

Service Parts

Residential/Commercial Generator Sets



Models:

15/30RYG
15/30RES/RESL

KOHLER[®]
POWER SYSTEMS

9001
KOHLER
POWER SYSTEMS
NATIONALLY REGISTERED

TP-6319 5/09e

Common Replacement Parts

Figure 1 identifies common replacement parts for your generator set. Refer to the groups on the following pages for a complete list of maintenance and service parts.

Description	Part Number	Quantity On Unit	
		15RYG/RES	30RYG/RES
Element, air cleaner	GM16944	1	1
Element, oil filter	GM28351	1	1
Belt, Poly-6V (39 in.)	GM28352		1
Belt, Poly-6V (40.75 in.)	GM28353	1	
Sensor, temperature	GM28823	1	1
PCB Assy., Relay board 12V	GM29671	1	1
Hose, upper radiator	GM33021	1	1
Hose, lower radiator	GM33022	1	1
Plug, spark	GM35826	4	4
Belt, timing	GM38753	1	1
Thermostat	GM38758	1	1

Figure 1 Common Replacement Parts

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Introduction

This manual lists service replacement parts for 15/30RYG and 15/30RES/RESL generator sets.

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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	Engine Block/Lower End	Engine Head/Upper End	Engine Trim Parts	Air Intake	Fuel System	Cooling System	Engine	Nameplates and Decals	Skid and Plant Mounting	Generator and Mounting	Control and Harness	Control and Harness	Literature
Group No.	1	2	3	101	103	104	105	107	109	201	301	301	701
Spec No.	Variation Number												
15RYG													
GM32850-GA1	1	1	1	GR1	GR2	GR3	GR4	GR6	GR7	*	GR8	GR8	226
GM32850-GA3	1	1	1	GR9	GR2	GR3	GR4	GR6	GR7	*	GR8	GR8	226
GM39949-GA1	1	1	3	GR1	GR2	GR3	3	GR6	GR7	*	2	2	226
GM39949-GA3	1	1	3	GR9	GR2	GR3	3	GR6	GR7	*	2	2	226
GM39949-GA7	1	1	3	GR1	GR10	GR3	3	GR6	GR7	*	2	2	226
GM39949-GA9	1	1	3	GR9	GR10	GR3	3	GR6	GR7	*	2**	3	226
GM39949-GA13	1	1	3	*	GR10	GR3	3	GR6	*	*	2**	3	226
GM39949-GA21	3	3	6	*	GR10	GR3	6	GR6	*	*	-	3	226
15RES													
GM32850-GA5	1	1	1	GR9	GR2	GR3	GR4	GR6	GR7	*	GR8	GR8	237
GM39949-GA5	1	1	3	GR9	GR2	GR3	3	GR6	GR7	*	2	2	237
GM39949-GA11	1	1	3	GR9	GR10	GR3	3	GR6	GR7	*	2	2	237
GM39949-GA15	1	1	3	*	GR10	GR3	3	GR6	*	*	2**	4	237
GM39949-GA20	3	3	6	*	GR10	GR3	6	GR6	*	*	-	4	237
15RESL													
GM39949-SA1	1	1	3	*	GR10	GR3	3	GR6	*	*	2**	4	275
GM39949-SA4	3	3	6	*	GR10	GR3	6	GR6	*	*	-	4	275
30RYG													
GM32850-GA2	1	1	2	GR1	GR2	GR3	GR5	GR6	GR7	*	GR8	GR8	228
GM32850-GA4	1	1	2	GR9	GR2	GR3	GR5	GR6	GR7	*	GR8	GR8	228
GM39949-GA2	1	1	4	GR1	GR2	GR3	4	GR6	GR7	*	2	2	228
GM39949-GA4	1	1	4	GR9	GR2	GR3	4	GR6	GR7	*	2	2	228
GM39949-GA8	1	1	4	GR1	GR10	GR3	4	GR6	GR7	*	2	2	228
GM39949-GA10	1	1	4	GR9	GR10	GR3	4	GR6	GR7	*	2	2	228
GM39949-GA14	1	1	4	*	GR10	GR3	4	GR6	*	*	2**	4	228
GM39949-GA17	2	2	5	*	GR10	GR3	5	GR6	*	*	-	4	228
GM39949-GA23	4	4	7	*	GR10	GR3	7	GR6	*	*	-	4	228
30RES													
GM32850-GA6	1	1	2	GR9	GR2	GR3	GR5	GR6	GR7	*	GR8	GR8	238
GM39949-GA6	1	1	4	GR9	GR2	GR3	4	GR6	GR7	*	2	2	238
GM39949-GA12	1	1	4	GR9	GR10	GR3	4	GR6	GR7	*	2	2	238
GM39949-GA16	1	1	4	*	GR10	GR3	4	GR6	*	*	2**	4	238
GM39949-GA18	2	2	5	*	GR10	GR3	5	GR6	*	*	-	4	238
GM39949-GA22	4	4	7	*	GR10	GR3	7	GR6	*	*	-	4	238
30RESL													
GM39949-SA2	1	1	4	*	GR10	GR3	4	GR6	*	*	2**	4	276
GM39949-SA3	2	2	5	*	GR10	GR3	5	GR6	*	*	-	4	276
GM39949-SA5	4	4	7	*	GR10	GR3	7	GR6	*	*	-	4	276

* Configured group. Refer to the generator set nameplate for the module number.

Turn to the respective group on the following pages for parts breakdowns.

**Units built before approximately April 1, 2007 used variation 2.

This exploded view diagram illustrates the assembly of a 1.6L 16V engine. The components are numbered as follows:

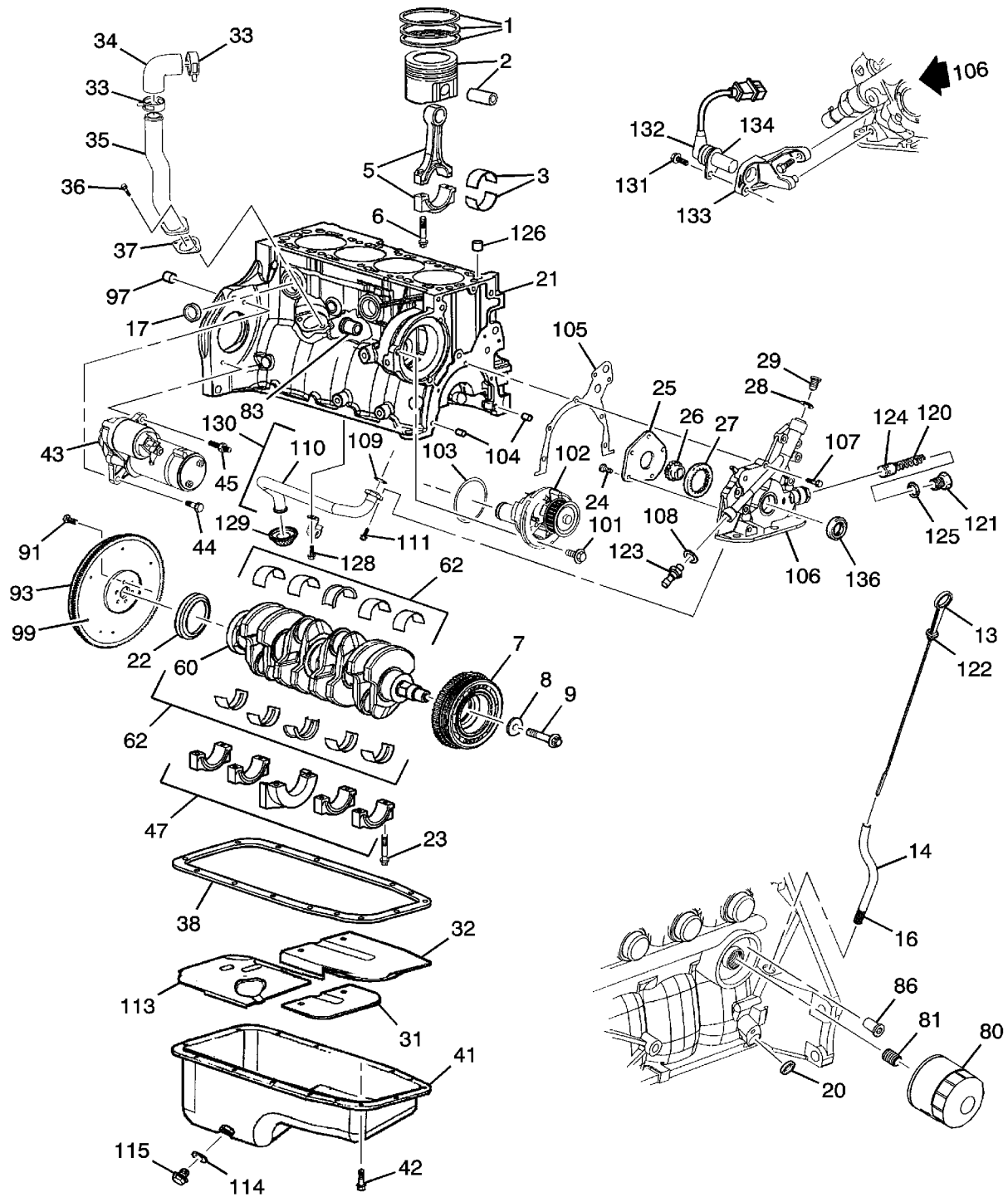
- Top End Components:** Piston and rings (1, 2), connecting rod (3), crankshaft (4), and various bolts (5, 6, 126).
- Valvetrain Components:** Intake and exhaust valves (132, 134), valve guides (131, 133), and associated hardware (106, 136).
- Engine Block Components:** Cylinder head (21), intake manifold (105), and various gaskets and seals (103, 104, 102, 101, 108, 123, 124, 120, 125, 121, 128, 111, 110, 109, 130, 83, 45, 44, 129).
- Timing Components:** Timing belt (7), timing pulleys (8, 9), and timing cover (62).
- Oil Pan Components:** Oil pan (41), oil pan gasket (38), and various bolts (113, 114, 115, 42, 31, 32, 47, 23, 22, 60, 99, 93, 91).
- Accessories:** Water pump (13), drive shaft (14), and various mounting hardware (16, 86, 81, 80, 20, 107, 25, 26, 27, 28, 29).

A dimension line indicates a length of 106mm for the crankshaft.

Group 1: Engine Block/Lower End

Item	Part Number	Description	Qty.		Item	Part Number	Description	Qty.	
			1	2				1	2
1	GM38640	Ring kit, piston (part of item 2)	4	4	62	GM38678	Bearing kit, crankshaft (position #1, 2, 3, 4, 5, 0.50 mm, green/blue)	4	4
2	GM38641	Piston w/pin (incl. items 1, 5, and 6)	1	1	62	GM38679	Bearing kit, crankshaft (pos. #3, std., brown)	4	4
3	GM38642	Bearing kit, connecting rod, standard	1	1	62	GM38680	Bearing kit, crankshaft (pos. #3, std., green)	4	4
3	GM38643	Bearing kit, connecting rod, 0.25 mm OS	1	1	80	GM28351	Element, oil filter	1	1
5	GM38644	Rod, connecting (part of item 3) Incl. item 6	4	4	81	GM38681	Fitting, oil filter	1	1
6	GM38645	Bolt, connecting rod (part of item 2)	8	8	82	GM38682	Sprocket, water pump (not shown)	1	1
7	GM38646	Pulley, crankshaft	1	1	83	GM38683	Plug, water pump hole	1	1
8	GM38647	Washer, crankshaft pulley	1	1	86	GM38684	Valve, oil filter bypass	1	1
9	GM38648	Bolt, crankshaft pulley	1	1	91	GM38685	Bolt, flywheel	6	6
13	GM38649	Indicator, oil level	1	1	93	GM38686	Gear, ring (part of item 99)	1	1
14	GM38650	Tube, oil level	1	1	97	GM38687	Pin	2	2
16	GM18933	Sealer, oil level ind. tube	AR	AR	99	GM38688	Flywheel	1	1
17	GM38651	Plug, engine block cool hole	7	7	101	GM38689	Bolt, water pump cover	3	3
20	GM38652	Plug, engine block cool hole	AR	AR	102	GM38690	Pump, water	1	1
21	GM38653	Block, engine (includes block, piston, rings)	1	1	103	GM38691	Seal, water pump cover	1	1
22	GM38654	Seal, crankshaft oil	1	1	104	GM38692	Pin	1	1
23	GM38655	Bolt, crankshaft bearing cap	10	10	105	GM38693	Gasket, oil pump	1	1
24	GM38656	Bolt, oil pump cover (part of item 106)	5	5	106	GM38694	Pump, oil (incl. items 24-27, 121, 125)	1	1
25	GM38657	Cover, oil pump (part of item 106)	1	1	107	GM38695	Bolt, oil pump	6	6
26	GM38658	Gear, oil pump (part of item 106)	1	1	108	GM38696	Seal	1	1
27	GM38659	Gear, oil pump drive (part of item 106)	1	1	109	GM38697	Seal, oil pump suction pipe	1	1
28	GM38660	Seal, oil pump housing	1	1	110	GM38698	Pipe, oil pump suction (part of item 130)	1	1
29	GM38661	Plug, oil pump housing	1	1	111	GM38717	Bolt, oil pump screen	2	2
30	GM38662	Baffle, oil pan	1	1	112	GM38699	Bolt, oil pump screen bracket	1	1
31	—	See item 113			113	GM38662	Baffle, oil pan	1	1
32	—	See item 113			114	GM38696	Seal, oil pan drain plug (part of item 41)	1	1
33	GM38663	Clamp, PVC hose	1	1	115	GM38700	Plug, oil pan drain (part of item 41)	1	1
34	GM38664	Hose, PVC	1	1	120	GM38701	Spring, oil pressure relief valve (part of item 106)	1	1
35	GM38665	Tube, PVC	1	1	121	GM38702	Plug, oil pressure relief valve bore	1	1
36	GM38666	Bolt, PVC tube	2	2	122	GM38703	Seal, oil fill cap	1	1
37	GM38667	Gasket, PVC tube	1	1	123	GM38704	Switch, engine oil pressure	1	1
38	GM38668	Gasket, oil pan	1	1	124	GM38705	Valve, oil pressure relief	1	1
41	GM38669	Pan, oil (incl. items 31, 113, 114, 115)	1	1	125	GM38706	Gasket, oil pressure relief valve bore plug	1	1
42	GM38670	Bolt, oil pan	5	5	126	GM38707	Pin, cylinder head	2	2
43	GM38671	Starter	1	1	128	GM38708	Bracket, oil pump screen	1	1
43	GM62221	Starter (engines built after Mar. 1, 2006)	1	1	130	GM38709	Screen, oil pump (incl. items 110, 129)	1	1
44	GM38672	Bolt, starter	1	1	131	GM38710	Bolt, crankshaft position sensor bracket	1	1
45	GM38673	Stud, starter	1	1	132	GM38711	Sensor, crankshaft position	1	1
60	GM38674	Crankshaft	1	1	133	GM38712	Bracket, crankshaft pos. sensor lead clip	1	1
62	GM38675	Bearing kit, crankshaft (position #1, 2, 4, 5, standard, brown)	4	4	134	GM38710	Bolt, crankshaft position sensor	1	1
62	GM38676	Bearing kit, crankshaft (position #1, 2, 4, 5, OS 0.25 mm, green)	4	4	134	GM38713	Bolt, crankshaft position sensor	3	3
62	GM38677	Bearing kit, crankshaft (position #1, 2, 3, 4, 5, standard, brown/blue)	4	4	136	GM38714	Seal, oil pump	1	1

Group 1: Engine Block/Lower End, continued



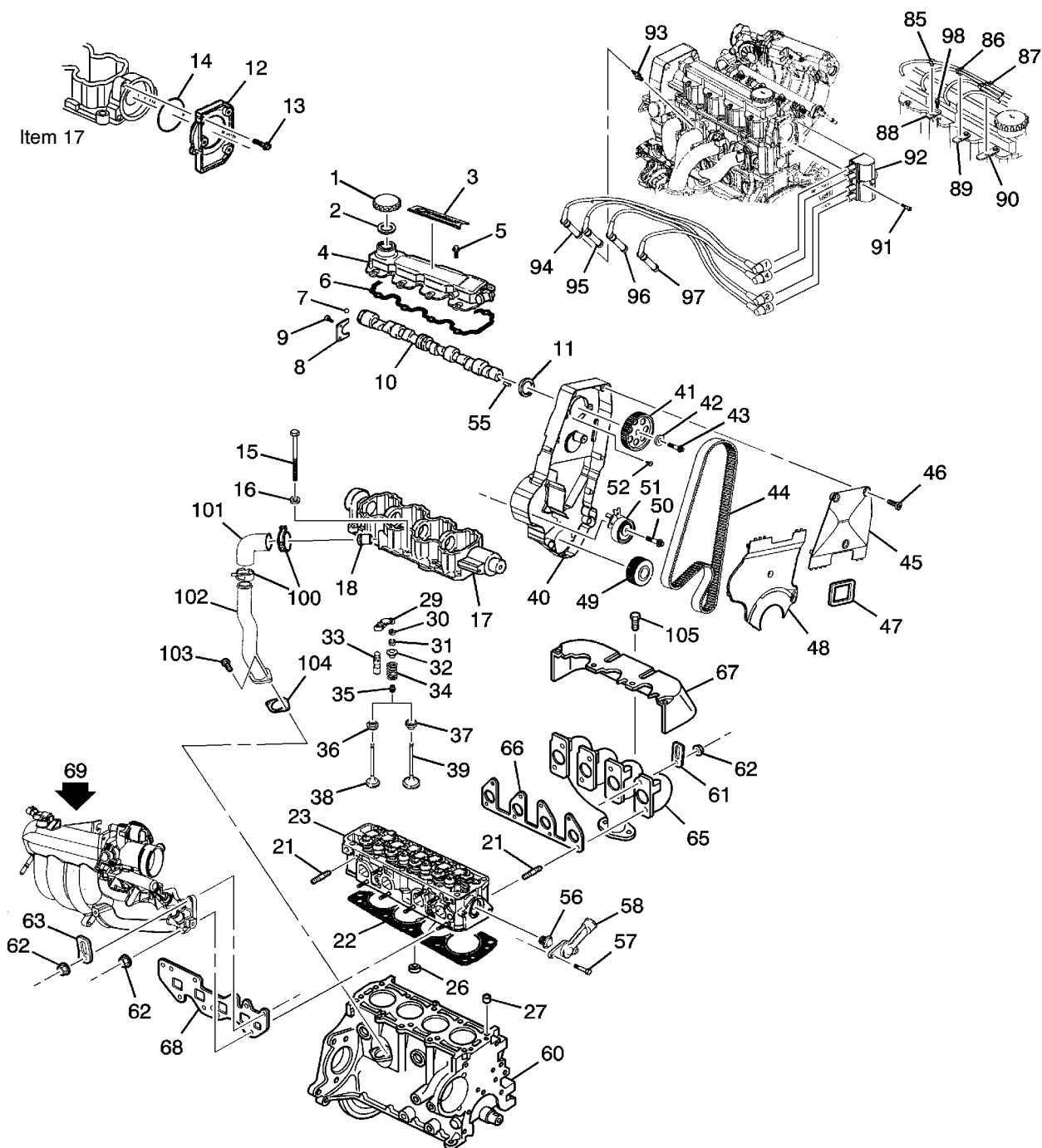
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Group 1: Engine Block/Lower End, continued

Item	Part Number	Description	Qty.		Item	Part Number	Description	Qty.	
			3	4				3	4
1	GM38640	Ring kit, piston (part of item 2)	4	4	62	GM38678	Bearing kit, crankshaft (position #1, 2, 3, 4, 5, 0.50 mm, green/blue)	4	4
2	GM38641	Piston w/pin (incl. items 1, 5, and 6)	1	1	62	GM38679	Bearing kit, crankshaft (pos. #3, std., brown)	4	4
3	GM38642	Bearing kit, connecting rod, standard	1	1	62	GM38680	Bearing kit, crankshaft (pos. #3, std., green)	4	4
3	GM38643	Bearing kit, connecting rod, 0.25 mm OS	1	1					
5	GM38644	Rod, connecting (incl. item 6)	4	4					
6	GM38645	Bolt, connecting rod (part of item 2)	8	8					
7	GM38646	Pulley, crankshaft	1	1	80	GM28351	Element, oil filter	1	1
8	GM38647	Washer, crankshaft pulley	1	1	81	GM38681	Fitting, oil filter	1	1
9	GM38648	Bolt, crankshaft pulley	1	1	82	GM38682	Sprocket, water pump (not shown)	1	1
13	GM38649	Indicator, oil level	1	1	83	GM38683	Plug, water pump hole	1	1
14	GM38650	Tube, oil level	1	1	86	GM38684	Valve, oil filter bypass	1	1
16	GM18933	Sealer, oil level ind. tube	AR	AR	91	GM38685	Bolt, flywheel	6	6
17	GM38651	Plug, engine block cool hole	7	7	93	GM38686	Gear, ring (part of item 99)	1	1
20	GM38652	Plug, engine block cool hole	AR	AR	97	GM38687	Pin	2	2
21	GM38653	Block, engine (includes block, piston, rings)	1	1	99	GM38688	Flywheel	1	1
22	GM38654	Seal, crankshaft oil	1	1	101	GM38689	Bolt, water pump cover	3	3
23	GM38655	Bolt, crankshaft bearing cap	10	10	102	GM38690	Pump, water	1	1
24	GM38656	Bolt, oil pump cover (part of item 106)	5	5	103	GM38691	Seal, water pump cover	1	1
25	GM38657	Cover, oil pump (part of item 106)	1	1	104	GM38692	Pin	1	1
26	GM38658	Gear, oil pump (part of item 106)	1	1	105	GM38693	Gasket, oil pump	1	1
27	GM38659	Gear, oil pump drive (part of item 106)	1	1	106	GM38694	Pump, oil (incl. items 24-27, 121, 125)	1	1
28	GM38660	Seal, oil pump housing	1	1	107	GM38695	Bolt, oil pump	6	6
29	GM38661	Plug, oil pump housing	1	1	108	GM38696	Seal	1	1
30	GM38662	Baffle, oil pan	1	1	109	GM38697	Seal, oil pump suction pipe	1	1
31	—	See item 113			110	GM38698	Pipe, oil pump suction (part of item 130)	1	1
32	—	See item 113			111	GM38717	Bolt, oil pump screen	2	2
33	GM38663	Clamp, PVC hose	1	1	112	GM38699	Bolt, oil pump screen bracket	1	1
34	GM38664	Hose, PVC	1	1	113	GM38662	Baffle, oil pan	1	1
35	GM38665	Tube, PVC	1	1	114	GM38696	Seal, oil pan drain plug (part of item 41)	1	1
36	GM38666	Bolt, PVC tube	2	2	115	GM38700	Plug, oil pan drain (part of item 41)	1	1
37	GM38667	Gasket, PVC tube	1	1	120	GM38701	Spring, oil pressure relief valve (part of item 106)	1	1
38	GM38668	Gasket, oil pan	1	1	121	GM38702	Plug, oil pressure relief valve bore	1	1
41	GM38669	Pan, oil (incl. items 31, 113, 114, 115)	1	1	122	GM38703	Seal, oil fill cap	1	1
42	GM38670	Bolt, oil pan	5	5	123	GM38704	Switch, engine oil pressure	1	
43	GM62221	Starter	1	1	123	364345	Switch, engine oil pressure		1
44	GM38672	Bolt, starter	1	1	123	GM66559	Lead, oil pressure switch (not shown)		1
45	GM38673	Stud, starter	1	1	124	GM38705	Valve, oil pressure relief	1	1
60	GM38674	Crankshaft	1	1	125	GM38706	Gasket, oil pressure relief valve bore plug	1	1
62	GM38675	Bearing kit, crankshaft (position #1, 2, 4, 5, standard, brown)	4	4	126	GM38707	Pin, cylinder head	2	2
62	GM38676	Bearing kit, crankshaft (position #1, 2, 4, 5, OS 0.25 mm, green)	4	4	128	GM38708	Bracket, oil pump screen	1	1
62	GM38677	Bearing kit, crankshaft (position #1, 2, 3, 4, 5, standard, brown/blue)	4	4	130	GM38709	Screen, oil pump (incl. items 110, 129)	1	1
					131	GM38710	Bolt, crankshaft position sensor bracket	1	1
					132	GM38711	Sensor, crankshaft position	1	1
					133	GM38712	Bracket, crankshaft pos. sensor lead clip	1	1
					134	GM38710	Bolt, crankshaft position sensor	1	1
					134	GM38713	Bolt, crankshaft position sensor	3	3
					136	GM38714	Seal, oil pump	1	1

AR As Required.

Group 2: Engine Head/Upper End



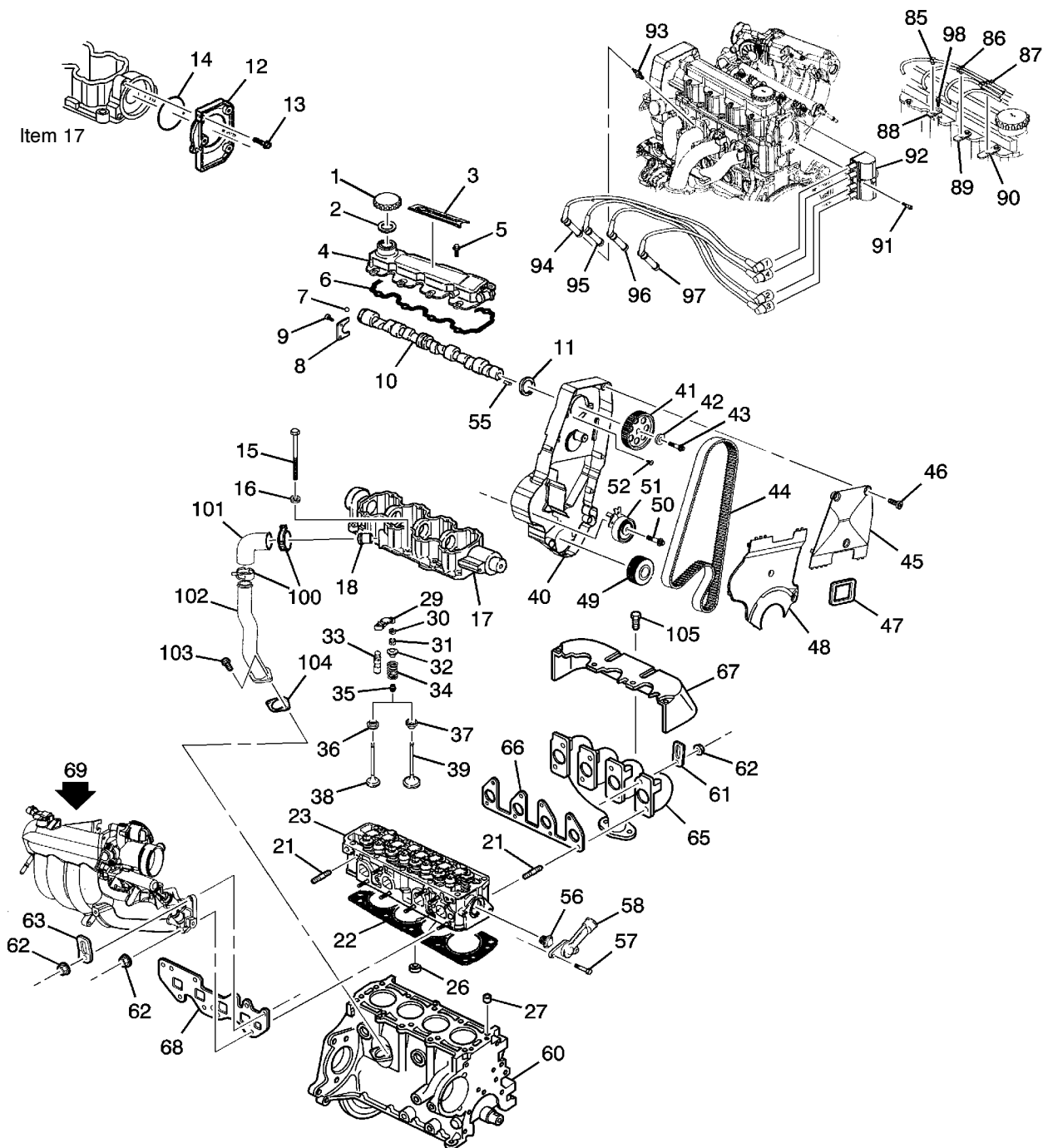
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Group 2: Engine Head/Upper End

Item	Part Number	Description	Quantity Variation		Item	Part Number	Description	Quantity Variation	
			1	2				1	2
1	GM38715	Cap, oil fill	1	1	41	GM38751	Sprocket, camshaft	1	1
2	GM38703	Seal, oil fill cap	1	1	42	GM38727	Washer, camshaft sprocket	1	1
3	—	Not sold as a service part	1	1	43	GM38752	Bolt, camshaft sprocket	1	1
4	GM38716	Cover, camshaft housing	1	1	44	GM38753	Belt, timing	1	1
5	GM38717	Bolt, camshaft housing cover	8	8	45	GM38754	Cover, timing belt front	1	1
6	GM38718	Gasket, camshaft housing cover	1	1	46	GM38670	Bolt, engine front cover	6	6
7	GM38719	Ball, camshaft (part of item 10)	1	1	48	GM38755	Cover, timing belt upper front	1	1
8	GM38720	Retainer, camshaft	1	1	49	GM38751	Sprocket, Crankshaft GM74549	1	1
9	GM38721	Bolt, camshaft retainer	2	2	50	GM38752	Bolt, camshaft sprocket	1	1
10	GM38773	Camshaft (includes items 7, 55)	1	1	51	GM38756	Tensioner, timing belt	1	1
11	GM38722	Seal, camshaft	1	1	52	GM38757	Bolt, timing belt tensioner	1	1
12	GM38723	Cover, camshaft housing	1	1	55	GM38707	Pin, camshaft housing	1	1
13	GM38724	Bolt, camshaft rear cover	3	3	GM92144	(part of item 10)	1	2	2
14	GM38725	Seal, camshaft hsg cover bolt	1	1	56	GM38758	Thermostat	1	1
15	GM38726	Bolt, cylinder head	10	10		(includes seal and item 58)			
16	GM38727	Washer, camshaft sprocket	1	1	57	GM38759	Bolt, thermostat housing	2	2
17	GM38728	Housing, camshaft	1	1	58	—	See item 56		
18	GM38729	Tube, PVC	1	1	60	GM38760	Engine, 1.6 L	1	1
21	GM38730	Stud, intake manifold, M8 x 96	4	4	62	GM38761	Nut, exhaust manifold	8	8
21	GM38731	Stud, intake manifold, M8 x 28	9	9	65	GM38762	Manifold, exhaust	1	1
22	GM38732	Gasket, cylinder head	1	1	66	GM28349	Gasket, exhaust manifold	1	1
23	GM38733	Head, cylinder	1	1	67	GM38763	Shield, exhaust manifold	1	1
26	GM38734	Seat, intake valve, 0.4 mm OS	4	4	68	GM38764	Gasket, intake manifold	1	1
26	GM38735	Seat, exhaust valve, 0.4 mm OS	4	4	69	TBD	Manifold, intake	1	1
26	GM38736	Seat, exhaust valve, standard	4	4	85	GM38765	Retainer, spark plug wire	1	1
26	GM38737	Seat, exhaust valve, 0.2 mm OS	4	4	86	GM38766	Retainer, spark plug wire	1	1
26	GM38738	Seat, intake valve, standard	4	4	87	GM38767	Retainer, spark plug wire	1	1
26	GM38739	Seat, intake valve, 0.2 mm OS	4	4	88	GM38768	Bracket, spark plug wire retainer	1	1
27	GM38707	Pin, cylinder head	2	2	89	GM38769	Bracket, spark plug wire retainer	1	1
29	GM38740	Arm, valve rocker	8	8	90	GM38770	Bracket, spark plug wire retainer	1	1
30	GM38741	Cap, valve stem	8	8	91	GM38710	Bolt, ignition coil bracket	1	1
30	GM38742	Seat, valve spring	8	8	92	GM38771	Coil, ignition	1	1
31	GM38743	Key, valve stem	16	16	93	GM35826	Spark plug	4	4
32	GM38744	Cap, valve spring	4	4	94	GM28356	Wire, spark plug #1 cylinder	1	1
33	GM38745	Adjuster	8	8	95	GM28357	Wire, spark plug #2 cylinder	1	1
34	GM38746	Spring, valve	8	8	96	GM28358	Wire, spark plug #3 cylinder	1	1
35	GM38747	Seal, valve stem	8	8	97	GM28359	Wire, spark plug #4 cylinder	1	1
36	GM38748	Rotator, valve	4	4	98	GM38710	Bolt, ignition coil bracket	1	1
37	GM38742	Seat, valve spring	8	8	100	GM38663	Clamp, PVC hose	1	1
37	GM38741	Seat, valve spring	8	8	101	GM38664	Hose, PVC	1	1
38	GM38749	Valve, exhaust	4	4	102	GM38665	Tube, PVC	1	1
39	GM38750	Valve, intake	1	1	103	GM38666	Bolt, PVC tube	2	2
40	GM40996	Timing case	1	1	104	GM38667	Gasket, PVC tube	1	1
					105	GM38772	Bolt, exh. manifold heat shield	5	5

TBD Part number to be determined.

Group 2: Engine Head/Upper End, continued

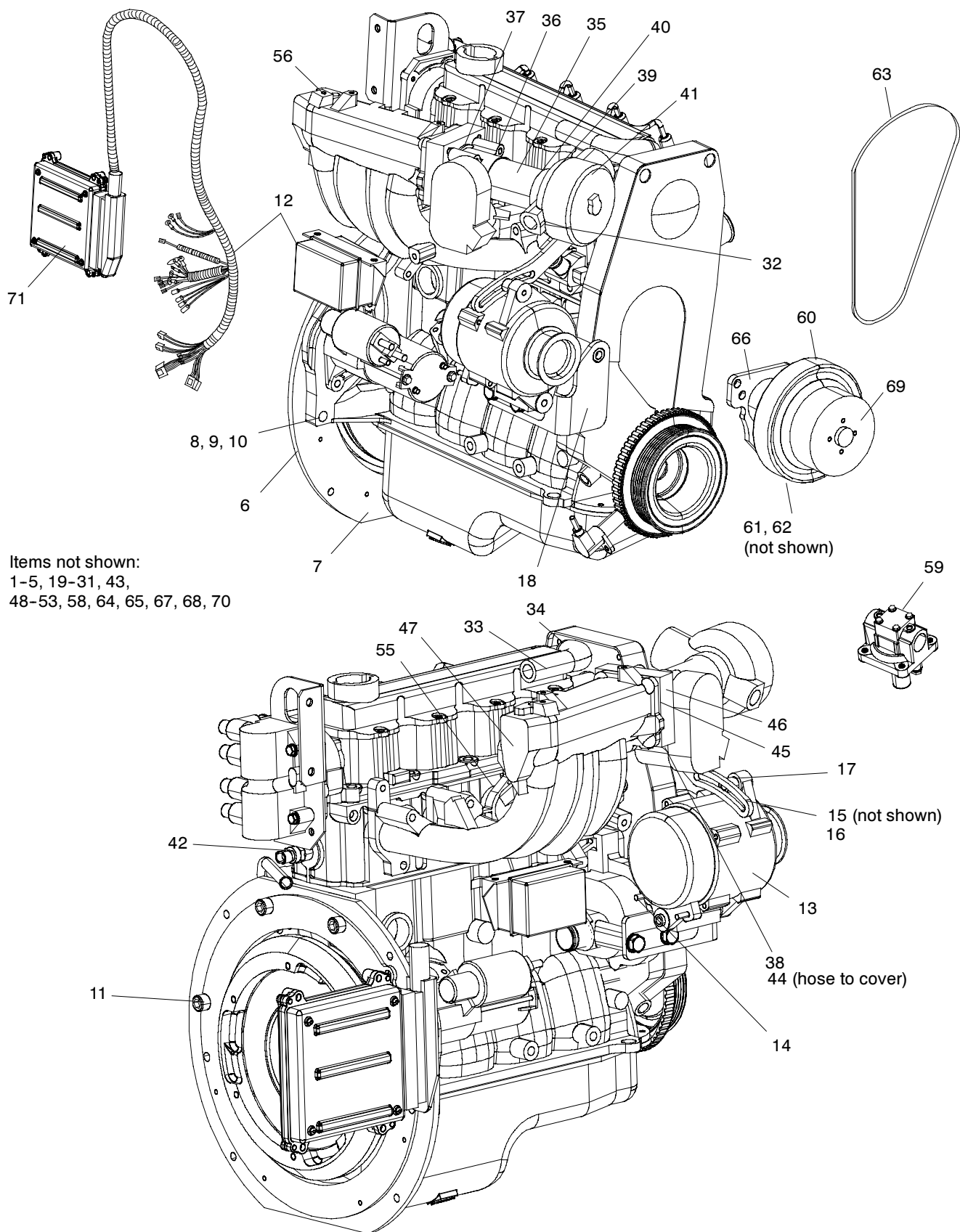


6319_2

Group 2: Engine Head/Upper End, continued

Item	Part Number	Description	Quantity		Item	Part Number	Description	Quantity	
			Variation					Variation	
			3	4				3	4
1	GM38715	Cap, oil fill	1	1	41	GM38751	Sprocket, camshaft	1	1
2	GM38703	Seal, oil fill cap	1	1	42	GM38727	Washer, camshaft sprocket	1	1
3	—	Not sold as a service part	1	1	43	GM38752	Bolt, camshaft sprocket	1	1
4	GM38716	Cover, camshaft housing	1	1	44	GM38753	Belt, timing	1	1
5	GM38717	Bolt, camshaft housing cover	8	8	45	GM38754	Cover, timing belt front	1	1
6	GM38718	Gasket, camshaft housing cover	1	1	46	GM38670	Bolt, engine front cover	6	6
7	GM38719	Ball, camshaft (part of item 10)	1	1	48	GM38755	Cover, timing belt upper front	1	1
8	GM38720	Retainer, camshaft	1	1	49	GM38751	Sprocket, camshaft	1	1
9	GM38721	Bolt, camshaft retainer	2	2	50	GM38752	Bolt, camshaft sprocket	1	1
10	GM38773	Camshaft (includes items 7, 55)	1	1	51	GM38756	Tensioner, timing belt	1	1
11	GM38722	Seal, camshaft	1	1	52	GM38757	Bolt, timing belt tensioner	1	1
12	GM38723	Cover, camshaft housing	1	1	55	GM38707	Pin, camshaft housing	1	1
13	GM38724	Bolt, camshaft rear cover	3	3	GM92144	(part of item 10)	2	2	
14	GM38725	Seal, camshaft hsg cover bolt	1	1	56	GM38758	Thermostat	1	1
15	GM38726	Bolt, cylinder head	10	10			(includes seal and item 58)	1	1
16	GM38727	Washer, camshaft sprocket	1	1	57	GM38759	Bolt, thermostat housing	2	2
17	GM38728	Housing, camshaft	1	1	58	—	See item 56	1	1
18	GM38729	Tube, PVC	1	1	60	GM38760	Engine, 1.6 L	1	1
21	GM38730	Stud, intake manifold, M8 x 96	4	4	62	GM38761	Nut, exhaust manifold	8	8
21	GM38731	Stud, intake manifold, M8 x 28	9	9	65	GM38762	Manifold, exhaust	1	1
22	GM38732	Gasket, cylinder head	1	1	66	GM28349	Gasket, exhaust manifold	1	1
23	GM38733	Head, cylinder	1	1	67	GM38763	Shield, exhaust manifold	1	1
26	GM38734	Seat, intake valve, 0.4 mm OS	4	4	68	GM38764	Gasket, intake manifold	1	1
26	GM38735	Seat, exhaust valve, 0.4 mm OS	4	4	69	TBD	Manifold, intake	1	1
26	GM38736	Seat, exhaust valve, standard	4	4	85	GM38765	Retainer, spark plug wire	1	1
26	GM38737	Seat, exhaust valve, 0.2 mm OS	4	4	86	GM38766	Retainer, spark plug wire	1	1
26	GM38738	Seat, intake valve, standard	4	4	87	GM38767	Retainer, spark plug wire	1	1
26	GM38739	Seat, intake valve, 0.2 mm OS	4	4	88	GM38768	Bracket, spark plug wire retainer	1	1
27	GM38707	Pin, cylinder head	2	2	89	GM38769	Bracket, spark plug wire retainer	1	1
29	GM38740	Arm, valve rocker	8	8	90	GM38770	Bracket, spark plug wire retainer	1	1
30	GM38741	Cap, valve stem	8	8	91	GM38710	Bolt, ignition coil bracket	1	1
30	GM38742	Seat, valve spring	8	8	92	GM38771	Coil, ignition	1	1
31	GM38743	Key, valve stem	16	16	93	GM35826	Spark plug	4	4
32	GM38744	Cap, valve spring	4	4	94	GM28356	Wire, spark plug #1 cylinder	1	1
33	GM38745	Adjuster	8	8	95	GM28357	Wire, spark plug #2 cylinder	1	1
34	GM38746	Spring, valve	8	8	96	GM28358	Wire, spark plug #3 cylinder	1	1
35	GM38747	Seal, valve stem	8	8	97	GM28359	Wire, spark plug #4 cylinder	1	1
36	GM38748	Rotator, valve	4	4	98	GM38710	Bolt, ignition coil bracket	1	1
37	GM38742	Seat, valve spring	8	8	100	GM38663	Clamp, PVC hose	1	1
37	GM38741	Seat, valve spring	8	8	101	GM38664	Hose, PVC	1	1
38	GM38749	Valve, exhaust	4	4	102	GM38665	Tube, PVC	1	1
39	GM38750	Valve, intake	1	1	103	GM38666	Bolt, PVC tube	2	2
40	GM40996	Timing case	1	1	104	GM38667	Gasket, PVC tube	1	1
					105	GM38772	Bolt, exh. manifold heat shield	5	5

Group 3: Engine Trim Parts



6319_3

Group 3: Engine Trim Parts

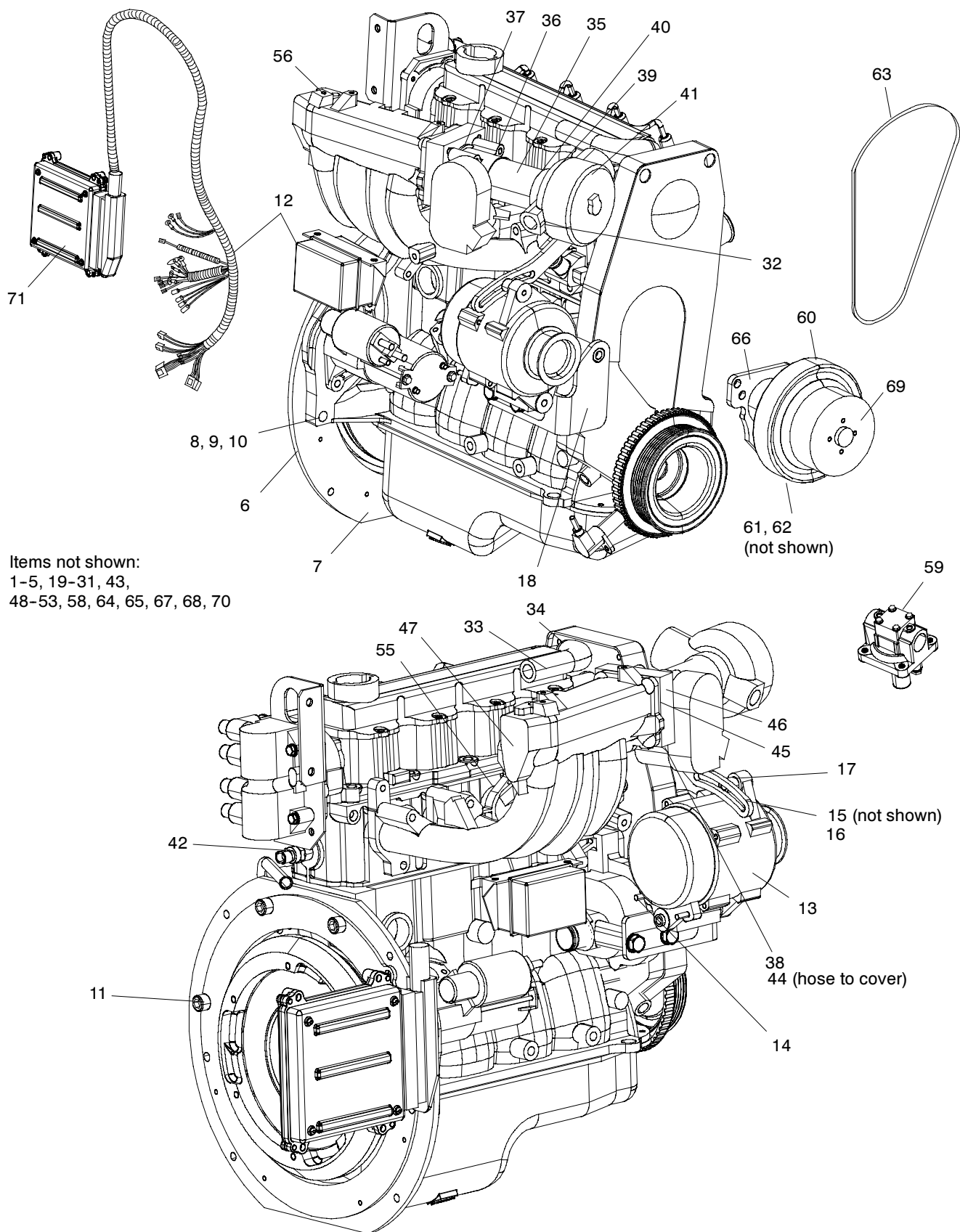
Item	Part Number	Description	Quantity				
			Variation				
1			1	2	3	4	5
1	GM39208	Adapter, freeze plug, 3/8 in. (not shown, above oil filter)	1	1	1	1	1
2	GM28959	Nut, M6-1.0 (not shown)	1	1	1	1	1
3	#	Nut, flanged, M8-1.25 (not shown)	1	1	1	1	1
4	#	Plug, pipe 3/8 in. (not shown, int. manifold)	1	1	1	1	1
5	—	Label, serial number (not shown)	1	1	1	1	1
6	GM39209	Backplate	1	1	1	1	1
7	GM39210	Plate, ring gear cover	1	1	1	1	1
8	GM28960	Washer, flat, 1/4 in. SAE	4	4	4	4	4
9	GM24188	Washer, lock, 1/4 in. SAE	4	4	4	4	4
10	#	Bolt, 1/4-20 x 1/2 in.	4	4	4	4	4
11	#	Screw, M12-1.75 x 30 mm skthd	5	5	5	5	5
12	GM39211	Harness, 1.6 L (incl. relay box)	1	1			
12	—	Harness (see Control and Harness group)			1	1	1
13	GM16180	Alternator	1	1	1	1	1
14	GM39213	Wire, ground	1	1	1	1	1
15	GM39214	Bracket, anchor alt. strap (not shown)	1	1	1	1	1
16	GM39215	Strap, alternator adjust	1	1	1	1	1
17	GM39216	Spacer, alternator adj. strap	1	1	1	1	1
18	GM39217	Bracket, mount	1	1	1	1	1
19	#	Bolt, M8-1.25 x 20 hex head, grade 8.8 (not shown)	2	2	2	2	2
20	#	Washer, flat, 5/16 USS (not shown)	1	1	1	1	1
21	#	Washer, lock, 5/16 (not shown)	4	4	4	4	4
22	#	Washer, flat, 5/16 (not shown)	1	1	1	1	1
23	#	Bolt, M8-1.25 x 50 hex head, grade 5 (not shown)	1	1	1	1	1
24	#	Washer, lock, M10 metric (not shown)	2	2	2	2	2
25	GM24190	Washer, flat, 3/8 SAE (not shown)	1	1	1	1	1
26	#	Bolt, M10-1.50 x 15 hex head, grade 8.8 (not shown)	1	1	1	1	1
27	#	Bolt, M8-1.25 x 25 hex head, grade 8.8 (not shown)	1	1	1	1	1
28	#	Bolt, M8-1.25 x 110 hex head, grade 8.8 (not shown)	1	1	1	1	1
29	#	Bolt, M10-1.50 x 25 hex head, grade 8.8 (not shown)	2	2	2	2	2
30	#	Nut, lock, M8-1.25 (not shown)	1	1	1	1	1
31	#	Washer, star, 3/8 in. (not shown)	1	1	1	1	1
32	GM39218	Cap, water outlet (connection on manifold)	1	1	1	1	1
33	GM39219	Hose, vent	1	1	1	1	1
34	GM39220	Clamp, hose, S-12 1 1/4 in.	1	1	1	1	1
35	GM39221	Hose, rubber, 2 in. ID	1	1	1	1	1
36	GM39222	Throttle body, Bosch 40mm	1	1	1	1	1
37	GM28360	Gasket, Bosch TB	1	1	1	1	1
38	GM39223	Fitting, vac, M16-1.5-6h	1	1	1	1	1
39	GM39224	Adapter, carb AH, 2 1/16 in. hose	1	1			
40	GM39225	Clamp, hose, S-32 2 1/4 in.	2	2	2	2	2
41	GM39226	Mixer	1	1			

Item	Part Number	Description	Quantity				
			Variation				
1			1	2	3	4	5
41	GM48125	Mixer			1		
41	GM48124	Air horn			1	1	1
42	GM39227	Sensor, T-map	1	1	1	1	1
43	#	Fitting, 1/2 MPT x 5/8, 90 elbow brass (not shown)	1	1			
44	GM39228	Hose, vacuum, 7/32 x 12 in.	1	1	1	1	1
45	GM39229	Gasket, int. manifold	1	1	1	1	1
46	GM39230	Adapter, intake/Bosch TB	1	1	1	1	1
47	GM39231	Plug (hole in rear of manifold)	1	1	1	1	1
48	#	Bolt, M6-1.0 x 25 skthd grade 12 (not shown)	4	4	4	4	4
49	GM28960	Washer, flat, 1/4 in. SAE (not shown)	5	5	5	5	5
50	GM24188	Washer, lock, 1/4 in. SAE (not shown)	5	5			
51	#	Bolt, 1/4-20 x 1/2 in. (not shown)	1	1			
52	#	Washer, flat, 1/4 in. hardened (not shown)	4	4	4	4	4
53	#	Screw, M6-1.0 x 45 mm socket head (not shown)	4	4	4	4	4
55	GM39232	Plug, injector hole	4	4	4	4	4
56	GM39233	Plug, map sensor port	1	1	1	1	1
58	GM16226	Plug, 1/8 in. NPS sg. head (not shown)	1	1			
59	GM16171	Regulator, fuel, 3/4 in. NPT	1	1	1	1	1
60	GM39234	Pulley, idler	1		1		
60	GM39235	Pulley		1		1	1
61	GM39236	Dust shield, idler	1		1		
62	GM39237	Spacer, idler, .370 L x 1.378 OD	1		1		
63	GM28353	Belt, Poly-6V, 40.75 in.	1		1		
63	GM28352	Belt, Poly-6V, 39 in.		1		1	1
64	#	Washer, lock, M10 metric (not shown)	1				
65	#	Bolt, M10-1.50 x 40 hex head grade 8.8 (not shown)	1		1		
66	GM39238	Base/hub assembly	1		1		
66	GM39239	Base/hub assembly		1		1	1
67	#	Bolt, M8-1.25 x 20 hex head, grade 8.8 (not shown)	2	2	2	2	2
68	#	Washer, lock, 5/16 (not shown)	2	2	2	2	2
69	GM39240	Spacer, fan	1		1		
69	GM39241	Spacer, fan		1			
69	GM48144	Spacer, fan				1	
69	GM55067	Spacer, fan					1
70	#	Bolt, 3/8-16 x 1 1/2 Allen grade 8 (not shown)	3		3		
70	#	Screw, cap, 3/8-16 x 2 skthd grade 8 (not shown)		3			
70	#	Screw, cap, 3/8-16 x 2 1/4 skthd (not shown)				3	3
71	GM39242	Module, ECU control	1				
71	GM39243	Module, ECU control		1	1	1	1
72	GM16144	Clamp, hose, 1 in. (not shown)	1	1	1	1	1
73	#	Plug, M18-1.5 hex socket head (not shown)			1	1	1

Common hardware; procure locally.

TBD Part number to be determined.

Group 3: Engine Trim Parts, continued



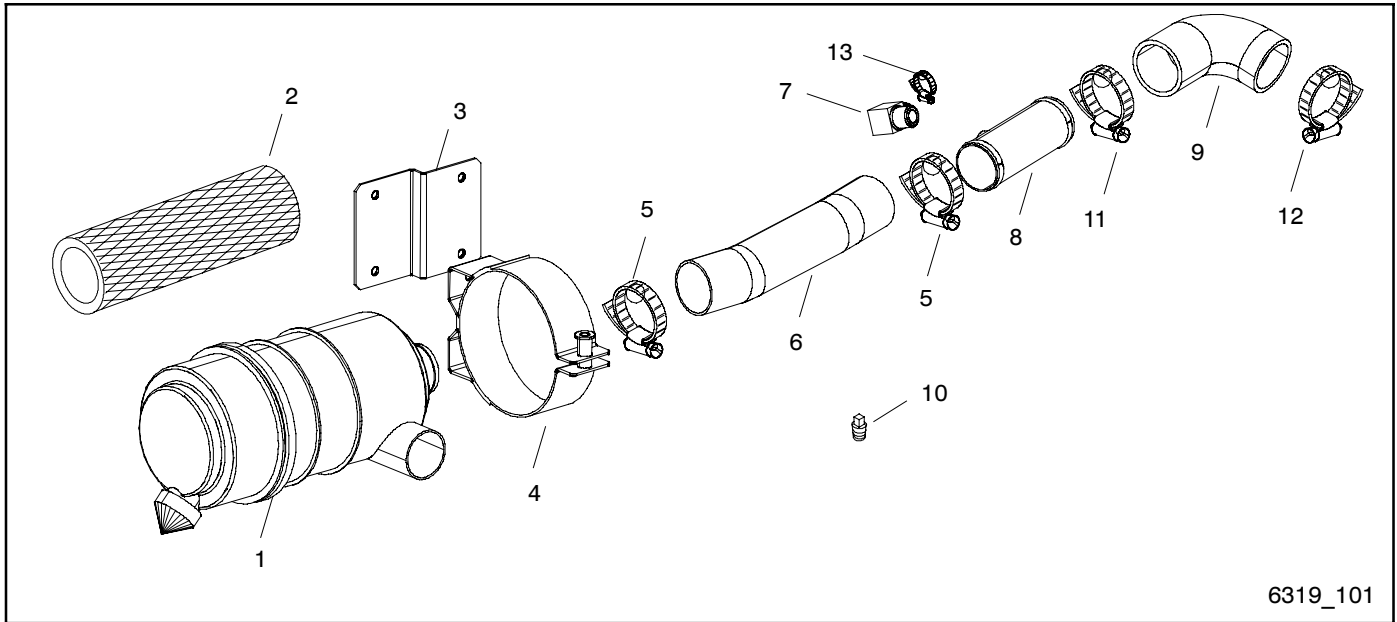
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Group 3: Engine Trim Parts, continued

Item	Part Number	Description	Qty.		Item	Part Number	Description	Qty.	
			Var.					Var.	
			6	7				6	7
1	GM39208	Adapter, freeze plug, 3/8 in. (not shown, above oil filter)	1	1	41	GM39226	Mixer		1
2	GM28959	Nut, M6-1.0 (not shown)	1	1	41	GM48125	Mixer	1	
3	#	Nut, flanged, M8-1.25 (not shown)	1	1	41	GM48124	Air horn	1	1
4	#	Plug, pipe 3/8 in. (not shown, int. manifold)	1	1	42	GM39227	Sensor, T-map	1	1
5	—	Label, serial number (not shown)	1	1	44	GM39228	Hose, vacuum, 7/32 x 12 in.	1	1
6	GM39209	Backplate	1	1	45	GM39229	Gasket, int. manifold	1	1
7	GM39210	Plate, ring gear cover	1	1	46	GM39230	Adapter, intake/Bosch TB	1	1
8	GM28960	Washer, flat, 1/4 in. SAE	4	4	47	GM39231	Plug (hole in rear of manifold)	1	1
9	GM24188	Washer, lock, 1/4 in. SAE	4	4	48	#	Bolt, M6-1.0 x 25 skthd grade 12 (not shown)	4	4
10	#	Bolt, 1/4-20 x 1/2 in.	4	4	49	GM28960	Washer, flat, 1/4 in. SAE (not shown)	5	5
11	#	Screw, M12-1.75 x 30 mm skthd	5	5	52	#	Washer, flat, 1/4 in. hardened (not shown)	4	4
12	—	Harness (see Control and Harness group)	1	1	53	#	Screw, M6-1.0 x 45 mm sckt hd (not shown)	4	4
13	GM16180	Alternator	1	1	55	GM39232	Plug, injector hole	4	4
14	GM39213	Wire, ground	1	1	56	GM39233	Plug, map sensor port	1	1
15	GM39214	Bracket, anchor alt. strap (not shown)	1	1	59	GM16171	Regulator, fuel, 3/4 in. NPT	1	1
16	GM39215	Strap, alternator adjust	1	1	60	GM39234	Pulley, idler	1	
17	GM39216	Spacer, alternator adj. strap	1	1	60	GM39235	Pulley		1
18	GM39217	Bracket, mount	1	1	61	GM39236	Dust shield, idler	1	
19	#	Bolt, M8-1.25 x 20 hx hd, grd 8.8 (not shown)	2	2	62	GM39237	Spacer, idler, .370 L x 1.378 OD	1	
20	#	Washer, flat, 5/16 USS (not shown)	1	1	63	GM28353	Belt, Poly-6V, 40.75 in.	1	
21	#	Washer, lock, 5/16 (not shown)	4	4	63	GM28352	Belt, Poly-6V, 39 in.		1
22	#	Washer, flat, 5/16 (not shown)	1	1	65	#	Bolt, M10-1.50 x 40 hx hd gr 8.8 (not shown)	1	
23	#	Bolt, M8-1.25 x 50 hx hd, grd 5 (not shown)	1	1	66	GM39238	Base/hub assembly	1	
24	#	Washer, lock, M10 metric (not shown)	2	2	66	GM39239	Base/hub assembly		1
25	GM24190	Washer, flat, 3/8 SAE (not shown)	1	1	67	#	Bolt, M8-1.25 x 20 hx hd, grd 8.8 (not shown)	2	2
26	#	Bolt, M10-1.50 x 15 hx hd, gr 8.8 (not shown)	1	1	68	#	Washer, lock, 5/16 (not shown)	2	2
27	#	Bolt, M8-1.25 x 25 hx hd, grd 8.8 (not shown)	1	1	69	GM39240	Spacer, fan	1	
28	#	Bolt, M8-1.25 x 110 hx hd, gr 8.8 (not shown)	1	1	69	GM55067	Spacer, fan		1
29	#	Bolt, M10-1.5 x 25 hx hd, grd 8.8 (not shown)	2	2	70	#	Bolt, 3/8-16 x 1 1/2 Allen grade 8 (not shown)	3	
30	#	Nut, lock, M8-1.25 (not shown)	1	1	70	#	Screw, cap, 3/8-16 x 2 1/4 skthd (not shown)		3
31	#	Washer, star, 3/8 in. (not shown)	1	1	71	GM39243	Module, ECU control	1	1
32	GM39218	Cap, water outlet (connection on manifold)	1	1	72	GM16144	Clamp, hose, 1 in. (not shown)	1	1
33	GM39219	Hose, vent	1	1	73	#	Plug, M18-1.5 hex socket head (not shown)	1	1
34	GM39220	Clamp, hose, S-12 1 1/4 in.	1	1					
35	GM39221	Hose, rubber, 2 in. ID	1	1					
36	GM39222	Throttle body, Bosch 40mm	1	1					
37	GM28360	Gasket, Bosch TB	1	1					
38	GM39223	Fitting, vac, M16-1.5-6h	1	1					
40	GM39225	Clamp, hose, S-32 2 1/4 in.	2	2					

Common hardware; procure locally.

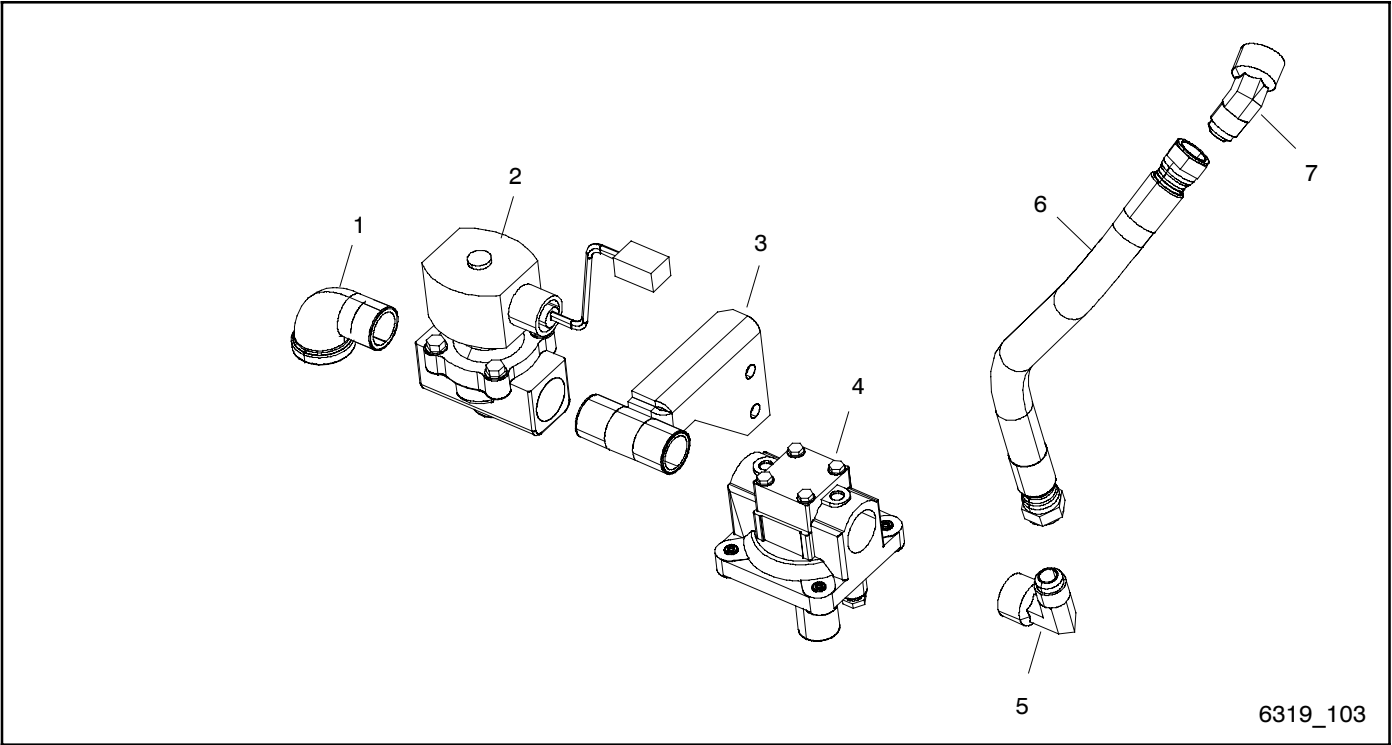
Group 101: Air Intake



6319_101

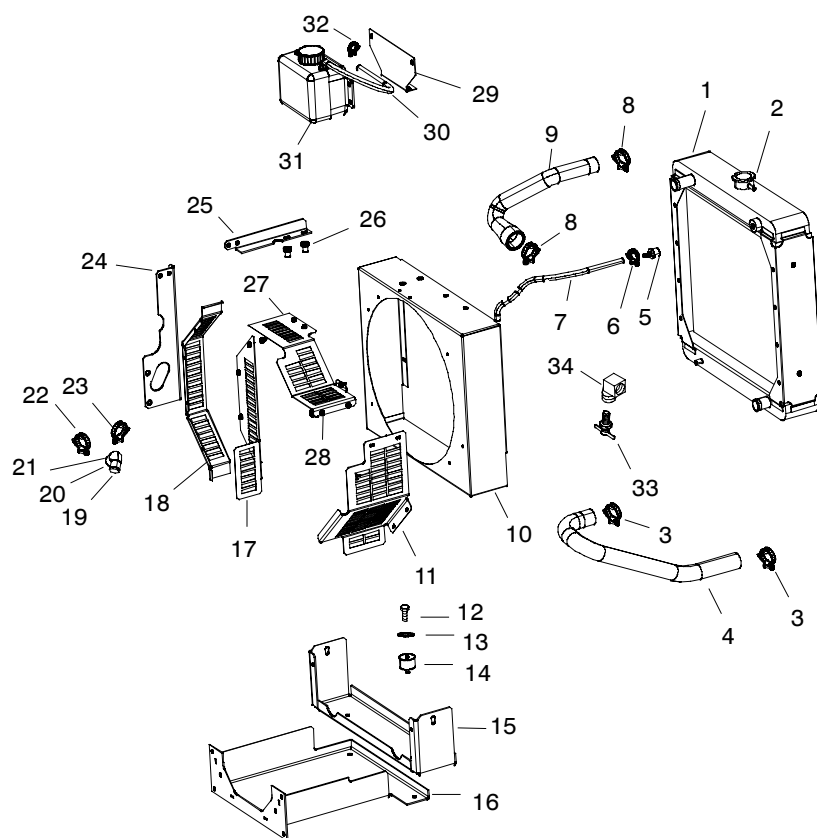
Item	Part Number	Description	Quantity			
			Variation			
			GR1	GR9	GM47660-MA1	GM47660-MA2
1	A-226955	Air cleaner assembly	1		1	
1	GM36199	Air cleaner assembly		1		1
2	GM16944	Element, air cleaner	1	1	1	1
3	GM34970	Bracket, air cleaner mtg.	1	1	1	1
4	226956	Mount, air cleaner, 5.72 in. ID	1	1	1	1
5	X-426-6	Clamp, hose, 1.56/2.5	2	2	2	2
6	X-581-18	Hose, flexible air	1	1	1	1
7	X-391-19	Connector, 90°, 5/8 in. ID hose	1	1	1	1
8	GM32867	Tube, air intake	1	1	1	1
9	GM32868	Hose, 90° elbow	1	1	1	1
10	X-75-1	Plug, pipe, 1/8 in. NPT	1	1	1	1
11	X-426-16	Clamp, hose, 1.81/2.75 in.	1	1	1	1
12	250081	Clamp, hose, 2.06/3 in.	1	1	1	1
13	X-426-3	Clamp, hose, 0.56/1.06 in.	1	1	1	1

Group 103: Fuel System



Item	Part Number	Description	Quantity	
			Variation	
			GR2	GR10
1	X-211-5	Elbow, street, 90° x 3/4 in. NPT	1	1
2	254859	Valve assembly, gas	1	
2	GM42530	Valve assembly, gas		1
3	GM23248	Bracket, fuel valve	1	1
4	—	Regulator (see Group 3)	1	1
5	X-447-18	Elbow, male tube 90°	1	1
6	GM36249	Line, flexible fuel	1	1
7	X-447-19	Elbow, male tube 90°	1	1

Group 104: Cooling System

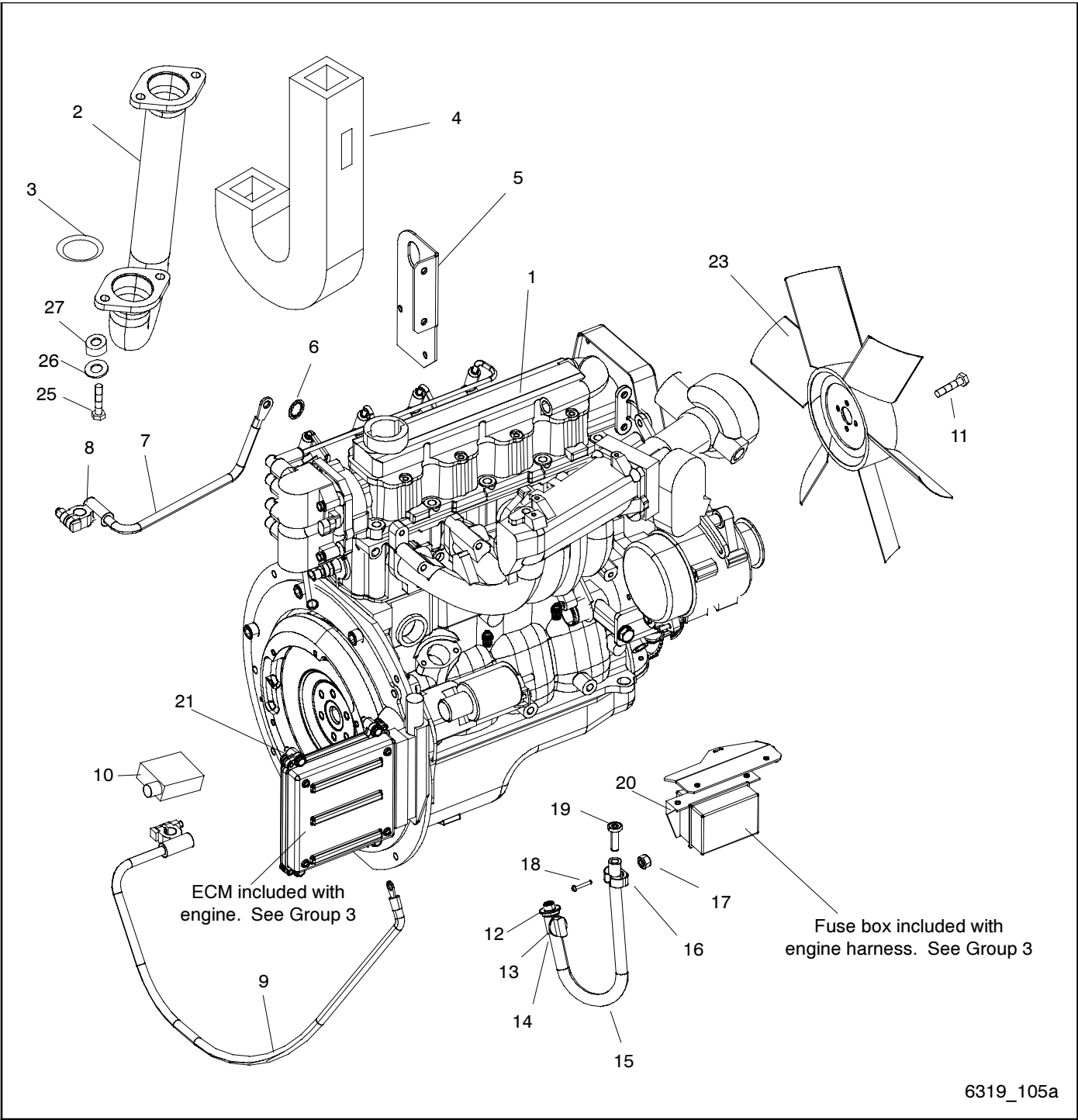


6319_104

Group 104: Cooling System

Item	Part Number	Description	Quantity
			Variation GR3
1	GM52727	Radiator assembly	1
2	224368	Cap, radiator	1
3	X-426-4	Clamp, hose, 1.31/2.25	2
4	GM33022	Hose, lower radiator	1
5	X-582-25	Connector, hose + vibra seal	1
6	X-426-9	Clamp, hose, 0.25/0.70	2
7	X-386-6	Fuel line, flexible	1
8	X-426-4	Clamp, hose, 1.31/2.25	2
9	GM33021	Hose, upper radiator	1
10	GM32873	Shroud, fan	1
11	GM32864	Guard, belt, RH	1
12	X-125-33	Bolt, hex cap	2
13	X-22-5	Washer, lock, 0.326 ID x 0.62 OD	2
14	239497	Vibromount	2
15	GM28570	Support, radiator	1
16	GM32863	Support, radiator	1
17	GM35333	Guard, belt, rear	1
18	GM35332	Guard, belt, LH	1
19	GM28706	Plug, hose	1
20	GM28530	Tee, coolant vent	1
21	GM28691	Connector, hose	1
22	X-426-10	Clamp, hose, 0.5/1	1
23	X-426-9	Clamp, hose, 0.63/1.5	1
24	GM50759	Bracket, shroud support	1
25	GM32874	Bracket, shroud support	1
26	227418	Nut, well, 1/4-20	2
27	GM32866	Guard, belt, top	1
28	X-6216-1	Screw, Phillips hex crimpite	15
29	GM38357	Bracket, water bottle	1
30	X-386-36	Line, flex fuel	1
31	256971	Bottle, overflow	1
32	X-426-9	Clamp, hose, 0.25/0.70	2
33	X-256-3	Valve, drain, 1/4 in. NPT	1
34	X-555-1	Elbow, street, 90° x 1/4 in. NPT	1

Group 105: Engine



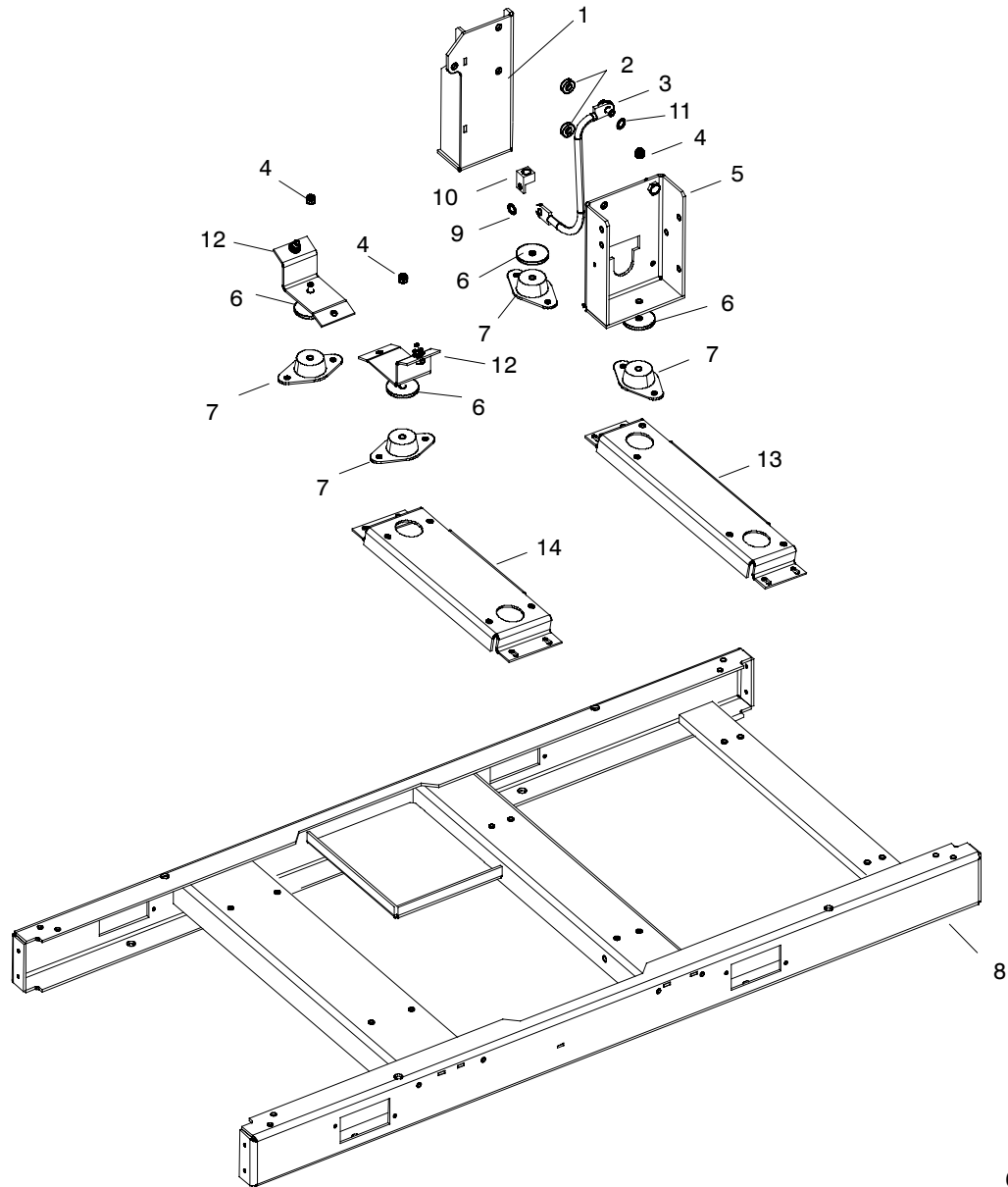
Group 105: Engine

Item	Part Number	Description	Quantity						
			Variation						
3	4	5	6	7	GR4	GR5			
1	GM33018	Engine assembly, GM 1.6L						1	1
1	GM47489	Engine assembly, GM 1.6L	1						
1	GM47155	Engine assembly, GM 1.6L		1					
1	GM55066	Engine assembly, GM 1.6L			1				
1	GM63608	Engine assembly, GM 1.6L				1			
1	GM63609	Engine assembly, GM 1.6L					1		
2	GM28534	Pipe, exhaust	1	1		1			
3	GM28711	Gasket, exhaust manifold	1	1		1			
4	GM28705	Insulating blanket, exhaust pipe	1	1		1			
5	GM65746	Bracket, lifting eye	1	1	1	1	1	1	1
6	X-22-14	Washer, lock, 0.391 ID x 0.975 OD	1	1	1	1	1	1	1
7	X-545-46	Cable, battery, no. 2 x 16 in., black (-)	1	1	1	1	1	1	1
8	GM30710	Boot, battery lug	1	1	1	1	1	1	1
9	X-545-37	Cable, battery, no. 2 x 34 in., red (+)	1	1	1	1	1	1	1
10	GM20748	Boot, battery lug	1	1	1	1	1	1	1
11	X-125-3	Bolt, hex cap	4	4		4		4	4
11	X-6238-6	Bolt, hex cap, 3/8-16 x 2 in., gr. 5			3		3		
12	276317	Washer, nylon, 0.578 ID x 1.067 OD	1	1	1	1	1	1	1
13	344826	Valve, oil drain, M14 x 1.50	1	1	1	1	1	1	1
14	X-426-9	Clamp, hose, 0.25/0.70 in.	1	1	1	1	1	1	1
15	X-612-27	Hose, rubber, straight, 0.375 ID	1	1	1	1	1	1	1
16	X-6084-1	Clip, J	1	1	1	1	1	1	1
17	X-6210-4	Nut, flange whiz, 8-32	1	1	1	1	1	1	1
18	X-51-11	Screw, pan head 8-32 x 3/4	1	1	1	1	1	1	1
19	GM20547	Plug, hose, 3/8	1	1	1	1	1	1	1
20	GM34643	Bracket, relay box						1	1
21	259632	Bumper	4	4	4	4	4	4	4
21	X-22-11	Washer, lock, 0.262 ID x 0.469 OD (not shown)	4	4	4	4	4	4	4
23	225771	Fan, pusher	1			1		1	
23	GM32871	Fan		1					1
23	GM55065	Fan			1		1		
25	M931-10040-82	Screw, hex cap	2	2	2	2	2		
26	X-801-3	Washer, hardened, 0.406 ID x 0.812 in. OD	2	2	2	2	2		
27	X-400-91	Spacer, 0.406 ID x 0.625 OD x 0.5 in.	2	2	2	2	2		

Group 107: Nameplate and Decals

Item	Part Number	Description	Quantity
			Variation GR6
1	238162	Decal, pos. battery connection	1
2	224233	Decal, 1-800 number	1
3	249808	Decal, warning rotating parts	1
4	249809	Decal, caution hot engine	1
5	249810	Decal, warning hot coolant	1
6	GM12070	Nameplate, Kohler	1
7	GM14167	Decal, drain	2
8	X-6246-11	Decal, Kohler Power Systems	1
9	GM15300	Decal, exhaust piping	1
10	GM13680	Nameplate, overlay	1
11	GM20577	Decal, fuel type	1
12	294520	Decal, danger high voltage	1
13	258815	Decal, warning voltage backfeed	1
14	273780	Decal, warning explosion	1
15	290435	Decal, equipment ground	1
16	GM35838	Decal, 4 wire reconnection	1
16	229883	Decal, 12 wire reconnection	1
17	GM38522	Decal, fuse panel	1
18	239796	Decal, warning, carbon monoxide	1

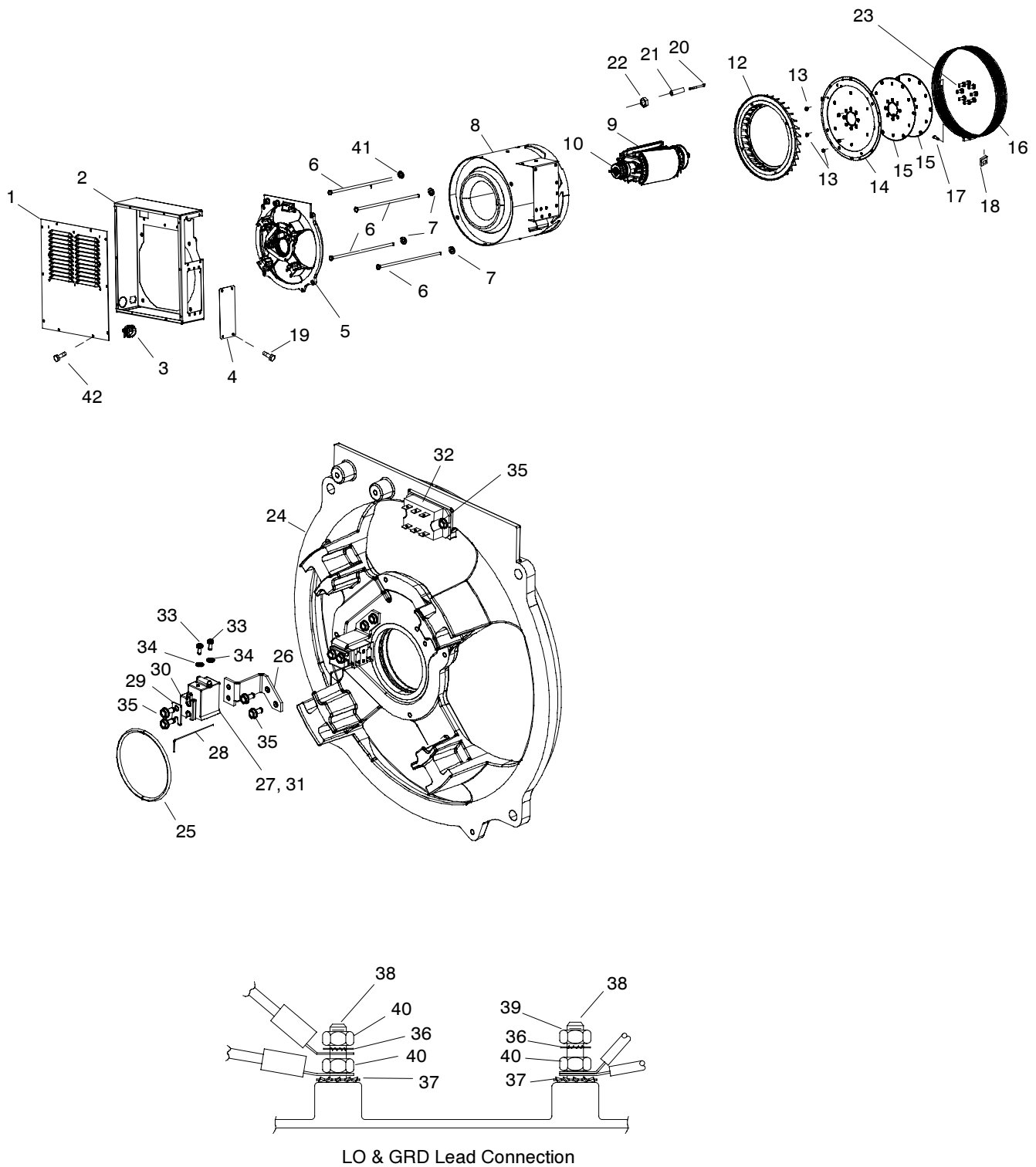
Group 109: Skid and Plant Mounting



6319_109a

Item	Part Number	Description	Quantity			
			Variation			
			GR7	GM47452-MA1	GM47452-MA2	GM47452-MA3
1	GM32859	Support, engine, LH	1	1	1	1
2	X-400-198	Spacer, 0.437 ID x 0.875 OD x 0.25 in.	3	3	3	3
3	LK-0616-1817	Strap, ground, 5 in.	1			
3	290418	Strap, ground, 8 in.		1	1	1
4	M982-08-80	Nut, hex elastic stop	4	4	4	4
5	GM32858	Support, engine, RH	1	1	1	1
6	X-25-96	Washer, plain, 0.406 ID x 2 in. OD	4	4	4	4
7	229127	Vibromount	4	4	4	4
8	GM32986-KCB	Skid	1	1		
8	GM32986-BLK	Skid			1	
9	X-22-16	Washer, lock, 0.326 ID x 0.883 in.	1	1	1	1
10	X-377-11	Connector, cable	1	1	1	1
11	X-22-14	Washer, lock, 0.391 ID x 0.975 OD	2	2	2	2
12	GM23751	Bracket, generator mounting	2	2	2	2
13	GM49119	Bracket, engine mounting, front				1
14	GM49120	Bracket, engine mounting, rear				1

Group 201: Generator and Mounting

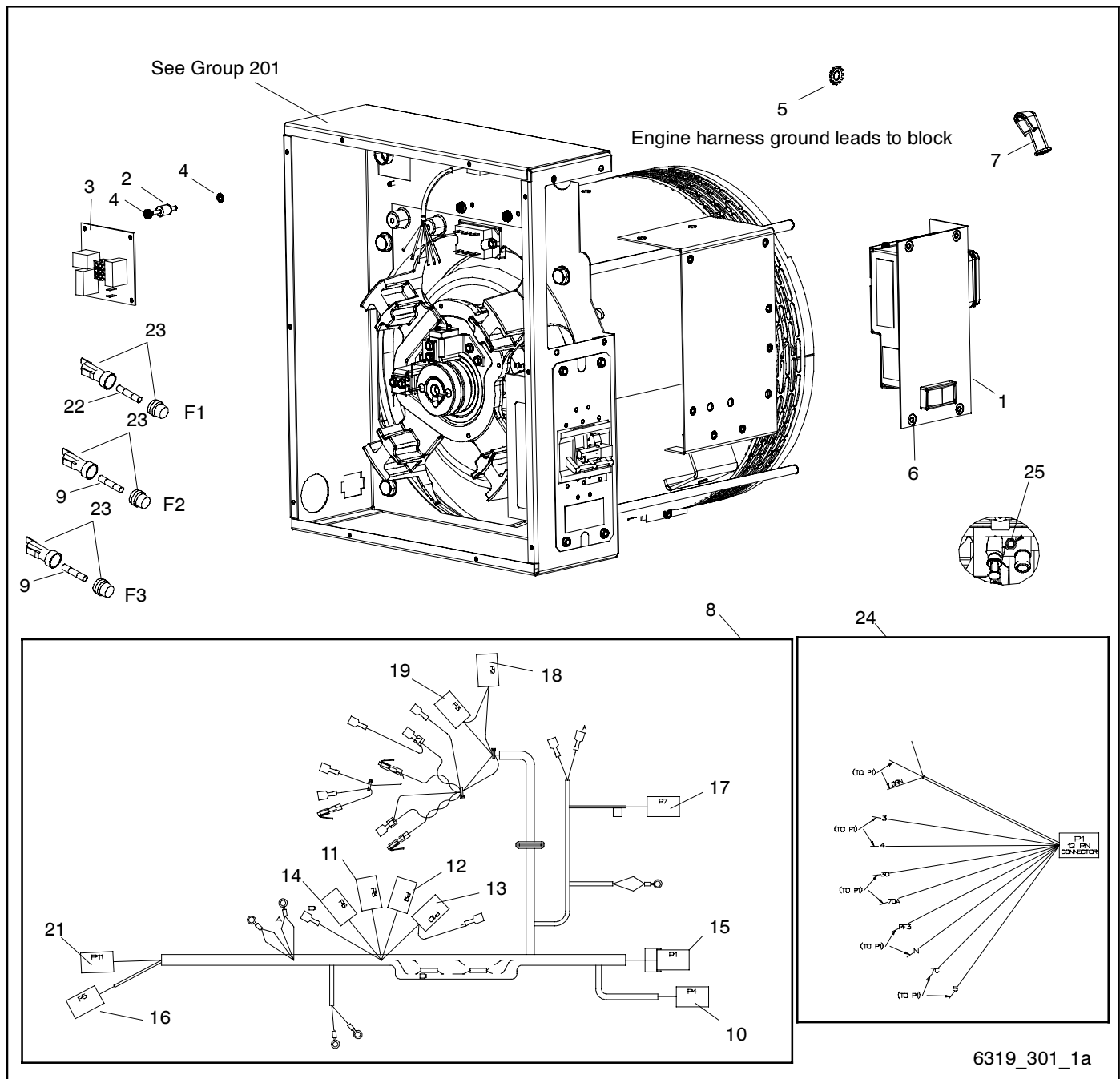


6319_201b

Group 201: Generator and Mounting

Item	Part Number	Description	Quantity Module						
			GM32849-MA1	GM32849-MA2	GM32849-MA3	GM32849-MA4	GM32849-MA5	GM32849-MA6	GM32849-MA12
1	GM32852	Louver panel, junction box	1	1	1	1	1	1	1
2	GM39727	Box, junction	1	1	1	1	1	1	1
3	X-6266-1	Connector, cable	1	1	1	1	1	1	1
4	GM32853	Cover, circuit breaker	1	1	1	1	1	1	1
5	GM26308	End bracket assembly (includes items 24-40)	1	1	1	1	1	1	1
6	X-6051-16	Screw, hex head machine	4	4					4
6	X-6051-17	Screw, hex head machine			4	4	4	4	
7	X-801-3	Washer, hardened, 0.406 ID x 0.812 in. OD	4	4	4	4	4	4	4
8	GM25984	Stator assembly	1						1
8	GM38802	Stator assembly		1					
8	GM28517	Stator assembly			1				
8	GM28522	Stator assembly				1			
8	GM28518	Stator assembly					1		
8	GM28523	Stator assembly						1	
9	GM24176	Rotor assembly (includes item 10, 11)	1	1					1
9	GM24647	Rotor assembly (includes item 10, 11)			1	1			
9	GM24501	Rotor assembly (includes item 10, 11)					1	1	
10	X-758-15	Bearing, ball	1	1	1	1	1	1	1
12	225214	Fan, generator 11 359447 Ring, collector	1	1	1	1	1	1	1
13	M933-07025-60	Screw, hex cap	6	6	6	6	6	6	6
14	GM28588	Disc, drive	1	1	1	1	1	1	1
15	257014	Disc, drive, 4P SAE 8 in. flywheel	2	2	2	2	2	2	2
16	229109	Guard, generator fan	1	1	1	1	1	1	1
17	X-67-125	Screw, hex washer, thread-forming	1	1	1	1	1	1	1
18	257442	Clip, speed	1	1	1	1	1	1	1
19	X-67-64	Screw, self-tapping	4	4	4	4	4	4	4
20	X-6284-2	Screw, slotted pan head machine	4	4	4	4	4	4	4
21	X-400-189	Spacer, 0.215 ID x 0.312 OD x 1.2 in.	4	4	4	4	4	4	4
22	X-6351-7	Nut, flange whiz lock, M5-0.8	4	4	4	4	4	4	4
23	X-6238-11	Bolt, hex cap	8	8	8	8	8	8	8
24	GM28378	Bracket, end	1	1	1	1	1	1	1
25	229110	O-ring, 2.859 in. ID	1	1	1	1	1	1	1
26	GM28383	Bracket, brush holder	2	2	2	2	2	2	2
27	238150	Spring, stainless steel	4	4	4	4	4	4	4
28	238247	Retainer, wire	2	2	2	2	2	2	2
29	238248	Shim, brush holder	2	2	2	2	2	2	2
30	239247	Holder, brush	2	2	2	2	2	2	2
31	239282	Brush	4	4	4	4	4	4	4
32	GM28483	SCR module	1	1	1	1	1	1	1
33	X-49-1	Screw, pan head 6-32 x 5/16	4	4	4	4	4	4	4
34	X-22-6	Washer, lock, 0.146 ID x 0.285 in. OD	4	4	4	4	4	4	4
35	X-67-64	Screw, self-tapping	10	10	10	10	10	10	10
36	X-22-11	Washer, lock, 0.262 ID x 0.469 OD	2	2	2	2	2	2	2
37	X-22-12	Washer, lock, 0.262 ID x 0.743 in. OD	2	2	2	2	2	2	2
38	X-6054-22	Stud, metric	2	2	2	2	2	2	2
39	M934-06-64	Nut, hex, 6 mm	1	1	1	1	1	1	1
40	M934-06-60	Nut, hex, 6 mm	3	3	3	3	3	3	3
41	X-22-14	Washer, lock, 0.391 ID x 0.975 in. OD	1	1	1	1	1	1	1
42	X-6216-1	Screw, Phillips hex crimp	10	10	10	10	10	10	10

Group 301: Control and Harness



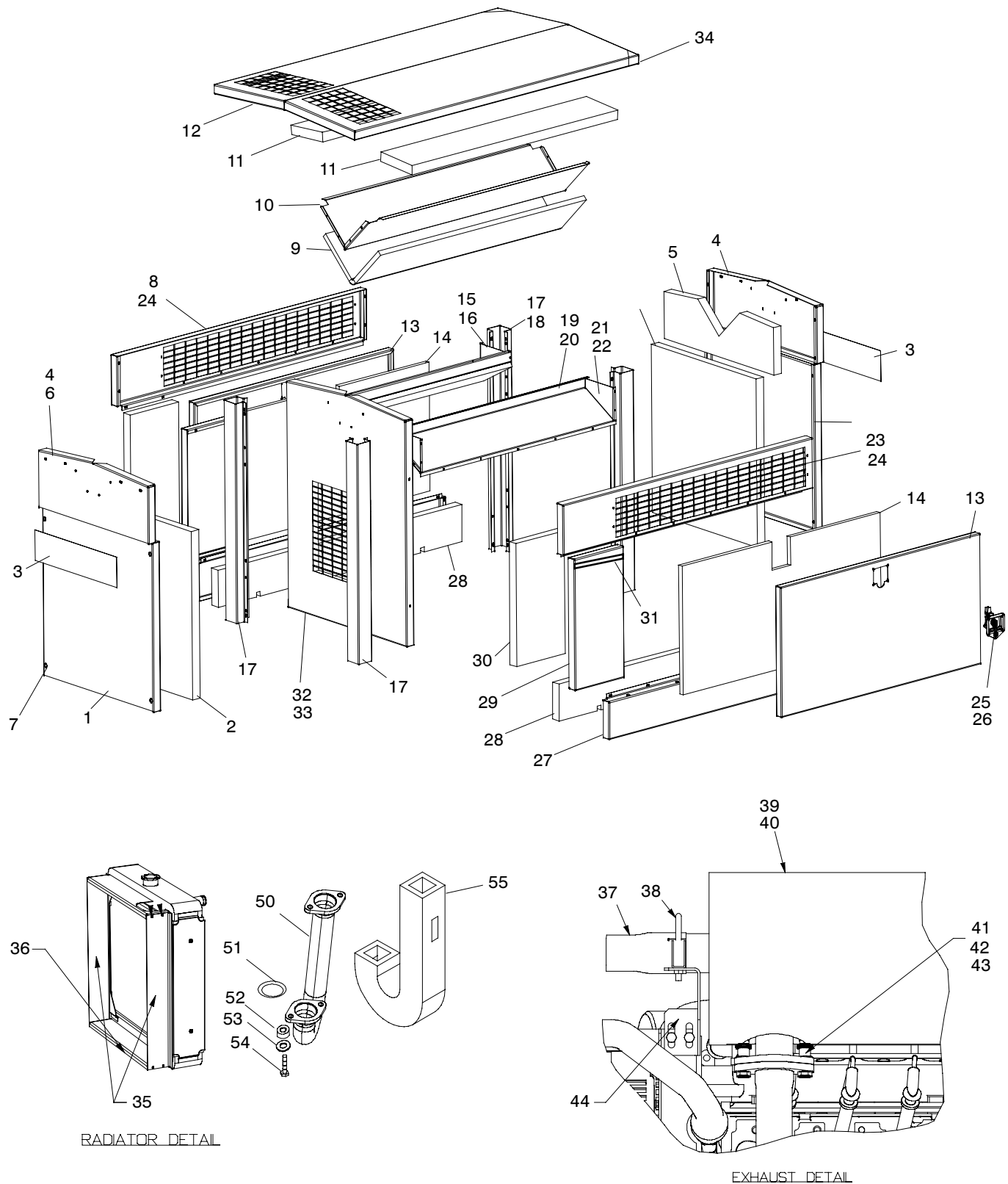
Group 301: Control and Harness

Item	Part Number	Description	Quantity
			Variation GR8
1	GM34969	Controller assembly, ADC 2100	1
2	282829	Vibromount	4
3	GM29671	PCB assembly, relay board, 12 V	1
4	X-22-20	Washer, lock, 0.172 ID x 0.373 in. OD	8
5	X-22-4	Washer, lock, 0.521 ID x 0.884 in. OD	1
6	X-67-64	Screw, self-tapping	4
7	238915	Boot	1
8	GM23534	Harness, wiring (includes items 10-21)	1
9	223316	Fuse, 10 A, 250 V (F2 and F3)	2
10	229989	Connector, receptacle	1
11	GM34394	Connector, weathertight	1
12	GM24991	Connector, 6-pin male	1
13	GM24992	Connector, 8-pin male	1
14	GM24994	Connector, 10-pin male	1
15	GM28678	Connector, weathertight	1
16	GM29249	Connector	1
17	GM15493	Connector, weathertight, 3-position	1
18	GM29998	Connector, 6-position, male	1
19	320711	Connector, 9-position	1
20	292370	Connector, plug, 2-position	1
21	GM29250	Connector	1
22	358337	Fuse, 10 A, 250 V (F1)	1
23	238426	Fuse holder, 0.25 x 1.25 in.	3
24	GM32324	Harness, pigtail	1
25	GM28823	Sender, water temperature	1

Group 301: Control and Harness, continued

Item	Part Number	Description	Quantity	
			Variation	
			2	4
1	GM34969	Controller assembly, ADC 2100	1	1
2	282829	Vibromount	4	4
3	GM29671	PCB assembly, relay board, 12 V	1	1
4	X-22-20	Washer, lock, 0.172 ID x 0.373 in. OD	8	8
5	X-22-4	Washer, lock, 0.521 ID x 0.884 in. OD	1	1
6	X-67-64	Screw, self-tapping	4	4
7	238915	Boot	1	1
8	GM36188	Harness, wiring (Serviced with GM50547-S; includes harness GM50547 and relay GM49746)	1	
8	GM50547	Harness, wiring (includes items 28-44)		1
9	223316	Fuse, 10 A, 250 V (F2 and F3)	2	2
10	358337	Fuse, 10 A, 250 V (F1)	1	1
11	238426	Fuse holder, 0.25 x 1.25 in.	3	3
12	GM32324	Harness, pigtail	1	1
13	GM28823	Sender, water temperature	1	1
14	GM39268	Strip, marker	1	1
15	X-49-2	Screw, pan head, 6-32 x 3/8	2	2
16	336635	Fuse holder	1	1
17	X-22-6	Washer, lock, 0.146 ID x 0.285 in. OD	2	2
18	X-6210-3	Nut, flange whiz, 6-32	2	2
19	239298	Fuse, 5 A	1	1
20	GM39266	Fuse, 20 A	1	1
21	283645	Fuse, 15 A	1	1
22	M7985A-05012-20	Screw, pan head machine	2	1
23	200705	Grommet, round	2	1
24	GM28787	Relay	2	
24	GM49746	Relay		1
25	M934-05-50	Nut, hex 5 mm	2	1
26	X-22-12	Washer, lock, 0.262 ID x 0.743 in. OD	2	2
27	X-377-11	Connector, cable	2	2
28	322583	Housing, socket	1	1
29	GM28678	Connector, weathertight	1	1
30	GM13697	Connector, weathertight, 2-position	1	1
31	GM36155	Connector, 4-position	1	1
32	GM36164	Connector, 56-position	1	1
33	GM36165	Locking cam	1	1
34	GM36166	Cover	1	1
35	GM38887	Connector, 1-position	1	1
36	GM13697	Connector, weathertight, 2-position	1	1
37	GM36161	Connector, 4-position	1	1
38	GM36159	Connector, 3-position	1	1
39	GM29249	Connector	1	1
40	GM36156	Connector, 6-position	1	1
41	229989	Connector, receptacle	1	1
42	320711	Connector, 9-position	1	1
43	GM29998	Connector, 6-position, blk, male	1	1
44	233959	Diode, 6 A	2	1

Group 501: Sound Housing



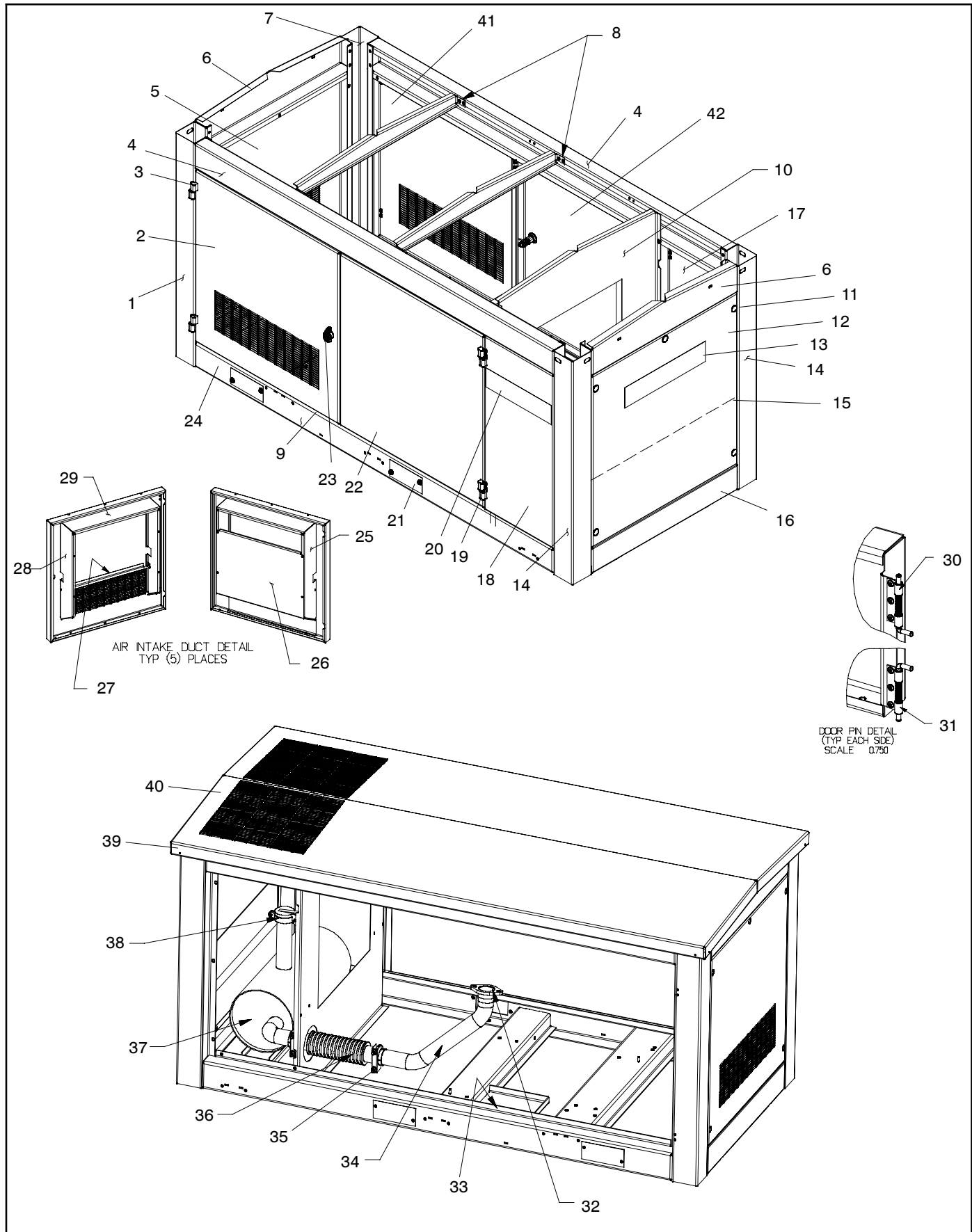
Items 16, 18, 20, 22, 24, 33,
45-49 are not shown.

6319_501

Group 501: Sound Housing

Item	Part Number	Description	Quantity			Item	Part Number	Description	Quantity		
			Module						Module		
			GM36247-KA1	GM36247-KA2	GM36247-KA3				GM36247-KA1	GM36247-KA2	GM36247-KA3
1	GM36240	Panel, end	2	2		30	GM37521	Foam, acoustic	2	2	2
1	GM47528	Panel, end			2	31	X-6348-2	Decal	2	2	2
2	GM37518	Foam, acoustic	2	2	2	32	GM36243	Panel, inner	1	1	1
3	X-6275-3	Logo, Kohler	2	2	2	33	GM37517	Foam, acoustic (not shown)	1	1	1
4	GM36241	Support, roof	2	2		34	GM42840	Corner, sound shield	4	4	
4	GM47529	Support, roof			2	34	GM47251	Corner, sound shield			4
5	GM37520	Foam, acoustic	1	1	1	35	GM30500	Flange, radiator side	2		
6	GM39399	Foam, acoustic	1	1	1	36	GM30501	Flange, radiator bottom	2		
7	X-301-24	Plug, button	8	8	8	37	GM39403	Elbow, exhaust	1		
8	GM36237	Rail, upper right	1	1		37	GM39402	Elbow, exhaust		1	1
8	GM47525	Rail, upper right			1	38	GM41094	Clamp, muffler, 1.88 dia.	1		
9	GM37524	Foam, acoustic	1	1	1	38	GM41095	Clamp, muffler		1	1
10	GM36246	Baffle, air intake	1	1	1	39	GM28536	Silencer	1		
11	GM37525	Foam, acoustic	2	2	2	39	GM28535	Silencer		1	1
12	GM36242	Roof, sound housing	1	1		40	GM28703	Insulator, silencer	1		
12	GM47530	Roof, sound housing			1	40	GM28704	Insulator, silencer		1	1
13	GM36244	Door, sound housing	2	2		41	GM29398	Gasket	1	1	1
13	GM47531	Door, sound housing			2	42	X-400-91	Spacer, .406 ID x .625 OD x .5 in.	2	2	2
14	GM37519	Foam, acoustic	2	2	2	43	X-801-3	Washer, hardened,			
15	GM28750	Support, duct, RS	2	2	2			0.406 ID x 0.812 in. OD	4	4	4
16	GM39401	Foam, acoustic (not shown)	2	2	2	44	GM39092	Bracket, silencer support	1	1	1
17	GM36236	Support, corner housing	4	4		45	257442	Clip, speed (not shown)	2	2	2
17	GM47524	Support, corner housing			4	46	GM15299	Decal, rainproof (not shown)	1	1	1
18	GM37539	Foam, acoustic (not shown)	4	4	4	47	GM39404	Panel, exhaust deflector			
19	GM36245	Duct, air intake	2	2	2			(not shown)	1	1	
20	GM37523	Foam, acoustic (not shown)	2	2	2	47	GM47532	Panel, exhaust deflector			1
21	GM28755	Support, duct, LS	2	2	2			(not shown)			
22	GM39400	Foam, acoustic (not shown)	2	2	2	48	GM39529	Panel, J-box cover (not shown)	1	1	1
23	GM36238	Rail, upper left	1	1		49	GM47500	Decal, notice orient exhaust pipe			
23	GM47526	Rail, upper left			1			(not shown)	1	1	1
24	GM39398	Foam, acoustic (not shown)	2	2	2	50	GM28534	Pipe, exhaust	1	1	1
25	276918	Latch, key locking	2	2	2	51	GM28711	Gasket, exhaust manifold	1	1	1
26	GM37674	Key	4	4	4	52	X-400-91	Spacer, .406 ID x .625 OD x .5 in.	2	2	2
27	GM36235	Rail, lower	2	2		53	X-801-3	Washer, hardened,			
27	GM47523	Rail, lower			2			0.406 ID x 0.812 in. OD	2	2	2
28	GM37522	Foam, acoustic	2	2	2	54	M931-10040-82	Screw, hex cap	2	2	2
29	GM36239	Panel, side	2	2		55	GM28705	Insulating blanket, exhaust pipe	1	1	1
29	GM47527	Panel, side			2						

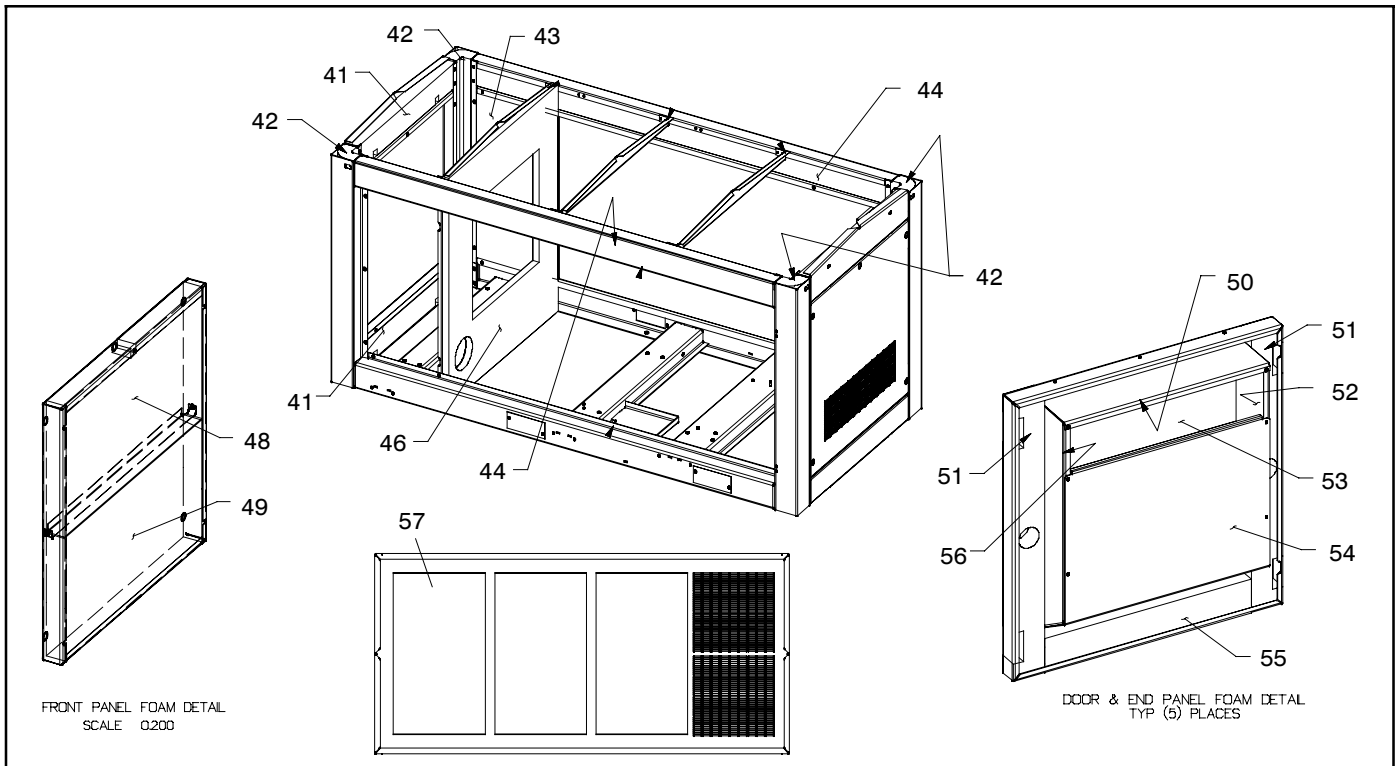
Group 501: Sound Housing, continued



Group 501: Sound Housing, continued

Item	Part Number	Description	Quantity			
			Module			
			GM47220-KA1	GM47220-KA2	GM60815-KA1	GM60815-KA2
1	GM47360	Channel, corner, rear RH	1		1	
1	GM47677	Channel, corner, rear RH		1		1
2	GM47211	Door	1		1	
2	GM47669	Door		1		1
3	GM40018	Hinge	4	4	4	4
4	GM47209	Rail, side	2		2	
4	GM47667	Rail, side		2		2
5	GM47213	Panel, rear	1		1	
5	GM47671	Panel, rear		1		1
6	GM47361	Rail, upper end	2		2	
6	GM47678	Rail, upper end		2		2
7	GM47359	Channel corner, rear LH	1		1	
7	GM47676	Channel corner, rear LH		1		1
8	GM58957	Support, roof	2	2	2	2
9	GM60103	Bumper service kit (includes 4 bumpers)	1	1	1	1
10	GM47215	Panel, rad. inner	1	1	1	1
11	X-301-24	Plug, button	10	10	10	10
12	GM47439	Panel, front	1		1	
12	GM47680	Panel, front		1		1
13	X-6275-3	Logo, Kohler	2	2	2	2
14	GM47358	Channel, corner, front	2		2	
14	GM47675	Channel, corner, front		2		2
15	GM58953	Brace, door	1	1	3	3
16	GM47438	Rail, end	2		2	
16	GM47679	Rail, end		2		2
17	GM60437	Panel, side RH	1		1	
17	GM60438	Panel, side RH		1		1
18	GM47212	Panel, side LH	1		1	
18	GM47670	Panel, side LH		1		1
19	GM40019	Hinge	4	4	4	4
20	X-6348-13	Decal, Kohler Power Systems	2	2	2	2
21	GM49270-KCB	Cover, skid rail	4		4	
21	GM49270-BLK	Cover, skid rail		4		4
22	GM47210	Door	1			
22	GM47668	Door		1		
22	GM60613	Door			1	
22	GM62672	Door				1
23	GM47709	Latch, locking	2	2	2	2
24	GM47219-KCB	Skid	1		1	
24	GM47219-BLK	Skid		1		1
25	GM39989	Duct, side	5	5	3	3
26	GM39976	Duct, bottom	5	5	3	3
27	GM58954	Brace, door	5	5	3	3
28	GM39975	Duct, side	5	5	3	3
29	GM39974	Duct, top	5	5	3	3
30	GM42042	Latch, cane bolt, LH	2	2	2	2
31	GM42041	Latch, cane bolt, RH	2	2	2	2
32	GM28711	Gasket, exhaust manifold	1	1	1	1
33	GM47450	Bracket, battery	1	1	1	1
34	GM47217	Pipe, exhaust	1	1	1	1
35	GM41095	Clamp, muffler 2.13 dia.	2	2	2	2
36	X-797-7	Hose, flex exhaust, 2.03 in. ID	1	1	1	1
37	GM47218	Silencer	1	1	1	1
38	276254	Cap, rain (fits 2.00 in. tube)	1	1	1	1
39	GM42840	Corner, sound shield (KCB)	4		4	
39	GM47251	Corner, sound shield		4		4
40	GM47214	Roof	1		1	
40	GM47672	Roof		1		1
41	GM47210	Door	1		1	
41	GM47668	Door		1		1
42	GM47211	Door	1			
42	GM47669	Door		1		
42	GM62673	Door			1	
42	GM62674	Door				1

Group 501: Sound Housing, continued



Item	Part Number	Description	Quantity Module			
			GM47220-KA1	GM47220-KA2	GM60815-KA1	GM60815-KA2
	GM47451	Foam, acoustic kit	1	1		
	GM60813	Foam, acoustic kit			1	1
41	GM47444	Foam, acoustic end rail	4	4	4	4
42	GM40008	Foam, acoustic	4	4	4	4
43	GM47442	Foam, acoustic side panel	2	2	2	2
44	GM47443	Foam, acoustic side rail	2	2	2	2
46	GM47362	Foam, acoustic	1	1	1	1
48	GM47441	Foam, acoustic front panel, top	1	1	3	3
49	GM58955	Foam, acoustic front panel, bottom	1	1	3	3
50	GM40012	Foam, acoustic	5	5	3	3
51	GM47448	Foam, acoustic rear panel, side	10	10	6	6
52	GM40014	Foam, acoustic	5	5	3	3
53	GM40011	Foam, acoustic	5	5	3	3
54	GM40015	Foam, acoustic	5	5	3	3
55	GM47449	Foam, acoustic door, bottom	5	5	3	3
56	GM40013	Foam, acoustic	5	5	3	3
57	GM47447	Foam, acoustic roof	3	3	3	3

Group 701: Literature

Item	Part Number	Description	Quantity					
			Variation					
			226	228	237	238	275	276
1	TP-5374	Warranty, 1-Year Limited, Industrial	1	1				
1	TP-6264	Warranty, 2-Year Limited, Residential			1	1		
1	TP-6463	Warranty, 5-Year, RESL					1	1
2	TP-6101	O/M Supplement, GM Engines	1	1	1	1	1	1
3	TP-6198	S/M 15/30RES/RYG	1	1	1	1	1	1
4	TP-6197	O/M 15/30RYG	1	1				
4	TP-6344	O/M 15/30RES			1	1	1	1
5	TP-6319	P/C 15/30RES/RYG	1	1	1	1	1	1
6	TP-6327	S/M GM 1.6L	1	1	1	1		
6	TP-6362	S/M GM 1.6L	1	1	1	1	1	1
7	TP-6329	I/M 15/30RYG	1	1				
8	TP-6341	I/M 15/30RES			1	1	1	1
9	TP-6437	W/D 15/30RES/RYG	1	1	1	1	1	1

Parts List: Accessories

Qty.	Description	Part No.
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Block Heater

Block Heater, 1000W, 120V GM32877-KA1

1	Bracket, block heater	GM32987
1	Heater, block	GM28585
1	Connector, hose	GM28690
1	Connector, hose + vibra seal	X-582-2
1	Hose, 0.63 in. ID	X-312-51
1	Hose, 0.63 ID	X-312-52
2	Clamp, hose, 0.5/1 in.	X-426-10
2	Clamp, hose, 0.56/1.06 in.	X-426-3
1	Tag, hang	279047
1	Conduit, convoluted	X-6003-79
1	Shield, heat	GM39629

Block Heater, 1000W, 240V GM32877-KA2

1	Bracket, block heater	GM32987
1	Heater, block	358327
1	Connector, hose	GM28690
1	Connector, hose + vibra seal	X-582-2
1	Hose, 0.63 in. ID	X-312-51
1	Hose, 0.63 ID	X-312-52
2	Clamp, hose, 0.5/1 in.	X-426-10
2	Clamp, hose, 0.56/1.06 in.	X-426-3
1	Conduit, convoluted	X-6003-79
1	Tag, hang	279047
1	Shield, heat	GM39629

Circuit Breakers

Line Circuit Breaker, 70A, 2P, 240V GM33030-KA3

1	Cover, circuit breaker	GM32854
1	Breaker, circuit	GM28743
4	Screw, machine	X-49-2
1	Decal, power breaker	GM15301

Line Circuit Breaker, 125A, 2P, 240V GM33030-KA4

1	Breaker, circuit	GM28792
1	Cover, circuit breaker	GM32854
1	Bracket, breaker mounting	GM35334
4	Screw, self-tapping	X-67-64
1	Decal, power breaker	GM15301

Line Circuit Breaker, 40A, 3P, 600V GM33030-KA9

3	Boot	238915
1	Circuit breaker	269252
1	Cover, circuit breaker	GM32860
6	Screw, pan head, 6-32 x 3/16	X-49-21
1	Decal, power breaker	GM15301

Line Circuit Breaker, 50A, 3P, 600V GM33030-KA11

3	Boot	238915
1	Circuit breaker, 50A, 480V, 3-pole	269249
1	Cover, circuit breaker	GM32860
6	Screw, pan head, 6-32 x 3/16	X-49-21
1	Decal, power breaker	GM15301

Qty.	Description	Part No.
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Line Circuit Breaker, 25A, 3P, 600V GM33030-KA12

3	Boot	238915
1	Circuit breaker, 25A, 600V, 3-pole	225168
1	Cover, circuit breaker	GM32860
6	Screw, pan head, 6-32 x 3/16	X-49-21
1	Decal, power breaker	GM15301

Line Circuit Breaker, 60A, 3P, 600V GM33030-KA13

3	Boot	238915
1	Circuit breaker, 60A, 600V, 3-pole	253224
1	Cover, circuit breaker	GM32860
6	Screw, pan head, 6-32 x 3/16	X-49-21
1	Decal, power breaker	GM15301

Line Circuit Breaker, 80A, 3P, 480V GM33030-KA14

3	Boot	238915
1	Circuit breaker, 80A, 480V, 3-pole	253225
1	Cover, circuit breaker	GM32860
6	Screw, pan head, 6-32 x 3/16	X-49-21
1	Decal, power breaker	GM15301

Line Circuit Breaker, 90A, 3P, 480V GM33030-KA15

3	Boot	238915
1	Circuit breaker, 90A, 600V, 3-pole	344905
1	Cover, circuit breaker	GM32860
6	Screw, pan head, 6-32 x 3/16	X-49-21
1	Decal, power breaker	GM15301

Line Circuit Breaker, 65A, 3P, 480V GM33030-KA16

3	Boot	238915
1	Circuit breaker, 65A, 600V, 3-pole	226769
1	Cover, circuit breaker	GM32860
6	Screw, pan head, 6-32 x 3/16	X-49-21
1	Decal, power breaker	GM15301

Line Circuit Breaker, 55A, 3P, 480V GM33030-KA17

3	Boot	238915
1	Circuit breaker, 55A, 600V, 3-pole	226768
1	Cover, circuit breaker	GM32860
6	Screw, pan head, 6-32 x 3/16	X-49-21
1	Decal, power breaker	GM15301

Line Circuit Breaker, 30A, 3P, 480V GM33030-KA18

3	Boot	238915
1	Circuit breaker, 30A, 600V, 3-pole	269250
1	Cover, circuit breaker	GM32860
6	Screw, pan head, 6-32 x 3/16	X-49-21
1	Decal, power breaker	GM15301

Line Circuit Breaker, 100A, 2P, 240V GM33030-KA19

1	Breaker, circuit	GM22482
1	Cover, circuit breaker	GM32854
1	Bracket, breaker mounting	GM35334
4	Screw, self-tapping	X-67-64
1	Decal, power breaker	GM15301

Line Circuit Breaker, 70A, 3P, 600V GM33030-KA32

3	Boot	238915
1	Circuit breaker, 70A, 600V, 3-pole	258381
1	Cover, circuit breaker	GM32860
6	Screw, pan head, 6-32 x 3/16	X-49-21
1	Decal, power breaker	GM15301

Parts List: Accessories

Qty.	Description	Part No.
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Electrical System

Battery, 1/12V, 675CCA, Wet PA-324553

1	Battery, wet charged, 12V, 675CCA	324367
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Battery, 1/12V, 525CCA, Wet GM48808-KA1

1	Battery, wet charged, 12V, 675CCA	GM48784
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Battery Charger, Float w/Alarms, 12V, 10A PAD-292863

1	TT Float/Equalize Battery Charger, Ind.	TT-680
1	Charger, assembly (includes the following parts)	D-292863
1	PCB assembly, battery charger alarm	B-262374
1	PCB assembly, battery charger control	C-262377
2	Washer, lock, 0.172 ID x 0.595 in. OD	X-22-18
3	Washer, lock, 0.146 ID x 0.53 in. OD	X-22-25
14	Washer, lock, 0.146 ID x 0.285 in. OD	X-22-6
2	Terminal, ring, male, 16-14 AWG	X-283-1
2	Terminal, ring, male, 10-12 AWG	X-283-11
3	Terminal, ring, male, 16-14 AWG	X-283-2
16	Screw, pan head, 6-32 x 1/4	X-49-25
4	Screw, pan head, 6-32 x 1/2	X-49-26
3	Screw, slotted pan head machine	X-49-39
2	Screw, pan head, 6-32 x 3/4	X-49-6
2	Screw, pan head, 10-32 x 1/2	X-50-1
2	Screw, pan head, 10-24 x 3/4	X-50-3
2	Screw, pan head, 8-32 x 3/4	X-51-11
2	Screw, pan head, 8/32 x 1/2	X-51-15
4	Screw, pan head, 1/4-20 x 3/4	X-51-30
1	Screw, slotted round head machine	X-51-53
2	Tubing, heat shrink	X-6079-2
2	Screw, Phillips hex crimpfit	X-6216-1
2	Nut, hex machine screw, 6-32	X-71-2
1	Decal, connection	233966
1	Diagram, wiring	233967
1	Fuse, 5A, 250V	239298
2	Clip, speed	257442
1	Fuse, 25A, 125V	262389
1	Transformer, 120/240V, 29.5V	262394
1	Decal, warning connection	262397
1	Clip, cable	262399
2	Fuse holder	263156
8	Spacer	287948
1	Lamp, 120V, 0.33W	291208
1	Decal	292387
1	Heatsink	292938
1	Strip, terminal	292940
1	Ammeter, 0-15A, DC	292941
1	Voltmeter, 0-25V, DC	292942
1	Module, SCR	292945
1	Resistor, 0.04/0.05 ohm, 35W	292947
1	Fuse, 7A, 250V	292948
1	Wiring harness, 12/24V float chargers	292958
1	Marker, strip	299090
1	Marker, strip	292962
2	Retainer	295010
1	Terminal block (NRP)	295314
4	Nut, captive, 6-32	298810
1	Box, battery charger	GM39656
1	Door, battery charger, silkscreened	325596
1	Nameplate, battery charger	325609
1	Cable tie	X-468-12
4	Washer, lock, 0.262 ID x 0.743 in. OD	X-22-12

Qty.	Description	Part No.
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Battery Charger, Float, 12V, 10A PAD-292862

1	TT Float/Equalize Battery Charger, Ind.	TT-680
1	Charger assembly, battery (includes the following parts)	D-292862
1	PCB assembly, battery charger control	C-262377
2	Washer, lock, 0.172 ID x 0.595 in. OD	X-22-18
3	Washer, lock, 0.146 ID x 0.53 in. OD	X-22-25
10	Washer, lock, 0.146 ID x 0.285 in. OD	X-22-6
2	Terminal, ring, male, 16-14 AWG	X-283-1
2	Terminal, ring, male, 10-12 AWG	X-283-11
3	Terminal, ring, male, 16-14 AWG	X-283-2
8	Screw, pan head, 6-32 x 1/4	X-49-25
4	Screw, pan head, 6-32 x 1/2	X-49-26
3	Screw, slotted pan head machine	X-49-39
2	Screw, pan head, 6-32 x 3/4	X-49-6
2	Screw, pan head, 10-32 x 1/2	X-50-1
2	Screw, pan head, 10-24 x 3/4	X-50-3
2	Screw, pan head, 8-32 x 3/4	X-51-11
2	Screw, pan head, 8/32 x 1/2	X-51-15
4	Screw, pan head, 1/4-20 x 3/4	X-51-30
1	Screw, slotted round head machine	X-51-53
2	Tubing, heat shrink	X-6079-2
2	Screw, Phillips hex crimpfit	X-6216-1
2	Nut, hex machine screw, 6-32	X-71-2
1	Decal, connection	233966
1	Diagram, wiring	233967
1	Fuse, 5A, 250V	239298
2	Clip, speed	257442
1	Fuse, 25A, 125V	262389
1	Transformer, 120/240V, 29.5V	262394
1	Decal, warning connection	262397
1	Clip, cable	262399
2	Fuse holder	263156
4	Spacer	287948
1	Lamp, 120V, 0.33W	291208
1	Decal	292387
1	Heatsink	292938
1	Strip, terminal	292940
1	Ammeter, 0-15A, DC	292941
1	Voltmeter, 0-25V, DC	292942
1	Module, SCR	292945
1	Resistor, 0.04/0.05 ohm, 35W	292947
1	Fuse, 7A, 250V	292948
1	Wiring harness, 12/24V float chargers	292958
1	Marker, strip	299090
1	Marker, strip	292962
2	Retainer	295010
1	Terminal block (NRP)	295314
4	Nut, captive, 6-32	298810
1	Box, battery charger	GM39656
1	Door, battery charger, silkscreened	325596
1	Nameplate, battery charger	325608
1	Cable tie	X-468-12
4	Washer, lock, 0.262 ID x 0.743 in. OD	X-22-12

Battery Charger GM32878-KA1

1	Charger, battery 12V 6A float equalizers	GM28341
1	Bracket, battery charger mounting	GM32862
6	Screw, hex cap	M933-06020-60
6	Nut, hex, 6 mm	M6923-06-80
2	Washer, plain	M125A-06-80

Battery Heater, 120VAC, 110W PA-358225

2	Cable tie	X-468-1
1	Heater, battery wrap	336814
1	Heater, battery pad	336825
1	TT Battery Heater, 8.5-30kW Ind/Res/Coml	TT-1221

Parts List: Accessories, continued

Qty.	Description	Part No.
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Run/Common Fault Relay, 12V		GM30414-KP1
1	PCB Assy, relay board 12V w/opt relay	GM29779
1	Harness, wiring relay board	GM30539
1	Installation instructions	TT-1423

Remote Digital Gauge		GM32337-KP2
1	Gauge, digital can J-1939	GM30565
1	Harness, remote	GM48148
1	TT ADC 2100 Controller Replacement	TT-1364
1	TT Remote Digital Gauge, 8.5-40 kW	TT-1439

Harness, 25 Ft., Remote Panel		GM32333-KP2
1	Harness, extension	GM32323

Harness, 15 Ft., Remote Panel		GM32333-KP1
1	Harness, extension	GM30248

Harness, 12 In., Pigtail		GM32332-KP1
1	Harness, pigtail	GM32324

Enclosure

Weather, Enclosed Silencer, UL2200		GM28601-KA1
4	Cover, skid rail	254758-KCB
4	Corner channel, weather enclosure	GM28595
32	Insert, threaded (metric), 6 mm	GM11040-2
1	Silencer	GM28536
1	Roof, weather enclosure	GM28593
2	Door, weather enclosure	GM31236
1	End panel, weather enclosure	GM28596
1	End panel, weather enclosure	GM28597
2	Side panel, weather enclosure	GM28598
1	Insulating blanket, silencer	GM28703
2	Duct, weather enclosure side	GM28749
2	Support, duct, right side	GM28750
4	Bracket, mounting	GM28751
2	Support, duct, left side	GM28755
1	Gasket	GM29398
1	Elbow, exhaust	GM30499
2	Flange, radiator side	GM30500
1	Flange, radiator bottom	GM30501
1	Flange, radiator top	GM30502
8	Screw, hex washer head, drill	X-794-1
38	Rivet, pop, 0.187 in.	X-781-19
4	Latch, lockable, black	GM31202
4	Key, latch	GM42778
2	Decal	X-6348-2
1	Plate, cover	GM33003
12	Screw, hex washer head, drill	X-794-2
1	Clamp, muffler, 1.87 in.	GM41094
4	Bushing, molded	GM31074-1
1	Decal, rainproof enclosure	GM15299
1	Foam, acoustic	GM37552
2	Decal, caution hot engine	249809
1	Bracket, silencer support	GM39092
4	Spacer, 0.406 ID x 0.625 OD x 0.5 in.	X-400-91
2	Screw, hex cap	M931-10050-82
8	Washer, hardened, 0.406 ID x 0.812 in. OD	X-801-3
4	Corner, sound shield (KCB)	GM42840
1	Wood base	PFS-2070
2	Pad, corrugated	PHS-9048
4	Washer, plain, 0.406 ID x 2 in. OD	X-25-96
1	Insulator, pipe	GM28705
1	Pipe, exhaust	GM28534
1	Gasket, exhaust manifold	GM28711
2	Screw, hex cap	M931-10040-82

Qty.	Description	Part No.
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Weather, Enclosed Silencer, UL2200		GM28601-KA2
4	Cover, skid rail	254758
4	Corner channel, weather enclosure	GM28595
24	Insert, threaded (metric), 6 mm	GM11040-2
1	Silencer	GM28535
1	Roof, weather enclosure	GM28593
2	Door, weather enclosure	GM31236
1	End panel, weather enclosure	GM28596
1	End panel, weather enclosure	GM28597
2	Side panel, weather enclosure	GM28598
1	Insulating blanket, silencer	GM28704
2	Duct, weather enclosure side	GM28749
2	Support, duct, right side	GM28750
4	Bracket, mounting	GM28751
2	Support, duct, left side	GM28755
1	Gasket	GM29398
1	Elbow, exhaust	GM30498
2	Flange, radiator side	GM30500
1	Flange, radiator bottom	GM30501
1	Flange, radiator top	GM30502
1	Bracket, silencer support	GM39092
8	Screw, hex washer head, drill	X-794-1
38	Rivet, pop, 0.187 in.	X-781-19
4	Latch, lockable, black	GM31202
4	Key, latch	GM42778
2	Decal	X-6348-2
1	Plate, cover	GM33003
12	Screw, hex washer head, drill	X-794-2
1	Clamp, muffler, 2.13 in.	GM41095
4	Bushing, molded	GM31074-1
1	Decal, rainproof enclosure	GM15299
1	Foam, acoustic	GM37552
2	Decal, caution hot engine	249809
1	Bracket, silencer support	GM39092
2	Spacer, 0.406 ID x 0.625 OD x 0.5 in.	X-400-91
2	Screw, hex cap	M931-10040-82
4	Washer, hardened, 0.406 ID x 0.812 in. OD	X-801-3
4	Corner, sound shield (KCB)	GM42840
1	Wood base	PFS-2070
2	Pad, corrugated	PHS-9048
4	Washer, plain, 0.406 ID x 2 in. OD	X-25-96
1	Insulator, pipe	GM28705
1	Pipe, exhaust	GM28534
1	Gasket, exhaust manifold	GM28711
2	Screw, hex cap	M931-10040-82

Parts List: Accessories, continued

Qty.	Description	Part No.
Weather, 15RESL (Sage) GM28601-KA3		
4	Cover, skid rail	254758-BLK
4	Corner channel, weather enclosure	GM47534
32	Insert, threaded (metric), 6 mm	GM11040-2
1	Silencer	GM28536
1	Roof, weather enclosure	GM47533
2	Door, weather enclosure	GM47538
1	End panel, weather enclosure	GM47535
1	End panel, weather enclosure	GM47536
2	Side panel, weather enclosure	GM47537
1	Insulating blanket, silencer	GM28703
2	Duct, weather enclosure side	GM28749
2	Support, duct, right side	GM28750
4	Bracket, mounting	GM28751
2	Support, duct, left side	GM28755
1	Gasket	GM29398
1	Elbow, exhaust	GM30499
2	Flange, radiator side	GM30500
1	Flange, radiator bottom	GM30501
1	Flange, radiator top	GM30502
8	Screw, hex washer head, drill	X-794-1
38	Rivet, pop, 0.187 in.	X-781-19
4	Latch, lockable, black	GM31202
4	Key, latch	GM42778
2	Decal	X-6348-2
1	Plate, cover	GM33003
12	Screw, hex washer head, drill	X-794-2
1	Clamp, muffler, 1.87 in.	GM41094
4	Bushing, molded	GM31074-1
1	Decal, rainproof enclosure	GM15299
1	Foam, acoustic	GM37552
2	Decal, caution hot engine	249809
1	Bracket, silencer support	GM39092
4	Spacer, 0.406 ID x 0.625 OD x 0.5 in.	X-400-91
2	Screw, hex cap	M931-10050-82
8	Washer, hardened, 0.406 ID x 0.812 in. OD	X-801-3
4	Corner, sound shield	GM47251
1	Wood base	PFS-2070
2	Pad, corrugated	PHS-9048
4	Washer, plain, 0.406 ID x 2 in. OD	X-25-96
1	Insulator, pipe	GM28705
1	Pipe, exhaust	GM28534
1	Gasket, exhaust manifold	GM28711
2	Screw, hex cap	M931-10040-82
Enclosure, Sound Shield GM36247-KA1		
See Group 501: Housing for parts list.		
Enclosure, Sound Shield GM36247-KA2		
See Group 501: Housing for parts list.		
Enclosure, Sound Shield GM36247-KA3		
See Group 501: Housing for parts list.		
Sound Shield Conversion GM33821-KA1		
6	Insert, threaded (metric), 6 mm	GM11040-2
1	Panel, discharge duct, right side	GM33814
1	Panel, discharge duct, left side	GM33815
1	Panel, discharge duct, front	GM33816
1	Panel, discharge duct, top	GM33817
1	Foam, acoustic (GM 15-30 kW 1.6L)	GM37549
6	Washer, nylon	X-6278-14
22	Screw, hex seal washer head, drill	X-794-4

Qty.	Description	Part No.
Sound Shield Conversion (Sage) GM33821-KA2		
6	Insert, threaded (metric), 6 mm	GM11040-2
1	Panel, discharge duct, right side	GM47539
1	Panel, discharge duct, left side	GM47540
1	Panel, discharge duct, front	GM47541
1	Panel, discharge duct, top	GM47542
1	Foam, acoustic (GM 15-30 kW 1.6L)	GM37549
6	Washer, nylon	X-6278-14
22	Screw, hex seal washer head, drill	X-794-4
Enclosure, Weather/Sound Attenuated GM39265-KA1		
2	Decal, caution hot engine	249809
4	Cover, skid rail	254758
1	Clamp, muffler, 1.88 in.	GM41094
30	Insert, threaded (metric), 6mm	GM11040-2
1	Decal, rainproof enclosure	GM15299
1	Silencer	GM28536
1	Roof, weather enclosure	GM28593
4	Corner channel, weather enclosure	GM28595
1	End panel, weather enclosure	GM28596
1	End panel, weather enclosure	GM28597
2	Side panel, weather enclosure	GM28598
1	Insulator, silencer	GM28703
2	Duct, weather enclosure side	GM28749
2	Support, duct, right side	GM28750
4	Bracket, mtg.	GM28751
2	Support, duct, left side	GM28755
1	Gasket	GM29398
1	Elbow, exhaust	GM30499
2	Flange, radiator side	GM30500
1	Flange, radiator bottom	GM30501
1	Flange, radiator top	GM30502
4	Bushing, molded	GM31074-1
4	Latch, lockable, black	GM31202
4	Key, latch	GM42778
2	Door, weather enclosure	GM31236
1	Plate, cover	GM33003
1	Panel, discharge duct, right side	GM33814
1	Panel, discharge duct, left side	GM33815
1	Panel, discharge duct, front	GM33816
1	Panel, discharge duct, top	GM33817
1	Foam, Acoustic (GM 15-30 kW 1.6L)	GM37549
1	Foam, acoustic	GM37552
1	Corner, sound shield	GM42840
6	Washer, nylon	X-6278-14
2	Decal	X-6348-2
38	Rivet, pop, 0.187 in.	X-781-19
8	Screw, hex washer head, drill	X-794-1
12	Screw, hex washer head, drill	X-794-2
20	Screw, hex seal washer head, drill	X-794-4
Fuel System		
Flex Fuel, Gas 3/4 In. GM28754-KA1		
1	Fuel line, flexible	326260
Natural Gas Strainer PA-290275		
1	Strainer, gas	292485
Additional Gas Solenoid Valve GM39123-KA1		
1	Bracket, fuel valve	254456
1	Valve assembly, gas	254859
1	Fuel line, flexible	GM41863
1	Harness, additional gas solenoid valve	GM39124
1	Elbow, pipe NPT	X-215-27
1	Elbow, oil line	X-447-18

Parts List: Accessories, continued

Qty.	Description	Part No.
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Additional Gas Solenoid Valve		GM39123-KA2
1	Bracket, fuel valve	254456
1	Valve assembly, gas	GM42530
1	Fuel line, flexible	GM41863
1	Harness, additional gas solenoid valve	GM46019
1	Elbow, pipe NPT	X-215-27
1	Elbow, oil line	X-447-18

Miscellaneous

Skid End Caps		GM35032-KP1
2	End cap, skid	GM35313
8	Screw, hex washer head, drill	X-794-1

Guard, Rodent		GM34362-KA1
1	Screen, air inlet guard	GM29351
8	Washer, plain	X-25-57
8	Screw, machine	X-49-36

Air Cleaner Restriction Indicator		PA-326237
1	TT Air Cleaner Restriction, 20-2000 kW	TT-1207
1	Gauge, restriction	273113

Oil Makeup/Low Level Shutdown		GM65412-KA1
2	Washer, nylon, .578 ID x 1.067 in. OD	276317
1	Valve, oil drain (M14 x 1.50)	344826
1	Gauge, oil level	GM65413
1	Bracket, oil level	GM65414
1	Bracket, oil tank	GM65415
1	Bottle, oil	GM65453
1	Harness, extension oil makeup kit	GM65783
1	Decal, check oil	GM66054
1	Tee, run M14 x 1.5	GM67070
2	Washer, plain	M125A-05-80
8	Washer, plain, 8.4 ID x 16.0 OD	M125A-08-80
6	Nut, hex 8mm	M6923-08-80
2	Screw, hex cap	M931-08035-60
2	Screw, hex cap	M933-05020-60
2	Screw, hex cap	M933-08016-60
4	Screw, hex cap	M933-08020-60
2	Nut, hex 5mm	M934-05-50
1	TT oil makeup, 30RES/RYG, RGEN30, RES	TT-1499
1	Bushing, reducing (1/2 x in. npt)	X-202-41
4	Washer, lock, .326 ID x .883 in. ID	X-22-16
2	Washer, lock, .20 ID x .373 in. OD	X-22-9
1	Fuel line, flexible	X-386-109
2	Connector, 90 deg. (in. ID hose)	X-391-21
1	Connector, 90 deg. (3/8 in. ID hose)	X-391-42
1	Fuel line, flexible	X-422-15
1	Line, flex fuel	X-422-38
6	Clamp, hose, .5/1 in.	X-426-10
1	Connector, hose + vibra seal	X-582-5

Silencer, Engine Mounted		GM32879-KP1
1	Silencer	GM28536
1	Insulating blanket, silencer	GM28703
1	Elbow, exhaust	GM30499
1	Gasket	GM29398
1	Clamp, muffler	GM41094
2	Screw, hex cap	M931-10050-60
2	Nut, hex, 10 mm	M6923-10-80
1	Bracket, silencer support	GM39092
4	Spacer, 0.406 ID x 0.625 OD x 0.5 in.	X-400-91
1	Insulator, pipe	GM28705
1	Pipe, exhaust	GM28534
1	Gasket, exhaust manifold	GM28711
2	Screw, hex cap	M931-10040-82
4	Washer, hardened, 0.406 ID x 0.812 in. OD	X-801-3

Qty.	Description	Part No.
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Silencer, Engine Mounted		GM32879-KP2
1	Silencer	GM28535
1	Insulating blanket, silencer	GM28704
1	Elbow, exhaust	GM30498
1	Gasket	GM29398
1	Clamp, muffler, 2.13 in.	GM41095
2	Screw, hex cap	M933-10035-60
2	Screw, hex cap	M931-10050-82
2	Nut, hex, 10 mm	M6923-10-80
1	Bracket, silencer support	GM39092
4	Spacer, 0.406 ID x 0.625 OD x 0.5 in.	X-400-91
1	Insulator, pipe	GM28705
1	Pipe, exhaust	GM28534
1	Gasket, exhaust manifold	GM28711
2	Screw, hex cap	M931-10040-82
4	Washer, hardened, 0.406 ID x 0.812 in. OD	X-801-3

Silencer, Critical, 2 in. NPT, SIEO		PA-324064
1	Silencer, critical SIEO, 2 in. NPT	276257

Exhaust, Flex		GM33818-KP1
1	Adapter, flexible exhaust	324089
1	Gasket	GM29398
1	Pipe, exhaust	GM33820
1	Clamp, muffler, 2.12 in.	X-722-5
2	Screw, hex cap	M933-10035-60
2	Nut, hex, 10 mm	M6923-10-80
1	Insulator, pipe	GM28705
1	Pipe, exhaust	GM28534
1	Gasket, exhaust manifold	GM28711
2	Screw, hex cap	M931-10040-82
2	Spacer, 0.406 ID x 0.625 OD x 0.5 in.	X-400-91
4	Washer, hardened, 0.406 ID x 0.812 in. OD	X-801-3

Flex Exhaust, Engine Mtd. Silencer		GM33818-KP2
1	Adapter, flexible exhaust	324089
1	Clamp, muffler, 2.12 in.	X-722-5

Flex Exhaust, Engine Mtd. Silencer		GM33818-KP3
1	Adapter, flexible exhaust	276242
1	Clamp, muffler, 1.87 in.	277706

Rain Cap		PA-225243
1	Cap, rain	276254

Rain Cap		PA-256851
1	Cap, vertical exhaust	276126

Duct Flange		GM33819-KP1
2	Flange, radiator side	GM30500
1	Flange, radiator bottom	GM30501
1	Flange, radiator top	GM30502
4	Washer, plain, 0.281 ID x 0.625 in. OD	X-25-40
4	Bolt, hex cap	X-465-2
8	Rivet, pop, 0.187 in.	X-781-19

Appendix A Abbreviations

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

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

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

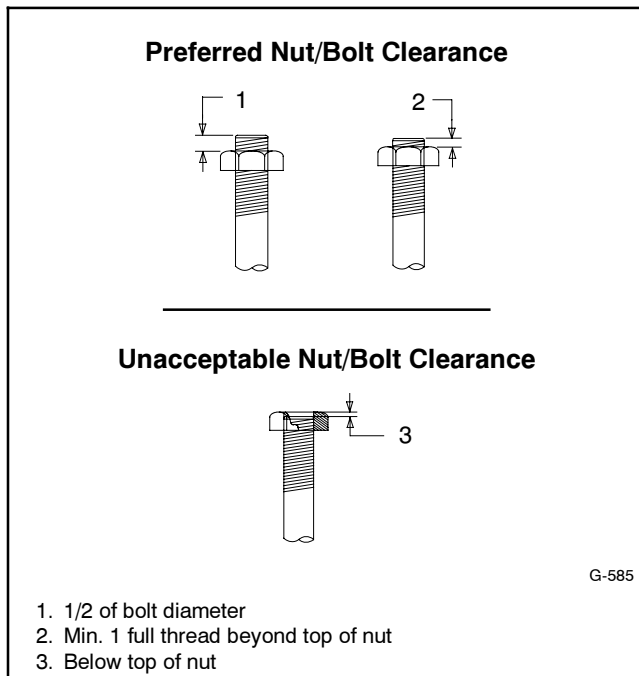


Figure 1 Acceptable Bolt Lengths

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.

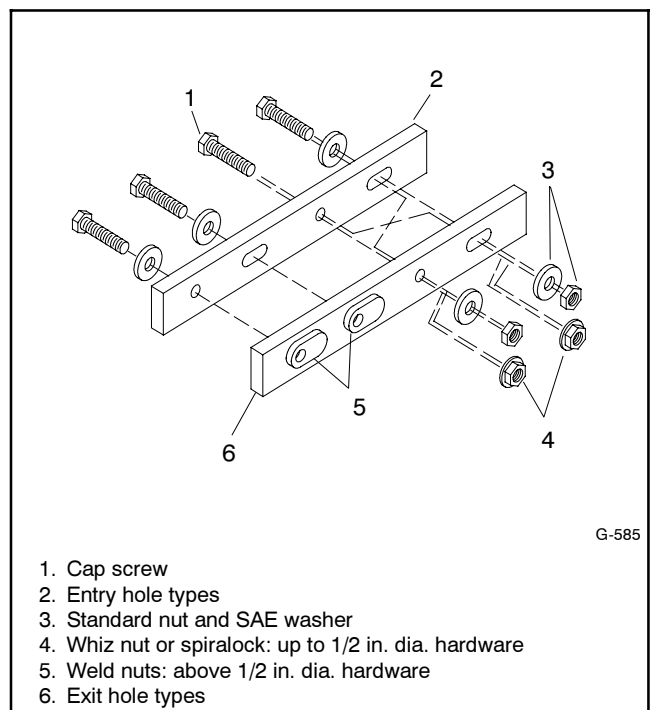


Figure 2 Acceptable Hardware Combinations

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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Notes

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KOHLER CO. Kohler, Wisconsin 53044
Phone 920-565-3381, Fax 920-459-1646
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Asia Pacific Headquarters
7 Jurong Pier Road
Singapore 619159
Phone (65) 6264-6422, Fax (65) 6264-6455