70 x 10
M7985A-04016-20	M4-0.70 x 16
M7985A-04020-20	M4-0.70 x 20
M7985A-04050-20	M4-0.70 x 50
M7985A-04100-20	M4-0.70 x 100
M7985A-05010-20	M5-0.80 x 10
M7985A-05012-20	M5-0.80 x 12
M7985A-05016-20	M5-0.80 x 16
M7985A-05020-20	M5-0.80 x 20
M7985A-05025-20	M5-0.80 x 25
M7985A-05030-20	M5-0.80 x 30
M7985A-05080-20	M5-0.80 x 80
M7985A-05100-20	M5-0.80 x 100
M7985A-06100-20	M6-1.00 x 100

Flat Head Machine Screws

M965A-04012-SS	M4-0.70 x 12
M965A-05012-SS	M5-0.80 x 12
M965A-05016-20	M5-0.80 x 16
M965A-06012-20	M6-1.00 x 12

* This metric hex bolt's hardness is grade 10.9.

Metric, continued

Part No.	Dimensions	Type
Hex Nuts		
M934-03-50	M3-0.50	Standard
M934-04-50	M4-0.70	Standard
M934-04-B	M4-0.70	Brass
M934-05-50	M5-0.80	Standard
M934-06-60	M6-1.00	Standard
M934-06-64	M6-1.00	Std. (green)
M6923-06-80	M6-1.00	Spiralock
M982-06-80	M6-1.00	Elastic Stop
M934-08-60	M8-1.25	Standard
M6923-08-80	M8-1.25	Spiralock
M982-08-80	M8-1.25	Elastic Stop
M934-10-60	M10-1.50	Standard
M934-10-60F	M10-1.25	Standard
M6923-10-80	M10-1.50	Spiralock
M6923-10-62	M10-1.50	Spiralock†
M982-10-80	M10-1.50	Elastic Stop
M934-12-60	M12-1.75	Standard
M934-12-60F	M12-1.25	Standard
M6923-12-80	M12-1.75	Spiralock
M982-12-80	M12-1.75	Elastic Stop
M982-14-60	M14-2.00	Elastic Stop
M6923-16-80	M16-2.00	Spiralock
M982-16-80	M16-2.00	Elastic Stop
M934-18-80	M18-2.5	Standard
M982-18-60	M18-2.50	Elastic Stop
M934-20-80	M20-2.50	Standard
M982-20-80	M20-2.50	Elastic Stop
M934-22-60	M22-2.50	Standard
M934-24-80	M24-3.00	Standard
M982-24-60	M24-3.00	Elastic Stop
M934-30-80	M30-3.50	Standard

Washers

Part No.	ID	OD	Thick.	Bolt/ Screw
M125A-03-80	3.2	7.0	0.5	M3
M125A-04-80	4.3	9.0	0.8	M4
M125A-05-80	5.3	10.0	1.0	M5
M125A-06-80	6.4	12.0	1.6	M6
M125A-08-80	8.4	16.0	1.6	M8
M125A-10-80	10.5	20.0	2.0	M10
M125A-12-80	13.0	24.0	2.5	M12
M125A-14-80	15.0	28.0	2.5	M14
M125A-16-80	17.0	30.0	3.0	M16
M125A-18-80	19.0	34.0	3.0	M18
M125A-20-80	21.0	37.0	3.0	M20
M125A-24-80	25.0	44.0	4.0	M24

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

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