

Service Parts

RV/Mobile Generator Sets



Models:

7CCO

7CCOZ

10CCO

10CCOZ

KOHLER[®]
POWER SYSTEMS

ISO 9001
KOHLER
GENERATORS
INTERNATIONALLY REGISTERED
U.S.A. Plant ISO Registered

Specification Series 190

TP-5596 1/97a

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Introduction

This manual contains a complete list of engine and generator service replacement parts for Kohler 7 and 10CCO/CCOZ Kubota-powered generator sets.

This manual includes the following main sections:

- **Table of Contents:** Lists the sections of this catalog.
- **Introduction (and other information sections):** Contains introductory material followed by sections on specification numbers, part numbers, and hardware.
- **Index:** Indexes specifications and their groups.
- **Group Parts Lists:** Lists part numbers of parts in the groups. Illustrations are given for most parts.
- **Kit List and kit sections:** Lists kits (by model) and their parts.
- **Appendices:** Includes Glossary of Abbreviations, Common Hardware Application Guidelines, Common Hardware Identification, General Torque Specifications, and Common Hardware List.

Number Significance

This catalog uses a variety of numbering systems. A description of these follows:

- **Specification Number:** The generator specification number (spec number) is six digits with a PA-, PB- or PE- prefix (Specification Number Index does not show prefixes). The first three digits designate generator size and engine model (specification series). The remaining digits are in sequence and identify a particular spec in a series. Spec numbers break down into groups.
- **Group Number:** A group consists of parts needed to perform one or more related functions. For example, the 101 group is the generator set Air Intake group.
- **Variation Number:** A group might have several variations. Parts comprising each variation perform the same function, but parts lists vary. For example, a 50 Hz generator alternator and 60 Hz generator alternator both perform the same function. However, they are constructed of different parts. Each of these differences necessitates the assignment of a group variation number.
- **Part Number:** The part number identifies an individual assembly, subassembly, component, or accessory kit.

Exploded View Drawings

- **Exploded view drawings:** One or more drawings which best represent a range of variations accompanies each Group Parts List in this catalog. The drawings are a guide to part identification—they are not intended for assembly, disassembly, or maintenance. **Use generator set service and other manuals for assembly and maintenance.**

Some parts are drawn out of proportion to display distinguishing characteristics. Some common parts are not drawn in detail. For example, the image of a hex cap screw represents a range of screws. Use the text description and part number to positively identify a part.

How to Find Part Numbers

FOLLOW THESE STEPS to identify a part:

STEP 1: Turn to the Specification Number Index in the front of the catalog. There is a table of spec numbers (grouped by model and listed vertically on the left) and the variations that comprise the groups of each spec number (listed horizontally). Locate a spec number and read across the page to see the variation numbers for the groups (identified by column headings).

STEP 2: Using the page number in the Table of Contents, turn to the group parts list in which the desired part belongs. Use the drawings and itemized text to locate the part and its part number.

Hardware Grades

When replacing hardware do not substitute inferior grade hardware. All hex. head screws are hardness grade 5, except where noted. Socket head screws are similar to grade 8. All replacement hardware should be at least equal to original manufacturer's hardware quality. Refer to Common Hardware Application Guidelines and Common Hardware Identification in the back of the manual.

Hardware References

Many common hardware items will appear in parts catalogs as **common hardware entries** or **hardware references**. A *common hardware entry* refers to the size of common hardware to apply in accordance with hardware guidelines. For example, item 2 (nut) in Figure 1 below would appear as "3/8-16 hardware" in the text. It indicates that the nut is 3/8-16 size. See Common Hardware Application Guidelines.

A *hardware reference* has the abbreviation "ref." in the part's description. Hardware references specify common hardware items; however, size or some other characteristic requires specification in that application. For example, item 1 in Figure 1 below might appear in the text as:

Screw, 3/8-16 x 1, ref. X-6021-1

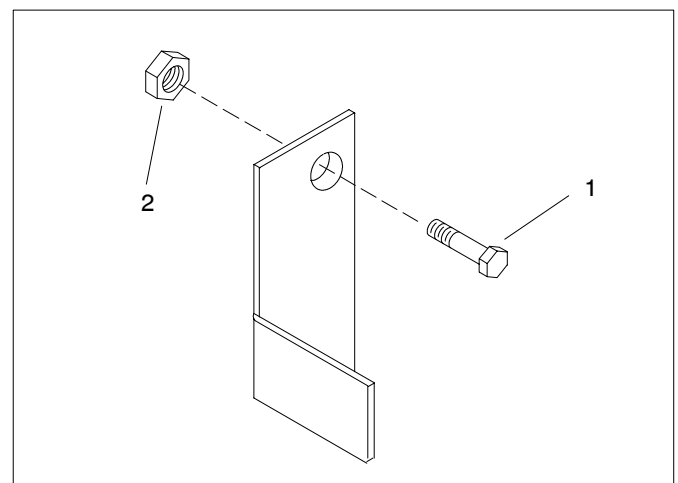


Figure 1. Hardware References

Specification Number Index

GROUP TITLE & NUMBER	<i>Crankcase</i>	<i>Oil Pan</i>	<i>Cylinder Head</i>	<i>Gear Case</i>	<i>Water Pump</i>	<i>Main Bearing Case</i>	<i>Cylinder Head Cover</i>	<i>Intake & Exhaust Manifold</i>	<i>Rocker Arm & Valves</i>	<i>Camshaft</i>	<i>Crankshaft & Piston</i>	<i>Flywheel</i>	<i>Starter</i>	<i>Fuel Injection pipes</i>
	1	2	3	4	5	6	7	9	11	12	13	14	15	16
SPEC NO.	VARIATION NUMBER													
7 kW														
190001	1	1	1	1	1	1	1	1	1	1	1	1	1	1
190003	1	1	1	1	1	1	1	1	1	1	1	1	1	1
190005	1	1	1	1	1	1	1	1	1	1	1	1	1	1
190007	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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190021	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 kW														
190002	2	2	2	2	2	2	2	2	2	2	2	2	2	2
190004	2	2	2	2	2	2	2	2	2	2	2	2	2	2
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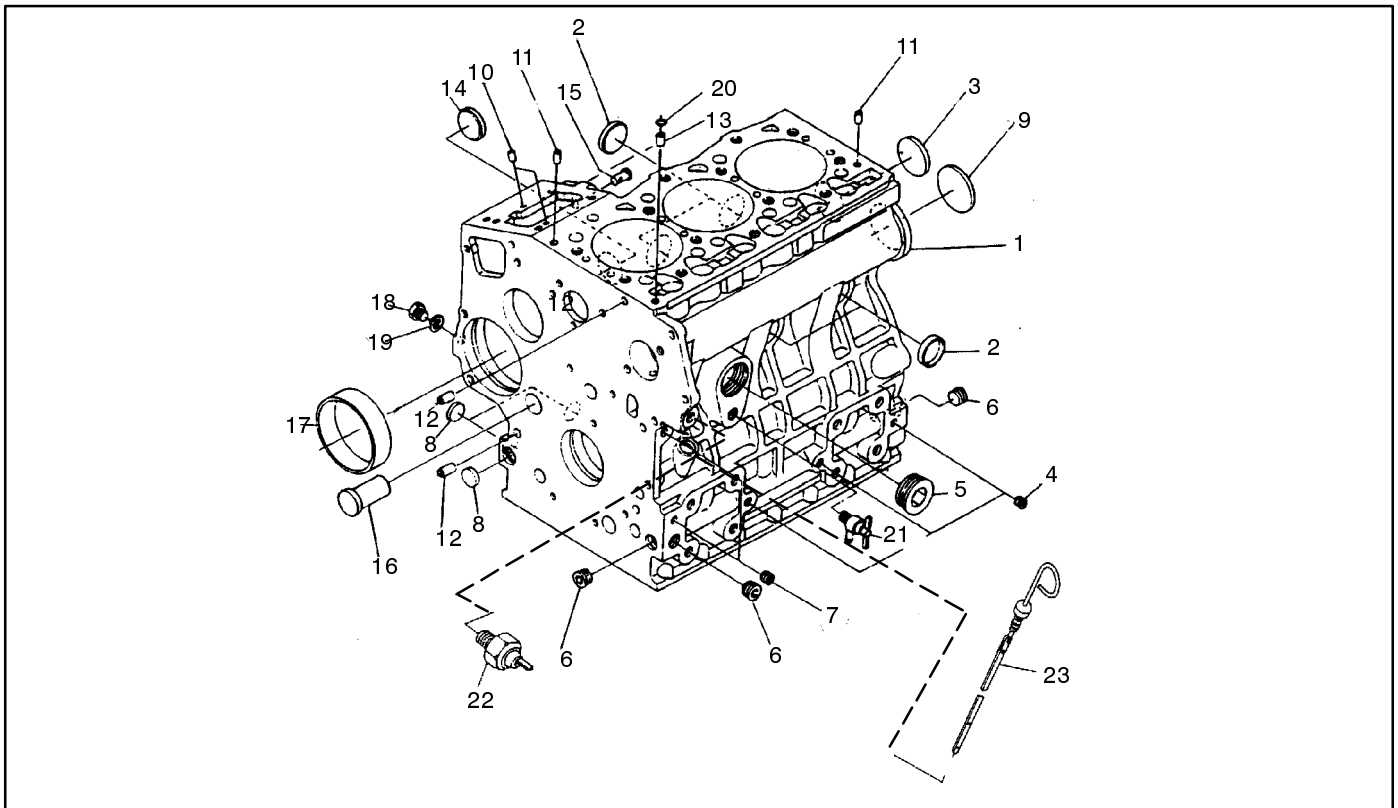
Specification Number Index

GROUP TITLE & NUMBER	17	18	19	20	21	22	23	24	25	26	29	30		
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190021	1	1	1	1	1	1	1	1	1	1	1	1		
10Kw														
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190024	2	2	2	2	1	2	2	2	2	1	1	2		

Specification Number Index

GROUP TITLE & NUMBER	<i>Air Intake</i>	<i>Cooling System</i>	<i>Engine</i>	<i>Nameplate and Decals</i>	<i>Oil Pressure Gauge & Switch</i>	<i>Skid and Plant Mounting</i>	<i>Generator and Mounting</i>	<i>Controller and Mounting</i>	<i>Literature</i>					
	101	104	105	107	108	109	201	301	701					
SPEC NO.	VARIATION NUMBER													
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190005	1	1	1	3	-	1	3	2	1					
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10Kw														
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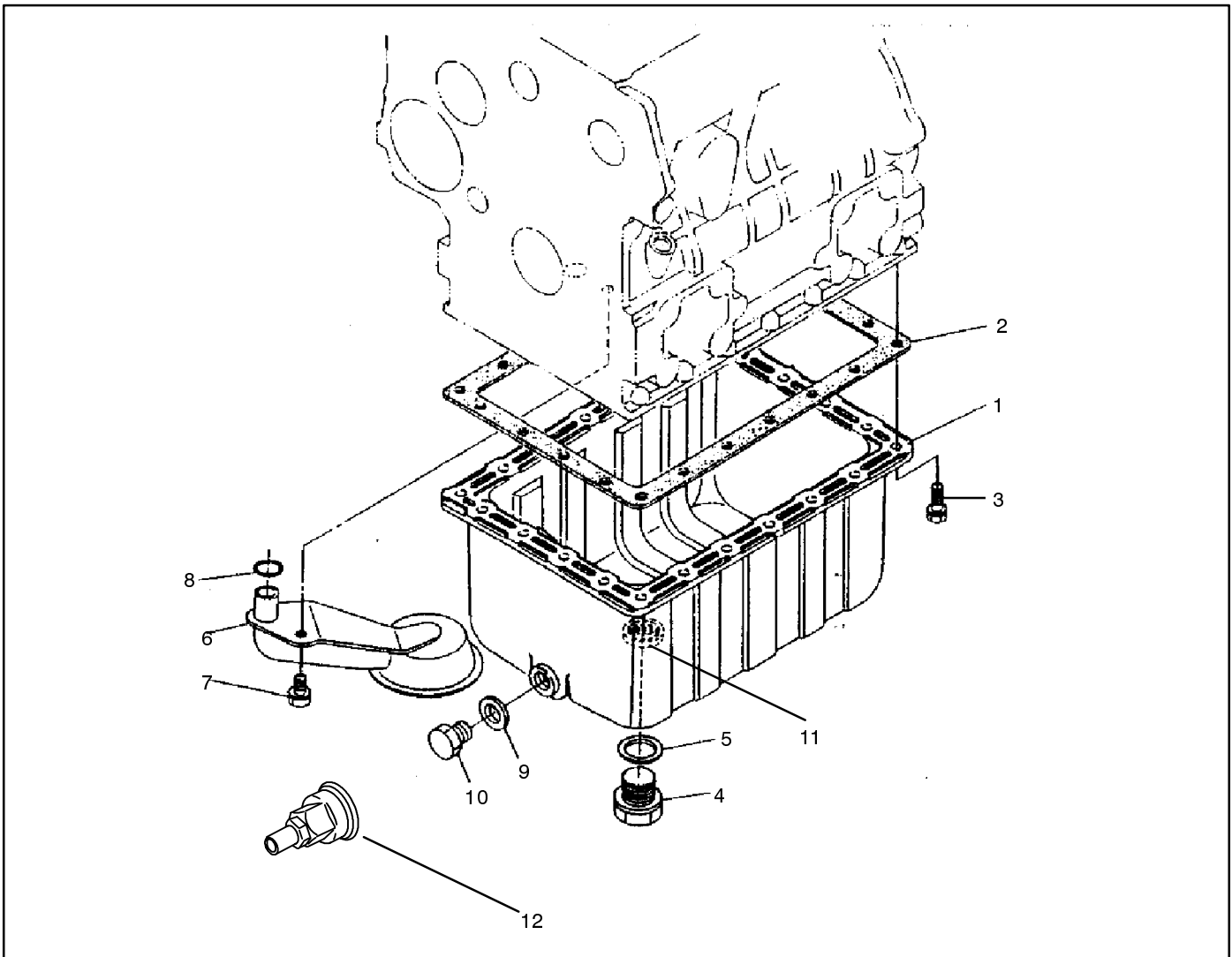
Group 1: Crankcase



Item	Qty.	Description Variation	Part No.
1	1	Complete Crankcase (Includes items 2-20)	322532
	1	Complete Crankcase (Includes items 2-20)	322510
2	4	Cap, Sealing	322085
	6	Cap, Sealing	322085
3	1	Cap, Sealing	322062
4	3	Plug	322079
	4	Plug	322079
5	1	Plug	322449
6	3	Plug	322362
7	2	Plug	322109
8	3	Plug, Expansion	322490
9	1	Plug, Expansion	322450
10	1	Pin, Straight	322040
	2	Pin, Straight	322040

Item	Qty.	Description Variation	Part No.
11	2	Pin, Straight	322041
12	2	Pin, Pipe	322071
13	1	Pin, Pipe	322307
14	1	Plug	322364
	2	Plug	322364
15	1	Pin, Start Spring	322403
	2	Pin, Start Spring	322403
16	1	Plug	322455
17	1	Bush, Governor Gear	322434
18	1	Plug	322063
19	1	Gasket	322059
20	1	O-Ring	322064
21	1	Cock Assembly, Drain	322137
22	1	Switch, Oil Pressure	322112
23	1	Dipstick, Oil	322376

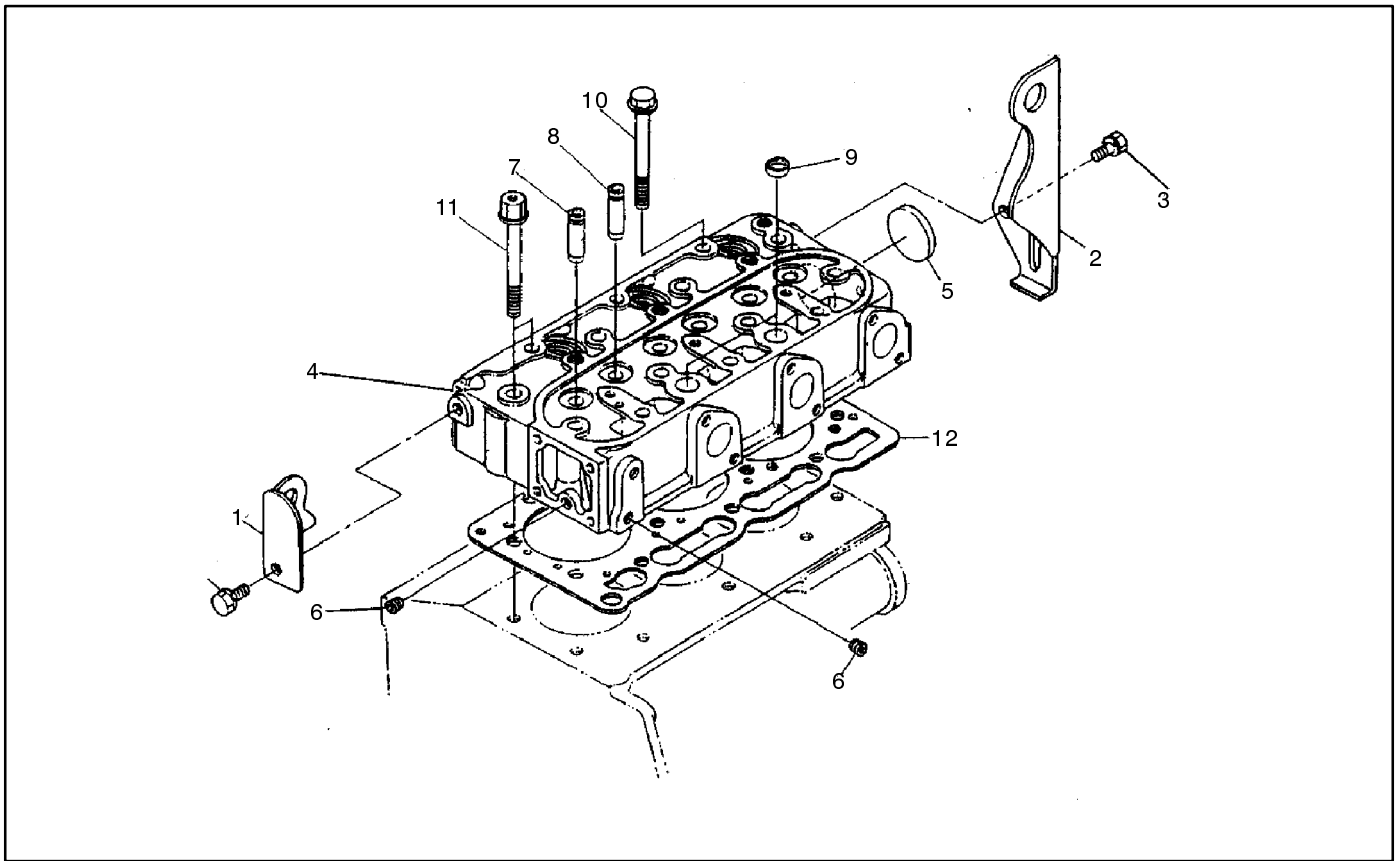
Group 2: Oil Pan



Item	Qty.	Description Variation	Part No.
1	1	Complete Oil Pan 1	322464
	1	Complete Oil Pan 2, 3	322465
2	1	Gasket, Oil Pan 1	322231
	1	Gasket, Oil Pan 2, 3	322236
3	22	Bolt 1	322001
	26	Bolt 2, 3	322001
4	1	Plug, Drain 1, 2, 3	322084

Item	Qty.	Description Variation	Part No.
5	1	Gasket 1, 2, 3	322086
6	1	Filter, Oil 1, 2, 3	322306
7	1	Bolt 1, 2, 3	322012
8	1	O-Ring 1, 2, 3	322035
9	1	Gasket 1, 2	322539
10	1	Plug 1, 2	322065
11	1	Nut, Drain 1, 2, 3	322457
12	1	Valve, Oil Drain 3	225696

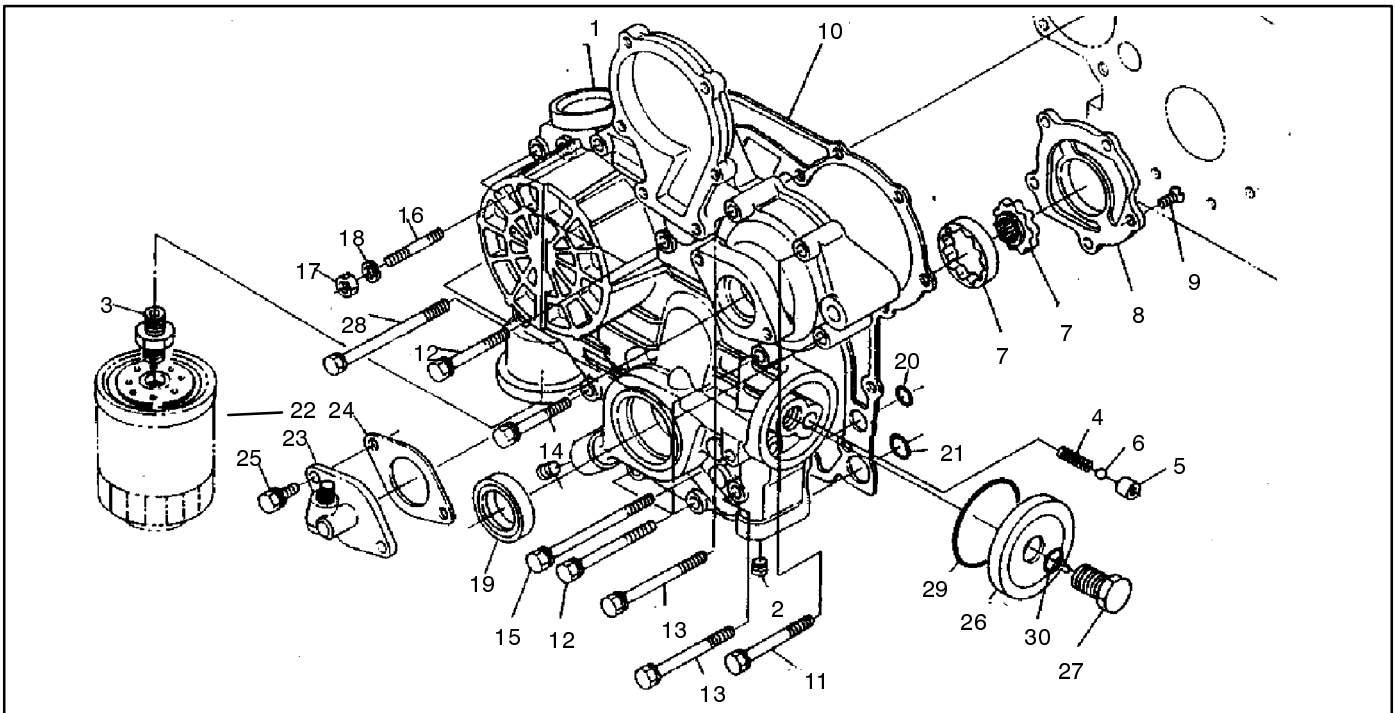
Group 3: Cylinder Head



Item	Qty.	Description Variation	Part No.
1	1	Hook, Engine 1 1, 2	322237
2	1	Hook, Engine 2 1, 2	322238
3	2	Bolt 1, 2	322011
4	1	Cylinder Head (Includes items 5-9) 1	322229
	1	Cylinder Head (Includes items 5-9) 2	322369
5	1	Cap, Sealing 1, 2	322080
6	2	Plug 1, 2	322079
7	3	Guide, Inlet Valve 1	322261
	4	Guide, Inlet Valve 2	322261

Item	Qty.	Description Variation	Part No.
8	3	Guide, Exhaust Valve 1	322262
	4	Guide, Exhaust Valve 2	322262
9	2	Cap, Sealing 1	322073
	3	Cap, Sealing 2	322073
10	12	Bolt, Cylinder Head 1	322239
	16	Bolt, Cylinder Head 2	322239
11	2	Bolt, Cylinder Head 1, 2	322410
12	1	Gasket, Cylinder Head 1	322225
	1	Gasket, Cylinder Head 2	322409

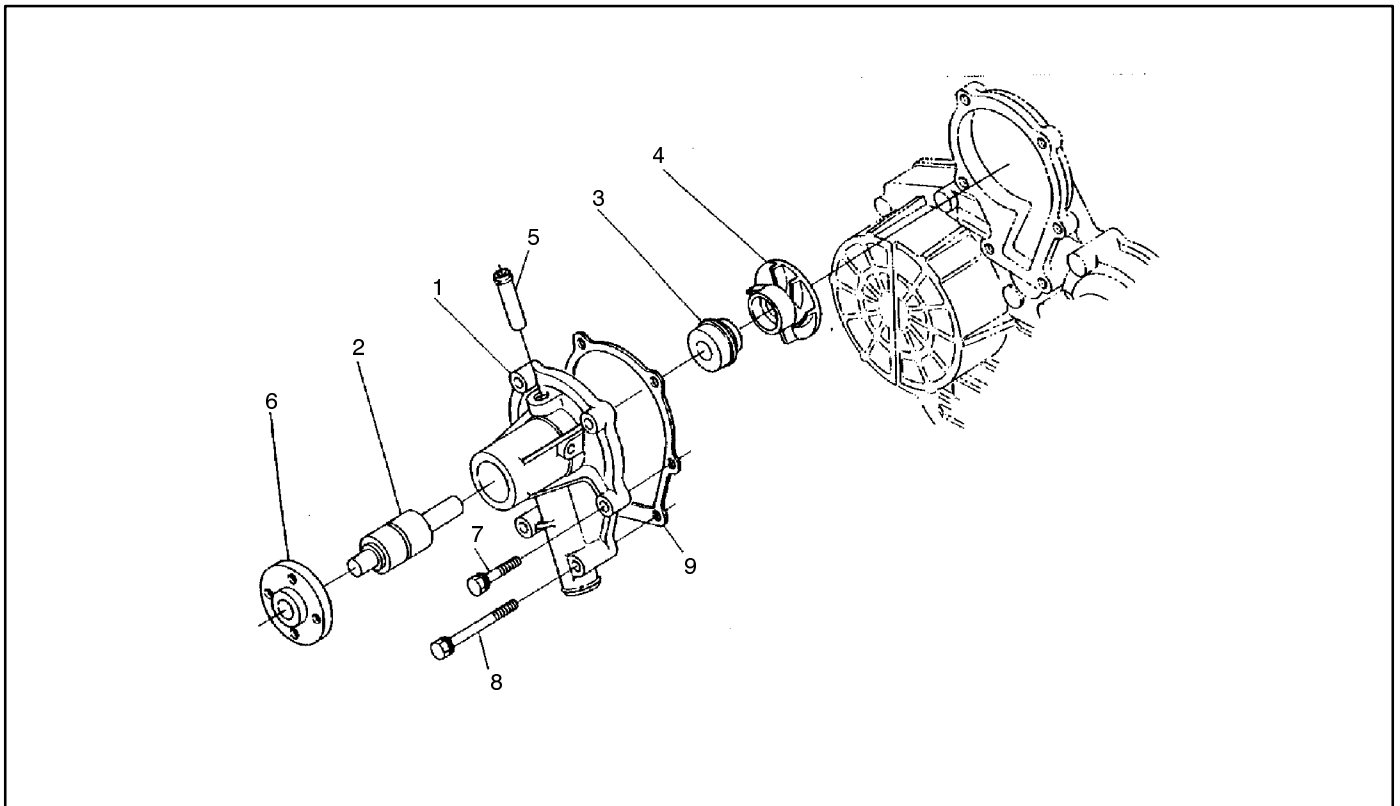
Group 4: Gear Case



Item	Qty.	Description Variation	Part No.
1	1	Complete Case, Gear (Includes items 2-9) 1, 2	322371
2	4	Plug 1	322363
	2	Plug 2	322363
3	1	Joint, Pipe 1, 2	322072
4	1	Spring 1, 2	322311
5	1	Seat, Valve 1, 2	322310
6	1	Ball 1, 2	322046
7	1	Rotor, Oil Pump 1, 2	322308
8	1	Cover, Oil Pump 1, 2	322375
9	5	Screw 1, 2	322357
10	1	Gasket, Gear Case 1, 2	322241
11	3	Bolt 1, 2	322007
12	6	Bolt 1	322008
	4	Bolt 2	322008
13	2	Bolt 1, 2	322009
14	1	Bolt 1, 2	322139

Item	Qty.	Description Variation	Part No.
15	2	Bolt 1, 2	322351
16	1	Stud 1, 2	322021
17	1	Nut 1, 2	322023
18	1	Washer, Spring 1, 2	322030
19	1	Seal, Oil 1, 2	322372
20	2	O-Ring 1, 2	322036
21	2	O-Ring 1, 2	322034
22	1	Cartridge Assembly, Oil 1, 2	322422
23	1	Cover 1, 2	322462
24	1	Gasket, H/Meter Unit 1, 2	322349
25	2	Bolt w/Washer 1, 2	322002
26	1	Cover 1, 2	322373
27	1	Bolt 1, 2	322374
28	1	Bolt 1, 2	322535
29	1	O-Ring 1, 2	322039
30	1	O-Ring 1, 2	322034

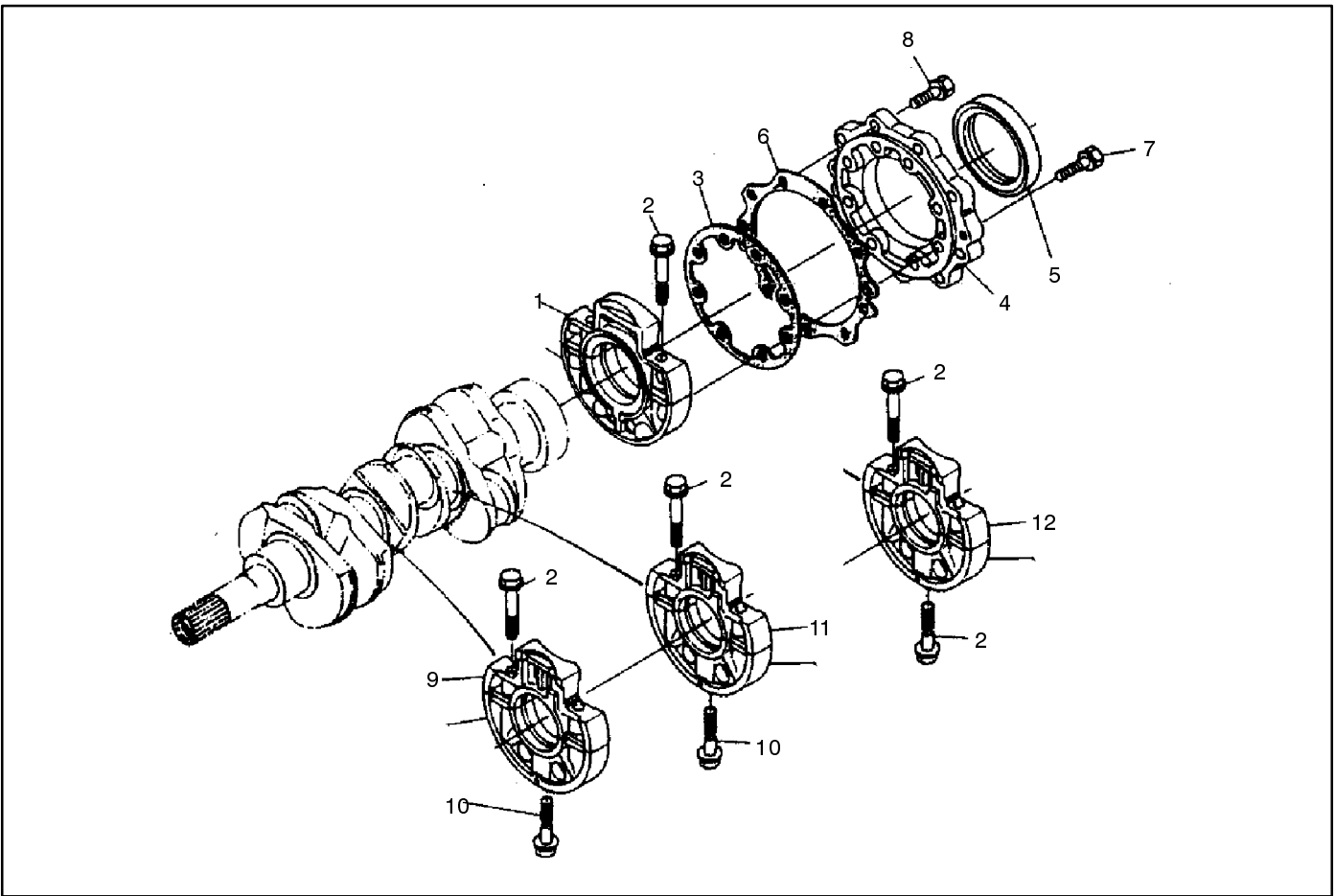
Group 5: Water Pump



Item	Qty.	Description Variation	Part No.
1	1	Water Pump Assembly (Includes items 2-6) 1, 2	322379
2	1	Bearing, Ball 1, 2	322383
3	1	Assy Seal, Mechanical 1, 2	322088
4	1	Impeller, Water Pump 1, 2	322381

Item	Qty.	Description Variation	Part No.
5	1	Pipe, Water Return 1 1, 2	322344
6	1	Flange, Water Pump 1	322382
	1	Flange, Water Pump 2	322526
7	4	Bolt 1, 2	322006
8	2	Bolt 1, 2	322010
9	1	Gasket, Water Pump 1, 2	322380

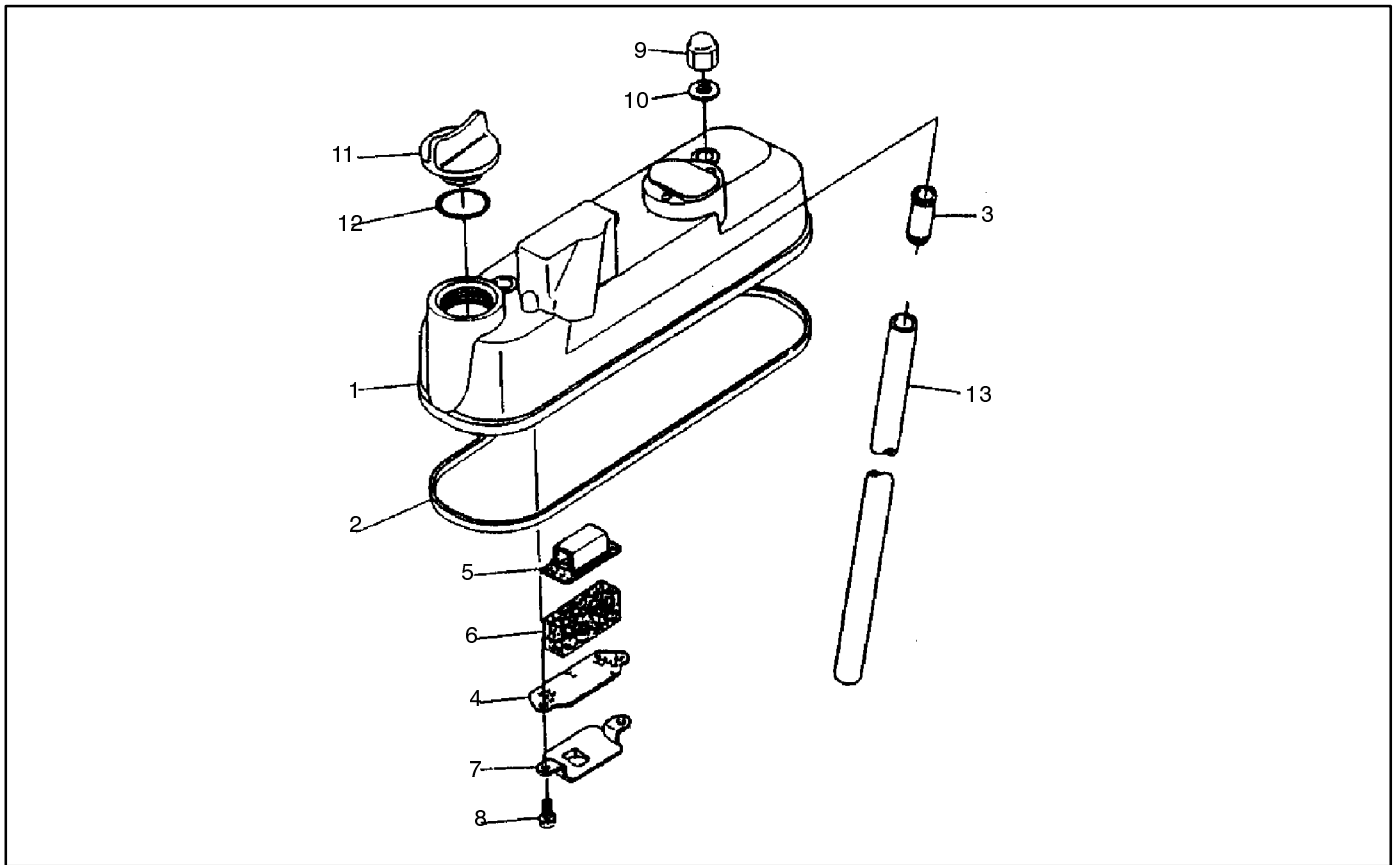
Group 6: Main Bearing Case



Item	Qty.	Description Variation	Part No.
1	1	Case, Main Bearing 1, 2	322240
2	6	Bolt, Bearing Case 1 1	322244
	8	Bolt, Bearing Case 1 2	322224
3	1	Gasket, Bearing Case 1, 2	322242
4	1	Cover, Bearing Case 1, 2	322246
5	1	Seal, Oil 1, 2	322243
6	1	Gasket, Bearing Case Cover 1, 2	322247

Item	Qty.	Description Variation	Part No.
7	8	Bolt 1, 2	322005
8	9	Bolt 1, 2	322004
9	1	Case, Main Bearing 1 1, 2	322411
10	2	Bolt, Bearing Case 2 1	322245
	3	Bolt, Bearing Case 2 2	322245
11	1	Case, Main Bearing 2 1, 2	322412
12	1	Case, Main Bearing 3 2	322413

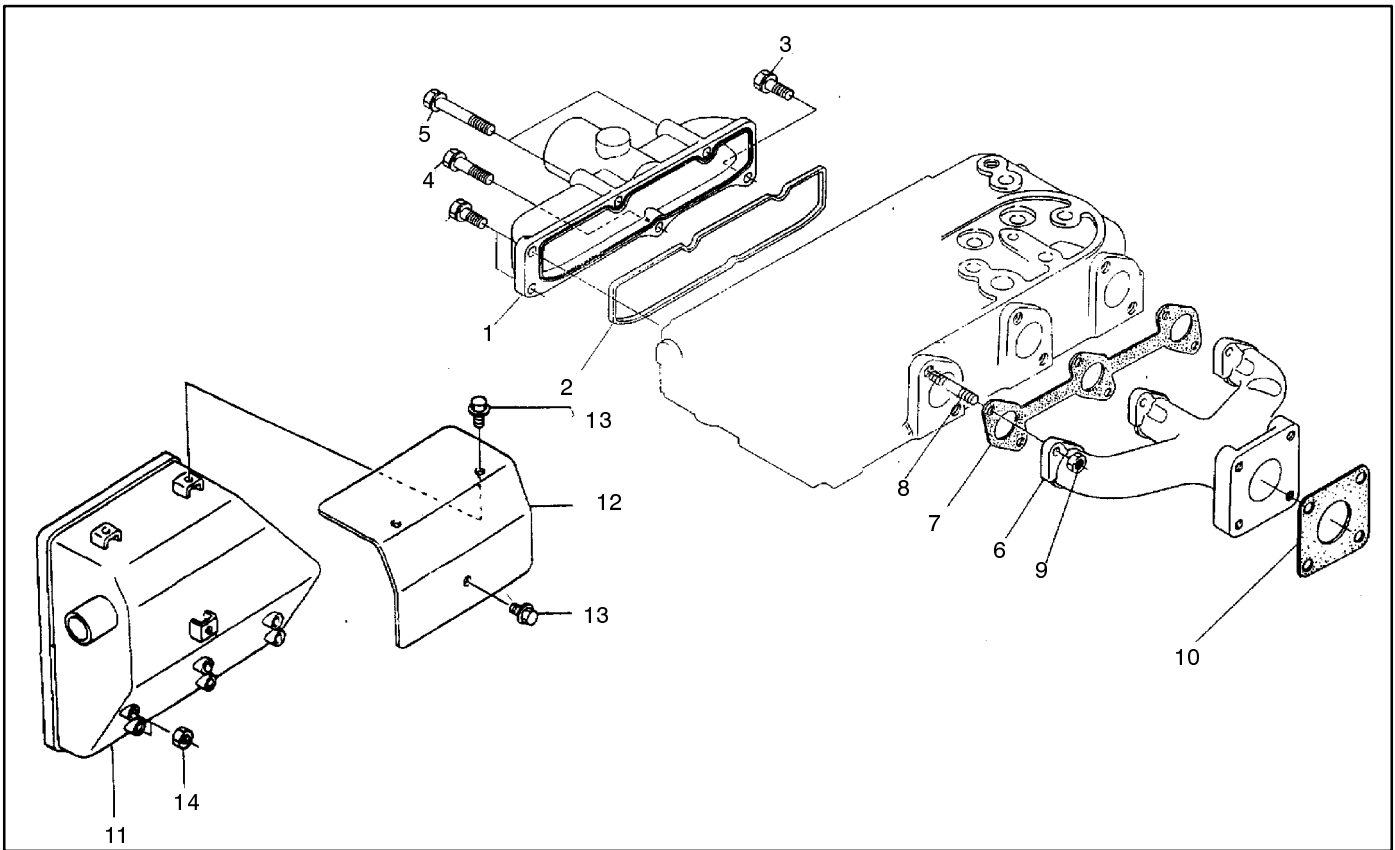
Group 7: Cylinder Head Cover



Item	Qty.	Description Variation	Part No.
1	1	Cover, Cylinder Head 1	322527
	1	Cover, Cylinder Head 2	322272
2	1	Gasket, Head Cover 1	322528
	1	Gasket, Head Cover 2	322273
3	1	Joint, Breather Pipe 1, 2	322252
4	1	Plate, Element 1 1, 2	322248
5	1	Plate, Element 2 1, 2	322249
6	1	Element, Breather 1, 2	322253
7	1	Oil Shield, Breather 1, 2	322250

Item	Qty.	Description Variation	Part No.
8	2	Screw, with Washer 1, 2	322025
9	3	Nut, Cap 1	322224
	4	Nut, Cap 2	322224
10	3	Gasket 1	322223
	4	Gasket 2	322223
11	1	Plug, Oil Filter 1	322194
	2	Plug, Oil Filter 2	322524
12	1	O-Ring 1	322038
	2	O-Ring 2	322038
13	1	Pipe, Breather 1, 2	322251

Group 9: Intake & Exhaust Manifold



Item	Qty.	Description Variation	Part No.
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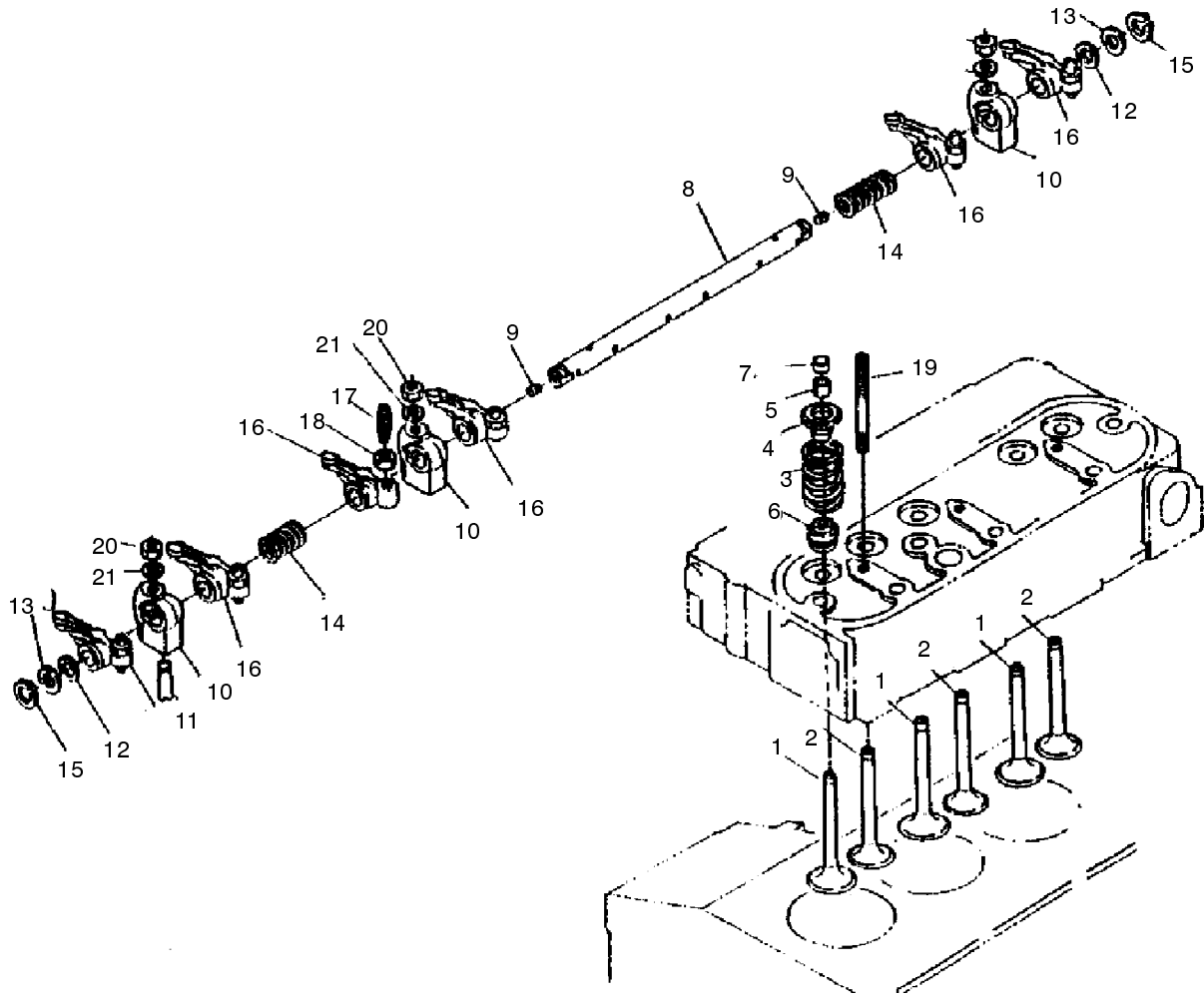
1	1	Manifold, Intake 1, 3	322385
1	1	Manifold, Intake 2	322414
2	1	Gasket, Intake Manifold 1, 3	322386
1	1	Gasket, Intake Manifold 2	322254
3	3	Bolt 1, 2, 3	322003
4	1	Bolt 1, 3	322006
	2	Bolt 2	322006
5	2	Bolt 1, 3	322008
	3	Bolt 2	322008
6	1	Manifold, Exhaust 1	322489
	1	Manifold, Exhaust 2	322467

Item	Qty.	Description Variation	Part No.
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7	1	Gasket, Exhaust Manifold 1, 3	322387
	1	Gasket, Exhaust Manifold 2	322255
8	6	Stud 1	322353
	8	Stud 2	322353
	3	Stud, Long 3	322613
	3	Stud, Short 3	322614
9	6	Nut 1	322447
	8	Nut 2	322447
10	1	Gasket, Muffler 1, 2	322081
11	1	Muffler 3	322584
12	1	Muffler Cover 3	225998
13	3	Bolt 3	X-6049-8
14	6	Nut 3	322447

Notes

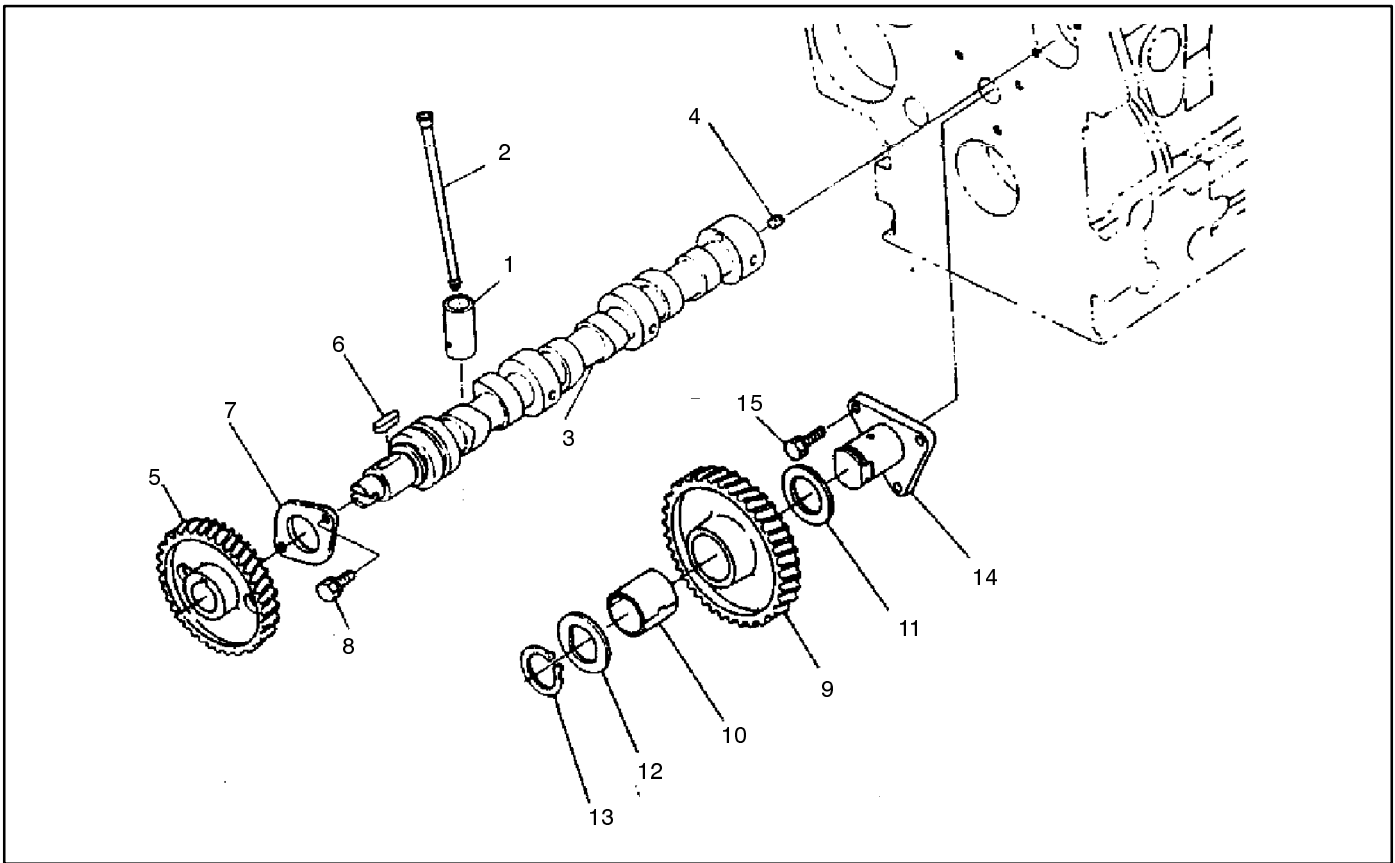
Group 11: Rocker Arm & Valves



Group 11: Rocker Arm & Valves

Item	Qty.	Description Variation	Part No.	Item	Qty.	Description Variation	Part No.
1	3	Valve, Inlet 1	322256	12	2	Washer 1 1, 2	322270
	4	Valve, Inlet 2	322256	13	2	Washer 2 1, 2	322271
2	3	Valve, Exhaust 1	322257	14	2	Spring, Rocker Arm 1	322267
	4	Valve, Exhaust 2	322257		3	Spring, Rocker Arm 2	322267
3	6	Spring, Valve 1	322415	15	2	Cir-Clip, External 1, 2	322534
	8	Spring, Valve 2	322415	16	6	Assembly, Rocker Arm (Includes items 17 & 18) 1	322263
4	6	Retainer, Valve Spring 1	322260		8	Assembly, Rocker Arm (Includes items 17 & 18) 2	322263
	8	Retainer, Valve Spring 2	322260	17	6	Screw, Adjusting 1	322265
5	6	Collet, Valve Spring 1	322074		8	Screw, Adjusting 2	322265
	8	Collet, Valve Spring 2	322074	18	6	Nut 1	322266
6	6	Seal, Valve Stem 1	322258		8	Nut 2	322266
	8	Seal, Valve Stem 2	322258	19	3	Stud 1	322269
7	6	Cap, Valve 1	322259		4	Stud 2	322269
	8	Cap, Valve 2	322259	20	3	Nut 1	322077
8	1	Shaft, Rocker Arm (Includes item 9) 1	322388		4	Nut 2	322077
	1	Shaft, Rocker Arm 2	322264	21	3	Washer, Plain 1	322078
9	2	Screw, Set 1, 2	322027		4	Washer, Plain 2	322078
10	3	Bracket, Rocker Arm 1	322268		4	Washer, Plain 2	322078
	4	Bracket, Rocker Arm 2	322268				
11	1	Screw, Set 1, 2	322075				

Group 12: Camshaft



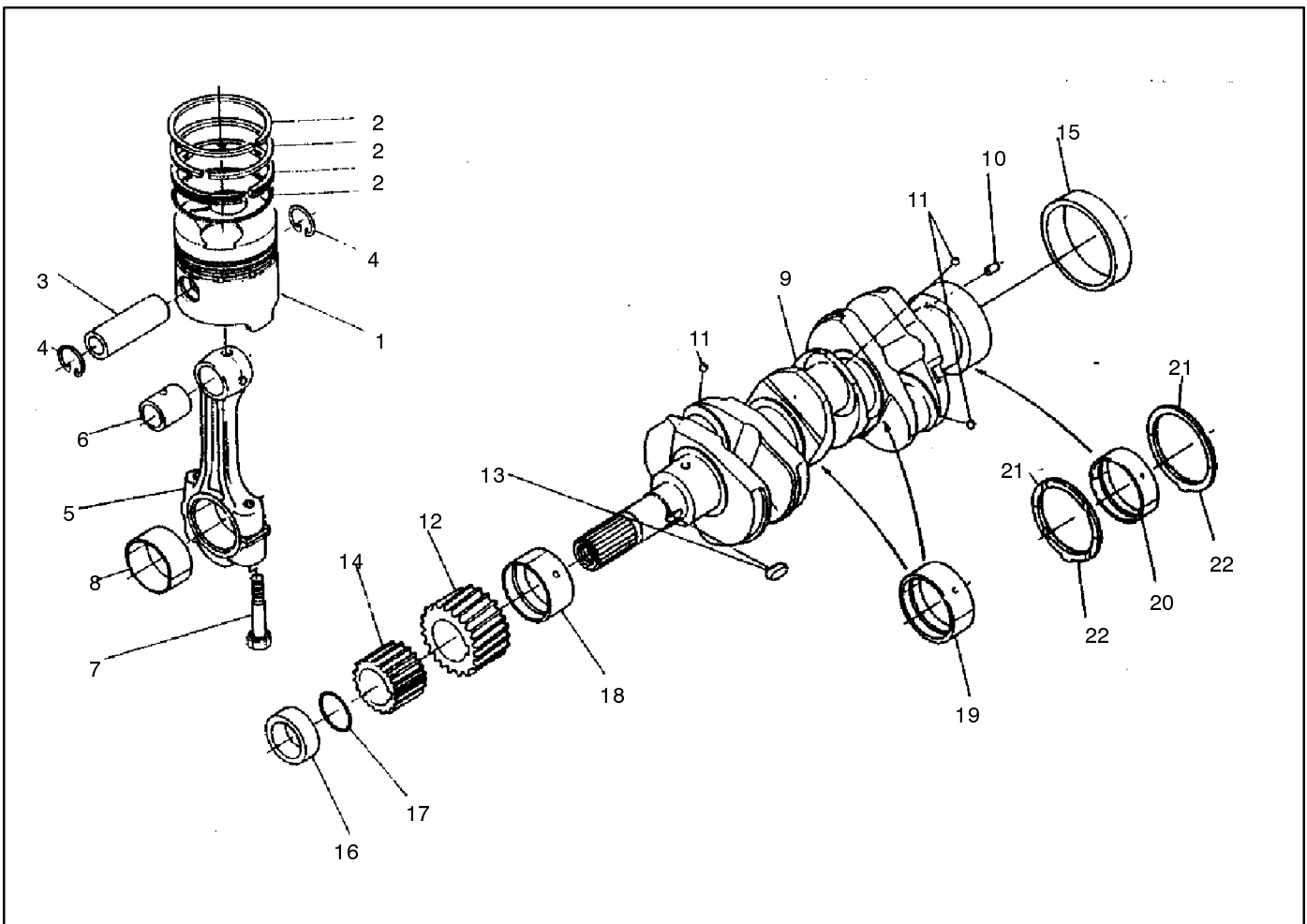
Item	Qty.	Description Variation	Part No.
1	6	Tappet 1	322389
	8	Tappet 2	322389
2	6	Push Rod 1	322274
	8	Push Rod 2	322274
3	1	Camshaft Assembly (Includes items 4-8) 1	322390
	1	Camshaft 2	X
4	1	Screw, Set 1,2	X
5	1	Gear, Camshaft 1,2	X
6	1	Key, Feather 1,2	X

Item	Qty.	Description Variation	Part No.
7	1	Stopper, Camshaft 1,2	X
8	2	Bolt 1,2	X
9	1	Complete Idle Gear 1 (Includes item 10) 1,2	322420
10	1	Bushing, Idle Gear 1,2	322421
11	1	Collar, Idle Gear 1 1,2	322303
12	1	Collar, Idle Gear 2 1,2	322304
13	1	Cir-Clip, Idle Gear 1,2	322302
14	1	Shaft, Idle Gear 1 1,2	322301
15	3	Bolt With Washer 1	322002

X Part not available separately.

Notes

Group 13: Crankshaft & Piston



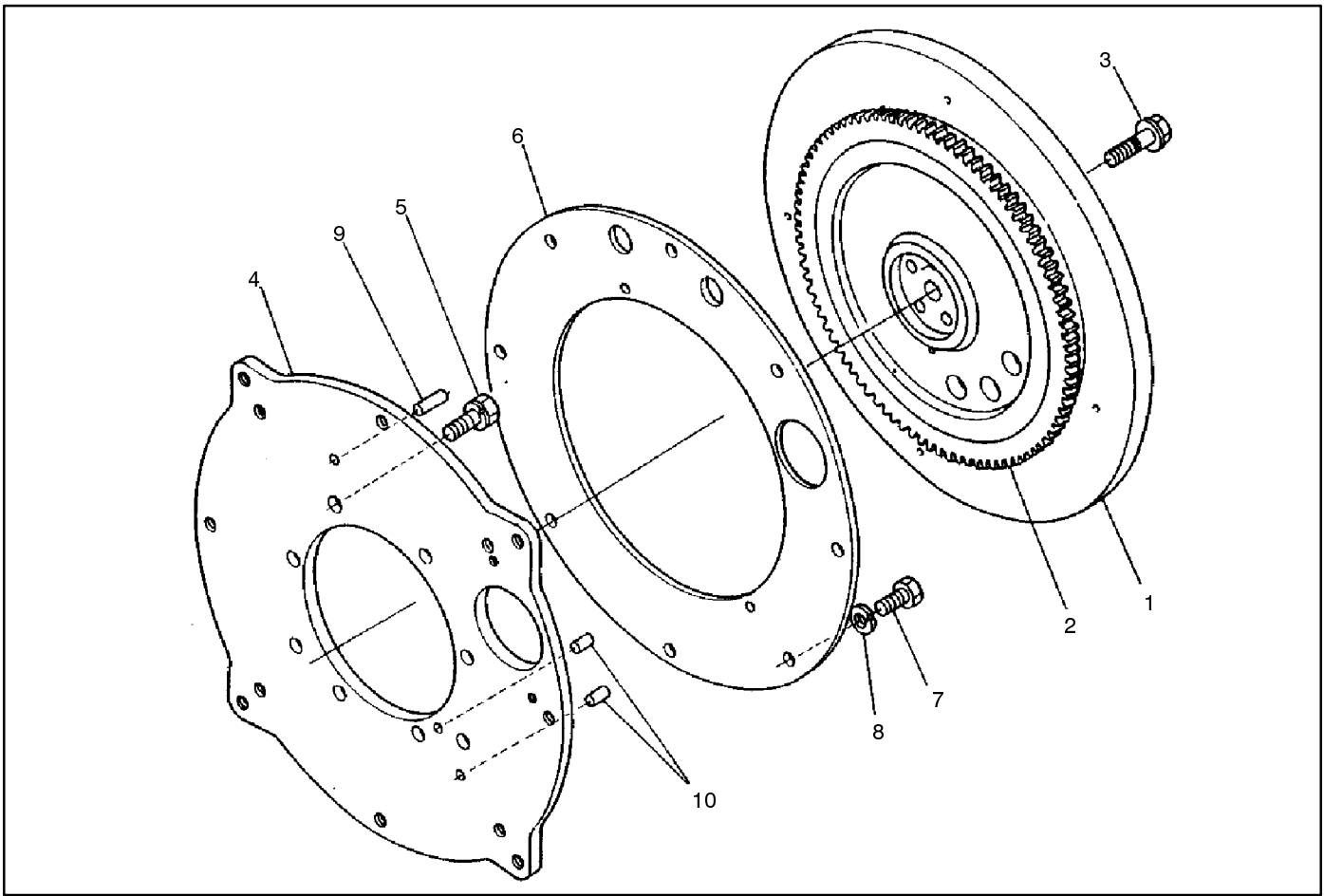
Item	Qty.	Description Variation	Part No.
1	3	Piston Std	322226
	1		
	4	Piston Std	322367
	2		
	3	Piston +0.5	322227
	1		
	4	Piston +0.5	322368
	2		
2	3	Piston Ring Assembly Std	322221
	1		
	4	Piston Ring Assembly Std	322418
	2		
	3	Piston Ring Assembly +0.5mm	322222
	1		
	4	Piston Ring Assembly +0.5mm	322419
	2		
3	3	Pin, Piston	322279
	1		
	4	Pin, Piston	322279
	2		

Item	Qty.	Description Variation	Part No.
4	6	Cir-Clip, Piston Pin	322280
	1		
	8	Cir-Clip, Piston Pin	322280
	2		
5	3	Connecting Rod Assembly (Includes items 6-8)	322283
	1		
	4	Connecting Rod Assembly (Includes items 6-8)	322283
	2		
6	3	Bushing, Piston Pin	322282
	1		
	4	Bushing, Piston Pin	322282
	2		
7	6	Bolt, Connecting Rod	322284
	1		
	8	Bolt, Connecting Rod	322284
	2		

Group 13: Crankshaft & Piston

Item	Qty.	Description Variation	Part No.	Item	Qty.	Description Variation	Part No.	
8	3	Bushing, Crankpin Std 1	322285	18	1	Bushing, Crankshaft 1 Std 1, 2	322291	
	4	Bushing, Crankpin Std 2	322285		1	Bushing, Crankshaft 1 -0.2mm 1, 2	322296	
	3	Bushing, Crankpin -0.2mm (Set) 1	322286		1	Bushing, Crankshaft 1 -0.4mm 1, 2	322297	
	4	Bushing, Crankpin -0.2mm (Set) 2	322286	19	2	Bushing, Crankshaft 2 Std (Set) 1	322292	
	3	Bushing, Crankpin -0.4mm (Set) 1	322287		3	Bushing, Crankshaft 2 Std (Set) 2	322292	
	4	Bushing, Crankpin -0.4mm (Set) 2	322287		2	Bushing, Crankshaft 2 -0.2mm (Set) 1	322298	
9	1	Complete Crankshaft (Includes items 10-15) 1	322235		3	Bushing, Crankshaft 2 -0.2mm (Set) 2	322298	
	1	Complete Crankshaft (Includes items 10-15) 2	322288		2	Bushing, Crankshaft 2 -0.4mm (Set) 1	322299	
10	1	Pin, Straight 1, 2	322040		3	Bushing, Crankshaft 2 -0.4mm (Set) 2	322299	
11	3	Ball 1	322047		20	1	Bushing, Crankshaft 3 Std (Set) 1, 2	322293
	4	Ball 2	322047		1	Bushing, Crankshaft 3 -0.2mm (Set) 1, 2	322294	
12	1	Gear, Crankshaft 1, 2	322300		1	Bushing, Crankshaft 3 -0.4mm (Set) 1, 2	322295	
13	1	Key 1, 2	322448		21	2	Bushing, Side 1 Std 1, 2	322105
14	1	Gear, Oil Pump Drive 1, 2	322309		2	Bushing, Side 1 +0.2mm 1, 2	322106	
15	1	Sleeve, Crankshaft 1, 2	322290		2	Bushing, Side 1 +0.4mm 1, 2	322107	
16	1	Collar, Crankshaft 1, 2	322289		22	2	Bushing, Side 2 Std 1, 2	322497
17	1	O-Ring 1, 2	322037		2	Bushing, Side 2 +0.2mm 1, 2	322498	
					2	Bushing, Side 2 +0.4mm 1, 2	322499	

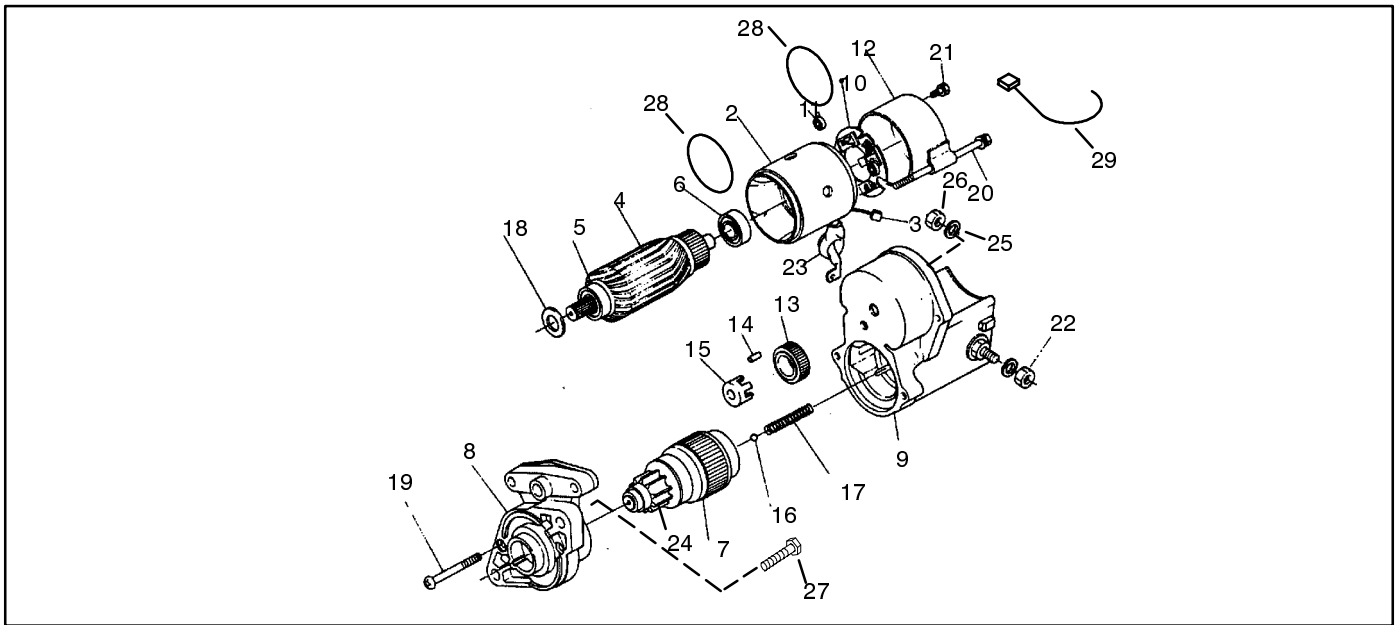
Group 14: Flywheel



Item	Qty.	Description Variation	Part No.
1	1	Complete Flywheel (Includes item 2) 1	322496
	1	Complete Flywheel (Includes item 2) 2	322513
2	1	Gear, Ring 1, 2	322404
3	6	Bolt, Flywheel 1, 2	322305
4	1	Plate, Rear End 1, 2	322512

Item	Qty.	Description Variation	Part No.
5	10	Bolt 1, 2	322076
6	1	Locator 1, 2	322511
7	8	Bolt 1, 2	322518
8	8	Washer, Spring 1, 2	322031
9	1	Pin, Straight 1, 2	322043
10	2	Pin, Straight 1, 2	322042

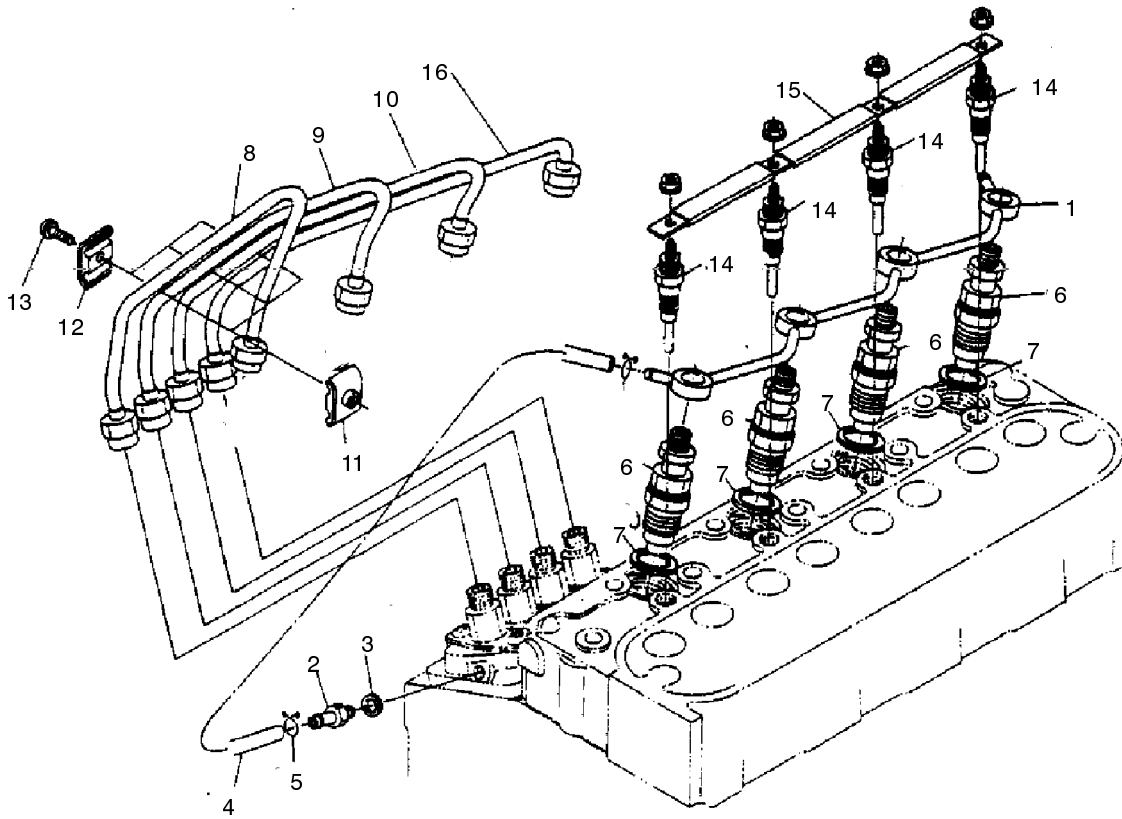
Group 15: Starter Component Parts



Item	Qty.	Description Variation	Part No.
1	1	Starter (Includes items 2-26, 28)	
		1	322098
		2	322439
		3	322585
2	1	Yoke	
		1	322090
		2	322441
		3	322586
3	2	Brush	
		1, 2, 3	322093
4	1	Armature	
		1	322089
		2	322440
		3	322587
5	1	Bearing, Ball	
		1	322103
		2	322530
		3	322588
6	1	Bearing, Ball	
		1	322104
		2	322444
		3	322589
7	1	Clutch	
		1, 2	322101
		3	322590
8	1	Housing	
		1, 2	322100
		3	322591
9	1	Switch, Magnetic	
		1	322099
		2	322525
		3	322592
10	1	Holder, Brush	
		1	322094
		2	322443
		3	322593
11	4	Spring, Brush	
		1, 2	322540
		3	322594
12	1	Frame, End	
		1, 2	322091
		3	322595

Item	Qty.	Description Variation	Part No.
13	1	Gear	
		1, 2	322082
		3	322596
14	5	Roller	
		1, 2, 3	322502
15	1	Retainer	
		1, 2	322503
		3	322597
16	1	Ball	
		1, 2, 3	322505
17	1	Spring	
		1, 2	322504
		3	322598
18	1	Washer, Felt	
		1	322097
19	2	Screw, Pan Head	
		1, 2	322096
		2	Bolt
		3	322599
20	2	Bolt, Through	
		1, 2	322092
		3	322600
21	2	Bolt	
		1, 2	322095
		3	322601
22	1	Nut, Hexagon	
		1, 2	322057
		3	322602
23	1	Cover, Cord	
		1, 2	322102
		3	322603
24	1	Pinion, Bevel	
		2	322442
25	1	Washer, Spring	
		2	322523
26	1	Nut, Hexagon	
		2	322515
27	2	Bolt	
		1, 2, 3	322015
28	2	O-Ring	
		3	322604
29		Cord, Stop Solenoid	
		1, 3	322605

Group 16: Fuel Injection Pipes

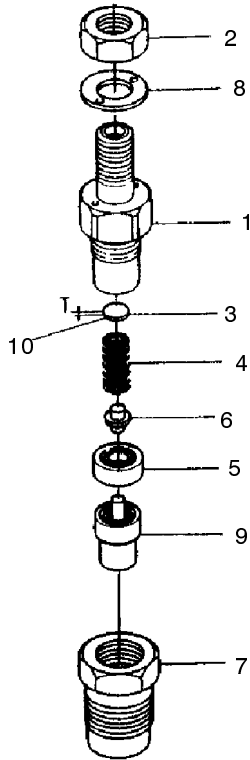


Group 16: Fuel Injection Pipes

Item	Qty.	Description Variation	Part No.
1	1	Pipe, Overflow 1	322392
1	1	Pipe, Overflow 2	322424
2	1	Screw Air Breather 1,2	322123
3	1	Gasket 1,2	322110
4	1	Pipe Assembly, Overflow (Includes item 5) 1,2	322423
5	2	Band, Pipe 1,2	322312
6	3	Holder, Nozzle 1	322400
	4	Holder, Nozzle 2	322400
7	3	Gasket 1	322134
	4	Gasket 2	322134
8	1	Pipe, Injection 1 1,2	322430

Item	Qty.	Description Variation	Part No.
9	1	Pipe, Injection 2 1,2	322431
10	1	Pipe, Injection 3 1,2	322432
11	2	Clamp, Pipe 1 1	322135
	3	Clamp, Pipe 1 2	322135
	2	Clamp, Pipe 2 1	322136
	3	Clamp, Pipe 2 2	322136
13	2	Screw, w/Washer 1	322026
	3	Screw, w/Washer 2	322026
14	3	Plug, Glow (engine serial numbers before 489915)	322405
14	3	Plug, Glow (engine serial numbers after 489915) 1	225464
	4	Plug, Glow 2	322341
15	1	Cord, Glow Plug 1	322406
	1	Cord, Glow Plug 2	322445
16	1	Pipe, Injection 4 2	322433

Group 17: Nozzle Component Parts



Item	Qty.	Description Variation	Part No.
1	3	Holder, Nozzle (Includes items 2-9) 1	322400
	4	Holder, Nozzle (Includes items 2-9) 2	322400
2	3	Nut 1	322142
	4	Nut 2	322142
3	3	Washer, Adjusting 1	322130
	4	Washer, Adjusting 2	322130
4	3	Spring, Nozzle 1	322129
	4	Spring, Nozzle 2	322129
5	3	Piece, Distance 1	322133
	4	Piece, Distance 2	322133

Item	Qty.	Description Variation	Part No.
6	3	Push Rod 1	322128
	4	Push Rod 2	322128
7	3	Nut, Nozzle 1	322132
	4	Nut, Nozzle 2	322132
8	3	Washer 1	322146
	4	Washer 2	322146
9	3	Piece, Nozzle 1	322401
	4	Piece, Nozzle 2	322401
10	1	Assembly Washer (Includes 1 of each of the adjusting washers which follow) 1,2	322151

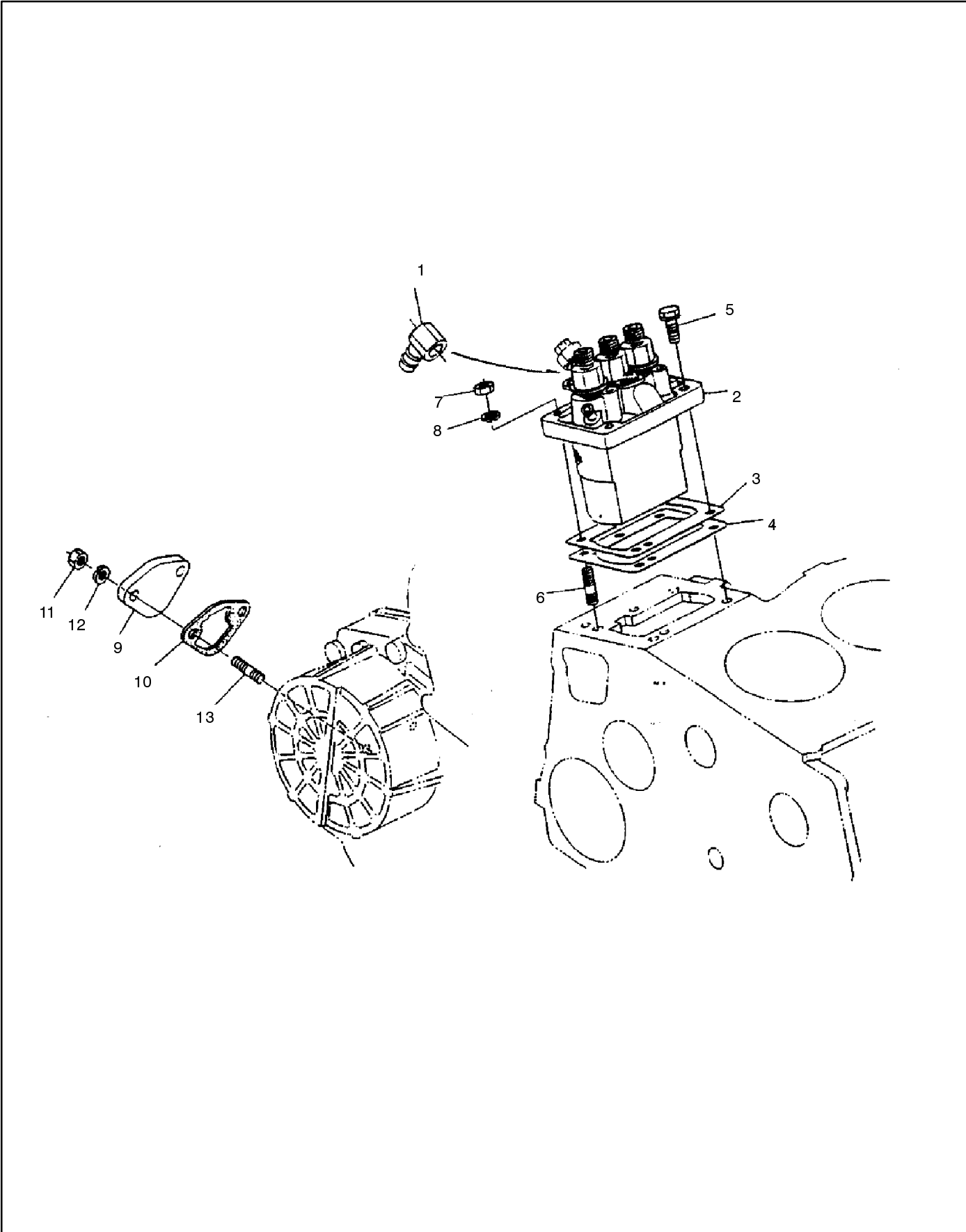
Group 17: Nozzle Component Parts

Item	Qty.	Description Variation	Part No.
		Washer, Adjusting T=0.900mm	322131
		Washer, Adjusting T=0.925mm	322152
		Washer, Adjusting T=0.950mm	322153
		Washer, Adjusting T=0.975mm	322154
		Washer, Adjusting T=1.000mm	322155
		Washer, Adjusting T=1.025mm	322156
		Washer, Adjusting T=1.050mm	322157
		Washer, Adjusting T=1.075mm	322158
		Washer, Adjusting T=1.100mm	322159
		Washer, Adjusting T=1.125mm	322160
		Washer, Adjusting T=1.150mm	322161
		Washer, Adjusting T=1.175mm	322162
		Washer, Adjusting T=1.200mm	322163
		Washer, Adjusting T=1.225mm	322164
		Washer, Adjusting T=1.250mm	322165
		Washer, Adjusting T=1.275mm	322166
		Washer, Adjusting T=1.300mm	322167
		Washer, Adjusting T=1.325mm	322168
		Washer, Adjusting T=1.350mm	322169
		Washer, Adjusting T=1.375mm	322170
		Washer, Adjusting T=1.400mm	322171
		Washer, Adjusting T=1.425mm	322172
		Washer, Adjusting T=1.450mm	322173

Item	Qty.	Description Variation	Part No.
		Washer, Adjusting T=1.475mm	322174
		Washer, Adjusting T=1.500mm	322175
		Washer, Adjusting T=1.525mm	322176
		Washer, Adjusting T=1.550mm	322177
		Washer, Adjusting T=1.575mm	322178
		Washer, Adjusting T=1.600mm	322179
		Washer, Adjusting T=1.625mm	322180
		Washer, Adjusting T=1.650mm	322181
		Washer, Adjusting T=1.675mm	322182
		Washer, Adjusting T=1.700mm	322183
		Washer, Adjusting T=1.725mm	322184
		Washer, Adjusting T=1.750mm	322185
		Washer, Adjusting T=1.775mm	322186
		Washer, Adjusting T=1.800mm	322187
		Washer, Adjusting T=1.825mm	322188
		Washer, Adjusting T=1.850mm	322189
		Washer, Adjusting T=1.875mm	322190
		Washer, Adjusting T=1.900mm	322191
		Washer, Adjusting T=1.925mm	322192
		Washer, Adjusting T=1.950mm	322193

Note: T= Thickness in millimeters

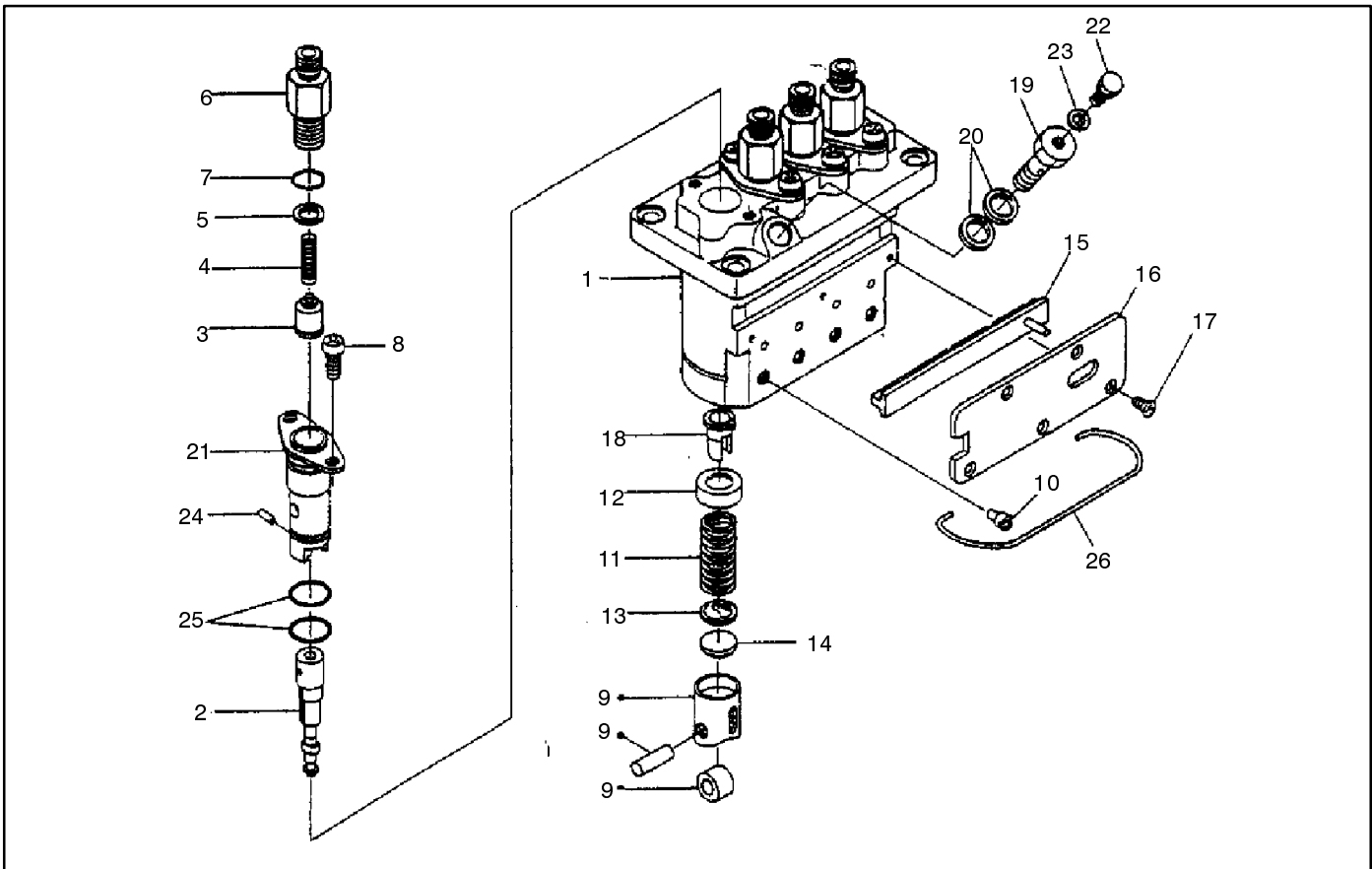
Group 18: Fuel Injection Pump



Group 18: Fuel Injection Pump

Item	Qty.	Description Variation	Part No.	Item	Qty.	Description Variation	Part No.
1	1	Joint	322361	7	2	Nut	322023
		1, 2				1	
2	1	Pump, Injection	322407		3	Nut	322023
		1				2	
	1	Pump, Injection (Engine serial numbers 489916 and above)	322606	8	2	Washer, Spring	322030
		1				1	
	1	Pump, Injection	322458		6	Washer, Spring	322030
		2				2	
3	1	Shim, Injection Pump	322196	9	1	Cover	322195
		1				1, 2	
	1	Shim, Injection Pump	322199	10	1	Gasket, Fuel Pump	322127
		2				1, 2	
4	2	Shim, Injection Pump	322197	11	2	Nut	322023
		1				1, 2	
	2	Shim, Injection Pump	322323	12	2	Washer, Spring	322030
		2				1, 2	
5	2	Bolt	322004	13	2	Stud	322020
		1				1, 2	
	3	Bolt	322019				
		2					
6	2	Stud	322140				
		1					
	3	Stud	322140				
		2					

Group 19: Injection Pump Component Parts



Item	Qty.	Description Variation	Part No.
1	1	Pump, Injection (Includes items 2-26) 1	322407
	1	Pump, Injection* 1	322606
	1	Pump, Injection (Includes items 2-26) 2	322458
2	3	Plunger, Pump 1	322394
	4	Plunger, Pump* 1	322607
	4	Plunger, Pump 2	322452
3	3	Valve, Delivery 1	322393
	3	Valve, Delivery* 1	322113
	4	Valve, Delivery 2	322113
4	3	Spring, Deliv. Valve 1	322397
	3	Spring, Deliv. Valve* 1	322116
	4	Spring, Deliv. Valve 2	322116

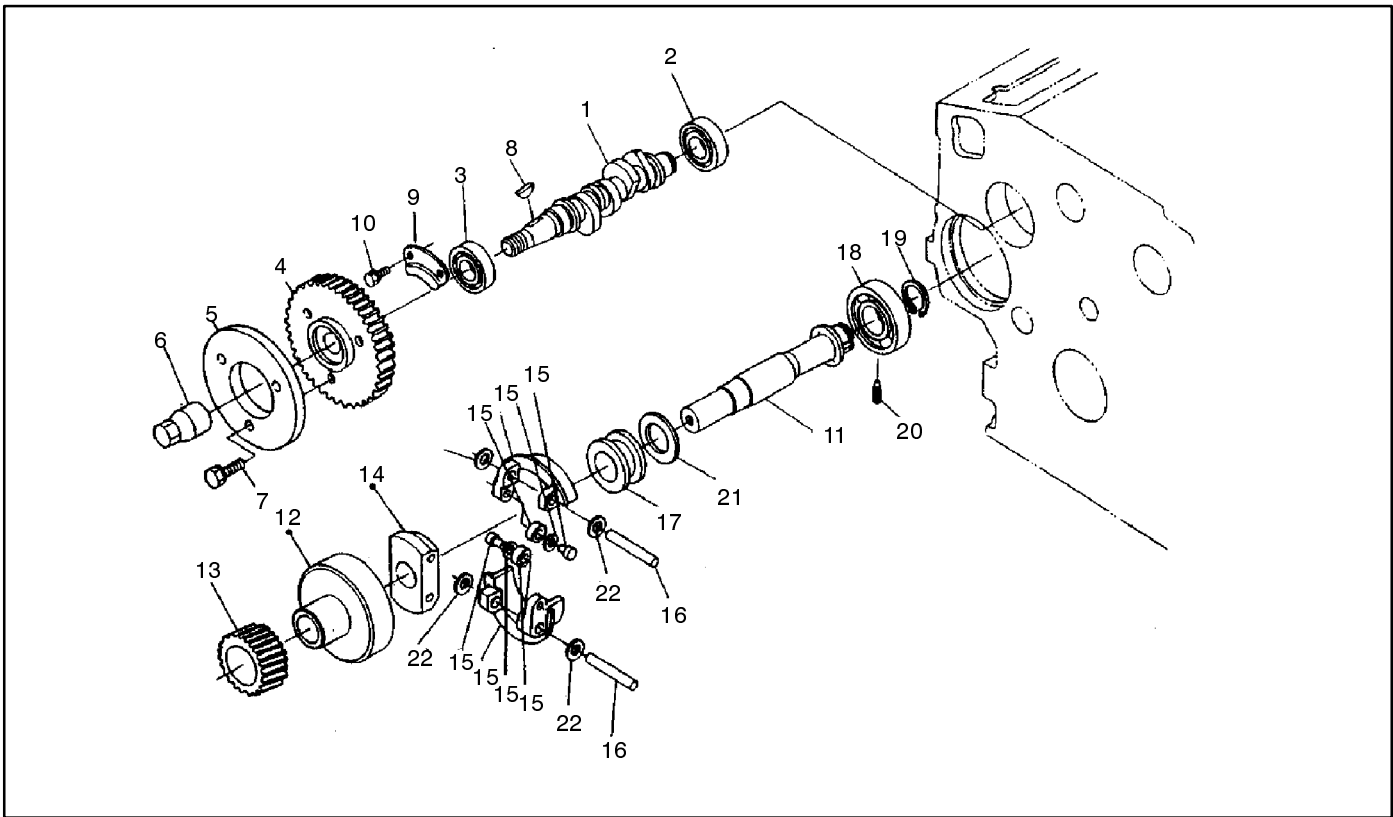
Item	Qty.	Description Variation	Part No.
5	3	Gasket, Deliv. Valve 1	322538
	3	Gasket, Deliv. Valve* 1	322117
	4	Gasket, Deliv. Valve 2	322117
6	3	Holder, Deliv. Valve 1	322396
	3	Holder, Deliv. Valve* 1	322426
	4	Holder, Deliv. Valve 2	322426
7	3	O-Ring 1	322366
	3	O-Ring* 1	322150
	4	O-Ring 2	322150
8	6	Screw 1	322352
	6	Screw* 1	322198
	8	Screw 2	322198

Group 19: Injection Pump Component Parts

Item	Qty.	Description Variation	Part No.	Item	Qty.	Description Variation	Part No.
9	3	Tappet 1	322313	18	3	Sleeve, Control 1	322321
	3	Tappet* 1	322114		3	Sleeve, Control* 1	322124
	4	Tappet 2	322114		4	Sleeve, Control 2	322124
10	3	Pin, Tappet Guide 1	322315	19	1	Screw, Hollow 1	322319
	3	Pin, Tappet Guide* 1	322118		1	Bolt, Joint* 1	322610
	4	Pin, Tappet Guide 2	322118		1	Screw, Hollow 2	322459
11	3	Spring, Plunger 1	322398	20	2	Gasket 1	322537
	3	Spring, Plunger* 1	322120		2	Gasket* 1	322148
	4	Spring, Plunger 2	322120		2	Gasket 2	322148
12	3	Seat, Spring Upper 1	322316	21	3	Set Plate 1	322318
	3	Seat, Spring Upper* 1	322119		3	Flange, Sleeve* 1	322126
	4	Seat, Spring Upper 2	322119		4	Flange, Sleeve 2	322126
13	3	Seat, Spring Lower 1	322317	22	1	Screw 1	322320
	3	Seat, Spring Lower* 1	322121		1	Screw* 1	322122
	4	Seat, Spring Lower 2	322121		1	Screw 2	322122
14	1	Shim 1	322322	23	1	Gasket 1	322365
	1	Shim* 1	322125		1	Gasket* 1	322149
	1	Shim 2	322125		1	Gasket 2	322149
15	1	Rack, Control 1	322395	24	4	Pin, Joint 1*, 2	322147
	1	Rack, Control* 1	322608	25	8	O-Ring 1*, 2	322115
	1	Rack, Control 2	322425	26	1	Pin, Clamp 2	322427
16	1	Plate 1	322399	27	1	Plug 1*	322611
	1	Plate* 1	322609	28	1	Gasket 1*	322612
	1	Plate 2	322428				
17	4	Screw 1	322356				
	4	Screw* 1	322145				
	5	Screw 2	322145				

* Use this part number for generator sets using variation 1 and engine serial numbers 489916 and above.

Group 20: Fuel Camshaft

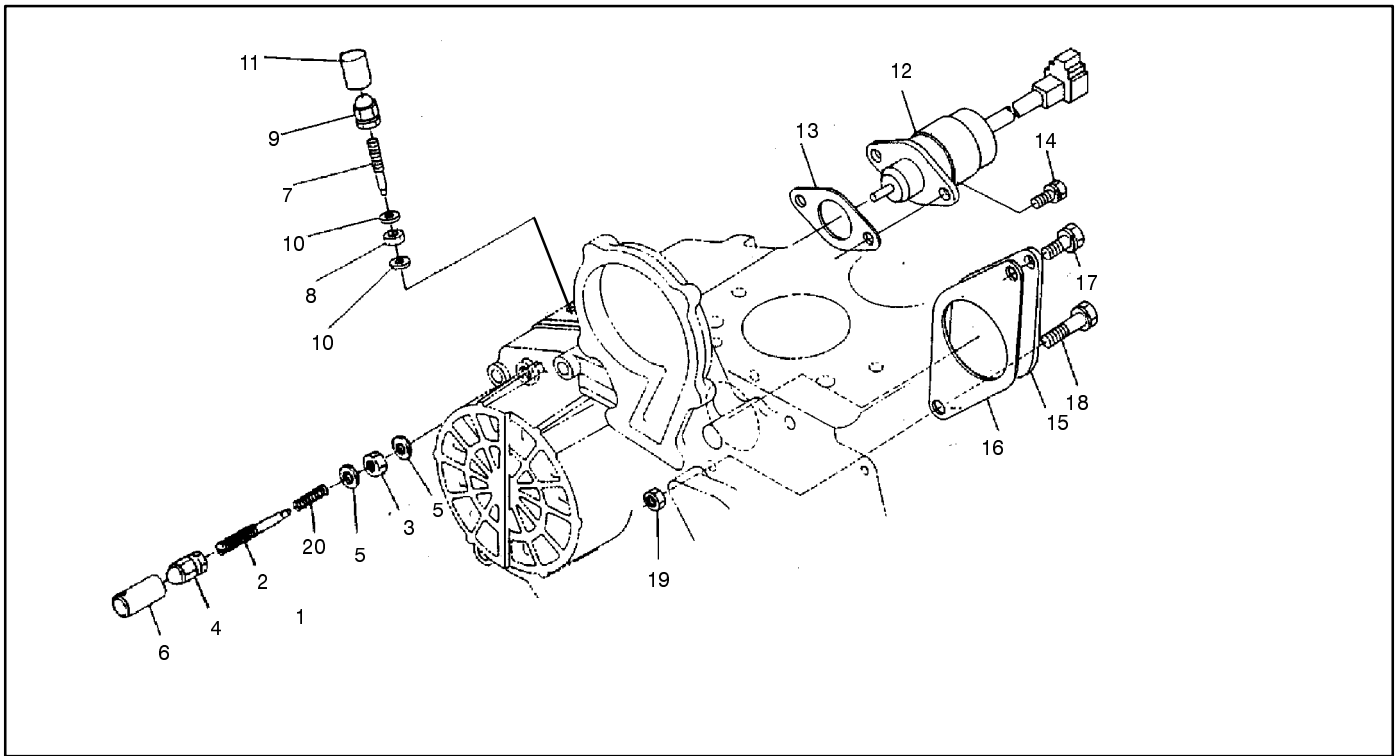


Item	Qty.	Description Variation	Part No.
1	1	Camshaft, Fuel 1	322391
	1	Camshaft, Fuel 2	322275
2	1	Bearing, Ball 1, 2	322053
3	1	Bearing, Ball 1, 2	322054
4	1	Gear, Injection Pump 1, 2	322451
5	1	Cam, Fuel 1 1, 2	322314
6	1	Nut, Cap 1, 2	322355
7	3	Bolt 1, 2	322003
8	1	Key, Woodruff 1, 2	322360
9	1	Stopper 1, 2	322277
10	2	Bolt 1, 2	322001
11	1	Shaft Assembly, Governor (Includes items 13-17) 1	322494
	1	Shaft Assembly, Governor (Includes items 13-17) 2	322495

Item	Qty.	Description Variation	Part No.
12	1	Holder, Governor Gear 1, 2	X
13	1	Gear, Governor 1, 2	X
14	1	Holder, Gov. Weight 1, 2	X
15	2	Complete Weight, Governor 1, 2	X
16	2	Shaft, Gov. Weight 1, 2	X
17	1	Sleeve, Governor 1, 2	X
18	1	Bearing, Ball 1, 2	322052
19	1	Cir-Clip, Gov. Shaft 1, 2	322476
20	1	Screw, Set 1, 2	322327
21	1	Collar, Gov. Holder 1, 2	322478
22	4	Washer, Gov. Weight 1, 2	322479

X Part not available separately.

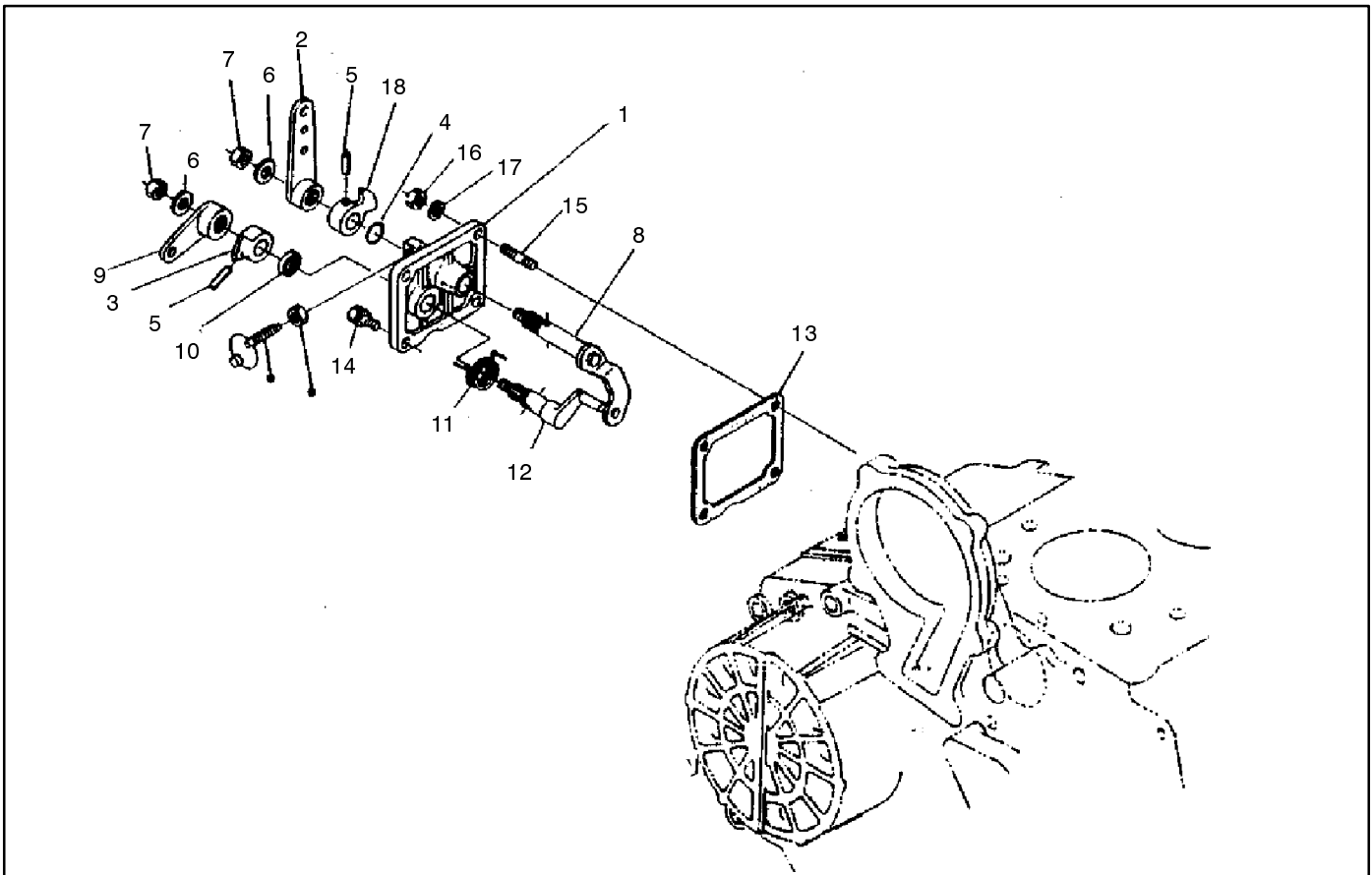
Group 21: Fuel Shut-off Solenoid



Item	Qty.	Description Variation	Part No.
1	1	Idle, Apparatus (Includes items 2-6) 1	322377
2	1	Bolt, Adjusting (Includes item 20) 1	322378
3	1	Nut 1	322141
4	1	Nut, Cap 1	322144
5	2	Gasket 1	322110
6	1	Cap 1	322325
7	1	Bolt, Adjusting 1	322324
8	1	Nut 1	322141
9	1	Nut, Cap 1	322144
10	2	Gasket 1	322110

Item	Qty.	Description Variation	Part No.
11	1	Cap 1	322325
12	1	Fuel Shut Off Solenoid 1	322469
13	1	Gasket, Solenoid Cover 1	322438
14	2	Bolt 1	322533
15	1	Cover, Hydraulic Pump 1	322454
16	1	Gasket 1	322453
17	1	Bolt 1	322013
18	1	Bolt 1	322016
19	1	Nut 1	322024
20		Spring 1	322460

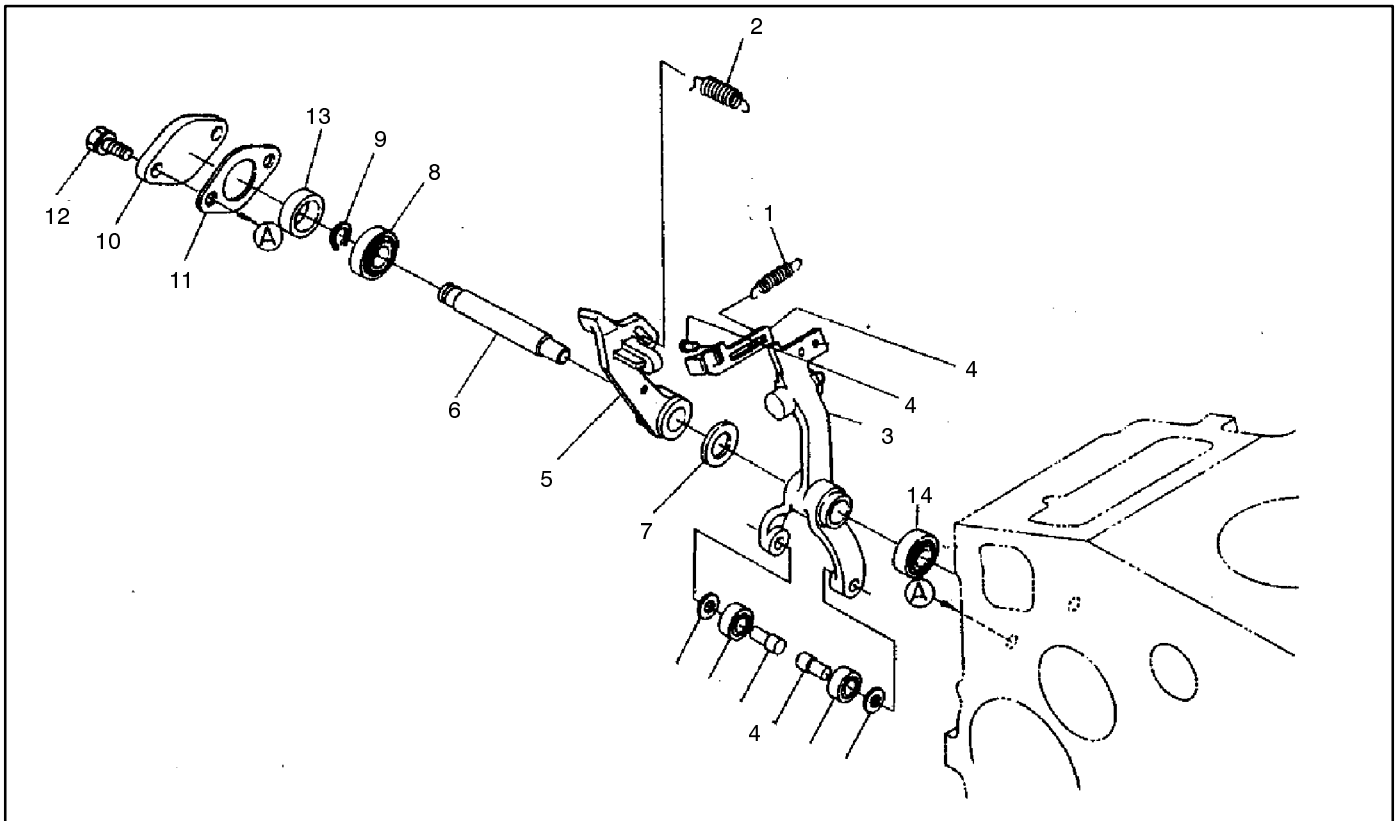
Group 22: Governor Plate



Item	Qty.	Description Variation	Part No.
1	1	Control Plate Assembly (Includes items 2-12) 1, 2	322484
2	1	Lever, Speed Control 1, 2	322435
3	1	Lever, Speed Control 1, 2	322334
4	1	O Ring 1, 2	322033
5	2	Pin, Spring 1, 2	322044
6	2	Washer, Plain 1, 2	322359
7	2	Nut 1, 2	322354
8	1	Complete Lever, Governor 1, 2	322480

Item	Qty.	Description Variation	Part No.
9	1	Lever, Engine Stop 1, 2	322436
10	1	Seal, Oil 1, 2	322087
11	1	Spring, Return 1, 2	322228
12	1	Shaft, Stop Lever 1, 2	322437
13	1	Gasket 1, 2	322335
14	2	Bolt w/Washer 1, 2	322002
15	2	Stud 1, 2	322020
16	2	Nut 1, 2	322023
17	2	Washer, Spring 1, 2	322030
18	1	Lever, Speed Control 1, 2	322485

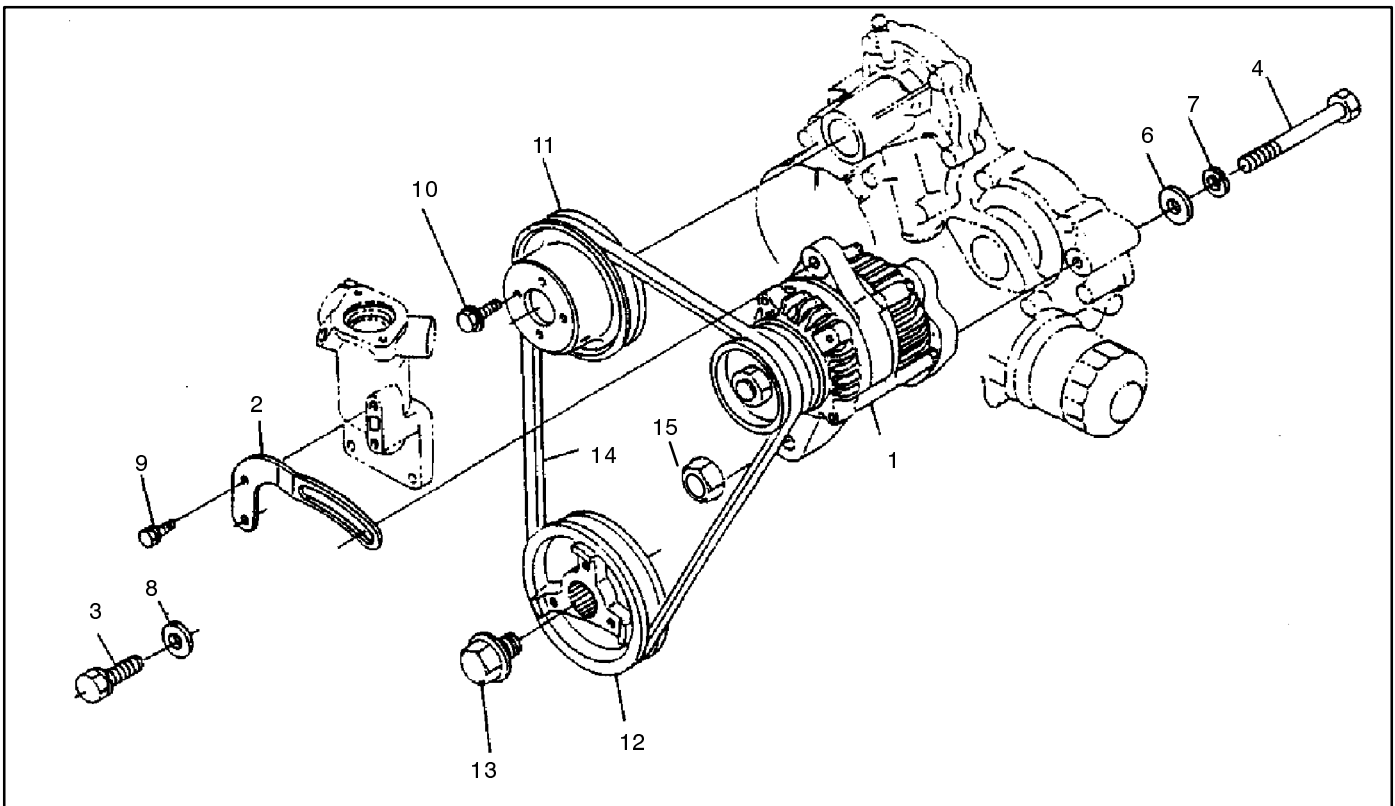
Group 23: Governor



Item	Qty.	Description Variation	Part No.
1	1	Spring, Start 1	322408
	1	Spring, Start 2	322461
2	1	Spring, Governor 1	322531
	1	Spring, Governor 2	322486
3	1	Fork Lever Assembly (Includes items 4-9) 1, 2	322482
4	1	Complete Lever, Fork 1, 2	322481
5	1	Lever, Fork 2 1, 2	322483
6	1	Shaft, Fork Lever 1, 2	322328

Item	Qty.	Description Variation	Part No.
7	1	Washer, Plain 1, 2	322358
8	1	Bearing, Ball 1, 2	322332
9	1	Cir-Clip, External 1, 2	322032
10	1	Cover, Fork Lever Shaft 1, 2	322330
11	1	Gasket 1, 2	322331
12	2	Bolt 1, 2	322533
13	1	Collar 1 1, 2	322329
14	1	Bearing, Ball 1, 2	322333

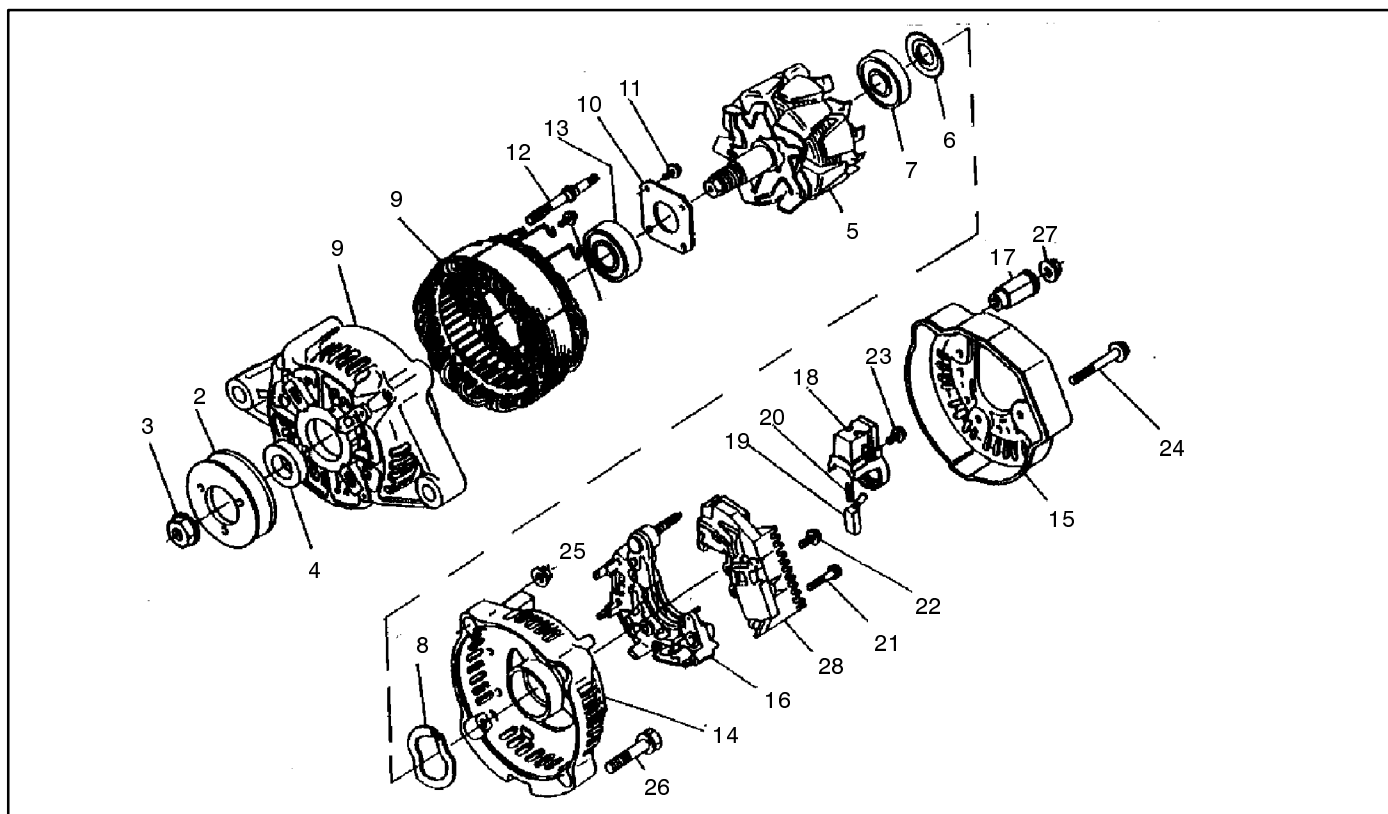
Group 24: Alternator Mounting



Item	Qty.	Description Variation	Part No.
1	1	Alternator 1, 2	322232
2	1	Alternator Adjustment Arm 1, 2	322339
3	1	Bolt 1, 2	322015
4	1	Bolt 1, 2	322018
5	1	Cover, Belt 1, 2	322468
6	1	Washer, Plain 1, 2	322028
7	1	Washer, Spring 1, 2	322031
8	1	Washer, Plain 1, 2	322029

Item	Qty.	Description Variation	Part No.
9	1	Bolt 1, 2	322002
10	4	Bolt, Flange 1, 2	322022
11	1	Pulley, Fan 1, 2	322348
12	1	Pulley, Fan Drive 1	322491
	1	Pulley, Fan Drive 2	322492
13	1	Bolt 1, 2	322350
14	1	V Belt 1, 2	322456
15	1	Nut, Hex M10 x 1.25 1, 2	X-6053-5

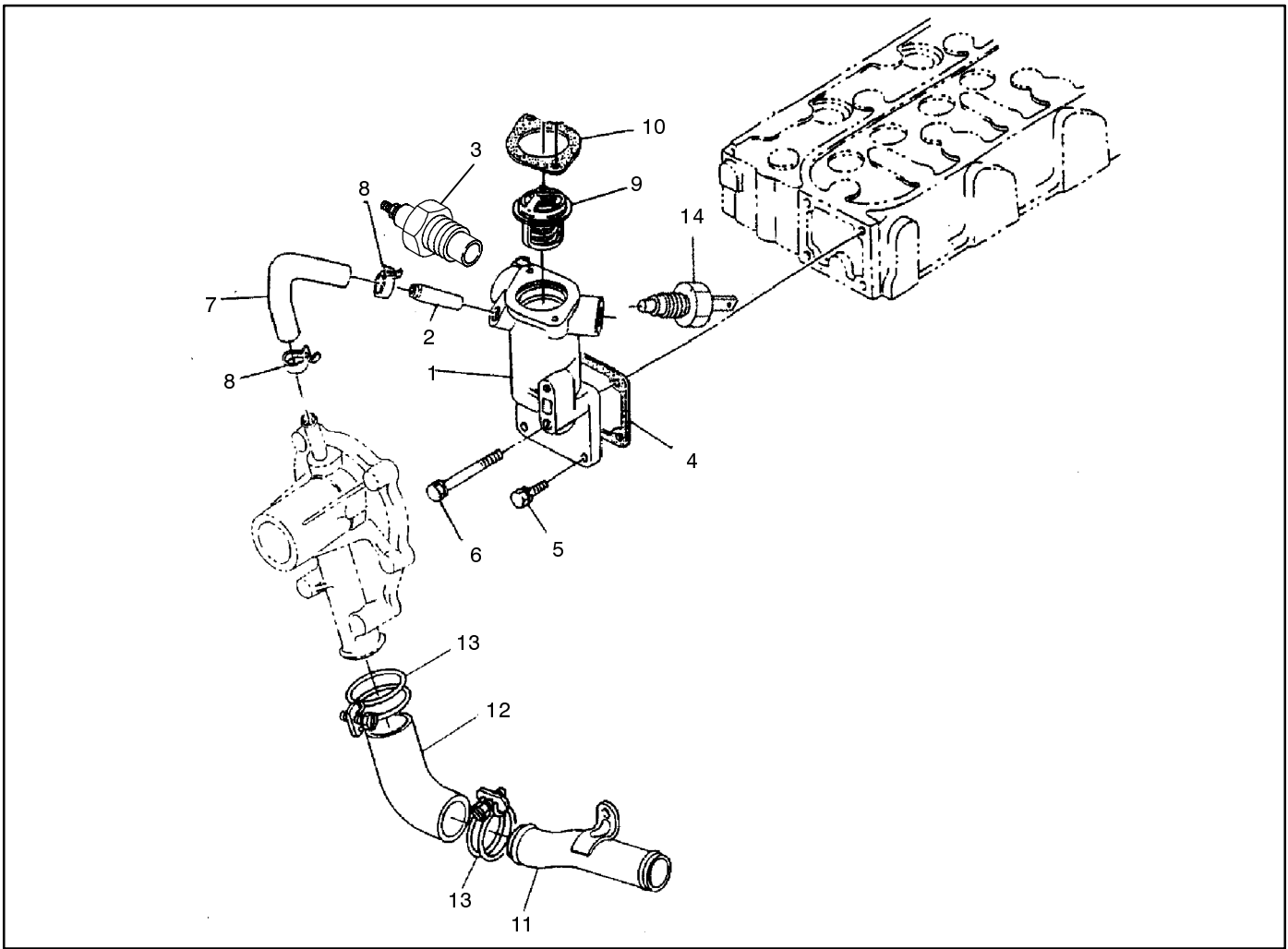
Group 25: Alternator Component Parts



Item	Qty.	Description Variation	Part No.
1	1	Alternator (Includes items 2-28) 1	322232
2	1	Pulley, Alternator 1	322202
3	1	Nut 1	322215
4	1	Collar 1	322203
5	1	Rotor 1	322200
6	1	Cover, Bearing 1	322211
7	1	Bearing, Ball 1	322209
8	1	Washer, Thrust 1	322212
9	1	Frame, Drive End 1	322233
10	1	Plate, Retainer 1	322208
11	4	Screw, Round Head 1	322217
12	2	Bolt, Through 1	322204
13	1	Bearing, Ball 1	322210
14	1	Frame, End 1	322337

Item	Qty.	Description Variation	Part No.
15	1	Cover, End 1	322338
16	1	Rectifier 1	322234
17	1	Bush, Insulation 1	322340
18	1	Holder, Brush 1	322205
19	2	Brush 1	322201
20	2	Spring, Brush 1	322206
21	2	Screw, Round Head 1	322218
22	6	Screw, Round Head 1	322219
23	1	Screw, Round Head 1	322220
24	3	Bolt 1	322213
25	2	Nut 1	322216
26	2	Bolt 1	322214
27	1	Nut 1	322058
28	1	Regulator 1	322207

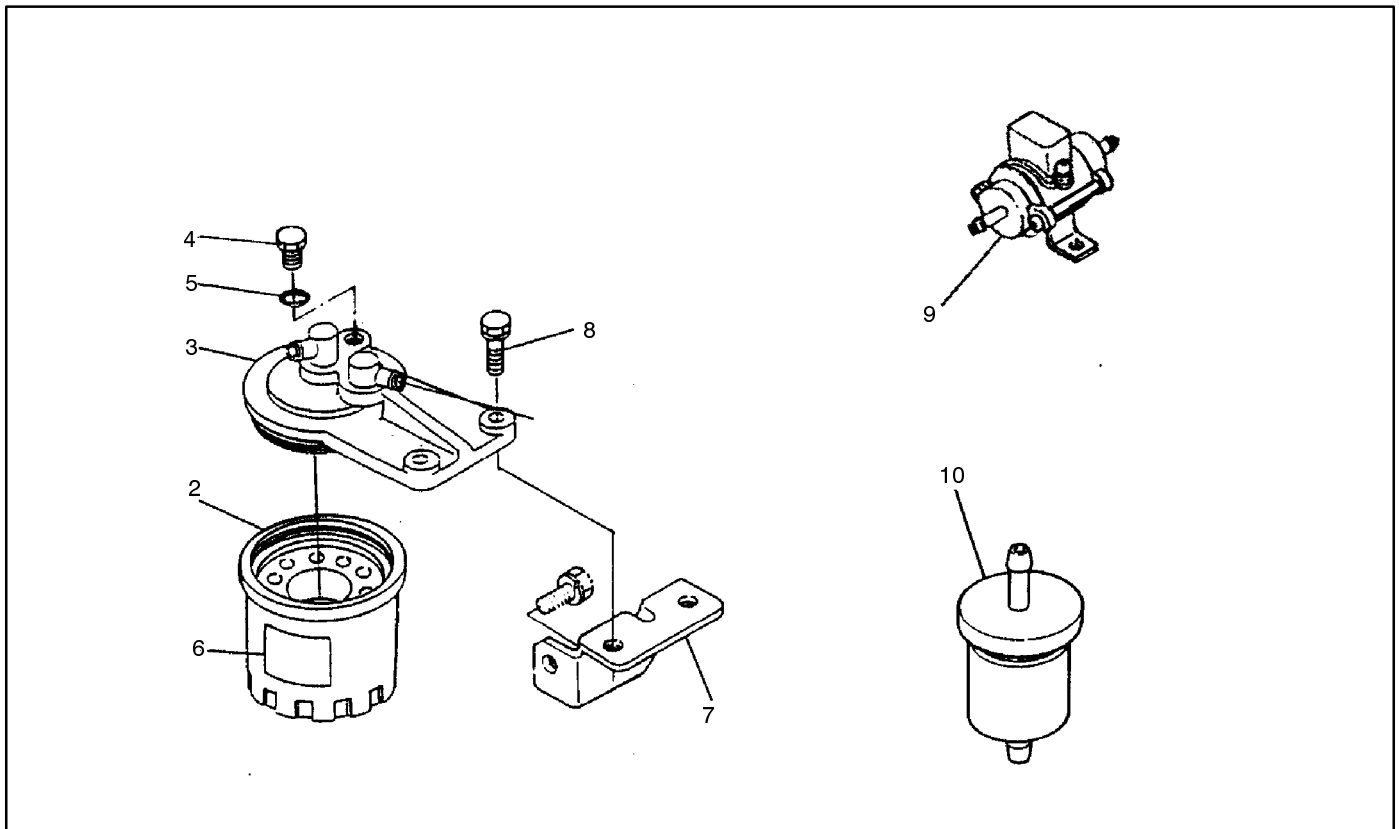
Group 26: Water Flange



Item	Qty.	Description Variation	Part No.
1	1	Flange, Water (Includes item 2) 1, 3	322470
2	1	Pipe, Water Return 1 1, 3	322347
3	1	Plug 1	322507
	1	Sender, Temperature 3	255240
4	1	Gasket, Water Flange 1, 3	322343
5	3	Bolt 1, 3	322002
6	1	Bolt 1, 3	322009

Item	Qty.	Description Variation	Part No.
7	1	Pipe, Water Return 2 1, 3	322345
8	2	Band, Pipe 1, 3	322346
9	1	Thermostat 1, 3	322501
10	1	Gasket 1, 3	322487
11	1	Pipe, Water 2 1, 3	322488
12	1	Pipe, Water 3 1, 3	322342
13	2	Clamp 1, 3	322520
14	1	Switch, Temperature 1, 3	322514

Group 29: Fuel Filter & Fuel Pump



Item	Qty.	Description Variation	Part No.
1	1	Filter Assembly, Fuel (Includes items 2-6) 1, 2	322068
2	1	Element, Filter 1, 2	322536
3	1	Cover, Filter 1, 2	322069
4	1	Plug, Filter Breather 1, 2	322506
5	1	O-Ring 1, 2	322060

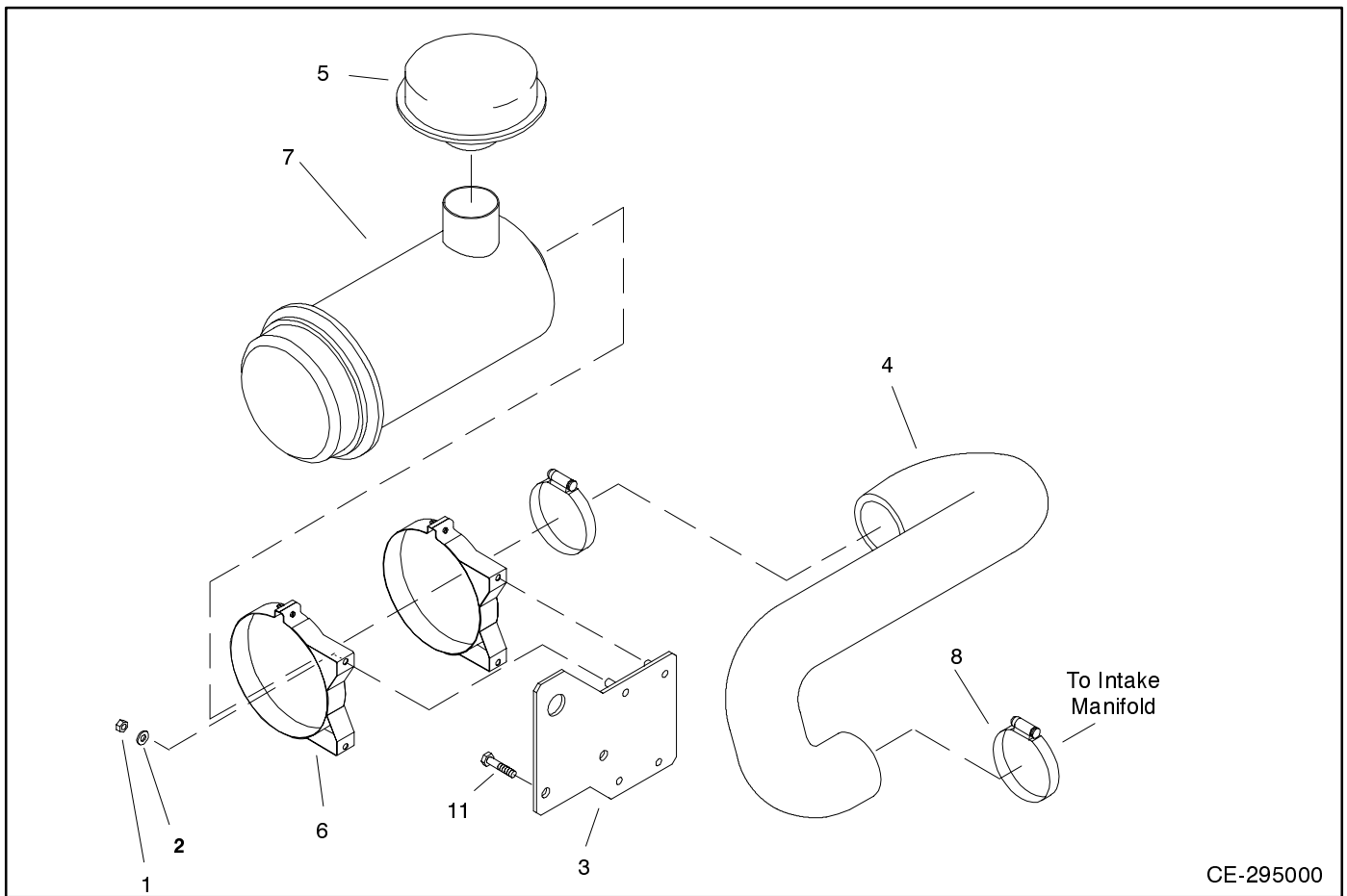
Item	Qty.	Description Variation	Part No.
6	1	Mark, Form 1, 2	322070
7	1	Holder, Fuel Filter 1, 2	322463
8	2	Bolt 1, 2	322014
9	1	Pump, Fuel 1, 2	322521
10	1	Filter, Fuel Pump 1, 2	322056

Group 30: Gasket Sets

Item	Qty.	Description	
		Variation	Part No.
1	1	Upper Gasket Set	322551
		1	
	1	Upper Gasket Set	322553
		2	

Item	Qty.	Description	
		Variation	Part No.
2	1	Lower Gasket Set	322552
		1	
	1	Lower Gasket Set	322554
		2	

Group 101: Air Intake



CE-295000

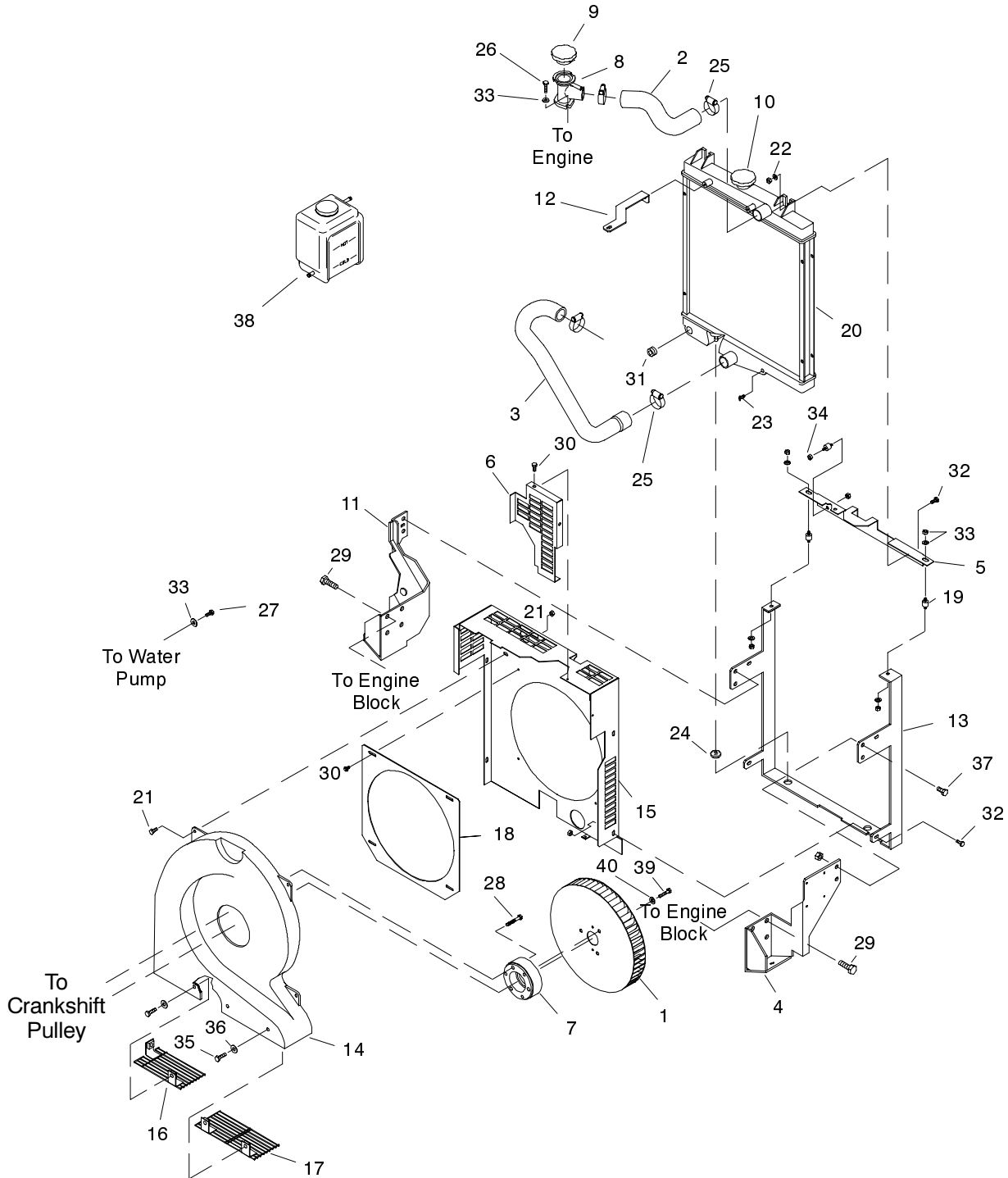
Item	Qty.	Description Variation	Part No.
1	8	Nut, 1/4-20 1, 2, 4, 5	#
2	1	Washer, 1/4 1, 2, 4, 5	#
3	1	Bracket, Air Cleaner 1 2 4, 5	225509 225549 225976
	1	Nut, Hex. (not shown) 4, 5	X-6053-3
4	1	Hose, Air Intake 1 2 4, 5	225510 225517 225517
5	1	Cap, Air Cleaner 1, 5	225977
6	2	Bracket, Mounting 1, 4, 5	258564
	2	Band, Mounting 2	258708

Item	Qty.	Description Variation	Part No.
7	1	Air Cleaner Assembly 1, 4, 5	A-258576
	1	Filter Element 1, 4, 5	258577
	1	Air Cleaner Assembly 2	A-258643
	1	Filter Element 2	258646
8	2	Clamp, Hose 1-9/16 x 2 1, 4, 5	X-426-6
9	1	Clamp, Hose 1-9/16 x 2 2	X-426-6
10	1	Clamp, Hose (Item not shown) 2	X-426-16
11	2	Screw, H.C. M8-1.25 1, 2	X-6050-8

X Item not sold separately
Common Hardware Procure Locally

Group 104: Cooling System

Illustration of variation 1 only



CE-250000

Group 104: Cooling System

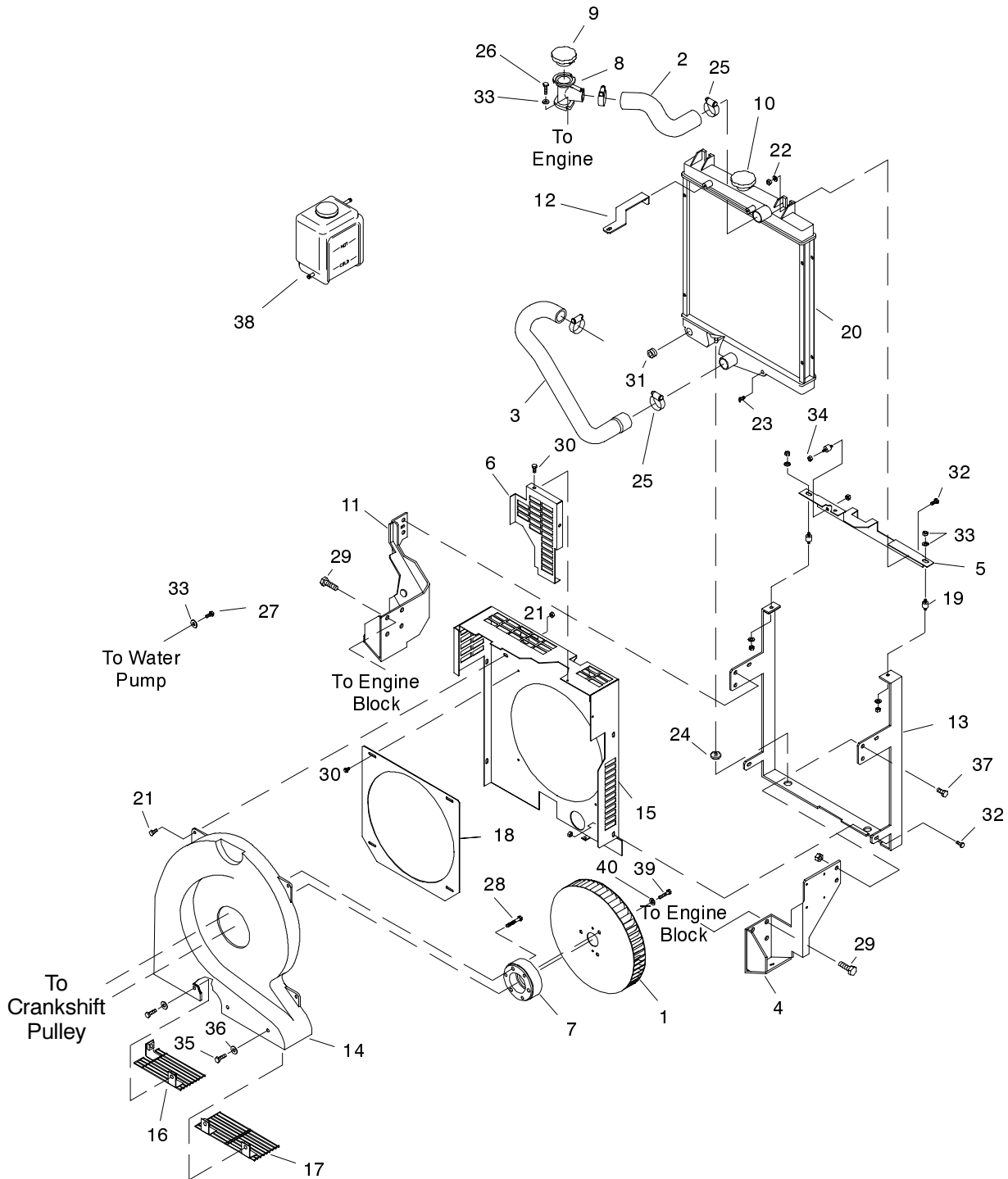
Item	Qty.	Description Variation	Part No.
1	1	Fan, Suction 1, 7	225617
	1	Fan, Blower 2	225214
	1	Fan, Pusher 4	225771
		5	225324
		6	225954
	1	Plate, Fan Mounting (Item not shown) 2	225540
	4	Nut, Elastic 10-32 (Item not shown) 2	X-101-12
	1	Spacer, Fan (Not shown) 4	225689
		5, 6	225325
2	1	Hose, Upper Radiator 1, 7	225507
		2	225557
		4	225698
		5, 6	225327
3	1	Hose, Lower Radiator 1, 7	225508
		2	225518
		4	225697
		5, 6	225328
4	1	Bracket, Engine Mounting (Right) 1, 5, 6, 7	225328
		2	225558
		4	225688
	1	Bracket, Radiator Support 5, 6	225329
5	1	Bracket, Radiator Mounting 1, 7	225514
6	1	Guard, Fan Right 1, 7	225535
7	1	Hub 1, 7	225612
		2	225539
		4	225689
8	1	Tube, Coolant Fill 1, 7	225547
	1	Tube, Coolant Fill 2, 3, 4	225562
9	1	Cap, Fill Tube Pressure (7 P.S.I.) 1, 2, 3	249683
10	1	Cap, Radiator 1, 7	225550

Item	Qty.	Description Variation	Part No.
11	1	Bracket, Engine Mounting (Left) 1, 3, 5, 6, 7	225611
		2	225559
		4	225690
	1	Bracket, Radiator Support 5, 6	225330
12	1	Bracket, Radiator Support 1, 7	225613
		2	225560
	1	Bracket, Radiator Mounting (Upper Left) 5, 6	225332
	1	Bracket, Radiator Mounting (Upper Right) 5, 6	225333
	1	Screw, H.C. M6 x 1 x 20 (Item not shown) (attaches bkt. to alt. arm) 2	X-6049-5
	1	Screw, H.C. M10-101.25 (Item not shown) 2	X-6050-8
13	1	Bracket, Radiator Mounting 1, 7	225614
		5, 6	225331
	2	Bracket, Radiator Support 1	225691
	1	Shroud, Radiator (Item not shown) 2	225561
	4	Screw, 1/4-20 x 1/2 ref. (Item not shown) 2	X-465-6
	2	Button, Plug (Item not shown) 2	X-301-24
	1	Mount, Vibro (Item not shown) 2	239497
	2	Screw, 5/16-18 x 1/2 ref. (Item not shown) 2	X-125-33
	2	Washer, Plain .384 x 1.628 x .188 (Item not shown) 2	X-25-129
14	1	Shroud, Fan 1, 7	225615
		4	225066
		5	225336
		6	225955
	1	Guard, Wire (Item not shown) 4	225314

Common Hardware Procure Locally

Group 104: Cooling System

Illustration of variation 1 only



CE-250000

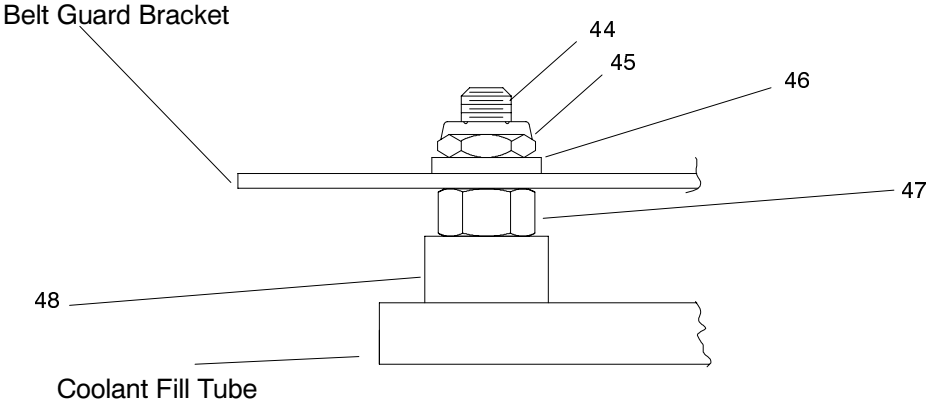
Group 104: Cooling System

Item	Qty.	Description Variation	Part No.
15	1	Cover, Fan Shroud	
		1, 7	225616
	1	Guard, Belt (Item not shown)	
		2 (Right)	225520
		2 (Left)	225551
		4	225687
		5 (Top)	225334
		6 (Top)	225956
		5, 6 (Bottom)	225957
		Screw, Phillips Head (Item not shown)	
	9	1, 2	X-6216-1
	10	5, 6	X-6216-1
	7	7	X-6216-1
16	1	Guard, Fan (Left)	
		1, 7	225619
17	1	Guard, Fan (Right)	
		1, 7	225620
18	1	Baffle, Fan	225628
		1, 7	
	1	Baffle, Air (Item not shown)	
		2	225541
	8	Screw, r.h.m.10-32 x 1/2 (Item not shown)	
		2	X-50-1
	8	Nut, Elastic 10-32 (Item not shown)	
		2	X-101-12
19	2	Mount, Controller	
		1, 7	246267
	1	Mount, Controller	
		2	241769
		Bumper (Item not shown)	
	1	2	259632
	4	5, 6	292834
20	1	Radiator Assembly	
		1, 7	A-225515
		2	A-225537
		4	A-225686
		5	A-225965
		6	A-225972
	1	Switch Assembly, Coolant Level	
		4	273404
21	3	Hardware, 1/4-20	
		1, 7	#

Item	Qty.	Description Variation	Part No.
22	2	Washer, Plain .266 x 1 x .062	
		1, 7	X-25-73
23	1	Valve, Drain 1/4	
		1, 2, 4, 5, 6, 7	X-256-3
	1	Elbow, Street (Item not shown)	
		2, 4	X-555-1
24	1	Grommet	
		1, 7	X-284-35
25	4	Clamp, Hose 1 15/16 x 1 3/16	
		1,2, 4, 5, 6, 7	X-426-8
26	2	Screw, H.C. M6 x 1 x 16	
		1, 2, 3, 7	X-6049-2
27	4	Screw, H.C. M6 x 1 x 10	
		1, 7	X-6049-8
28	3	Screw, H.C. M8-1.25	
		1, 4, 7	X-6050-15
29	8	Screw, H.C. M10-1.25	
		1, 2, 3, 4, 7	X-6068-1
30	7	Screw, Phillips	
		1, 7	X-6216-1
31	1	Plug, Pipe1/2	
		1, 2, 7	X-75-3
32	2	Bolt, 1/4-20	
		1, 7	#
33	4	Washer, 1/4	
		1, 7	#
34	4	Nut, 1/4	
		1, 7	#
35	4	Bolt, 5/16-18	
		1, 7	#
36	7	Washer, 5/16-18	
		1, 7	#
37	7	Hardware, 3/8-16	
		1, 7	#
38	1	Bottle, Overflow	
		1, 2, 3, 4, 5, 6, 7	249396
	2	Clamp, Hose (Item not shown)	
		1, 2, 3, 4, 5, 6, 7	X-426-9
39	3	Screw, 5/16-18 x 1.25, ref.	
		1, 7	X-125-24
	3	Screw, H.C.	
		1, 7	X-6050-15
	4	Screw, H.C.	
		5	X-6049-3
40	3	Washer, 5/16	
		1, 7	#
	3	Washer, Hardened	
		2	X-801-4
	4	Washer, 1/4	
		5	#
41	1	Bracket, Top Belt Guard (Item not shown)	
		3	225609
42	1	Bracket, Right Belt Guard (Item not shown)	
		3	225610

Common Hardware Procure Locally

Group 104: Cooling System



Variation 4 Only

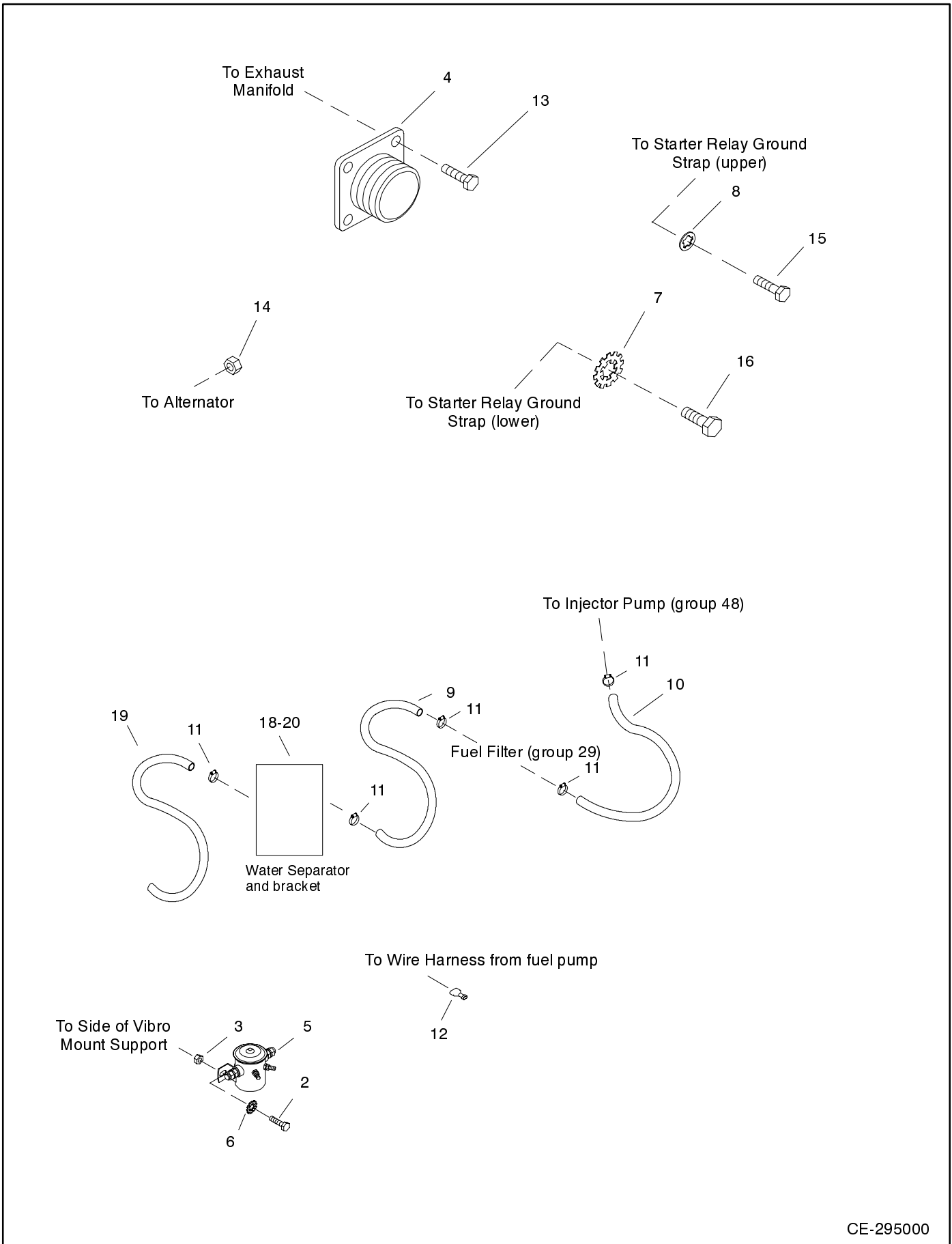
Group 104: Cooling System

Item	Qty.	Description Variation	Part No.
43	1	Guard, Belt (Item not shown)	
		3	225608
	1	Guard, Belt (Item not shown)	
		4	225689
44	2	Stud	
		4	322384

Item	Qty.	Description Variation	Part No.
45	4	Washer, 1/4	
		4	#
46	4	Nut, Elastic	
		4	X-101-25
47	4	Nut, M6 x 1	
		4	X-6053-1
48	7	Spacer, 1/20 x 9/32 x 1/4	
		4	X-400-31

Common Hardware Procure Locally

Group 105: Engine



CE-295000

Group 105: Engine

Item	Qty.	Description Variation	Part No.
1	1	Engine Assembly (V905BG) 1	A-225502
	1	Engine Assembly (V1305BG) 2, 3, 4	A-225503
	1	Engine Assembly (D905BG) 5, 6	A-225985
2	1	1/4-20 x 5/8 Bolt 1, 2, 3, 4, 5, 6	#
3	1	1/4-20 Nut 1, 2, 3, 4, 5, 6	#
4	1	Flange, Exhaust Outlet 1, 2, 3, 4	225548
5	1	Relay 1, 2, 3, 4, 5, 6	233442
6	1	Washer, Shakeproof 1, 3, 4, 5, 6	X-22-12
7	1	Washer, Shakeproof 3/8 1, 2, 3, 4, 5, 6	X-22-14
8	1	Washer, Lock Shakeproof 1, 5, 6	X-22-5
9	1	Line, Fuel 1, 2, 3, 4, 6	X-386-93
	1	Line, Fuel 5	X-386-101
	2	Hose Connector, Elbow (not shown) 5	X-391-25

Item	Qty.	Description Variation	Part No.
10	1	Line, Fuel 1, 5, 6	X-386-95
	1	Line, Fuel 2, 3, 4	X-386-93
11	4	Clamp, Hose 1, 2, 4, 6	X-426-9
	6	Clamp, Hose 5	X-426-9
12	2	Terminal (Fuel Pump Leads) 1, 2, 3, 4, 5, 6	X-431-29
13	4	Screw, H.C. M8-1.25 1, 2, 3, 4	X-6050-3
14	1	Nut, hex. M6 x 1 1, 2, 3, 4, 5, 6	X-6053-1
15	1	Nut, hex. M8 x 1.25 1, 5, 6	X-6053-2
16	1	Screw, H.C. M10-1.25 1, 2, 3, 4, 5, 6	X-6068-1
17	1	Clamp, Breather Hose (Item not shown) 2, 3	X-672-3
18	1	Water Separator Filter 5	225251
	2	Pipe Plug (not shown) 5	X-75-41
19	1	Fuel Line 5	X-386-34
20	1	Bracket, Water Separato r 5	225604
21	1	Muffler Cover 5, 6	225998

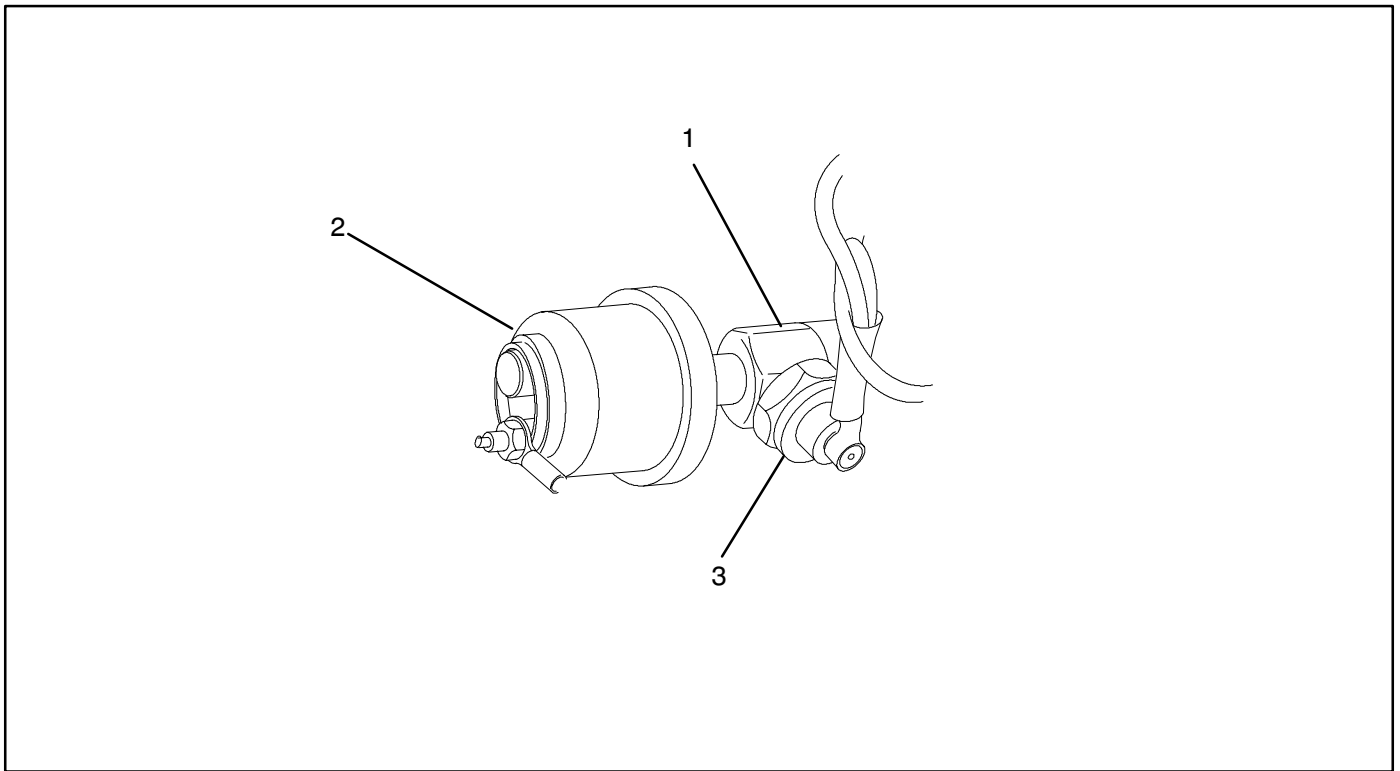
Common Hardware Procure Locally

Group 107: Nameplate and Decals

Item	Qty.	Description Variation	Part No.
1	1	Decal, 1-800 Number all	224233
2	1	Decal, Model 1, 3, 5, 7, 10, 12	225553
	1	Decal, Model 2, 4, 6, 8, 9, 11	225554
3	1	Marker, Adhesive all	238162
4	1	Decal, Ground all	238575
5	1	Nameplate all	239573
6	1	Decal, Warning <i>Backfeed</i> 1, 2, 5-12	239771
7	1	Decal, warning <i>Fire Hazard</i> all	239773
8	1	Decal, <i>10 Amp</i> 1, 2, 5, 6, 7, 8, 10, 11	241771

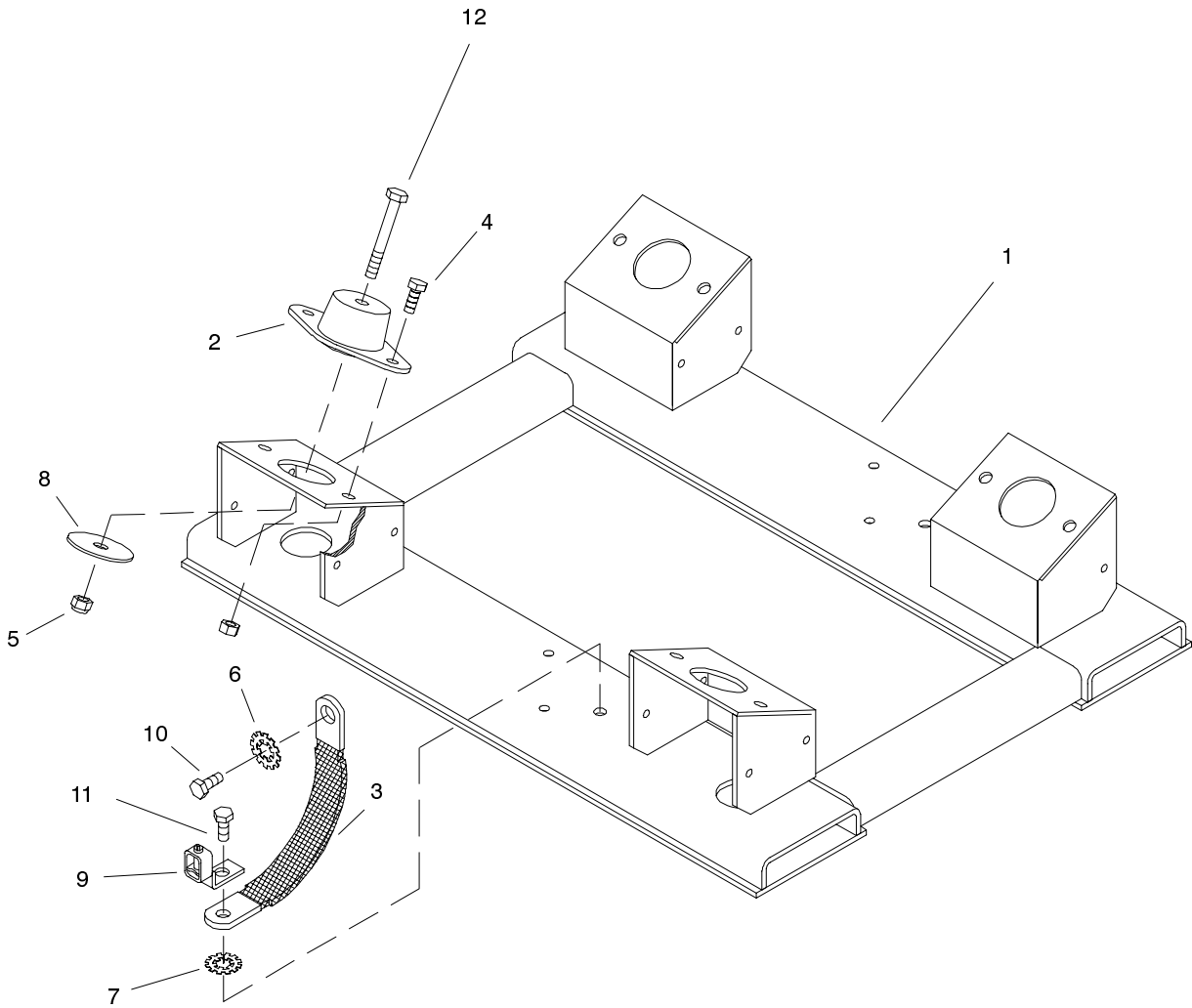
Item	Qty.	Description Variation	Part No.
9	1	Decal, warning <i>Rotating Parts</i> all	249808
10	1	Decal, Warning <i>Hot Engine</i> 1-11	249809
11	1	Decal, Warning <i>Hot Coolant</i> all	249810
12	1	Decal, <i>RV Listed</i> 1, 2, 7, 8, 10, 11	259282
13	1	Decal, Stripe all	278433
14	1	Decal, Water Drain all	280561
15	1	Decal, Oil Drain all	280562
16	1	Logo, Kohler all	X-6276-3
17	1	Decal, CSA 1, 2, 7, 8	225165
18	1	Decal, Standby Connection 3, 4	255885

Group 108: Oil Pressure Gauge & Switch



Item	Qty.	Description Variation	Part No.
1	1	Adapter, Sender 1, 99	225307
2	1	Sender, Oil Pressure Gauge 1	264390
2	1	Sender, Oil Pressure Gauge 99	344305
3	1	Switch, Oil Pressure (supplied with engine) 1, 99	322112

Group 109: Skid and Plant Mounting



CF-295000

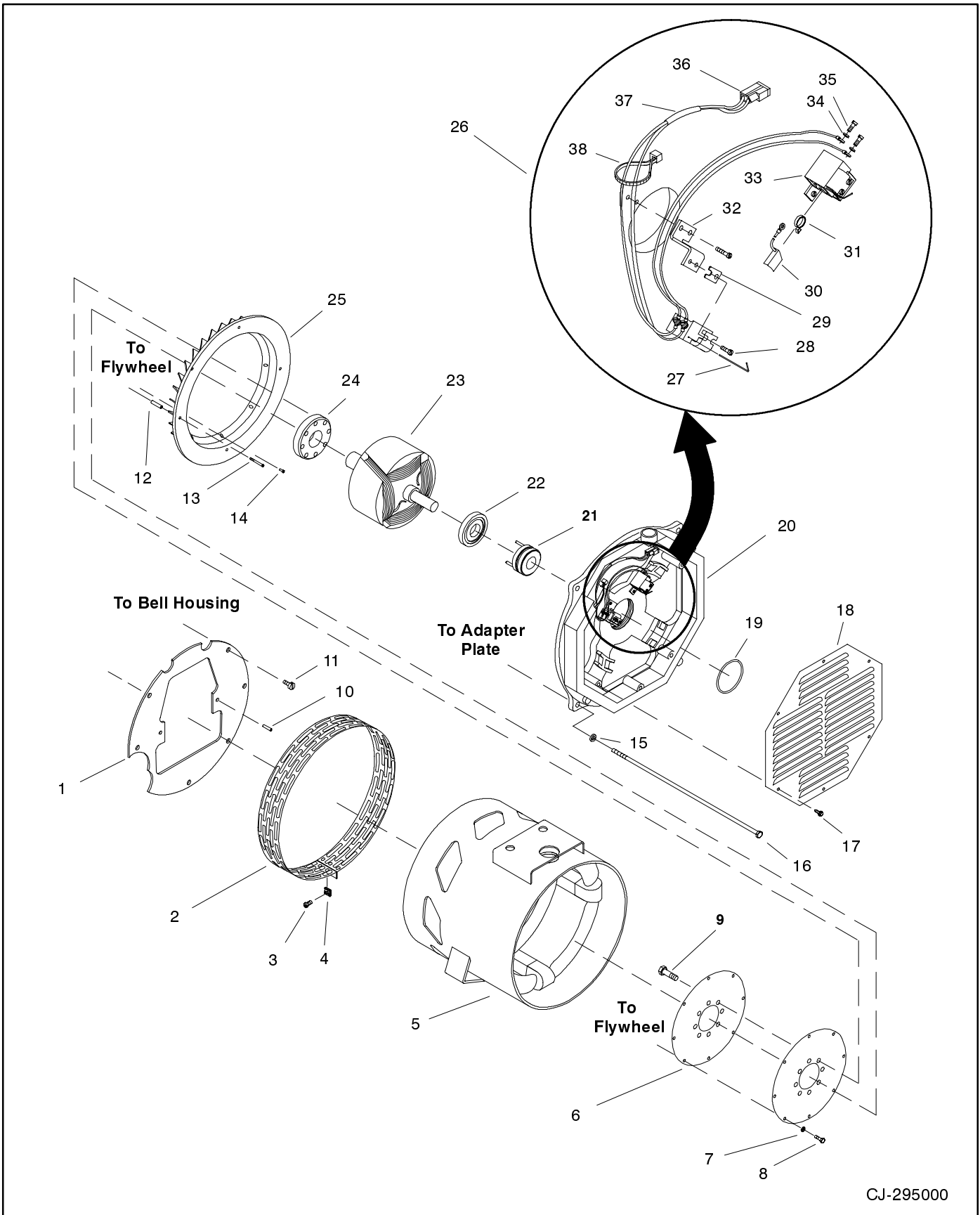
Group 109: Skid and Plant Mounting

Item	Qty.	Description Variation	Part No.
1	1	Skid 1, 4	225519
	1	Skid 2	225521
	1	Skid 3	225694
2	4	Mount, Vibro 1, 4	278322
	2	Mount, Vibro (Engine End) 2, 3	229127
	2	Mount, Vibro (Generator End) 2, 3	225124
3	1	Strap, Ground 1, 4	287363
	1	Strap, Ground 2, 3	290418
4	8	Hardware, 5/16 1	#

Item	Qty.	Description Variation	Part No.
5	4	Nut, Elastic Stop 5/16-18 1, 2, 4	X-101-16
6	1	Washer, Shakeproof 3/8 1, 2, 3, 4	X-22-14
7	1	Washer, Lock 5/16 1, 2, 3, 4	X-22-16
8	4	Washer, Plain .406x2 x.188 1, 2, 3, 4	X-25-96
9	1	Terminal, Grounding 1, 2, 3, 4	X-377-11
10	1	Screw, H.C. M10-1.25 1, 2, 3, 4	X-6068-1
11	1	Hex Head Cap Screw 5/16-18 x .875 1,3, 4	X-125-31
12	1	Bolt, 5/16 1, 4	#

Common Hardware Procure Locally

Group 201: Generator and Mounting



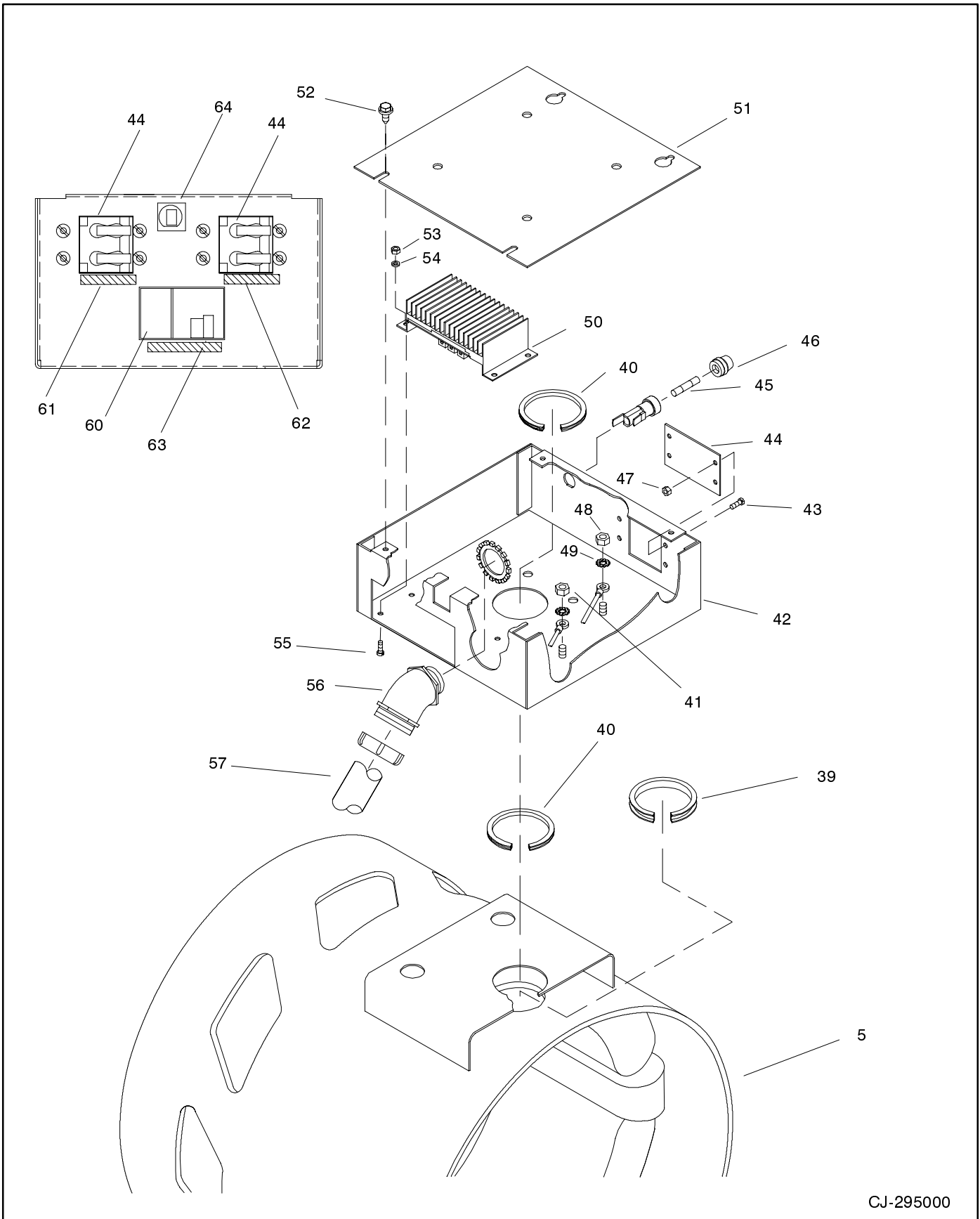
Group 201: Generator and Mounting

Item	Qty.	Description Variation	Part No.
1	1	Plate, Locator 1	229097
		See group 14 for locator plate in other variations	
2	1	Guard, Generator Fan 1, 2, 5, 6, 8, 12	229109-BLK
3	1	Screw, Self-Tapping 10-24 1, 2, 5, 6, 8, 12	X-67-125
4	1	Clip, Speed 1, 2, 5, 6, 8, 12	257442
5	1	Stator Assembly 1, 5, 8, 12	225277
	1	Stator Assembly 2, 6	225278
6	2	Disc, Armature Drive 1, 2, 5, 6, 8, 12	257017
7	8	Washer, 5/16 1, 2, 5, 6, 8, 12	#
8	8	Screw, H.C. M8-1.25 1, 2, 5, 6, 8, 12	X-6050-8
9	8	Cap Screw, 3/8-16 1, 2, 5, 6, 8, 12	X-6238-3
10	2	Pin, Knurled 1	229356
11	7	Screw, H.C. M8-1.5 1	X-6051-13
12	4	Spacer 1, 2, 5, 6, 8, 12	X-400-189
13	4	Screw, Pan Head Metric 1, 2, 5, 6, 8, 12	X-6284-1
14	4	Screw, Pan Head Metric 1, 2, 5, 6, 8, 12	X-6284-2
15	4	Washer, Hardened 1, 2, 5, 6, 8, 12	X-801-3
16	4	Bolt, Over 2, 6	X-6051-17
	4	Bolt, Over 1, 5, 8, 12	X-6051-16
	4	Cap, Plastic (Item not shown) 1, 2, 5, 6, 8, 12	X-6214-4
17	6	Screw, Self-Tapping 10-32 1, 2, 5, 6, 8, 12	X-67-113

Item	Qty.	Description Variation	Part No.
18	1	Panel, End Bracket 1, 2, 5, 6, 8, 12	225545
19	1	O-Ring 1, 2, 5, 6, 8, 12	229110
20	1	Bracket, End 1, 2, 5, 6, 8, 12	225531
21	1	Collector Ring 1, 2, 5, 6, 8, 12	238134
22	1	Bearing, Ball 1, 2, 5, 6, 8, 12	X-758-15
23	1	Rotor Assembly (Includes items 21, 22, 24) 1, 5, 8, 12	A-225273
	1	Rotor Assembly (Includes items 21, 22, 24) 2, 6	A-225274
24	1	Hub, Drive 1, 2, 5, 6, 8, 12	229060
25	1	Fan, Generator 1, 2, 5, 6, 8, 12	225215
26	1	Bracket Assembly, Engine (Includes items 19, 20, 27-38) 1, 2, 5, 6, 8, 12	A-225532
27	2	Retainer, Wire 1, 2, 5, 6, 8, 12	238247
28	4	Screw, Hex Eead Machine #10-32 1, 2, 5, 6, 8, 12	X-97-13
29	2	Shim, Brush Holder 1, 2, 5, 6, 8, 12	238248
30	4	Brush 1, 2, 5, 6, 8, 12	239282
31	4	Spring 1, 2, 5, 6, 8, 12	238150
32	2	Bracket, Brush Holder 1, 2, 5, 6, 8, 12	229178
33	2	Holder, Brush 1, 2, 5, 6, 8, 12	239247
34	4	Washer, Lock #6 1, 2, 5, 6, 8, 12	X-22-6
35	4	Screw, r.h.m. 6-32x5 1, 2, 5, 6, 8, 12	X-49-1
36	1	Terminal 1, 2, 5, 6, 8, 12	269166
37	1	Sleeve, Insulating 1, 2, 5, 6, 8, 12	X-415-2

Common Hardware Procure Locally

Group 201: Generator and Mounting



CJ-295000

Group 201: Generator and Mounting

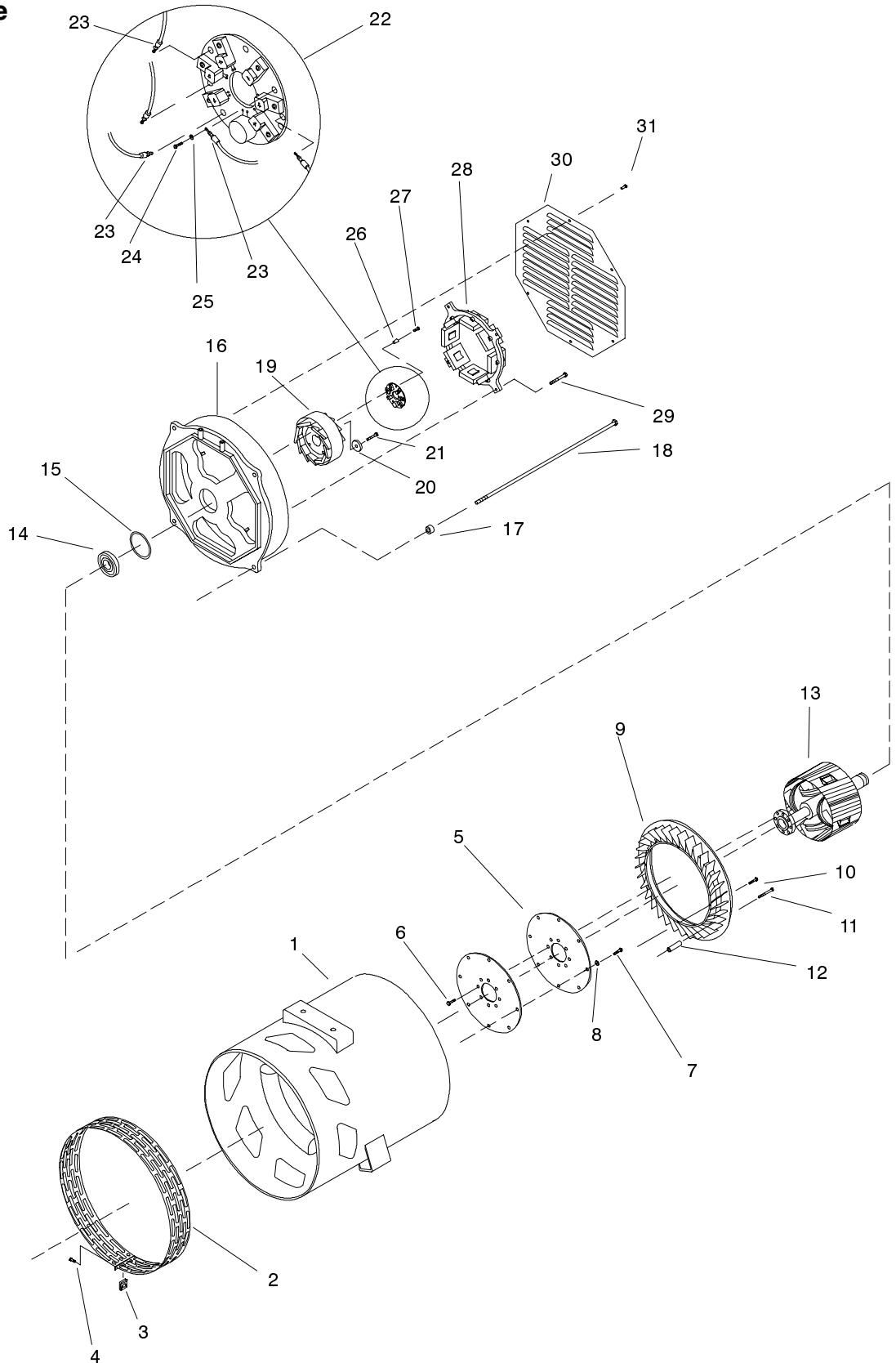
Item	Qty.	Description Variation	Part No.
38	1	Tie, Cable 1, 2, 5, 6, 8, 12	X-468-6
39	1	Grommet, Nylon 1	X-6028-1
40	1	Grommet, Nylon 1, 2, 5, 6, 8, 12	X-6033-6
41	1	Nut, Hex (Green) 1, 2, 5, 6, 8, 12	X-81-8
42	1	Box, Junction 1, 2, 5, 6, 12	225529
	1	Box, Junction 8	225988
43	4	Screw, r.h.m. 6-32x1/4 1, 2, 5, 6, 8, 12	X-49-25
44	1	Plate, Cover 1, 2, 5, 6	245264-BLK
	2	Breaker, Circuit 8	X-506-36
	1	Breaker, Circuit 12	X-506-36
	1	Terminal, Jumper 12	249956
45	1	Fuse, 10 amp 1, 2, 5, 6, 12	223316
46	1	Holder, Fuse 1, 2, 5, 6, 12	238426
47	4	Nut, #6-32 1, 12	#
48	2	Nut, 1/4-20 1, 8, 12	#
49	2	Washer, Shakeproof 1/4 1, 2, 5, 6, 8, 12	X-22-12
50	1	Voltage Regulator, PBIIE 1, 2, 5, 6, 8, 12	E-278598
51	1	Cover, Junction Box 1, 2, 5, 6, 8, 12	225530
52	4	Screw, Phillips Hex Crimptite 1, 2, 5, 6, 8, 12	X-6216-1
53	4	Nut, #8-32 1, 8, 12	#

Item	Qty.	Description Variation	Part No.
54	4	Washer, #8 1, 8, 12	#
55	2	Screw, 1/4-20 1, 8, 12	#
56	1	Conduit Connector 1	X-6027-10
57	1	Harness, Wiring (AC) 1, 2, 5, 6, 12	225506
	1	Harness, Wiring (AC) 8	225984
	4	Terminal 1, 2, 5, 6	X-283-12
58	1	Box Assembly, Junction (Includes items 42, 43, 44, 47) 1, 2, 5, 6, 12	A-225287
	1	Box Assembly, Junction (Includes items 42, 43, 44, 47) 8	A-225989
59	1	Button, Plug 1-3/8 (non-CSA specs) 5, 6 (Item not shown)	X-301-7
60	1	Breaker, GFI 8	225466
	1	Bracket, Breaker Mountng 8	225465
	1	Base, GFI 8	225467
61	1	Decal, 30 amp Main 8	228697
62	1	Decal, 30 amp Lights 8	228698
63	1	Decal, 30 amp Teceptacle 8	228699
64	1	Breaker, Circuit 8	250719
65	1	Controller Extension Harness (not shown) 8	225993
66	1	AC Extension Harness (from junction box to rear of controller) (not shown) 8	225994

Common Hardware Procure Locally

Group 201: Generator and Mounting

3 Phase Mobile



BY-250000

3 Phase Mobile

Group 201: Generator and Mounting

Item	Qty.	Description Variation	Part No.
1	1	Stator Assembly 3, 9	225283
	1	Stator Assembly 4, 10	225284
	1	Stator Assembly 7, 11	225695
2	1	Guard, Generator Fan 3, 4, 7, 9, 10, 11	229109-BLK
3	1	Clip, Speed 3, 4, 7, 9, 10, 11	257442
4	1	Screw, Self-Tapping 3, 4, 7, 9, 10, 11	X-67-125
5	2	Disc, Armature Drive 3, 4, 7, 9, 10, 11	257017
6	8	Screw, 3/8-16 x .875 3, 4, 7, 9, 10, 11	X-6238-3
7	8	Screw, H. C., M8-1.25 3, 4, 7, 9, 10, 11	X-6050-8
8	8	Washer, 5/16 3, 4, 7, 9, 10, 11	
9	1	Fan, Generator 3, 4, 7, 9, 10, 11	225215
10	4	Screw, M5 x .8 x 10mm 3, 4, 7, 9, 10, 11	X-6284-1
11	4	Screw, M5 x .8 x 45mm 3, 4, 7, 9, 10, 11	X-6284-2
12	4	Spacer 3, 4, 7, 9, 10, 11	X-400-189
13	1	Rotor Assembly (includes item 14) 3, 9	A-229146
	1	Rotor Assembly (includes item 14) 4, 7, 10, 11	A-229148
14	1	Bearing, Ball 3, 4, 7, 9, 10, 11	X-758-15
15	1	O-Ring 3, 4, 7, 9, 10, 11	229110
16	1	Bracket, End 3, 4, 7	229090
	1	Bracket, End 9, 10, 11	344566

Item	Qty.	Description Variation	Part No.
17	4	Washer, Hardened 3, 4, 7	X-801-3
18	4	Screw, H.C. M10 x 1.5 4, 7, 10, 11	X-6051-17
	4	Screw, H.C. M10 3, 9	X-6051-16
19	1	Exciter, Armature 3, 4, 7	229098
	1	Exciter, Armature 9, 10, 11	344567
20	1	Washer, Plain 3, 4, 7, 9, 10, 11	X-25-129
21	1	Screw, 3/8-16 x .875 3, 4, 7, 9, 10, 11	X-6238-3
22	1	Circuit Board Assy. 3, 4, 7, 9, 10, 11	A-229152
23	3	Terminal 3,7	X-283-7
	3	Terminal 9, 11	X-283-2
24	5	Screw, 8-32 x .75 3, 4, 7, 9, 10, 11	X-51-8
25	5	Washers, Lock #8 3, 4, 7, 9, 10, 11	X-22-7
26	3	Spacer 3, 4, 7, 9, 10, 11	X-712-17
27	3	Screw, Self-Tapping 3, 4, 7, 9, 10, 11	X-67-129
28	1	Exciter Assembly, Field 3,4,7	A-229276
	1	Exciter Assembly, Field 3,4,7	344569
29	4	Screw, Hex. Head 3, 4, 7, 9, 10, 11	X-97-15
30	1	Panel, End Bracket 3, 4, 7, 9, 10, 11	225545
31	6	Screw, Self-Tapping 3, 4, 7, 9, 10, 11	X-67-113

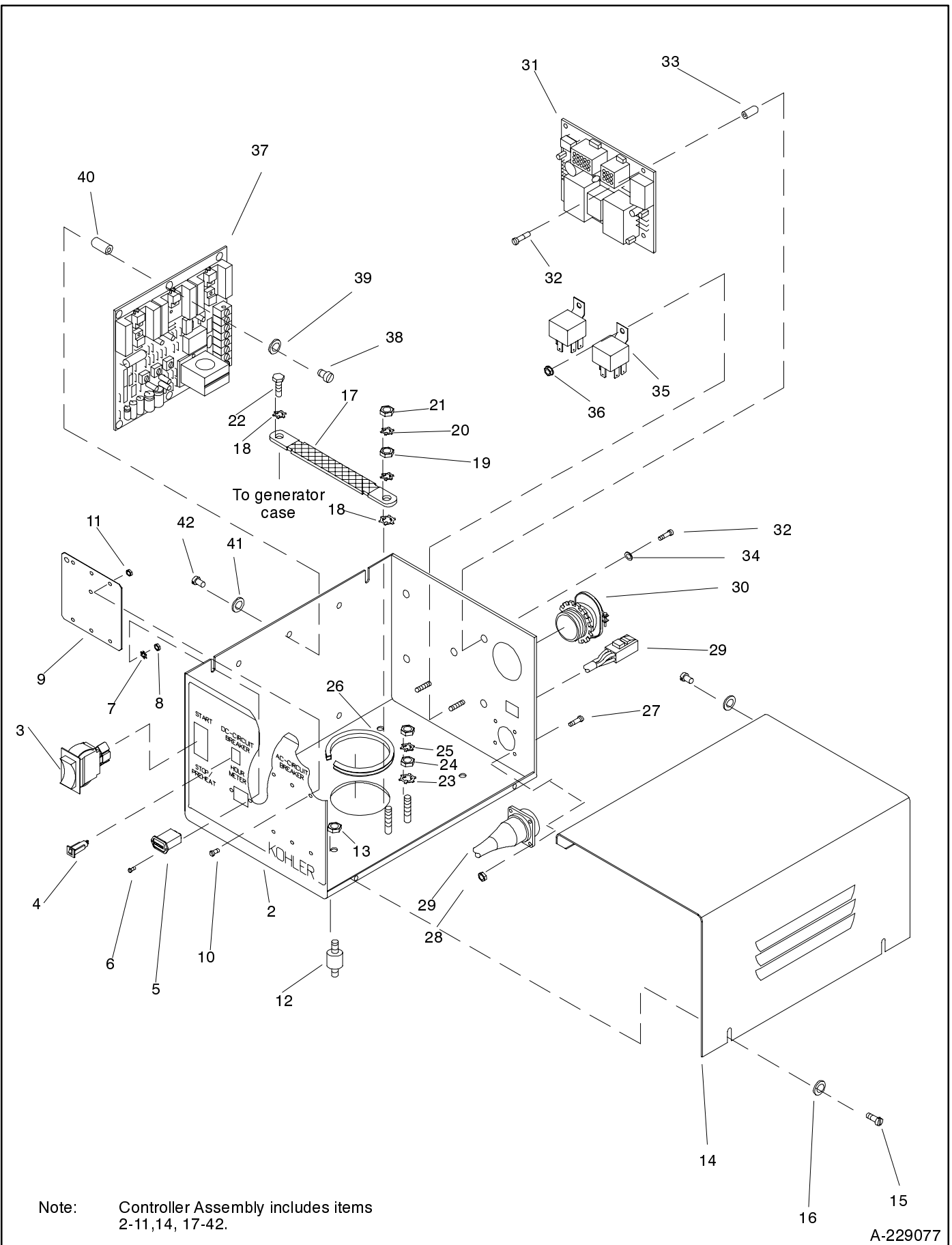
Group 301: Controller & Mounting

Item	Qty.	Description Variation	Part No.
1	1	Harness, Wiring (Includes the following not shown)	
		4	225310
		5	225989
	1	Diode, 6 Amp. 100V	233959
	1	Conector, Plug	239493
A/R		Pin, Female Gold Plated	292838
A/R		Pin, Female	287783
	1	Terminal, 2 Position	269165
A/R		Pin, Female	273661
	1	Connector, 2 Position	269166
	1	Connector, 6 Position	269190
A/R		Pin, Female Gold Plated	241606
	1	Boot	290262
2	1	Controller Assembly (Includes items 3-23)	A-225312
		4	
	1	Controller Assembly (Includes items 3-23)	A-225992
		5	
3	1	Circuit board, Universal	G-239563
		4, 5	
4	1	Washer, Lock 1/4	X-22-11
		4, 5	
5	2	Washer, Lock #6	X-22-6
		4, 5	
6	10	Screw, r.h.m. #6-32	X-49-25
		4, 5	
7	4	Screw, r.h.m. #6-32	X-49-26
		4, 5	
8	2	Screw, Pan Head #6-32	X-49-39
		4, 5	
9	4	Screw, Phillips Hex	X-6216-1
		4, 5	
10	6	Nut, hex #6-32	X-71-2
		4, 5	
11	1	Nut, Hex (green)	X-81-8
		4, 5	
12	2	Fuse, 10 Amp.	223316
		4	
13	1	Box, Silkscreened	225313
		4	
	1	Box, Silkscreened	225991
		5	

Item	Qty.	Description Variation	Part No.
14	1	Cover, Controller	225527
		4, 5	
15	2	Holder, Fuse	238426
		4	
	2	Breaker, Circuit	250719
		5	
16	1	Meter, Hour	238736
		4, 5	
17	4	Mount, Controller	241769
		4, 5	
18	1	Switch, Rocker	249406
		4	
	1	Switch, Rocker	229997
		5	
19	2	Relay	259391
		4, 5	
20	5	Spacer, Circuit Board	287948
		4, 5	
21	1	Harness, Wiring (Includes the following not shown)	225308
		4	
	4	Diode, 6 Amp.,100V	233959
	1	Connector, Receptacle	239496
A/R		Pin, Male	287782
A/R		Pin, Male Gold Plated	292839
	1	Connector, 9 Position	259689
A/R		Pin, Female Gold Plated	241606
	1	Connector, 6 Position	269190
	1	Connector, 15 Position	269366
22	2	Nut, #10-32	#
		4	
23	4	Nut,1/4-20	#
		4	
24	1	Ring, Lock	151511
		4	
25	1	Switch, Toggle (Prime)	268042
		4	
26	1	Controller Harness (Top) (not shown)	225997
		4	
27	1	AC Harness (Bottom) (not shown)	225999
		4	

Common Hardware Procure Locally

Group 301: Controller and Mounting



3 Phase Mobile

Group 301: Controller and Mounting

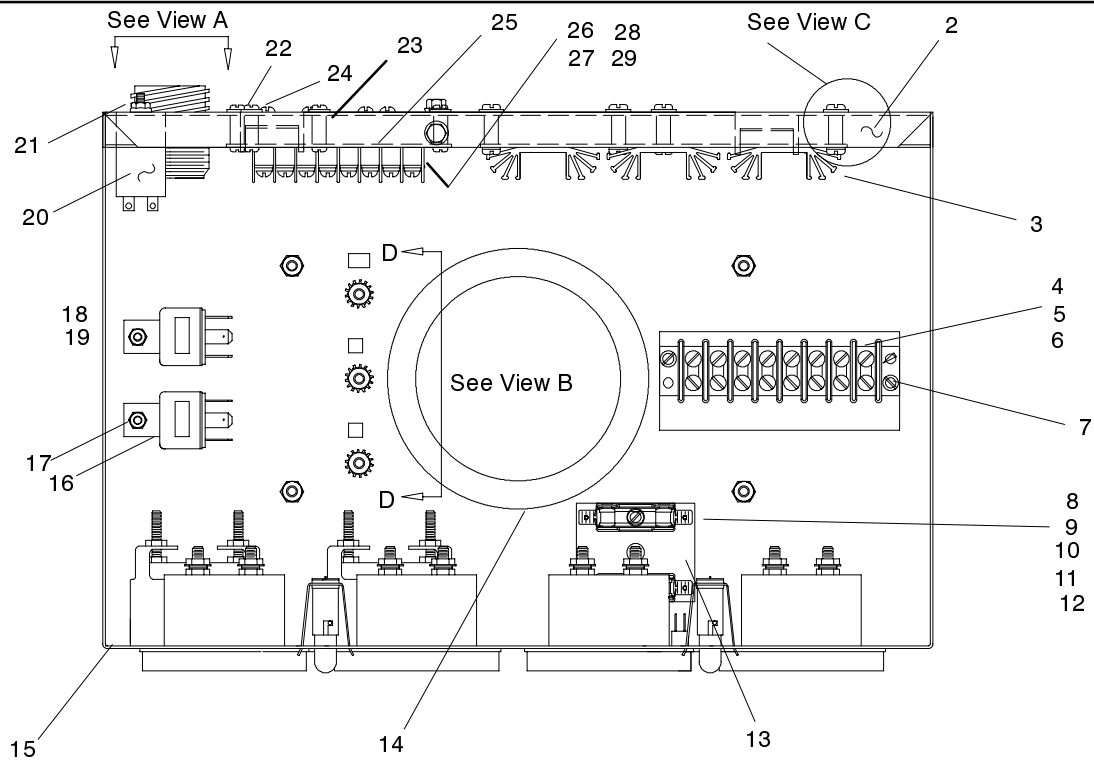
Item	Qty.	Description Variation	Part No.
1	1	Controller Assembly	See chart below
	2		
2	1	Box, Silkscreen	229075
	2		
3	1	Switch, Rocker	249406
	2		
4	1	Breaker, Circuit, 10 Amp. (DC)	250719
	2		
5	1	Meter, Hour	238736
	2		
6	6	Screw, 6-32 x .625	X-49-26
	2		
7	5	Washer, Lock #6	X-22-6
	2		
8	2	Nut, Hex. 6-32	X-71-2
	2		
9	1	Plate, Cover	246434
	2		
10	6	Screw, 6-32 x 5	X-49-1
	2		
11	6	Nut, 6-32	#
	2		
12	4	Mount, Controller	229353
	2		
13	4	Nut, 1/4-20	#
	2		
14	1	Cover, Controller	229076
	2		
15	2	Screw, 10-24 X 1/2	X-67-126
	2		
16	2	Washers, #10	#
	2		
17	1	Strap, Ground	246083
	2		
18	2	Washer, Shakeproof	X-22-12
	2		
19	1	Nut, hex. 1/4-20	X-76-2
	2		
20	3	Washer, Lock 1/4	X-22-11
	2		
21	1	Nut, hex 1/4-20 (green)	X-81-8
	2		
22	1	Bolt, 1/4-20	#
	2		
23	2	Washer, 1/4 #8-32 Int.-Ext. tooth	X-22-12
	2		
24	2	Nut, hex 1/4-20	X-76-2
	2		
25	3	Washer, Lock 1/4	X-22-11
	2		
26	1	Grommet, Nylon	X-6033-4
	2		
27	4	Nut, 6-32	#
	2		

Item	Qty.	Description Variation	Part No.
28	6	Screw, 6-32 x 1/2	X-49-26
	2		
29	1	Harness, Controller (Includes the following not shown)	See chart below
	1	Fuse, 10 Amp.	223316
	4	Diode, 6 Amp. 100V	233959
	1	22 Pin Connector	239496
	1	6 Pin Connector P3	241616
	1	6 Pin Connector	241617
	1	12 Pin Connector	254852
	1	9 Pin Connector	259689
	1	In-line Fuse Holder	269216
	1	15 Pin Connector	269366
	2		
30	1	Connector, Cable	X-6266-1
	2		
31	1	Circuit Board, Universal	G-239563
	2		
32	10	Screw, 6-32 x 1/4	X-49-25
	2		
33	5	Spacer, Circuit Board	287948
	2		
34	5	Washer, #6	#
	2		
35	2	Relay	259391
	2		
36	2	Nut, #10-32	
	2		
37	1	Voltage regulator, PB5	B-258296
	2		
38	6	Screw, #8-32 x 1/4	X-51-8
	2		
39	6	Washer, Nylon	239665
	2		
40	6	Spacer	229357
	2		
41	2	Washer, #8	#
	2		
	4	Washer, Lock #8	X-22-7
	2		
42	6	Screw, # 8-32 x 3/8	X-51-12
	2		
43	1	Harness, Engine Wiring (not shown)	225658
	2		

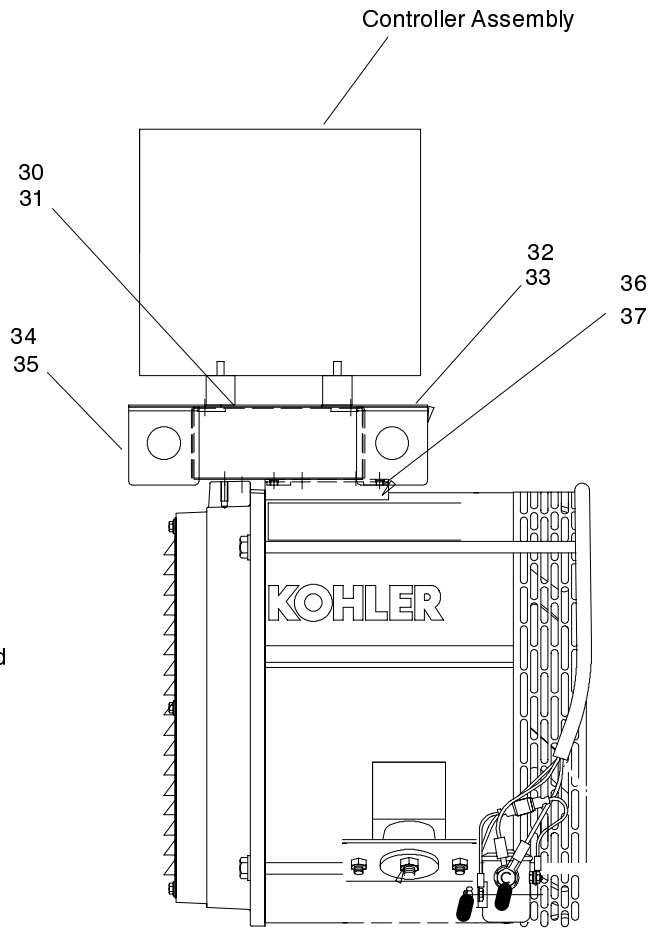
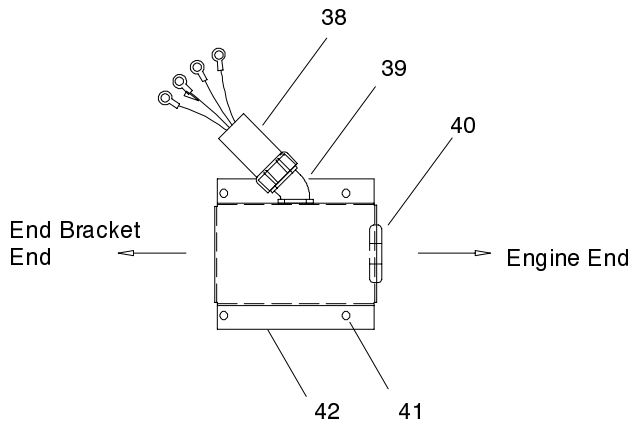
Description	Part Number	
	Serial Numbers before 344383	Serial Numbers 344383 and after
Controller assembly	A-229077	A-225459
Controller wiring harness	229129	225460
Full flashing resistor (10 ohm)	Not Used	226660

Group 301: Controller and Mounting

Spec 190011 Only



Top View of Conduit Connection Bracket



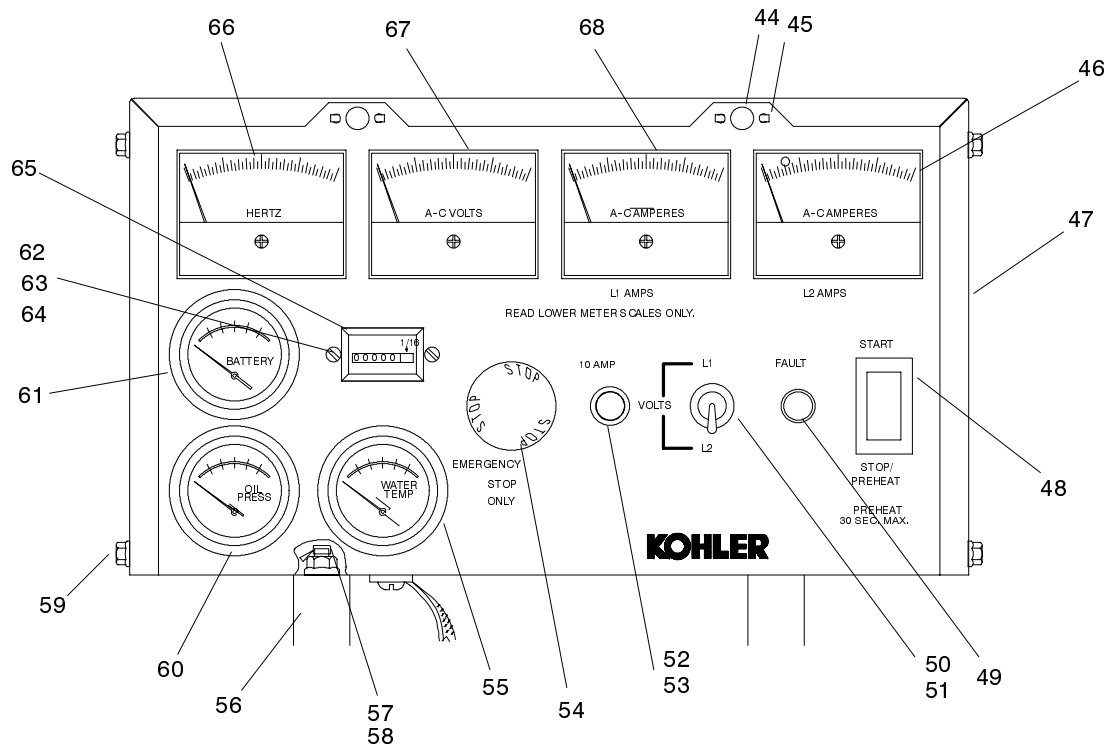
Group 301: Controller and Mounting

Item	Qty.	Description Variation	Part No.
1	1	Controller Assembly (Includes item 2-29, 44-82) 3	A-225296
2	1	Plate, Hinge 3	225298
3	1	Voltage Regulator Assembly (PB5) 3	A-258296
4	1	Block, Terminal 3	246115
5	2	Screw, 8-32 3	X-51-53
6		Nut, 8-32 3	#
7	1	Strip, Marker 3	225301
8	1	Holder, Fuse 3	292821
9	1	Fuse, 1.5 Amp 3	291207
10	2	Screw, 6-32 x 3/8 3	X-49-2
11	2	Washer, Lock #6 3	X-22-6
12	2	Nut, 6-32 3	#
13	1	Marker, Strip 3	225939
14	1	Grommet 3	X-284-31
15	1	Box, Controller 3	225302
16	2	Relay 3	259391
17	2	Hardware, 10-32 3	#
18	2	Relay 3	259391
19	1	Hardware, 10-32 3	3
20	2	Relay 3	241736
21		Nut, 6-32 3	#

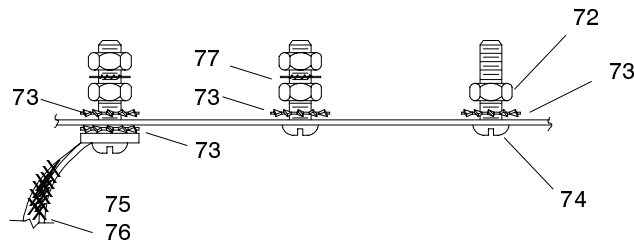
Item	Qty.	Description Variation	Part No.
22	10	Screw, 6-32 x 1/4 3	X-49-25
23	5	Spacer, Circuit Board 3	287948
24	5	Washer, #6 3	#
25	1	Universal Circuit Board 3	E-239563
26	1	Circuit Board Assembly 3	A-258296
27	8	Screw, 6-32 x 1/4 3	X-49-25
28	4	Spacer, Circuit Board 3	287948
29	4	Washer, #6 3	#
30	4	Screw, 5/16-18 x .50 3	X-125-33
31	4	Washer, 5/16 3	259391
32	1	Plate, Controller mounting 3	225305
33	2	1/4 Hardware 3	#
34	2	Transformer, Current 3	254786
35	4	Bracket, CT Mounting 3	225161
36	2	Hardware, 1/4 3	#
37	1	Washer, Shakeproof 3	X-22-12
38	1	Bolt, 1/4-20 3	#
39	1	Conduit, Flexible 3	X-6026-13
40	1	Bushing (not shown) 3	X-6344-12
41	1	Connector, Conduit 3	X-6027-10
42	1	Grommet, 1 3/4 3	X-284-4
43	1	Bracket, Conduit Connection 3	225306
44	4	Hardware, 1/4 3	#
45	4	Harness, Wiring 3	225692

Group 301: Controller and Mounting

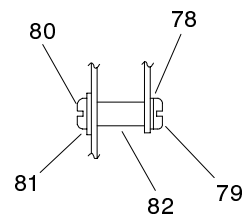
Spec 190011 Only



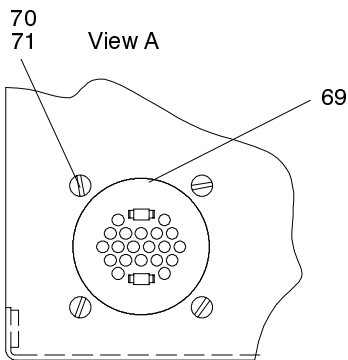
View B



View C



View A



Group 301: Controller and Mounting

Item	Qty.	Description Variation	Part No.
44	2	Lamp 3	225126
45	2	Socket, Lamp 3	284990
46	1	Ammeter 3	225174
47	1	Cover, Controller 3	225304
48	1	Switch, rocker 3	249406
49	1	Lamp 3	269373
50	1	Switch, Toggle 3	238357
51	1	Ring, Lock 3	151511
52	1	Holder, Fuse 3	238426
53	1	Fuse, 10 Amp 3	223316
54	1	Switch, Stop 3	225941
55	1	Gauge, Water Temperature 3	282898
56	4	Bumper 3	292834
57	4	Nut, 5/16-18 3	#
58	4	Plug, Cap 3	X-519-1
59	9	Screw, Crimptight 3	X-6216-1
60	1	Gauge, Oil Pressure 3	282897
61	1	Gauge, Voltage 3	253329
62	2	Nut, Hex 6-32 3	X-71-2
63	2	Washer, Lock #6 3	X-22-6
64	2	Screw, Pan Head 6-32 x 1/2 3	X-49-39

Item	Qty.	Description Variation	Part No.
65	1	Meter, Hour 3	238736
66	1	Meter, Frequency 3	295069
67	1	Voltmeter 3	282814
68	1	Ammeter 3	225174
69	1	Harness, Controller (Includes the following not shown)	225303
	1	Fuse, 10 Amp	223316
	5	Diode, 6 Amp, 100 volt	223959
	1	Connector, Receptacle	239496
	1	Connector, 12 Position	254852
	1	Connector, 9 Position	259689
	1	Holder, Fuse	269216
	1	Connector, 15 Position	269366
	1	Resistor, Field Flashing 3	226666
70	4	Screw, 6-32 x 1/2 3	X-49-26
71	4	Nut, 6-32 3	#
72	5	Nut, Hex 10-24 3	X-6234-6
73	4	Washer, Lock 3	X-22-50
74	3	Screw, 10-24 x 1 3	X-50-70
75	1	Sleeve 3	X-696-5
76	1	Strap, Ground 3	X-6046-2
77	2	Washer, External Tooth #10 3	X-22-22
78	6	Washer, Nylon 3	239665
79	6	Screw, 8-32 x 1/4 3	X-51-8
80	6	Screw, 8-32 x 3/8 3	X-51-12
81	6	Washer, Lock #8 3	X-22-7
82	6	Spacer 3	229357

Group 701: Literature

Item	Qty.	Description Variation	Part No.
1	1	Guide, Safety 1, 2	TP-5251
2	1	RV Warranty 1	TP-5376
3	1	Service Manual, Kubota Engine 1, 2	TP-5546

Item	Qty.	Description Variation	Part No.
4	1	Operation Manual 1	TP-5594
	1	Operation Manual 2	TP-5647
5	1	Generator Service Manual 1	TP-5595
	1	Generator Service Manual 2	TP-5648
6	1	Parts Catalog, Engine and Generator 1,2	TP-5596

Kit List

	7 KW	10 KW
Circuit Breaker Kits		
100 volt, 2 wire, 60 hz.	PA-229186	N/A
100/200 volt, 3 wire, 50 hz.	PA-229394	PA-229393
100/200 volt, 3 wire, 60 hz.,	PA-229392	PA-229542
110/220 volt, 3 wire, 50 hz.	PA-229394	PA-229393
110/220 volt, 3 phase	PA-225673	PA-260110
120/240 volt, 3 wire, 50 hz.	PA-225630	PA-229392
120/240 volt, 3 wire, 60 hz.	PA-229394	PA-229393
220 volt, 2 wire, 50 hz.	PA-225639	PA-225640
240/416 volt, 3 phase	PA-225669	PA-260109
600 volt, 3 phase	PA-260111	PA-260111
220/480 volt, 4 wire	PA-225670	N/A
Cooling System		
Block heater	PA-225680	PA-225680
Remote radiator assembly	PA-225299	PA-225300
Exhaust System Kits		
Exhaust Installation Kit	PA-225627	PA-225627
Flexible Exhaust Connector	PA-225607	PA-225607
Muffler	PA-225606	PA-225606
Silencer	PA-225321	PA-225321
Spark Arrestor	PA-225323	PA-225323
Fuel System Kits		
Flexible fuel line	PA-225677	PA-225677
Fuel water separator	PA-225624	PA-225624
Heavy-duty fuel pump	PA-225463	PA-225463
Harness Kits		
Remote, 7.5 foot extension 1 phase models	PA-225552	PA-225552
Remote, 12 foot, 1 phase models	PA-225536	PA-225536
Remote, 12 foot, 3 phase models	PA-249941	PA-249941
Remote, 15 feet 1 phase models	PA-225563	PA-225563
Remote, 15 foot, 3 phase models	PA-249334	PA-249334
Extension harness, 15 feet 1 phase models	PA-225580	PA-225580
Extension harness, 25 feet 1 phase models	PA-225581	PA-225581
Extension harness, 25 feet 3 phase models	PA-249336	PA-249336
Remote Start Kits		
Remote Start Panel	PA-225576	PA-225576
Remote Start and 2 Meter Panel	PA-225585	PA-225585
Remote Start and 2 Meter Panel	PA-344040	PA-344040
Remote Start and 4 Meter Panel	PA-225588	PA-225588
Remote Start and 4 Meter Panel	PA-344041	PA-344041
Senders, engine	PA-225618	PA-225618
Paint and Miscellaneous Kits		
Black spray paint	221292	221292
Kit, battery	N/A	PA-273660

N/A Not Applicable

Kit Parts Lists

Qty.	Description	Kit/Part No.
Circuit Breaker Kits		
Circuit breaker PA-225630		
1	Decal, notice	246242
1	Terminal, jumper	249956
1	Breaker, Circuit, 25 Amp.	X-506-40
1	Installation Instructions	TT-875
Circuit breaker PA-225639		
1	Decal, notice	246242
1	Plate, cover	229183
1	Breaker, Circuit, 30 Amp.	X-506-49
1	Installation Instructions	TT-875
Circuit breaker PA-225640		
1	Decal, notice	246242
1	Plate, cover	229183
1	Breaker, Circuit, 40 Amp.	X-506-50
1	Installation Instructions	TT-875
Circuit breaker PA-225669		
1	Decal, notice	246242
1	Breaker, Circuit, 25 Amp.	225168
1	Installation Instructions	TT-799
3	Boot	238915
Circuit breaker PA-225670		
1	Decal, notice	246242
1	Breaker, Circuit	250575
1	Installation Instructions	TT-799
Circuit breaker PA-225673		
1	Decal, notice	246242
1	Breaker, Circuit, 12 Amp.	225672
1	Installation Instructions	TT-799
Circuit breaker PA-229186		
1	Decal, notice	246242
1	Plate, cover	229183
1	Breaker, Circuit, 70 Amp.	X-506-48
1	Installation Instructions	TT-875
Circuit breaker PA-229392		
1	Decal, notice	246242
1	Breaker, Circuit, 35 Amp.	X-506-42
1	Installation Instructions	TT-875
Circuit breaker PA-229393		
1	Decal, notice	246242
1	Terminal, jumper	249956
1	Breaker, Circuit, 42 Amp.	X-506-43
1	Installation Instructions	TT-875
Circuit breaker PA-229394		
1	Decal, notice	246242
1	Terminal, jumper	249956
1	Breaker, Circuit, 30 Amp., 2 pole	X-506-36
1	Installation Instructions	TT-875
Circuit breaker PA-229542		
1	Decal, notice	246242
1	Terminal, jumper	249956
1	Breaker, Circuit, 50 Amp.	X-506-38
1	Installation Instructions	TT-875
Circuit breaker PA-260109		
1	Decal, notice	246242
1	Breaker, Circuit, 30 Amp.	269250
1	Installation Instructions	TT-799
3	Boot	238915

Qty.	Description	Kit/Part No.
Circuit breaker PA-260110		
1	Decal, notice	246242
1	Breaker, Circuit, 40 Amp.	269252
1	Installation Instructions	TT-799
3	Boot	238915
Circuit breaker PA-260111		
1	Decal, notice	246242
1	Breaker, Circuit, 20 Amp.	269251
1	Installation Instructions	TT-799
Cooling System Kits		
Block Heater PA-225292		
1	Installation Instructions	TT-1009
2	Washer, plain	X-25-40
2	Hose	X-312-52
6	Clamp, Hose 1/2-1 13/16	X-426-3
2	Clamp, Hose 1 15/16	X-426-8
1	Connector, Hose	X-582-1
1	Bushing, Reducer 1/2	168848
1	Connector, Hose	225250
1	Bracket, Block Heater	225293
1	Hose, Molded	225294
1	Bracket, Block Heater	225297
1	Block Heater	276358
Remote Radiator Assembly PA-225299		
1	Radiator assembly remote	A-225668
1	Harness, wiring	225682
1	Harness, wiring	225683
1	Harness, wiring	225684
1	Relay	259391
1	Holder, in-line fuse	269216
1	Fuse, 15 Amp.	238645
2	Insulink	X-367-3
1	Terminal	X-431-25
1	Screw, r.h.m. 10-32 x 1/2	X-50-1
1	Nut, Whiz	X-6210-1
Remote Radiator Assembly PA-225300		
1	Radiator assembly	A-225664
1	Harness, wiring	225682
1	Harness, wiring	225683
1	Harness, wiring	225684
1	Relay	259391
1	Holder, in-line fuse	269216
1	Fuse, 15 Amp.	238645
2	Insulink	X-367-3
1	Terminal	X-431-25
1	Screw, r.h.m. 10-32 x 1/2	X-50-1
1	Nut, Whiz	X-6210-1
Exhaust System Kits		
Muffler Kit PA-225606		
1	Muffler, exhaust	225603
1	Adapter, hose	286831
1	Clamp, muffler	288827
Flexible Exhaust Connector PA-225607		
1	Elbow, 90 degrees	151771
1	Connector, exhaust	254972
Exhaust Installation Kit PA-225627		
1	Elbow, 90 Degrees	151771
1	Nipple, Pipe 1 1/2 x 2	155029

Kit Parts Lists

Qty.	Description	Kit/Part No.
Silencer		
	PA-225321	
1	Muffler, exhaust	225316
1	Adapter, exhaust	X-570-22
Spark Arrestor		
	PA-225323	
1	Clamp, muffler	X-722-4
1	Arrestor, Spark	225319
1	Connector	225320
1	Clamp, muffler	277706
Fuel System Kits		
Flexible Fuel Line		
	PA-225677	
1	Line, flexible fuel	225675
1	Line, flexible fuel	225676
2	Clamp, hose	X-426-9
1	Elbow, 1/2-20 x 1/4	X-447-6
1	Elbow, oil line connector	X-447-7
Fuel/water Separator		
	PA-225624	
1	Filter, water separator	225251
1	Bracket, separator filter	225604
2	Washer, plain	X-25-40
1	Line, flex fuel	X-386-101
1	Line, fuel	X-386-95
2	Connector, hose elbow	X-391-25
2	Clamp, hose	X-426-9
2	Screw, H.C.	X-465-16
2	Screw, H.C. (Metric)	X-6068-1
2	Plug, pipe	X-75-41
Heavy-Duty Fuel Pump		
	PA-225463	
1	Installation Instructions	TT-1138
3	Nut, elastic stop	X-101-25
11	Washer, plain	X-25-40
3	Grommet	X-284-29
2	Insulink	X-367-3
1	Flexible Fuel Line	X-386-74
1	Flexible Fuel Line	X-386-99
2	Connector, Hose Elbow	X-391-20
4	Clamp, hose	X-426-9
2	Screw, Hex. Head Cap	X-6049-1
2	Union, banjo	X-6288-1
1	Bracket, fuel pump mounting	225462
1	Pump, fuel	229051
2	Lead, wire	229056
Harness Kits		
12-Inch Remote Harness (pigtail)		
	PA-225536	
1	Harness	225536
7.5-Foot Remote Harness		
	PA-225552	
1	Harness	225552
15-Foot Remote Harness		
	PA-225563	
1	Harness, remote 15 feet	225563
15-Foot Remote Harness		
	PA-225580	
1	Harness, extension 15 feet	225580
25-Foot Remote Harness		
	PA-225580	
1	Harness, extension 25 feet	225581
12-Inch Remote Harness (Pigtail)		
	PA-249941	
1	Harness	249941
15-Foot Remote Harness		
	PA-249334	
1	Harness	243934
25-Foot Remote Harness		
	PA-249336	
1	Harness	243936

Qty.	Description	Kit/Part No.
Remote Start Kits		
Remote Start Panel		
	PA-225576	
1	Installation Instructions	TT-872
1	Panel assembly remote	A-225574
(Includes the following)		
1	Connector, plug 6 position	241617
1	Panel, remote	260105
1	Switch, rocker	269296
Remote Start And 2-Meter Panel		
	PA-225585	
1	Installation Instructions	TT-874
1	Panel, control	A-225584
(Includes the following)		
1	Panel, silkscreened	225583
1	Switch, rocker	249330
1	Harness, wiring	249331
1	Gauge, oil pressure	249438
1	Gauge, water temperature	249440
Remote Start And 2-Meter Panel		
	PA-344040	
1	Installation Instructions	TT-1072
1	Decal, warning	249494
1	Panel, control	A-344033
(Includes the following)		
1	Panel, control	344029
1	Switch, rocker	344039
1	Harness, wiring	344031
1	Gauge, oil pressure	344036
1	Gauge, water temperature	344035
Remote Start And 4-Meter Panel		
	PA-225588	
1	Installation Instructions	TT-873
1	Panel, control	A-225587
(Includes the following)		
1	Panel, silkscreened	225586
1	Switch, rocker	249330
1	Gauge, oil pressure	249438
1	Gauge, water temperature	249440
1	Meter, hour	249461
1	Voltmeter, battery	249462
1	Harness, panel	249467
Remote Start And 4-Meter Panel		
	PA-344041	
1	Installation Instructions	TT-1073
1	Decal, warning	249494
1	Panel, control	A-344034
(Includes the following)		
1	Panel, control	344030
1	Switch, rocker	344039
1	Harness, wiring	344032
1	Gauge, oil pressure	344036
1	Gauge, water temperature	344035
1	Meter, hour	344038
1	Voltmeter, battery	344037
Engine Sender		
	PA-225618	
1	Sender, water temperature	249348
1	Sender, oil pressure	344305
1	Adapter, sender	225307
1	Installation Instructions	TT-885
Miscellaneous Kits		
Black Spray Paint		
	221292	
1	Black spray paint	221292
Battery Kit		
	PA-273660	
1	Battery	291918
1	Base, wood battery	PFS-940
1	Clip, 1/2"	PNP-4003

Appendix A.

Glossary of Abbreviations

Abbreviations are used throughout this manual. Normally in the text they will appear in complete form with the abbreviation following in parenthesis the first time they are used. After that they will appear in the abbreviated form. The commonly used abbreviations are shown below.

AC	alternating current	etc.	et cetera (and so forth)
AISI	American Iron and Steel Institute	ext.	external
Amp	ampere	°F	Fahrenheit degree
Amps	amperes	fl. oz.	fluid ounce, fluid ounces
ANSI	American National Standard Institute	FM	frequency modulation
API	American Petroleum Institute	ft.	foot, feet
approx.	approximate, approximately	ft. lbs.	foot pound, foot pounds
A/R	as required, as requested	ga.	gauge
A/S	as supplied, as stated, as suggested	gal./ gals.	gallon, gallons
ASA	American Standards Association	gph	gallons per hour
ASME	American Society of Mechanical Engineers	gpm	gallons per minute
assy.	assembly	gr.	grade
ASTM	American Society for Testing Materials	grd.	ground
ATDC	after top dead center	HCHT	high cylinder head temperature
aux.	auxiliary	HET	high exhaust (or engine) temperature
AWG	American Wire Gauge	Hg	mercury (element)
AWM	appliance wiring material	H ₂ O	water
BBDC	before bottom dead center	HP	horsepower
BDC	before dead center	hr, hrs	hour
BHP	brake horsepower	Hz	hertz (cycles per second)
bmep	brake mean effective pressure	ID	inside diameter
Btu	British thermal unit	IEEE	Institute of Electrical and Electronic Engineers
°C	Celsius degree	in.	inch(es)
cc	cubic centimeter	inc.	incorporated
CCA	cold cranking Amps.	in. lbs.	inch pounds
CEC	Canadian Electrical Code	int.	internal
cfh	cubic feet per hour	int.-ext.	internal-external
cfm	cubic feet per minute	ISO	International Standards Organization
CID	cubic inch displacement	J	joule, joules
cm	centimeter, centimeters	JIS	Japanese Industry Standard
cmm	cubic meters per minute	kg	kilogram, kilograms
co.	company	kg/cm ²	kilograms per square centimeter
cont'd.	continued	kgm	kilogram meter(s)
CSA	Canadian Standards Association	kJ	kilojoules (btu cal)
CT	current transformer	km	kilometer, kilometers
cu. in.	cubic inch, cubic inches	kPa	kiloPascal, kiloPascals
cyl.	cylinder	kph	kilometers per hour
dB	decibel	kV	kilovolt
dBA	decibels (A weighted)	kVA	kilovolt amperes
DC	direct current	kW	kilowatt, kilowatts
DCR	direct current resistance	kWH	kilowatt hour
deg.	degree	L	liter, liters
dept.	department	LxWxH	length x width x height
dia.	diameter	LED(s)	light emitting diode
e.g.	example given	lb., lbs.	pound, pounds
EIA	Electronic Industries Association	L/hr.	liter per hour, liters per hour
EMI	electromagnetic interference	L/min.	liter(s) per minutes
EPA	Environmental Protection Agency	LOP	low oil pressure

LP	liquefied petroleum	pot.	potentiometer
m	meter, meters	ppm	parts per million
m ³	cubic meter, cubic meters	psi	pounds per square inch
max.	maximum	pt., pts.	pint, pints
MCM	one thousand circular mils.	PVC	polyvinyl chloride
megger	megohmmeter	qt., qts.	quart, quarts
MHz	megahertz	qty.	quantity
mi.	mile, miles	ref.	reference
mil	one one-thousandth of an inch	RFI	radio frequency interference
min.	minimum	r.h.m.	round-head machine (screw)
mJ	millijoule, millijoules	rms	root mean square
MJ	mega joule, mega joules	RPM	revolutions per inch
mm	millimeter, millimeters	RTV	room temperature vulcanization
m ³ /min	cubic meters per minute	SAE	Society of Automotive Engineers
MPa	megaPascal	SCR	silicon controlled rectifier
mW	milliwatt, milliwatts	sec.	second, seconds
MW	megawatt, megawatts	spec.	specs, specification
N/A	not available or not applicable	sq.	square
NBS	National Bureau of Standards	sq. cm	square centimeters
N.C.	normally closed	sq. in.	square inch, square inches
NEC	National Electrical Code	tach	tachometer
NEMA	National Electrical Manufacturers Association	TDC	top dead center
NFPA	National Fire Protection Association	tech. pub.	technical publications
Nm	Newton meter, Newton meters	temp.	temperature
no., nos	number, numbers	TIF	telephone influence factor
NPT	National Standard taper pipe thread per general use	TP, TPs	technical publications
N/R	not required	turbo	turbocharger
OC	overcrank	UHF	ultrahigh frequency
OD	outside diameter	UNC	Unified coarse thread (was NC)
OEM	original equipment manufacturer	UNF	Unified fine thread (was NF)
OS	overspeed, oversize	UL	Underwriter's Laboratories, Inc.
O/S	oversize	U/S	undersize
OSHA	Occupational Safety and Health Act	U.S.A.	United States of America
OV	overvoltage	v	volt, volts
oz.	ounce, ounces	vac	volts alternating current
PF	power factor	vdc	volts direct current
PMG	permanent magnet generator	VHF	very high frequency
		W	watt, watts

Appendix B.

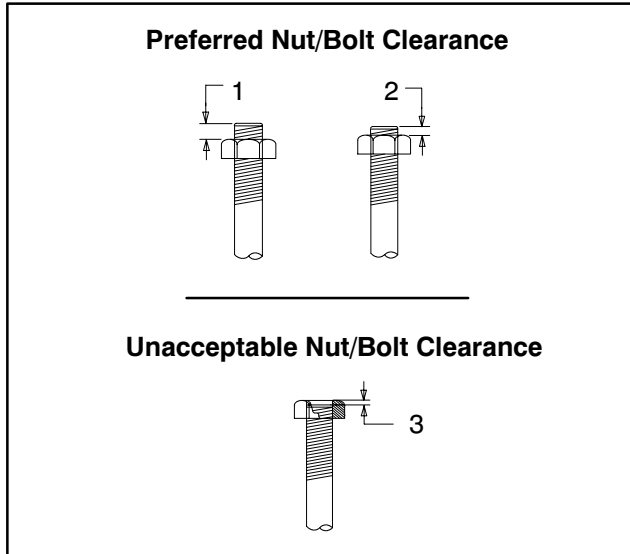
Common Hardware Application Guidelines

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 2 as a guide. As a general rule, a minimum length of one thread beyond the nut and a maximum length of 1/2 the bolt/screw diameter beyond the nut is the preferred method.

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

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



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

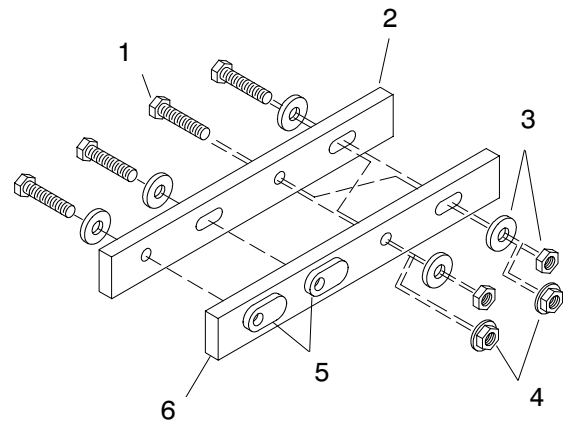
Figure 2. Acceptable Bolt Lengths

Steps for common hardware application:

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

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

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



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

Figure 3. Acceptable Hardware Combinations

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Nuts

Styles



Hex. Head



Lock Nut or
Nylock Nut



Square Nut



Cap Nut or
Acorn Nut



Wing Nut

Grade (Hardness)

American Standard



Grade 2



Grade 5

Metric



5.8



8.8



10.9



12.9

Sample Dimensions

American Standard

Major Thread Diameter In Fractional Inches Or $\frac{1}{4}$ -20 Threads Per Inch
Screw Number Size

Metric

Major Thread Diameter In Millimeters $M8-1.25$ Distance Between Threads In Millimeters

Washers

Styles



Plain
Washer



Split Lock Washer
or Spring Washer



Spring Washer
or Wave Washer



External
Tooth Lock
Washer



Internal Tooth
Lock Washer



Internal-External Tooth
Lock Washer

Grade (Hardness)

There is no marking to identify hardness. Usually hardened washers have a black oxide or black phosphate finish rather than a zinc (silver-colored) finish.

Sample (Hardness)

Plain Washers

Internal Dimension $\frac{9}{32} \times \frac{5}{8} \times \frac{1}{16}$ Thickness
External Dimension

Lock Washers

$\frac{5}{8}$
Internal Dimension

Figure 5. Nuts/Washers

Appendix D.

General Torque Specifications

Use the following specifications for SAE fasteners when no torque values are given elsewhere in this or the service manual for a specified bolt. The values given are based on

new plated threads. Increase values by 20% if nonplated threads are used.

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

Use the following specifications for metric fasteners when no torque values are given elsewhere in this manual for a specified bolt. These values are based on new plated threads. Increase values by 20% if nonplated threads are used.

Screws threaded into aluminum must have two diameters of threads engaged and may require 30% or more reduction in the torque.

Torque ft-lb (Nm)

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

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Appendix E.

Common Hardware List

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

HEX BOLTS (GRADE 5)

<u>Part Number</u>	<u>Dimensions</u>	<u>Part Number</u>	<u>Dimensions</u>
X-465-17	1/4-20 x .38	X-6238-13	3/8-16 x 4.50
X-465-6	1/4-20 x .50	X-6238-18	3/8-16 x 5.50
X-465-2	1/4-20 x .62	X-6238-25	3/8-16 x 6.50
X-465-16	1/4-20 x .75		
X-465-18	1/4-20 x .88	X-6238-14	3/8-24 x .75
X-465-7	1/4-20 x 1.00	X-6238-16	3/8-24 x 1.25
X-465-8	1/4-20 x 1.25	X-6238-21	3/8-24 x 4.00
X-465-9	1/4-20 x 1.50	X-6238-22	3/8-24 x 4.50
X-465-10	1/4-20 x 1.75		
X-465-11	1/4-20 x 2.00	X-6024-5	7/16-14 x .75
X-465-12	1/4-20 x 2.25	X-6024-2	7/16-14 x 1.00
X-465-14	1/4-20 x 2.75	X-6024-8	7/16-14 x 1.25
X-465-21	1/4-20 x 5.00	X-6024-3	7/16-14 x 1.50
		X-6024-4	7/16-14 x 2.00
X-465-25	1/4-28 x .38	X-6024-11	7/16-14 x 2.75
X-465-20	1/4-28 x 1.00	X-6024-12	7/16-14 x 6.50
X-125-33	5/16-18 x .50	X-129-15	1/2-13 x .75
X-125-23	5/16-18 x .62	X-129-17	1/2-13 x 1.00
X-125-3	5/16-18 x .75	X-129-18	1/2-13 x 1.25
X-125-31	5/16-18 x .88	X-129-19	1/2-13 x 1.50
X-125-5	5/16-18 x 1.00	X-129-20	1/2-13 x 1.75
X-125-24	5/16-18 x 1.25	X-129-21	1/2-13 x 2.00
X-125-34	5/16-18 x 1.50	X-129-22	1/2-13 x 2.25
X-125-25	5/16-18 x 1.75	X-129-23	1/2-13 x 2.50
X-125-26	5/16-18 x 2.00	X-129-24	1/2-13 x 2.75
		X-129-25	1/2-13 x 3.00
230578	5/16-18 x 2.25	X-129-27	1/2-13 x 3.50
		X-129-29	1/2-13 x 4.00
X-125-29	5/16-18 x 2.50	X-129-30	1/2-13 x 4.50
X-125-27	5/16-18 x 2.75	X-463-9	1/2-13 x 5.50
X-125-28	5/16-18 x 3.00	X-129-44	1/2-13 x 6.00
X-125-22	5/16-18 x 4.50	X-129-51	1/2-20 x .75
X-125-32	5/16-18 x 5.00	X-129-45	1/2-20 x 1.25
X-125-35	5/16-18 x 5.50	X-129-52	1/2-20 x 1.50
X-125-36	5/16-18 x 6.00		
X-125-40	5/16-18 x 6.50	X-6021-3	5/8-11 x 1.00
		X-6021-4	5/8-11 x 1.25
X-125-43	5/16-24 x 1.75	X-6021-2	5/8-11 x 1.50
X-125-44	5/16-24 x 2.50	X-6021-1	5/8-11 x 1.75
X-125-30	5/16-24 x .75		
X-125-39	5/16-24 x 2.00	273049	5/8-11 x 2.00
X-125-38	5/16-24 x 2.75		
		X-6021-5	5/8-11 x 2.25
X-6238-2	3/8-16 x .62	X-6021-6	5/8-11 x 2.50
X-6238-10	3/8-16 x .75	X-6021-7	5/8-11 x 2.75
X-6238-3	3/8-16 x .88	X-6021-12	5/8-11 x 3.75
X-6238-11	3/8-16 x 1.00	X-6021-11	5/8-11 x 4.50
X-6238-4	3/8-16 x 1.25	X-6021-10	5/8-11 x 6.00
X-6238-5	3/8-16 x 1.50	X-6021-9	5/8-18 x 2.50
X-6238-1	3/8-16 x 1.75		
X-6238-6	3/8-16 x 2.00	X-6239-1	3/4-10 x 1.00
X-6238-17	3/8-16 x 2.25	X-6239-8	3/4-10 x 1.25
X-6238-7	3/8-16 x 2.50	X-6239-2	3/4-10 x 1.50
X-6238-8	3/8-16 x 2.75	X-6239-3	3/4-10 x 2.00
X-6238-9	3/8-16 x 3.00	X-6239-4	3/4-10 x 2.50
X-6238-19	3/8-16 x 3.25	X-6239-5	3/4-10 x 3.00
X-6238-12	3/8-16 x 3.50	X-6239-6	3/4-10 x 3.50
X-6238-20	3/8-16 x 3.75		
		X-792-1	1-8 x 2.25
		X-792-5	1-8 x 3.00
		X-792-8	1-8 x 5.00

NUTS

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

NOTE

6-32 and 8-32 standard nuts must be used for circuit board mountings and some controller assembly applications and are not classified as common hardware. For this reason they are not on this list.

PLAIN WASHERS

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

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