

Service Parts

Engine

Engine Models:

John Deere 6090HF485

Generator Models:

230-300REOZJD

230-300DSEJD

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Introduction

This manual lists service replacement parts for John Deere engine model 6090HF485.

At the time of print this manual applied to the engine models listed in the Model Index. On occasion this manual may apply to engines not listed in the Model Index.

Information in this publication represents data available at the time of print. The generator set manufacturer 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.

Index. Lists the engine models and groups.

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

Numbering System Significance

This manual uses the following numbering systems:

Engine Model. The product identification number located on the engine nameplate. Engines break down into groups.

Group Number. A unique number representing a parts group needed to assemble an engine function. For example, Group 1 is the Air Intake group.

Variation Number. A group might have several variations. Each variation performs the same function with different parts lists. For example, a 12-volt alternator and 24-volt alternator both perform the same function, but, with different parts. Each difference requires a group variation or module number.

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

Illustrations

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

How to Find Part Numbers

Use the following steps to locate a service replacement part.

1. Locate the engine nameplate to **identify the engine model number**.
2. **Turn to the Model Index.** The first column lists the engine model numbers. The headings identify the groups of parts that make up the engine.
3. **Identify the group** most likely to include the service part number.
4. **Find the group variation number** at the intersection of the model row and the group column. Note the variation number.
5. **Page forward to locate the group** identified in step 3 or find the appropriate page in the Table of Contents.
6. **Find the part on the illustration** and note the item number of the part or **find the part description in the parts list**.
7. Select **the part number that corresponds to your group variation**. The first column lists the illustration item number. Find the variation identified in the Model Index in the appropriate column on the right side of the parts list table. Find the quantity used at the intersection of the item number row and the variation column. A blank space at the intersection means the variation/module does not use that part number.

Hardware References

Many common hardware items do not appear in parts manuals or will appear as common hardware entries. A common hardware entry lists the size of the hardware. For example, an item that appears as "Hardware, 3/8-16" in the text means that the piece is 3/8-16 size. Obtain common hardware locally.

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.

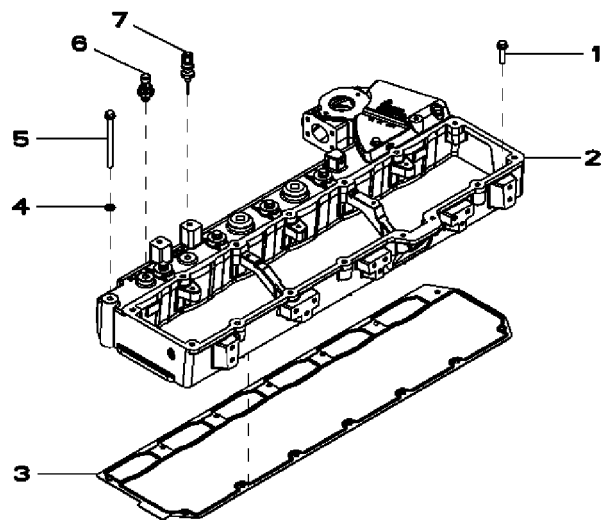
Model Index

Group Title	Air Intake	Water Pump	Water Pump Inlet	Thermostat	Fan Belt	Fan Drive	Vent Tube	Camshaft	Valve Train	Rocker Arm Cover	Fuel Injection System	Fuel Filter	Crankshaft	Crankshaft Pulley
Group No.	1	2	4	5	6	7	10	11	12	13	14	18	19	20
	Variation Number													
Engine Model														
230-300 kW														
6090HF485	1701	2001	5701	3908	2400	234A	2901	4601	4901	1101	1601	3511	4701	1319
					2437									

Group Title	Piston & Connecting Rod Flywheel Flywheel Housing Cylinder Head Exhaust Manifold Exhaust Elbow Dipstick Oil Pan Oil Cooler Oil Pump Cylinder Block Timing Gear Cover Turbocharger & Oil Lines												
	Group No.	21	22	23	24	25	26	28	29	30	31	32	34
	Variation Number												
Engine Model													
230-300 kW													
6090HF485	4801	1506	1401	5101	2805	6402	4003	1916	5921	5001	4601	7701	6519

Group Title													
	<i>Starter Motor</i>	<i>Alternator</i>	<i>Alternator Brackets</i>	<i>Cylinder Head Gasket Set</i>	<i>Overhaul Gasket Set</i>	<i>Wiring Harness</i>	<i>Turbo Air Inlet</i>	<i>Engine Gas Recirculation</i>					
	Group No.	36	37	38	40	41	43	45	47				
		Variation Number											
	Engine Model												
	230-300 kW												
	6090HF485	3005	3119	6202	9902	9902	8401	5405	8902				

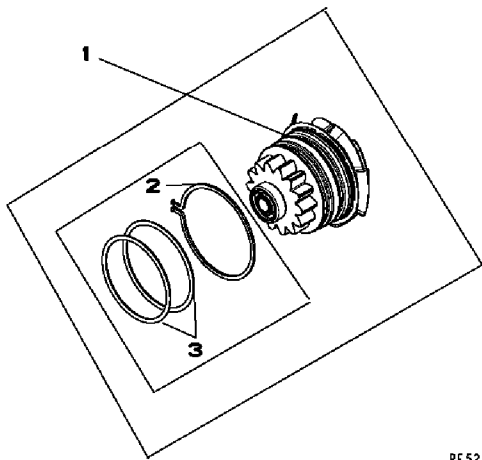
Group 1: Air Intake



Item	Part Number	Description	Qty.
			Variation 1701
1	#	Screw, M8 x 35	7
2	GM50218	Intake manifold	1
3	GM50142	Gasket	1
4	GM50168	Washer, sealing	7
5	#	Screw, M8 x 110	7
6	GM49999	Sensor, manifold air press	1
7	GM50003	Sensor, temperature	1

Common hardware; procure locally.

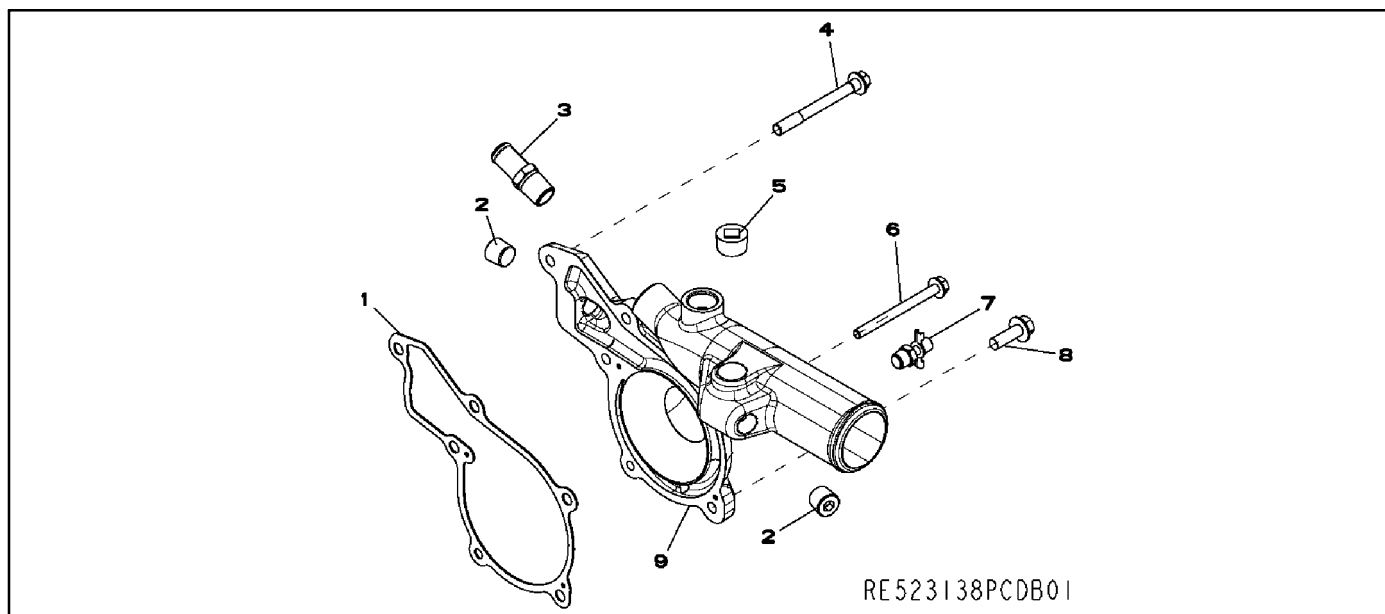
Group 2: Water Pump



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Item	Part Number	Description	Qty.
			Variation 2001
1	GM50245	Kit, water pump	1
2	GM50172	Snap ring	1
3	GM50205	O-ring Kit	1

Group 4: Water Pump Inlet

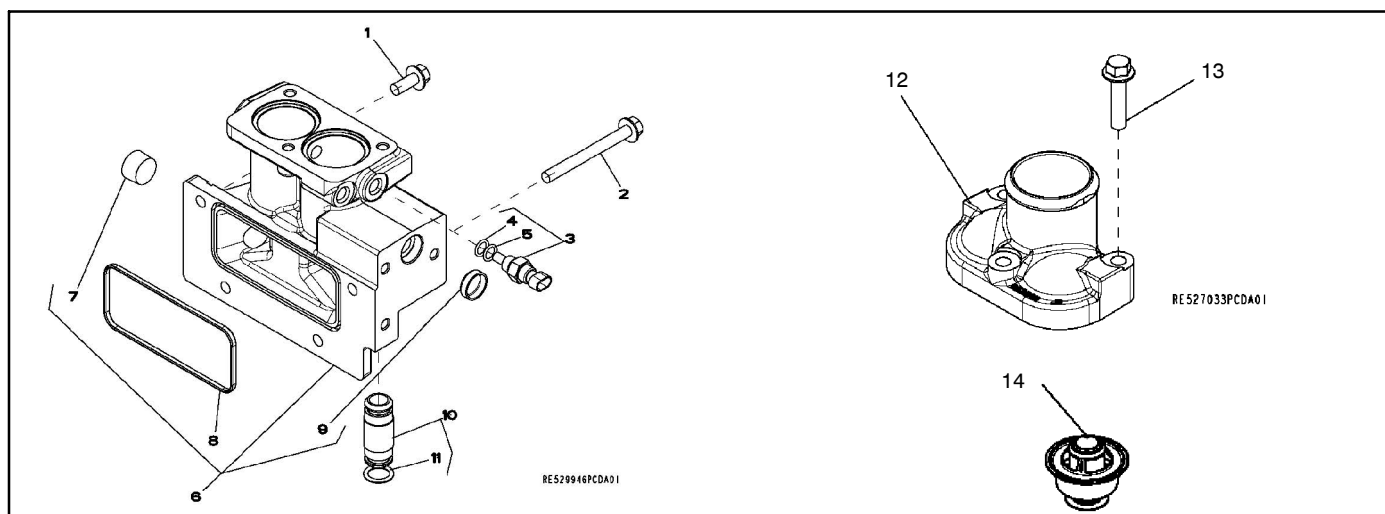


Item	Part Number	Description	Qty. Variation 5701
1	352737	Gasket	1
2	GM18862	Pipe plug, 1/2 in.	2
3	223461	Fitting, hose	1
4	#	Screw	3
5	GM50197	Hose	1

Item	Part Number	Description	Qty. Variation 5701
6	#	Screw	1
7	223435	Drain valve	1
8	#	Screw, M10 x 30	1
9	GM50233	Connection, water pump	1

Common hardware; procure locally.

Group 5: Thermostat

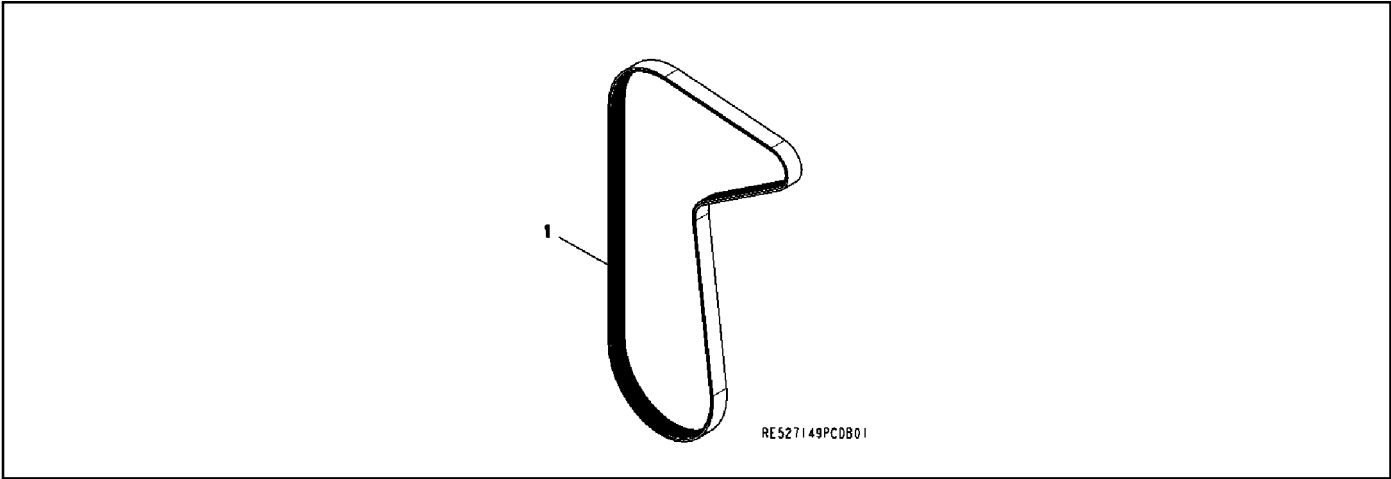


Item	Part Number	Description	Qty. Variation 3908
1	#	Screw, M10 x 25	3
2	#	Screw, M10 x 100	1
3	GM18785	Sensor, coolant temperature	1
4	GM21508	O-ring	1
5	GM50114	O-ring	1
6	GM50244	Housing	1
7	#	Pipe plug	1

Item	Part Number	Description	Qty. Variation 3908
8	GM50134	Gasket	1
9	223409	Plug	1
10	GM50203	Tube	1
11	GM50131	O-ring	1
12	GM50185	Housing	1
13	#	Screw, M10 x 45	3
14	GM50291	Thermostat	2

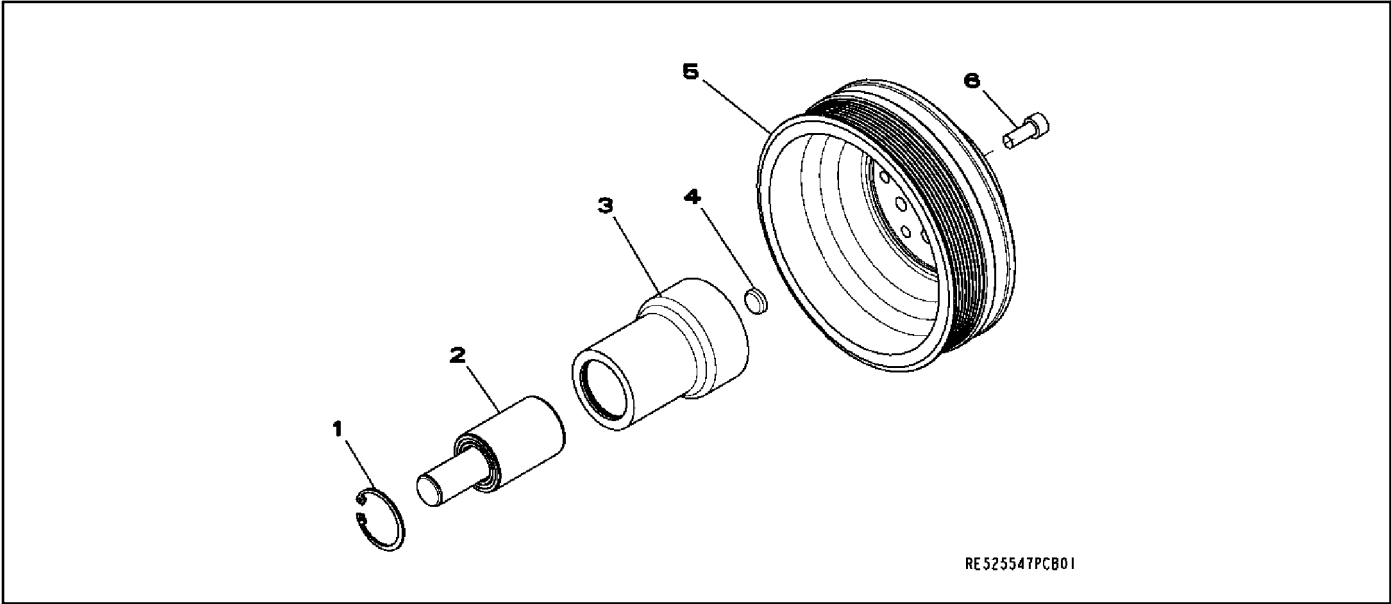
Common hardware; procure locally.

Group 6: Fan Belt



Item	Part Number	Description	Qty.
			Variation
1	GM50121 352793	V-belt	2408 2437 1

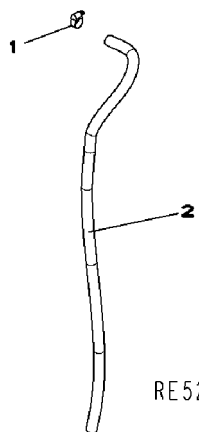
Group 7: Fan Drive



Item	Part Number	Description	Qty.
			Variation 234A
1	GM50110	Snap ring	1
2	352708	Bearing	1
3	GM50189	Hub	1
4	#	Plug	1
5	GM50188	Pulley	1
6	#	Screw	6

Common hardware; procure locally.

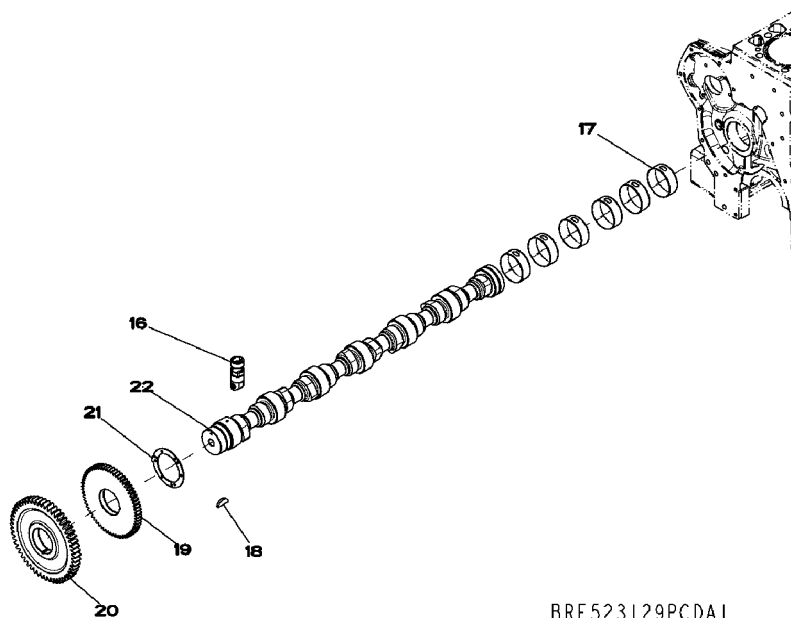
Group 10: Vent Tube



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Item	Part Number	Description	Qty.
			Variation 2901
1	336705	Clamp, hose	1
2	GM50118	Tube	1

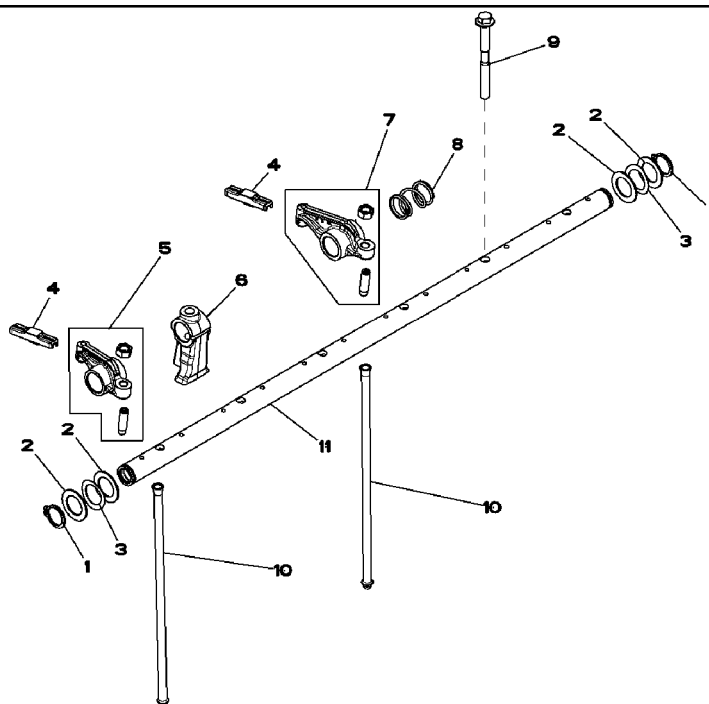
Group 11: Camshaft



BRE523129PCDA1

Item	Part Number	Description	Qty.
			Variation 4601
16	GM50214	Cam follower roller	12
17	223889	Bushing	6
18	352700	Shaft key	1
19	GM50141	Gear	1
20	GM50138	Gear	1
21	GM50132	Washer	1
22	GM50167	Camshaft	1

Group 12: Valve Train



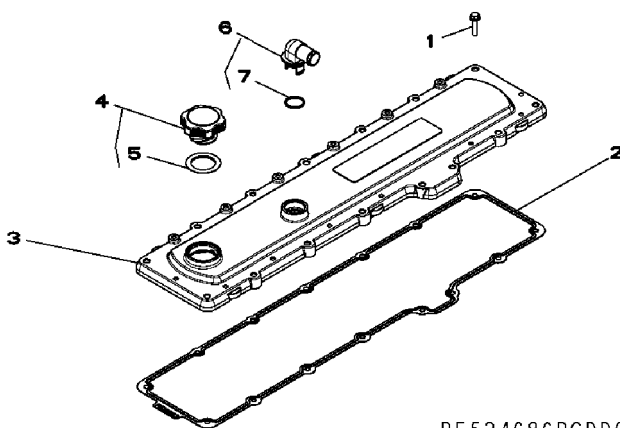
RE523132PCDB01

Item	Part Number	Description	Qty.
			Variation 4901
1	GM50111	Snap ring	2
2	GM50182	Washer	4
3	GM50123	Washer	2
4	GM50154	Guide	12
5	GM50212	Rocker arm	6
6	GM50137	Pedestal	6

Item	Part Number	Description	Qty.
			Variation 4901
7	GM50211	Rocker arm	6
8	GM50136	Spring	5
9	#	Cap screw	6
10	223877	Push rod	12
11	GM50213	Rocker arm shaft	1

Common hardware; procure locally.

Group 13: Rocker Arm Cover



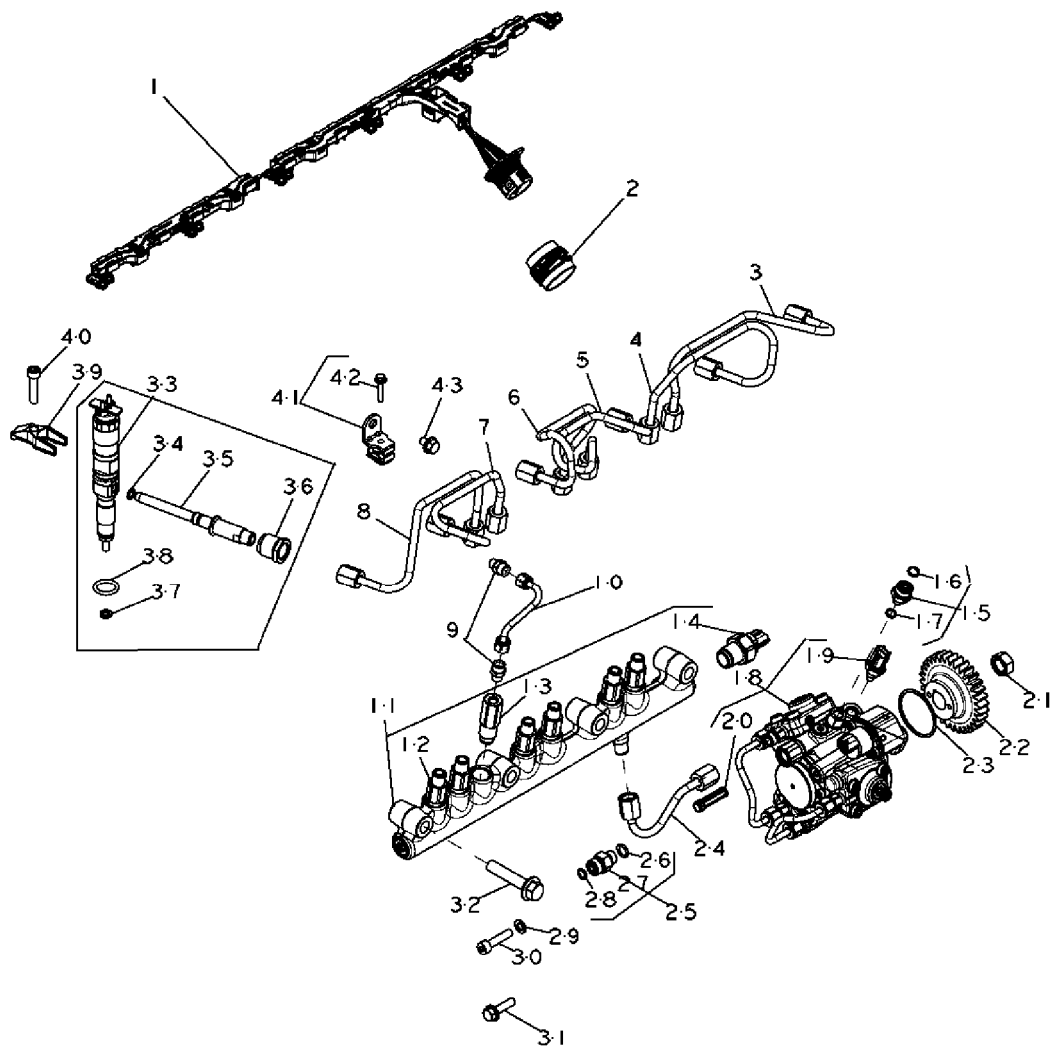
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Item	Part Number	Description	Qty.
			Variation 1101
1	#	Screw, M8 x 35	15
2	GM50143	Gasket	1
3	GM50287	Cover	1
4	GM50275	Filler cap	1

Item	Part Number	Description	Qty.
			Variation 1101
5	GM50190	O-ring	1
6	GM50285	Fitting, elbow	1
7	360170	O-ring	1

Common hardware; procure locally.

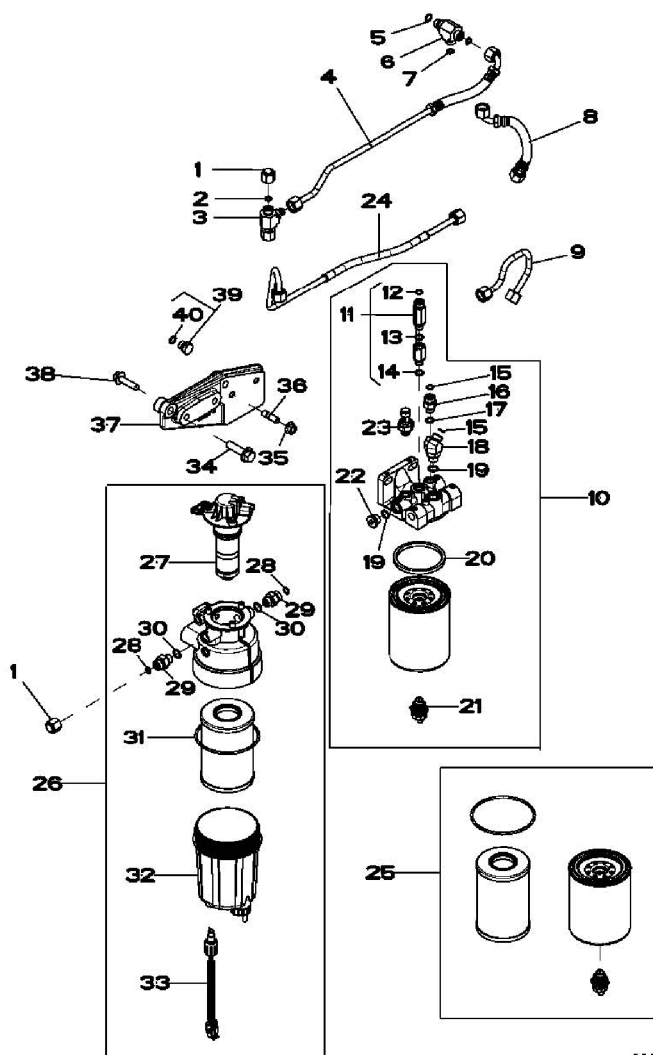
Group 14: Fuel Injection System



Item	Part Number	Description	Qty.	Item	Part Number	Description	Qty.
			Variation 1601				Variation 1601
1	GM50229	Wiring harness	1	24	GM50215	Fuel line	1
2	GM50170	Connector	1	25	GM50116	Fitting, adapter	1
3	GM50256	Fuel line	1	26	GM21508	O-ring	1
4	GM50257	Fuel line	1	27	GM50106	Fitting, adapter	1
5	GM50258	Fuel line	1	28	360555	O-ring	1
6	GM50259	Fuel line	1	29	#	Washer, 8.400 x 15 x 1.600 mm	1
7	GM50260	Fuel line	1	30	#	Screw, M8 x 35	1
8	GM50261	Fuel line	1	31	#	Screw, M8 x 30	2
9	GM50202	Fitting, adapter	2	32	#	Screw	4
10	GM50216	Line	1	33	GM50279	Kit, nozzle	1
11	GM50224	Fuel line	1	34	360165	O-ring	6
12	GM46637	Restrictor	6	35	GM50225	Fitting	6
13	GM50252	Pressure relief valve	1	36	GM50153	Tube nut	6
14	GM50243	Sensor	1	37	GM50119	Washer	6
15	GM50250	Fitting, adapter	1	38	GM46635	O-ring	6
16	360555	O-ring	1	39	GM49839	Clamp	6
17	GM32896	O-ring, 8.100 x 1.600 mm	1	40	GM46623	Cap screw	6
18	GM50210	Fuel pump	1	41	GM50262	Clamp	3
19	GM46641	Sensor, fuel temperature	1	42	GM50274	Screw with washer	1
20	GM50251	Kit	1	43	GM50033	Cap screw	3
21	224161	Nut	1				
22	GM50140	Gear	1				
23	GM50177	O-ring	1				

Common hardware; procure locally.

Group 18: Fuel Filter



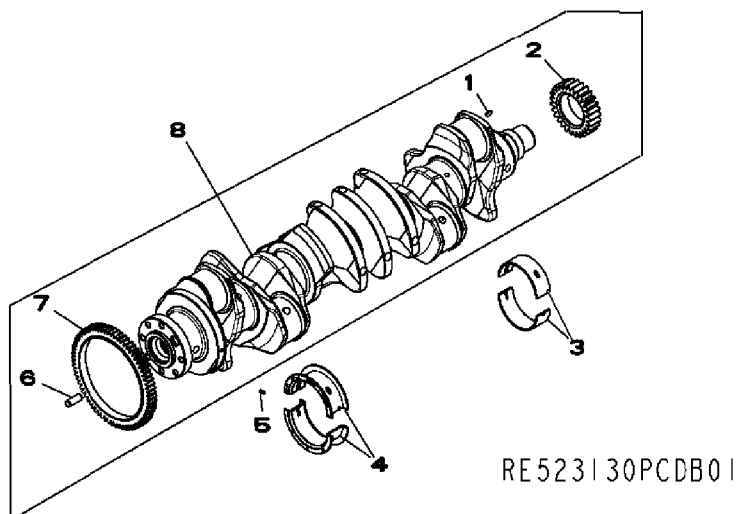
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Item	Part Number	Description	Qty. Variation 3511
1	#	Fitting	3
2	360555	O-ring	2
3	GM50109	Fitting, tee	1
4	GM50996	Fuel line	1
5	GM21508	O-ring	1
6	GM50108	Fitting, tee	1
7	360555	O-ring	2
8	GM50255	Fuel line	1
9	GM50234	Fuel line	1
10	GM50281	Filter	1
11	GM50280	Bleed valve	1
12	360165	O-ring	1
13	GM50114	O-ring	1
14	GM50114	O-ring	1
15	360165	O-ring	2
16	GM50106	Fitting, adapter	1
17	GM50114	O-ring	1
18	360556	Fitting, elbow, 45 deg.	1
19	GM50115	O-ring	2
20	GM18730	Packing	1

Item	Part Number	Description	Qty. Variation 3511
21	GM50242	Drain valve	1
22	GM50292	Fitting plug	1
23	GM50230	Sensor	1
24	GM50217	Fuel line	1
25	GM50263	Filter kit	1
26	GM50236	Filter, fuel pump and filter assembly	1
27	GM50241	Fuel pump, 24 V	1
28	360165	O-ring	2
29	GM50107	Fitting, adapter	2
30	GM50115	O-ring	2
31	GM50193	O-ring	1
32	GM50997	Bowl	1
33	GM50198	Sensor, moisture	1
34	#	Screw, M12 x 45	2
35	#	Flange nut, M10	2
36	GM50113	Stud	2
37	GM50160	Bracket	1
38	#	Screw	2
39	360013	Fitting plug	1
40	GM21508	O-ring	1

Common hardware; procure locally.

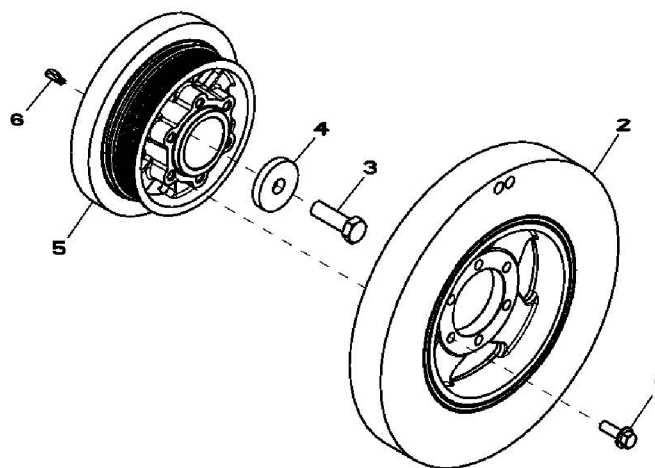
Group 19: Crankshaft



Item	Part Number	Description	Qty. Variation 4701
1	352746	Key	1
2	352715	Gear	1
3	GM50283	Bearing	1
4	GM50284	Bearing, thrust	1
5	#	Dowel pin, 4 x 14 mm	1
6	223754	Dowel pin	6
8	GM50290	Crankshaft	1

Common hardware; procure locally.

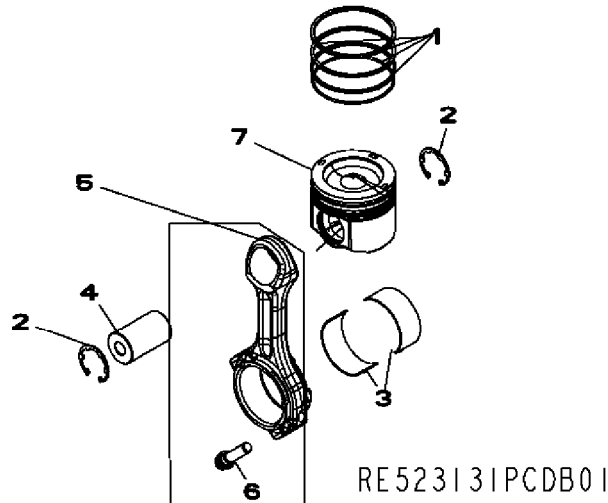
Group 20: Crankshaft Pulley



Item	Part Number	Description	Qty. Variation 1319
1	#	Cap screw, M10 x 30	6
2	GM50231	Torsional damper	1
3	#	Cap screw, M16 x 50	1
4	GM18712	Washer	1
5	GM50286	Torsional damper	1
6	GM50194	Key	1

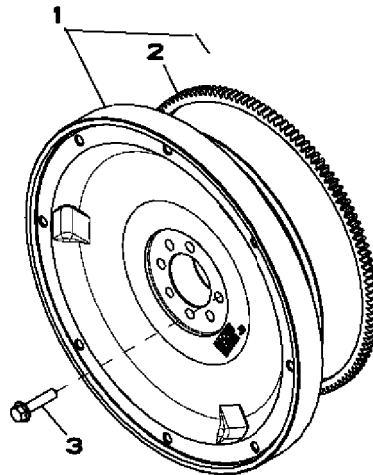
Common hardware; procure locally.

Group 21: Piston & Connecting Rod



Item	Part Number	Description	Qty.
			Variation 4801
1	GM50240	Piston ring kit	6
2	GM50159	Snap ring	12
3	GM50282	Bearing	6
4	GM50135	Piston pin	6
5	GM50208	Connecting rod	6
6	GM18728	Screw	2
7	GM50289	Kit, cylinder liner/piston w/rings	1

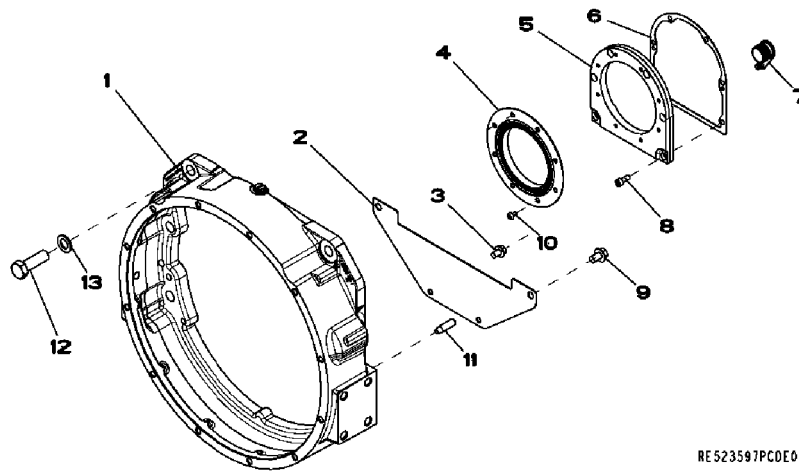
Group 22: Flywheel



Item	Part Number	Description	Qty.
			Variation 1506
1	223708	Flywheel	1
2	223750	Gear	1
3	#	Cap screw	6

Common hardware; procure locally.

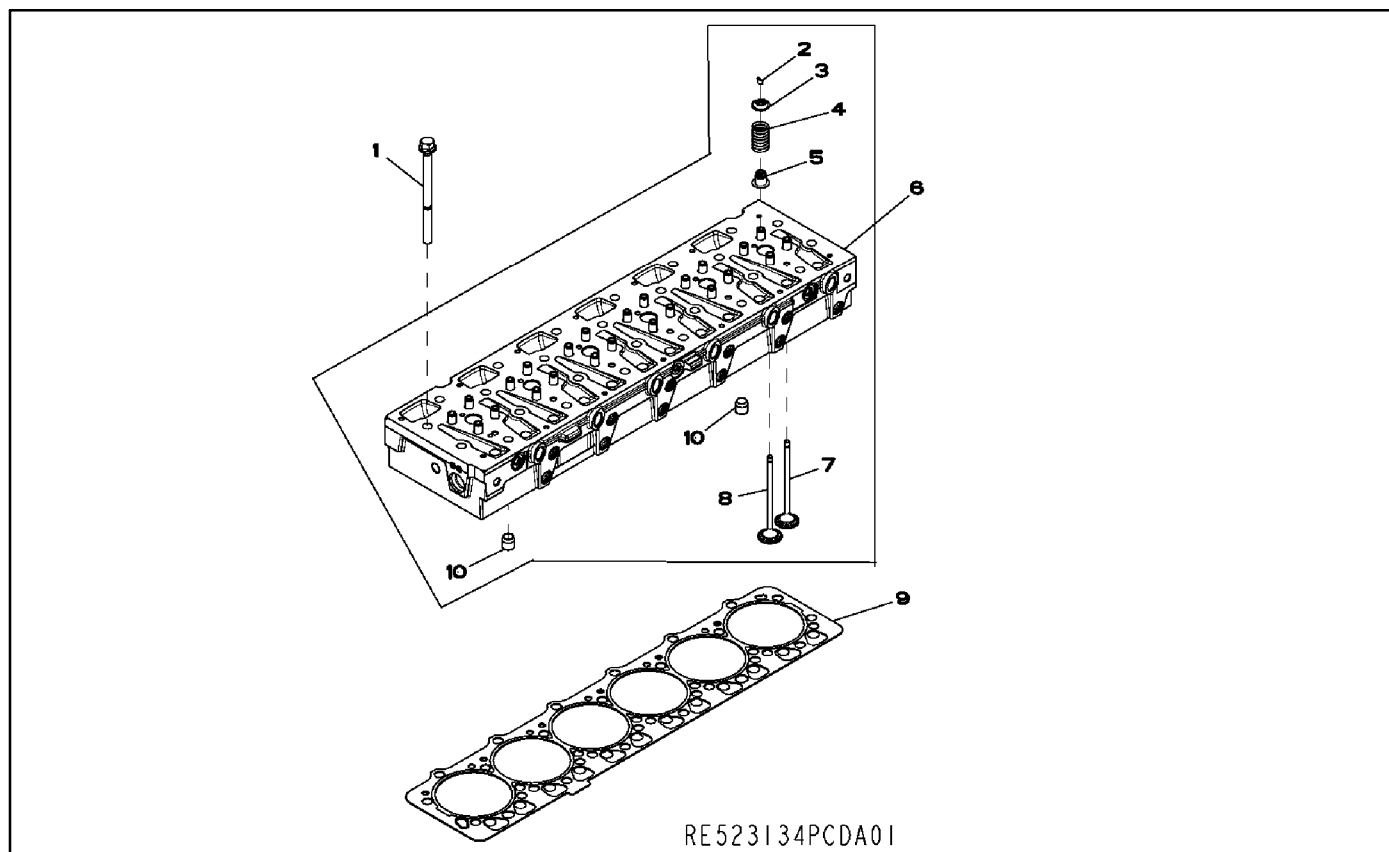
Group 23: Flywheel Housing



Item	Part Number	Description	Qty.
			Variation 1401
1	GM50161	Housing	1
2	GM50158	Cover	1
3	#	Screw, M10 x 16	2
4	GM50222	Seal	1
5	GM50147	Housing	1
6	GM50192	Gasket	1
7	GM18691	Plug	1
8	#	Screw, M8 x 20	6
9	#	Screw, M12 x 20	2
10	#	Screw, M6 x 12	8
11	352707	Dowel pin	2
12	#	Cap screw, M20 x 60	6
13	#	Washer	6

Common hardware; procure locally.

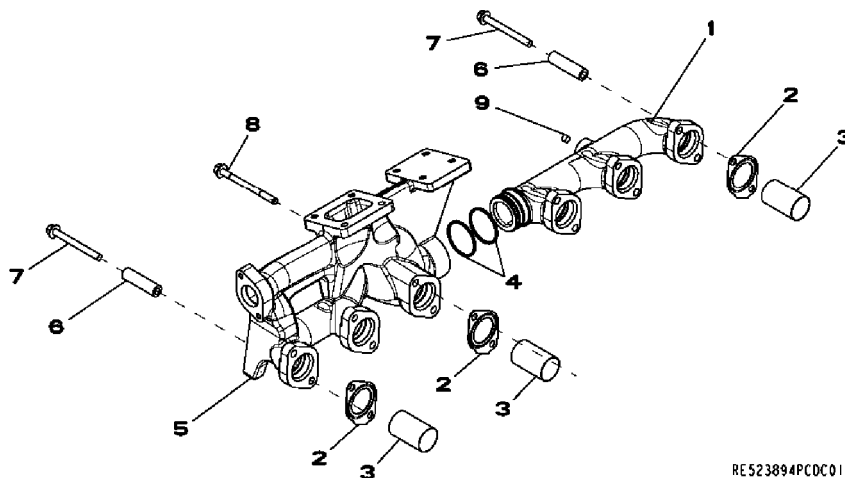
Group 24: Cylinder Head



Item	Part Number	Description	Qty.
			Variation 5101
1	#	Screw	26
2	GM50173	Retainer	48
3	GM50139	Retainer	24
4	GM50127	Spring	24
5	GM50271	Seal	24
6		Cylinder head	1
7	GM50163	Exhaust valve	12
8	GM50162	Intake valve	12
9	GM50133	Gasket	1
10	223755	Bushing	2

Common hardware; procure locally.

Group 25: Exhaust Manifold

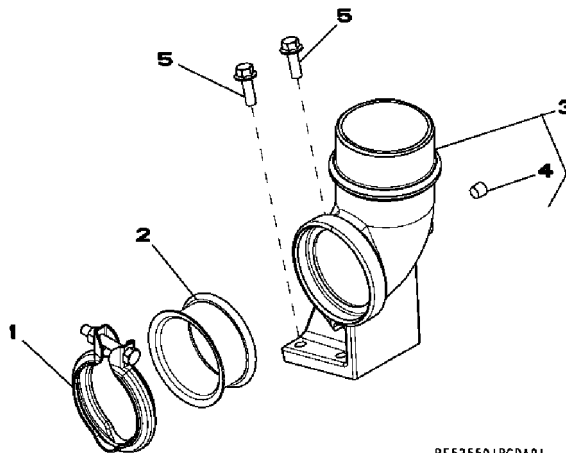


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Item	Part Number	Description	Qty.
			Variation 2805
1	GM50152	Exhaust manifold	1
2	GM50156	Gasket	6
3	GM50191	Sleeve	6
4	GM50120	Ring	2
5	GM50165	Exhaust manifold	1
6	GM49881	Spacer	11
7	#	Screw, M10 x 100	11
8	#	Cap screw	1
9	GM18873	Pipe plug	1

Common hardware; procure locally.

Group 26: Exhaust Elbow

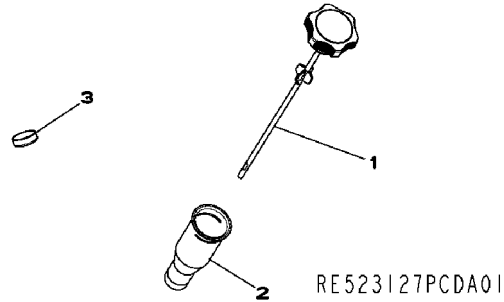


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Item	Part Number	Description	Qty.
			Variation 6402
1	GM50117	Clamp	1
2	223891	Adapter	1
3	GM50273	Fitting, elbow	1
4	#	Pipe plug	1
5	#	Screw, M10 x 30	4

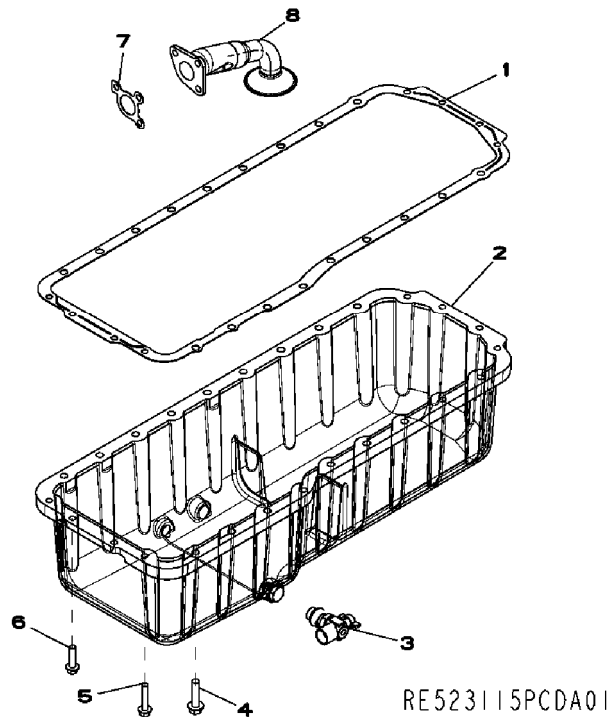
Common hardware; procure locally.

Group 28: Dipstick



Item	Part Number	Description	Qty.
			Variation 4003
1	GM50196	Dipstick	1
2	GM50126	Dipstick tube	1
3	GM18877	Cap, oil fill hole	1

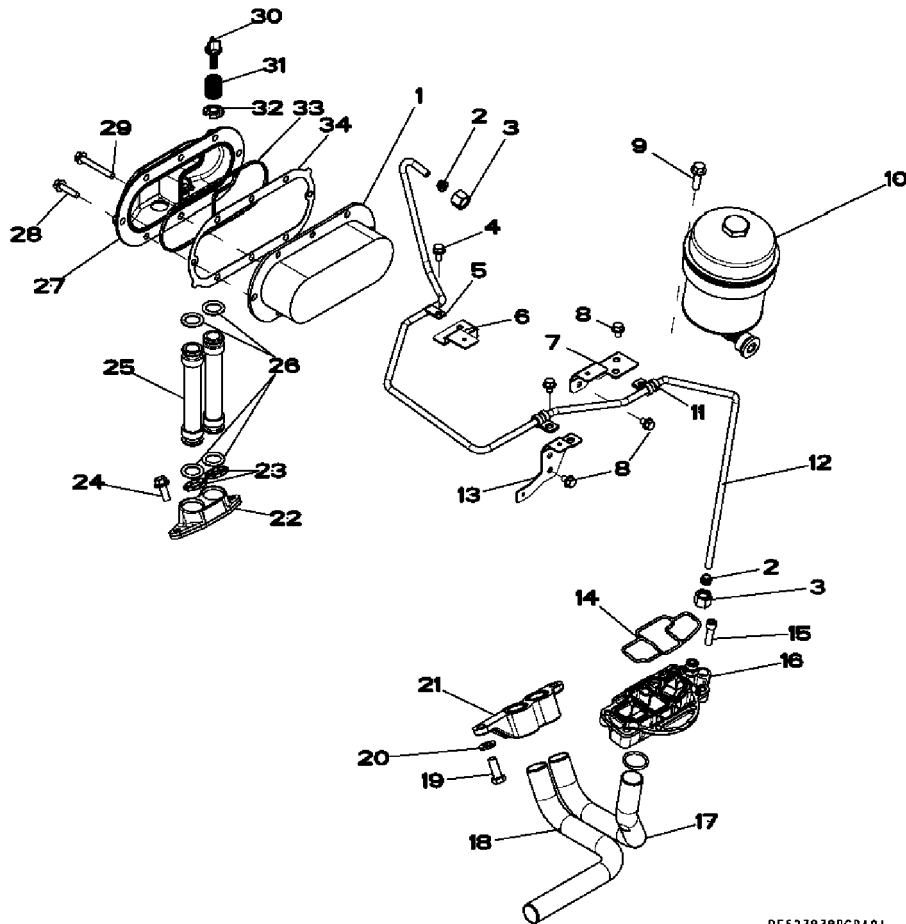
Group 29: Oil Pan



Item	Part Number	Description	Qty.
			Variation 1916
1	GM50221	Gasket	1
2	GM50246	Oil pan	1
3	GM50204	Drain valve	1
4	#	Screw, M12 x 50	18
5	#	Screw, M10 x 45	8
6	-	Not used	
7	352709	Gasket	1
8	GM50220	Oil pump intake	1
9	#	Cap screw, M10 x 60 (oil pump intake, not shown)	3

Common hardware; procure locally.

Group 30: Oil Cooler



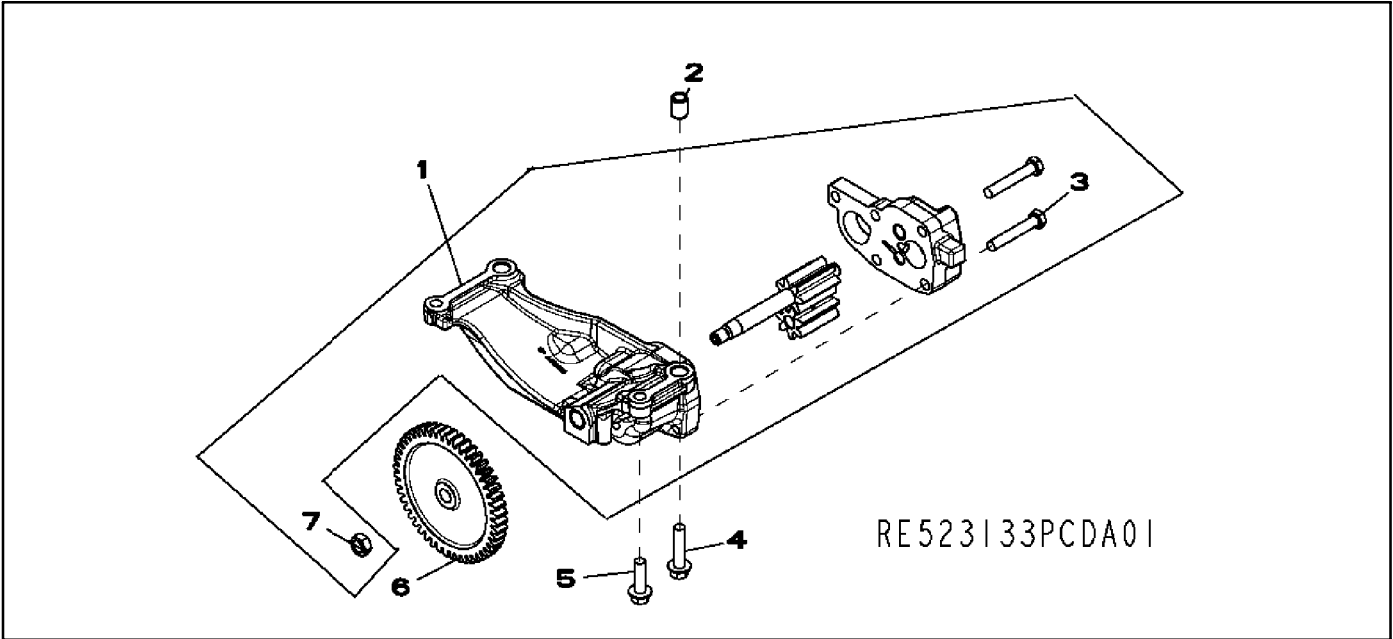
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Item	Part Number	Description	Qty.
			Variation 5921
1	223680	Oil cooler	1
2	—	—	1
3	—	—	1
4	#	Screw, M8 x 16	1
5	336549	Clamp	1
6	GM50181	Bracket	1
7	GM50267	Bracket	1
8	GM50033	Cap screw	6
9	#	Screw, M10 x 35	4
10	GM50200	Filter	1
11	GM48731	Filter element	1
12	GM50293	Clamp	2
13	GM50238	Oil line	1
14	GM50266	Bracket	1
15	GM50207	Seal kit	2
16	#	Cap screw	1
17	GM50219	Fitting, adapter	1
18	GM50146	Oil tube	1
19	352732	Oil tube	1

Item	Part Number	Description	Qty.
			Variation 5921
19	#	Cap screw, M12 x 30	2
20	#	Washer, 13 x 25 x 3 mm	2
21	GM50247	Fitting, adapter	1
22	GM50145	Fitting, adapter	1
23	GM50129	Seal	2
24	#	Screw, M10 x 25	2
25	GM50206	Oil tube	2
26	GM50149	Packing	4
27	GM50128	Cover	1
28	#	Screw, M8 x 35	7
29	#	Screw, M8 x 65	1
30	352722	Valve	1
31	352811	Spring, bypass	1
32	GM50130	Retainer	1
33	GM18835	Seal	1
34	GM50249	Gasket	1
35	GM50267	Bracket (not shown)	1

Common hardware; procure locally.

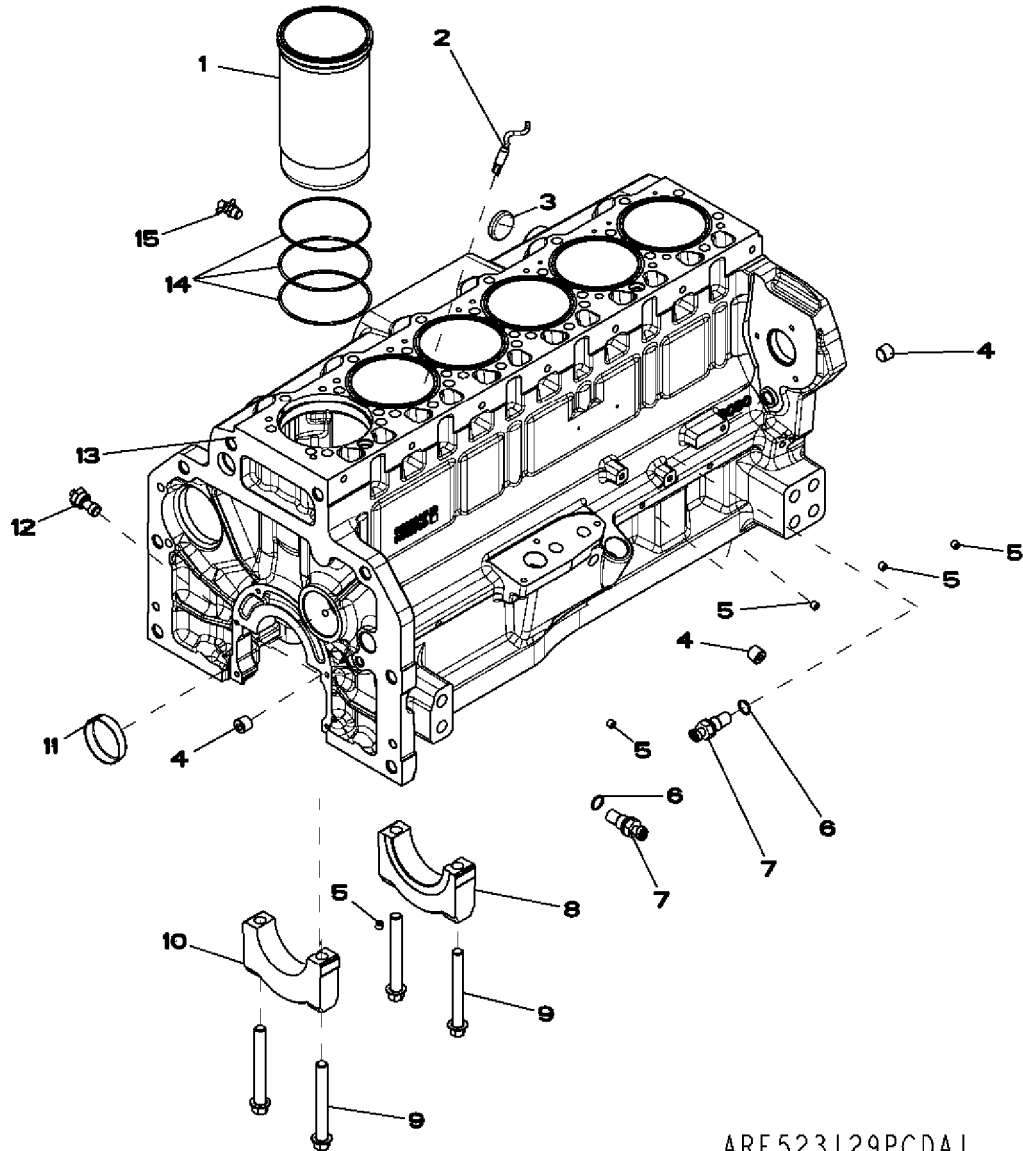
Group 31: Oil Pump



Item	Part Number	Description	Qty.
			Variation 5001
1	GM50209	Oil pump	1
2	GM18727	Bushing	2
3	#	Cap screw, M10 x 60	2
4	#	Screw, M10 x 45	2
5	#	Screw, M10 x 35	2
6	GM50125	Gear	1
7	#	Nut	1

Common hardware; procure locally.

Group 32: Cylinder Block

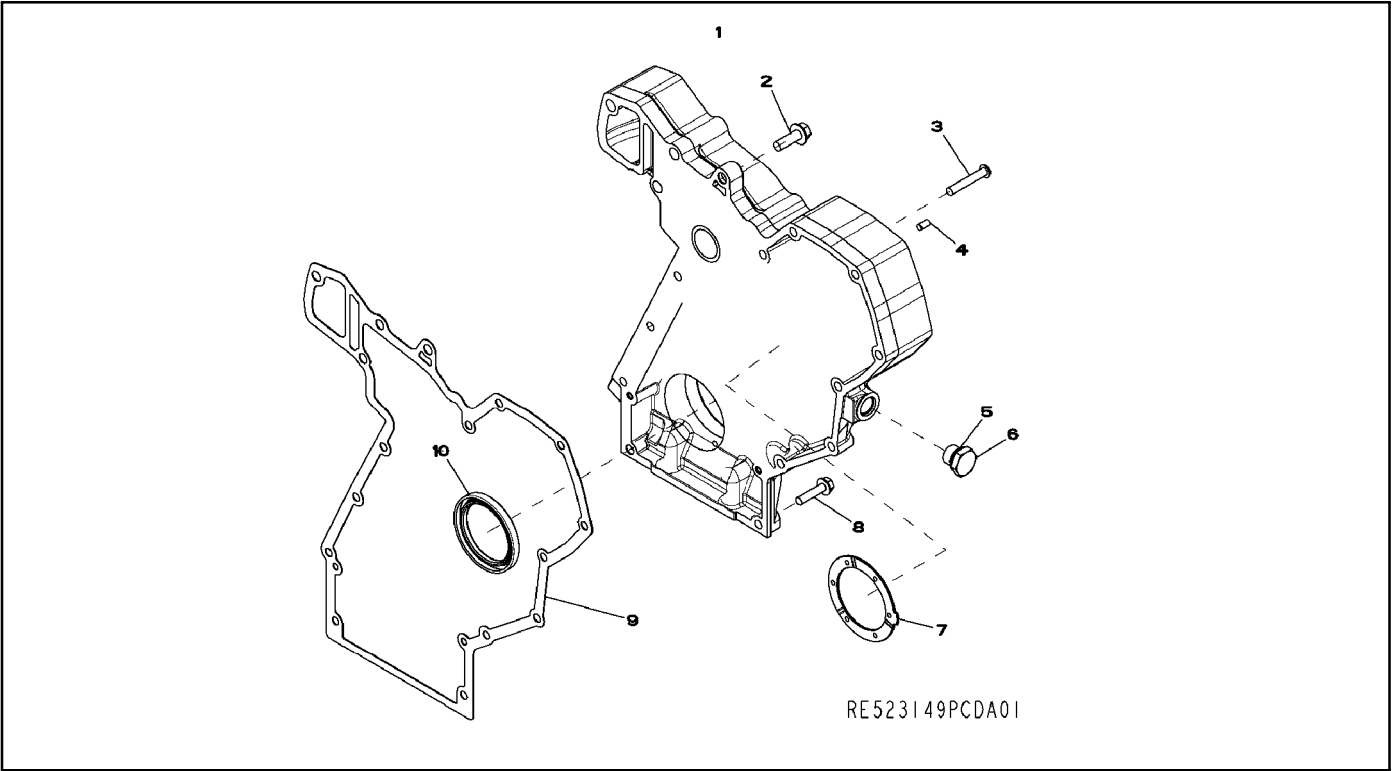


ARE523I29PCDAI

Item	Part Number	Description	Qty.
			Variation 4601
1	—	Piston liner kit (see Group 21)	1
2	GM50232	Orifice	6
3	224157	Cap	1
4	GM18862	Pipe plug, 1/2 in.	3
5	GM18873	Pipe plug	5
6	360180	O-ring, 17.3 x 2.2 mm	1
7	GM49939	Sensor, engine speed	2
8	352813	Bearing cap, thrust	1
9	#	Cap screw	14
10	352748	Bearing cap	6
11	223866	Cap	1
12	GM32919	Sensor, pressure	1
13		Cylinder block	1
14	223716	Kit	6
15	223435	Drain valve	1

Common hardware; procure locally.

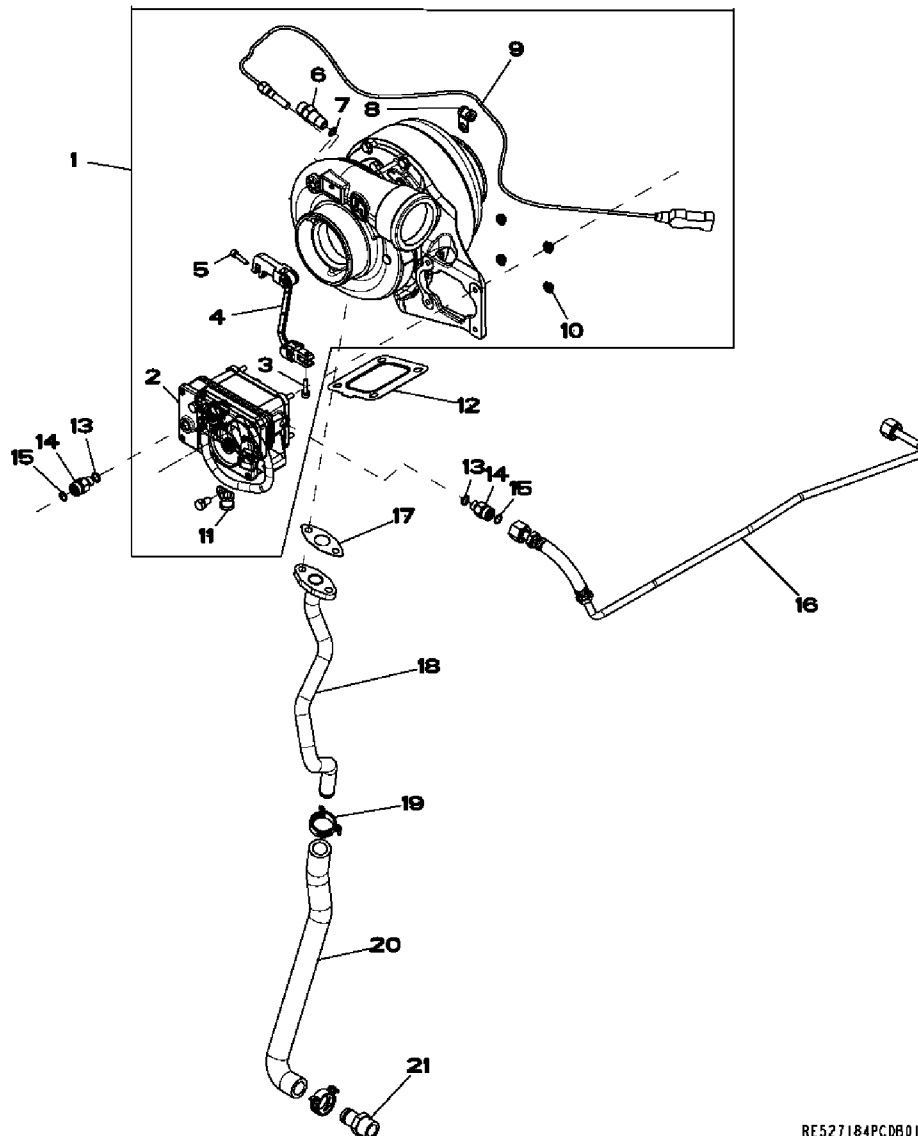
Group 34: Timing Gear Cover



Item	Part Number	Description	Qty.
			Variation 7701
1	GM50144	Cover	1
2	#	Screw	3
3	#	Screw, M10 x 30	1
4	223731	Dowel pin	2
5	360180	O-ring, 17.3 x 2.2 mm	1
6	360078	Plug, drain	1
7	GM50132	Washer	1
8	#	Screw, M8 x 35	3
9	352738	Gasket	1
10	223677	Seal	1

Common hardware; procure locally.

Group 35: Turbocharger and Oil Lines

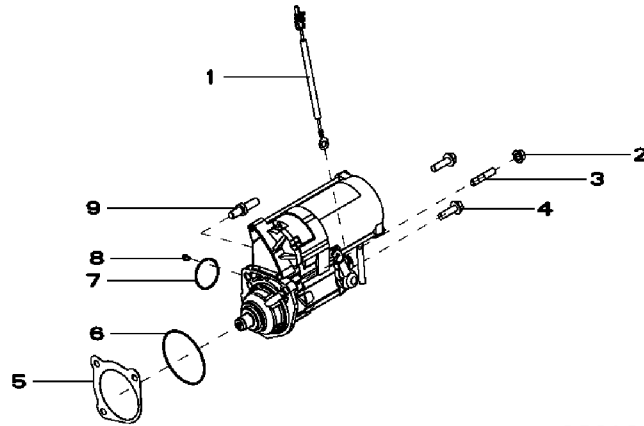


RE527184PCDB01

Item	Part Number	Description	Qty.
			Variation 6519
1	GM50264	Turbocharger	1
2	GM50014	Actuator	1
3	GM50062	Screw with washer	2
4	GM50022	Linkage	1
5	GM50062	Screw with washer	2
6	GM50027	Fitting	1
7	360165	O-ring	4
8	GM49901	Clamp	1
9	GM50015	Sensor	1
10	GM49824	Nut	4
11	GM50184	Clamp	1
12	352809	Gasket	1

Item	Part Number	Description	Qty.
			Variation 6519
13	360178	O-ring, 9.300 x 2.200 mm	2
14	GM49819	Fitting, adapter	2
15	360555	O-ring	2
16	GM50239	Line	1
17	GM49894	Gasket	1
18	GM50237	Oil line	1
19	GM50270	Hose clamp	2
20	GM50166	Hose	1
21	GM50253	Fitting	1
—	GM50033	Cap screw	1
—	GM49825	Screw	2

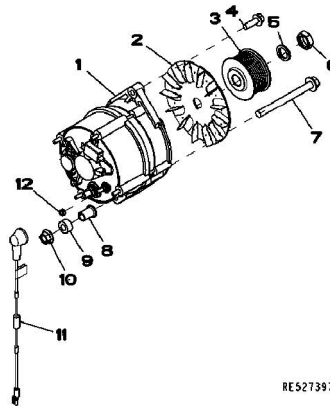
Group 36: Starter Motor



RE525528PCDA01

Item	Part Number	Description	Qty.
			Variation 3005
—	GM50201	Starter motor	1
—	GM17554	Label (not shown)	1
1	GM50199	Wiring lead	1
2	#	Flange nut, M10	1
3	—	Not used	
4	#	Screw, M10 x 35	2
5	223791	Gasket	1
6	—	Not used	
7	—	Not used	
8	—	Not used	
9	GM50112	Stud	1

Group 37: Alternator

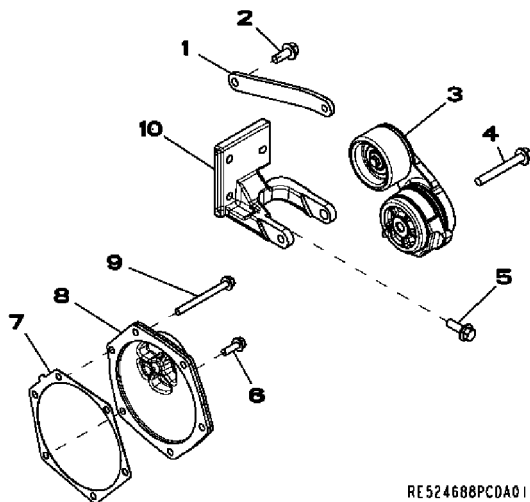


RE527397PCDA01

Item	Part Number	Description	Qty.
			Variation 3119
1	GM50998	Alternator	1
2	360588	Fan	1
3	352792	Pulley	1
4	#	Screw	1
5	224331	Washer	1
6	#	Nut	1
7	#	Screw, M10 x 100	1
8	360076	Bushing	1
9	GM30364	Spacer	1
10	#	Flange nut, M10	1
11	GM32923	Harness, wiring	1
12	#	Lock nut, M5	2

Common hardware; procure locally.

Group 38: Alternator Brackets

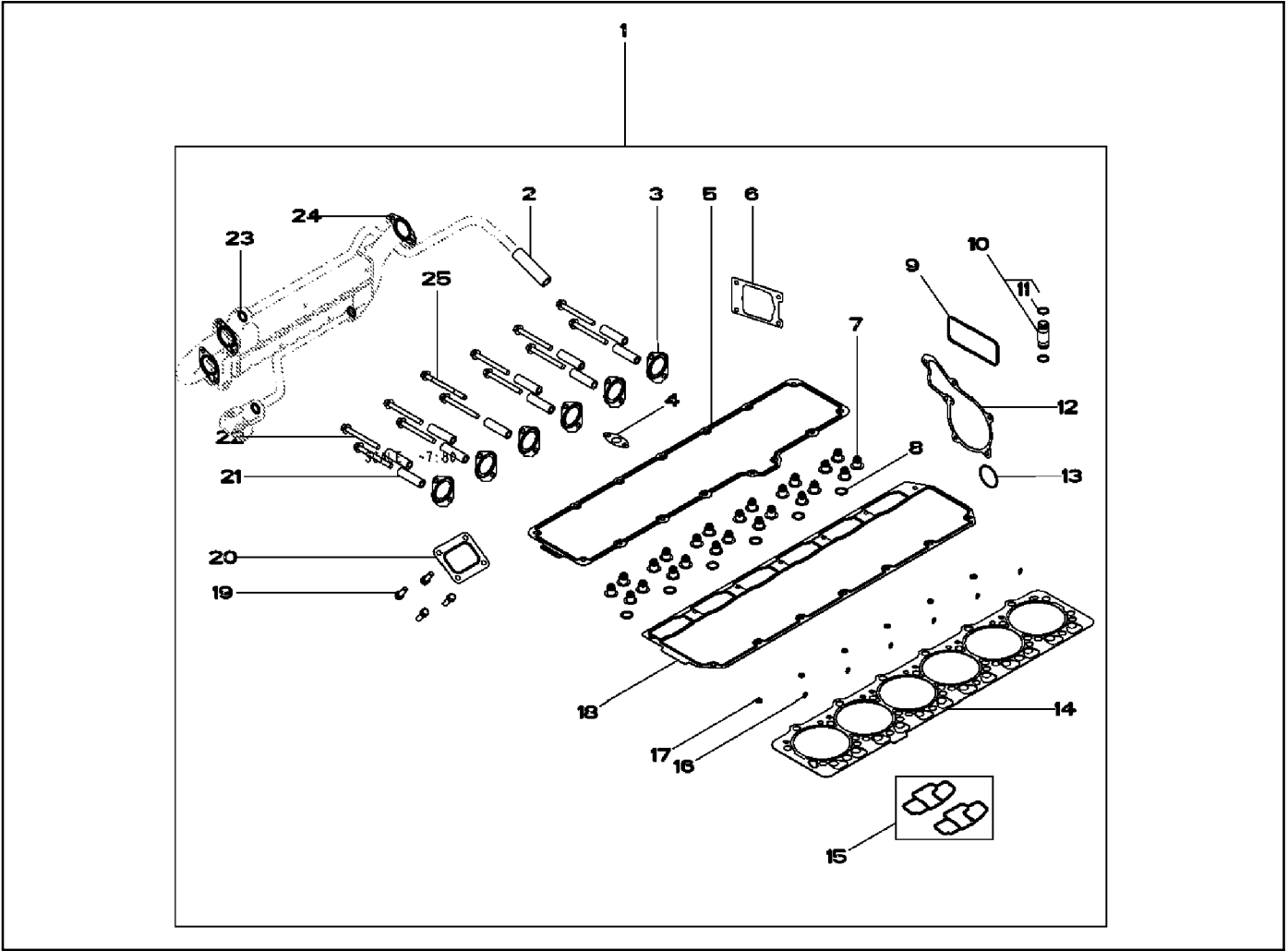


RE524688PCDA01

Item	Part Number	Description	Qty.
			Variation 6202
1	GM50175	Strap	1
2	#	Screw, M10 x 25	1
3	GM49938	Tightener	1
4	#	Screw, M10 x 80	1
5	#	Screw, M10 x 30	3
6	#	Screw, M8 x 25	1
7	223774	Gasket	1
8	GM50164	Cover	1
9	#	Screw, M8 x 90	5
10	GM50174	Bracket	1

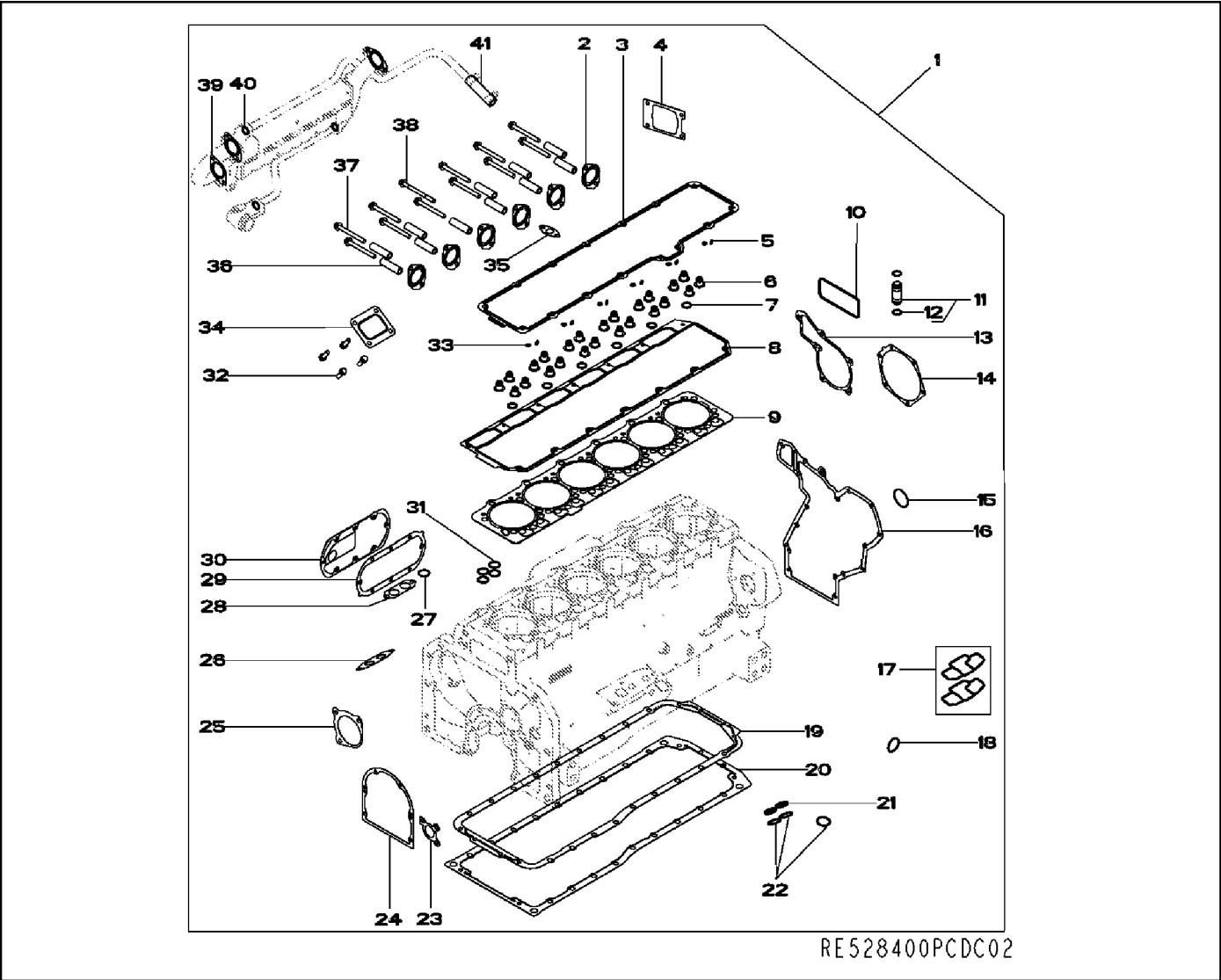
Common hardware; procure locally.

Group 40: Cylinder Head Gasket Set



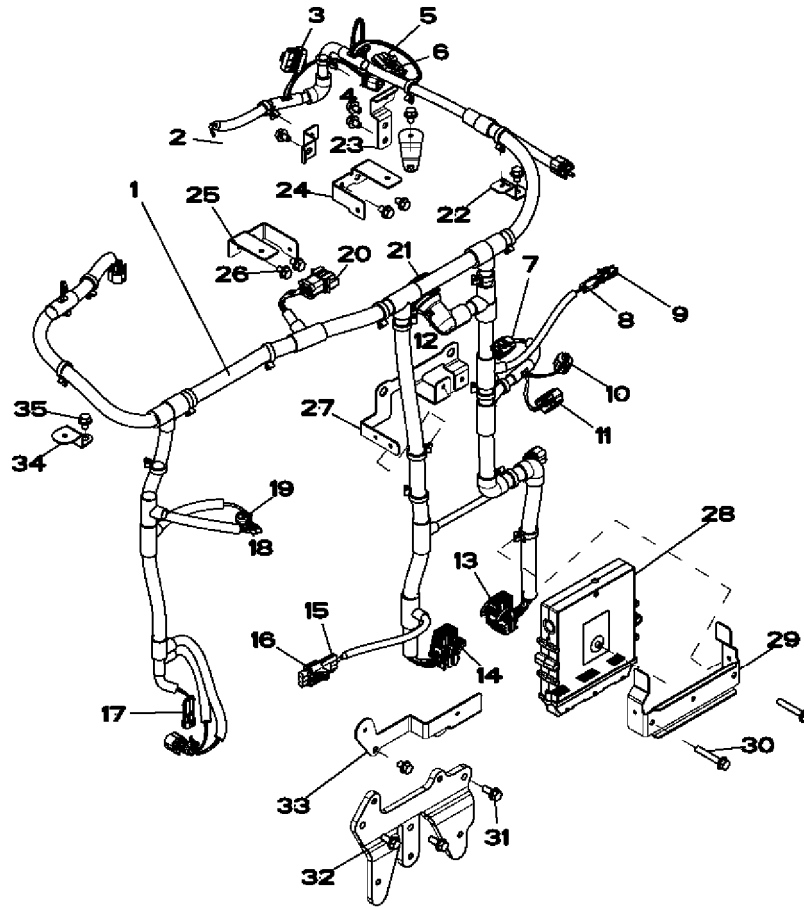
Item	Part Number	Description	Qty.
			Variation 9902
1	GM50278	Gasket kit (includes items 2-25)	1

Group 41: Overhaul Gasket Set



Item	Part Number	Description	Qty.
			Variation 9902
1	GM50277	Gasket kit (includes items 2-41)	1

Group 43: Wiring Harness

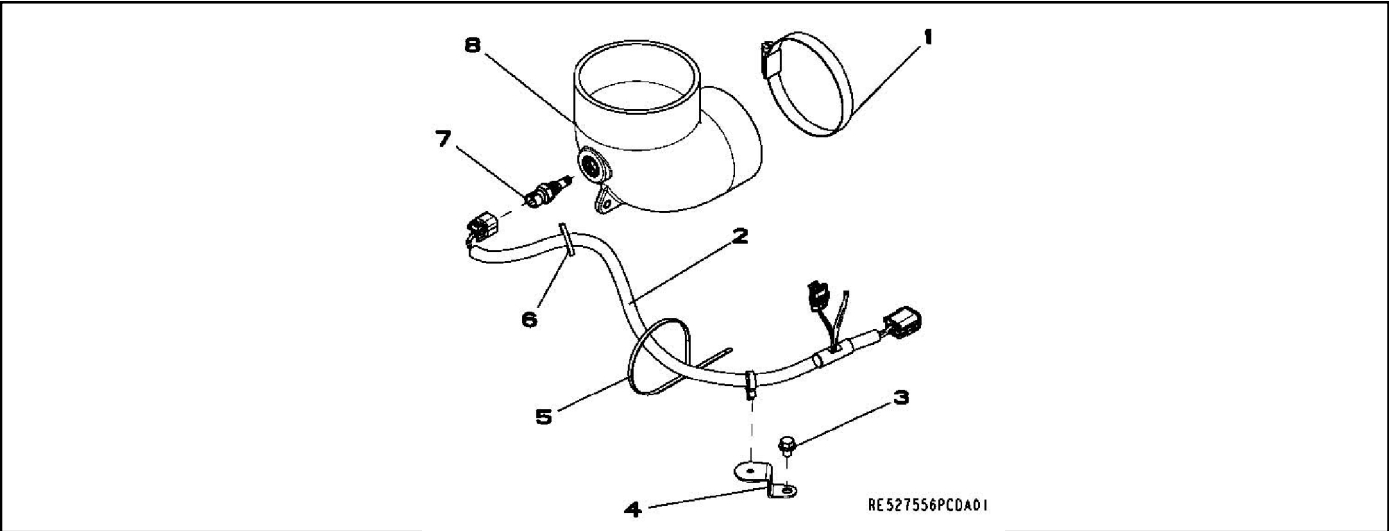


Item	Part Number	Description	Qty.
			Variation 8401
1	GM50223	Wiring harness	1
2	#	Connector	6
3	#	Connector	1
4	#	Connector	5
5	#	Connector	1
6	#	Terminal, connector	3
7	#	Terminal, connector	1
8	GM32804	Connector	1
9	GM32805	Connector	1
10	#	Connector	1
11	#	Terminal, connector	1
12	GM50171	Connector	1
13	#	Connector	1
14	#	Connector	1
15	GM32770	Connector	1
16	#	Connector	2
17	#	Connector	1
18	#	Connector	1

Item	Part Number	Description	Qty.
			Variation 8401
19	#	Connector	4
20	#	Connector	1
21	GM50169	Connector	1
22	GM50186	Bracket	2
23	GM50180	Bracket	1
24	GM50179	Bracket	1
25	GM50178	Bracket	1
26	GM50033	Cap screw	12
27	GM50187	Bracket	1
28	GM49989	Engine controller	1
29	GM50265	Strap	1
30	#	Screw	2
31	#	Screw	3
32	GM50150	Bracket	1
33	GM50183	Bracket	3
34	GM50176	Bracket	2
35	GM50033	Cap screw	1

Common hardware; procure locally.

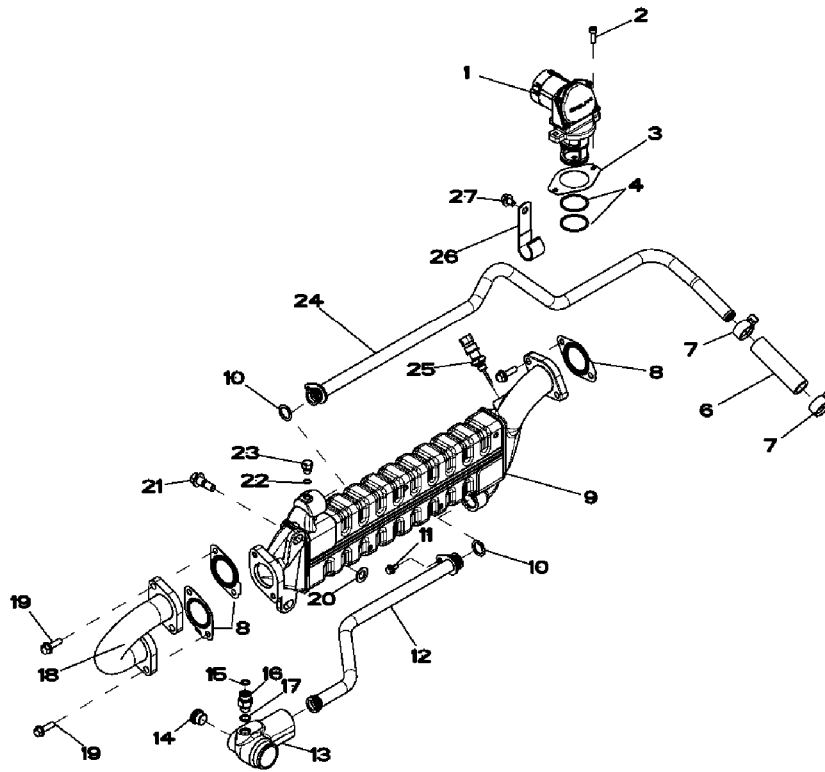
Group 45: Turbo Air Inlet



Item	Part Number	Description	Qty.
			Variation 5405
1	GM50083	Clamp, hose	1
2	GM50272	Wiring harness	1
3	GM50033	Cap screw	1
4	GM50176	Bracket	1
5	#	Tie band	1
6		Block clamp	1
7	GM50034	Thermocouple, air temperature	1
8	GM50040	Hose	1

Common hardware; procure locally.

Group 47: Engine Gas Recirculation



Item	Part Number	Description	Qty. Variation 8902
1	GM50276	Exhaust gas recycling valve	1
2	#	Screw, M6 x 20	2
3	GM49849	Gasket	1
4	GM49878	O-ring	2
6	GM50155	Radiator hose	1
7	GM50122	Hose clamp	2
8	GM50148	Gasket	3
9	GM50226	Oil cooler	1
10	GM50131	O-ring	1
11	#	Screw, M6 x 12	2
12	GM50269	Line	1
13	GM50268	Manifold, coolant	1
14	#	Pipe plug	2
15	360555	O-ring	1
16	GM50106	Fitting, adapter	1
18	GM50235	Tube	1
19	#	Cap screw	6
20	#	Washer, 13 x 24 x 1.200 mm	2
21	GM50157	Bolt	2
24	GM50228	Tube	1
25	GM50004	Sensor, temperature, exhaust gas recirculation	1
26	GM50124	Clip	1
27	GM50033	Cap screw	1

Common hardware; procure locally.

Notes

Appendix A Common Hardware Identification

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

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

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

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

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

Sample Dimensions

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

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

Metric (Screws, Bolts, Studs, and Nuts)

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

Plain Washers

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

Lock Washers

5/8
 — Internal Dimension

Appendix B Common Hardware List

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

American Standard

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

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

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

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

Hex Head Bolts (Full Thread)

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

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

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

Pan Head Machine Screws

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

Flat Head Machine Screws

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

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

Metric, continued

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

Washers

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

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

