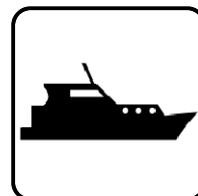


Service Parts

Marine Generator Sets



Models:

11/11.5CCFOZ

13.5/14CCOZ

13EOZ/11EFOZ

14EOZ/11.5EFOZ

15.5EOZ/13EFOZ

1- and 3-Phase

9001
KOHLER
POWER SYSTEMS
NATIONALLY REGISTERED

KOHLER[®]
POWER SYSTEMS

TP-5591 2/03d

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Introduction

This manual lists service replacement parts for 13.5/14CCOZ and 13-15.5EOZ marine generator sets.

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

Information in this publication represents data available at the time of print. Kohler Co. reserves the right to change this publication and the products represented without notice and without any obligation or liability whatsoever.

This manual includes the following main sections:

Table of Contents. Lists the sections of the manual.

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

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

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

Kit Sections. List modules and accessories and their parts.

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

xin:004:002

Numbering System Significance

This manual uses the following numbering systems:

Specification Number. The product identification number located on the generator set nameplate. 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.

xin:004:003:a

Illustrations

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

xin:004:004a

How to Find Part Numbers

Use the following steps to locate a service replacement part.

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

xin:004:005

Hardware References

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

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

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

xin:004:006

Specification Number Index

Group Title	<i>Cylinder Block</i>	<i>Gear Housing</i>	<i>Oil Pan</i>	<i>Cylinder Head</i>	<i>Intake Manifold</i>	<i>Camshaft & Drive Gear</i>	<i>Turbocharger</i>	<i>Crankshaft & Flywheel</i>	<i>Piston & Connecting Rod</i>	<i>Lub. Oil System</i>	<i>Lub. Oil Cooler</i>	<i>Lub. Oil Line</i>	<i>Cooling Sea Water System</i>
Group No.	1	2	3	5	6	7	8	9	9	10	11	12	13
Spec No.	Variation Number												

126113	1	1	1	1	1	1	1	1	1	1	1	1	1
126119	1	1	1	1	1	1	1	1	1	1	1	1	1
126124	1	1	1	1	1	1	1	1	1	1	1	1	1
126125	1	1	1	1	1	1	1	1	1	1	1	1	1
126126	1	1	1	1	1	1	1	1	1	1	1	1	1
126147	1	1	1	1	1	1	1	1	1	1	1	1	1
126148	1	1	1	1	1	1	1	1	1	1	1	1	1
126149	1	1	1	1	1	1	1	1	1	1	1	1	1
126164	1	1	1	1	1	1	1	1	1	1	1	1	1
126165	1	1	1	1	1	1	1	1	1	1	1	1	1
126170	1	1	1	1	1	1	1	1	1	1	1	1	1
126172	1	1	1	1	1	1	1	1	1	1	1	1	4
126180	1	1	1	1	1	1	1	1	1	1	1	1	1
126187	1	1	1	1	1	1	1	1	1	1	1	1	1
126188	1	1	1	1	1	1	1	1	1	1	1	1	4
126205	2	2	2	2	2	2	—	2	2	2	—	2	2
126206	2	2	2	2	2	2	—	2	2	2	—	2	5
126207	3	3	2	3	3	2	2	3	3	2	—	2	3
126208	3	3	2	3	3	2	2	3	3	2	—	3	6
126209	3	3	2	3	3	2	2	3	3	2	—	3	3
126210	3	3	2	3	3	2	2	3	3	2	—	3	6

— Not applicable.

Specification Number Index

Group Title		<i>Cooling Fresh Water Pump</i>	<i>Cooling Fresh Water Cooler</i>	<i>Fuel Injection Pump</i>	<i>Fuel Injection Lines</i>	<i>Fuel Line & Filter</i>	<i>Governor</i>	<i>Starting Motor</i>	<i>Gasket Set</i>					
Group No.	14	15	16	17	18	19	20	21						
Spec No.	Variation Number													
126113	1	1	1	1	1	1	1	1						
126119	1	1	1	1	1	1	1	1						
126124	1	1	1	1	1	1	1	1						
126125	1	1	1	1	1	1	1	1						
126126	1	1	1	1	1	1	1	1						
126147	1	1	1	1	1	1	1	1						
126148	1	1	1	1	1	1	1	1						
126149	1	1	1	1	1	1	1	1						
126164	1	1	1	1	1	1	1	1						
126165	1	1	1	1	1	1	1	1						
126170	1	1	1	1	1	1	1	1						
126172	6	1	1	1	1	1	2	1						
126180	1	1	1	1	1	1	1	1						
126187	1	1	1	1	1	1	1	1						
126188	6	1	1	1	1	1	2	1						
126205	2	2	2	2	2	2	1	2						
126206	3	2	2	2	2	3	2	2						
126207	4	3	3	3	2	4	1	3						
126208	5	3	3	3	2	5	2	3						
126209	4	3	3	3	2	4	1	3						
126210	5	3	3	3	2	5	2	3						

— Not applicable.

Specification Number Index

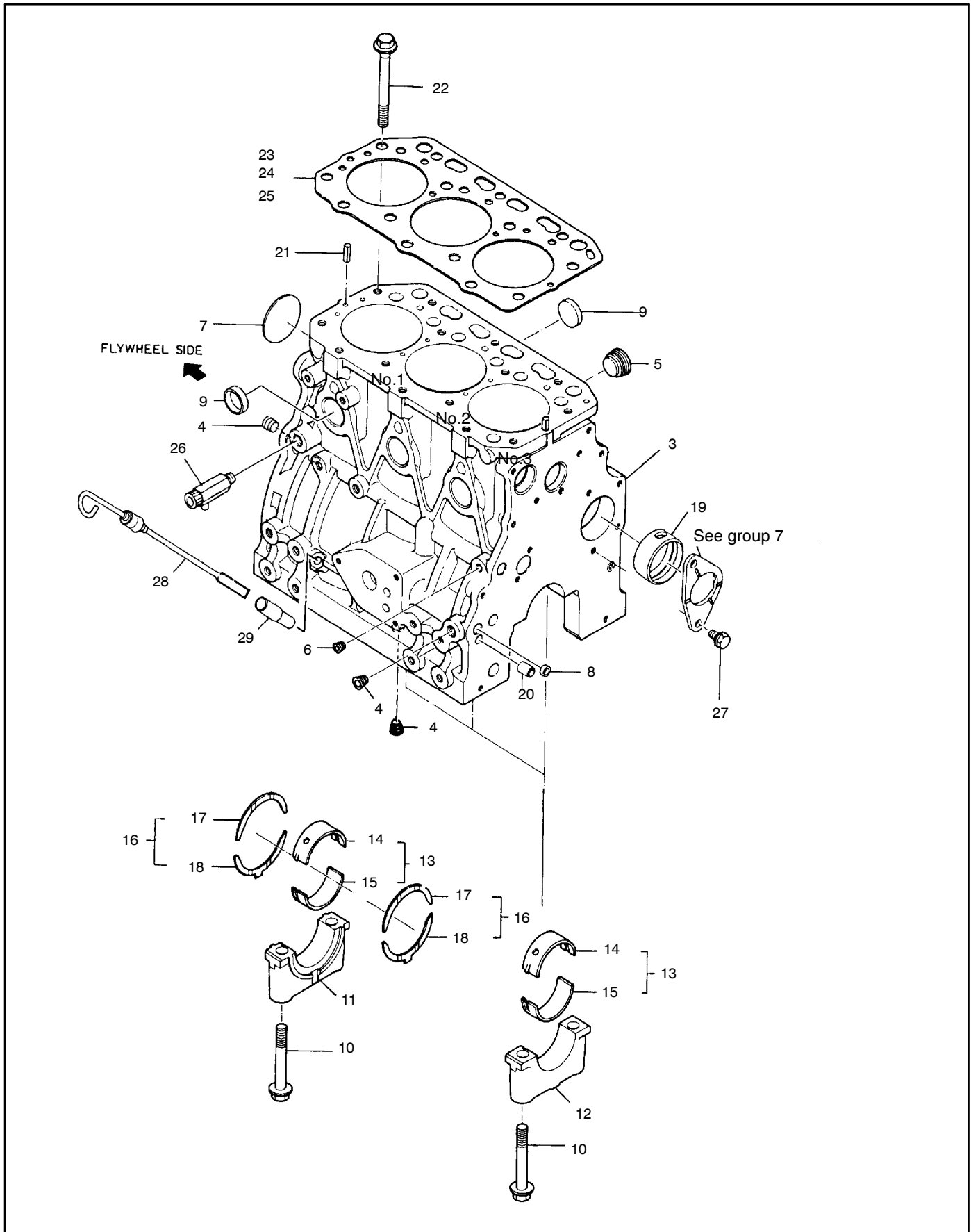
Group Title	<i>Fuel System</i>	<i>Cooling System</i>	<i>Engine</i>	<i>Nameplates and Decals</i>	<i>Skid and Plant Mounting</i>	<i>Generator and Mounting</i>	<i>Controller and Mounting</i>	<i>Housing</i>	<i>Literature</i>				
Group No.	103	104	105	107	109	201	301	501	701				
Spec No.	Variation Number												

126113	4	7	17	8	10	17	20	—	10				
126119	4	7	17	8	10	21	24	—	10				
126124	4	7	22	9	10	25	25	—	10				
126125	4	7	17	9	10	25	25	—	10				
126126	4	7	17	10	10	21	26	—	10				
126147	4	15	17	12	10	25	36	—	10				
126148	4	15	22	12	10	25	38	8	10				
126149	4	15	17	13	10	21	37	—	10				
126164	4	20	17	12	10	31	36	—	10				
126165	4	15	22	12	10	31	38	14	10				
126170	4	20	17	13	10	28	37	—	10				
126172	8	21	33	12	10	31	42	—	10				
126180	4	20	22	12	10	31	38	11	10				
126187	4	20	17	12	10	36	36	—	10				
126188	8	21	33	12	10	36	42	—	10				
126205	15	28	44	19	15	31	52	—	32				
126206	16	29	45	19	15	31	53	—	32				
126207	15	28	46	20	15	28	54	—	33				
126208	16	29	47	20	15	28	55	—	33				
126209	15	28	46	19	15	36	52	—	34				
126210	16	29	47	19	15	36	53	—	34				

— Not applicable.

Notes

Group 1: Cylinder Block

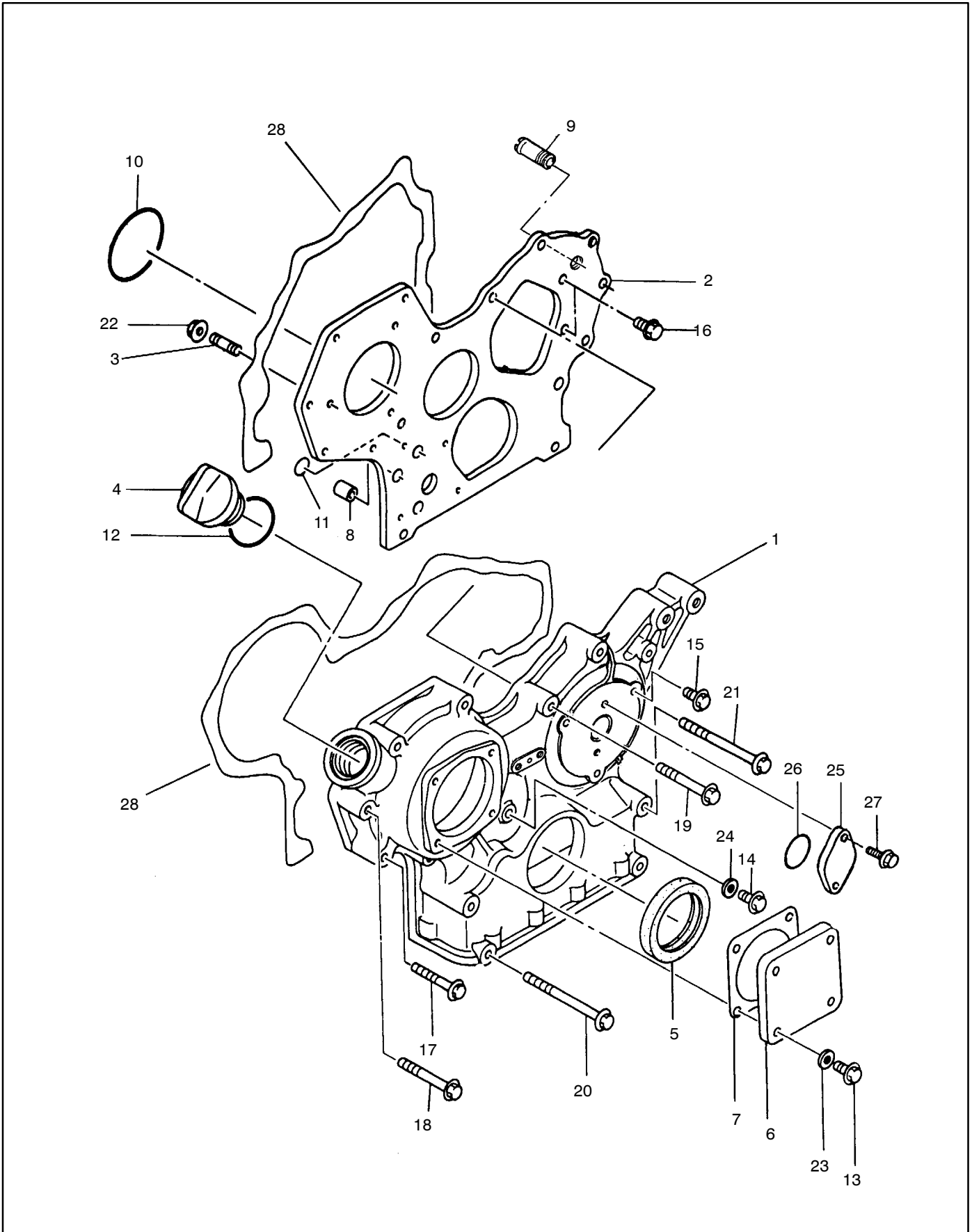


Group 1: Cylinder Block

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	229811	Block assembly, cylinder (includes items 3-21)	1		
1	GM13338	Block assembly, cylinder (includes items 3-21)		1	
1	GM13341	Block assembly, cylinder (includes items 3-21)			1
2	X	Refer to item 1	1	1	1
3	X	Block, cylinder	1	1	1
4	252771	Plug, PT 1/4	3	3	3
5	252566	Plug	1	1	1
6	256515	Plug, PT 1/8 screw	1	1	1
7	225827	Plug 50	1	1	1
8	252728	Plug 12	2	2	2
9	225824	Plug 30	8	8	8
10	252803	Bolt, bearing cap	8	8	8
11	X	Bearing cap	1	1	1
12	X	Bearing cap	4	4	4
13	256762	Main bearing (includes items 14 and 15)	4		
13	GM13297	Main bearing (includes items 14 and 15)		4	4
13	256763	Main bearing under size 0.25 (includes items 14 and 15)	4		
13	256585	Main bearing under size 0.25 (includes items 14 and 15)		4	4
14	X	Main bearing	4	4	4
15	X	Main bearing	4	4	4
16	256764	Bearing, thrust (includes items 17 and 18)	2		
16	252977	Bearing, thrust (includes items 17 and 18)		2	2
16	256765	Bearing, thrust 0.25 over-size (includes items 17 and 18)	2	2	2
17	X	Bearing, thrust	2	2	2
18	X	Bearing, thrust	2	2	2
19	252933	Bush, camshaft	1	1	1
20	252932	Pipe, knock	2		
21	250963	Spring pin 6 x 12	2		
22	252797	Stud, cylinder head	14	14	14
23	229726	Gasket, cylinder head	1		
23	GM13296	Gasket, cylinder head		1	
23	GM13304	Gasket, cylinder head			1
24		Refer to item 23	1		
25		Refer to item 23	1		
26	252394	Cock	1	1	1
27	252696	Bolt, M8 x 16 plated	2		
27	225818	Bolt, M8 x 14 plated		2	2
28	252951	Dipstick	1	1	1
29	252759	Guide, dipstick	1	1	1

X Item not sold separately

Group 2: Gear Housing

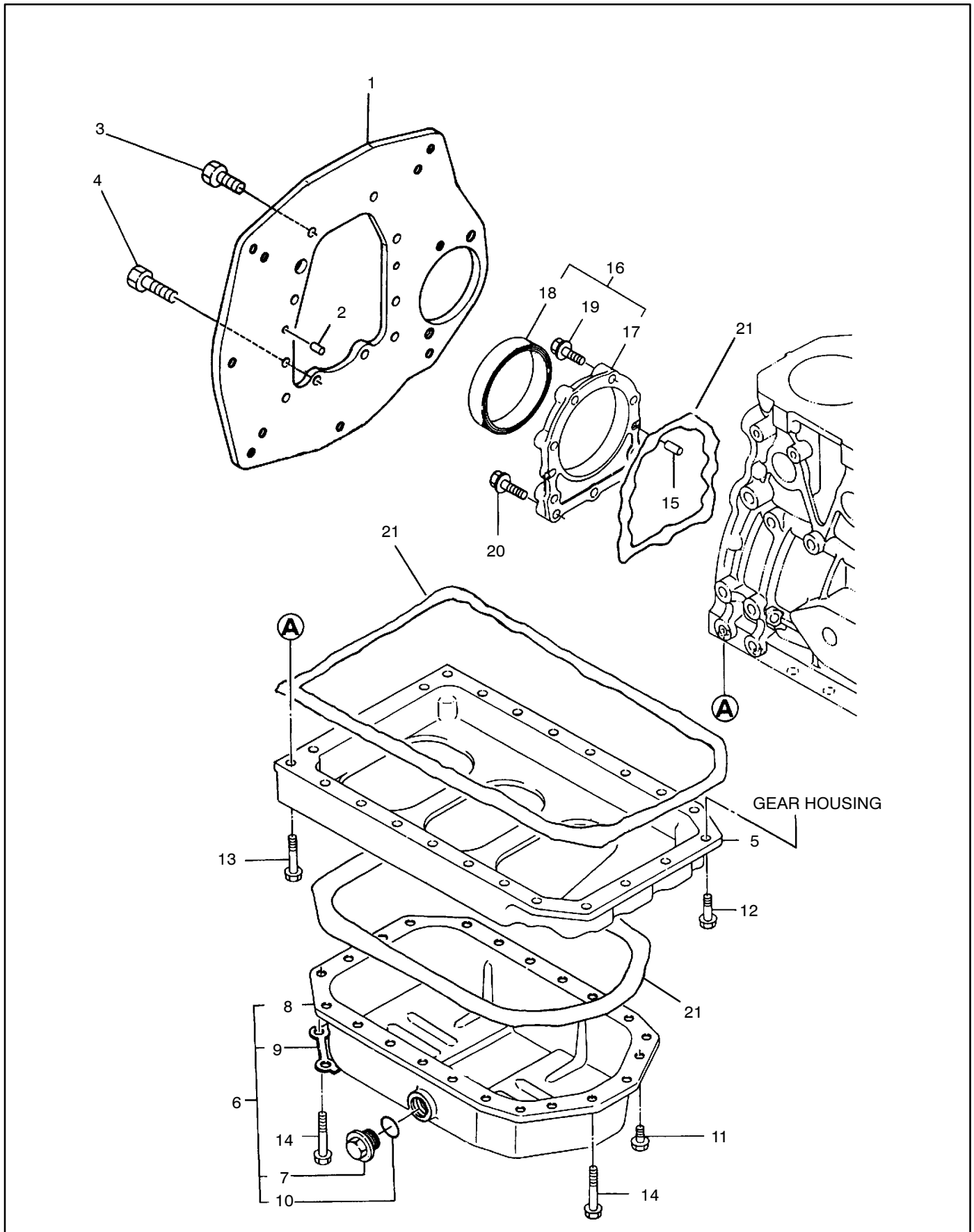


Group 2: Gear Housing

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	252860	Housing, gear	1		
1	229799	Housing, gear (includes item 5)		1	1
2	229720	Plate, gear cover	1		1
2	252861	Flange, gear housing		1	
3	252409	Stud, M8 x 22	3	3	3
4	250837	Cap, lub. oil supply	1	1	1
5	252931	Seal, oil	1	1	1
6	256531	Cover	1	1	1
7	252085	Gasket	1	1	1
8	252932	Pipe, knock	2	2	2
9	229721	Joint	1		1
10	252764	O-ring, F.I. pump	1	1	1
11	250981	O-ring	2	2	2
12	252684	O-ring	1	1	1
13	252695	Bolt, M8 x 12 plated	4	4	4
14	252696	Bolt, M8 x 16 plated	1	1	1
15	252696	Bolt, M8 x 16 plated	3	3	3
16	252697	Bolt, M8 x 20 plated	2	2	2
17	252703	Bolt, M8 x 45 plated	4	4	4
18	252704	Bolt, M8 x 50 plated	2	2	2
19	256798	Bolt, M8 x 55 plated	3	3	3
20	256799	Bolt, M8 x 85 plated	2	2	2
21	229500	Bolt, M8 x 90 plated	2	2	2
22	252723	Nut, M8	3	3	3
23	252734	Seal, washer 8	4	4	4
24	252734	Seal, washer 8	1	1	1
25	252750	Cover, blind	1	1	1
26	256796	O-ring	1	1	1
27	225816	Bolt, M6 x 12 plated	2		
27	252693	Bolt, M6 x 16 plated		2	2
28	252998	Liquid gasket	AR	AR	AR

AR As Required

Group 3: Oil Pan



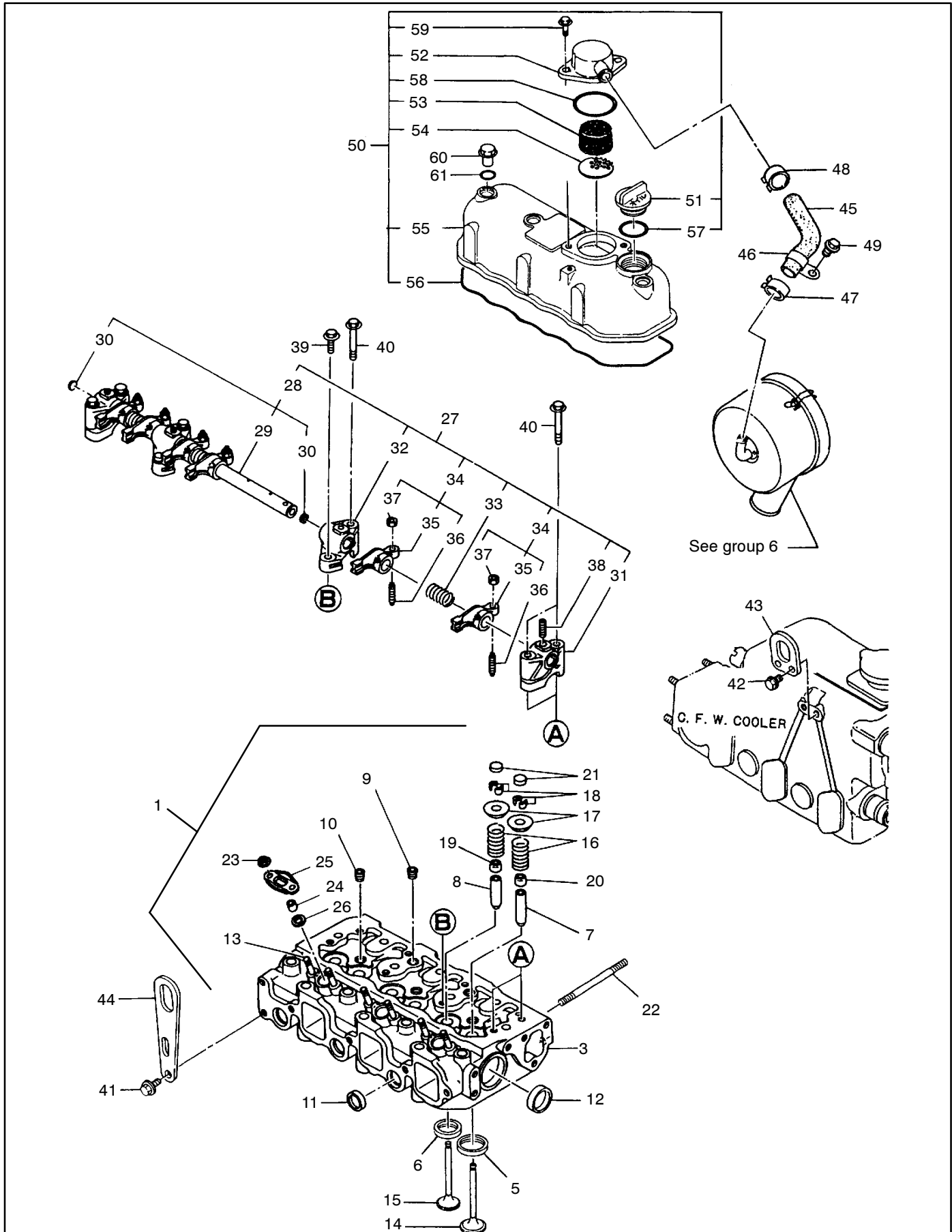
Group 3: Oil Pan

Item	Part Number	Description	Quantity	
			Variation Number	
			1	2
1	229114	Back plate	1	1
2	256750	Parallel pin 8 x 20	2	2
3	229505	Bolt, M10 x 20	6	
3	225923	Bolt, M10 x 20		6
4	252714	Bolt, M10 x 25	4	
4	363210	Bolt, M10 x 25		4
5	256751	Spacer, oil sump	1	1
6	229729	Sump assembly, lub. oil	1	1
7	252943	Plug 22	1	1
8	X	Refer to item 12	1	1
9	256752	Support, oil sump	1	
10	256796	O-ring	1	
10	252687	O-ring		1
11	252696	Bolt, M8 x 16 plated	4	
11	252703	Bolt, M8 x 45 plated		20
12	252699	Bolt, M8 x 25 plated	2	
12	252696	Bolt, M8 x 16 plated		4
13	252703	Bolt, M8 x 45 plated	20	
14	252704	Bolt, M8 x 50 plated	4	
14	252699	Bolt, M8 x 25 plated		2
15	256750	Parallel pin 8 x 16	2	2
16	225866	Case assembly, oil seal (includes item 17 and 18)	1	1
17	X	Case, oil seal	1	1
18	252930	Seal, oil	1	1
19	225819	Bolt, M8 x 30 plated	6	
19	363430	Bolt, M8 x 30		6
20	252701	Bolt, M8 x 35 plated	3	3
21	252998	Liquid gasket	AR	AR

X Item not sold separately

AR As Required

Group 5: Cylinder Head

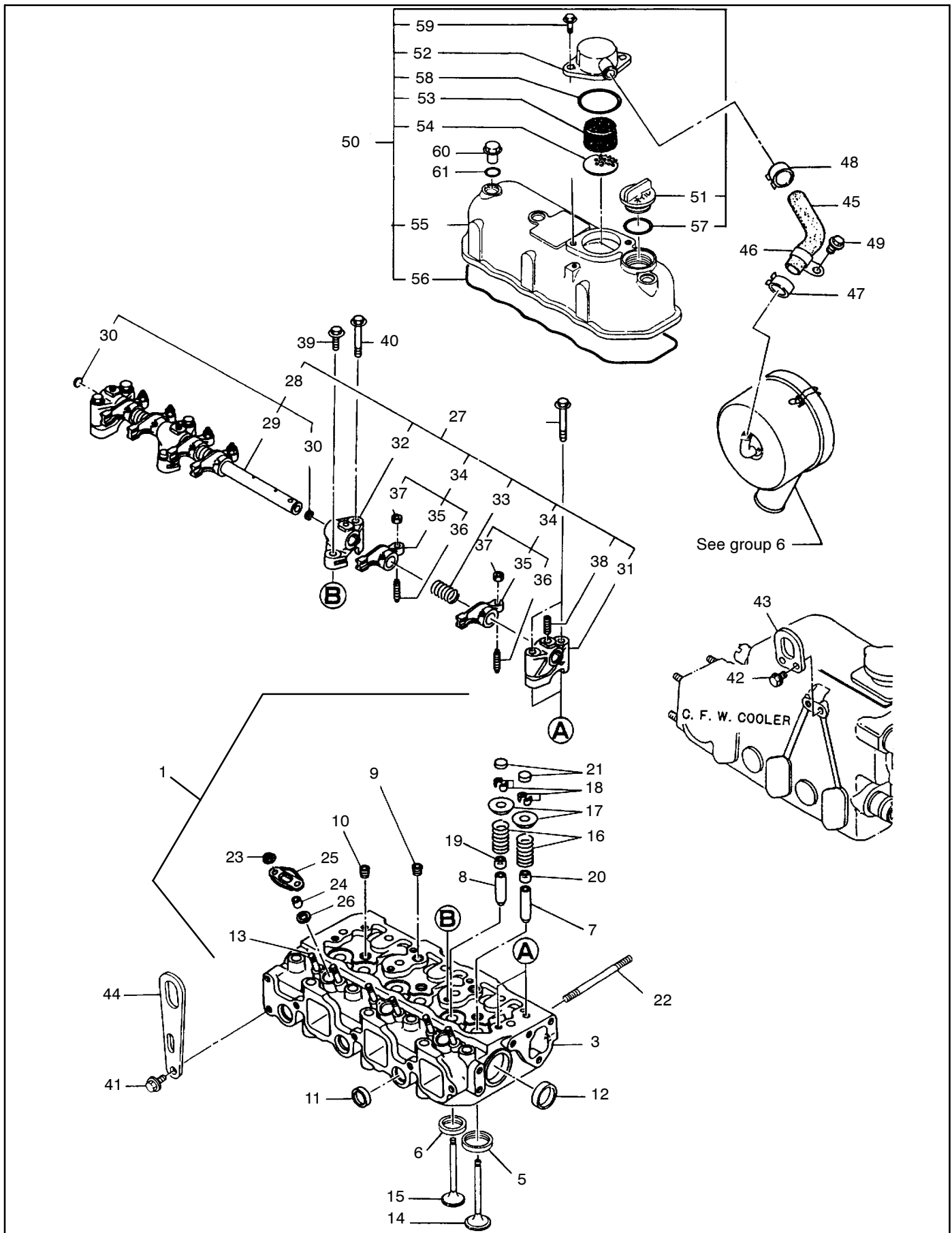


Group 5: Cylinder Head

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	229814	Head assembly, cylinder (includes items 2-23)	1		
1	GM13298	Head assembly, cylinder (includes items 2-23)		1	
1	GM13337	Head assembly, cylinder (includes items 2-23)			1
2		Refer to item 1	1	1	1
3	X	Head, cylinder	1	1	1
3	250963	Spring pin, 6 x 12 (not shown)		1	1
4	X	Piece	3	3	3
5	229427	Seat, intake valve	3		
5	252871	Seat, intake valve		3	3
6	229427	Seat, exhaust valve	3		
6	252872	Seat, exhaust valve		3	3
7	256736	Guide, intake valve	3	3	3
8	256768	Guide, exhaust valve	3		
8	252811	Guide, exhaust valve		3	3
9	256825	Plug, Pt 1/4	2		
9	250974	Plug, Pt 1/4		2	2
10	250975	Plug Pt 3/8, screw	3	3	3
11	252729	Plug 22	3	3	3
12	252732	Plug 40	2	2	2
13	252717	Stud, M6 x 20 plated	6	6	6
14	252778	Valve, intake	3	3	3
15	252779	Valve, exhaust (before engine serial number 10153)	3	3	
15	252780	Valve, exhaust (serial numbers 10153 and after)	3		3
16	252934	Spring, valve	6	6	6
17	252935	Retainer, spring	6	6	6
18	252737	Cotter	12		
18	363216	Cotter 8		6	6
19	252754	Seal, valve stem	3	3	3
20	256578	Seal, valve stem	3	3	3
21	252740	Cap, valve	6		
21	345355	Cap, valve		6	6
22	252721	Stud, M8 x 100 plated	2		
23	229507	Nut, M6	8		
23	250989	Nut, M6		8	8
24	252743	Protector, nozzle	3	3	3
25	252745	Retainer	3	3	3
26	252744	Seat, nozzle	3	3	3
27	229444	Shaft, assembly, rocker (includes items 28-38)	1		
27	225867	Shaft, assembly, rocker (includes items 28-38)		1	1
28	225891	Shaft, rocker arm (includes items 29 and 30)	1		
28	256766	Shaft, rocker arm (includes items 29 and 30)		1	1
29	X	Shaft, rocker arm	1	1	1
30	X	Plug 10	2	2	2
31	252843	Support, rocker arm	2	2	2
32	252844	Support, rocker arm	2	2	2
33	252815	Spring	3	3	3

X Item not sold separately

Group 5: Cylinder Head, continued



Group 5: Cylinder Head, continued

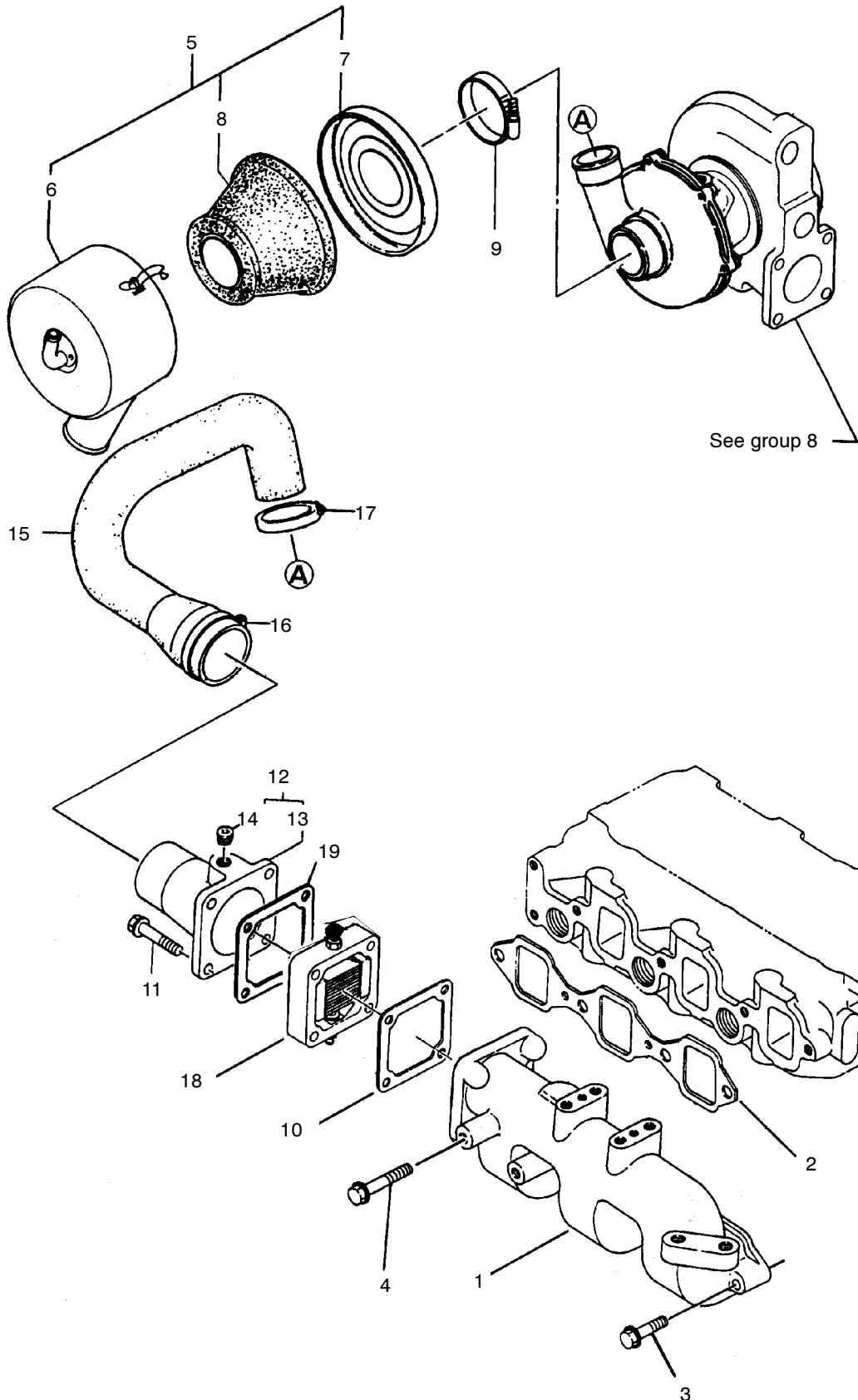
Item	Part Number	Description	Quantity		
			Variation 1	Variation 2	Variation 3
34	225869	Arm assembly, rocker (includes items 35-37)	6	6	6
35	X	Arm, rocker	6	6	6
36	225774	Screw, valve	6		
36	229844	Screw, valve		6	6
37	252817	Nut, M8	6	6	6
38	252722	Stud, M8 x 18 plated	3	3	3
39	252699	Bolt, M8 x 25 plated	3	2	2
40	252704	Bolt, M8 x 50 plated	6	6	6
41	225818	Bolt, M8 x14 plated	2		
42	252696	Bolt, M8 x 16 plated	2	2	2
43	256542	Lifter, engine	1	1	1
44	256532	Lifter, engine	1		
44	363110	Lifter, engine		1	1
45	229414	Pipe, breather	1	1	1
46	256625	Clamp	1		
47	229421	Clamp 16	1		
47	GM13316	Clamp 16		1	1
48	229425	Clamp	1	1	1
49	252694	Bolt, M8 x 10 plated	1		
50	225868	Bonnet assembly (includes items 51-59)	1	1	1
51	250837	Cap, lub. oil supply	1	1	1
52	225773	Cover, breather	1	1	1
53	252805	Baffle, breather	1	1	1
54	252806	Plate, shelter	1	1	1
55	X	Bonnet	1	1	1
56	256767	Gasket, bonnet	1	1	1
57	252684	O-ring	1	1	1
58	225812	O-ring	1	1	1
59	252696	Bolt, M8 x 16 plated	2	2	2
60	252470	Knob	3	3	3
61	250801	O-ring	3	3	3

X Item not sold separately

Group 6: Intake Manifold

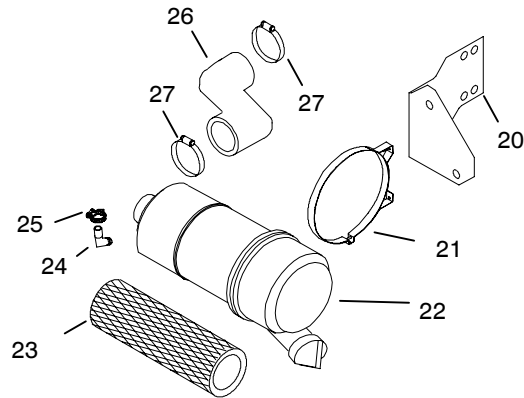
Variations 1 and 3

Variation 2 below generator set serial number 0723548



Group 6: Intake Manifold

Variation 2 Generator Set Serial Numbers 0723548 and After

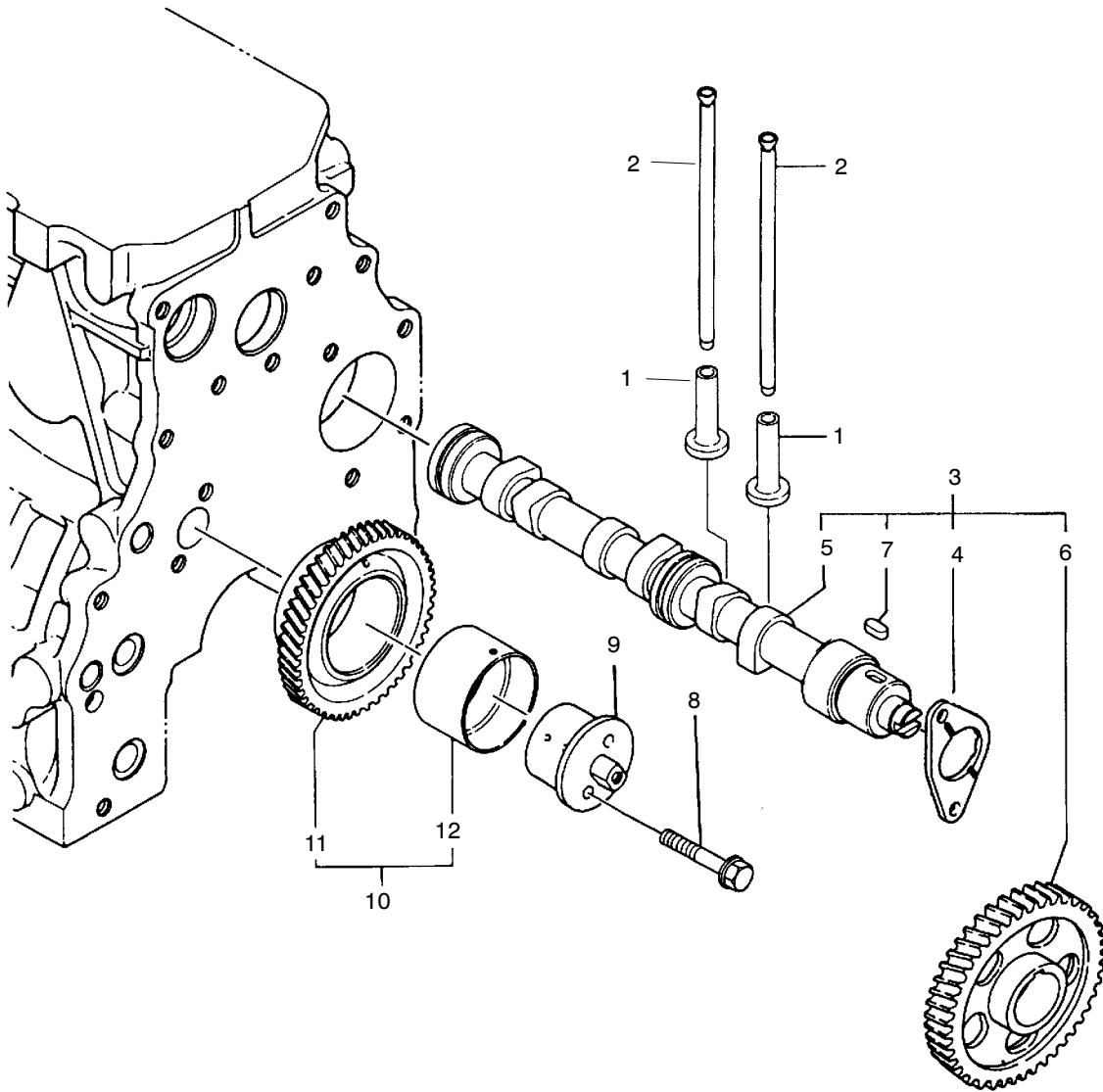


Service Kit GM25563 includes items 20-27.

Item	Part Number	Description	Quantity		
			Variation Number 1	Variation Number 2	Variation Number 3
1	229723	Manifold assembly, intake	1	1	1
2	225874	Gasket	1	1	1
3	252699	Bolt, M8 x 25 plated	3	3	3
4	252701	Bolt, M8 x 35 plated	1	1	1
5	229442	Silencer assembly (includes items 6-8)	1	1	1
6	X	Body, silencer	1	1	1
7	229443	Plate, bottom	1	1	1
8	250902	Element, cleaner	1	1	1
9	229493	Clamp 48	1	1	1
10	229434	Gasket	1		
10	229719	Gasket		1	1
11	252702	Bolt, M8 x 40 plated	4		4
11	252703	Bolt, M8 x 45 plated		4	
12	229429	Joint assembly (includes items 13 & 14)	1	1	1
13	X	Joint	1	1	
13	GM13327	Joint, air heater			1
14	256515	Plug, PT 1/8 screw	1		1
15	256627	Pipe	1		1
16	229494	Clamp 60	1		1
17	229493	Clamp 48	1		1
18	229825	Air heater	1	1	1
19	229434	Gasket	1	1	1
20	GM22513	Bracket, air cleaner		1	
21	GM21380	Mount, air cleaner (4.77 in. ID)		1	
22	GM22512	Air cleaner assembly		1	
23	GM24456	Element, air cleaner		1	
24	X-391-12	Connector (3/8 in. ID hose)		1	
25	X-426-9	Clamp, hose, 0.25/0.70 in.		1	
26	GM22514	Hose, molded, air cleaner		1	
27	X-426-6	Clamp, hose, 1.56/2.5 in.		2	

X Item not sold separately

Group 7: Camshaft

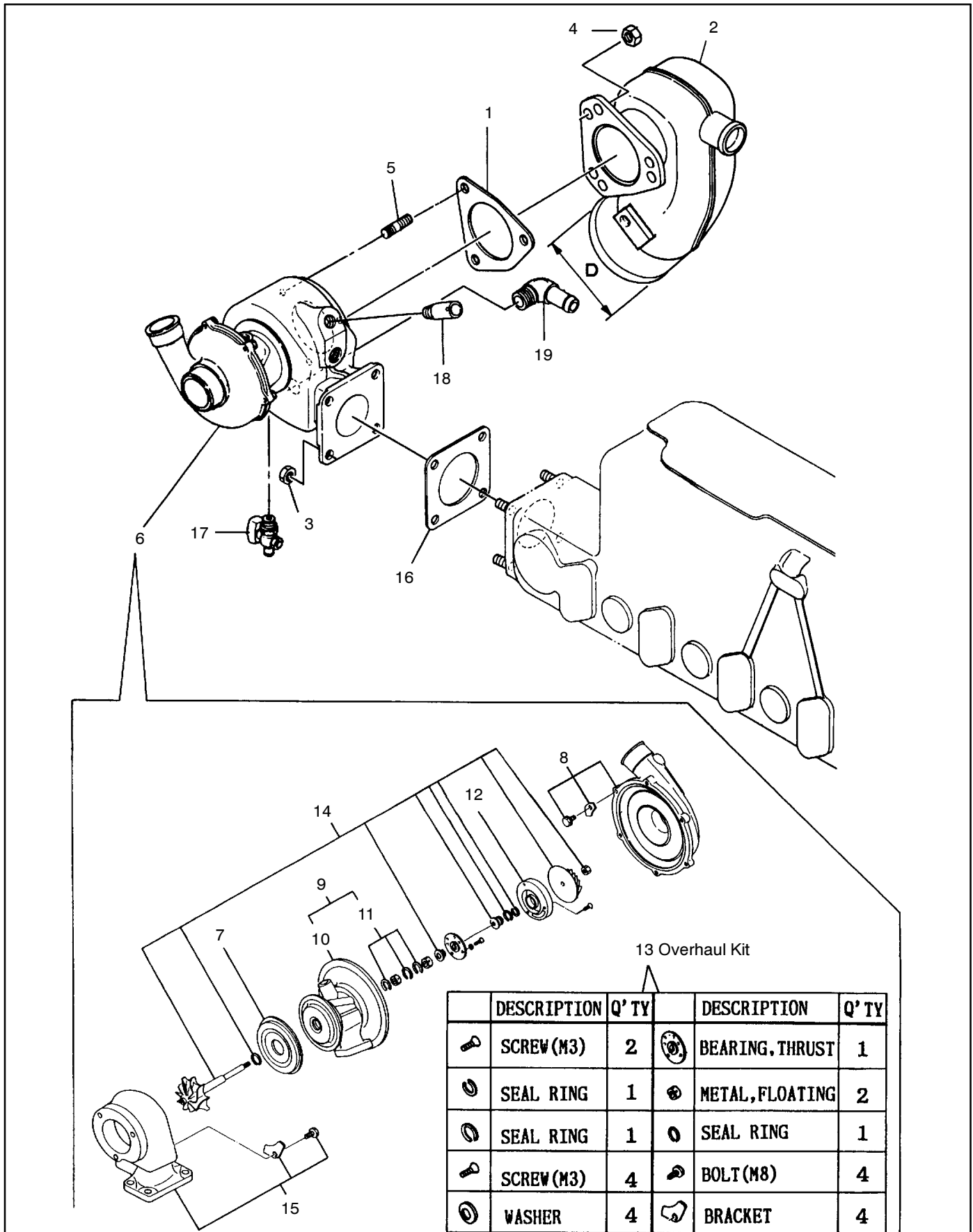


Group 7: Camshaft

Item	Part Number	Description	Quantity	
			Variation Number	
			1	2
1	252819	Tappet	6	6
2	229404	Push rod	6	
2	252820	Push rod		6
3	225873	Camshaft assembly (includes item 4-7)	1	1
4	252804	Bearing, thrust	1	1
5	X	Camshaft	1	1
6	256587	Gear, camshaft	1	1
7	252669	Key	1	1
8	252703	Bolt, M8 x 45 plated	2	2
9	256581	Shaft, idle gear	1	
9	252782	Shaft, idle gear		1
10	229456	Gear, idle (includes items 13 and 14)	1	
10	256590	Gear, idle (includes items 13 and 14)		1
11	X	Gear, idle	1	
12	229455	Bus, idle gear	1	
12	252825	Bus, idle gear		1

X Item not sold separately

Group 8: Turbocharger

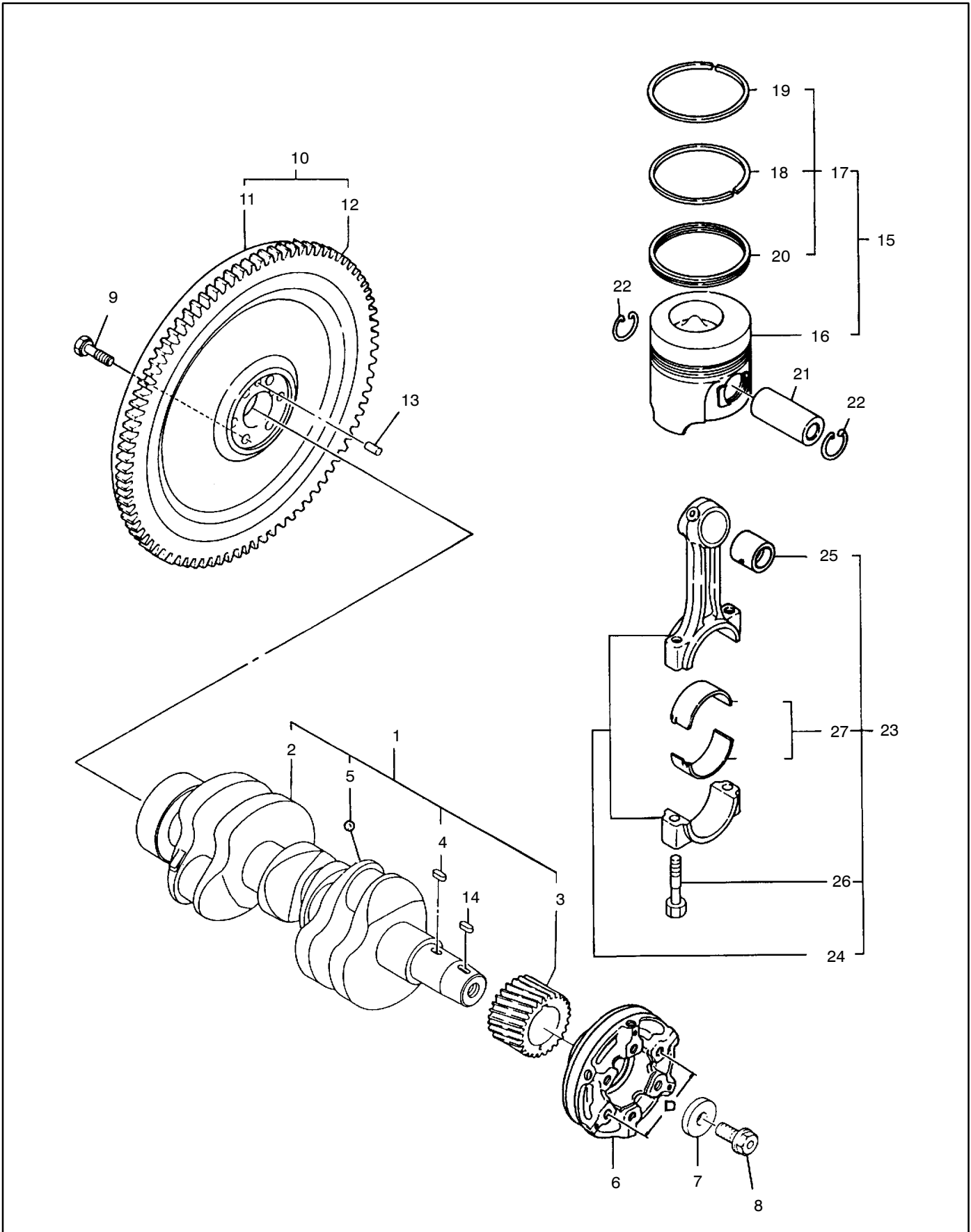


Group 8: Turbocharger

Item	Part Number	Description	Quantity	
			Variation Number	
			1	2
1	229435	Gasket	1	
1	256653	Gasket		1
2	229472	Elbow, mixing	1	
2	256651	Elbow, mixing		1
3	229509	Nut, M8	3	3
4	229509	Nut, M8	4	4
5	256579	Stud	3	3
6	229309	Turbocharger Assembly (includes items 7-15)	1	1
7	256686	Protector, heat	1	1
8	229473	Housing assembly, blower	1	1
9	229424	Housing assembly, bearing (includes items 12 and 13)	1	1
10	X	Housing, bearing	1	1
11	X	Circlip	3	3
12	229475	Plate assembly, seal	1	1
13	229311	Overhaul Kit	1	1
14	229310	Rotor assembly, turbo	1	
14	229312	Rotor assembly, turbo		1
15	229737	Housing assembly, turbo	1	1
16	252929	Gasket	1	
16	GM13332	Gasket		1
17	252329	Cock PT 1/8	1	1
18	229403	Joint	1	1
19	229317	Joint	1	1

X Item not sold separately

Group 9: Crankshaft & Flywheel



Group 9: Crankshaft & Flywheel

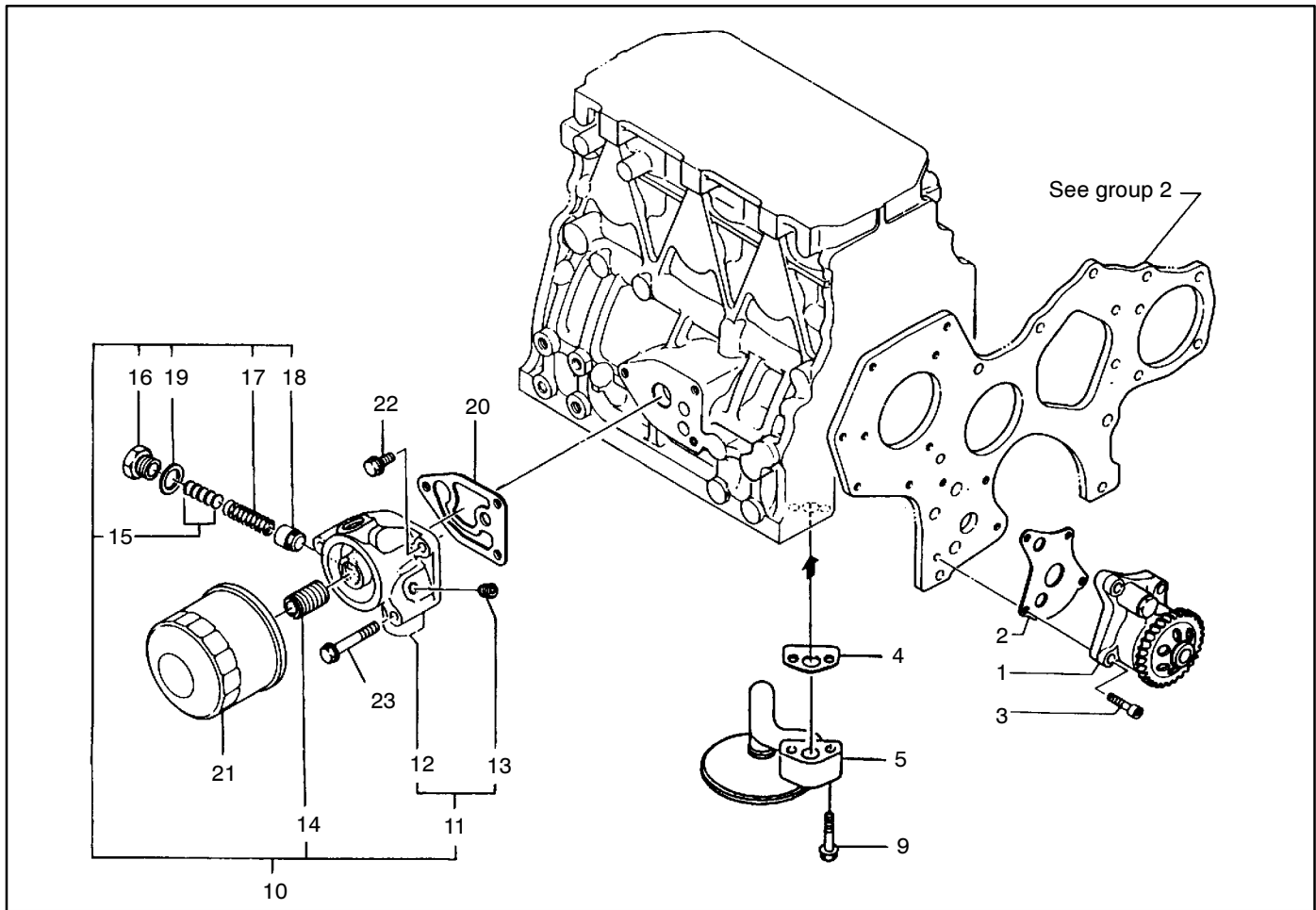
Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	229727	Crankshaft assembly (includes items 2-5)	1		
1	GM13299	Crankshaft assembly (includes items 2-5)			
2	X	Crankshaft	1	1	1
3	252821	Gear, crankshaft	1	1	1
4	252669	Key	1	1	1
5	X	Ball, steel	4	3	3
6	229730	V-pulley	1	1	1
7	252937	Washer	1	1	1
8	252763	Bolt, V-pulley	1	1	1
9	252401	Bolt, flywheel	6	6	6
10	229116	Flywheel assembly (includes items 12 and 13)	1	1	1
11	X	Flywheel	1	1	1
12	252774	Gear, ring	1	1	1
13	250960	Parallel pin 8 x 16	1		
13	256750	Parallel pin 8 x 16		1	1
14	229749	Key 7 x 16	1	1	1
15	345356	Piston w/rings (includes items 16 and 17)	3		
15	GM13300	Piston w/rings (includes items 16 and 17)		3	
15	363437	Piston w/rings (includes items 16 and 17)			3
15	229514	Piston w/rings over-sized 0.25 (includes items 16 and 17)	3		
15	GM13301	Piston w/rings over-sized 0.25 (includes items 16 and 17)		3	
15	363438	Piston w/rings over-sized 0.25 (includes items 16 and 17)			3
16	X	Piston	3	3	3
17	229512	Ring Set (includes items 18-20)	3		
17	GM13302	Ring Set (includes items 18-20)		3	
17	363439	Ring Set (includes items 18-20)			3
17	229513	Ring Set over-sized 0.25 (includes items 18-20)	3		
17	GM13303	Ring Set over-sized 0.25 (includes items 18-20)		3	
17	GM13305	Ring Set over-sized 0.25 (includes items 18-20)			3
18	X	Ring, second	3	3	3
19	X	Ring, top	3	3	3
20	X	Ring, oil	3	3	3
21	252822	Pin, piston	3		
21	363440	Pin, piston		3	3
22	252751	Circlip	8		
22	363441	Circlip		8	8
23	252980	Rod assembly, connecting (includes items 24-27)	3	3	3
24	X	Rod, connecting	3	3	3
25	252781	Bush, piston pin	3	3	3
26	250889	Bolt, connecting rod	6	6	6
27	252979	Bearing, crankpin	3	3	3
27	256588	Bearing, pin under-sized 0.25	3	3	3

GM13302

GM13301

X Item not sold separately

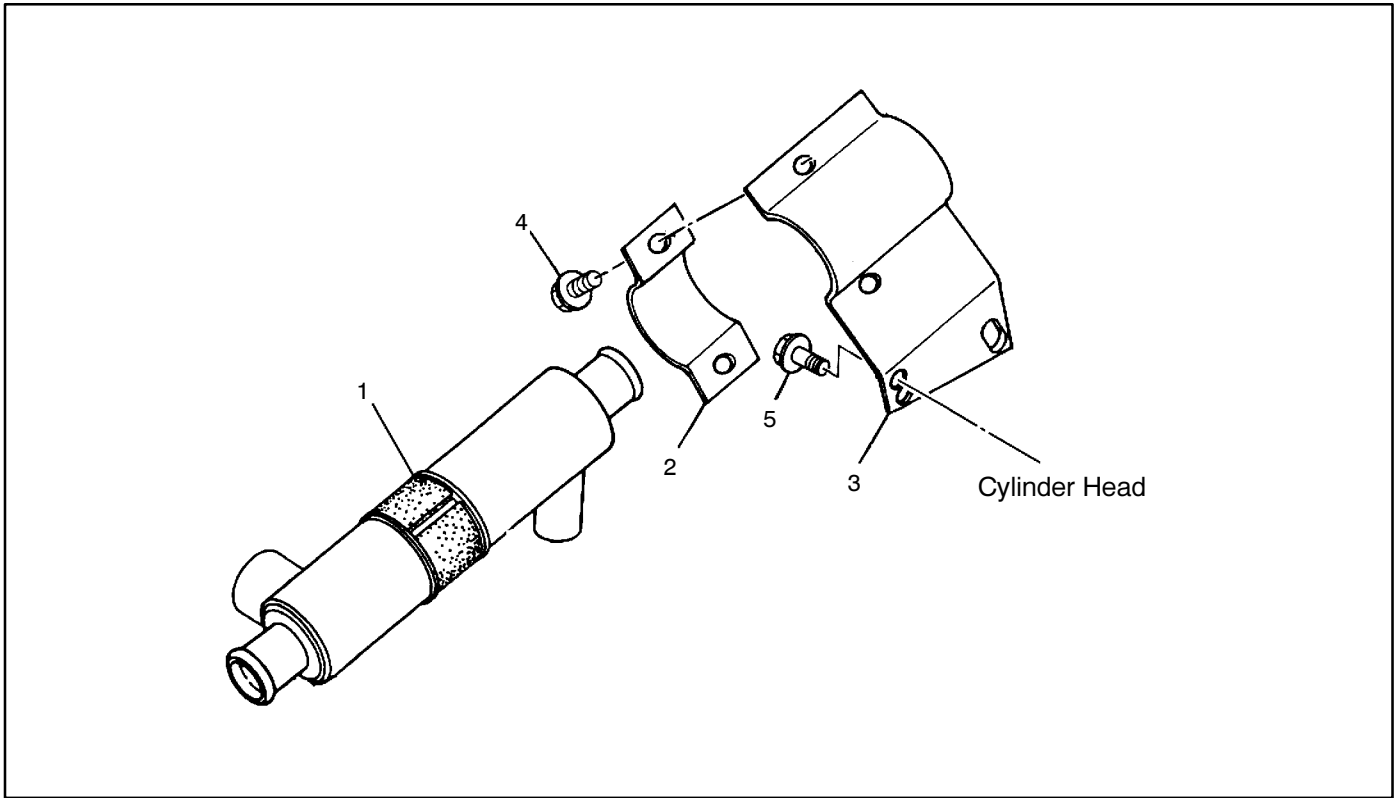
Group 10: Lube Oil System



Item	Part Number	Description	Quantity	
			Variation Number 1	Variation Number 2
1	256598	Pump, lube oil	1	
1	225412	Pump, lube oil		1
2	252829	Gasket, lub. oil pump	1	1
3	252724	Bolt, M6 x 25	4	4
4	225775	Gasket	1	1
5	252831	Pipe assembly, oil inlet (includes items 6-8)	1	1
6	X	Inlet (not shown)	1	1
7	X	Pipe (not shown)	1	1
8	X	Flange (not shown)	1	1
9	252701	Bolt, M8 x 35 plated	2	2
10	229430	Bracket assembly, filter (includes items 11-19)	1	
11	229431	Bracket assembly (includes items 12 and 13)	1	
12	X	Bracket	1	
12	256591	Bracket, strainer		1
13	250974	Plug PT 1/4 screw	1	
14	256582	Stud	1	
14	225413	Bolt, lube oil strainer		1
14	252834 252835	Nut (not shown)		1
14	250981	O-ring		1
15	256573	Shim set	1	
16	256577	Retainer	1	
17	256574	Spring, valve	1	
18	256575	Valve	1	
19	250971	Gasket 18, round	1	
20	229736	Gasket	1	
20	225776	Gasket		1
21	252834	Filter, oil	1	1
22	252697	Bolt, M8 x 20 plated	1	3
23	256798	Bolt, M8 x 55 plated	2	

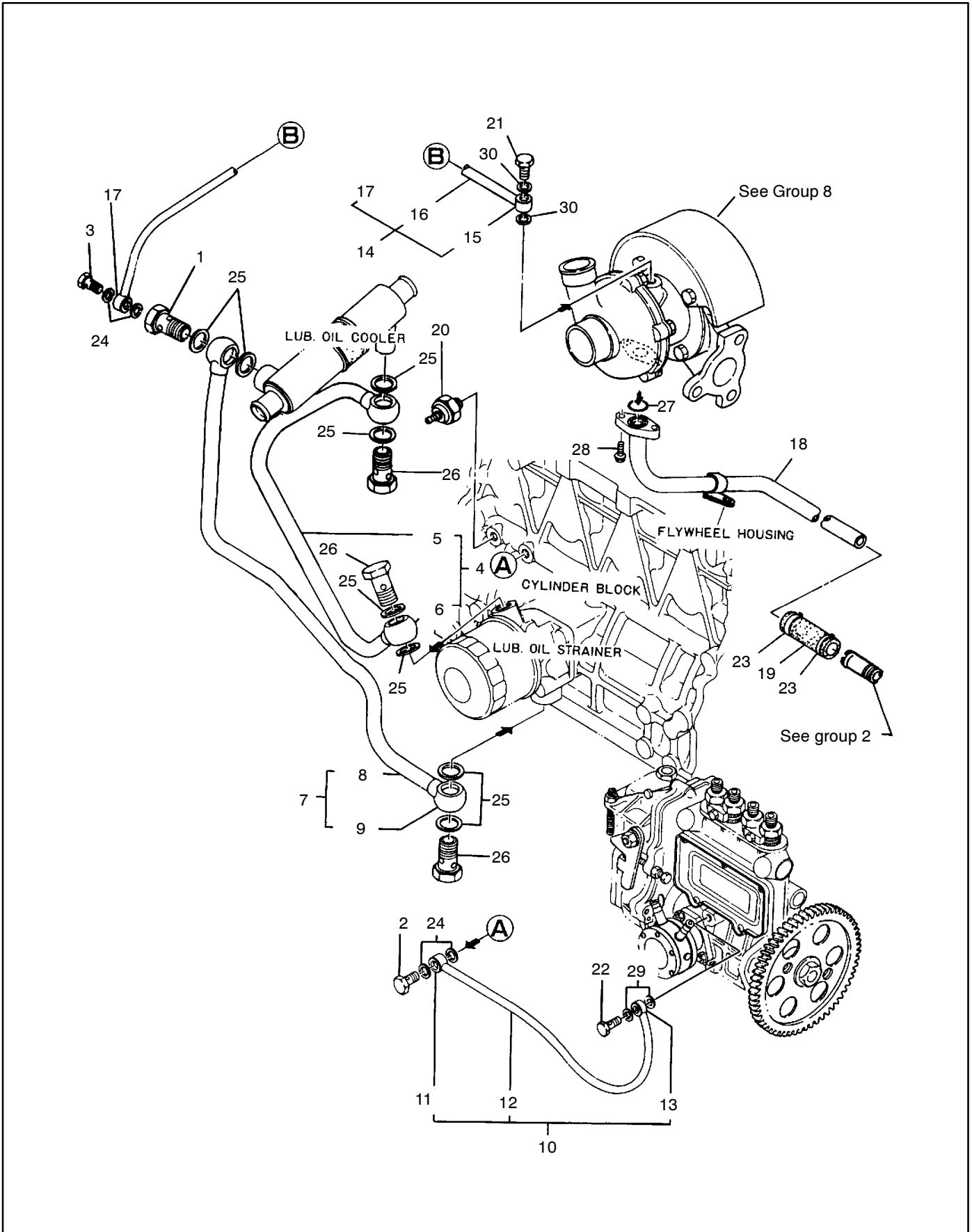
X Item not sold separately

Group 11: Lube Oil Cooler



Item	Part Number	Description	Quantity
			Variation Number
1	229413	Cooler assembly, lub. oil	1
2	256600	Retainer	1
3	229467	Support	1
4	229467	Bolt, M8 x 10 plated	2
5	225808	Bolt, M8 x 14 plated	2

Group 12: Lube Oil Line

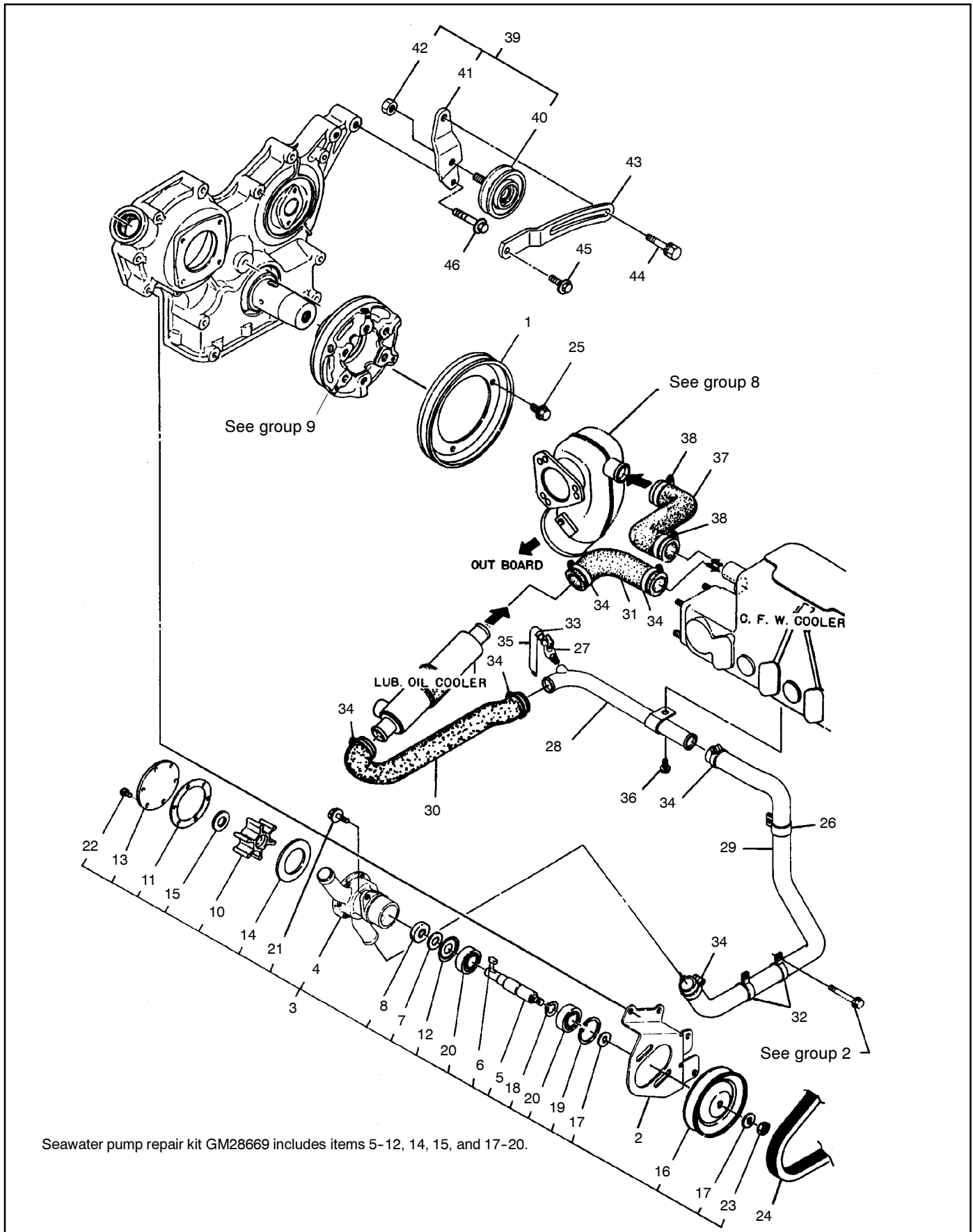


Group 12: Lube Oil Line

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	256613	Bolt, M20 x M10	1		
2	252084	Bolt, joint 10	1	1	1
3	256572	Bolt, pipe joint	1		
4	229417	Pipe, lube oil (includes items 5 and 6)	1		
5	X	Pipe, lube oil	1		
6	X	Pipe joint	2		
7	229418	Pipe, lube oil (includes items 8 and 9)	1		
8	X	Pipe, lube oil	1		
9	X	Pipe joint	2		
10	256773	Pipe, lube oil (includes item 11 -13)	1	1	
10	GM13306	Pipe, lube oil			1
10	229865	Retainer			1
10	252694	Bolt, M8 x 10 plated			1
11	X	Joint	1	1	1
12	X	Pipe, lube oil	1	1	1
13	X	Joint	1	1	1
14	229419	Pipe, lube oil (includes items 15-17)	1		
15	X	Joint, pipe	1		
16	X	Pipe, lube oil	1		
17	X	Joint	1		
18	229731	Pipe, return	1		1
19	229735	Joint rubber	1		1
20	256530	Switch, oil pressure	1	1	1
21	256568	Bolt, pipe joint	1		1
22	229410	Bolt 8, pipe joint	1		
22	252090	Bolt 8, pipe joint		1	1
23	229490	Clamp 22	2		2
24	250968	Gasket 10, round	2	2	2
25	256657	Gasket 20, round	8		
26	256658	Bolt, joint 15	3		
27	256660	O-ring	1		1
28	252693	Bolt, M6 x 16 plated	2		2
29	252734	Seal washer 8	2	2	2
30	250967	Gasket 8, round	4		2

X Item not sold separately

Group 13: Cooling Seawater System



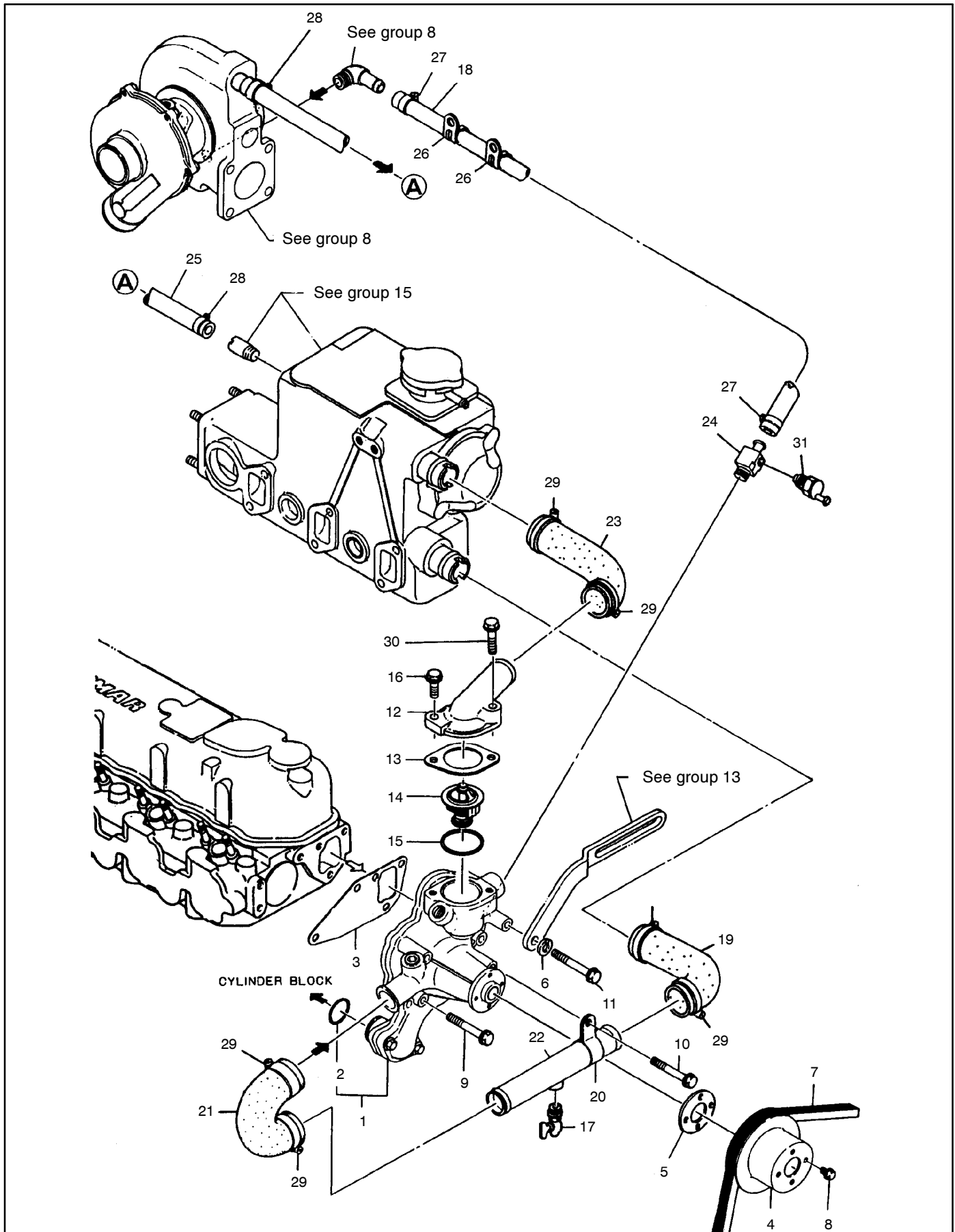
Group 13: Cooling Seawater System

Item	Part Number	Description	Quantity					
			Variation Number					
			1	2	3	4	5	6
1	229306	V-pulley	1	1	1	1	1	1
2	229313	Bracket	1	1	1	1	1	1
3	256504	Pump assembly, cooling water (includes item 4-22)	1	1	1	1	1	1
4	X	Body	1	1	1	1	1	1
5	252437	Shaft, pump*	1	1	1	1	1	1
6	252473	Key, feather*	1	1	1	1	1	1
7	252474	Washer, water drip*	1	1	1	1	1	1
8	250871	Seal, oil*	1	1	1	1	1	1
9	229955	Impeller kit (includes items 10 and 11)	1	1	1	1	1	1
10	250872	Impeller*	1	1	1	1	1	1
11	252475	Gasket*	1	1	1	1	1	1
12	252438	Cover, bearing*	1	1	1	1	1	1
13	252439	Cover	1	1	1	1	1	1
14	229324	Plate*	1	1	1	1	1	1
15	252690	Seal, oil*	1	1	1	1	1	1
16	252464	V-pulley, C.W. pump	1	1	1	1	1	1
17	252466	Washer*	2	2	2	2	2	2
18	252346	Circlip*	1	1	1	1	1	1
19	252348	Circlip*	1	1	1	1	1	1
20	252364	Ball bearing*	2	2	2	2	2	2
21	229496	Bolt, M8 x 16	2	2	2	2	2	2
22	229504	Bolt, M4 x 8	6	6	6	6	6	6
23	229506	Nut, M8	1	1	1	1	1	1
24	256503	V-belt	1	1	1	1	1	1
25	229497	Bolt, M6 x 8 plated	3	3	3	3	3	3
26	229307	Retainer	1	1	1	1	1	1
27	252329	Cock PT 1/8	1	1	1	1	1	1
28	229724	Pipe, cooling water	1			1		
28	GM13307	Pipe, cooling water		1	1		1	1
29	229318	Pipe, cooling water	1	1	1	1	1	1
30	229420	Pipe, cooling water	1			1		
30	252902	Pipe, cooling water		1	1		1	1
31	256607	Pipe, cooling water	1	1	1	1	1	1
32	229316	Retainer	2			2		
32	229327	Retainer		2	2		2	2
33	229411	Clamp 9	1			1		
33	229409	Clamp		1	1		1	1
34	229491	Clamp 35	6	4	4	6	4	4
35	252350	Pipe	1	1	1	1	1	1
36	252696	Bolt, M8 x 16 plated	1	1	1	1	1	1
37	256614	Pipe, cooling water	1			1		
37	252903	Pipe, cooling water		1			1	
38	229491	Clamp 35	2	2	2	2	2	2
39	229484	Pulley assembly, tension (includes items 39-41)	1	1	1	1	1	1
40	229483	Pulley assembly, tension	1	1	1	1	1	1
41	229485	Bracket, pulley	1	1	1	1	1	1
42	229510	Nut, M10	1	1	1	1	1	1
43	229426	Adjuster, V-belt	1	1	1			
43	359554	Adjuster, V-belt				1	1	1
44	252692	Bolt, M8 x 25	1	1	1	1	1	1
45	229499	Bolt, M8 x 18 plated	1	1	1	1	1	1
46	229503	Bolt, M10 x 35 plated	1	1	1	1	1	1

X Item not sold separately

* Seawater pump repair kit GM28669 includes items 5-12, 14, 15, and 17-20.

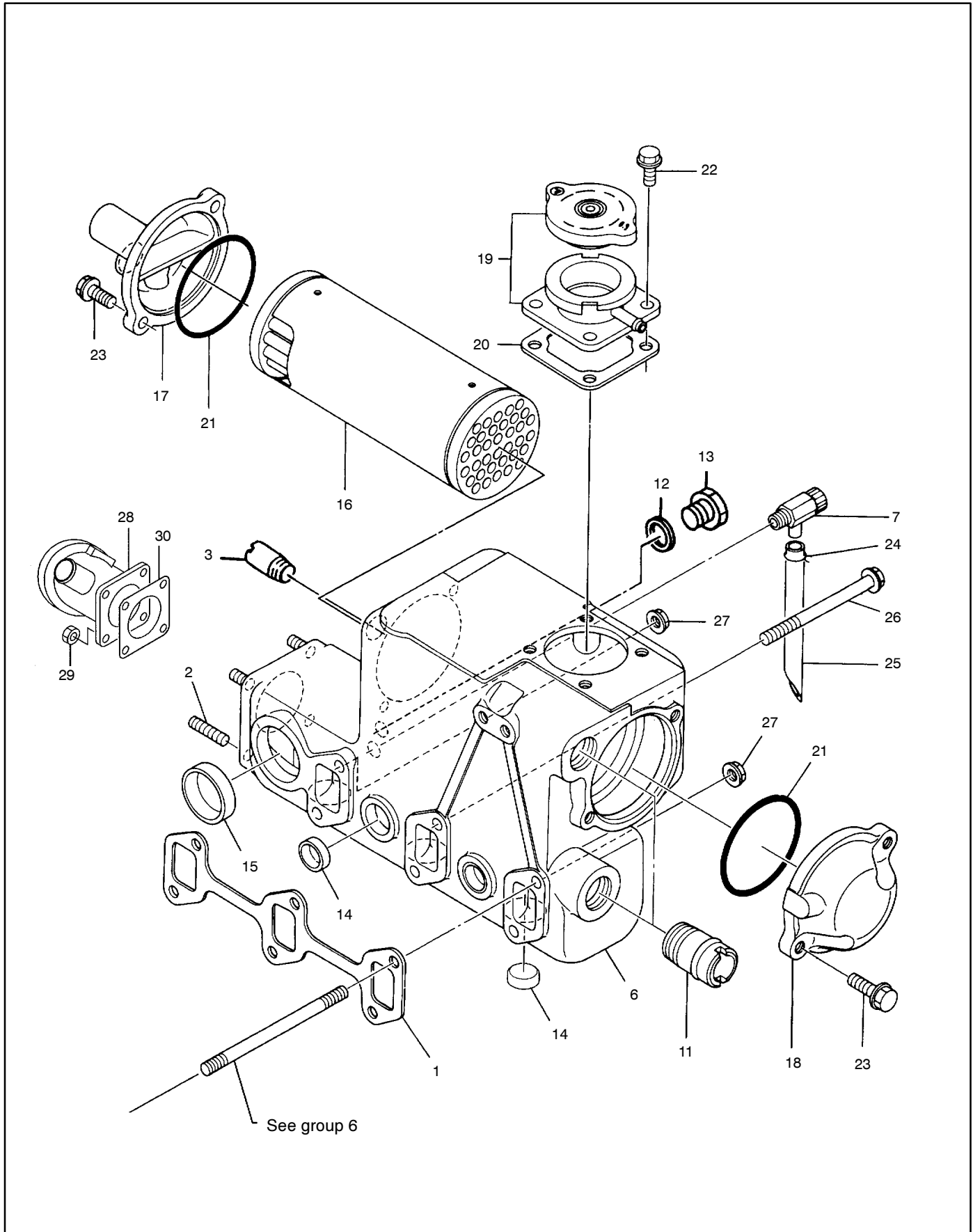
Group 14: Cooling Freshwater Pump



Group 14: Cooling Freshwater Pump

Item	Part Number	Description	Quantity					
			Variation Number					
			1	2	3	4	5	6
1	252879	Pump assembly, cooling pump (includes item 2)	1	1	1	1	1	1
2	252839	O-ring	1	1	1	1	1	1
3	252838	Gasket, water pump	1	1	1	1	1	1
4	252920	V-pulley	1	1	1	1	1	1
5	252858	Washer	1	1	1	1	1	1
6	229487	Spring washer	1	1	1	1	1	1
7	276141	Alternator V-belt	1					
7	GM11551	Alternator V-belt		1		1		
7	344829	Alternator V-belt (24 V units)			1		1	1
8	229498	Bolt, M6 x 10 plated	4	4	4	4	4	4
9	256798	Bolt, M8 x 55 plated	2	2	2	2	2	2
10	256798	Bolt, M8 x 55 plated	1	1	1	1	1	1
11	252706	Bolt, M8 x 65 plated	1	1	1	1	1	1
12	252895	Cover, thermostat	1	1	1	1	1	1
13	229432	Gasket	1					1
13	249865	Gasket		1	1	1	1	1
14	252896	Thermostat	1	1	1	1	1	1
15	229433	Gasket	1	1	1	1	1	1
16	252699	Bolt, M8 x 25 plated	1	1	1	1	1	1
17	252329	Cock Pt 1/8	1			1	1	1
17	GM13327	Cock R1/8		1	1			
17	GM13333	Washer 8, polished		1	1	1	1	
18	249842	Pipe	1					1
18	GM13313	Pipe				1	1	
19	252890	Joint	1	1	1	1	1	1
20	252891	Retainer	1	1	1	1	1	1
21	252892	Joint 28	1	1	1	1	1	1
22	252893	Pipe, cooling water	1	1	1	1	1	1
23	225315	Joint	1	1	1	1	1	1
24	249845	Joint	1					1
25	249838	Hose, rubber	1			1	1	1
26	249846	Clamp, wire harness	2			2	2	2
27	249843	Clamp	2			2	2	2
28	249839	Clamp	2			2	2	2
29	229492	Clamp	6	6	6	6	6	6
30	252701	Bolt, M8 x 35 plated	1	1	1	1	1	1
31	252095	Switch, water temperature	1	1	1	1	1	1

Group 15: Cooling Freshwater Cooler

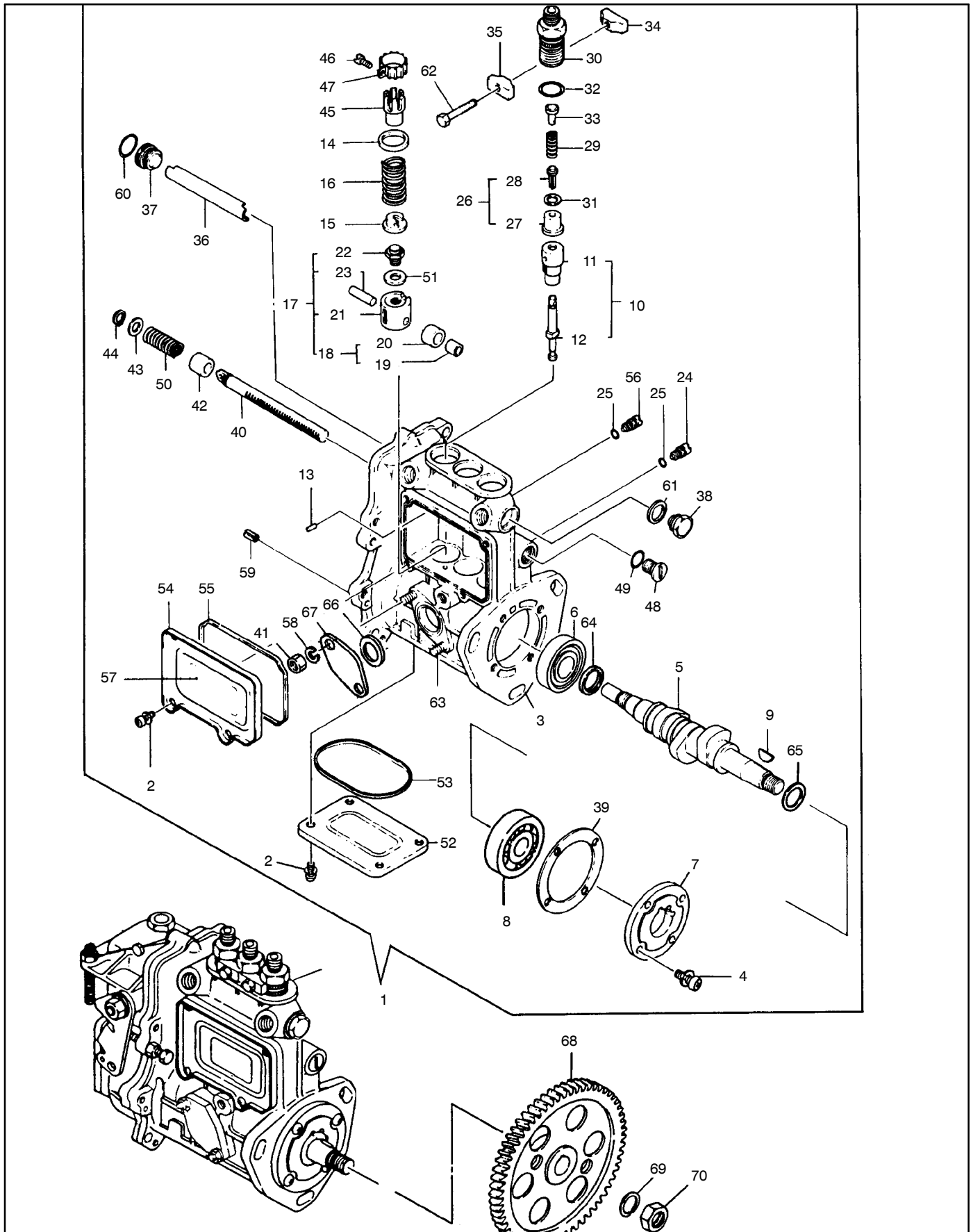


Group 15: Cooling Freshwater Cooler

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
1	256770	Gasket, exhaust manifold	1	1	1
2	256579	Stud	4	4	4
3	229403	Joint	1		1
3	250975	Plug PT3/8, screw		1	
4	229733	Cooler assembly, freshwater (includes items 5-23)	1	1	1
5	229732	Cooler, freshwater (includes items 6-15)	1	1	1
6	X	Body, cooler	1	1	1
7	252394	Cock (includes items 8-10)	1	1	1
8	X	O-ring (not shown)	1	1	1
9	X	Body, cock (not shown)	1	1	1
10	X	Valve (not shown)	1	1	1
11	252472	Joint, pipe	2	2	2
12	229753	Gasket 17, round	1	1	1
13	250877	Plug PF 3/8	1	1	1
14	252730	Plug 28	7	7	7
15	252732	Plug 40	1	1	1
16	229725	Core assembly	1	1	1
17	252887	Cover	1	1	1
18	256544	Cover	1	1	1
19	252748	Filler assembly	1	1	1
20	252749	Gasket, filler	1	1	1
21	252685	O-ring	2	2	2
22	252696	Bolt, M8 x 16 plated	4	4	4
23	252699	Bolt, M8 x 25 plated	4	4	4
24	229714	Retainer	1	1	1
25	252350	Pipe	1	1	1
26	252708	Bolt, M8 x100 plated	4	4	4
27	252723	Nut, M8	2	2	2
28	GM13328	Elbow, water mixing		1	
29	229509	Nut, M8		4	
30	252929	Gasket		1	

X Item not sold separately

Group 16: Fuel Injection Pump

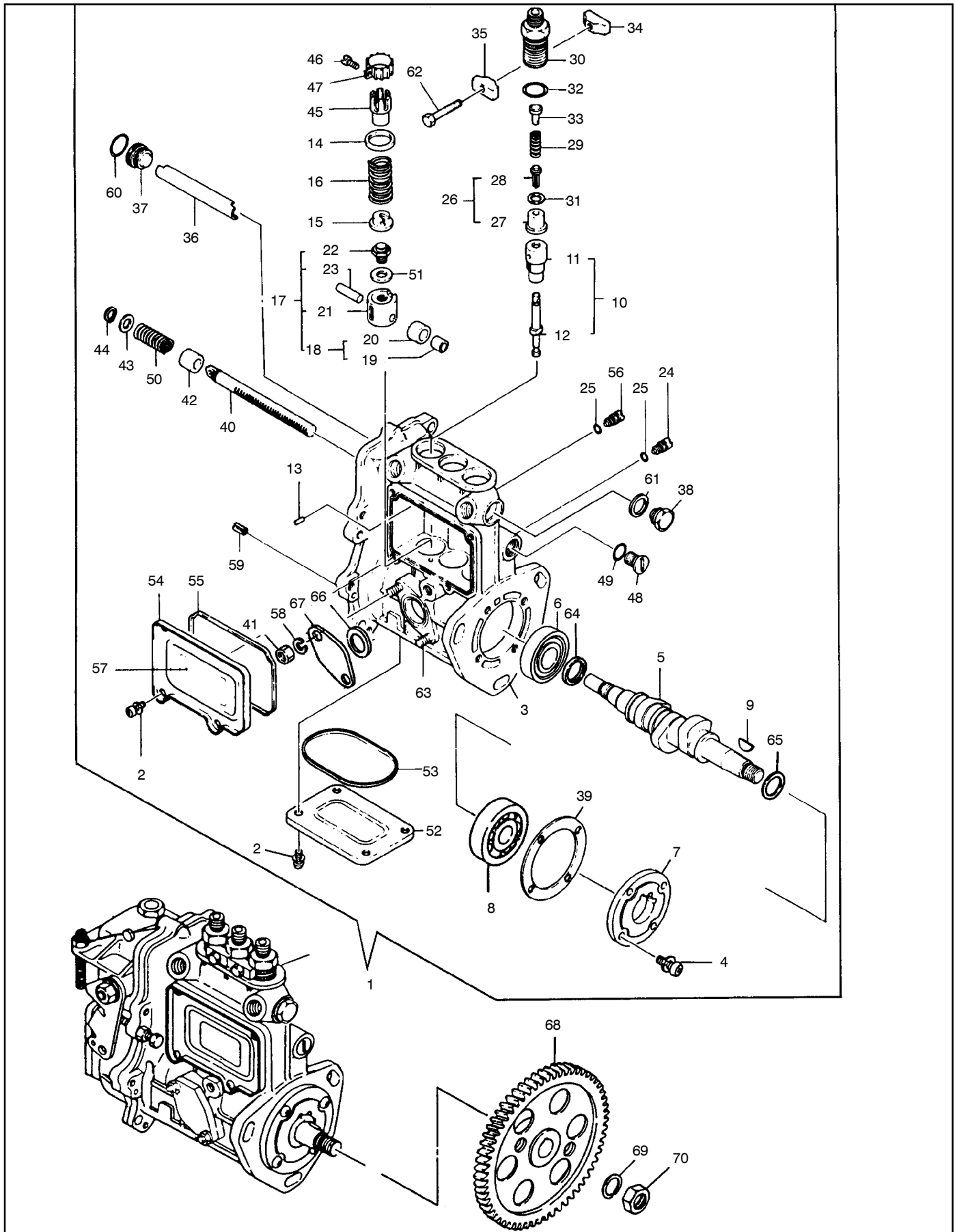


Group 16: Fuel Injection Pump

Item	Part Number	Description	Quantity		
			Variation 1	Variation 2	Variation 3
1	229812	Pump, injector (includes items 2-67)	1		
1	GM13336	Pump, injector (includes items 2-67)		1	
1	GM13336	Pump, injector (includes items 2-67)			1
2	225814	Screw, M5 x 10	8	8	8
3	X	Body, fuel injector pump	1	1	1
4	225815	Screw, M6 x 16	4	4	4
5	229728	Camshaft	1		
5	256734	Camshaft		1	1
6	256543	Ball bearing, thrust	1	1	1
7	256535	Retainer, bearing	1	1	1
8	256794	Ball bearing	1		
8	256556	Ball bearing		1	1
9	256528	Key	1	1	1
10	256608	Plunger w/barrel (includes items 11 and 12)	3		3
10	GM13322	Plunger w/barrel (includes items 11 and 12)		3	
11	X	Barrel	3	3	3
12	X	Plunger	3	3	3
13	256721	Pin, barrel locking	3	3	3
14	252589	Retainer	3	3	3
15	256536	Spring shoe, plunger	3	3	3
16	252490	Spring, plunger	3	3	3
17	252848	Tappet assembly (includes item 18-23)	3	3	3
18	252593	Roller assembly (includes items 19 and 20)	3		
18	X	Roller assembly (includes items 19 and 20)		3	3
19	X	Roller, inner	3	3	3
20	X	Roller, outer	3	3	3
21	X	Guide, roller	3	3	3
22	X	Bolt, adjusting	3	3	3
23	X	Pin, roller	3	3	3
24	256537	Locking, tappet	3	3	3
25	252849	O-ring	3	3	3
26	229458	Valve w/seat, delivery (includes items 27 and 28)	3		
26	256583	Valve w/seat, delivery (includes items 27 and 28)		3	3
27	X	Seat	3	3	3
28	X	Valve, delivery	3	3	3
29	229459	Spring, valve	3		
29	256777	Spring, valve		3	3
30	229460	Valve guard, delivery	3		
30	256724	Valve guard, delivery		3	3
31	250839	Gasket, delivery	3	3	3
32	250840	O-ring	3	3	3
33	229461	Stopper, valve	3		
33	256725	Stopper, valve		3	3
34	256726	Locking	2	2	2
35	256727	Locking	2	2	2
36	256728	Deflector	1		
36	225779	Deflector		1	1
37	256778	Check bolt, deflector	1	1	1
38	256779	Plug	1	1	1
39	256729	Shim set, adjusting	1	1	1
40	256730	Rack, control	1		
40	225780	Rack, control		1	1

X Item not sold separately

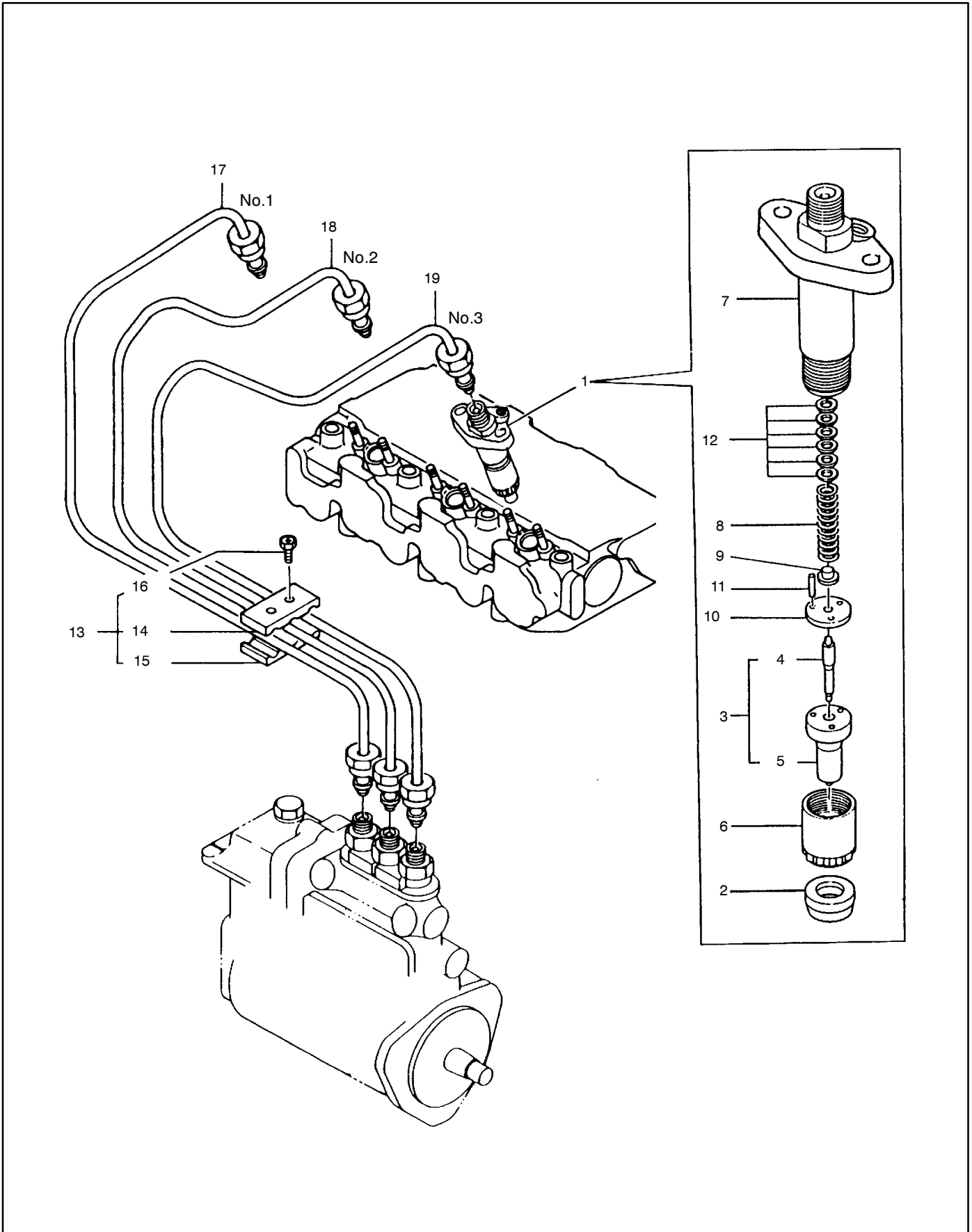
Group 16: Fuel Injection Pump, continued



Group 16: Fuel Injection Pump, continued

Item	Part Number	Description	Quantity		
			Variation Number		
			1	2	3
41	252725	Nut, M6	2		
41	225824	Nut, 6		2	2
42	256780	Bush, rack	1	1	1
43	256694	Spacer, aux. spring	1	1	1
44	256695	Circlip	1	1	1
45	256696	Pinion, control	3	3	3
46	256697	Screw, pinion	3	3	3
47	256698	Pinion	3	3	3
48	256781	Plug	1	1	1
49	252850	O-ring	1	1	1
50	256699	Spring, rack	1	1	1
51	256700	Shim pack	3	3	3
52	256782	Cover	1	1	1
53	252926	Gasket	1		
53	256783	Gasket		1	1
54	225893	Cover, side	1		
54	256784	Cover, side		1	1
55	252927	Gasket	1		
55	256785	Gasket		1	1
56	256701	Locking, rack	1	1	1
57	225791	Label, caution	1	1	1
58	225804	Spring washer	2	2	2
59	225808	Spring pin	2	2	2
60	252686	O-ring	1	1	1
61	256663	Seal washer	1		
61	363448	Seal washer		1	1
62	225821	Bolt, M5 x 30 plated	2	2	2
62	229741	Spring washer		2	2
63	256776	Stud, feed pump	2	2	2
64	256702	Spacer 3.25 mm	1	1	1
65	256703	Spacer 1.5 mm	1	1	1
66	252851	Gasket	1	1	1
67	256755	Cover, blind	1	1	1
68	229457	Gear	1		
68	252827	Gear		1	1
69	252666	Washer 12, spring	1	1	1
70	252725	Nut, M12	1	1	1

Group 17: Fuel Injection Lines

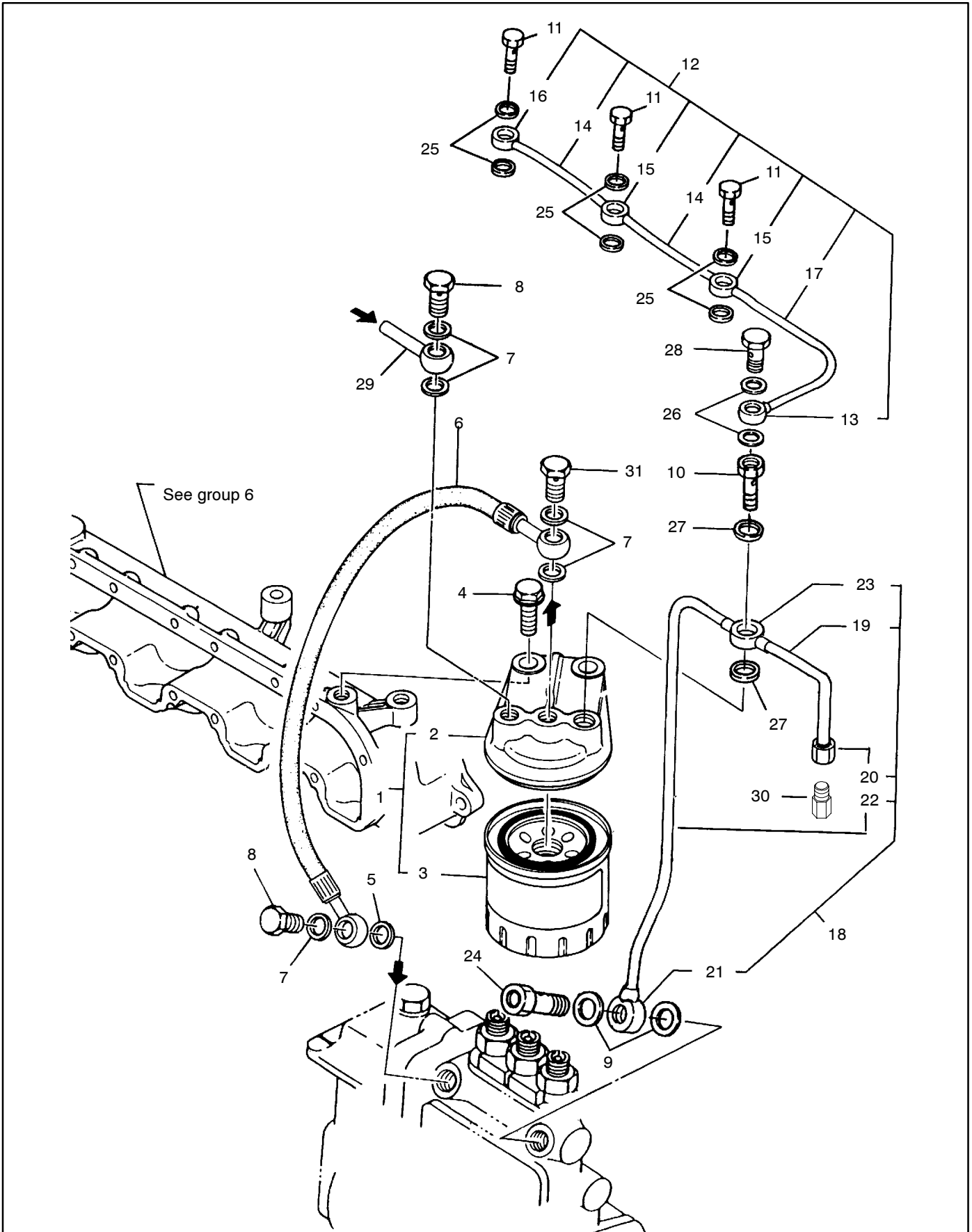


Group 17: Fuel Injection Lines

Item	Part Number	Description	Quantity		
			Variation Number 1	Variation Number 2	Variation Number 3
1	229521	Valve assembly, fuel injection (includes items 2-5)	3		
1	224360	Valve assembly, fuel injection (includes items 2-5)		3	
1	229872	Valve assembly, fuel injection (includes items 2-5)			3
2	256597	Gasket	3		
3	229405	Nozzle assembly, fuel injection (includes items 4 and 5)	3		
3	225004	Nozzle assembly, fuel injection (includes items 4 and 5)		3	
3	229873	Nozzle assembly, fuel injection (includes items 4 and 5)			3
4	X	Valve	3	3	3
5	X	Body	3	3	3
6	256520	Nut, nozzle case	3	3	3
7	256706	Holder	3	3	3
8	256521	Spring, nozzle	3	3	3
9	256522	Seat, nozzle spring	3	3	3
10	256523	Plate, stop	3	3	3
11	256707	Pin	6	6	6
12	256524	Shim pack	3	3	3
13	252453	Retainer (includes items 14 - 16)	1		
13	256774	Retainer (includes items 14 - 16)		1	1
14	X	Clamp, upper	1		
15	X	Clamp, lower	1		
16	225777	Bolt, M4 x 12	2		
16	225418	Bolt, M4 x 12 hex socket		2	2
17	256756	Pipe, fuel injection	1		
17	GM13308	Pipe, fuel injection		1	1
18	256757	Pipe, fuel injection	1		
18	GM11309	Pipe, fuel injection		1	1
19	256758	Pipe, fuel injection	1		
19	GM13310	Pipe, fuel injection		1	1

X Item not sold separately

Group 18: Fuel Line & Filter

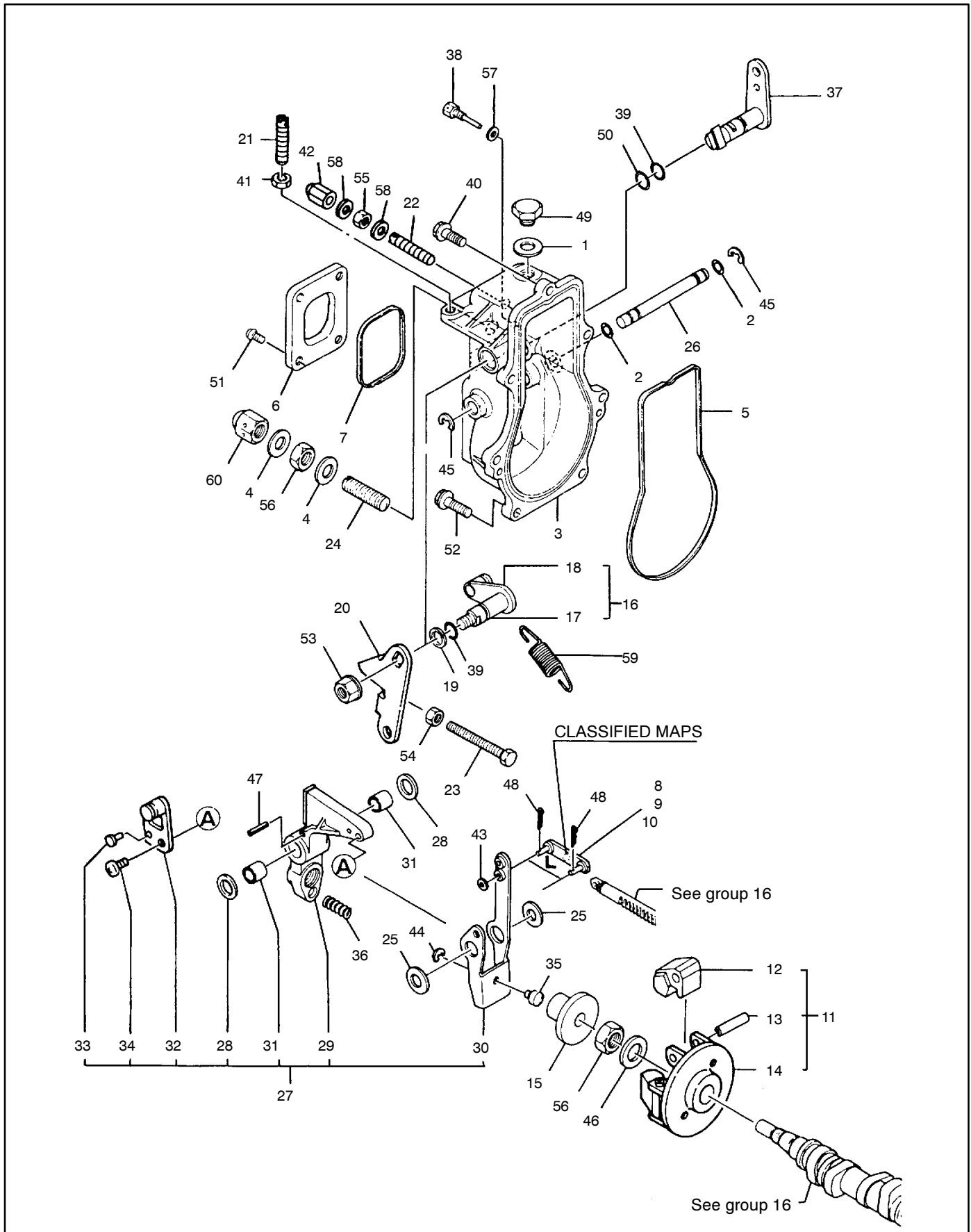


Group 18: Fuel Line & Filter

Item	Part Number	Description	Quantity	
			Variation Number	
			1	2
1	256609	Filter assembly, fuel (includes item 2 and 3)	1	1
2	X	Body, fuel filter	1	1
3	225021	Filter, fuel	1	
3	252898	Filter, fuel		1
4	225820	Bolt, M10 x 30 plated	2	
4	229768	Bolt, M10 x 30 plated		2
5	252739	Gasket	1	
5	225424	Gasket		1
6	229842	Pipe, fuel	1	1
7	250969	Gasket 12, round	5	5
8	250972	Bolt, M6, joint	2	2
9	252739	Gasket	2	2
10	225796	Bolt, pipe joint	1	1
11	256713	Bolt, pipe joint	3	3
12	GM13315	Pipe, fuel return (includes item 13-17)	1	1
13	X	Joint	1	1
14	X	Pipe	3	3
15	X	Joint, pipe	3	3
16	X	Joint, pipe	1	1
17	X	Pipe, return	1	1
18	229466	Pipe, return (includes items 19-23)	1	
18	GM13314	Pipe, return (includes items 19-23)		1
19	X	Pipe	1	1
20	X	Joint	1	1
21	X	Pipe joint	1	1
22	X	Pipe, return	1	1
23	X	Pipe joint	1	1
24	252792	Valve assembly, check	1	1
25	252355	Gasket 6, round	8	6
26	250967	Gasket 8, round	2	2
27	252675	Gasket 14, round	2	2
28	252677	Bolt, pipe joint	1	1
29	256567	Joint 12, pipe	1	1
30	229331	Pipe adapter	1	
31	250972	Bolt, M6, joint	1	
31	229552	Bolt, pipe joint		1

X Item not sold separately

Group 19: Governor



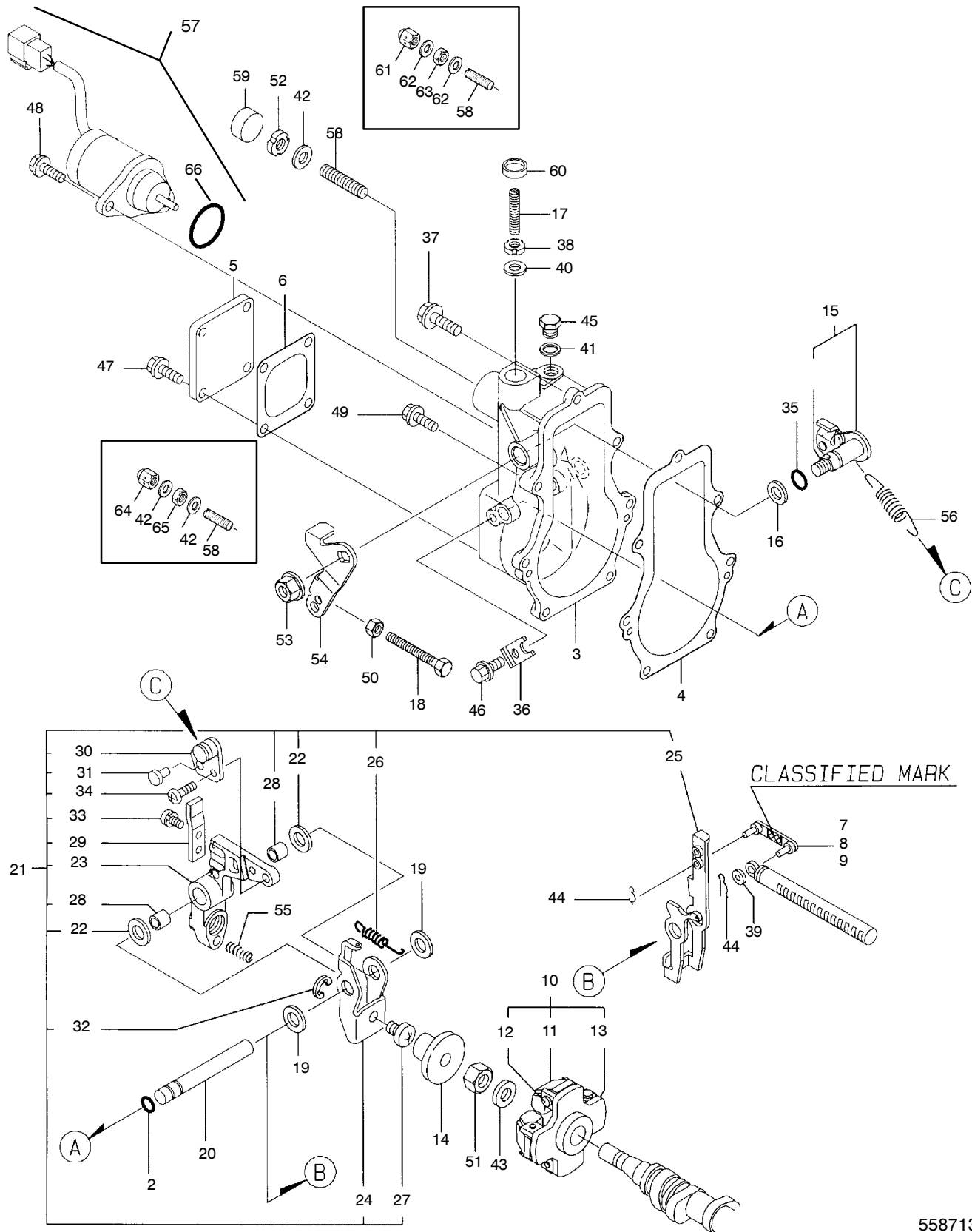
Group 19: Governor

Item	Part Number	Description	Quantity
			Variation Number
			1
1	225829	Seal washer 10	2
2	252849	O-ring	2
3	229486	Case, governor	1
4	252367	Seal washer 12	1
5	252853	Gasket, governor case	1
6	252854	Cover, governor case	1
7	252855	Gasket, case cover	1
8	256787	Link 30 mm	1
9	256558	Link 31 mm	1
10	256559	Link 30.5 mm	1
11	252974	Weight assembly, governor (includes items 12-14)	1
12	X	Weight	4
13	X	Pin, governor weight	4
14	X	Support	1
15	225781	Sleeve	1
16	252794	Shaft assembly, control (includes items 17 and 18)	1
17	X	Shaft	1
18	X	Hook	1
19	225782	Spacer, shaft	1
20	225800	Lever, control	1
21	225783	Bolt, revol. limit	1
22	225783	Bolt, revol. limit	1
23	225784	Bolt, idle limit	1
24	225785	Bolt, fuel control	1
25	225786	Spacer assembly	2
26	225787	Shaft, governor lever	1
27	252795	Lever assembly, governor (includes items 28-34)	1
28	252592	Shim set	2
29	X	Lever, tension	1
30	X	Lever, governor	1
31	X	Bush	2
32	X	Hook	1
33	X	Pin	1
34	X	Screw, M6 x 12	1
35	225788	Shifter	1
36	256732	Spring, fuel control	1
37	225801	Lever assembly, stop	1
38	225789	Pin, stop lever	1
39	252856	O-ring	1
40	225790	Bolt, washer based	1
41	225767	Lock nut	1
42	225702	Nut, cap	1
43	225803	Washer	1
44	225805	Circlip	1
45	225806	Circlip	2
46	256704	Washer	1
47	225807	Spring pin	1
48	225809	Snap pin	2
49	256517	Plug	1
50	225811	O-ring	1
51	225814	Screw M5 x 10	4
52	225817	Bolt, M6 x 20 plated	6
53	252723	Nut, M8	1
54	225825	Lock nut, M6 plated	1
55	225825	Lock nut, M6 plated	1
56	225826	Lock nut, M12 plated	2
57	250994	Seal washer 6	1
58	228828	Seal washer	2
59	225795	Spring governor	1
60	225770	Nut, cap	1

X Item not sold separately

Group 19: Governor, continued

Variations 2-5

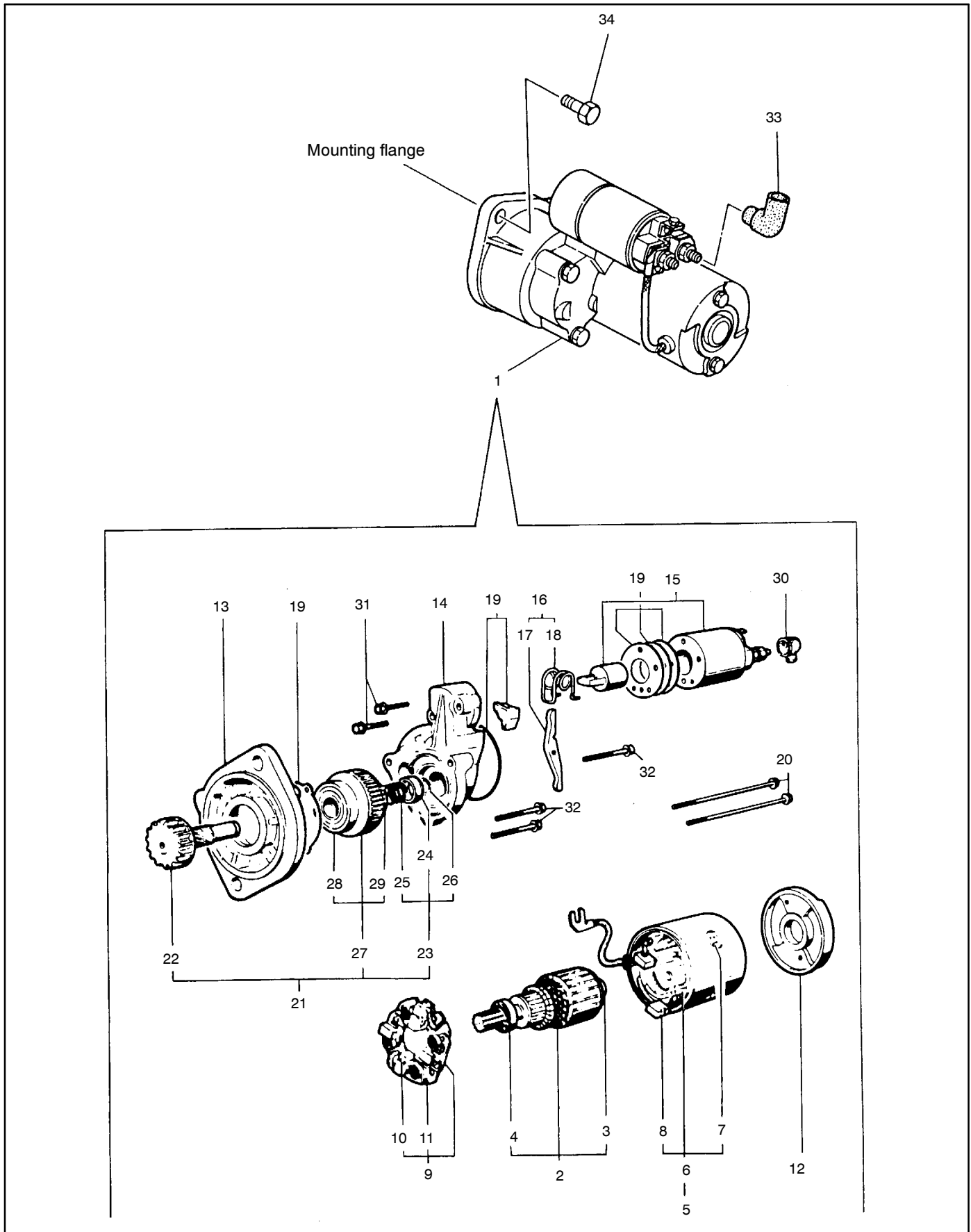


Group 19: Governor, continued

Item	Part Number	Description	Quantity			
			Variation Number			
			2	3	4	5
1	X	Governor assembly (includes items 2-52)	1	1	1	1
2	252849	O-ring	2	2	2	2
3	X	Case, governor	1	1	1	1
4	225417	Gasket, spacer	1	1		
4	363449	Gasket, spacer			1	1
5	225414	Cover	1	1	1	1
6	225408	Packing	1	1		
6	363450	Packing			1	1
7	256787	Link 30 mm	1	1	1	1
8	256558	Link 31 mm	1	1	1	1
9	256559	Link 30.5 mm	1	1	1	1
10	252974	Weight assembly, gov. (includes items 11-13)	1	1	1	1
11	X	Weight	4	4	4	4
12	X	Pin, governor weight	4	4	4	4
13	X	Support	1	1	1	1
14	225781	Sleeve	1	1	1	1
15	225409	Shaft assy., control	1	1		
15	252794	Shaft assy., control			1	1
16	225782	Spacer, shaft	1	1	1	1
17	GM13294	Bolt, revol. limit	1	1		
17	225784	Bolt, revol. limit			1	1
18	225784	Bolt, idle limit	1	1	1	1
19	229722	Spacer assembly	2	2	2	2
20	225415	Shaft, governor lever	1	1	1	1
21	225421	Lever assembly, governor (includes items 22-34)	1	1	1	1
22	252592	Shim set	2	2	2	2
23	X	Lever	1	1	1	1
24	X	Lever, governor	1	1	1	1
25	X	Lever, governor	1	1	1	1
26	225407	Spring	1	1	1	1
27	X	Shifter	1	1	1	1
28	X	Bush	2	2	2	2
29	X	Fitting	1	1	1	1
30	X	Hook, tension lever	1	1	1	1
31	X	Pin	1	1	1	1
32	X	Circlip	1	1	1	1
33	X	Screw, M6 x 12	1	1	1	1
34	X	Screw, M5 x 10	2	2	2	2
35	252856	O-ring	2	2	2	2
36	229692	Retainer, shaft	1	1	1	1
37	225790	Bolt, washer based	1	1		
38	225391	Carb nut, high idle	1	1		
38	225767	Nut, lock			1	1
39	225803	Washer 4	1	1	1	1
40	363451	Seal washer 6	1	1	1	1
41	363452	Seal washer 10	2	2	2	2
42	225424	Seal washer 12	2	2	2	2
43	256704	Washer 12	1	1	1	1
44	225809	Snap pin 4	2	2		
44	225803	Washer 4 (not shown)			2	2
45	256517	Plug	1	1	1	1
46	229498	Bolt, M6 x 10 plated	1	1	1	1
47	229498	Bolt, M6 x 10 plated	4	4	4	4
48	225818	Bolt, M6 x 14 plated	2	2	2	2
49	225817	Bolt, M6 x 20 plated	6	6	6	6
50	225825	Nut, lock M6 plated	1	1	1	1
51	225826	Nut, lock M12 plated	1	1	1	1
52	225390	Carb nut, flow limit	1	1	1	1
53	252723	Nut, M8	1	1	1	1
54	225800	Lever, control	1	1	1	1
55	GM13320	Spring, fuel control	1	1	1	1
56	225795	Spring governor	1	1	1	1
57	225461	Kit, fuel solenoid (includes item 66)	1	1	1	1
57	344746	Fuel solenoid, 24 V (also order item 66)		1		1
58	225785	Bolt, fuel control	1	1	1	1
59	225381	Plug 22	1	1	1	1
60	225382	Plug 14	1	1	1	1
61	225702	Nut, cap			1	1
62	225423	Seal washer 6			1	1
63	225825	Nut, lock 6			1	1
64	225770	Nut, cap			1	1
65	225826	Nut, lock M2 plated			1	1
66	225427	O-ring	1	1	1	1

X Item not sold separately

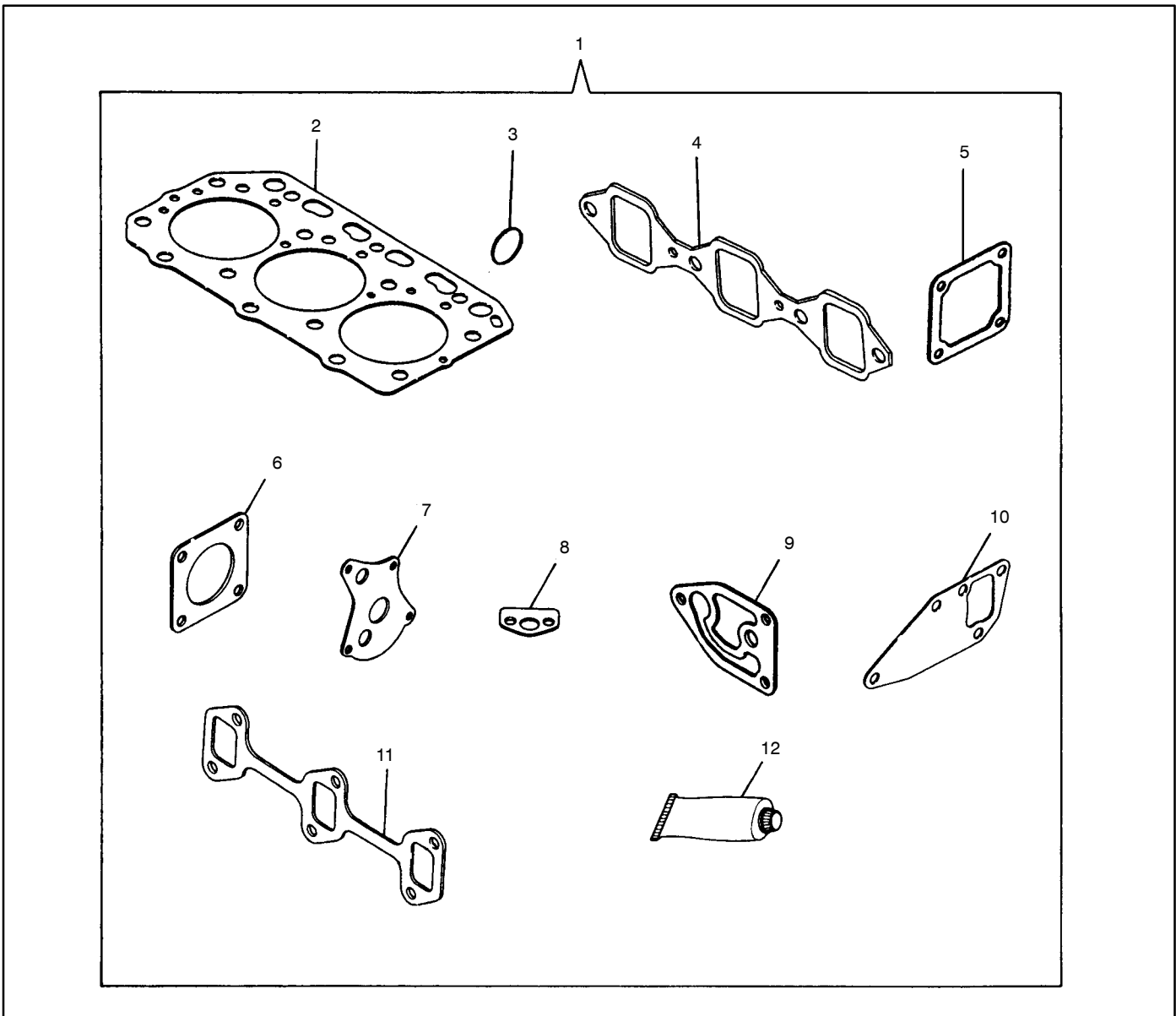
Group 20: Starting Motor



Group 20: Starting Motor

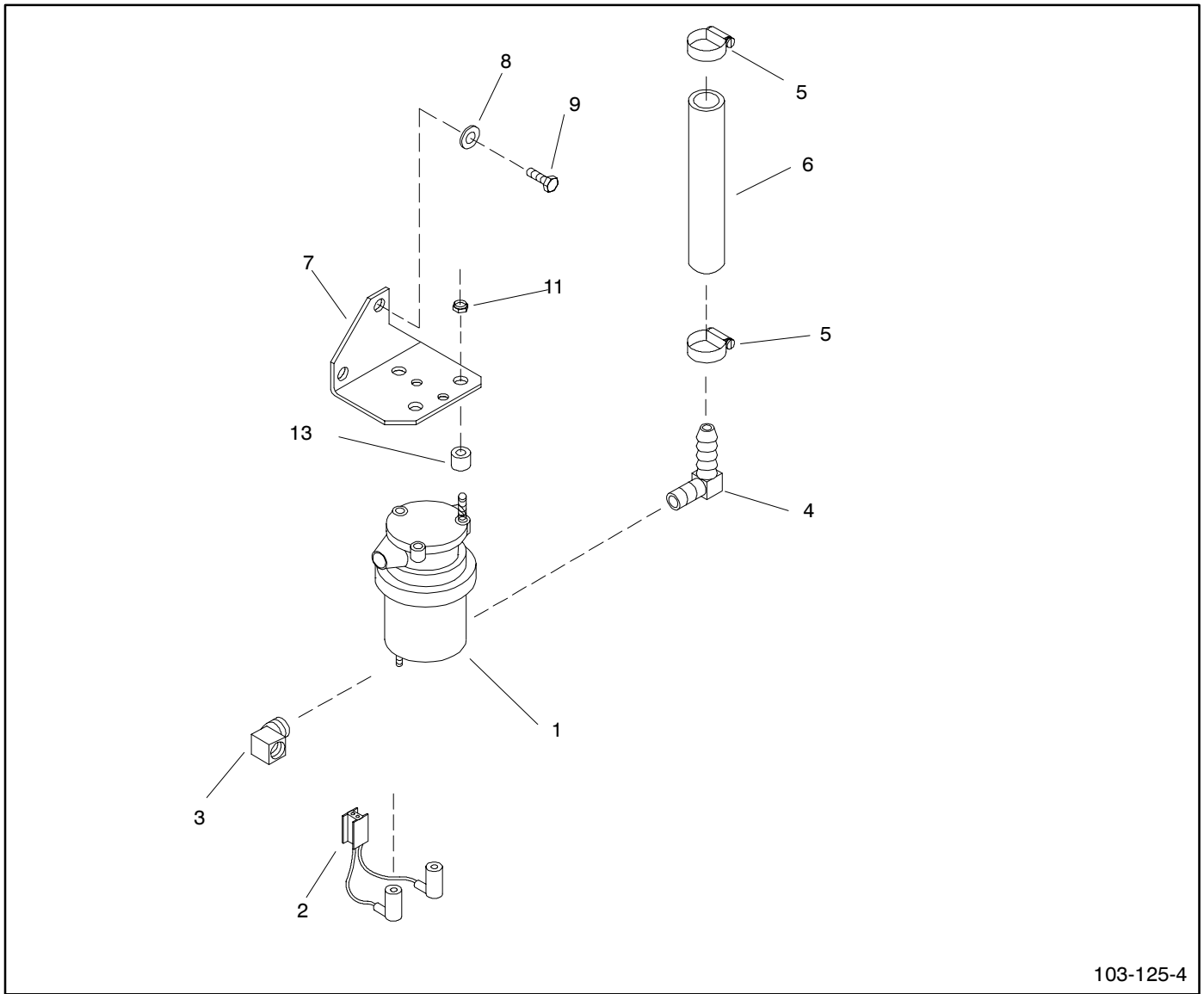
Item	Part Number	Description	Quantity	
			Variation Number	
			1	2
1	225013	Starter (includes items 2- 32)	1	
1	344743	Starter, 24 V		1
2	225895	Armature assembly (includes items 3 and 4)	1	
3	225896	Bearing	1	
4	225897	Bearing	1	
5	229477	Yoke assembly (includes items 6-8)	1	
6	225989	Coil assembly, field	1	
7	225899	Screw, pole core set	4	
8	225900	Brush (+)	2	
9	225901	Holder assembly, brush (includes items 10 and 11)	1	
10	225902	Brush	2	
11	225903	Spring, brush	4	
12	225904	Cover, rear	1	
13	225905	Housing assy., gear	1	
14	225906	Housing, center	1	
15	225907	Switch, magnetic	1	
16	225908	Lever set, shift (includes items 17 and 18)	4	
17	229478	Lever	1	
18	229479	Spring	1	
19	225909	Dust cover	1	
20	225910	Bolt, through	2	
21	225911	Pinion assembly (includes items 22-29)	1	
22	225912	Shaft, pinion	1	
23	225913	Stopper set, pinion (includes items 24-26)	1	
24	229480	Stopper, pinion	1	
25	229481	Spring	1	
26	229482	Clip, pinion stopper	1	
27	225914	Clutch assembly (includes items 28 and 29)	1	
28	225915	Ball bearing	1	
29	225916	Ball bearing	1	
30	225917	Cover, terminal	1	
31	225920	Bolt, M6 x 32 plated	2	
32	225921	Bolt, M6 x 40 plated	3	
33	252481	Cover, terminal	1	1
34	252713	Bolt, M12 x 30 plated	2	2

Group 21: Gasket Set



Item	Part Number	Description	Quantity		
			1	2	3
1	229813	Gasket set	1		
1	GM13335	Gasket set (3TNE88)		1	
1	GM13340	Gasket set (3TNE84)			1
2	229726	Gasket, cylinder head	1		
3	250981	O-ring	1		
4	225874	Gasket	1		
5	229434	Gasket	1		
6	252929	Gasket	1		
7	252829	Gasket, L.O. pump	1		
8	225775	Gasket	1		
9	229736	Gasket	1		
10	252838	Gasket, C.W. pump	1		
11	256770	Gasket, exhaust manifold	1		
12	252998	Gasket, liquid	1		

Group 103: Fuel System

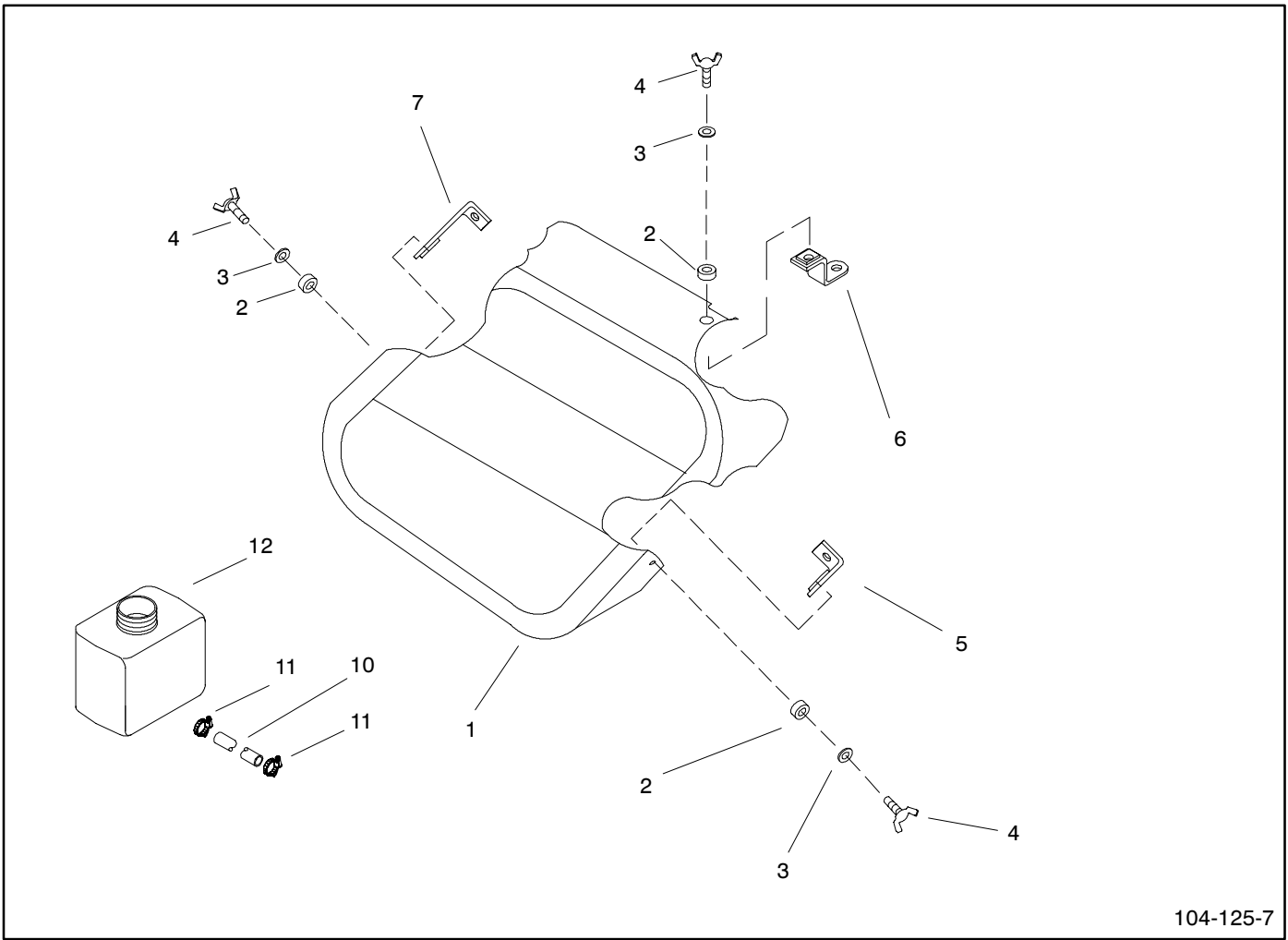


103-125-4

Item	Part Number	Description	Quantity			
			Variation Number			
			4	8	15	16
1	229051	Pump, fuel	1		1	
1	344740	Pump, fuel		1		1
2	229168	Lead assembly	1	1	1	1
3	X-555-1	Elbow, street 1/4 x 1/4	1	1	1	1
4	X-391-20	Connector, hose elbow	1	1	1	1
5	X-426-9	Clamp, hose	2	2	2	2
6	X-386-48	Line, fuel	1	1	1	1
7	229053	Bracket, fuel pump	1	1	1	1
8	#	Washer, 3/8	2	2	2	2
9	X-6051-2	Screw, HC M10 -1.50	2	2		
11	X-101-25	Nut, lock	3	3	3	3
12	#	Washer, 1/4	9	9	9	9
13	X-284-39	Grommet	3	3	3	3
15	229331	Adaptor, pipe (not shown)	1	1	1	1

Common hardware; procure locally

Group 104: Cooling System



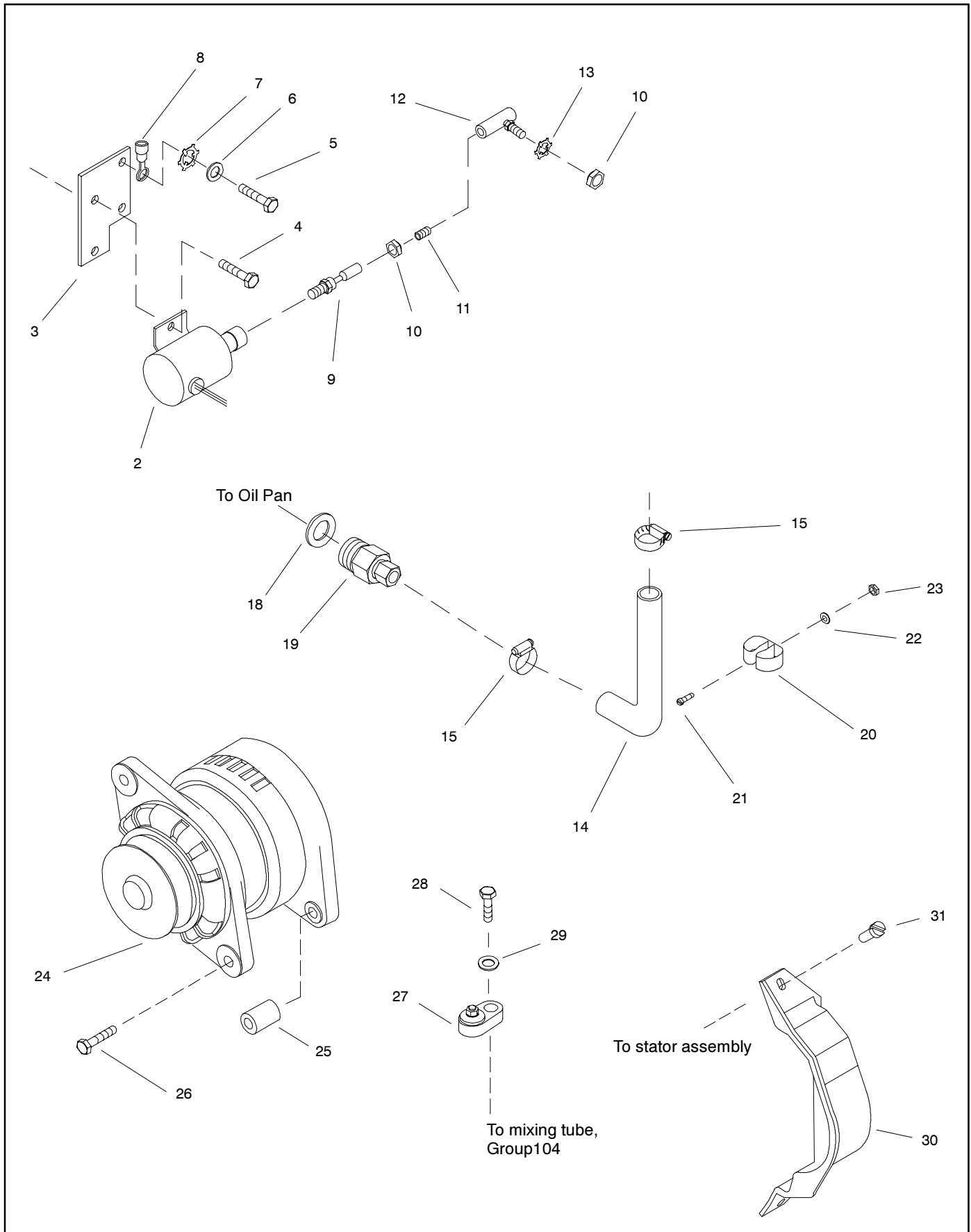
104-125-7

Group 104: Cooling System

Item	Part Number	Description	Quantity					
			Variation Number					
			7	15	20	21	28	29
1	229055	Guard, belt	1					
1	344320	Guard, belt		1	1		1	1
1	344815	Guard, alternator fan (not shown)				1		1
2	X-284-29	Grommet	3	3				
2	X-284-39	Grommet			3	3	3	3
3	#	Washer, 1/4	3	3	3	3	3	3
4	229330	Screw, wing	3	3	3	3	3	3
5	229201	Bracket, belt guard (right)	1	1	1		1	
5	344820	Bracket, belt guard (right)				1		1
6	229199	Bracket, belt guard (top)	1	1	1		1	
6	344819	Bracket, belt guard (top)				1		1
7	229286	Bracket, belt guard (left)	1	1	1		1	
7	344821	Bracket, belt guard (left)				1		1
7	X-6050-9	Screw, hex head cap (not shown)			1	1		
7	X-6053-2	Nut, hex			1	1		
9	See Group 14	Belt, drive	1	1	1	1	1	1
10	X-386-34	Line, flex. fuel 5/16 x 28		2	2	2	2	2
11	X-426-9	Clamp, hose		1	1	1	1	1
12	359037	Bottle, overflow		1	1	1	1	1
12	X-6050-8	Screw, hex head cap (not shown)		2				
12	X-6050-4	Screw, hex head cap (not shown)			1	1		
12	359039	Bracket, water bottle (not shown)		1	1	1	1	1
12	X-400-104	Spacer, .344 x .750 x .500			1	1	1	1

Common hardware; procure locally

Group 105: Engine



Group 105: Engine

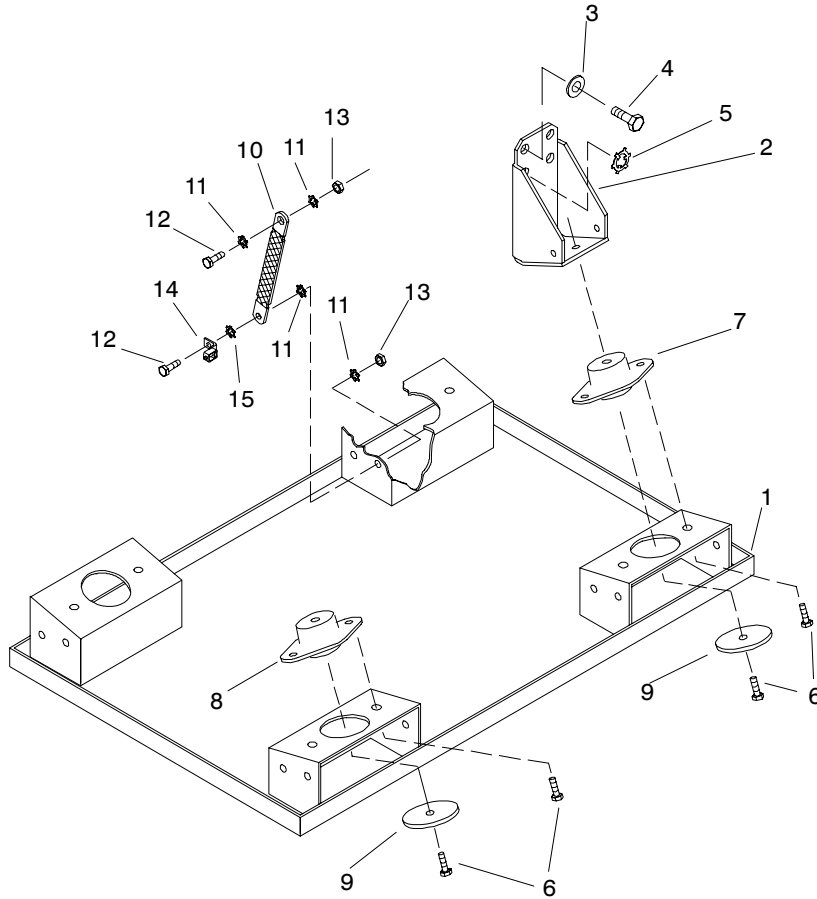
Item	Part Number	Description	Quantity						
			Variation Number						
			17	22	33	44	45	46	47
1	A-229188	Engine assembly (not shown) (3JH2L-T)	1	1	1				
1	A-359582	Engine assembly (not shown) (3TNE88)				1	1		
1	A-359583	Engine assembly (not shown) (3TNE84T)						1	1
2	258628	Solenoid, fuel (12 V)	1						
2	344747	Solenoid, fuel (24 V)			1				
3	229399	Bracket, solenoid	1	1	1				
4	#	Hardware, 1/4-20	2	2	2				
5	X-6050-8	Screw, M8-1.25	2	2	2				
6	#	Washer, 5/16	2	2	2				
7	X-22-16	Washer, lock 5/16	1	1	1				
8	X-283-15	Terminal	1	1	1				
9	229352	Ball joint	1	1	1				
10	X-81-9	Nut, hex	2	2	2				
11	X-352-82	Stud	1	1	1				
12	273730	Ball joint	1	1	1				
13	X-22-11	Washer, lock 1/4	1	1	1				
14	X-651-34	Hose	1			1	1	1	1
15	X-426-18	Clamp, hose	2			2	2	2	2
18	X-25-145	Washer, 1.25 x .875 x .062	1	1	1	1	1	1	1
19	344828	Valve, drain	1			1	1	1	1
20	X-6084-1	Clip, hose	1						
20	276959	Clip, hose				1	1	1	1
21	X-51-15	Screw, RHM 8-32 x 1/2	1			1	1	1	1
22	#	Washer, #8	1						
23	X-101-11	Nut, elastic stop 8-32	1			1	1	1	1
24	256924	Alternator, 12 V (See Group 13 for alternator adjusting arm)	1	1		1		1	
24	344742	Alternator, 24 V (See Group 13 for alternator adjusting arm)			1		1		1
24	X-431-37	Terminal			1				
25	X-400-184	Spacer	1	1		1		1	
25	X-400-152	Spacer			1		1		1
26	#	Hardware, 5/16-18	1	1	1	1	1	1	1
27	249872	Switch, high temp. cutout	1	1	1	1	1	1	1
28	X-6050-8	Screw, M 8-1.25	1	1	1				
29	X-25-44	Washer, .562 x .328 x .062	1	1	1	1	1	1	1
30	229113	Guard, generator fan	1	1	1	1	1	1	1
31	X-67-113	Screw, self tapping	2	2	2	2	2	2	2

Common hardware; procure locally

Group 107: Nameplate and Decals

Item	Part Number	Description	Quantity						
			Variation Number						
			8	9	10	12	13	19	20
1	249810	Decal, warning "hot coolant"	1	1	1	1	1	1	1
2	226917	Decal, neg. battery connection	1	1	1	1	1	1	1
3	290435	Decal, equipment ground	1	1	1				
3	344295	Decal, equipment ground	1				1	1	1
4	GM14167	Decal, drain	3	3	3	3	3	3	3
5	249808	Decal, warning, "rotating parts"	1	1	1	1	1	1	1
6	224233	Decal, 1-800 number	1	1	1	1	1	1	1
7	249809	Decal, warning "hot engine"	1	1	1	1	1	1	1
8	229177	Nameplate	1	1	1	1	1		
9	X-793-3	Rivet, pop	4	4	4	4	4		
10	229831	Decal, reconnection		1		1		1	
11	344486	Decal, CE		1	1	1	1	1	1
12	299883	Decal, voltage reconnection			1				
13	X-6348-3	Decal, Kohler Power System				1	1	1	1

Group 109: Skid and Plant Mounting

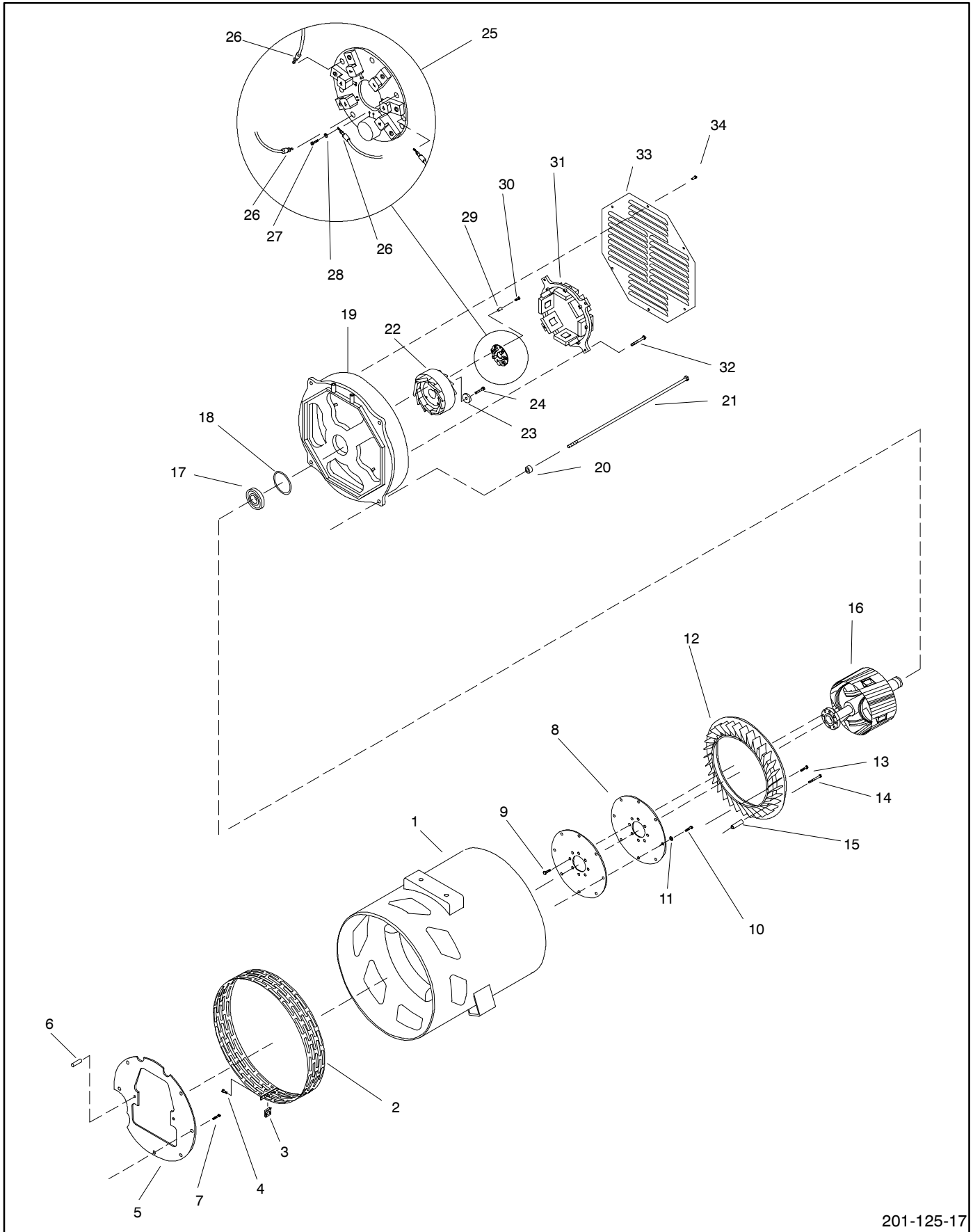


109-125-10

Item	Part Number	Description	Quantity	
			10	15
1	229082	Tray	1	1
2	229080	Bracket, engine mounting	2	2
3	#	Washer, 3/8	7	7
4	X-6051-2	Screw, hex. hd. M10-1.50	8	8
5	X-22-15	Washer, lock	1	1
6	#	Hardware, 5/16-18	12	12
7	229127	Mount, vibro (engine end)	2	2
8	278322	Mount, vibro (generator end)	2	2
9	X-25-96	Washer, plain	4	4
10	245297	Strap, ground	1	1
11	X-22-12	Washer, shakeproof	4	4
12	#	Hardware, 1/4-20	2	2
13	#	Hardware, 1/4-20	2	2
14	X-377-12	Connector, cable	1	1
15	X-22-11	Washer, lock 1/4	1	1

Common hardware; procure locally

Group 201: Generator and Mounting



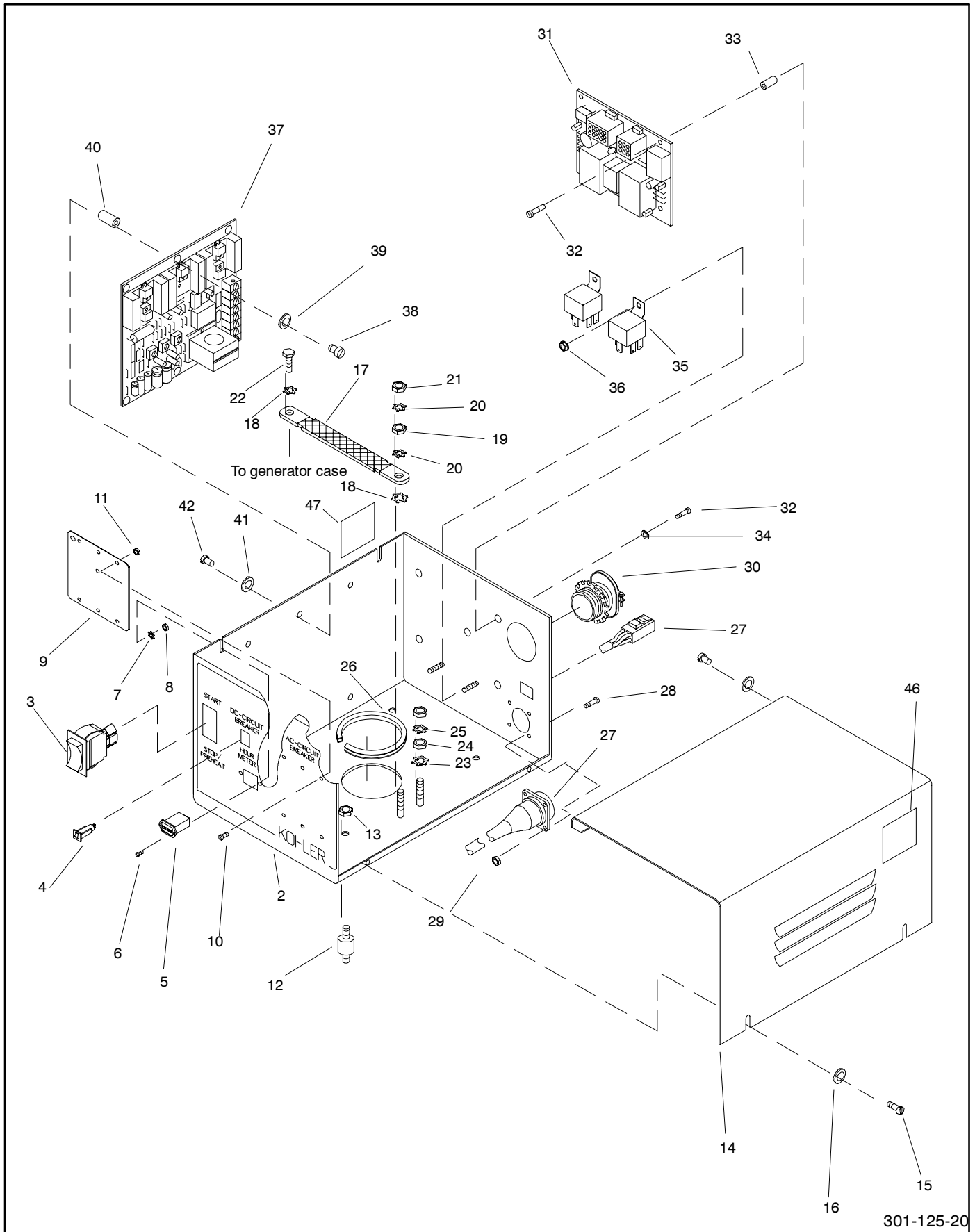
201-125-17

Group 201: Generator and Mounting

Item	Part Number	Description	Quantity						
			Variation Number						
			17	21	25	28	31	36	
1	229143	Stator assembly	1						
1	229267	Stator assembly		1		1			
1	229885	Stator assembly			1		1	1	1
1		Stator assembly			1				
2	229109	Guard, generator fan	1	1	1	1	1	1	1
3	257442	Clip, speed	1	1	1	1	1	1	1
4	X-67-125	Screw, self tapping	1	1	1	1	1	1	1
5	229097	Plate, locator	1	1	1	1	1	1	1
6	229356	Pin, knurled	2	2	2	2	2	2	2
7	X-6051-13	Screw, HC, M10-1.50	6	6	6	6	6	6	6
8	257017	Disc, armature drive	2	2	2	2	2	2	2
9	X-6238-3	Screw, 3/8-16 x .875	8	8	8	8	8	8	8
10	X-6050-8	Screw, HC, M8-1.25	8	8	8	8	8	8	8
11	#	Washer, 5/16	8	8	8	8	8	8	8
12	225215	Fan, generator	1	1	1	1	1	1	1
13	X-6284-1	Screw, M5 x .8 x 10mm	4	4	4	4	4	4	4
14	X-6284-2	Screw, M5 x .8 x 45mm	4	4	4	4	4	4	4
15	X-400-189	Spacer	4	4	4	4	4	4	4
16	A-229149	Rotor assembly (includes item 17)	1	1	1	1	1	1	1
16	A-226950	Rotor assembly (includes item 17)							1
17	X-758-15	Bearing, ball	1	1	1	1	1	1	1
18	229110	O-ring	1	1	1	1	1	1	1
19	229072	Bracket, end	1	1	1				
19	344565	Bracket, end				1	1	1	1
20	X-801-3	Washer, hardened	4	4	4	4	4	4	4
21	X-6051-18	Screw, HC, M10 x 1.5	4	4	4	4	4	4	4
22	229099	Exciter, armature	1	1	1				
22	344568	Exciter, armature				1	1	1	1
23	X-25-129	Washer, plain	1	1	1	1	1	1	1
24	X-6238-3	Screw, 3/8-16 x .875	1	1	1	1	1	1	1
25	A-229152	PCB assy, diode board	1	1	1	1	1	1	1
26	X-283-3	Terminal	3	3	3	3	3	3	3
27	X-51-8	Screw, 8-32 x .75	5	5	5	5	5	5	5
28	X-22-7	Washers, #6	5	5	5	5	5	5	5
29	X-712-17	Spacer	3	3	3	3	3	3	3
30	X-67-129	Screw, self tapping	3	3	3				
30	X-67-135	Screw, self tapping				3	3	3	3
31	A-229277	Exciter assembly, field	1	1	1				
31	344570	Exciter assembly, field				1	1	1	1
32	X-97-14	Screw, hex head machine	4	4	4	4	4	4	4
33	225545	Panel, end bracket	1	1	1	1	1	1	1
34	X-67-113	Screw, self tapping	6	6	6	6	6	6	6

Common hardware; procure locally

Group 301: Controller and Mounting



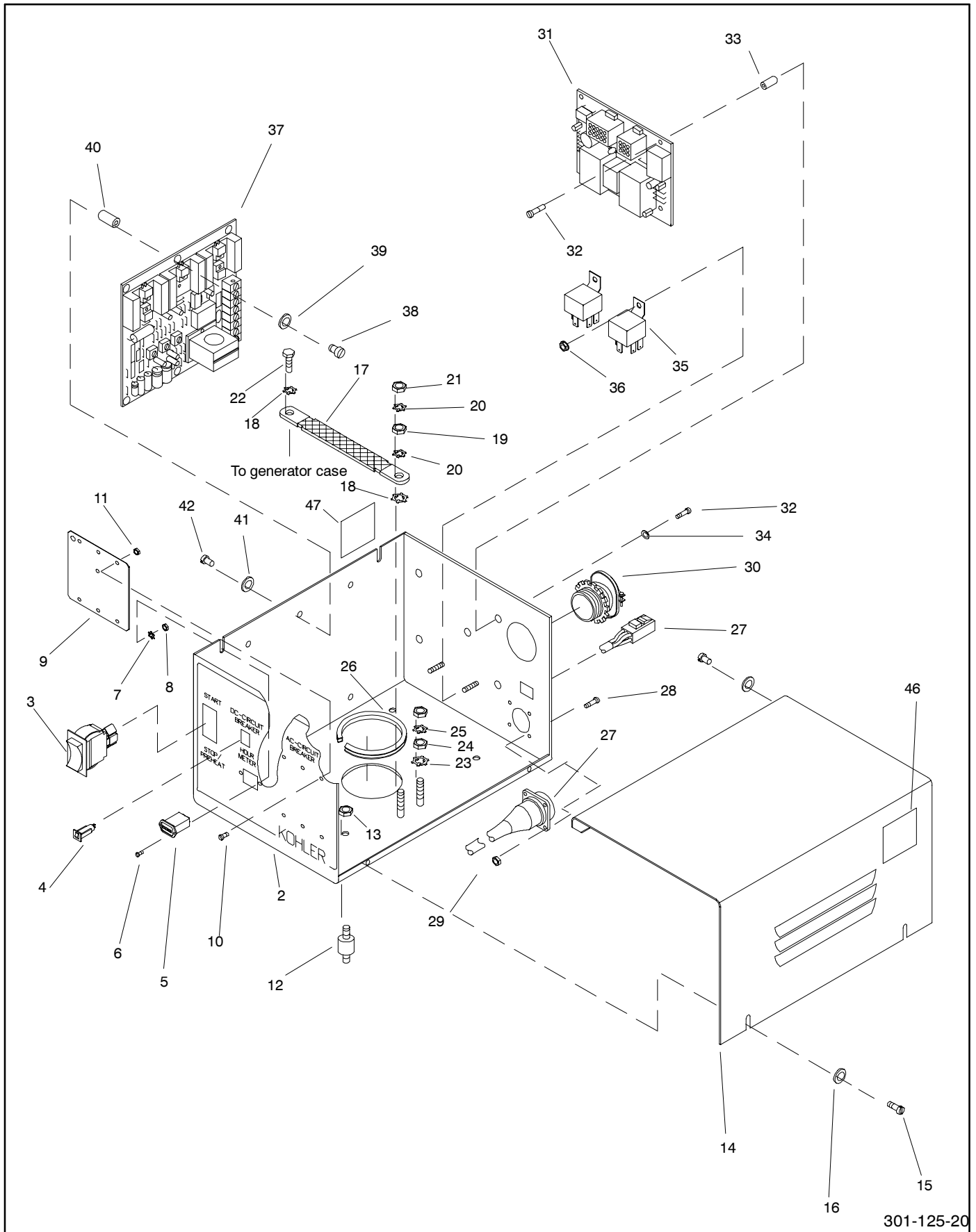
Group 301: Controller and Mounting

Item	Part Number	Description	Quantity												
			Variation Number												
			20	24	25	26	36	37	38	42	52	53	54	55	
1	A-229077	Controller assembly*	1	1											
1	A-229882	Controller assembly*			1	1									
1	A-359146	Controller assembly*					1	1			1		1		
1	A-344745	Controller assembly*								1		1		1	
1	A-344324	Controller assembly*							1						
2	229075	Box, silkscreen	1	1	1	1									
2	344325	Box, silkscreen					1	1		1	1	1	1	1	
2	344338	Box, silkscreen							1						
3	249406	Switch, rocker	1	1	1	1	1	1		1	1	1	1	1	
3	229997	Switch, rocker							1						
4	250719	Breaker, circuit 10 amp.	1	1	1	1	1	1	1	1	1	1	1	1	
5	238736	Meter, hour	1	1	1	1	1	1	1	1	1	1	1	1	
6	X-49-26	Screw, 6-32 x .625	6	6	6	6	6	6	6	6	6	6	6	6	
7	X-22-6	Washer, lock #6	5	5	5	5	5	5	5	5	5	5	5	5	
8	X-71-2	Nut, hex 6-32	2	2	2	2	2	2	2	2	2	2	2	2	
9	246434	Plate, cover	1	1	1	1	1	1			1		1		
9	229205	Breaker, circuit AC							1	1		1		1	
10	X-49-1	Screw, 6-32x5	6	6	6	6	6	6	6	6	6	6	6	6	
11	#	Nut, #6-32	6	6	6	6	6	6	6	6	6	6	6	6	
12	229353	Mount, controller	4	4	4	4	4	4	4	4	4	4	4	4	
13	#	Nut, 1/4-20	4	4	4	4	4	4	4	4	4	4	4	4	
14	229076	Cover, controller	1	1	1	1	1	1			1		1		
14	GM10538	Cover, controller							1	1		1		1	
15	X-67-52	Screw, 10-24 X 1/2	2	2	2	2	2	2	4	4	2	4	2	4	
16	#	Washers, #10	2	2	2	2	2	2	2	2	2	2	2	2	
17	246083	Strap, ground	1	1	1	1	1	1	1	1					
17	LK-0616-1515	Lead									1	1	1	1	
18	X-22-12	Washer, shakeproof	2	2	2	2	2	2	2	2	2	2	2	2	
19	X-76-2	Nut, hex 1/4-20	1	1	1	1	1	1	1	1	1	1	1	1	
20	X-22-11	Washer, lock 1/4	3	3	3	3	3	3	3	3	3	3	3	3	
21	X-81-8	Nut, hex 1/4-20 (green)	1	1	1	1	1	1	1	1	1	1	1	1	
22	#	Bolt, 1/4-20	1	1	1	1	1	1	1	1	1	1	1	1	
23	X-22-12	Washer,1/4 #8-32 int.-ext. tooth	2	2	2	2	2	2	2	2	2	2	2	2	
24	X-76-2	Nut, hex 1/4-20	2	2	2	2	2	2	2	2	2	2	2	2	
25	X-22-11	Washer, lock 1/4	3	3	3	3	3	3	3	3	3	3	3	3	
26	X-6033-4	Grommet, nylon	1	1	1	1	1	1	1	1	1	1	1	1	
27	229129	Harness, controller	1	1							1	1	1	1	
27	359147	Harness, controller			1	1	1	1			1	1	1	1	
27	344012	Harness, controller (includes items *)							1						
27	223316	Fuse, 10 amp.*	1	1	1	1	1	1	1	1	1	1	1	1	
27	233959	Diode, 6 amp, 100V*	1	1	1	1	1	1	1	1	1	1	1	1	
27	239496	22 pin connector*	1	1	1	1	1	1	1	1	1	1	1	1	
27	241616	6 pin connector (P3)*	1	1	1	1	1	1	1	1	1	1	1	1	
27	241617	6 pin connector*	1	1	1	1	1	1	1	1	1	1	1	1	
27	254852	12 pin connector*	1	1	1	1	1	1	1	1	1	1	1	1	
27	259689	9 pin connector*	1	1	1	1	1	1	1	1	1	1	1	1	
27	269216	Holder, fuse*	1	1	1	1	1	1	1	1	1	1	1	1	
27	269366	15 pin connector*	1	1	1	1	1	1	1	1	1	1	1	1	
28	#	Nut, #6-32	4	4	4	4	4	4	4	4	4	4	4	4	
29	X-49-26	Screw, 6-32x1/2	6	6	6	6	6	6	6	6	6	6	6	6	
30	X-6266-1	Connector, cable	1	1	1	1	1	1	1	1	1	1	1	1	
31	H-239563	Circuit board, universal (12 V)	1	1	1	1	1	1	1		1		1		
31	A-344753	Circuit board, universal (24 V)												1	
32	X-49-25	Screw, 6-32x1/4	10	10	10	10	10	10	10	10	10	10	10	10	
33	287948	Spacer, circuit board	5	5	5	5	5	5	5	5	5	5	5	5	
34	#	Washer, #6	5	5	5	5	5	5	5	5	5	5	5	5	
35	259391	Relay, 12 V	2	2	2	2	2	2	2		2		2		
35	272684	Relay, 24 V												2	
36	#	Nut, #10-32	2	2	2	2	2	2	2	2	2	2	2	2	
37	B-258296	Voltage regulator, PB-5	1	1											
37	A-344342	Voltage regulator, PB-5			1	1	1	1	1	1	1	1	1	1	
38	X-51-8	Screw, #8-32 x 1/4	6	6	6	6	6	6	6	6	6	6	6	6	
39	239665	Washer, nylon	6	6	6	6	6	6	6	6	6	6	6	6	
40	229357	Spacer	6	6	6	6	6	6	6	6	6	6	6	6	

* Controller Assembly includes items 2-11, 14, 17-45.

Common hardware; procure locally

Group 301: Controller and Mounting, continued



301-125-20

Group 301: Controller and Mounting, continued

Item	Part Number	Description	Quantity													
			Variation Number													
			20	24	25	26	27	32	36	37	38	42	52	53	54	55
40	229357	Spacer	6	6	6	6			6	6	6	6	6	6	6	6
41	#	Washer, #8	2	2	2	2			2	2	2	2	2	2	2	2
41	X-22-7	Washer, lock #8	4	4	4	4			4	4	4	4	4	4	4	4
42	X-51-12	Screw, # 8-32x3/8	6	6	6	6			6	6	6	6	6	6	6	6
43	229228	Harness, engine wiring (not shown)	1	1	1	1			1	1						
43	344015	Harness, engine wiring (not shown)									1	1				
44	233442	Relay, status (not shown)					1	1								
45	229233	Harness, air heater relay (not shown)					1	1								
46	254831	Decal, regulator adjustment											1	1	1	1
47	294520	Decal, danger (high voltage)							1	1		1	1	1	1	1

Common hardware; procure locally

Group 501: Housing

Item	Part Number	Description	Quantity
			Variation Number
1	D-1128	(All items not shown) Grommet	5
2	X-117-3	Screw, HC #10-32 x .625	4
3	X-25-45	Washer, .208 x .75 x .060 plain	4
4	X-281-3	Hose, air cleaner	1
5	X-284-23	Grommet	1
6	X-301-36	Plug, button	3
7	X-301-37	Plug, button	6
8	X-391-38	Elbow, hose	1
9	X-400-192	Spacer	4
10	X-400-194	Spacer	6
11	X-426-1	Clamp, hose 2-17/32	4
12	X-426-16	Clamp, hose	4
13	X-426-4	Clamp, hose	2
14	X-426-8	Clamp, hose 1 15/16 x 1 3/16	2
15	X-507-9	Hose, radiator	1
16	X-582-23	Connector, hose	1
17	X-6216-1	Screw, Phil. hex	6
18	X-6278-1	Washer, nylon	6
19	X-6292-2	Hose, flexible air	1
20	229197	Rail, sound shield	1
21	229198	Rail, sound shield	1
22	229210	Base	1
23	229236	Seal, dampening	2
24	229250	Insulation, acoustic	1
25	229249	Hose, molded	1
26	229252	Insulation, acoustic	1
27	229253	Insulation, acoustic	1
28	229321	Plate, controller	1
29	229328	Seal, dampening	1
30	229538	Insulation, acoustic	2
31	229890	Tube, exhaust	1
32	229905	Rail, end	1
33	229920	Tube, exhaust	1
34	246267	Mount, controller	4
35	344605	Coupling, bulkhead pipe	1
36	A-344328	Enclosure, sound shield (includes all the following)	1
37	X-6348-1	Decal	1
38	229130	Panel, front	1
39	229131	Panel, left rear	1
40	229232	Panel, right rear	1
41	229196	Panel, top	1
42	229195	Panel, left door	1
43	229194	Panel, right door	1
44	229912	Panel, rear	1
45	229341	Bracket, door catch	4
46	229924	Support, rear mounting	2
47	229902	Support, rear mounting	2
48	229951	Latch, grabber door	1
49	343165	Decal, caution	1
50	344486	Decal, CE	1

Group 701: Literature

Item	Part Number	Description	Quantity			
			Variation Number			
			10	32	33	34
1	TP-5592	Operation Manual, 11CCFOZ-24CCOZ 1-Phase and 3-Phase	1			
1	TP-6068	Operation Manual, 5-32EOZ Marines (all TNE engines)		1	1	1
1	TP-6069	Installation Manual, 5-32EOZ Marines (all TNE engines)		1	1	1
2	TP-5591	Parts Catalog 11CCFOZ-14CCOZ1-Phase and 3-Phase	1			
3	TP-5650	Service Manual, Yanmar Engine (3JH2)	1			
4	TP-5630	Service Manual, Kohler Generator 11CCFOZ-24CCOZ 1-Phase and 3 Phase	1			
4	TP-6071	Service Manual, 13-24EOZ Marine		1	1	1
5	TP-5620	Marine Safety Precautions	1			
6	TP-6067	Operation Manual, Yanmar TNE Series		1	1	1
7	TP-5876	Service Manual, Yanmar Engine 3TNE74		1	1	1

Parts List: Accessories

Qty.	Description	Part No.
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Battery Cables

Battery Cable Kit		PA-250633
1	Cable, battery (positive)	X-545-50
1	Cable, battery (negative)	X-545-49

Circuit Breakers

Circuit Breaker Kit		PA-229243
1	Breaker, circuit, 60 amp	229205
1	Plate, cover	229208
1	Boot	290262
1	Decal	246242
1	Installation Instructions (3-phase)	TT-799
1	Installation Instructions (1-phase)	TT-875

Circuit Breaker Kit		PA-229400
1	Plate, cover	229208
1	Boot	238915
1	Decal, notice	246242
1	Breaker, circuit, 50 amp	249479
1	Installation Instructions (3-phase)	TT-799
1	Installation Instructions (1-phase)	TT-875

Circuit Breaker Kit		PA-229401
1	Plate, cover	229208
1	Boot	238915
1	Decal, notice	246242
1	Breaker, circuit, 70 amp	229397
1	Installation Instructions (3-phase)	TT-799
1	Installation Instructions (1-phase)	TT-875

Circuit Breaker Kit		PA-229914
2	Plate, cover	229208
1	Boot	238915
1	Decal, notice	246242
1	Breaker, circuit, 50 amp	229917
1	Installation Instructions	TT-875

Circuit Breaker Kit		PA-260109
1	Breaker, circuit, 30 amp, 600V	269250
1	Decal, notice	246242
3	Boot	238915
1	Installation Instructions	TT-799

Circuit Breaker Kit		PA-260110
1	Breaker, circuit, 40 amp, 600V	269252
1	Decal, notice	246242
3	Boot	238915
1	Installation Instructions	TT-799

Circuit Breaker Kit		PA-260111
1	Breaker, circuit, 20 amp, 600V	269251
1	Decal, notice	246242
1	Installation Instructions	TT-799

Qty.	Description	Part No.
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Conversion Kit

12 V to 24 V Conversion		PA-359570
1	PCB assembly, lopcon w/time delay, 24 V	A-344753
1	Screw, hex head machine	X-125-22
1	Spacer, 0.344 ID x 0.625 OD x 1.5 in.	X-400-152
1	Terminal, female flag, 16-14 AWG	X-431-37
2	Relay	272684
1	Pump, fuel	344740
1	Alternator, battery charging	344742
1	Bracket, alternator adjusting	359554
1	Starter motor	344743
1	Guard, alternator fan	344815
1	Bracket, belt guard (upper)	344819
1	Bracket, belt guard (RS)	344820
1	Bracket, belt guard (LS)	344821
1	Belt, V, 46 in.	344829
1	Solenoid	344746

Flexible Fuel Lines

Flexible Fuel Line Kit		PA-249338
2	Hose, fuel overflow	249340

Fuel Attachment Block

Fuel Block		PA-229834
1	Installation Instructions	TT-1010
2	Screw	X-125-29
1	Connector, hose, 1/8	X-380-1
1	Fuel line, 1/4 in.	X-386-19
1	Fuel line, 1/2 in.	X-386-57
2	Elbow, hose connector	X-391-20
2	Spacer, 0.344 x 0.625 x 0.656	X-400-100
4	Clamp, hose	X-426-9
2	Fitting, hose	X-652-3
1	Block, fuel	229835

Harnesses

Extension Harness Kit ,15 Ft.		PA-249334
1	Strap, wire, 5/8	X-526-3
1	Harness, extension	249334

Extension Harness Kit, 25 Ft.		PA-249336
1	Strap, wire, 5/8	X-526-3
1	Harness, extension	249336

Remote Harness Kit, Pigtail		PA-249941
1	Harness, extension	249935

Fire System Interface		PA-229833
1	Harness, wiring	229832
1	Installation Instructions	TT-930

Coolant Overflow Extension Hose

Coolant Overflow Extension Hose		PA-229931
2	Clamp, hose	X-426-10
1	Hose, 10.8 ft.	X-651-30

Parts List: Accessories

Qty.	Description	Part No.
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Overspeed Shutdown

Overspeed Shutdown Kit

PA-229241

1	Circuit board assembly	B-249812
4	Washer, plain	X-25-9
8	Screw, slotted pan head machine	X-49-25
1	Plate, adapter	229070
1	Harness, overspeed	229234
3	Spacer	249974
4	Spacer, circuit board	287948
1	Installation Instructions	TT-911

Panel and Meter Kits

Remote Start Panel Kit

PA-250797

1	Panel assembly, remote	A-250795
1	Connector, plug	241617
1	Panel, remote	250796
1	Switch, rocker	269296
1	Decal, warning	249494
1	Installation Instructions	TT-642

Remote Start and 4-Meter Panel

PAA-267414

1	Screw, RHM, 8-32 x 3/4	X-51-11
1	Decal, warning	249494
1	Installation Instructions	TT-688
1	Panel assembly, control (includes the following)	A-267414
1	Switch, rocker	249330
1	Harness, wiring	249467
1	Panel	249419
1	Gauge, oil pressure	249438
1	Gauge, water temperature	249440
1	Meter, hour	249461
1	Voltmeter, battery	249462

Remote Start and 2-Meter Panel

PAA-267415

1	Screw, RHM, 8-32 x 3/4	X-51-11
1	Decal, warning	249494
1	Installation Instructions	TT-687
1	Panel assembly, control (includes the following)	A-267415
1	Switch, rocker	249330
1	Harness, wiring	249331
1	Panel	249332
1	Gauge, oil pressure	249438
1	Gauge, water temperature	249440

Remote Start and 2-Meter Panel (12 Volt)

PA-344040

1	Installation Instructions	TT-1072
1	Decal, warning	249494
1	Panel assembly, control (includes the following)	A-344033
1	Switch, rocker	344039
1	Harness, wiring	344031
1	Panel	344029
1	Gauge, oil pressure	344036
1	Gauge, water temperature	344035

Qty.	Description	Part No.
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Remote Start and 4-Meter Panel (12 Volt)

PA-344041

1	Installation Instructions	TT-1073
1	Decal, warning	249494
1	Panel assembly, control (includes the following)	A-344034
1	Switch, rocker	344039
1	Harness, wiring	344032
1	Panel	344030
1	Gauge, oil pressure	344036
1	Gauge, water temperature	344035
1	Voltmeter	344037
1	Hourmeter	344038

Remote Start Panel Kit (12 Volt)

PA-359581

1	Installation Instructions	TT-1245
1	Panel assembly (includes * items)	A-226965
1	* Panel, control	226964
1	* Harness, wiring	226979
1	* Hourmeter	238736
1	* Switch, rocker	344039
1	Decal, warning	249494

Remote Start Panel Kit (24 Volt)

GM23015-KP1

1	Panel assembly (includes * items)	GM23014
1	* Panel, control	226964
1	* Harness, wiring	226979
1	* Hourmeter	238736
1	* Switch, rocker	344839
1	Decal, warning	249494

Remote Start and 2-Meter Panel (24 Volt)

PA-344842

1	Installation Instructions	TT-1072
1	Panel, remote start and meter (includes the following)	A-344840
1	Gauge, water temperature	344035
1	Gauge, oil pressure	344036
1	Harness, panel wiring	344031
1	Panel, cutout	344029
1	Switch, rocker	344839
1	Decal, warning	249494

Remote Start and 4-Meter Panel (24 Volt)

PA-344843

1	Installation Instructions	TT-1073
1	Panel, remote start and meter	A-344841
1	Gauge, water temperature	344035
1	Gauge, oil pressure	344036
1	Voltmeter	344037
1	Hourmeter	344038
1	Harness, panel wiring	344032
1	Panel, cutout	344030
1	Switch, rocker	344839
1	Decal, warning	249494

Parts List: Accessories, continued

Qty.	Description	Part No.
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Pre-Heat Kit

Air Intake Heater Kit (12 V)

PA-229240

1	Washer, shakeproof	X-22-12
2	Washer, plain	X-25-40
1	Terminal	X-431-38
1	Screw, HC 1/4-20 x .75	X-465-16
1	Screw, HC 1/4-20 x .50	X-465-6
2	Nut, whiz lock 1/4-20	X-6210-2
1	Harness, air heater	229233
1	Relay	233442
1	Boot	238915
1	Installation Instructions	TT-897

Air Intake Heater Kit (24 V)

PA-344748

1	Washer, 0.267 x 0.760 x 0.040 in. internal- external-tooth, lock	X-22-12
2	Washer, 0.281 x 0.625 x 0.06 in. plain	X-25-40
1	Screw, 1/4-20 x 0.75 in.	X-465-16
1	Screw, 1/4-20 x 0.625 in.	X-465-2
1	Conduit, convoluted	X-6003-5
2	Nut, whiz 1/4-20	X-6210-2
1	Harness, wiring	229233
1	Boot	238915
1	Relay	344741
1	Heater, air	344903
2	Gasket, air heater	344904
4	Screw, HC, M8 x 60 mm	M931-08060-60
4	Washer, plain (#8)	M125A-08-80
1	Installation instructions	TT-897

Seawater Strainers

1	Filter, water 1/2 in.	X-661-1
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Sender Kits

Sender Kit

(Oil Pressure and Water Temp.)

PA-229390

1	Bushing, reducer 1/8 x 1/4	X-202-27
1	Sender, oil pressure	344305
1	Sender, water temperature	249348
1	Installation Instructions	TT-896

Ship-To-Shore Switches

Transfer Switch Kit

PAA-246374

1	Switch assembly, transfer	A-246374
1	Installation Instructions	TT-535

Transfer Switch Kit

PAA-260086

1	Switch assembly, transfer	A-260086
1	Installation Instructions	TT-535

Siphon Break

Siphon Break Kit

PA-229929

1	Valve, siphon	229929
1	Installation Instructions	TT-927

Siphon Break Kit

241430

1	Valve assembly	A-241429
1	Tee pipe, 2/4 x 3/4 x 1/2	X-203-6
2	Connector, 90 deg. elbow	X-391-22

Qty.	Description	Part No.
------	-------------	----------

Siphon Break Hose Connection

GM10086-KP1

2	Grommet	X-284-43
2	Clamp, hose	X-426-15
1	Valve, siphon break	229929
2	Connector, hose	344999
1	Hose, 1 in. ID, 11.54 in.	GM10091
1	Hose, 1 in. ID, 6.54 in.	GM10092

Siphon Break Hose Connection

GM10087-KP1

2	Grommet	X-284-43
2	Clamp, hose	X-426-15
1	Valve, siphon break	229929
2	Connector, hose	344999
1	Hose, 1 in. ID, 11.54 in.	GM10093
1	Hose, 1 in. ID, 9.45 in.	GM10094

Parts List: Accessories, continued

Qty.	Description	Part No.
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Sound Shields

Sound Shield Kit

PA-229230

5	Grommet	D-1128
4	Screw, HC #10-32 x .625	X-117-3
4	Washer, .406 x .812 x .065 plain	X-25-37
10	Washer, .281 x .625 x .065 plain	X-25-40
4	Washer, .208 x .75 x .060 plain	X-25-45
4	Grommet	X-284-36
3	Plug, button	X-301-36
6	Plug, button	X-301-37
1	Elbow, 90 deg. hose	X-391-24
4	Spacer	X-400-192
4	Clamp, hose 2-17/32	X-426-1
2	Clamp, hose	X-426-4
2	Clamp, hose 1-15/16	X-426-8
10	Screw, hex	X-465-18
1	Hose, radiator	X-507-9
1	Connector, hose	X-582-16
6	Nut, whiz	X-6210-2
6	Screw, Phillips hex	X-6216-1
4	Screw, 3/8	X-6238-3
6	Washer, nylon	X-6278-1
1	Hose, flexible air	X-6292-2
1	Rail, sound shield	229197
1	Rail, sound shield	229198
1	Rail, end	229202
1	Base	229210
2	Seal, dampening	229236
1	Hose, molded	229249
1	Insulation, acoustic	229250
1	Insulation, acoustic	229252
1	Insulation, acoustic	229253
1	Coupling, bulkhead	229291
1	Plate, controller	229321
1	Seal, dampening	229328
2	Insulation, acoustic	229538
4	Mount, controller	246267
1	Enclosure, sound shield (Includes the following)	A-229224
1	Logo, Kohler	X-6267-1
1	Logo, Kohler	X-6267-2
1	Panel, front	229130
1	Panel, left rear	229131
1	Panel, right rear	229132
1	Panel, top	229196
1	Panel, left door	229195
1	Panel, right door	229194
1	Panel, rear	229203
1	Latch, door	229951
1	Decal, caution	343165
1	Decal, CE	344486

Qty.	Description	Part No.
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Sound Shield Kit

PA-344334

1	Installation Instructions	TT-906
5	Grommet	D-1128
4	Screw, HC #10-32 x .625	X-117-3
10	Washer, .281 x .625 x .065 plain	X-25-40
4	Washer, .208 x .75 x .060 plain	X-25-45
1	Hose, air cleaner	X-281-3
3	Plug, button	X-301-36
6	Plug, button	X-301-37
1	Elbow, 90 deg. hose	X-391-24
4	Spacer	X-400-192
6	Spacer	X-400-194
4	Clamp, hose 2-17/32	X-426-1
4	Clamp, hose	X-426-16
2	Clamp, hose	X-426-4
2	Clamp, hose 1-15/16	X-426-8
10	Screw, hex	X-465-18
1	Hose, radiator	X-507-9
1	Connector, hose	X-582-16
6	Screw, Phillips hex	X-6216-1
6	Washer, nylon	X-6278-1
1	Hose, flexible air	X-6292-2
1	Rail, sound shield	229197
1	Rail, sound shield	229198
1	Base	229210
2	Seal, dampening	229236
1	Insulation, acoustic	229250
1	Hose, molded	229249
1	Insulation, acoustic	229252
1	Insulation, acoustic	229253
1	Coupling, bulkhead	229291
1	Plate, controller	229321
1	Seal, dampening	229328
2	Insulation, acoustic	229538
1	Tube, exhaust	229890
1	Rail, end	229905
1	Tube, exhaust	229920
4	Mount, controller	246267
1	Enclosure, sound shield (include all the following)	A-344328
1	Decal	X-6348-1
1	Panel, front	229130
1	Panel, left rear	229131
1	Panel, right rear	229132
1	Panel, top	229196
1	Panel, left door	229195
1	Panel, right door	229194
1	Panel, rear	229912
2	Support, rear mounting	229924
2	Support, rear mounting	229902
1	Latch, grabber door	229951
1	Decal, caution	343165
1	Decal, CE	344486

Parts List: Accessories, continued

Qty.	Description	Part No.	Qty.	Description	Part No.
Sound Shield Kit			PA-359481		
1	Installation Instructions	TT-1235	1	Installation Instructions	TT-1325
28	Washer, plain, .281 ID x .625 in. OD	X-25-142	28	Washer, 0.281 x 0.625 x 0.065	X-25-142
4	Washer, plain, .406 ID x .812 in. OD	X-25-37	4	Washer, plain, 0.406 x 0.812 x 0.065	X-25-37
1	Hose, Exhaust, 2 x 4 in.	GM10074	4	Clamp, hose, 2.75 x 1.81	X-426-16
4	Clamp, hose, 2.81/3.75 in.	X-426-1	4	Clamp, hose, 3.75 x 2.81	X-426-1
4	Clamp, hose, 1.81/2.75 in.	X-426-16	2	Clamp, hose, 1.75 x 0.81	X-426-8
2	Clamp, hose, 1.31/2.25 in.	X-426-4	28	Screw, hex cap, 1/4-20	X-465-24
2	Clamp, hose, .81/1.75 in.	X-426-8	4	Screw, hardened, 3/8-16 x 0.62	X-6238-2
28	Screw, hex head machine	X-465-24	6	Screw, PHM, 1/4-20 x 2	X-73-33
1	Hose, exhaust, 3 in. x 9.75 in.	GM10075	1	Hose, exhaust, 3 x 9.75 in.	GM10075
1	Channel, U	X-6047-16	1	Hose, exhaust, 2 x 4 in.	GM10074
2	Clip, speed	X-6220-1	6	Washer, fiber, 0.25 in. ID x 0.71 in. OD	222889
4	Screw, hex head machine (EXP)	X-6238-2	1	Tube, exhaust, 2 in./3 in. OD	229920
6	Screw, cross recess pan head machine	X-73-33	6	Connector, outside	GM15486
40	Rivet, pop, .187 in.	X-781-14	2	Connector, inside	GM15487
6	Washer, fiber, .25 ID x .71 in. OD	222889	1	Base, 25.75 x 41.25 in.	359586
1	Hose, molded, 1 in. ID	229249	1	Support, RH, service side	GM22698
1	Tube, exhaust, fiberglass, 2 in. OD	229920	1	Support, LH, nonservice side	GM22699
4	Mount, controller	246267	2	Extruded rail, 14.02 in.	344681
10	Clip, speed	297596	2	Extruded rail, 5.0 in.	344687
6	Connector, outside corner	344137	2	Extruded rail, 3.6 in.	359641
2	Coupling, inside corner	344138	2	Extruded rail, 22.94 in.	344689
18	Bracket, corner rail	344635	2	Extruded rail, 22.56 in.	359642
2	Bracket, corner rail	344636	3	Extruded rail, 20.25 in.	344691
1	Support, sound shield	344679	1	Tube, exhaust, 2 in. OD	344694
1	Support, sound shield	344680	1	Door, engine end, 21.5 x 18.85 in.	359506-S
2	Rail, sound shield	344681	1	Door, generator end, 21.5 x 10.31 in.	359509-S
2	Rail, sound shield	344687	1	Door, rear, 21.5 x 6.27 in.	359652-S
2	Rail, sound shield	359641	1	Door, LH nonservice side, 24.81 x 18.85 in.	359517-S
2	Rail, sound shield	344689	1	Door, RH service side, 24.81 x 18.85 in.	359521-S
2	Rail, sound shield	359642	1	Duct, end bracket, 21.56 x 15.56 in.	359525-S
2	Rail, sound shield	344691	1	Panel, nonservice side, 9.91 x 10.34 in.	359529-S
1	Tube, exhaust, stainless steel, 2 in.	344694	1	Panel, service side, with decal, 9.91 x 10.34 in.	359532-S
1	Door, sound shield	359506	1	Roof, generator, 21.5 x 6.65 in.	359537-S
1	Door, sound shield	359509	1	Roof, engine, 24.81 x 21.5 in.	359540-S
1	Door, subassembly, sound shield	359652	1	Rail, service side, 35 x 4.48 in.	363514-S
1	Door, sound shield (LS)	359517	1	Rail, engine end, 21.75 x 4.48 in.	363518-S
1	Door, subassembly, sound shield (RH)	359521	1	Rail, nonservice side, 35 x 4.48 in.	363521-S
1	Duct, sound shield	359525	1	Rail, generator end, 21.75 x 4.48 in.	363525-S
1	Panel, sound shield	359529	44	Screw, drill, #8 stainless steel	X-794-5
1	Panel, sound shield	359532	12	Clip, speed	297596
1	Roof, alternator	359537	1	Hose, 1.0 in. ID	229249
1	Roof, subassembly sound shield	359540			
1	Hose, air intake	X-6292-4			
1	Foam, acoustical kit	359558			
3	Insulation, acoustic foam	359584			
1	Base	359586			
1	Rail, subassembly, sound shield	363514			
1	Rail, subassembly (front)	363518			
1	Rail, subassembly, sound shield	363521			
1	Rail, subassembly (rear)	363525			
Sound Shield Kit			GM22731-KP2		

Appendix A Abbreviations

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

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

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

Appendix B Common Hardware Application Guidelines

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

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

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

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

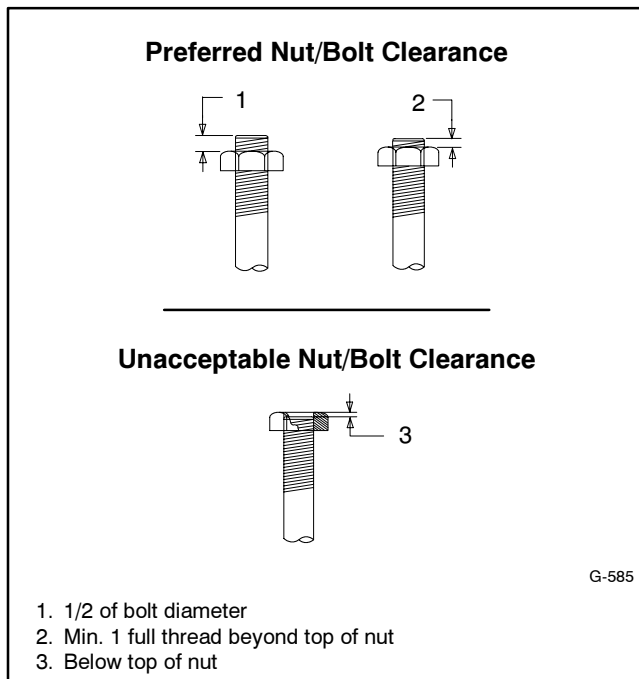


Figure 1 Acceptable Bolt Lengths

Steps for common hardware application:

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

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

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

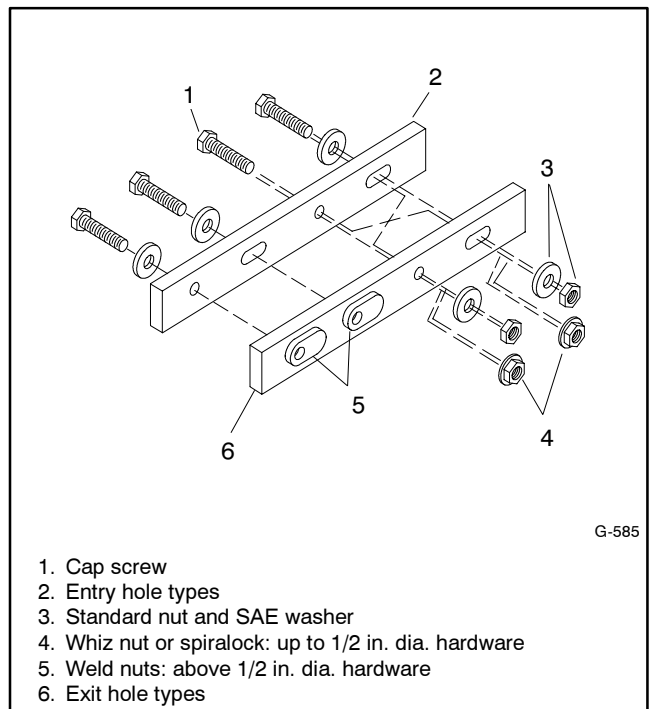


Figure 2 Acceptable Hardware Combinations

Appendix C General Torque Specifications















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











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






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

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

Appendix D Common Hardware Identification

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

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

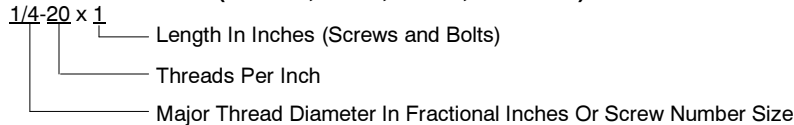
Hardness Grades	
American Standard	
Grade 2	
Grade 5	
Grade 8	
Grade 8/9 (Hex Socket Head)	
Metric	
Number stamped on hardware; 5.8 shown	

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

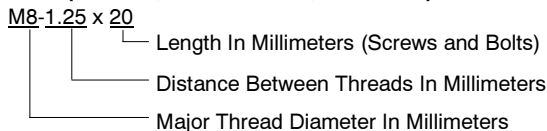
Phillips® screw is a registered trademark of Phillips Screw Company.

Sample Dimensions

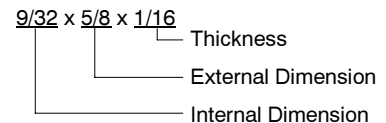
American Standard (Screws, Bolts, Studs, and Nuts)



Metric (Screws, Bolts, Studs, and Nuts)



Plain Washers



Lock Washers



Appendix E Common Hardware List

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

American Standard

Part No.	Dimensions	Part No.	Dimensions	Part No.	Dimensions	Type		
Hex Head Bolts (Grade 5)								
X-465-17	1/4-20 x .38	X-6238-14	3/8-24 x .75	Hex Nuts				
X-465-6	1/4-20 x .50	X-6238-16	3/8-24 x 1.25	X-6009-1	1-8	Standard		
X-465-2	1/4-20 x .62	X-6238-21	3/8-24 x 4.00	X-6210-3	6-32	Whiz		
X-465-16	1/4-20 x .75	X-6238-22	3/8-24 x 4.50	X-6210-4	8-32	Whiz		
X-465-18	1/4-20 x .88			X-6210-5	10-24	Whiz		
X-465-7	1/4-20 x 1.00	X-6024-5	7/16-14 x .75	X-6210-1	10-32	Whiz		
X-465-8	1/4-20 x 1.25	X-6024-2	7/16-14 x 1.00					
X-465-9	1/4-20 x 1.50	X-6024-8	7/16-14 x 1.25	X-6210-2	1/4-20	Spiralock		
X-465-10	1/4-20 x 1.75	X-6024-3	7/16-14 x 1.50	X-6210-6	1/4-28	Spiralock		
X-465-11	1/4-20 x 2.00	X-6024-4	7/16-14 x 2.00	X-6210-7	5/16-18	Spiralock		
X-465-12	1/4-20 x 2.25	X-6024-11	7/16-14 x 2.75	X-6210-8	5/16-24	Spiralock		
X-465-14	1/4-20 x 2.75	X-6024-12	7/16-14 x 6.50	X-6210-9	3/8-16	Spiralock		
X-465-21	1/4-20 x 5.00	X-129-15	1/2-13 x .75	X-6210-10	3/8-24	Spiralock		
X-465-25	1/4-28 x .38	X-129-17	1/2-13 x 1.00	X-6210-11	7/16-14	Spiralock		
X-465-20	1/4-28 x 1.00	X-129-18	1/2-13 x 1.25	X-6210-12	1/2-13	Spiralock		
		X-129-19	1/2-13 x 1.50	X-6210-15	7/16-20	Spiralock		
X-125-33	5/16-18 x .50	X-129-20	1/2-13 x 1.75	X-6210-14	1/2-20	Spiralock		
X-125-23	5/16-18 x .62	X-129-21	1/2-13 x 2.00					
X-125-3	5/16-18 x .75	X-129-22	1/2-13 x 2.25	X-85-3	5/8-11	Standard		
X-125-31	5/16-18 x .88	X-129-23	1/2-13 x 2.50	X-88-12	3/4-10	Standard		
X-125-5	5/16-18 x 1.00	X-129-24	1/2-13 x 2.75	X-89-2	1/2-20	Standard		
X-125-24	5/16-18 x 1.25	X-129-25	1/2-13 x 3.00					
X-125-34	5/16-18 x 1.50	X-129-27	1/2-13 x 3.50	Washers				
X-125-25	5/16-18 x 1.75	X-129-29	1/2-13 x 4.00	Part No.	ID	OD	Thick.	Bolt/ Screw
X-125-26	5/16-18 x 2.00	X-129-30	1/2-13 x 4.50	X-25-46	.125	.250	.022	#4
230578	5/16-18 x 2.25	X-463-9	1/2-13 x 5.50	X-25-9	.156	.375	.049	#6
X-125-29	5/16-18 x 2.50	X-129-44	1/2-13 x 6.00	X-25-48	.188	.438	.049	#8
X-125-27	5/16-18 x 2.75			X-25-36	.219	.500	.049	#10
X-125-28	5/16-18 x 3.00	X-129-51	1/2-20 x .75	X-25-40	.281	.625	.065	1/4
X-125-22	5/16-18 x 4.50	X-129-45	1/2-20 x 1.25	X-25-85	.344	.687	.065	5/16
X-125-32	5/16-18 x 5.00	X-129-52	1/2-20 x 1.50	X-25-37	.406	.812	.065	3/8
X-125-35	5/16-18 x 5.50			X-25-34	.469	.922	.065	7/16
X-125-36	5/16-18 x 6.00	X-6021-3	5/8-11 x 1.00	X-25-26	.531	1.062	.095	1/2
X-125-40	5/16-18 x 6.50	X-6021-4	5/8-11 x 1.25	X-25-15	.656	1.312	.095	5/8
		X-6021-2	5/8-11 x 1.50	X-25-29	.812	1.469	.134	3/4
X-125-43	5/16-24 x 1.75	X-6021-1	5/8-11 x 1.75	X-25-127	1.062	2.000	.134	1
X-125-44	5/16-24 x 2.50	273049	5/8-11 x 2.00					
X-125-30	5/16-24 x .75	X-6021-5	5/8-11 x 2.25					
X-125-39	5/16-24 x 2.00	X-6021-6	5/8-11 x 2.50					
X-125-38	5/16-24 x 2.75	X-6021-7	5/8-11 x 2.75					
		X-6021-12	5/8-11 x 3.75					
X-6238-2	3/8-16 x .62	X-6021-11	5/8-11 x 4.50					
X-6238-10	3/8-16 x .75	X-6021-10	5/8-11 x 6.00					
X-6238-3	3/8-16 x .88							
X-6238-11	3/8-16 x 1.00	X-6021-9	5/8-18 x 2.50					
X-6238-4	3/8-16 x 1.25							
X-6238-5	3/8-16 x 1.50	X-6239-1	3/4-10 x 1.00					
X-6238-1	3/8-16 x 1.75	X-6239-8	3/4-10 x 1.25					
X-6238-6	3/8-16 x 2.00	X-6239-2	3/4-10 x 1.50					
X-6238-17	3/8-16 x 2.25	X-6239-3	3/4-10 x 2.00					
X-6238-7	3/8-16 x 2.50	X-6239-4	3/4-10 x 2.50					
X-6238-8	3/8-16 x 2.75	X-6239-5	3/4-10 x 3.00					
X-6238-9	3/8-16 x 3.00	X-6239-6	3/4-10 x 3.50					
X-6238-19	3/8-16 x 3.25							
X-6238-12	3/8-16 x 3.50	X-792-1	1-8 x 2.25					
X-6238-20	3/8-16 x 3.75	X-792-5	1-8 x 3.00					
X-6238-13	3/8-16 x 4.50	X-792-8	1-8 x 5.00					
X-6238-18	3/8-16 x 5.50							
X-6238-25	3/8-16 x 6.50							

Metric

Hex head bolts are hardness grade 8.8 unless noted.

Part No.	Dimensions	Part No.	Dimensions	Part No.	Dimensions
Hex Head Bolts (Partial Thread)					
M931-05055-60	M5-0.80 x 55	Hex Head Bolts (Partial Thread), continued		M961-14025-60	M14-1.50 x 25
M931-06040-60	M6-1.00 x 40	M960-16090-60	M16-1.50 x 90	M933-14025-60	M14-2.00 x 25
M931-06055-60	M6-1.00 x 55	M931-16090-60	M16-2.00 x 90	M961-14050-82	M14-1.50 x 50
M931-06060-60	M6-1.00 x 60	M931-16100-60	M16-2.00 x 100		
M931-06060-SS	M6-1.00 x 60	M931-16120-60	M16-2.00 x 120	M961-16025-60	M16-1.50 x 25
M931-06070-60	M6-1.00 x 70	M931-16150-60	M16-2.00 x 150	M933-16025-60	M16-2.00 x 25
M931-06070-SS	M6-1.00 x 70			M961-16030-82	M16-1.50 x 30*
M931-06075-60	M6-1.00 x 75	M931-20065-60	M20-2.50 x 65	M933-16030-82	M16-2.00 x 30*
M931-06090-60	M6-1.00 x 90	M931-20100-60	M20-2.50 x 100	M933-16035-60	M16-2.00 x 35
M931-06145-60	M6-1.00 x 145	M931-20120-60	M20-2.50 x 120	M961-16040-60	M16-1.50 x 40
M931-06150-60	M6-1.00 x 150	M931-20140-60	M20-2.50 x 140	M933-16040-60	M16-2.00 x 40
		M931-20160-60	M20-2.50 x 160	M961-16045-82	M16-1.50 x 45
M931-08035-60	M8-1.25 x 35	M931-22090-60	M22-2.50 x 90	M933-16045-82	M16-2.00 x 45
M931-08040-60	M8-1.25 x 40	M931-22120-60	M22-2.50 x 120	M933-16050-60	M16-2.00 x 50
M931-08040-82	M8-1.25 x 40*	M931-22160-60	M22-2.50 x 160	M933-16050-82	M16-2.00 x 50*
M931-08045-60	M8-1.25 x 45			M933-16060-60	M16-2.00 x 60
M931-08050-60	M8-1.25 x 50	M931-24090-60	M24-3.00 x 90	M933-16070-60	M16-2.00 x 70
M931-08055-60	M8-1.25 x 55	M931-24120-60	M24-3.00 x 120		
M931-08055-82	M8-1.25 x 55*	M931-24160-60	M24-3.00 x 160	M933-18035-60	M18-2.50 x 35
M931-08060-60	M8-1.25 x 60	Hex Head Bolts (Full Thread)			
M931-08070-60	M8-1.25 x 70	M933-04006-60	M4-0.70 x 6	M933-18050-60	M18-2.50 x 50
M931-08070-82	M8-1.25 x 70*			M933-18060-60	M18-2.50 x 60
M931-08075-60	M8-1.25 x 75	M933-05006-60	M5-0.80 x 6	M933-20050-60	M20-2.50 x 50
M931-08080-60	M8-1.25 x 80	M933-05030-60	M5-0.80 x 30	M933-20055-60	M20-2.50 x 55
M931-08090-60	M8-1.25 x 90	M933-05035-60	M5-0.80 x 35		
M931-08095-60	M8-1.25 x 95	M933-05050-60	M5-0.80 x 50	M933-24060-60	M24-3.00 x 60
M931-08100-60	M8-1.25 x 100			M933-24065-60	M24-3.00 x 65
M931-08110-60	M8-1.25 x 110	M933-06010-60	M6-1.00 x 10	M933-24070-60	M24-3.00 x 70
M931-08120-60	M8-1.25 x 120	M933-06012-60	M6-1.00 x 12		
M931-08130-60	M8-1.25 x 130	M933-06014-60	M6-1.00 x 14	Pan Head Machine Screws	
M931-08140-60	M8-1.25 x 140	M933-06016-60	M6-1.00 x 16	M7985A-03010-20	M3-0.50 x 10
M931-08150-60	M8-1.25 x 150	M933-06020-60	M6-1.00 x 20	M7985A-03012-20	M3-0.50 x 12
		M933-06025-60	M6-1.00 x 25	M7985A-04010-20	M4-0.70 x 10
M931-10040-82	M10-1.25 x 40*	M933-06040-60	M6-1.00 x 40	M7985A-04016-20	M4-0.70 x 16
M931-10040-60	M10-1.50 x 40	M933-06050-60	M6-1.00 x 50	M7985A-04020-20	M4-0.70 x 20
M931-10045-60	M10-1.50 x 45			M7985A-04050-20	M4-0.70 x 50
M931-10050-60	M10-1.50 x 50	M933-07025-60	M7-1.00 x 25	M7985A-04100-20	M4-0.70 x 100
M931-10050-82	M10-1.25 x 50				
M931-10055-60	M10-1.50 x 55	M933-08010-60	M8-1.25 x 10	M7985A-05010-20	M5-0.80 x 10
M931-10060-60	M10-1.50 x 60	M933-08012-60	M8-1.25 x 12	M7985A-05012-20	M5-0.80 x 12
M931-10065-60	M10-1.50 x 65	M933-08016-60	M8-1.25 x 16	M7985A-05016-20	M5-0.80 x 16
M931-10070-60	M10-1.50 x 70	M933-08020-60	M8-1.25 x 20	M7985A-05020-20	M5-0.80 x 20
M931-10080-60	M10-1.50 x 80	M933-08025-60	M8-1.25 x 25	M7985A-05025-20	M5-0.80 x 25
M931-10080-82	M10-1.25 x 80	M933-08030-60	M8-1.25 x 30	M7985A-05030-20	M5-0.80 x 30
M931-10090-60	M10-1.50 x 90	M933-08030-82	M8-1.25 x 30*	M7985A-05080-20	M5-0.80 x 80
M931-10090-82	M10-1.50 x 90*			M7985A-05100-20	M5-0.80 x 100
M931-10100-60	M10-1.50 x 100	M933-10012-60	M10-1.50 x 12		
M931-10110-60	M10-1.50 x 110	M961-10020-60	M10-1.25 x 20	M7985A-06100-20	M6-1.00 x 100
M931-10120-60	M10-1.50 x 120	M933-10020-60	M10-1.50 x 20		
M931-10130-60	M10-1.50 x 130	M933-10025-60	M10-1.50 x 25		
M931-10140-60	M10-1.50 x 140	M961-10025-60	M10-1.25 x 25		
M931-10180-60	M10-1.50 x 180	M933-10025-82	M10-1.50 x 25		
M960-10330-60	M10-1.25 x 330	M961-10030-60	M10-1.25 x 30		
		M933-10030-60	M10-1.50 x 30		
M931-12045-60	M12-1.75 x 45	M933-10030-82	M10-1.50 x 30*		
M960-12050-60	M12-1.25 x 50	M961-10035-60	M10-1.25 x 35		
M960-12050-82	M12-1.25 x 50*	M933-10035-60	M10-1.50 x 35		
M931-12050-60	M12-1.75 x 50	M933-10035-82	M10-1.50 x 35		
M931-12050-82	M12-1.75 x 50	M961-10040-60	M10-1.25 x 40		
M931-12055-60	M12-1.75 x 55				
M931-12060-60	M12-1.75 x 60	M933-12016-60	M12-1.75 x 16		
M931-12060-82	M12-1.75 x 60	M933-12020-60	M12-1.75 x 20		
M931-12065-60	M12-1.75 x 65	M961-12020-60F	M12-1.50 x 20		
M931-12075-60	M12-1.75 x 75	M933-12025-60	M12-1.75 x 25		
M931-12080-60	M12-1.75 x 80	M933-12025-82	M12-1.75 x 25*		
M931-12090-60	M12-1.75 x 90	M961-12030-60	M12-1.25 x 30		
M931-12100-60	M12-1.75 x 100	M961-12030-82F	M12-1.50 x 30		
M931-12110-60	M12-1.75 x 110	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*		

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

Metric, continued

Part No.	Dimensions	Type
Hex Nuts		
M934-03-50	M3-0.50	Standard
M934-04-50	M4-0.70	Standard
M934-05-50	M5-0.80	Standard
M982-05-60	M5-0.80	Elastic Stop
M934-06-60	M6-1.00	Standard
M934-06-64	M6-1.00	Std. (green)
M6923-06-80	M6-1.00	Spirallock
M982-06-80	M6-1.00	Elastic Stop
M934-08-60	M8-1.25	Standard
M6923-08-80	M8-1.25	Spirallock
M982-08-80	M8-1.25	Elastic Stop
M934-10-60	M10-1.50	Standard
M934-10-60F	M10-1.25	Standard
M6923-10-80	M10-1.50	Spirallock
M6923-10-62	M10-1.50	Spirallock†
M982-10-80	M10-1.50	Elastic Stop
M934-12-60	M12-1.75	Standard
M934-12-60F	M12-1.25	Standard
M6923-12-80	M12-1.75	Spirallock
M982-12-80	M12-1.75	Elastic Stop
M982-14-60	M14-2.00	Elastic Stop
M6923-16-80	M16-2.00	Spirallock
M982-16-80	M16-2.00	Elastic Stop
M934-18-80	M18-2.5	Standard
M982-18-60	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.

Notes

TP-5591 2/03d

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