

MARINE

ILLUSTRATED

PARTS MANUAL

MODEL MP5.0/5.7L

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"TYPICAL VIEWS ARE SHOWN"**ENGINE ROTATION**

Engine Rotation is identified as "RH" or "LH" with the engine model number. Rotation always is determined from the flywheel end looking toward the front of the engine. In some instances, propeller shaft rotation may be opposite to that of the engine.

When ordering a replacement engine, production block or parts for the engine, be certain to check engine rotation. **DO NOT rely on propeller rotation in order to determine engine rotation.**

LEFT-HAND ROTATION is STANDARD ROTATION.

(Flywheel turns counterclockwise when viewed from flywheel end of the engine.)

RIGHT-HAND ROTATION is OPPOSITE ROTATION.

(Flywheel turns clockwise when viewed from flywheel end of the engine.)

HOW TO READ THIS PARTS BOOK:

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RB001005H	Base Engine Assembly, 5.7L	1

①

②

③

④

- ①
- ITEM NUMBER - This number corresponds with the number in the exploded view on the facing page.
-
- ②
- PART NUMBER - This is the designated part number for the particular component or assembly.
-
- ③
- DESCRIPTION - This identifies what the component or assembly is.
-
- ④
- QUANTITY - This refers to the number of pieces used.

=====

Symbols shown throughout parts list are defined here or on the bottom of the individual parts list page.

- AR
- = As Required
-
- OPT
- = Optional
-
- NSS
- = Not Serviced Separately
-
- NA
- = Not Available
-
- SS
- = Single Station Control
-
- DS
- = Dual Station Control
-
- OS
- = Oversize
-
- US
- = Undersize
-
- NS
- = Not Shown
-
- TBD
- = To Be Determined
-
- NI
- = Not Illustrated

REPLACEMENT PARTS:**WARNING:**

Electrical, ignition and fuel system components on Crusader Engines are designed and manufactured to comply with U.S. Coast Guard rules and regulations to minimize risks of fire or explosion.

Use of replacement electrical, ignition and fuel system components which do not comply with these rules and regulations could result in a fire or explosion hazard and should be avoided.

GASKET AND DECAL KIT NUMBERS:

Description	Part Number
Complete Engine Overhaul Gasket Set	TBD
Valve Grind Gasket Set	TBD
Oil Pan Gasket Set	TBD
Intake Manifold Gasket Set	TBD
On Board Spare Parts Kit	TBD

MAINTENANCE ITEM PART NUMBERS:

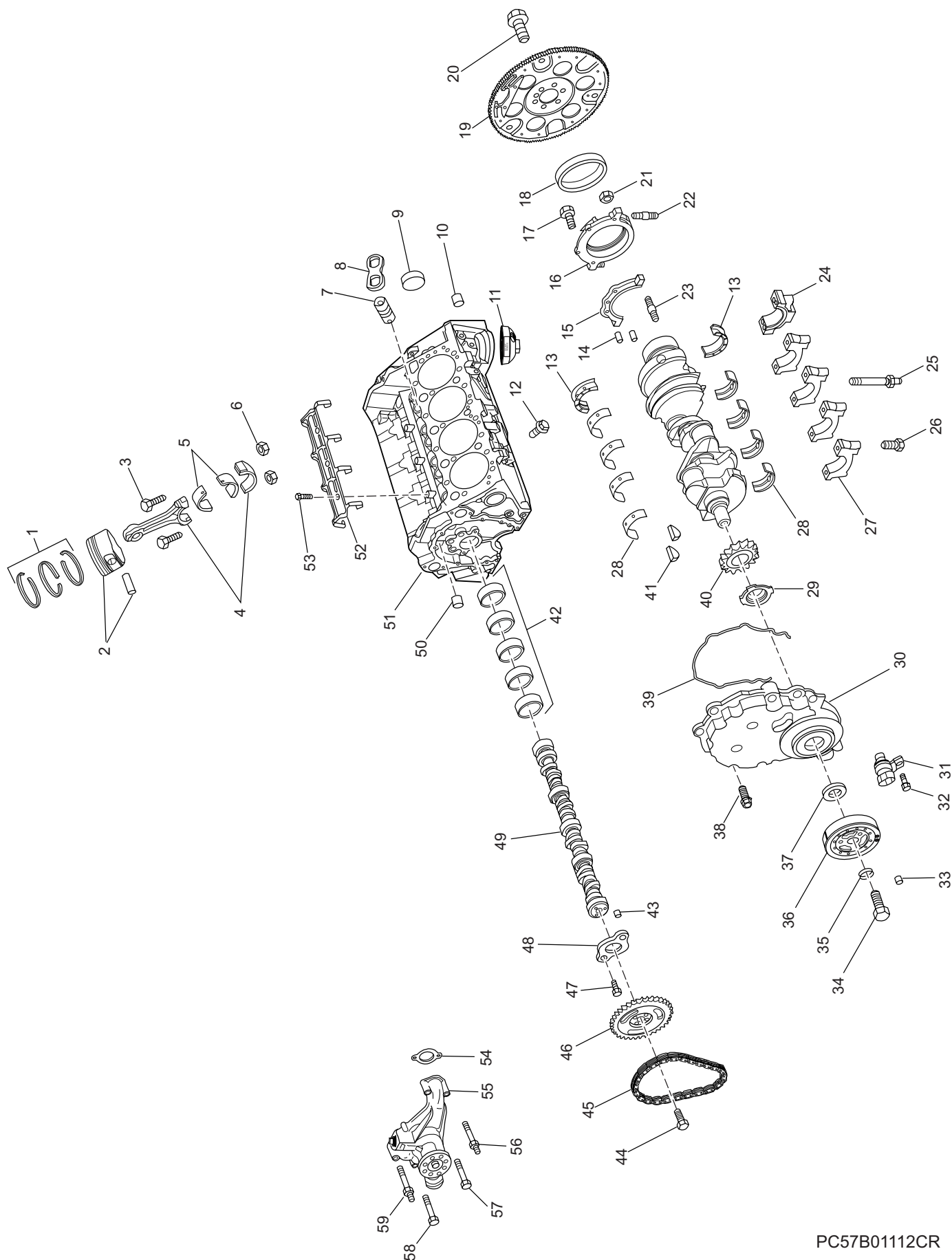
Description	Part Number
Oil Filter	22679
Fuel Filter	RP080026
Spark Plugs	RP030010
Spark Plug Wire Set	RK120018A
Alternator Drive Belt	R066008

MARINE TRANSMISSIONS:

Crusader Engines are equipped with Velvet Drive or Hurth Transmissions, or "V"-drives. If transmission parts are required, contact your dealer or closest Crusader Parts Distributor for required parts.

Parts manuals and overhaul manuals are available through Crusader Distributors.

CYLINDER BLOCK ASSEMBLY - FIGURE 1

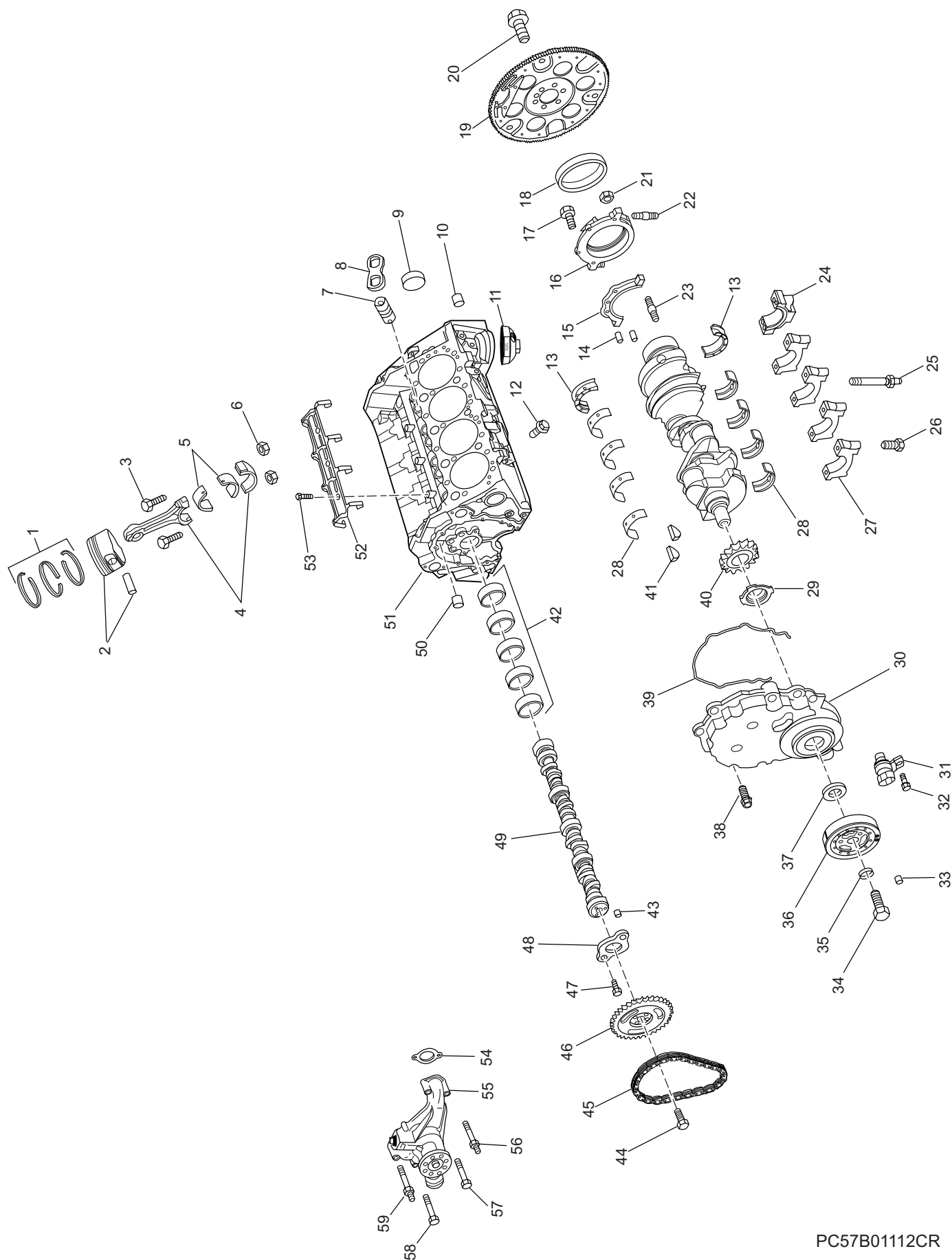


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CYLINDER BLOCK ASSEMBLY - FIGURE 1

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
*	RB001005H	Base Engine Assembly	
1	7080560	Ring Set , piston (STD)	8
2	7080570	Piston , (STD)	8
3	7080280	Bolt , connecting rod cap	16
4	RA011012	Connecting Rod (STD)	8
5	R007023	Bearing Set , connecting rod (STD)	8
6	TBD	Nut , connecting rod cap	16
7	R035038	Lifter , valve	16
8	7231570	Guide , valve lifter	8
9	R069064	Plug , camshaft	1
10	7057470	Plug , oil gallery	
11	R079051	Adapter , oil bypass 5.7L	1
12	7050110	Plug , engine block coolant drain hole	2
13	7057200	Bearing , crankshaft (thrust)	1
14	TBD	Pin , flywheel locating	2
15	7070370	Gasket , crankshaft rear oil seal housing	1
16	7071330	Housing , crankshaft rear oil seal	1
17	7057250	Bolt , crankshaft rear oil seal housing	2
17	7057260	Bolt , crankshaft rear oil seal housing	AR
18	7071360	Seal , crankshaft rear oil	1
19	RA138008	Flywheel Assembly (Rear)	1
19	RA138010	Flywheel Assembly (Front)	AR
20	7070480	Bolt , flywheel attaching	6
21	7057270	Nut , crankshaft rear oil seal housing	2
22	7150210	Stud , crankshaft rear oil seal housing	2
23	7050700	Stud , crankshaft rear oil seal housing	2
24	NSS	Cap , crankshaft bearing #5	1
25	7050870	Stud , crankshaft bearing cap	5
26	7050690	Bolt , crankshaft bearing cap	5
27	NSS	Cap , crankshaft bearing #1 - #4	4
28	7057190	Bearing , crankshaft (STD)	4
29	R056001	Ring , crankshaft position sensor reluctor	1
30	R004010A	Cover , engine front cover (includes gasket and seal)	1
31	R020038	Sensor , crankshaft position	1
32	TBD	Bolt , crankshaft position sensor attaching	1
33	7050180	Pin , front groove (crankshaft balancer)	1
34	R009091	Bolt , crankshaft balancer	1

CYLINDER BLOCK ASSEMBLY - FIGURE 1

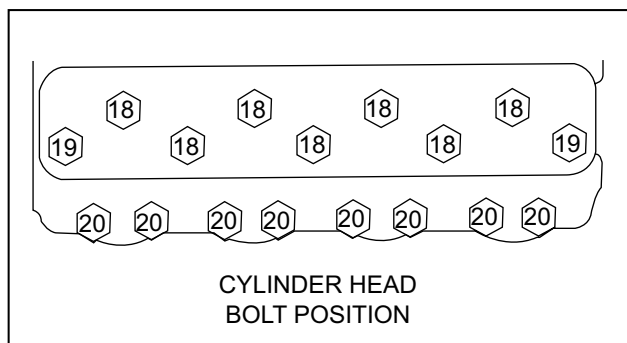
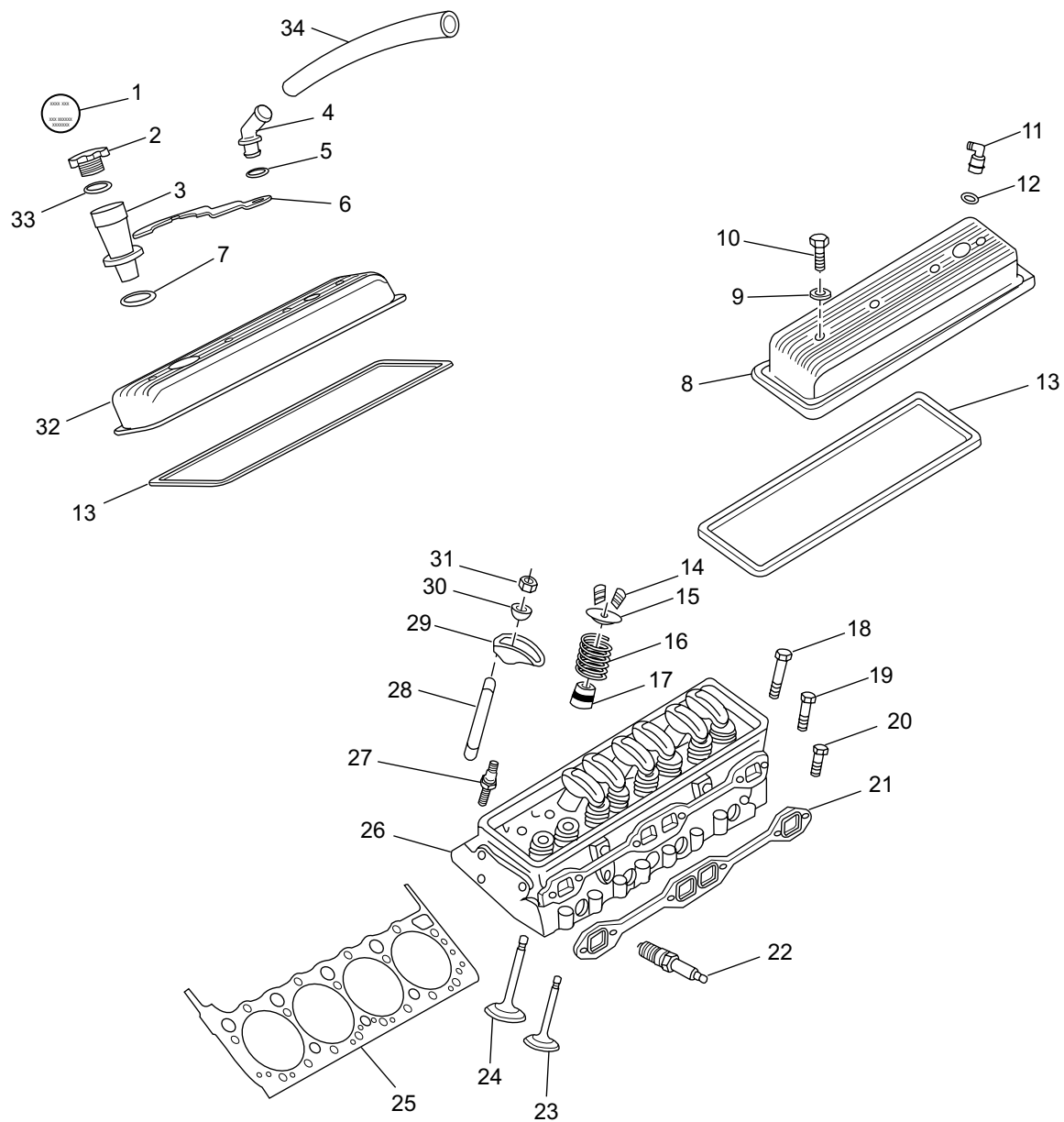


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CYLINDER BLOCK ASSEMBLY - FIGURE 1

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
35	R096074	Washer , crankshaft balancer bolt	1
36	R064010A	Balancer , crankshaft	1
37	7070610	Seal , crankshaft front oil	1
38	R009177	Bolt , engine front cover attaching	8
39	NSS	Gasket , engine front cover	1
40	R054024	Sprocket , crankshaft	1
41	R164024	Key , crankshaft balancer	2
42	RK051030	Bearing Set , camshaft	1
43	R022022	Pin , camshaft sprocket locating	1
44	7130030	Bolt , camshaft sprocket attaching	1
45	R055011	Chain , camshaft timing	1
46	7080690	Sprocket , camshaft	1
47	7070700	Bolt , camshaft retaining	2
48	R109050	Retainer , camshaft	1
49	RA050021	Camshaft , engine	1
50	TBD	Plug , oil gallery	1
51	NSS	Block , engine	
52	7231600	Retainer , valve lifter	1
53	TBD	Bolt , valve lifter retainer	3
54	RM0203	Gasket , water pump to engine block	2
55	RA057027	Water Pump Assembly	1
56	R095026	Stud , water pump attaching	1
57	90305175	Bolt , water pump attaching	1
58	90305275	Bolt , water pump attaching	1
59	R095026	Stud , water pump attaching	1

CYLINDER HEAD ASSEMBLY - FIGURE 2

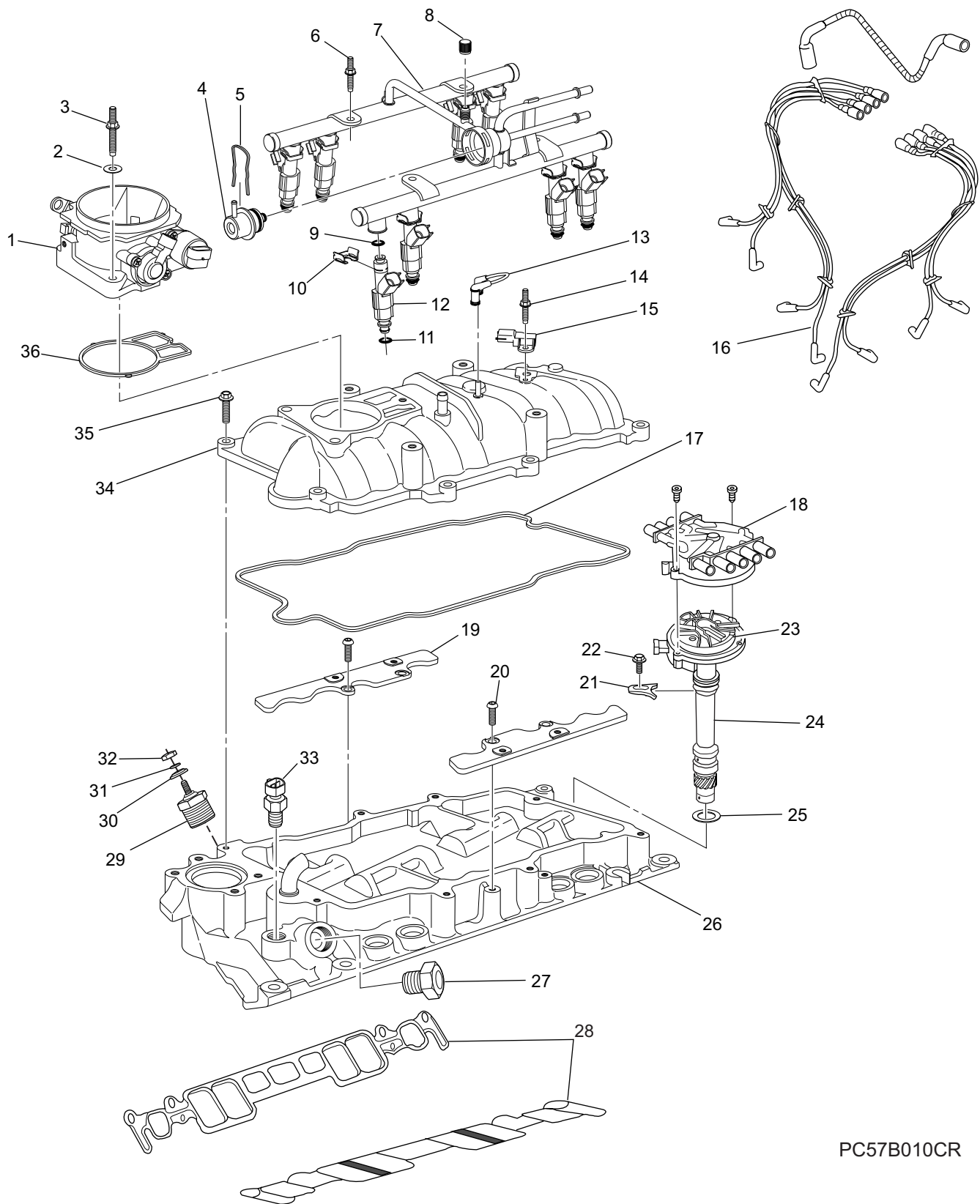


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CYLINDER HEAD ASSEMBLY - FIGURE 2

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R143137	Decal , oil fill riser cap	1
2	R034037	Cap , oil fill riser	1
3	R034048	Riser , oil fill	1
4	R024013C	Elbow , breather tube	1
5	R094002	Grommet , breather tube elbow	1
6	R127098	Retainer , oil fill riser	1
7	R047228	Grommet , oil fill riser	1
8	7231550	Cover , rocker (left side)	1
9	NSS	Washer , rocker cover retaining bolt	8
10	7231510	Bolt , rocker cover retaining	8
11	R035015	Valve , positive crankcase ventilation	1
12	R094015	Grommet , pcv valve	1
13	RM0193	Gasket , rocker cover	2
14	R049012	Retainer , valve stem	32
15	7231260	Cap , valve spring	16
16	7231080	Valve Spring Assembly	16
17	7231240	Seal , valve stem (intake)	8
17	7231830	Seal , valve stem (exhaust)	8
18	R009168	Bolt , cylinder head to engine block (long)	14
19	7057300	Bolt , cylinder head to engine block (medium)	4
20	7057280	Bolt , cylinder head to engine block (short)	16
21	96306	Gasket , exhaust manifold	2
22	R030010	Spark Plug	8
23	7231250	Valve , (intake)	8
24	7231270	Valve , (exhaust)	8
25	RM0195	Gasket , cylinder head	2
26	7057560	Cylinder Head Assembly	2
27	R095034	Stud , valve rocker arm	16
28	7231000	Push Rod	16
29	R038011	Rocker Arm , valve	16
30	NSS	Ball , rocker arm	16
31	R017069	Nut , rocker arm attaching	16
32	R033008	Cover , rocker (right side)	1
33	NSS	O-Ring , oil fill riser cap	1
34	20806	Hose , breather	1

INTAKE MANIFOLD ASSEMBLY - FIGURE 3

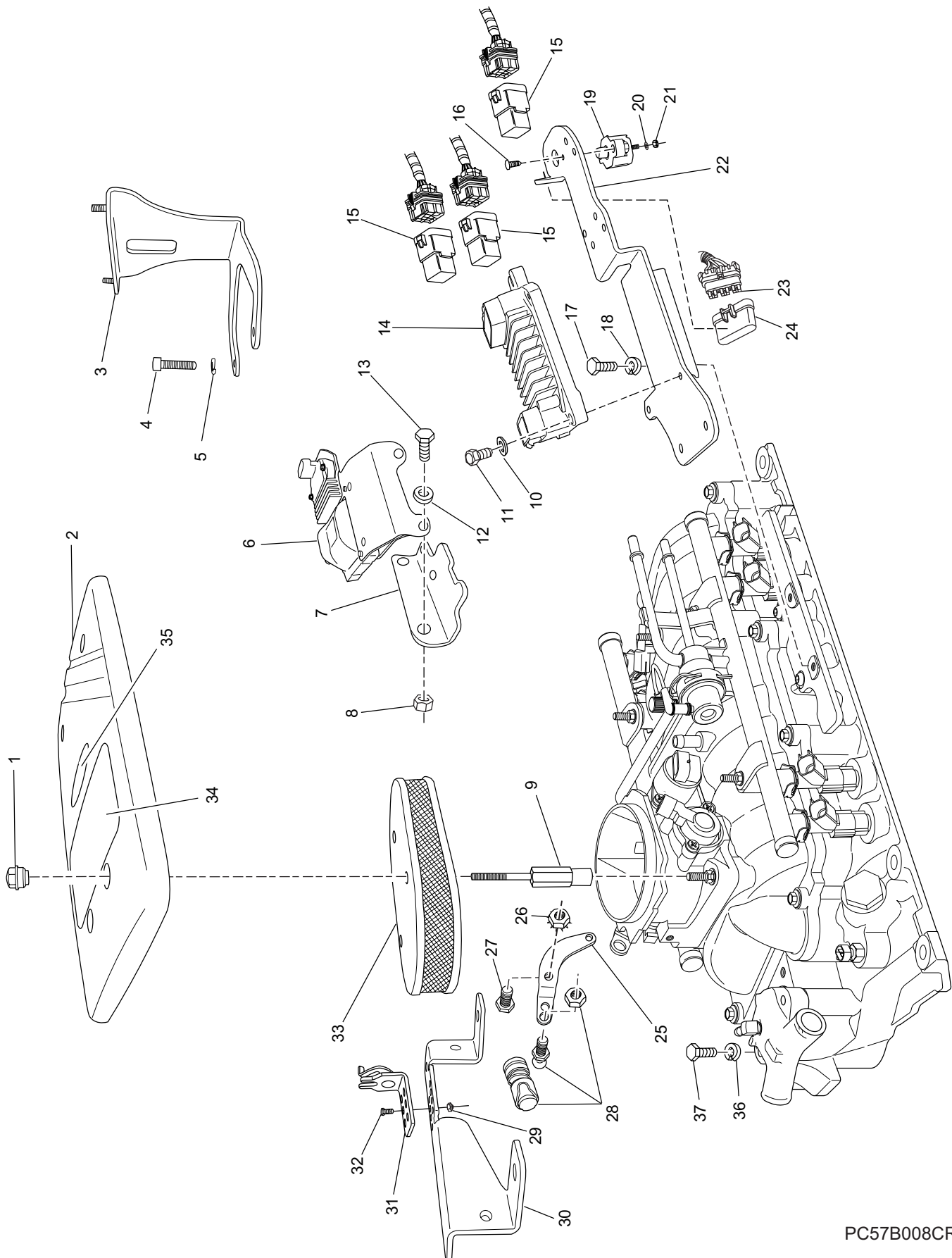


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INTAKE MANIFOLD ASSEMBLY - FIGURE 3

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RA035040	Throttle Body , mechanical throttle	1
1	TBD	Throttle Body , electronic throttle	1
2	NSS	Washer , throttle body attaching stud	3
3	R095040	Stud , throttle body attaching	3
4	R088002	Regulator , fuel pressure	1
5	TBD	Retainer , fuel pressure regulator	1
6	R095041	Stud , fuel rail attaching	4
7	RA086002	Fuel Rail Assembly	1
8	TBD	Cap , fuel pressure service port	1
9	NSS	O-Ring , fuel injector (top)	8
10	TBD	Clip , fuel injector retaining	8
11	NSS	O-Ring , fuel injector (bottom)	8
12	RA087007	Fuel Injector Assembly	8
13	R085074A	Hose , fuel pressure regulator vacuum	1
14	R095041	Stud , MAP sensor attaching	1
15	R020039	Sensor , manifold absolute pressure	1
16	RK120018A	Spark Plug Wire Set	1
17	RM0271	Gasket , upper intake manifold to lower	1
18	RA108009	Cap , high voltage switch	1
19	TBD	Plate , component attaching	2
20	TBD	Bolt , component attaching plate attaching	4
21	R127026A	Hold Down , high voltage switch	1
22	R009193	Bolt , high voltage switch hold down	1
23	RA103011	Rotor , high voltage switch	1
24	RA107044	High Voltage Switch Assembly	1
25	RM0123	Gasket , high voltage switch assembly	1
26	R002023	Intake Manifold , lower	1
27	R069069	Plug , intake manifold	1
28	RM0250	Gasket , intake manifold	1
29	R020003	Sender , temperature (SS)	1
29	22701	Sender , temperature (DS)	AR
30	95011000	Washer , sender terminal	1
31	95300300	Lockwasher , sender terminal	1
32	95011000	Nut , sender terminal	1
33	R020019	Sensor , engine coolant temperature	1
34	R002024	Intake Manifold , upper	1
35	98222025	Bolt , upper intake manifold to lower attaching	8
36	RM0272	Gasket , throttle body to upper manifold	1

INTAKE MANIFOLD COMPONENTS - FIGURE 4

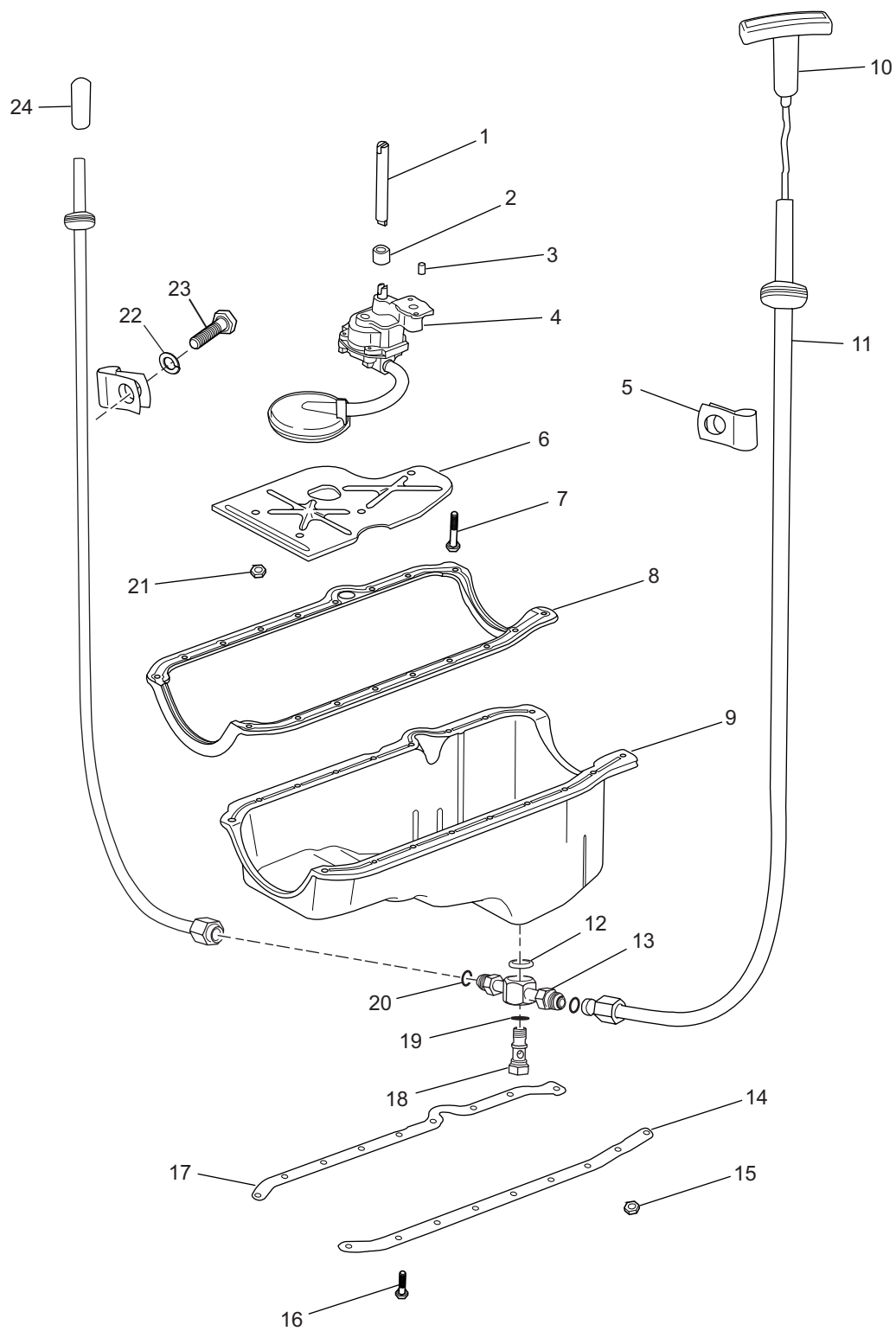


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INTAKE MANIFOLD COMPONENTS - FIGURE 4

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R009194	Nut , engine cover attaching	4
2	R060059	Cover , engine	1
3	R090259	Bracket , engine cover mounting	1
4	RS6257	Bolt , engine cover bracket attaching	2
5	93920000	Lockwasher , engine cover bracket attaching	2
6	RA117011	Ignition Coil/Module Assembly	1
7	R090249	Bracket , ignition coil/module assembly mounting	1
8	RS2058	Nut , attaching	2
9	R095038	Stud , flame arrestor/engine cover attaching	2
10	RS2178	Washer , ECM attaching	2
11	90105075	Bolt , ECM attaching	2
12	92100000	Washer , attaching	2
13	RS0254	Bolt , attaching	2
14	R116019	Engine Control Module	1
15	R130012	Relay Assembly	3
16	RS5084	Bolt , circuit breaker mounting	2
17	98223016	Bolt , bracket attaching	2
18	93920000	Lockwasher , bracket attaching	2
19	R153006C	Circuit Breaker Assembly (60 amp)	1
20	TBD	Washer , circuit breaker terminal	2
21	TBD	Nut , circuit breaker terminal	2
22	R090250	Bracket , ECM/relay mounting	1
23	R153017B	Fuses , 20 amp	3
24	R126014	Cover , fuse holder	1
25	R081007	Throttle Arm , throttle body	1
26	RS1078	Nut , throttle arm attaching	2
27	RS0251	Bolt , throttle arm attaching	2
28	R178003	Ball Joint Assembly , cable attaching	1
29	RS2055	Locking Nut , cable clip mounting bolt	2
30	R090248	Throttle Bracket , intake	1
31	R090086	Attaching Clip , throttle cable (single)	1
32	RS5122	Bolt , cable clip mounting	2
33	R145025	Flame Arrestor	1
34	R143130	Decal , "Captain's Choice"	1
34	R143130A	Decal , "Crusader Engines"	1
35	R143140	Decal , "5.7 MPI" silver/red	1
36	RS2179	Lockwasher , housing attaching	2
37	L00905	Bolt , thermostat housing attaching	2

OIL PAN and OIL PUMP ASSEMBLY - FIGURE 5

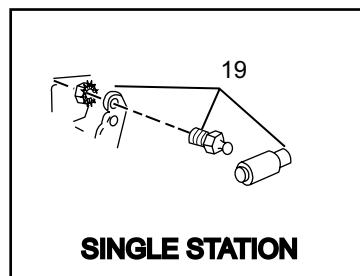
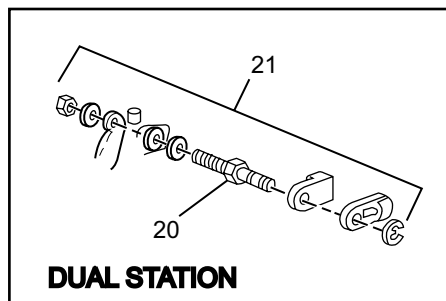
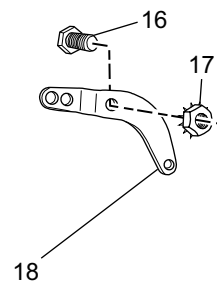
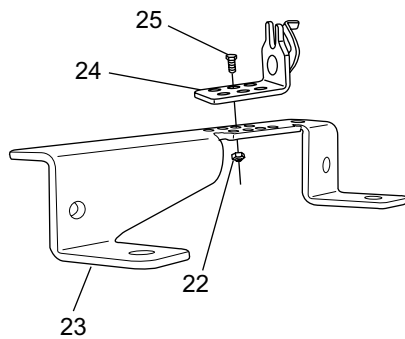
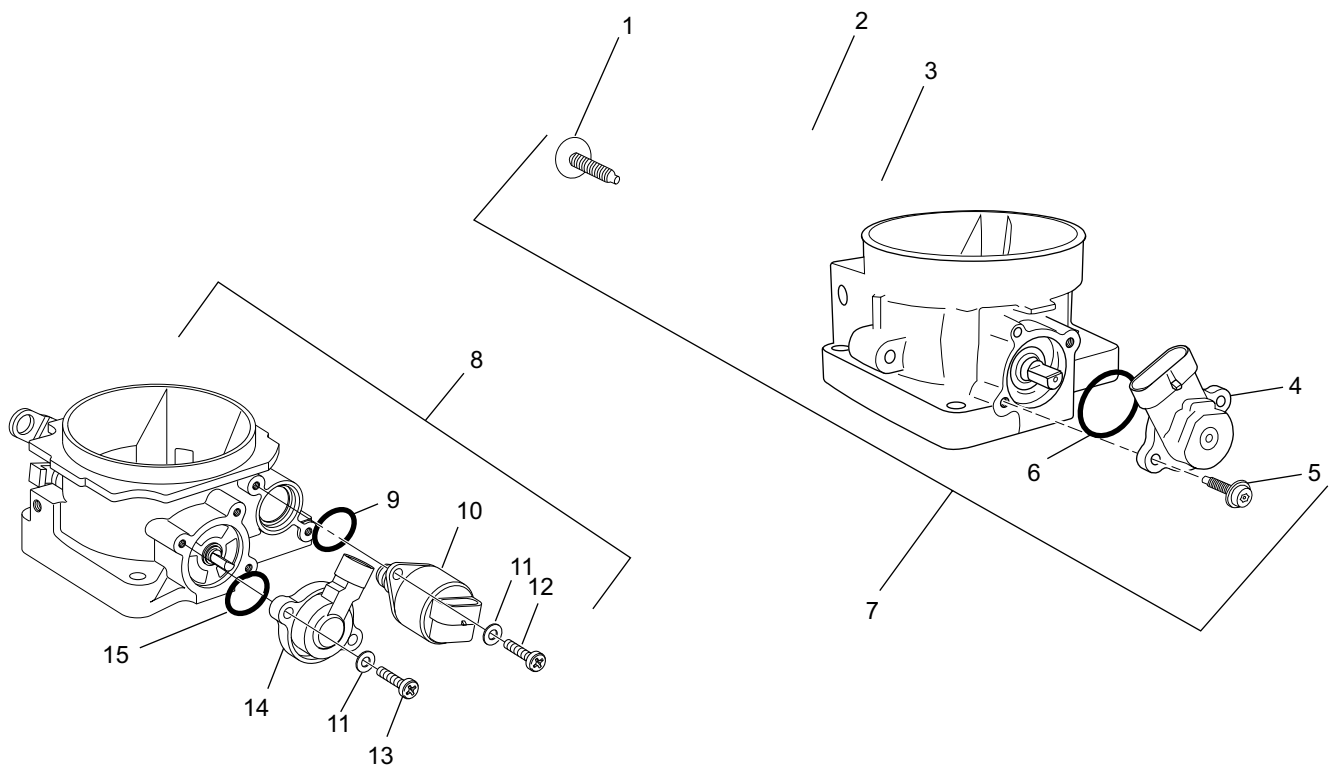


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OIL PAN and OIL PUMP ASSEMBLY - FIGURE 5

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R058054	Shaft , oil pump drive	1
2	7100220	Retainer , oil pump drive shaft	1
3	R022022	Pin , oil pump locating	2
4	RA070010	Oil Pump Assembly	1
5	R127015	Clamp , strap	2
6	7090430	Deflector , crankshaft oil	1
7	7100380	Bolt , oil pump	1
8	RM0249	Gasket , oil pan	1
9	7090400	Oil Pan	1
10	R041073	Dipstick , oil level (0-4 degree)	1
10	R041074	Dipstick , oil level (12 degree)	AR
10	R041075	Dipstick , oil level (V-drive)	AR
11	98505	Tube , oil level dipstick	2
12	23535	O-ring , oil pan dipstick tube fitting	1
13	98432	Fitting , oil pan dipstick tube	1
14	7090440	Reinforcement , oil pan (LH)	1
15	95200010	Nut , oil pan	4
16	7090030	Bolt , oil pan	14
17	7090450	Reinforcement , oil pan (RH)	1
18	98466	Bolt , oil pan dipstick tube fitting	1
19	NSS	O-ring , oil pan dipstick tube fitting bolt	1
20	NSS	O-ring , oil pan dipstick tube	2
21	7150750	Nut , crankshaft oil deflector	5
22	RS2180	Lockwasher , strap clamp	2
23	RS0302	Bolt , strap clamp	2
24	45343	Cap , oil pan dipstick tube	1
NI	TBD	Kit , oil drain	1

THROTTLE BODY and RELATED COMPONENTS - FIGURE 6

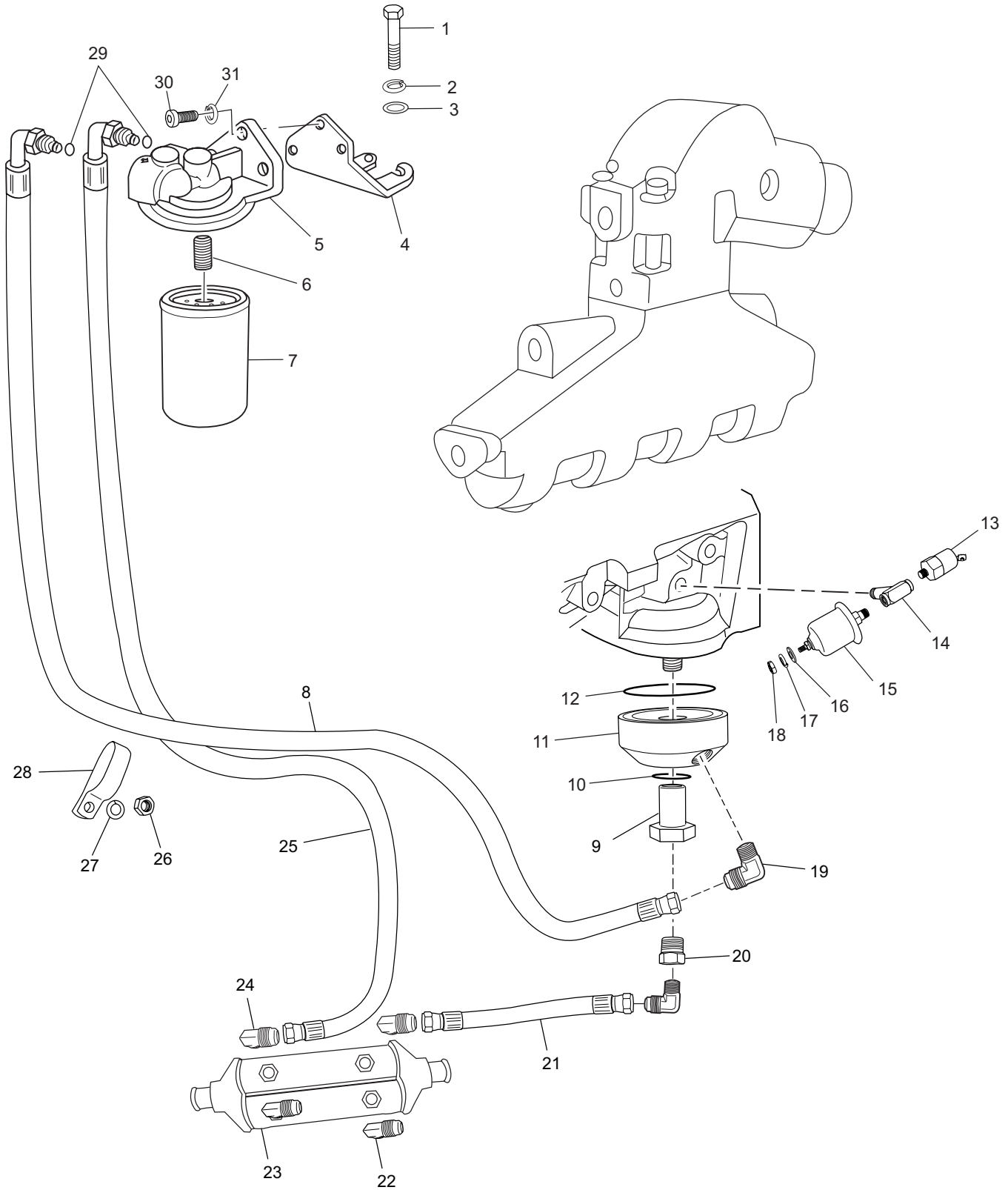


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THROTTLE BODY and RELATED COMPONENTS - FIGURE 6

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	TBD	Screw , throttle actuator motor attaching (electronic throttle body)	2
2	TBD	Motor , throttle actuator (electronic throttle body)	1
3	TBD	Gasket , throttle actuator (electronic throttle body)	1
4	TBD	Sensor , throttle position (electronic throttle body)	1
5	TBD	Screw , TP sensor attaching (electronic throttle body)	2
6	TBD	O-Ring Seal , TP Sensor (electronic throttle body)	1
7	TBD	Throttle Body Assembly , (electronic throttle body)	1
8	RA035040	Throttle Body Assembly , (mechanical throttle body)	1
9	49067	O-Ring Seal , idle air control valve (mechanical throttle body)	1
10	49060	Valve , idle air control (mechanical throttle body)	1
11	TBD	Washer , IAC valve/TP sensor attaching (mechanical throttle body)	4
12	TBD	Screw , IAC valve attaching (mechanical throttle body)	2
13	TBD	Screw , TP sensor attaching (mechanical throttle body)	2
14	49061	Sensor , throttle position (mechanical throttle body)	1
15	TBD	O-Ring Seal , throttle position sensor (mechanical throttle body)	1
16	RS0251	Bolt , throttle arm attaching	2
17	RS1078	Nut , throttle arm attaching	2
18	R081007	Throttle Arm , throttle body	1
19	R178003	Ball Joint Assembly , cable attaching (single)	1
20	22978	Pivot Pin , cable attaching (dual)	AR
21	23235	Cable Attaching Kit , dual	AR
22	RS2055	Locking Nut , cable clip mounting bolt	2
23	R090248	Throttle Bracket , intake	1
24	R090086	Cable Clip , throttle attaching (single)	1
25	RS5122	Bolt , cable clip mounting	2

REMOTE OIL FILTER COMPONENTS - FIGURE 7

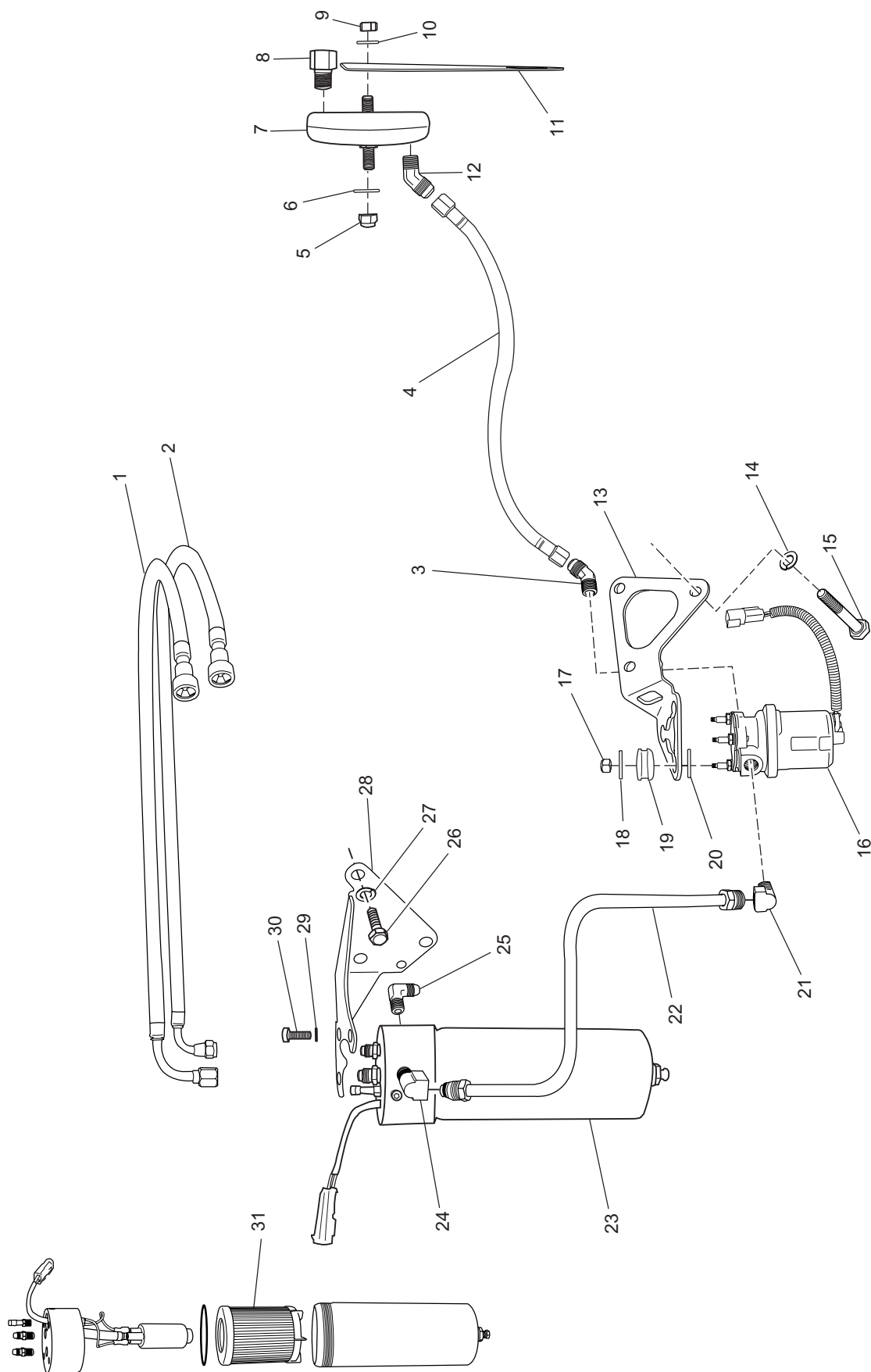


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REMOTE OIL FILTER COMPONENTS - FIGURE 7

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	90305525	Bolt , oil filter header mounting bracket attaching	2
2	RS2180	Lockwasher , attaching bolt	2
3	RS2674	Washer , attaching bolt	2
4	R090226	Bracket , oil filter header mounting	1
5	R079066	Oil Filter Header	1
6	R024203	Nipple , header filter adapter	1
7	22679	Filter , oil	1
8	RA045120D	Hose Assembly , bypass adapter to filter header	1
9	R017073	Fitting , oil bypass adapter attaching	1
10	R047202	O-ring , oil bypass adapter attaching fitting	1
11	R079051	Adapter , oil bypass	1
12	R047203	O-ring , oil bypass adapter	1
13	R020015A	Switch , oil pressure	1
14	R024205	Tee , sender attaching	1
15	R020001	Sender , oil pressure	1
16	92300200	Washer , sender terminal	1
17	95300300	Lockwasher , sender terminal	1
18	95011000	Nut , sender terminal	1
19	R024184	Fitting , 90 degree	2
20	R024182	Fitting , adapter	1
21	RA045103D	Hose Assembly , oil cooler to bypass adapter	1
22	R024010	Fitting , 90 degree	2
23	R147035	Cooler , oil	1
24	R024184	Fitting , 90 degree	2
25	RA045120D	Hose Assembly , filter header to oil cooler	1
26	RS1028	Nut , strap clamp attaching	1
27	RS2180	Lockwasher , strap clamp attaching	1
28	22121	Clamp , strap	3
29	22897	O-Ring , oil line	2
30	99333020	Bolt , oil filter header mounting	3
31	RS2179	Lockwasher , oil filter header mounting bolt	3

FUEL CONTROL CELL (FCC) COMPONENTS- FIGURE 8

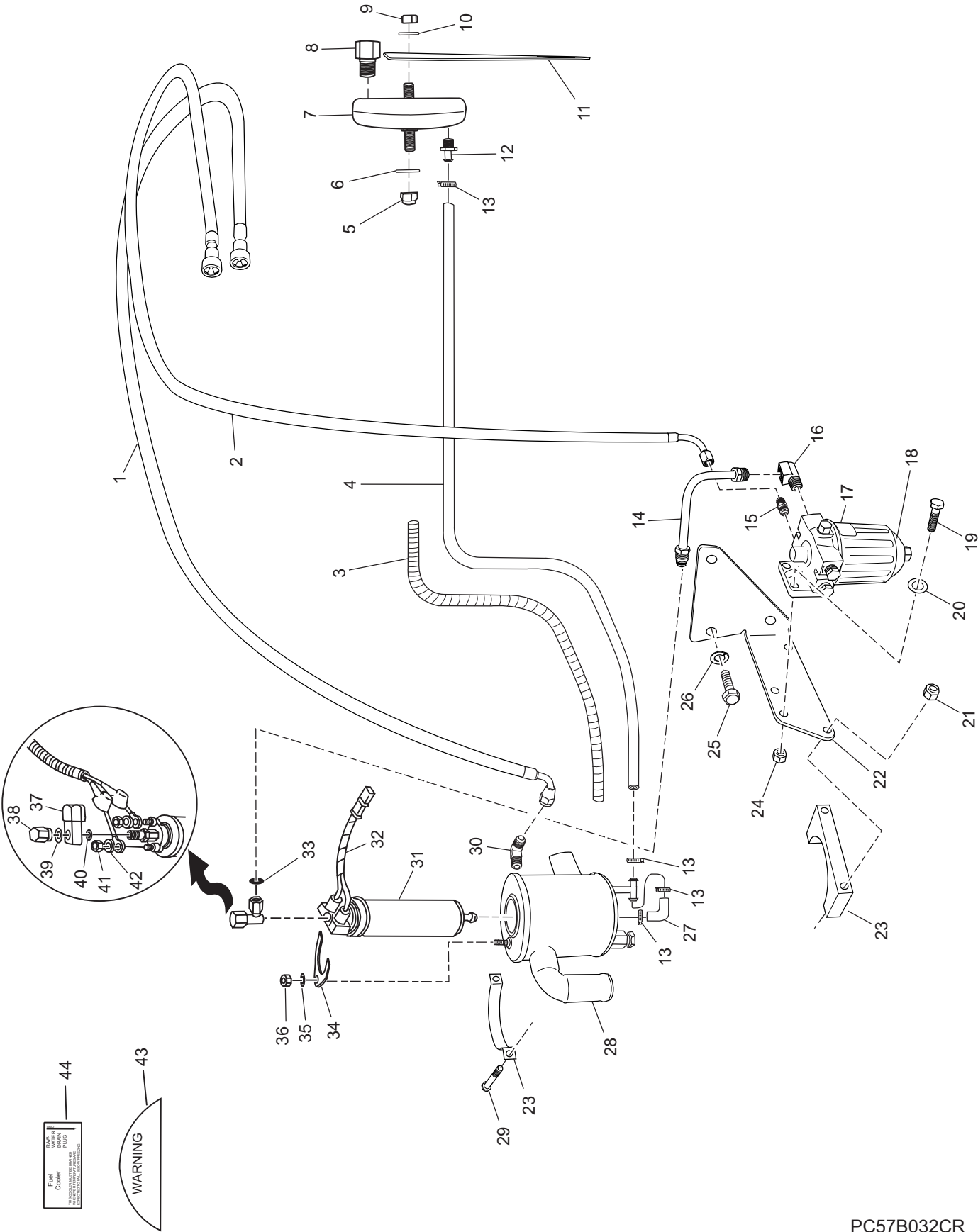


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FUEL CONTROL CELL (FCC) COMPONENTS- FIGURE 8

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RA085090A	Hose Assembly , FCC to fuel rail (inlet)	1
2	RA085091A	Hose Assembly , fuel rail to FCC (return)	1
3	R024197	Fitting , 45 degree	1
4	RA085071	Hose Assembly , filter to low-pressure pump	1
5	TBD	Locking Nut , fuel filter	1
6	TBD	Washer , fuel filter	1
7	47038	Filter , fuel	1
8	R024196	Fitting , fuel inlet	1
9	TBD	Nut , fuel filter mounting	1
10	TBD	Washer , fuel filter mounting	1
11	R090239	Bracket , fuel filter mounting	1
12	R024197	Fitting , 45 degree	1
13	R090223	Bracket , low-pressure fuel pump mounting	1
14	RS2180	Lockwasher , bracket mounting	3
15	RS0305	Bolt , bracket mounting	3
16	RA080018	Fuel Pump , low-pressure	1
17	RS1521L	Locking Nut , low-pressure fuel pump	3
18	R096142	Washer , fuel pump mounting	3
19	R094035A	Grommet , mounting bracket	3
20	R096142	Washer , fuel pump mounting	3
21	R024017	Fitting , 90 degree	1
22	RA085096	Hose Assembly , low-pressure pump to FCC	1
23	RA080025	Fuel Control Cell Assembly	1
24	R024017	Fitting , 90 degree	1
25	R024076	Fitting , 90 degree	1
26	RS0304	Bolt , FCC mounting bracket	3
27	RS2180	Lockwasher , FCC mounting bracket	3
28	R090179B	Bracket , FCC mounting	1
29	RS2180	Lockwasher , FCC mounting	3
30	RS0302	Bolt , FCC mounting	3
31	RP080026	Fuel Filter , FCC assembly	1

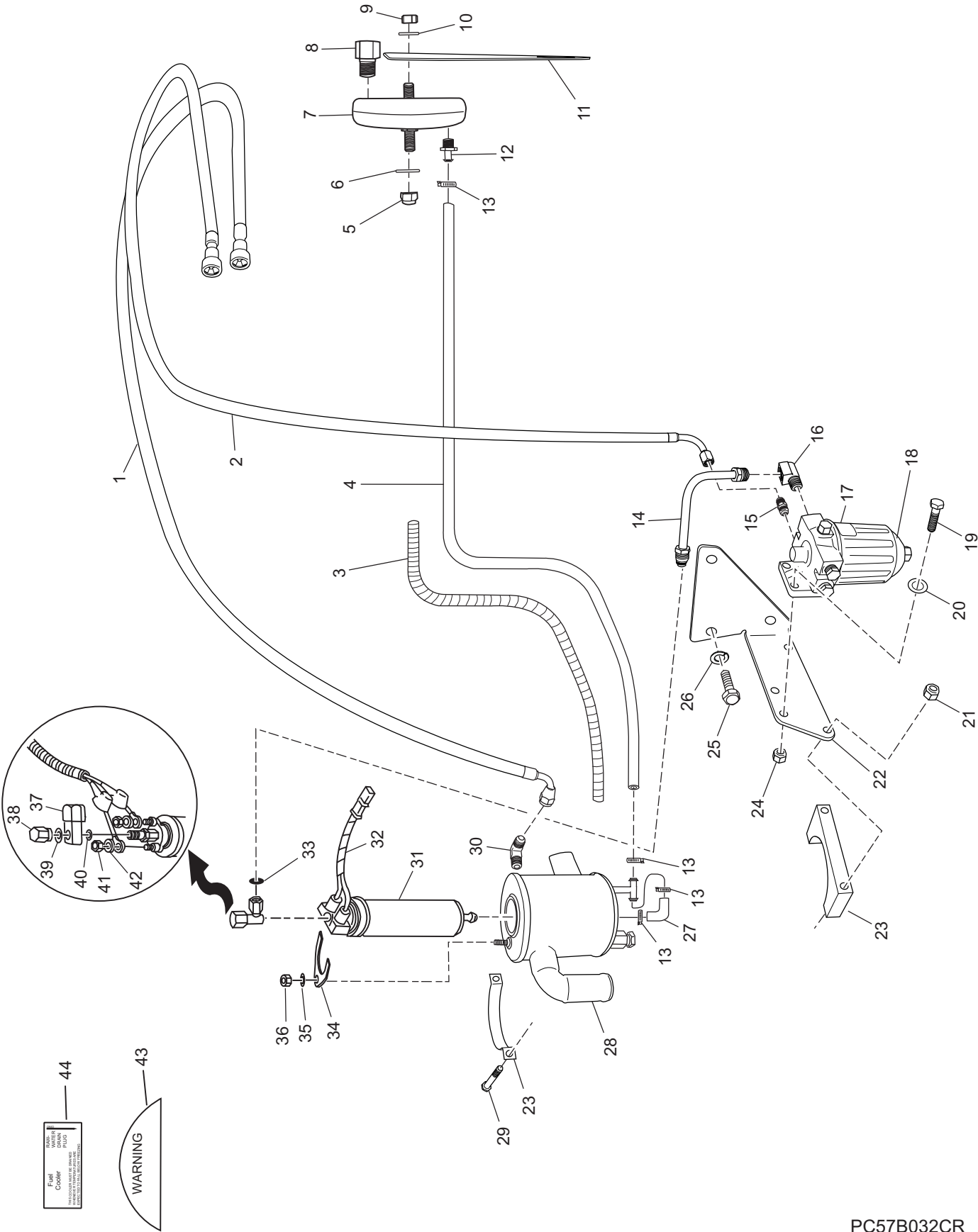
RETURNLESS FUEL SYSTEM COMPONENTS- FIGURE 9



RETURNLESS FUEL SYSTEM COMPONENTS- FIGURE 9

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RA085091A	Fuel Line Assembly , fuel rail to fuel cooler	1
2	RA085090A	Fuel Line Assembly , filter to fuel rail	1
3	47064	Conduit , protective	1
4	98431	Fuel Line Assembly , filter to fuel pump	1
5	TBD	Locking Nut , fuel filter	1
6	TBD	Washer , fuel filter	1
7	47038	Filter , fuel	1
8	R024196	Fitting , fuel inlet	1
9	TBD	Nut , fuel filter mounting	1
10	TBD	Washer , fuel filter mounting	1
11	R090239	Bracket , fuel filter mounting	1
12	30636	Fitting , fuel outlet	1
13	RS3864	Clamp , fuel line	4
14	RA085097	Fuel Line Assembly , fuel pump to filter	1
15	R024163A	Fitting , straight adapter	1
16	R024017	Fitting , 90 degree	1
17	47046	Fuel Filter , racor water separating	1
18	47047	Element , racor fuel filter (not shown)	1
19	RS0282	Bolt , filter mounting	2
20	92200000	Washer , mounting bolt	2
21	95310300	Locking Nut , fuel cooler mounting	2
22	R090256	Bracket , fuel cooler/filter mounting	1
23	23554	Retainer , fuel cooler rubber	1
24	RS2060	Nut , mounting bolt	2
25	RS0302	Bolt , fuel cooler/filter bracket mounting	3
26	RS2180	Lockwasher , mounting bolt	3
27	49041	Fuel Line Assembly , 90 degree elbow	1
28	RA147045	Fuel Cooler Assembly	1
29	90318325	Bolt , fuel cooler mounting	2
30	R024163	Fitting , 90 degree	1
31	47039	Electric Fuel Pump Assembly	1
32	49038	Wire Harness , fuel pump to engine harness	1
33	TBD	O-Ring , fuel line assembly	2
34	98642	Retainer , fuel pump	1
35	TBD	Starwasher , retaining nut	1
36	TBD	Nut , fuel pump retainer attaching	1

RETURNLESS FUEL SYSTEM COMPONENTS- FIGURE 9 (cont'd)

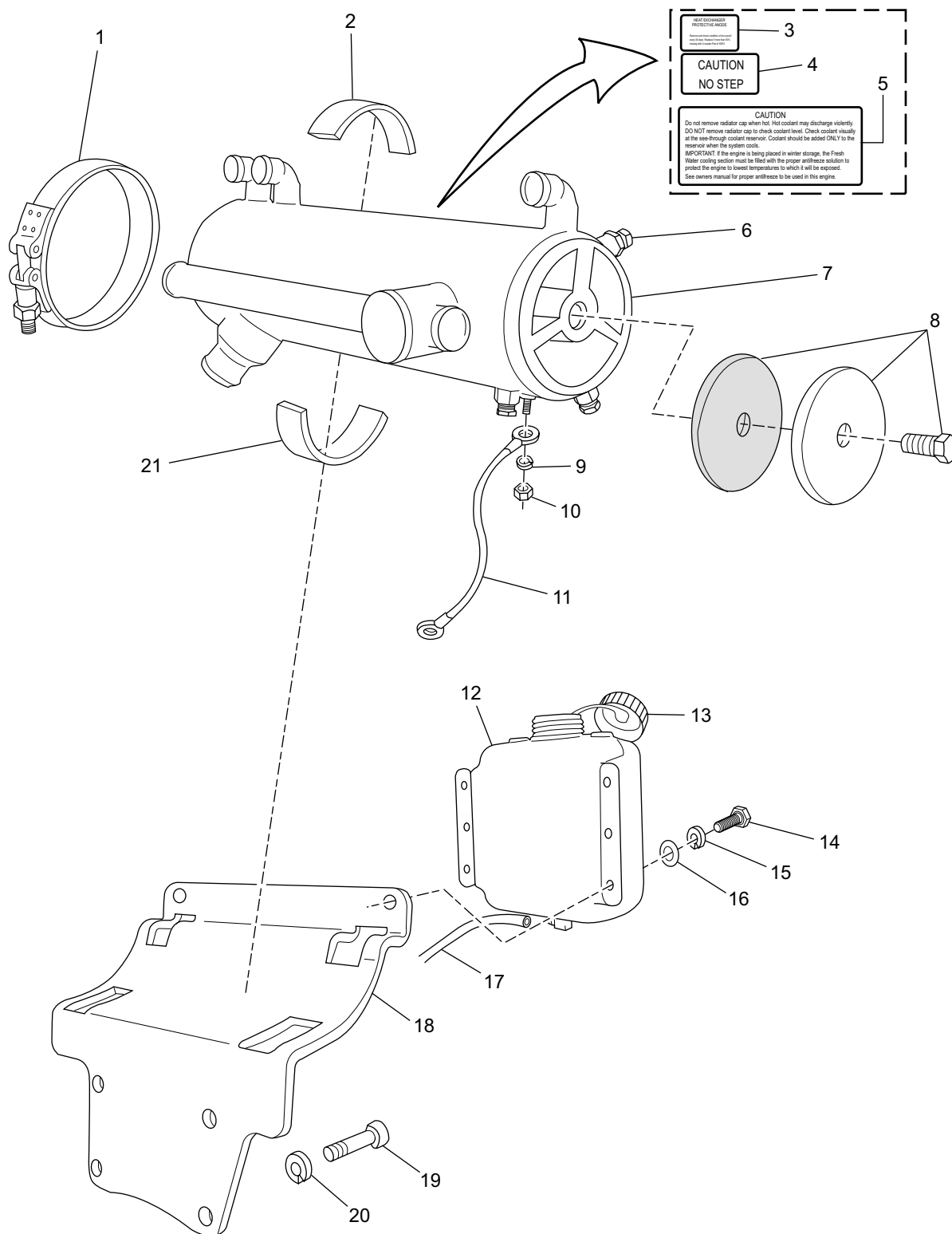


PC57B032CR

RETURNLESS FUEL SYSTEM COMPONENTS- FIGURE 9 (cont'd)

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
37	98440	Fitting , fuel line to fuel pump	1
38	98442	Nut , fitting to fuel pump	1
39	23515	O-Ring , fuel pump sealing (small)	1
40	23516	O-Ring , fuel pump sealing (large)	1
41	NSS	Nut , wire retaining	2
42	NSS	Lockwasher , retaining nut	2
43	23649	Decal , fuel system warning	1
44	23645	Decal , fuel cooler system warning	1

HEAT EXCHANGER and COMPONENTS - FIGURE 10

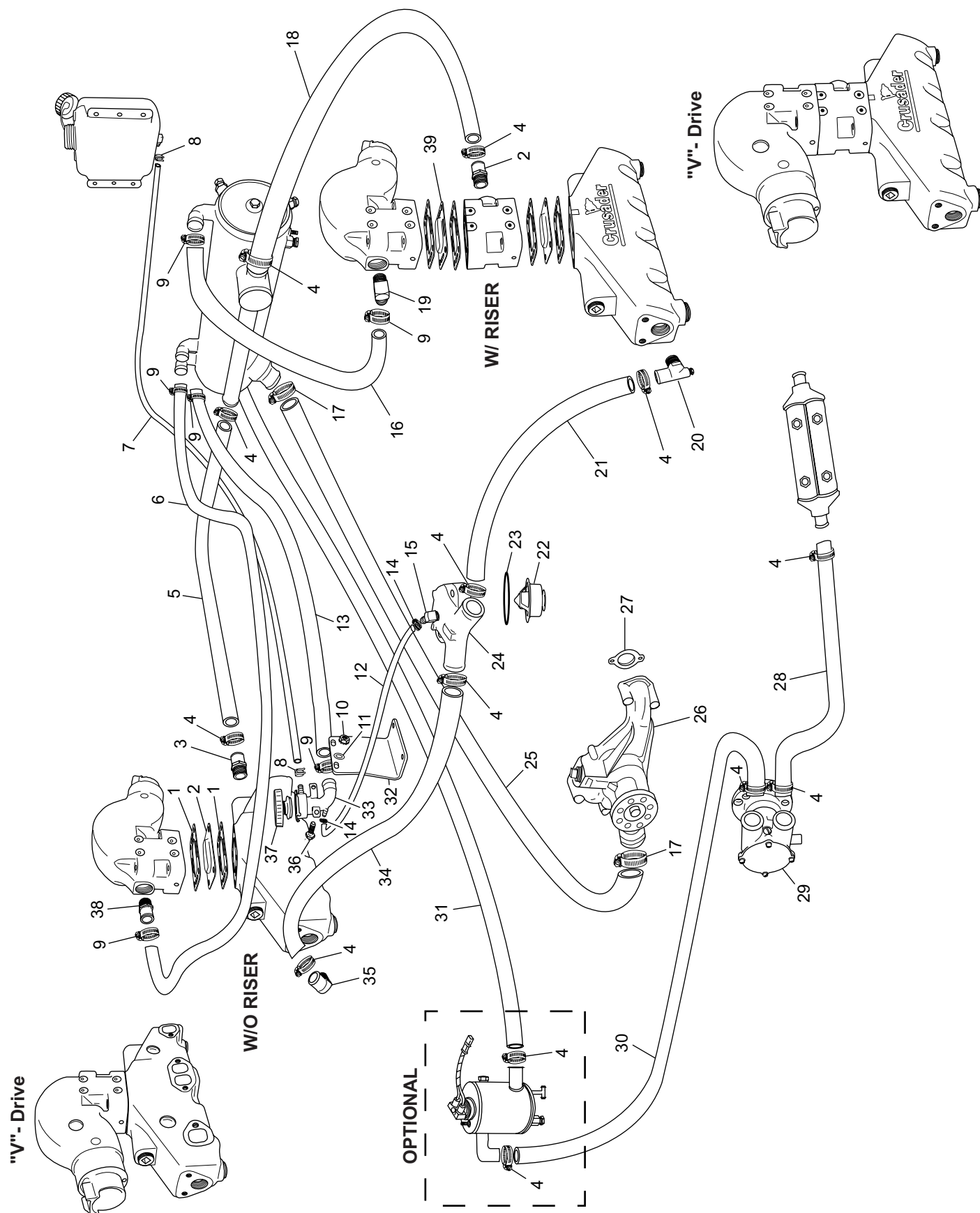


PC57B033CR

HEAT EXCHANGER and COMPONENTS - FIGURE 10

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R171009	Clamp , exchanger mounting	2
2	R094041	Isolator , top	2
3	23267	Decal , exchanger	1
4	22847	Decal , exchanger	1
5	23657	Decal , exchanger	1
6	R168008	Zinc , sacrificial	1
7	RA147044	Heat Exchanger Assembly	1
8	22164	End Cap Kit , exchanger	AR
9	TBD	Lockwasher , ground wire stud	1
10	TBD	Nut , ground wire stud	1
11	R101013	Wire , grounding	1
12	R146002	Bottle , coolant overflow	1
13	23527	Cap , coolant fill	1
14	RS0280	Bolt , coolant overflow mounting (3/4")	2
15	RS2179	Lockwasher , mounting bolt	2
16	92200000	Washer , mounting bolt	2
17	R045139	Tube , overflow	1
18	R090258	Bracket , heat exchanger	1
19	90368100	Bolt , heat exchanger bracket	4
20	RS2180	Lockwasher , heat exchanger bracket bolt	4
21	R094040	Isolator , bottom	2

FRESH WATER COOLING SYSTEM COMPONENTS - FIGURE 11

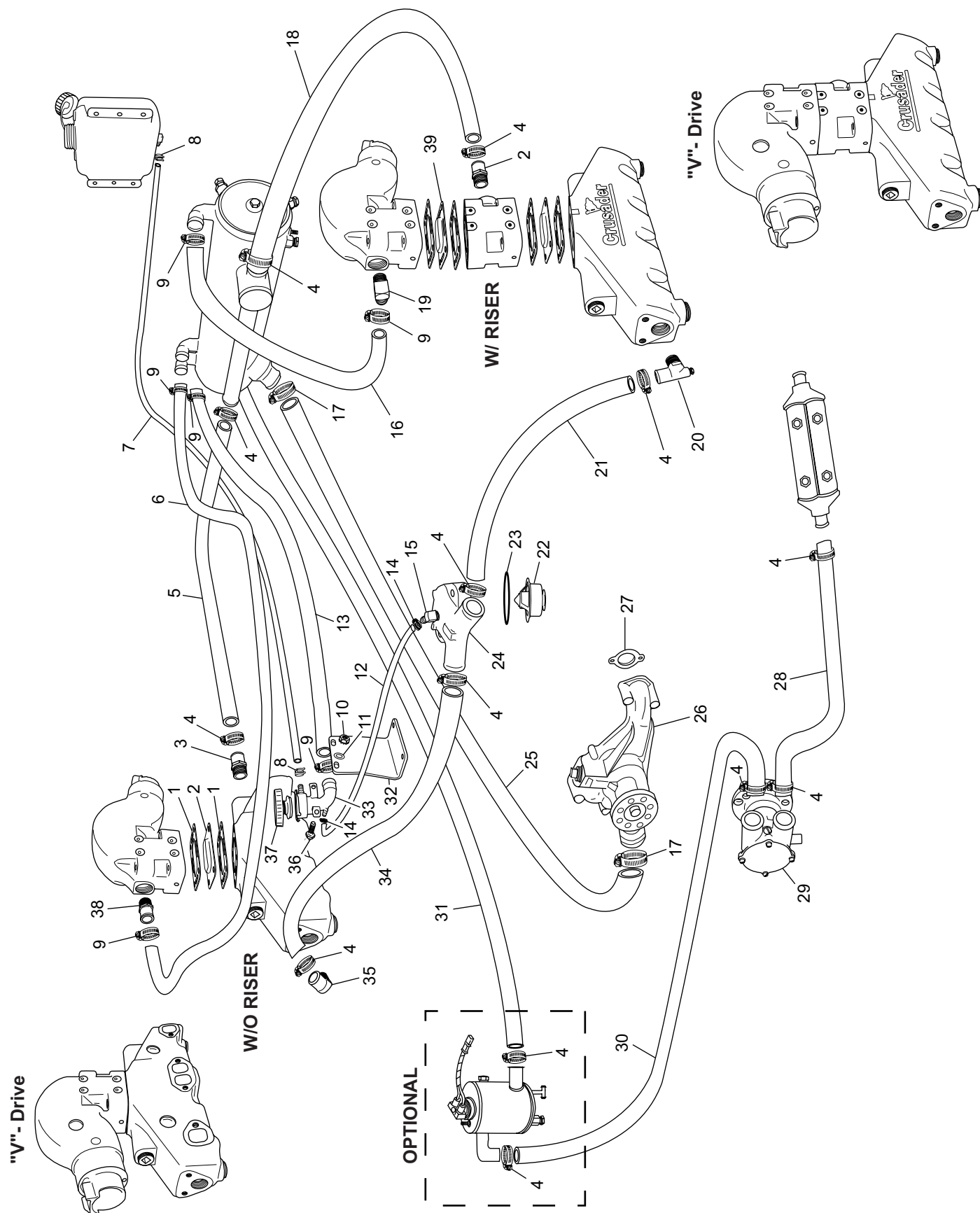


PC57B034CR

FRESH WATER COOLING SYSTEM COMPONENTS - FIGURE 11

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	98127	Gasket , elbow to riser / elbow to manifold / riser to manifold	8
2	98124	Wing Plate , blockoff	2
3	97852	Fitting , straight	2
4	RS3858	Clamp , hose (#20)	14
5	18402	Hose , manifold to heat exchanger (Starboard)	1
5	R045145	Hose , manifold to heat exchanger (Starboard)(w/ 4" risers)	AR
6	18340	Hose , heat exchanger to exhaust elbow (Starboard STD)	1
6	R045125A	Hose , heat exchanger to exhaust elbow (Starboard "V"- Drive)	AR
6	R045124A	Hose , heat exchanger to exhaust elbow (Starboard)(w/ 4" risers)	AR
7	R045139	Hose , fill riser to overflow bottle	1
8	R127084	Clamp , hose	2
9	RS3851	Clamp , hose (#16)	6
10	RS1078	Nut , fill riser attaching	2
11	92100000	Lockwasher , fill riser attaching	2
12	R045132	Hose , thermostat housing fitting to fill riser	1
13	R045124	Hose , fill riser to heat exchanger	1
14	RS3870	Clamp , hose	2
15	R024055	Fitting , thermostat housing 90 degree	1
16	R045125	Hose , heat exchanger to exhaust elbow (Port STD)	1
16	18311	Hose , heat exchanger to exhaust elbow (Port "V"- Drive)	1
17	RS3855	Clamp , hose (#32)	2
18	18402	Hose , manifold to heat exchanger (Port)	1
18	R045145	Hose , manifold to heat exchanger (Port)(w/ 4" risers)	AR
19	R024006A	Fitting , 90 degree	1
20	30624	Fitting , exhaust manifold (90 degree)	1
21	R045140	Hose , thermostat housing to exhaust manifold (Port)	1
22	R026002F	Thermostat , (160 degree)	1
23	TBD	O-Ring , thermostat	1
24	97851	Housing , thermostat	1
25	18306	Hose , circulation pump to exchanger	1
26	RA057027	Water Pump Assembly	1
27	RM0266	Gasket , water pump to engine block	2
28	R045106	Hose , oil cooler to raw water pump	1
29	RA057026	Raw Water Pump Assembly	1
30	R045102	Hose , raw water pump to fuel cooler (returnless fuel)	1

FRESH WATER COOLING SYSTEM COMPONENTS - FIGURE 11 (cont'd)

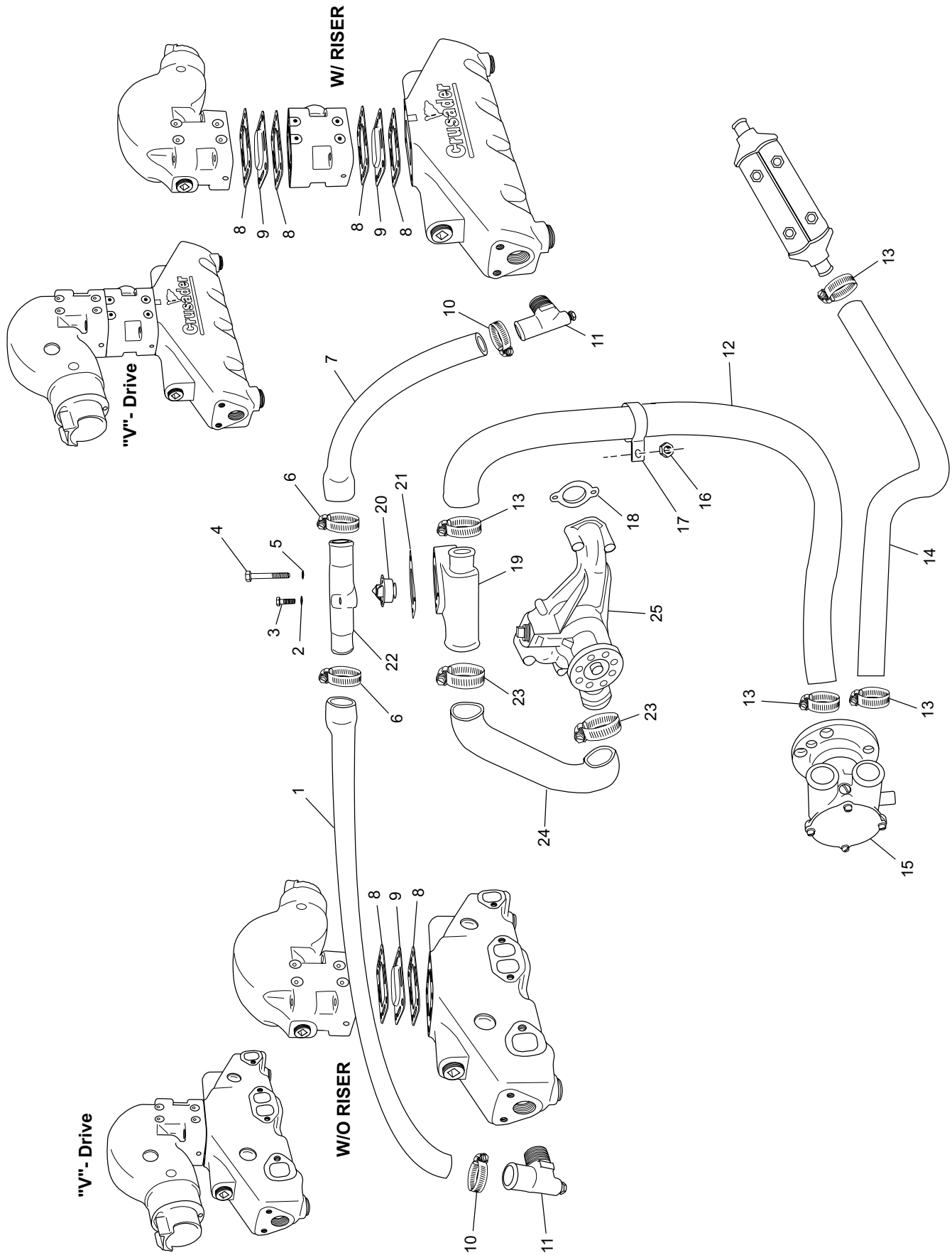


PC57B034CR

FRESH WATER COOLING SYSTEM COMPONENTS - FIGURE 11 (cont'd)

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
30	R045112	Hose , raw water pump to fuel cooler (returnless fuel)(RH rotation engine)	AR
31	R045102A	Hose , fuel cooler to heat exchanger (returnless fuel)	1
32	R090260	Bracket , fill riser mounting	1
33	R034047	Fill Riser Assembly	1
34	R045141	Hose , thermostat housing to exhaust manifold (Starboard)	1
35	97854	Fitting , exhaust manifold (90 degree)	1
36	90105075	Bolt , fill riser attaching	2
37	RK034006A	Cap ,fill riser pressure cap (7 lb.)	1
38	97852	Fitting , straight	1
39	98124A	Wing Plate , pass-thru	2

RAW WATER COOLING SYSTEM COMPONENTS - FIGURE 12

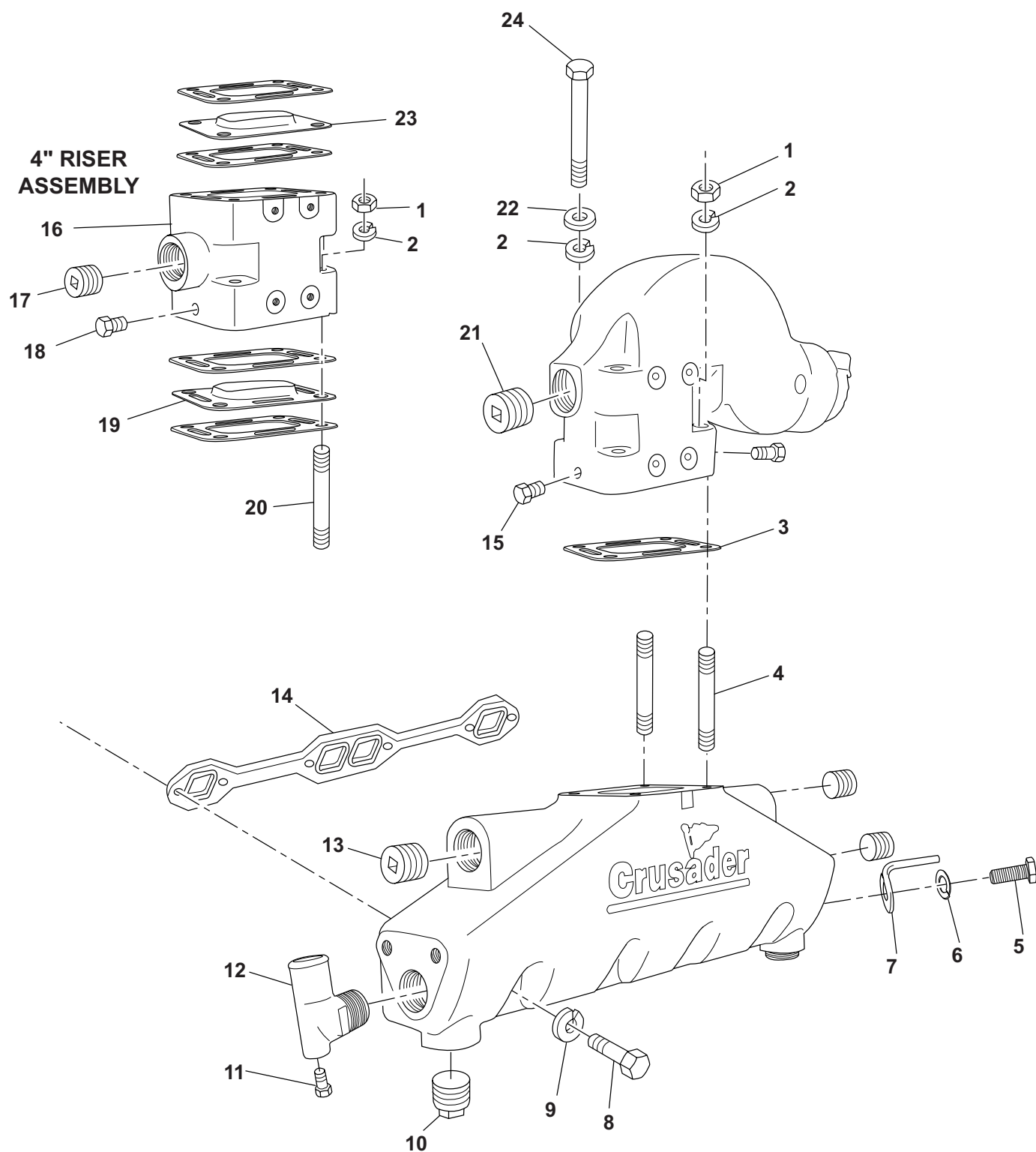


PC57B019CR

RAW WATER COOLING SYSTEM COMPONENTS - FIGURE 12

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R045141	Hose , fill riser to exhaust manifold (starboard)	1
2	93920000	Lockwasher , attaching bolt	1
3	98223035	Bolt , upper fill riser to lower fill riser attaching	1
4	98333080	Bolt , upper fill riser to lower fill riser attaching	2
5	RS2179	Lockwasher , attaching bolt	2
6	RS3858	Clamp , hose	2
7	R045140	Hose , fill riser to exhaust manifold (port)	1
8	98127	Gasket , elbow to riser / elbow to manifold / riser to manifold	8
9	98124A	Wing Plate , pass-thru	4
10	RS3858	Clamp , hose	2
11	30624	Fitting , 90 degree	2
12	R045097	Hose , raw water pump to fill riser	1
13	RS3858	Clamp , hose	4
14	R045106	Hose , oil cooler to raw water pump	1
15	RA057026	Raw Water Pump Assembly	1
16	RS1527	Nut , strap clamp attaching	1
17	R090082	Clamp , strap	1
18	RM0203	Gasket , water pump to engine block	2
19	R025031	Fill Riser , lower	1
20	R026002	Thermostat , coolant (160 degree)	1
21	RM0258	Gasket , upper fill riser to lower fill riser	1
22	R025032	Fill Riser , upper	1
23	RS3852	Clamp , hose	2
24	R045048	Hose , fill riser to water pump	1
25	RA057027	Water Pump Assembly	1

EXHAUST MANIFOLD and COMPONENTS - FIGURE 13

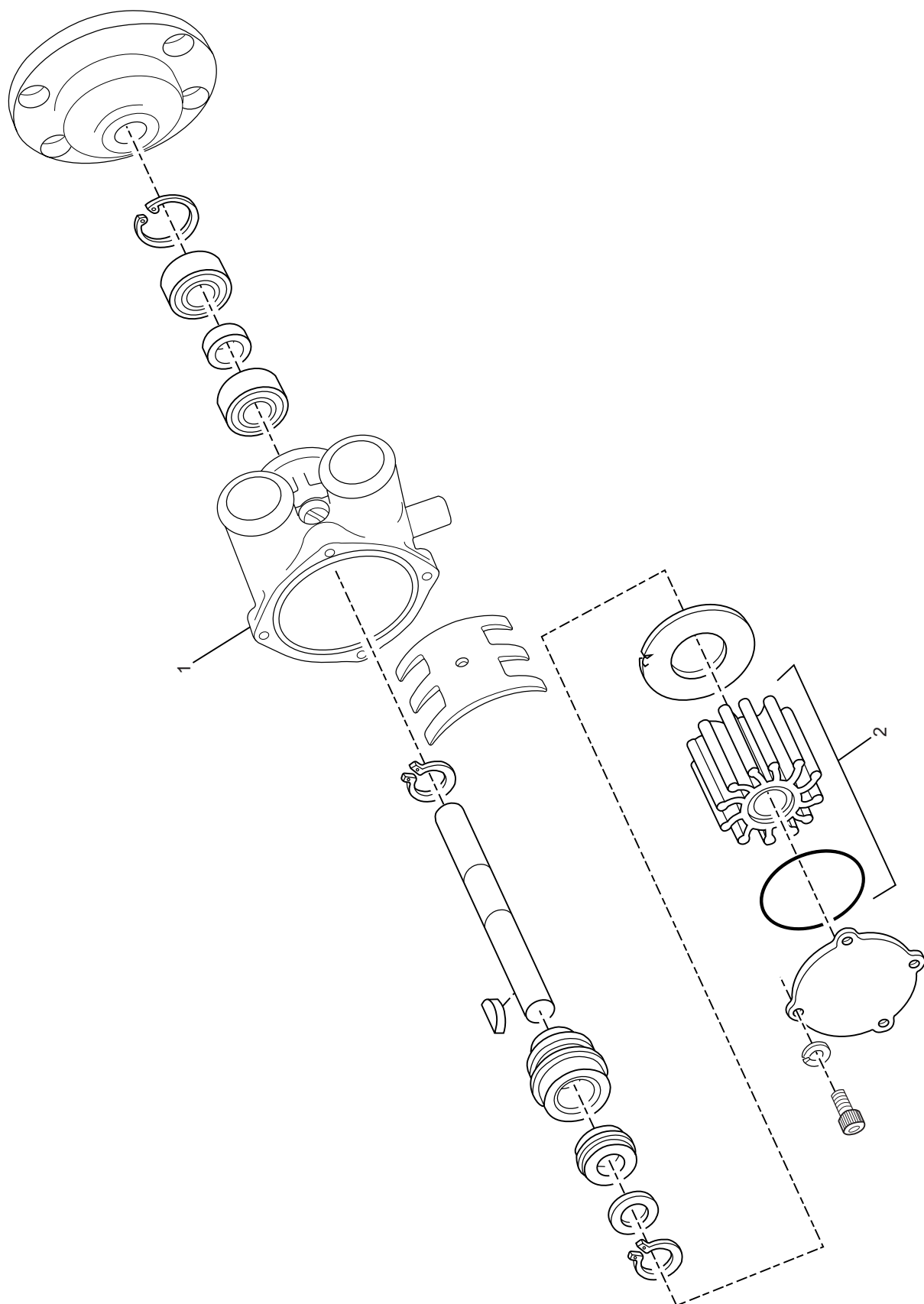


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EXHAUST MANIFOLD and COMPONENTS - FIGURE 13

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	95300000	Nut , elbow attaching stud	4
2	93300000	Lockwasher , elbow attaching stud	8
3	98127	Gasket , manifold/elbow/riser	8
4	20827	Stud , exhaust elbow attaching (T)	4
5	RS2180	Bolt , wire loom attaching	2
6	RS0302	Lockwasher , attaching bolt	2
7	R096144	Bracket , spark plug wire loom	2
8	RS0316	Bolt , manifold to cylinder head	8
9	RS2180	Lockwasher , manifold to cylinder head	8
10	103876	Plug , drain	4
11	RS3552	Plug , drain	1
12	30624	Fitting , water elbow (90 degree)	1
13	103876	Plug , exhaust manifold (1")	6
14	96306	Gasket , manifold to cylinder head	2
15	RS3552	Plug , drain	4
*	22818	4-Inch Riser Kit	1
16	98128	Exhaust Riser	2
17	RS3556	Plug , exhaust riser (3/4")	2
18	RS3554	Plug , drain	4
19	98124A	Wing Plate , pass-thru	2
20	20783	Stud , riser mounting (2 3/4")	4
21	RS3556	Plug , exhaust elbow (3/4")	2
22	RS2674	Washer , elbow attaching	4
23	98124	Wing Plate , block-off	2
24	90305475	Bolt , exhaust elbow attaching (4 3/4")	4
*NOTE: See Fresh Water Cooling section for parts used on Fresh Water Cooled engines.			

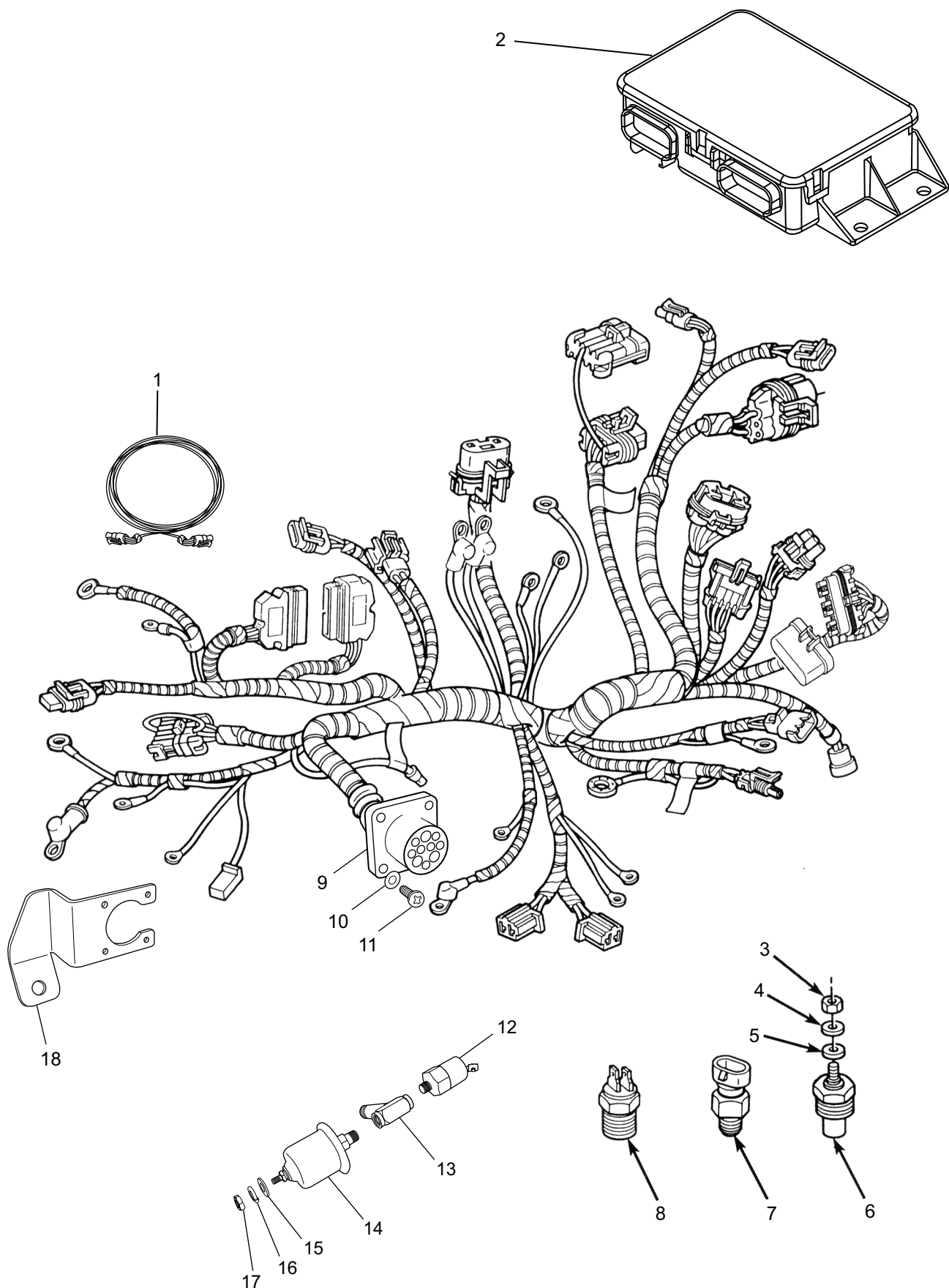
RAW WATER COOLING PUMP - FIGURE 14



RAW WATER COOLING PUMP - FIGURE 14

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RA057026	Raw Water Pump Assembly	1
2	RP061017	Kit , impeller	1

WIRING HARNESS ASSEMBLIES and SENDERS - FIGURE 15

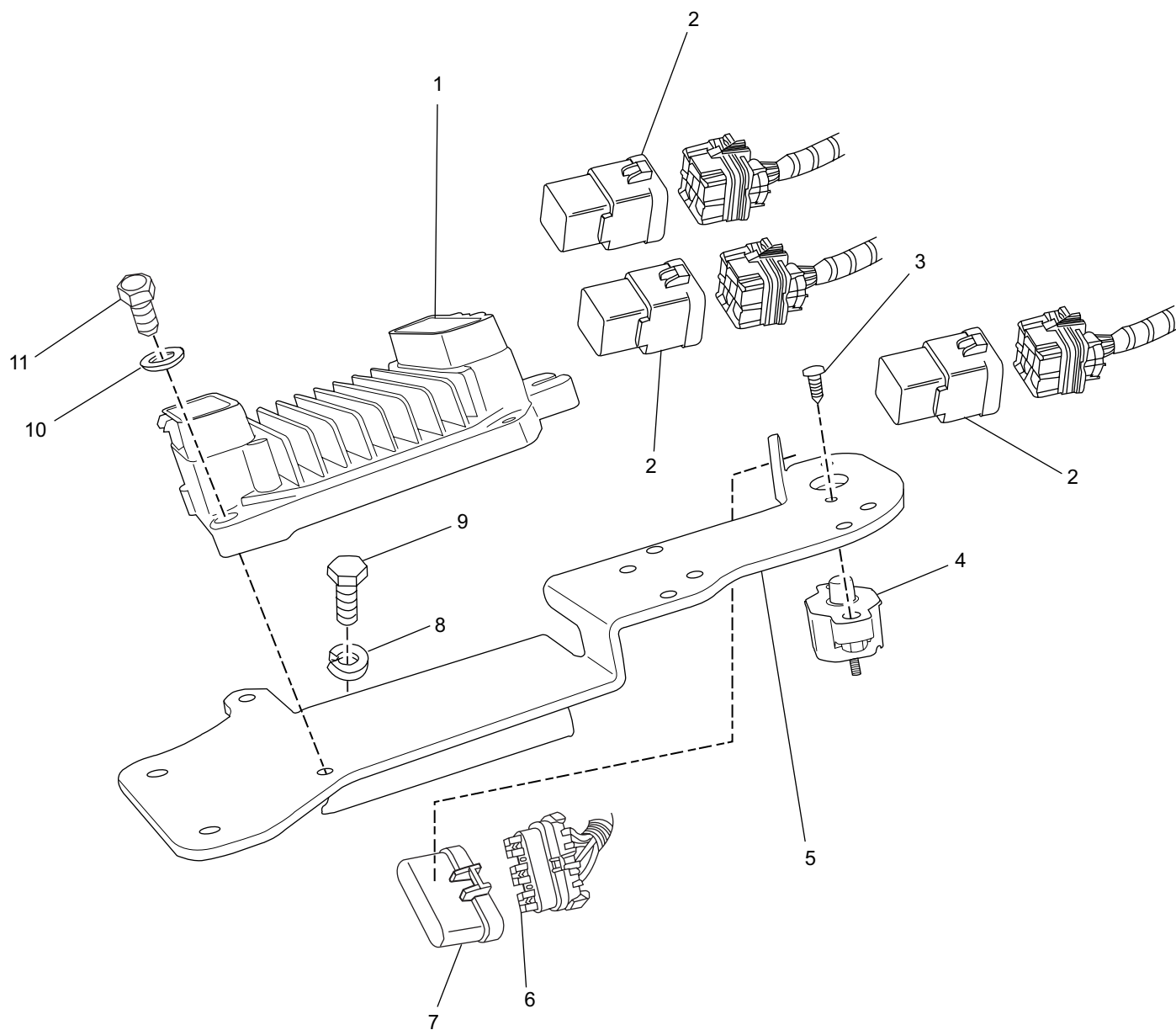


PC57B025CR

WIRING HARNESS ASSEMBLIES and SENDERS - FIGURE 15

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RA121072A	Harness , slave 4-pin connector (twin applications only)	AR
2	TBD	Throttle Actuator Control (TAC) Module (electronic throttle control only)	AR
3	95011000	Nut , sender terminal	1
4	95300300	Lockwasher , sender terminal	1
5	92300200	Washer , sender terminal	1
6	R020003	Sender , temperature	1
6	22701	Sender , temperature (VDO)	AR
7	R020019	Sensor , engine coolant temperature (ECT)	1
8	R020037	Switch , transmission alarm	1
9	RA121067C	Engine Wiring Harness Assembly , mechanical throttle body	1
9	TBD	Engine Wiring Harness Assembly , electronic throttle body	AR
10	R096142	Washer , main harness attaching	4
11	RS5115	Screw , main harness attaching	4
12	R020015A	Switch , oil pressure	1
13	R024205	Tee , sender attaching	1
14	R020001	Sender , oil pressure	1
14	22702	Sender , oil pressure (VDO)	AR
15	92300200	Washer , sender terminal	1
16	95300300	Lockwasher , sender terminal	1
17	95011000	Nut , sender terminal	1
18	R090251	Bracket , main harness attaching	1

ECM and RELAYS - FIGURE 16

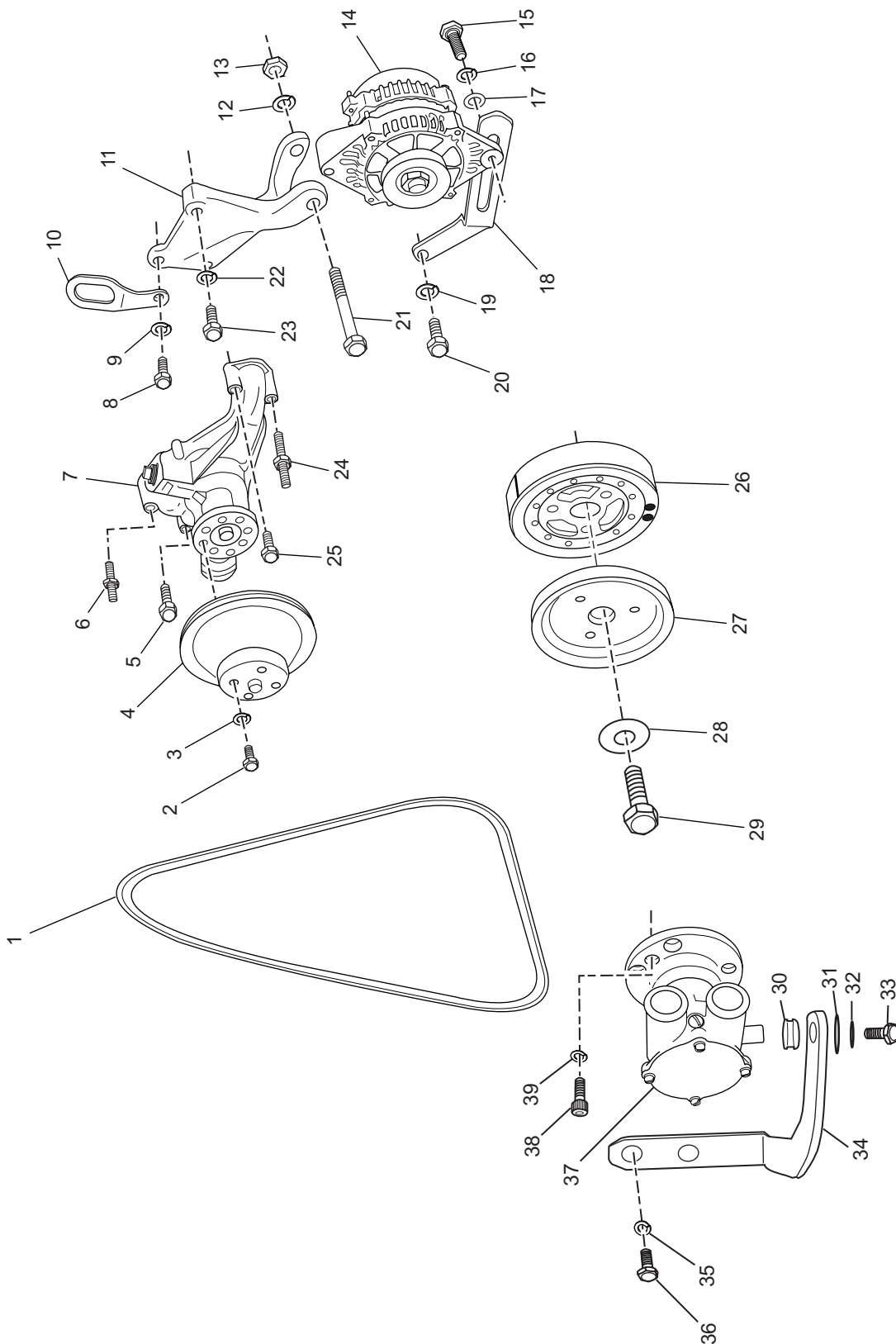


PC57B016

ECM and RELAYS - FIGURE 16

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R116019	Engine Control Module	1
2	R130012	Relay , fuel pump, ignition, starter	3
3	RS5084	Bolt , circuit breaker mounting	2
4	R153006C	Circuit Breaker Assembly (60 amp)	1
5	R090250	Bracket , ECM/relay mounting	1
6	R153017B	Fuses , 20 amp	3
7	R126014	Cover , fuse holder	1
8	93920000	Lockwasher , bracket attaching bolt	2
9	98223016	Bolt , bracket attaching	2
10	RS2178	Washer , ECM attaching	2
11	90105075	Bolt , ECM attaching	2

ACCESSORY DRIVE SYSTEM COMPONENTS - FIGURE 17

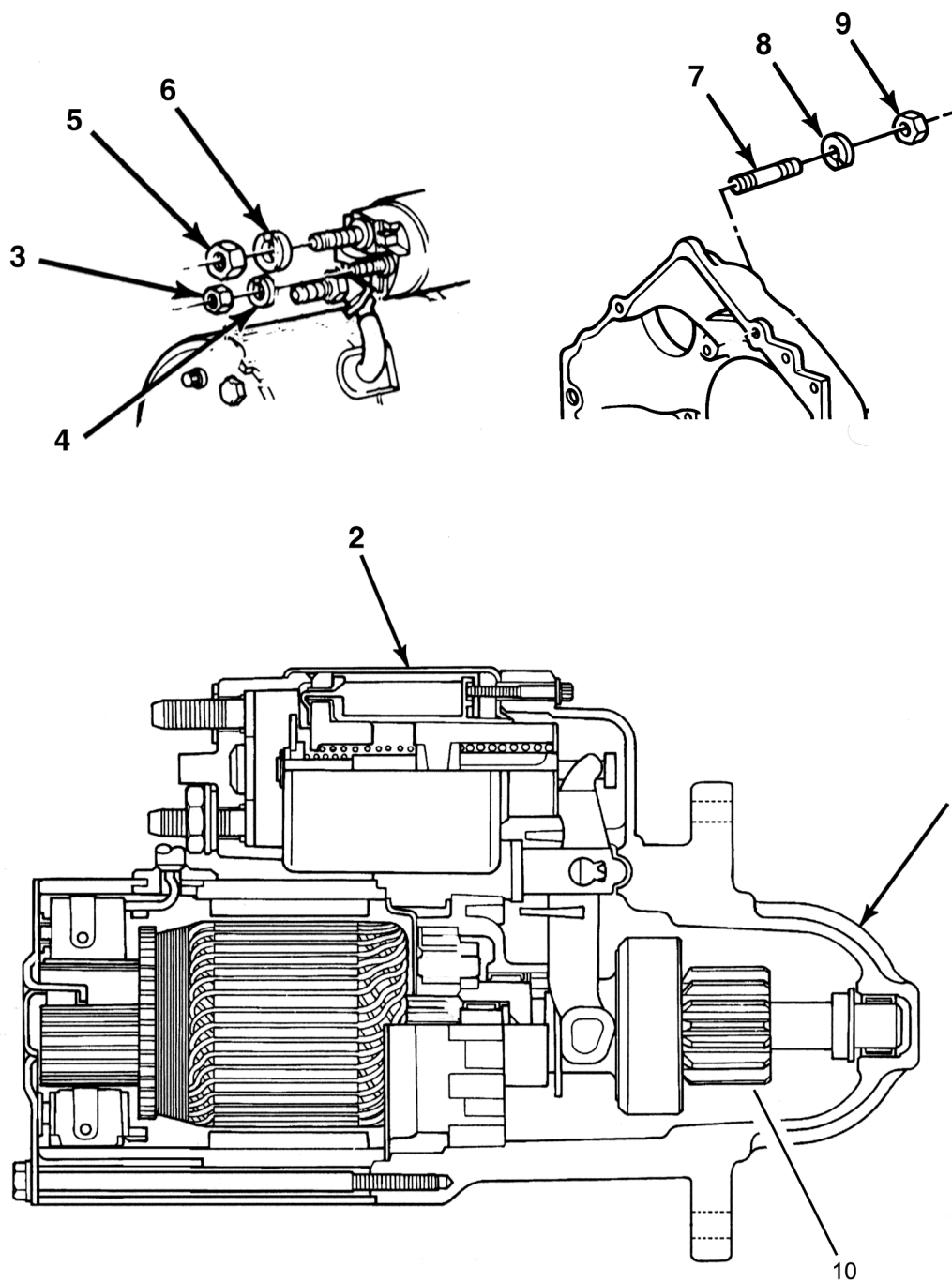


PC57B029

ACCESSORY DRIVE SYSTEM COMPONENTS - FIGURE 17

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R066008	Belt , alternator drive	1
2	RS0775	Bolt , water pump pulley attaching	4
3	RS2179	Lockwasher , water pump pulley attaching bolt	4
4	R065049	Pulley , water pump	1
5	90305275	Bolt , water pump mounting	1
6	R095026	Stud , water pump mounting	1
7	RA057027	Water Pump Assembly	1
8	RS0305	Bolt , lift bracket attaching	2
9	RS2180	Lockwasher , lift bracket attaching bolt	2
10	R042008	Bracket , lift	1
11	R090075	Bracket , alternator mounting	1
12	RS2180	Lockwasher , alternator mounting	1
13	RS1028	Nut , alternator mounting	1
14	RA097007B	Alternator Assembly (70 amp)	1
15	RS6531	Bolt , alternator mounting	1
16	RS2179	Lockwasher , alternator mounting bolt	1
17	RS2673	Washer , alternator mounting bolt	1
18	R099009	Bracket , alternator adjusting strap	1
19	RS2180	Lockwasher , alternator bracket attaching bolt	1
20	RS0304	Bolt , alternator bracket attaching	1
21	RS0316	Bolt , alternator mounting	1
22	RS2180	Lockwasher , alternator bracket attaching bolt	1
23	RS0306	Bolt , alternator bracket attaching	1
24	R095026	Stud , water pump mounting	1
25	90305175	Bolt , water pump mounting	1
26	R064010A	Balancer , crankshaft	1
27	R065045	Pulley , alternator drive belt	1
28	R096074	Washer , crankshaft balancer	1
29	R009091	Bolt , crankshaft balancer	1
30	R094038	Grommet , rubber	1
31	RS2673	Washer , mounting bolt large	1
32	RS2179	Washer , mounting bolt small	1
33	RS0280	Bolt , raw water pump mounting	1
34	R090177A	Bracket , raw water pump mounting	1
35	RS2181	Lockwasher , raw water pump mounting bracket	2
36	RS0302	Bolt , raw water pump mounting bracket	2
37	RA057026	Raw Water Pump Assembly	1
38	R009161	Bolt , raw water pump-to-balancer mounting	3
39	RS2180	Lockwasher , raw water pump-to-balancer mounting	3

STARTER ASSEMBLY COMPONENTS - FIGURE 18

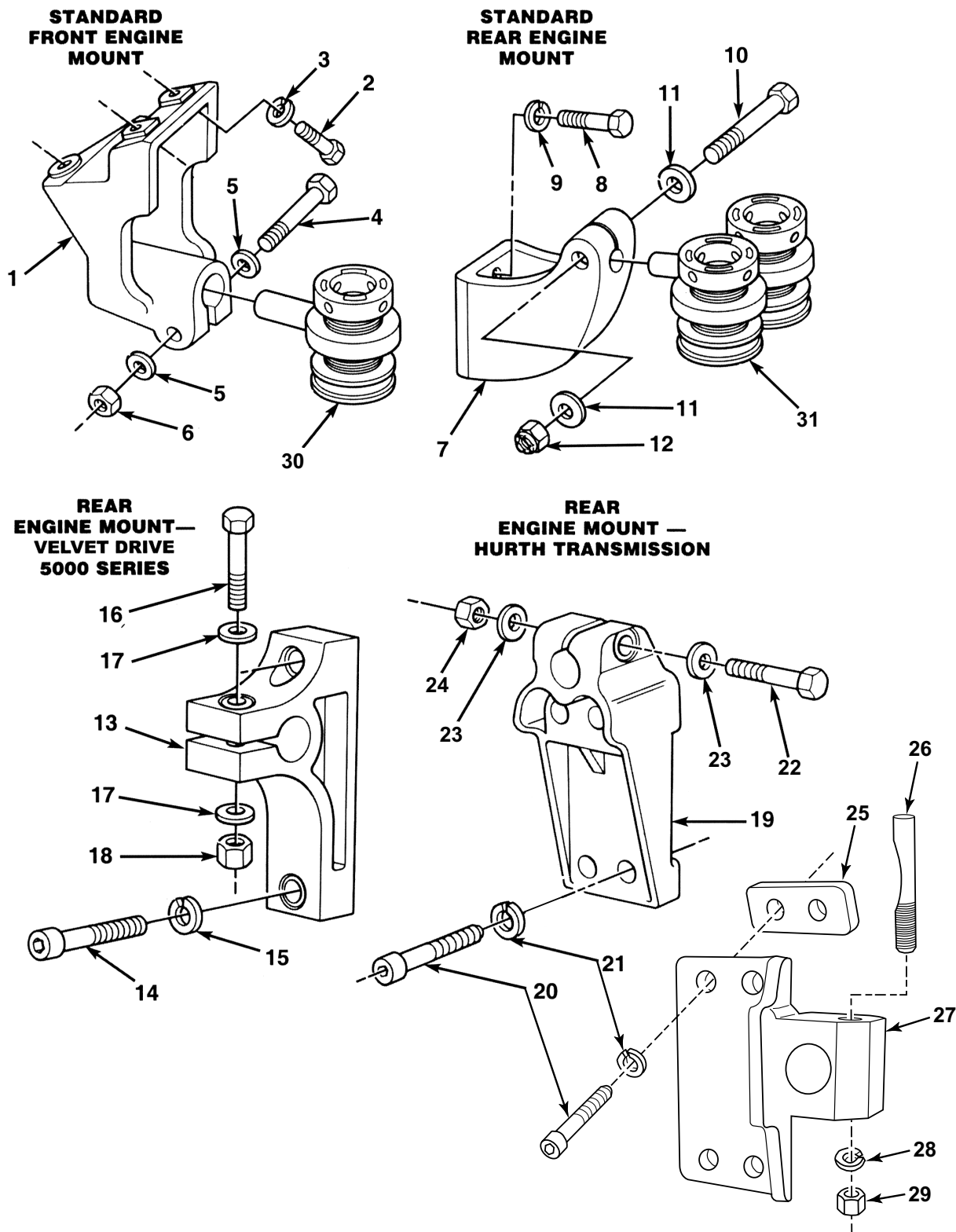


PC81016

STARTER ASSEMBLY COMPONENTS - FIGURE 18

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RA122009	Starter Motor Assembly (starter up position)	1
2	RU0050	Solenoid , starter	1
3	RS7036	Nut , solenoid terminal	1
4	93003000	Lockwasher , solenoid terminal	1
5	RS7019	Nut , solenoid terminal	1
6	TBD	Lockwasher , solenoid terminal	1
7	R031018	Stud , starter mounting	2
8	RS2181	Lockwasher , starter mounting	2
9	RS1029	Nut , starter mounting	2
10	RU0051	Drive , starter	1

ENGINE and TRANSMISSION MOUNTS - FIGURE 19

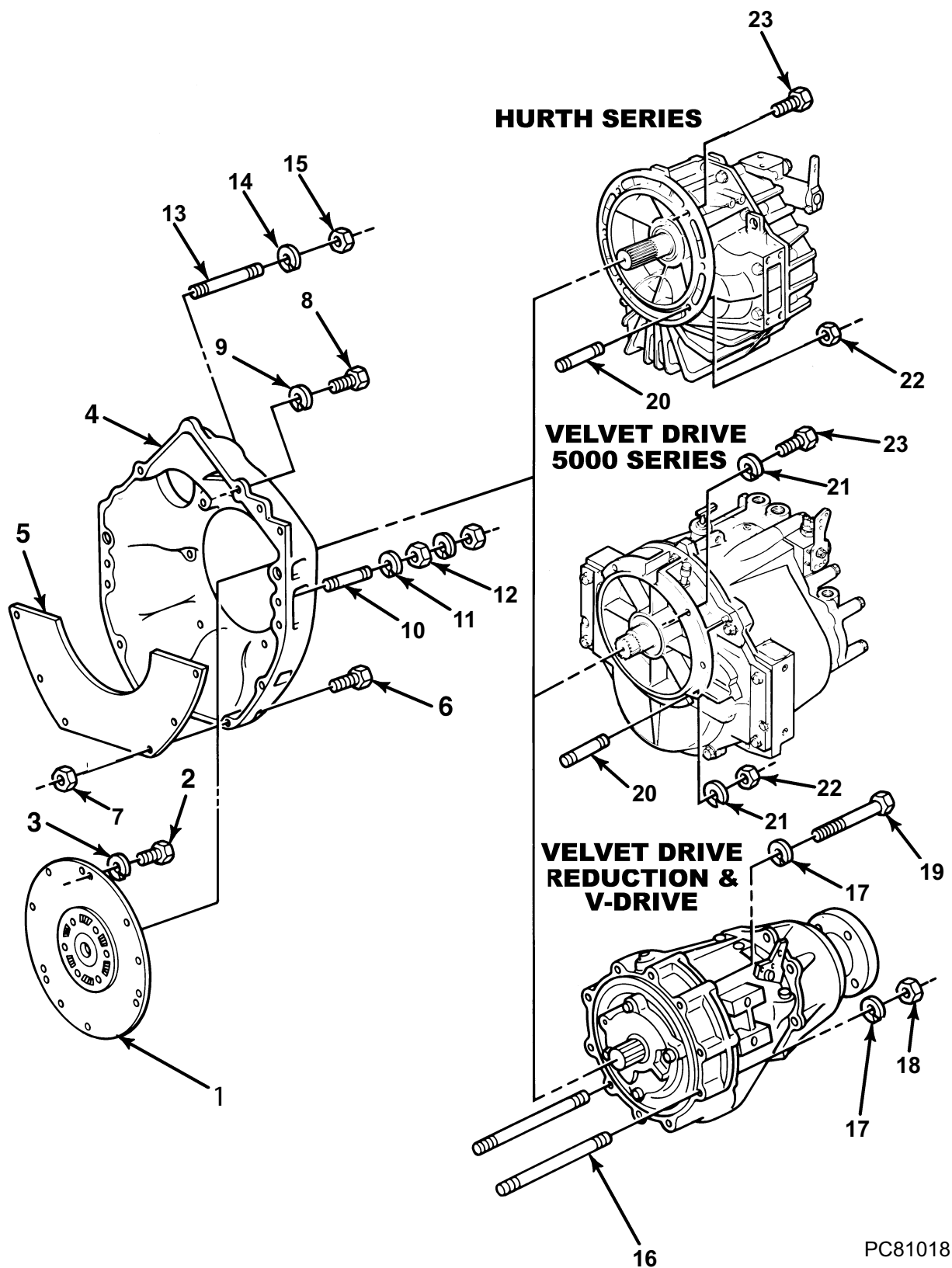


PC81017

ENGINE and TRANSMISSION MOUNTS - FIGURE 19

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
		Standard Front Engine Mount	
1	97938	Bracket , engine mounting (front)	2
2	RS0305	Bolt , socket head	4
2	RS3442	Stud	2
N.S.	RS1028	Nut , attaching	2
3	RS2180	Lockwasher , bracket mounting bolt	6
4	90318225	Bolt , trunnion shaft (2 1/4")	2
5	92300000	Washer , trunnion bolt	4
6	95310300	Nut , trunnion bolt - locking	2
		Standard Rear Engine Mount	
7	97917	Bracket , engine mounting (Rear)	2
8	RS0328	Bolt , bracket to transmission (1 1/4")	4
9	RS2181	Lockwasher , bracket mounting bolt	4
10	90318325	Bolt , trunnion shaft (3 1/4")	2
11	92300000	Washer , trunnion bolt	4
12	95310300	Nut , trunnion bolt - locking	2
		Rear Engine Mount - Velvet Drive 5000 Series	
13	98224	Bracket , transmission mounting (Starboard)	1
13	98225	Bracket , transmission mounting (Port)	1
14	RS6336	Bolt , bracket to transmission (12 mm x 60 mm)	4
15	RS7071	Lockwasher (12 mm)	4
16	90318325	Bolt , trunnion shaft (3 1/4")	2
17	92300000	Washer , trunnion bolt	4
18	95310300	Nut , trunnion bolt - locking	2
		Rear Engine Mount - Hurth Transmission	
19	R090174A	Bracket , engine mounting (rear)	2
20	RS6331	Bolt , bracket to transmission (12 mm x 35 mm)	4
20	RS6336	Bolt , bracket to transmission (12 mm x 60 mm)	4
21	RS7071	Lockwasher (12 mm)	8
22	90318325	Bolt , trunnion shaft (3 1/4")	2
23	92300000	Washer , trunnion bolt	4
24	95310300	Nut , trunnion bolt - locking	2
25	R109049	Spacer , bracket to transmission	2
26	R095020	Bolt , trunnion shaft	2
27	R090217	Bracket , engine mounting (port)	1
27	R090218	Bracket , engine mounting (starboard)	1
28	RS2181	Lockwasher , trunnion bolt	2
29	RS1529	Nut , trunnion bolt - locking	2
		Mount Supports	
30	97926	Mount , engine support (single front)	2
31	97905	Mount , engine support (dual rear)	2

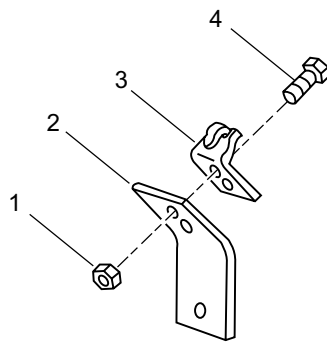
BELL HOUSING ASSEMBLY - FIGURE 20



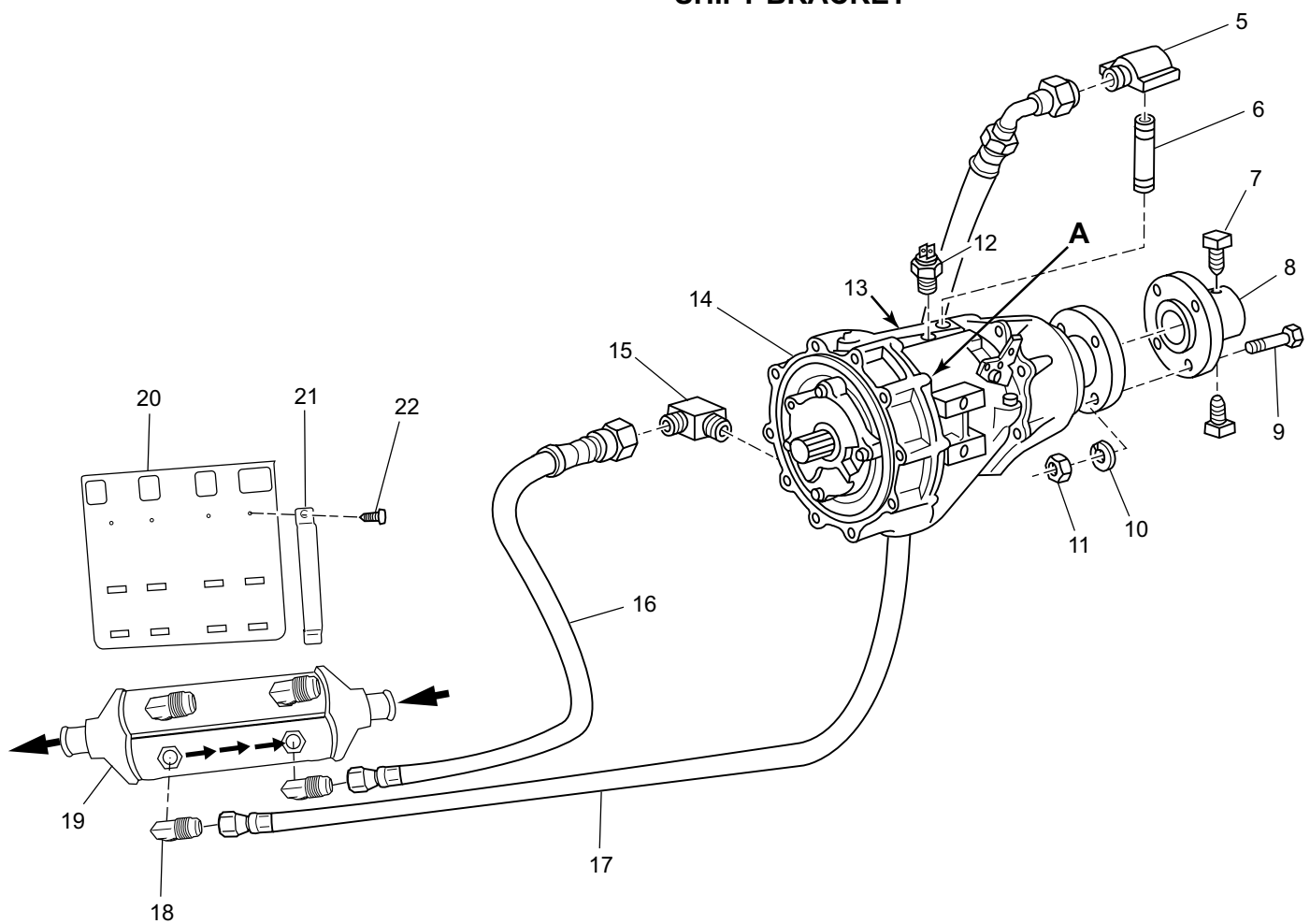
BELL HOUSING ASSEMBLY - FIGURE 20

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R140018	Drive Damper Assembly , (Hurth and 5000 series only)	1
1	R140004	Drive Damper Assembly , (Standard Velvet Drive)	1
2	98446030	Bolt , damper to flywheel (1")	6
3	93940000	Lockwasher , damper bolt	6
4	R142014	Bellhousing , flywheel	1
5	R019008	Cover , bellhousing	1
6	RS0256	Bolt , cover to bellhousing (1")	5
6	90105125	Bolt , cover to bellhousing (1 1/4")	1
7	RS1078	Nut , cover bolt	6
8	98443050	Bolt , bellhousing to block	2
8	99443030	Bolt , SHCS (behind starter)	1
9	93940000	Lockwasher , bellhousing bolt	2
10	R031031	Stud , bellhousing mounting	2
11	93940000	Lockwasher , mounting stud	4
12	97440000	Nut , mounting stud	4
13	R031018	Stud , starter mounting (1 5/8")	2
14	RS2181	Lockwasher , starter mounting stud	2
15	RS1029	Nut , starter mounting stud	2
Velvet Drive Reduction & "V"-Drive			
16	96541	Stud , transmission mounting (4")	2
17	RS2181	Lockwasher , transmission mounting	6
18	RS1029	Nut , transmission mounting stud	2
19	RS0337	Bolt , transmission mounting	4
Velvet Drive 5000 & Hurth Gears			
20	R031018	Stud , transmission mounting (1 5/8")	2
21	RS2180	Lockwasher , transmission mounting	6
22	RS1029	Nut , transmission mounting stud	2
23	RS0329	Bolt , transmission mounting	4

TRANSMISSION AND RELATED COMPONENTS (VELVET DRIVE IN-LINE) - FIGURE 21



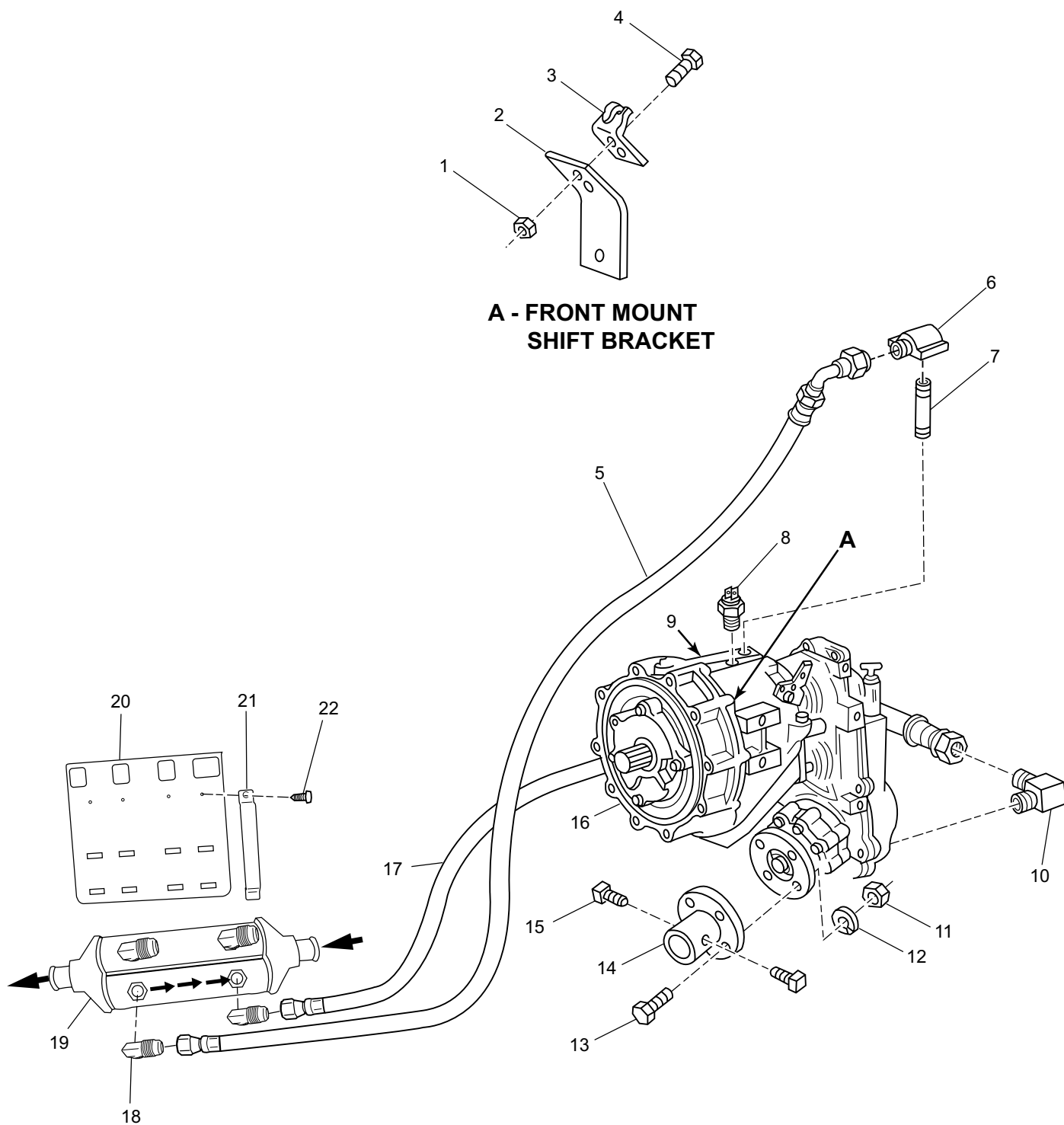
**A - FRONT MOUNT
SHIFT BRACKET**



TRANSMISSION AND RELATED COMPONENTS (VELVET DRIVE IN-LINE) - FIGURE 21

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RS2055	Nut , attaching bolt	2
2	96341	Shift Bracket (front mount)	1
3	R090086	Cable Clip , single cable	1
3	22232	Cable Clip , dual cable clip (not shown)	OPT
4	RS5122	Bolt , clip attaching (1/2")	2
5	R024008	Elbow , hose - transmission (90 degree)	1
6	RS4674	Nipple , pipe (3")	1
7	2000090	Screw , set - coupler	2
8	R148001	Coupler , prop shaft (1" shaft)	OPT
8	R148002	Coupler , prop shaft (1 1/8" shaft)	OPT
8	R148003	Coupler , prop shaft (1 1/4" shaft)	OPT
8	R148004	Coupler , prop shaft (1 3/8" shaft)	OPT
8	R148005	Coupler , prop shaft (1 1/2" shaft)	OPT
8	R148007	Coupler , prop shaft (1 3/4" shaft)	OPT
8	R148008	Coupler , prop shaft (2" shaft)	OPT
9	22136	Bolt , coupling (1 1/2")	4
10	RS2181	Lockwasher , coupling bolt	4
11	RS1529	Nut , coupling bolt	4
12	R020037	Sender , temperature alarm	1
13	R153002	Switch Kit , neutral start (not shown)	1
13A	25542	Switch & O-Ring Assembly (not shown)	1
14	RA157003	Transmission (1:1 Direct Drive)	1
14	RA157004	Transmission (1.52:1 Reduction)	1
14	RA157004A	Transmission (1.88:1 Reduction)	1
14	RA157004D	Transmission (2.57:1 Reduction)	1
14	RA157004E	Transmission (2.91:1 Reduction)	1
15	R024010	Elbow , hose - transmission (90 degree)	1
16	RA045007H	Hose Assembly , cooler to transmission	1
17	RA045007N	Hose Assembly , transmission to cooler	1
18	30526	Fitting , 90 degree	2
19	R147035	Oil Cooler Assembly	1
20	R090194	Bracket , cooler	1
21	R171007	Strap , cooler mounting	2
22	RS5115	Screw , cooler mounting	2

TRANSMISSION AND RELATED COMPONENTS (VELVET DRIVE "V"-DRIVE) - FIGURE 22

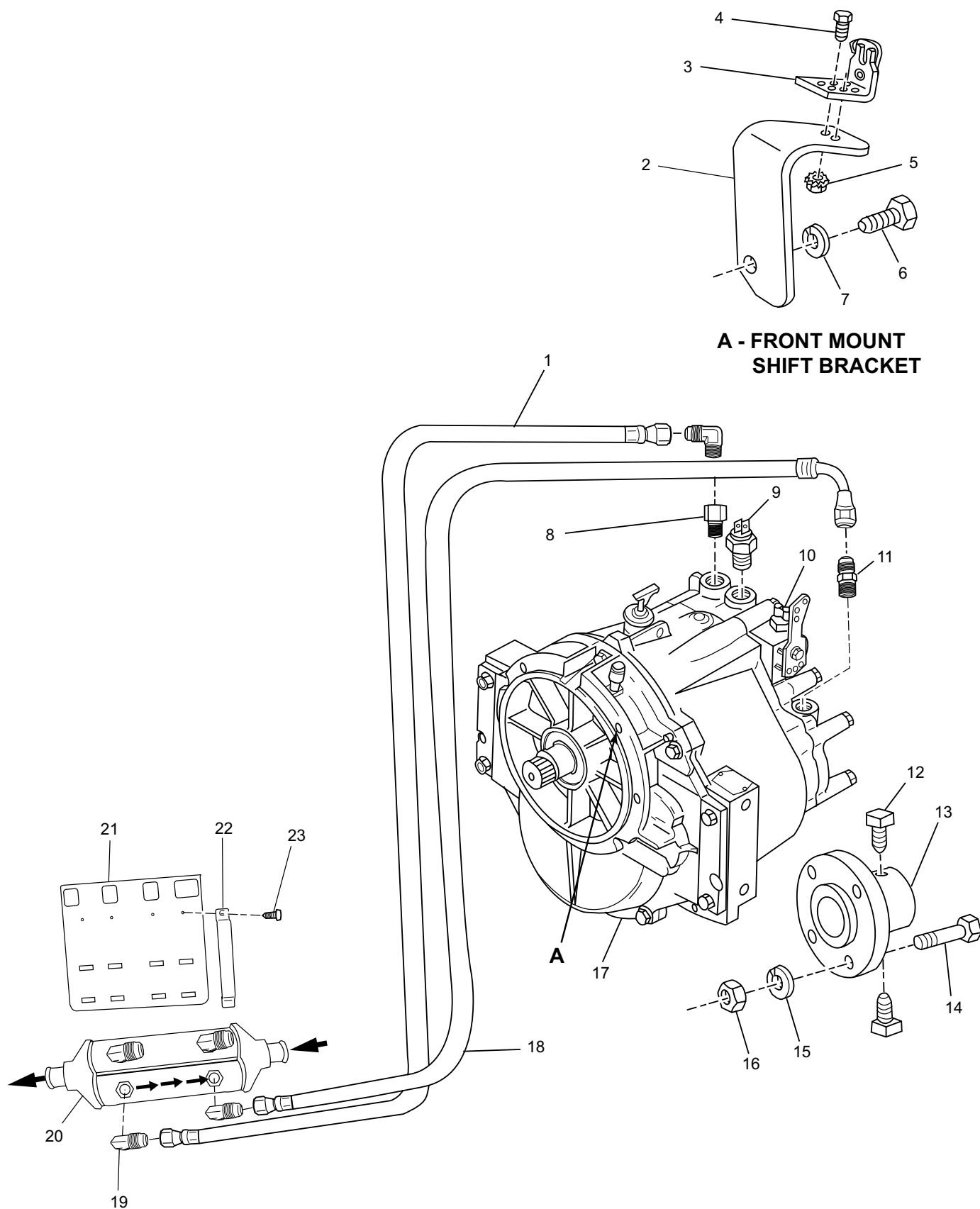


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TRANSMISSION AND RELATED COMPONENTS (VELVET DRIVE "V"-DRIVE) - FIGURE 22

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RS2055	Nut , attaching bolt	2
2	96341	Shift Bracket (front mount)	1
3	R090086	Cable Clip , single cable	1
3	22232	Cable Clip , dual cable clip (not shown)	OPT
4	RS5122	Bolt , clip attaching (1/2")	2
5	RA045007N	Hose Assembly , transmission to cooler	1
6	R024008	Elbow , hose - transmission (90 degree)	1
7	RS4674	Nipple , pipe (3")	1
8	R020037	Sender , temperature alarm	1
9	R153002	Switch Kit , neutral start (not shown)	1
9A	25542	Switch & O-Ring Assembly (not shown)	1
10	R024010	Elbow , hose - transmission (90 degree)	1
11	RS1529	Nut , coupling bolt	4
12	RS2181	Lockwasher , coupling bolt	4
13	22136	Bolt , coupling (1 1/2")	4
14	R148001	Coupler , prop shaft (1" shaft)	OPT
14	R148002	Coupler , prop shaft (1 1/8" shaft)	OPT
14	R148003	Coupler , prop shaft (1 1/4" shaft)	OPT
14	R148004	Coupler , prop shaft (1 3/8" shaft)	OPT
14	R148005	Coupler , prop shaft (1 1/2" shaft)	OPT
14	R148007	Coupler , prop shaft (1 3/4" shaft)	OPT
14	R148008	Coupler , prop shaft (2" shaft)	OPT
15	2000090	Screw , set - coupler	2
16	RA156002B	Transmission (1.51:1 Reduction)	1
16	RA156002D	Transmission (1.99:1 Reduction)	1
16	RA156002E	Transmission (2.49:1 Reduction)	1
17	RA045007N	Hose Assembly , cooler to transmission	1
18	30526	Fitting , 90 degrees	2
19	R147035	Oil Cooler Assembly	1
20	R090194	Bracket , cooler	1
21	R171007	Strap , cooler mounting	2
22	RS5115	Screw , cooler mounting	2

TRANSMISSION AND RELATED COMPONENTS (VELVET DRIVE 5000) - FIGURE 23



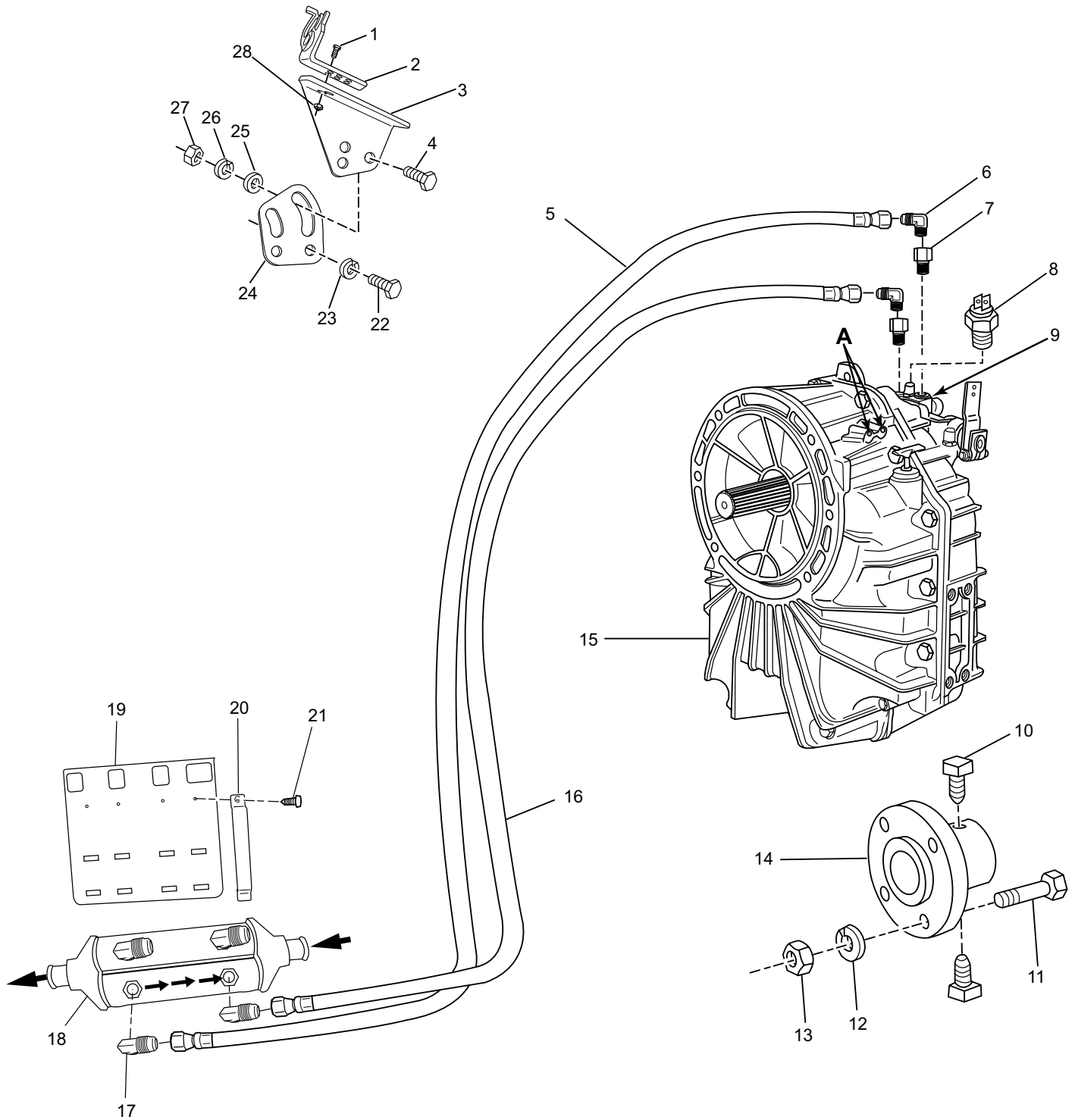
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TRANSMISSION AND RELATED COMPONENTS (VELVET DRIVE 5000) - FIGURE 23

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RA045007N	Hose Assembly , transmission to cooler	1
2	98227	Shift Bracket , (front entry)	1
3	R090086	Cable Clip , single cable	1
3	22232	Cable Clip , dual cable clip (not shown)	OPT
4	RS5122	Bolt , clip attaching (1/2")	2
5	RS2055	Nut , attaching bolt	2
6	TBD	Bolt , shift bracket attaching	2
7	TBD	Washer , shift bracket attaching bolt	2
8	R024196	Fitting , adapter	1
9	R020037	Sender , temperature alarm	1
10	25542	Switch & O-Ring Assembly (not shown)	1
11	30603	Fitting , adapter	1
12	2000090	Screw , set - coupler	2
13	R148001	Coupler , prop shaft (1" shaft)	OPT
13	R148002	Coupler , prop shaft (1 1/8" shaft)	OPT
13	R148003	Coupler , prop shaft (1 1/4" shaft)	OPT
13	R148004	Coupler , prop shaft (1 3/8" shaft)	OPT
13	R148005	Coupler , prop shaft (1 1/2" shaft)	OPT
13	R148007	Coupler , prop shaft (1 3/4" shaft)	OPT
13	R148008	Coupler , prop shaft (2" shaft)	OPT
14	22136	Bolt , coupling (1 1/2")	4
15	RS2181	Lockwasher , coupling bolt	4
16	RS1529	Nut , coupling bolt	4
17	RA157020B	Transmission (1.50:1 Reduction) Down Angle	1
17	RA157020C	Transmission (2:1 Reduction) Down Angle	1
17	RA157020D	Transmission (2.45:1 Reduction) Down Angle	1
17	RA157020E	Transmission (2.80:1 Reduction) Down Angle	1
17	RA156008	Transmission (1.25:1 Reduction) V-Drive	1
17	RA156008A	Transmission (1.50:1 Reduction) V-Drive	1
17	RA156008B	Transmission (2:1 Reduction) V-Drive	1
17	RA156008C	Transmission (2.50:1 Reduction) V-Drive	1
18	RA045007P	Hose Assembly , cooler to transmission	1
19	30526	Fitting , 90 degrees	3
20	R147035	Oil Cooler Assembly	1
21	R090194	Bracket , cooler	1
22	R171007	Strap , cooler mounting	2
23	RS5115	Screw , cooler mounting	2

TRANSMISSION AND RELATED COMPONENTS (HURTH GEAR) - FIGURE 24

**A - FRONT MOUNT
SHIFT BRACKET**



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TRANSMISSION AND RELATED COMPONENTS (HURTH GEAR) - FIGURE 24

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RS5122	Bolt , cable clip attaching	2
2	R090086	Cable Clip , single cable	1
2	22232	Cable Clip , dual cable clip (not shown)	OPT
3	R090202	Shift Bracket , cable clip attaching	1
4	RS0282	Bolt , shift bracket attaching	2
5	RA045007N	Hose Assembly , transmission to cooler	1
6	R024010	Fitting , 90 degree	2
7	R024196	Fitting , adapter	2
8	R020037	Sender , temperature alarm	1
9	25542	Switch & O-Ring Assembly (not shown)	1
10	2000090	Screw , set - coupler	2
11	90418138	Bolt , coupling (1 3/8")	4
12	RS2181	Lockwasher , coupling bolt	4
13	RS1529	Nut , coupling bolt	4
14	R148001	Coupler , prop shaft (1" shaft)	OPT
14	R148002	Coupler , prop shaft (1 1/8" shaft)	OPT
14	R148003	Coupler , prop shaft (1 1/4" shaft)	OPT
14	R148004	Coupler , prop shaft (1 3/8" shaft)	OPT
14	R148005	Coupler , prop shaft (1 1/2" shaft)	OPT
14	R148007	Coupler , prop shaft (1 3/4" shaft)	OPT
14	R148008	Coupler , prop shaft (2" shaft)	OPT
15	RA157022	Transmission 630A (1.22:1 Reduction)	1
15	RA157022A	Transmission 630A (1.55:1 Reduction)	1
15	RA157022B	Transmission 630A (2.00:1 Reduction)	1
15	RA157022C	Transmission 630A (2.50:1 Reduction)	1
15	RA157022D	Transmission 630A (2.70:1 Reduction)	1
15	RA157023F	Transmission 800A (2.85:1 Reduction)	1
15	RA156009	Transmission 630V (1.29:1 Reduction)	1
15	RA156009A	Transmission 630V (1.50:1 Reduction)	1
15	RA156009B	Transmission 630V (2.00:1 Reduction)	1
15	RA156009C	Transmission 630V (2.50:1 Reduction)	1
16	RA045007T	Hose Assembly , cooler to transmission	1
17	30526	Fitting , 90 degrees	2
18	R147035	Oil Cooler Assembly	1
19	R090194	Bracket , cooler	1
20	R171007	Strap , cooler mounting	2
21	RS5115	Screw , cooler mounting	2
22	RS6529	Bolt , shift bracket attaching	2
23	93930000	Lockwasher , shift bracket attaching bolt	2
24	R090235	Bracket , shift	1
25	RS2674	Washer , shift bracket attaching bolt	2
26	RS2179	Lockwasher , attaching bolt	2
27	RS1027	Nut , shift bracket attaching bolt	2
28	RS2055	Nut , cable clip attaching bolt	2

Contents:

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Cylinder Head Assembly / Front Cover - Figure 2	6
Exhaust Manifold Assembly / Knock Sensors - Figure 3	10
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Oil Pan and Oil Pump Assembly - Figure 5	14
Throttle Body Assemblies and Related Components - Figure 6	16
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Heat Exchanger and Components - Figure 9	22
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“TYPICAL VIEWS ARE SHOWN”**ENGINE ROTATION**

Engine Rotation is identified as “RH” or “LH” with the engine model number. Rotation always is determined from the flywheel end looking toward the front of the engine. In some instances, propeller shaft rotation may be opposite to that of the engine.

When ordering a replacement engine, production block or parts for the engine, be certain to check engine rotation. **DO NOT rely on propeller rotation in order to determine engine rotation.**

LEFT-HAND ROTATION is STANDARD ROTATION.

(Flywheel turns counterclockwise when viewed from flywheel end of the engine.)

RIGHT-HAND ROTATION is OPPOSITE ROTATION.

(Flywheel turns clockwise when viewed from flywheel end of the engine.)

HOW TO READ THIS PARTS BOOK:

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RB001005I	Base Engine Assembly, 6.0L	1

①

②

③

④

- ①
- ITEM NUMBER - This number corresponds with the number in the exploded view on the facing page.
-
- ②
- PART NUMBER - This is the designated part number for the particular component or assembly.
-
- ③
- DESCRIPTION - This identifies what the component or assembly is.
-
- ④
- QUANTITY - This refers to the number of pieces used.

=====

Symbols shown throughout parts list are defined here or on the bottom of the individual parts list page.

- AR
- = As Required
-
- OPT
- = Optional
-
- NSS
- = Not Serviced Separately
-
- NA
- = Not Available
-
- OS
- = Oversize
-
- US
- = Undersize
-
- NS
- = Not Shown
-
- TBD
- = To Be Determined
-
- NI
- = Not Illustrated

REPLACEMENT PARTS:**WARNING:**

Electrical, ignition and fuel system components on Crusader Engines are designed and manufactured to comply with U.S. Coast Guard rules and regulations to minimize risks of fire or explosion.

Use of replacement electrical, ignition and fuel system components which do not comply with these rules and regulations could result in a fire or explosion hazard and should be avoided.

MAINTENANCE ITEM PART NUMBERS:

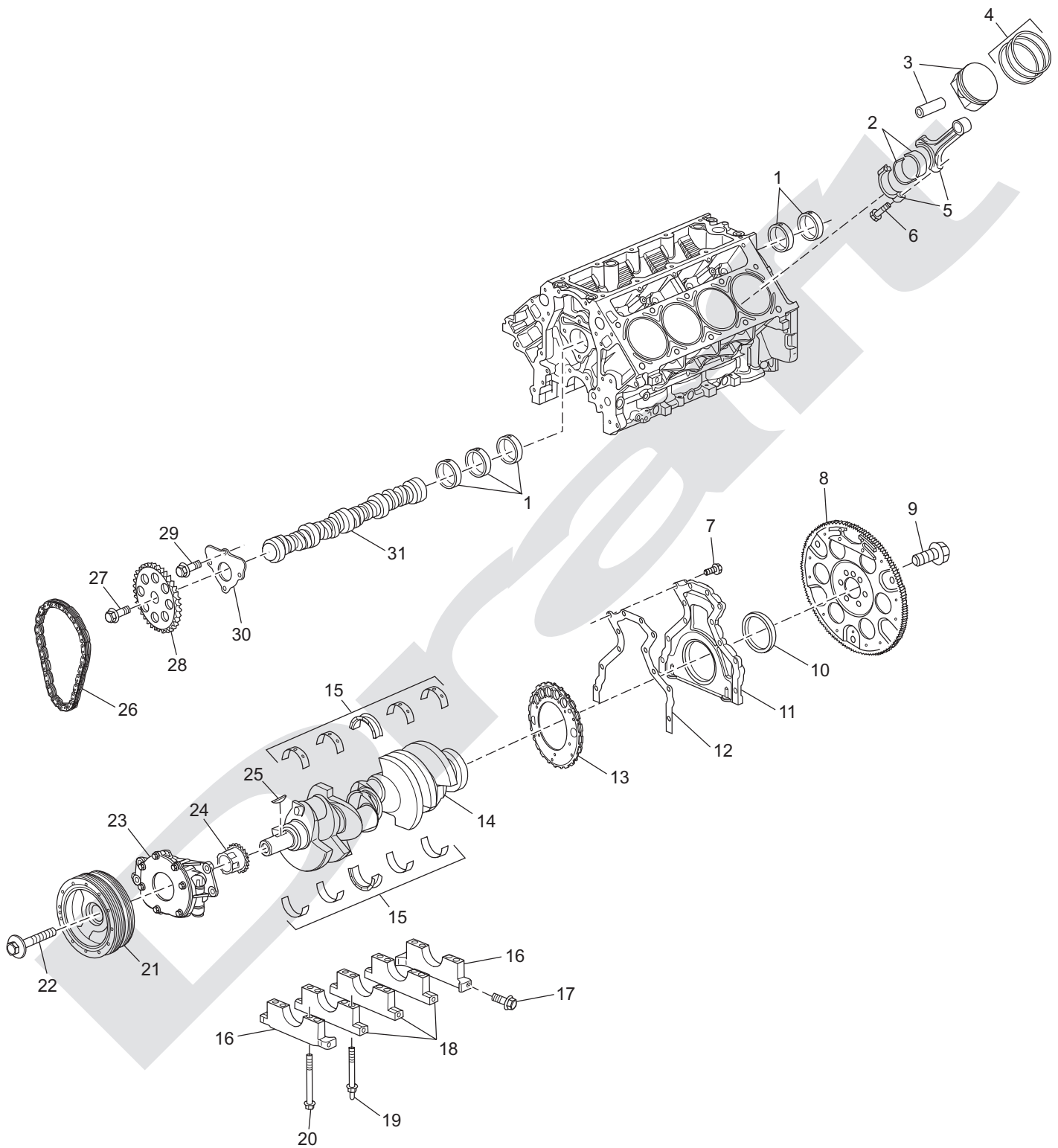
Description	Part Number
Oil Filter	22679
Fuel Filter (FCC)	RP080026
Spark Plugs	RP030011
Spark Plug Wire Set	RK120021
Serpentine Drive Belt	R066027
Raw Water Pump Impeller Kit	RP061022

MARINE TRANSMISSIONS:

Crusader Engines are equipped with Velvet Drive or Hurth Transmissions, standard or "V"-drive. If transmission parts are required, contact your dealer or closest Crusader Parts Distributor for required parts.

Parts manuals and overhaul manuals are available through Crusader Distributors.

CYLINDER BLOCK ASSEMBLY - FIGURE 1

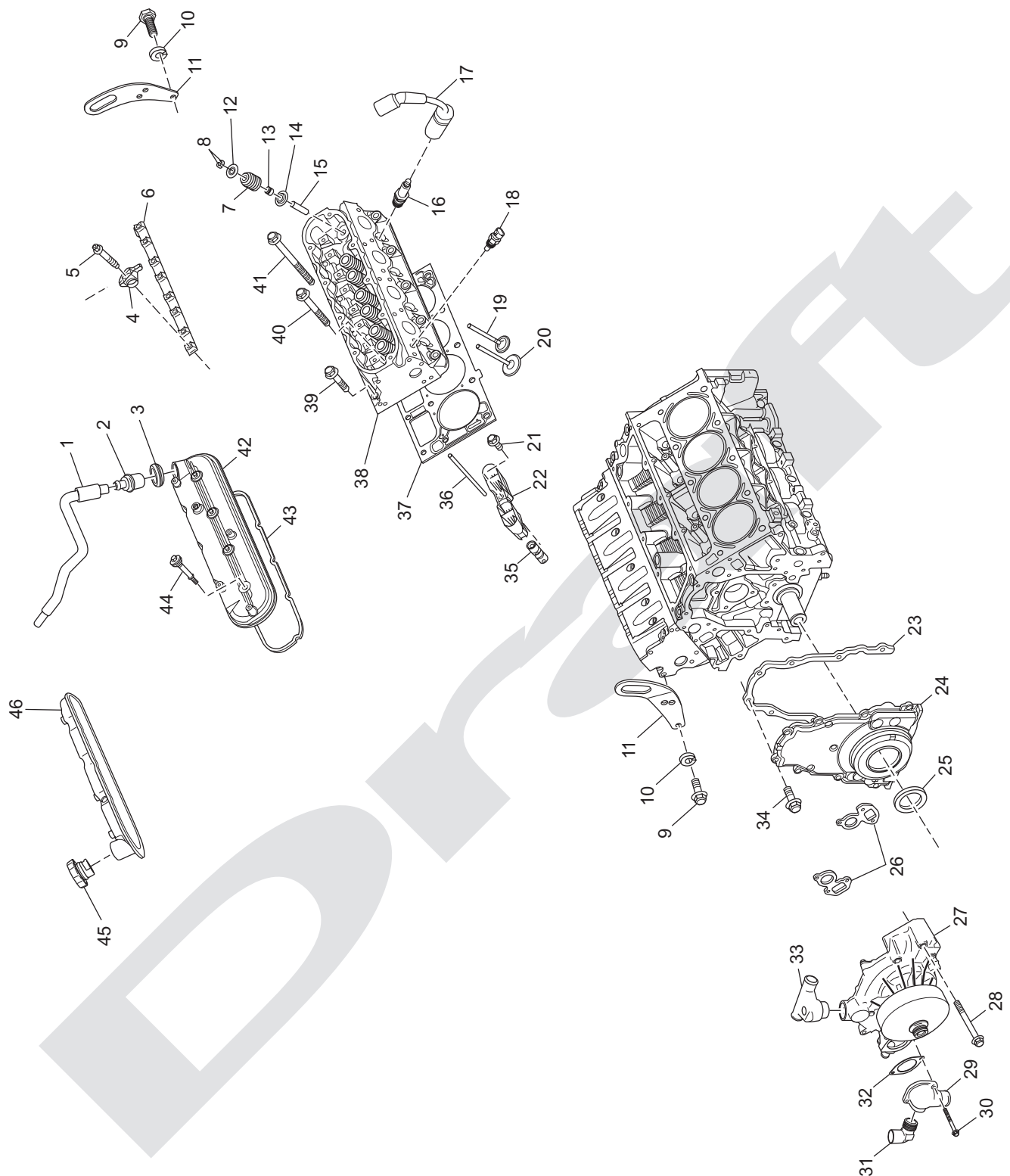


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CYLINDER BLOCK ASSEMBLY - FIGURE 1

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
*	RB001021	Base Engine Assembly	
1	TBD	Bearing Set , camshaft	1
2	TBD	Bearing Set , connecting rod (STD)	8
3	TBD	Piston , (STD)	8
4	TBD	Ring Set , piston (STD)	8
5	TBD	Connecting Rod (STD)	8
6	TBD	Bolt , connecting rod cap	16
7	TBD	Bolt , rear engine cover	12
8	TBD	Flywheel Assembly	1
9	TBD	Bolt , flywheel attaching	6
10	R047236	Seal , crankshaft rear oil	1
11	TBD	Cover , rear engine	1
12	TBD	Gasket , rear engine cover	1
13	part of item #14	Reluctor Ring , crankshaft	1
14	TBD	Crankshaft Assembly	1
15	TBD	Bearing Set , crankshaft	1
16	TBD	Cap , crankshaft bearing #1 and #5	2
17	TBD	Bolt , crankshaft bearing cap side	10
18	TBD	Cap , crankshaft bearing #2 - #4	3
19	TBD	Stud , crankshaft bearing cap attaching	
20	TBD	Bolt , crankshaft bearing cap attaching	
21	R064016	Balancer , crankshaft	1
22	TBD	Bolt , crankshaft balancer	1
23	TBD	Oil Pump Assembly	1
24	TBD	Drive , oil pump	1
25	TBD	Woodruf Key , crankshaft	1
26	TBD	Chain , timing	1
27	TBD	Bolt , camshaft sprocket attaching	1
28	TBD	Sprocket , camshaft	1
29	TBD	Bolt , camshaft retainer attaching	3
30	TBD	Retainer , camshaft	1
31	TBD	Camshaft	1

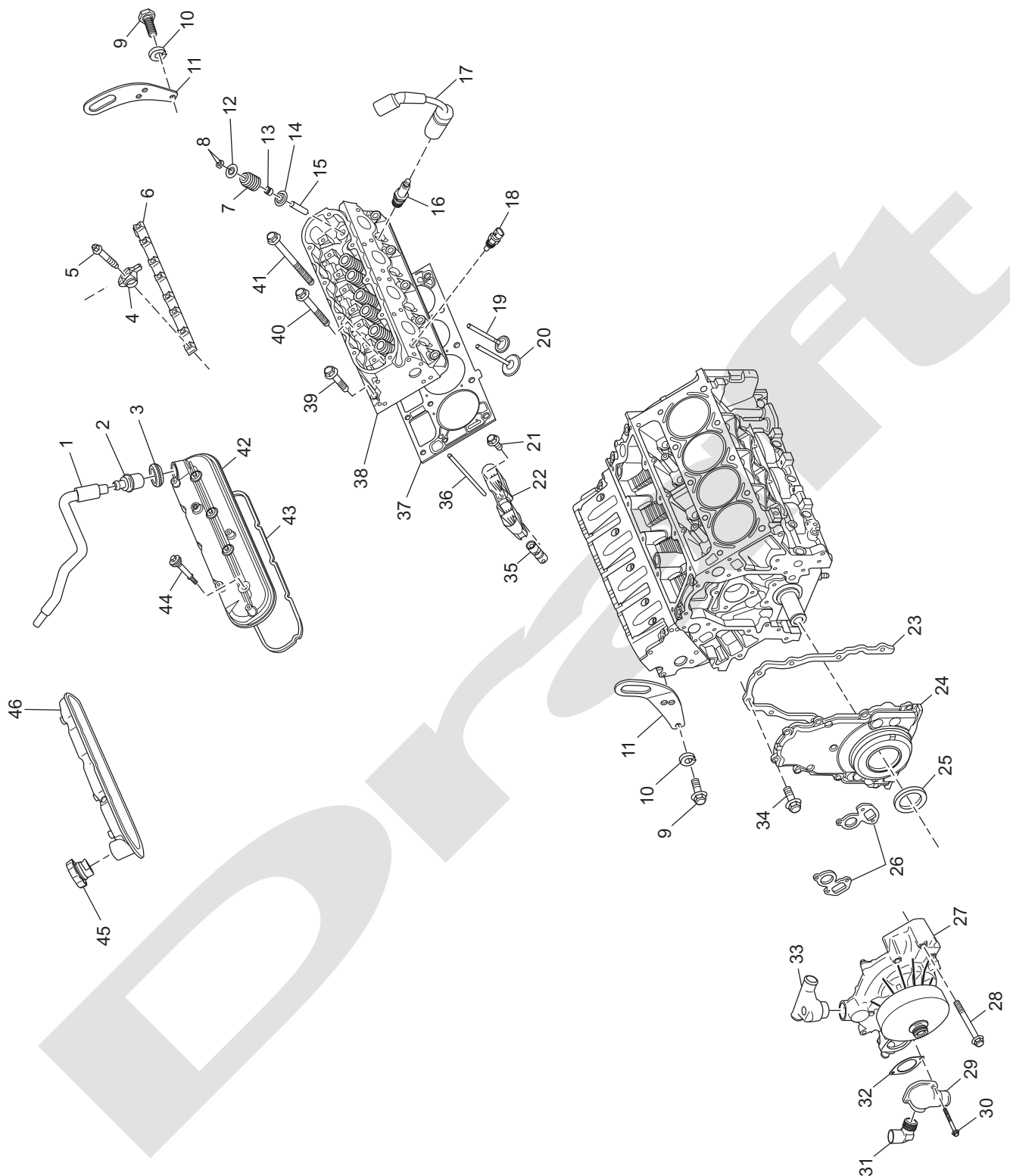
CYLINDER HEAD ASSEMBLY / FRONT COVER - FIGURE 2



CYLINDER HEAD ASSEMBLY / FRONT COVER - FIGURE 2

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	TBD	Hose , PCV valve	1
2	TBD	Valve , positive crankcase ventilation (PCV)	1
3	TBD	Grommet , PCV valve	1
4	TBD	Rocker Arm , valve	16
5	TBD	Bolt , valve rocker arm attaching	16
6	TBD	Guide , valve rocker arm	2
7	TBD	Valve Spring Assembly	16
8	TBD	Retainer , valve stem	32
9	98443025	Bolt , lifting eye attaching	4
10	93940000	Lockwasher , lifting eye attaching bolt	4
11	R042012	Lifting Eye	2
12	TBD	Cap , valve spring	16
13	TBD	Seal , valve stem	16
14	TBD	Rotator , valve	32
15	TBD	Guide , valve stem	16
16	RP030011	Spark Plug	8
17	RK120021	Spark Plug Wire Set	1
18	R020046	Engine Coolant Temperature (ECT) Sensor	1
19	TBD	Valve , exhaust (STD)	8
20	TBD	Valve , intake (STD)	8
21	TBD	Bolt , valve lifter retainer attaching	8
22	TBD	Retainer , valve lifter	8
23	RM0280	Gasket , front engine cover	1
24	TBD	Cover , front engine	1
25	R047237	Seal , front engine cover oil	1
26	RM0281	Gasket , water circulating pump	2
27	RA057033	Water Circulation Pump Assembly	1
28	TBD	Bolt , water circulating pump attaching	6
29	R025036	Housing , thermostat	1
30	TBD	Bolt , thermostat housing attaching	2
31	727003	Fitting , 90 degree	1
32	RM0275	Gasket , thermostat housing	2
33	R025035	Waterneck , tee, F/W outlet	1
34	TBD	Bolt , front engine cover attaching	8

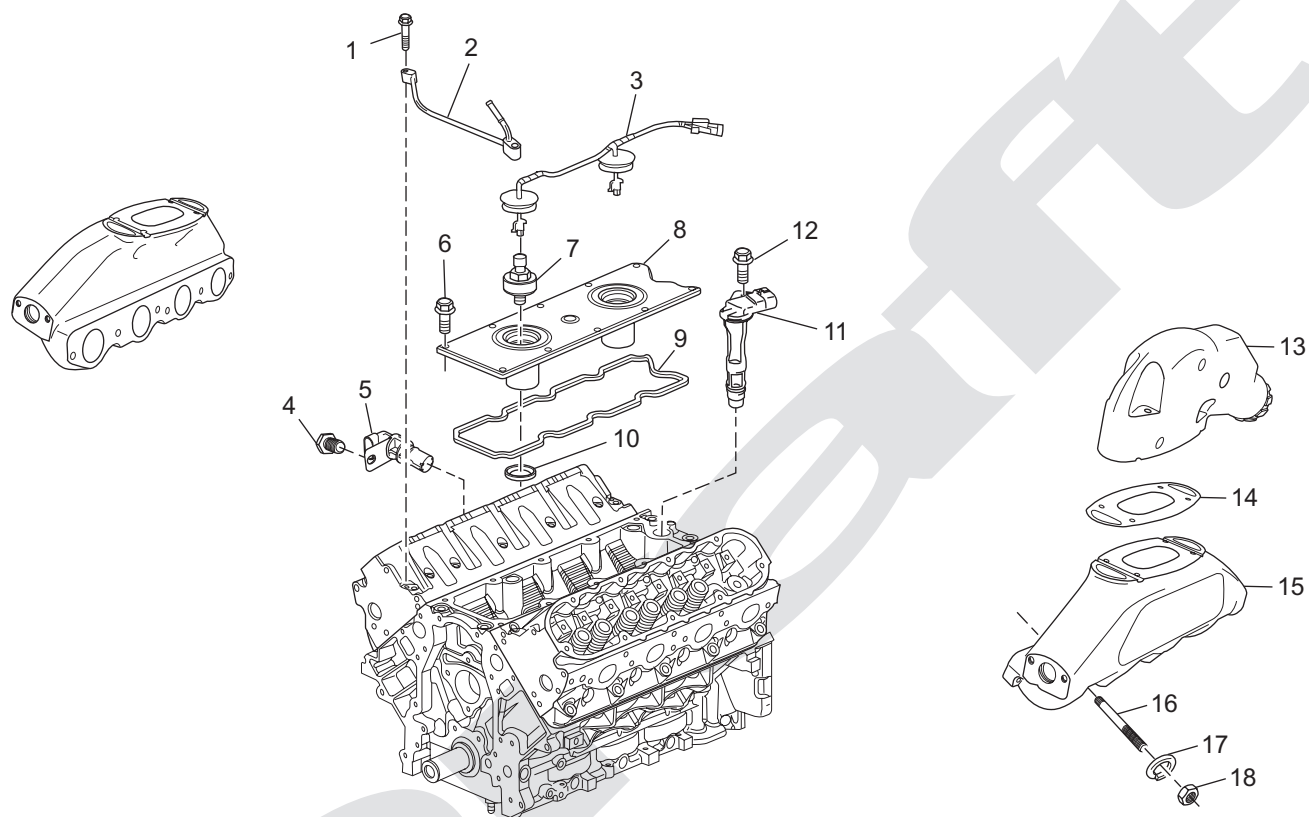
CYLINDER HEAD ASSEMBLY / FRONT COVER - FIGURE 2 (cont'd)



CYLINDER HEAD ASSEMBLY / FRONT COVER - FIGURE 2 (cont'd)

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
35	TBD	Lifter , valve	16
36	TBD	Push Rod	16
37	RM0278	Gasket , Cylinder Head (LH)	1
NI	RM0278	Gasket , Cylinder Head (RH)	1
38	R003016	Cylinder Head	2
39	TBD	Bolt , cylinder head (short)	16
40	TBD	Bolt , cylinder head (medium)	4
41	TBD	Bolt , cylinder head (long)	14
42	TBD	Cover , rocker (LH)	1
43	TBD	Gasket , rocker cover	2
44	TBD	Bolt , rocker cover attaching	8
45	R034038B	Cap , oil fill tube	1
46	TBD	Cover , rocker (RH)	1

EXHAUST MANIFOLD / KNOCK SENSORS - FIGURE 3

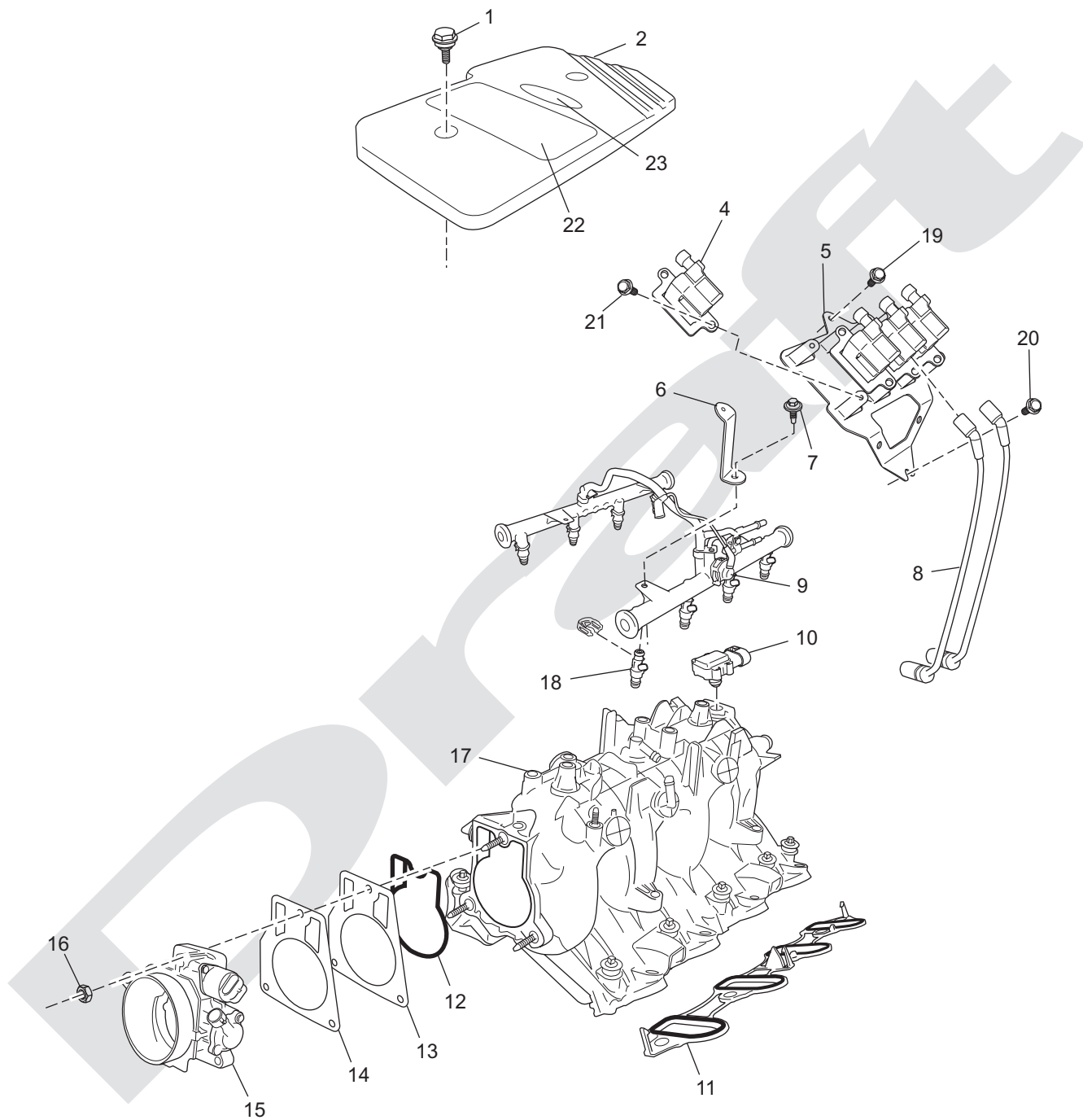


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EXHAUST MANIFOLD / KNOCK SENSORS - FIGURE 3

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	TBD	Bolt , coolant air bleed pipe attaching	2
2	TBD	Pipe , coolant air bleed	1
3	TBD	Harness , knock sensor	1
4	TBD	Bolt , crankshaft position attaching	1
5	R020044	Sensor , crankshaft position	1
6	TBD	Bolt , valley cover attaching	10
7	R020043	Sensor , knock	2
8	TBD	Cover , valley	1
9	TBD	Gasket , valley cover	1
10	TBD	Seal , knock sensor oil	2
11	R020045	Sensor , camshaft position	1
12	TBD	Bolt , camshaft position attaching	1
13	R029016	Elbow , exhaust	2
14	RM0274	Gasket , exhaust elbow to manifold	2
15	R028023	Manifold , exhaust	2
16	R031035	Stud , exhaust manifold attaching	12
17	93930000	Lockwasher , exhaust manifold stud attaching	12
18	97330000	Nut , exhaust manifold stud attaching	12

INTAKE MANIFOLD COMPONENTS - FIGURE 4

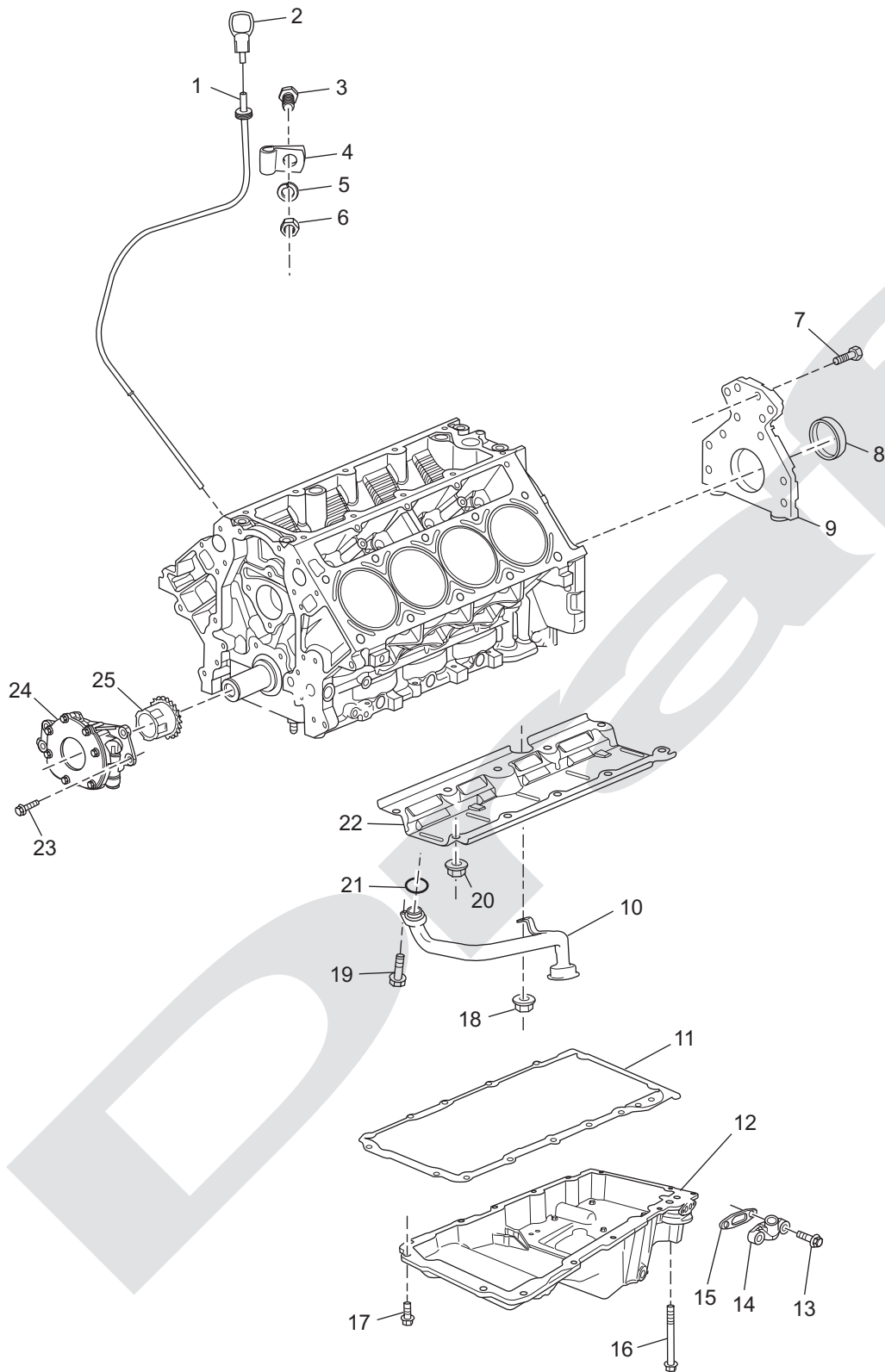


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INTAKE MANIFOLD COMPONENTS - FIGURE 4

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R009204	Knob , cover retention	1
2	R060064	Cover , engine	1
4	R117013	Coil , ignition	8
5	R090273	Bracket , ignition coil mounting	2
6	R090268	Bracket , coil support	2
7	TBD	Bolt , fuel rail attaching	4
8	RK120021A	Spark Plug Wire Set	1
9	R088003	Regulator , fuel pressure (returnless type fuel system Only)	1
10	R020036	Sensor , manifold absolute pressure (MAP)	1
11	TBD	Intake Manifold Gasket Set	1
12	TBD	Seal , throttle body	1
13	R062087	Plate , throttle body adapter	1
14	RM0251	Gasket , throttle body	1
15	RA035036	Throttle Body Assembly	1
16	TBD	Nut , throttle body attaching	3
17	R002025	Intake Manifold	1
18	RA087008	Fuel Injector Assembly	8
19	RS5126	Bolt , coil bracket attaching, top	2
20	98223015	Bolt , coil bracket attaching, bottom	2
NI	93920000	Lockwasher , coil bracket attaching, bottom	2
21	91107075	Screw , ignition coil attaching	16
22	TBD	Decal , cover, "Capatain's Choice"	1
23	R143164	Decal , cover, oval, "6.0L MPI"	1

OIL PAN and OIL PUMP ASSEMBLY - FIGURE 5

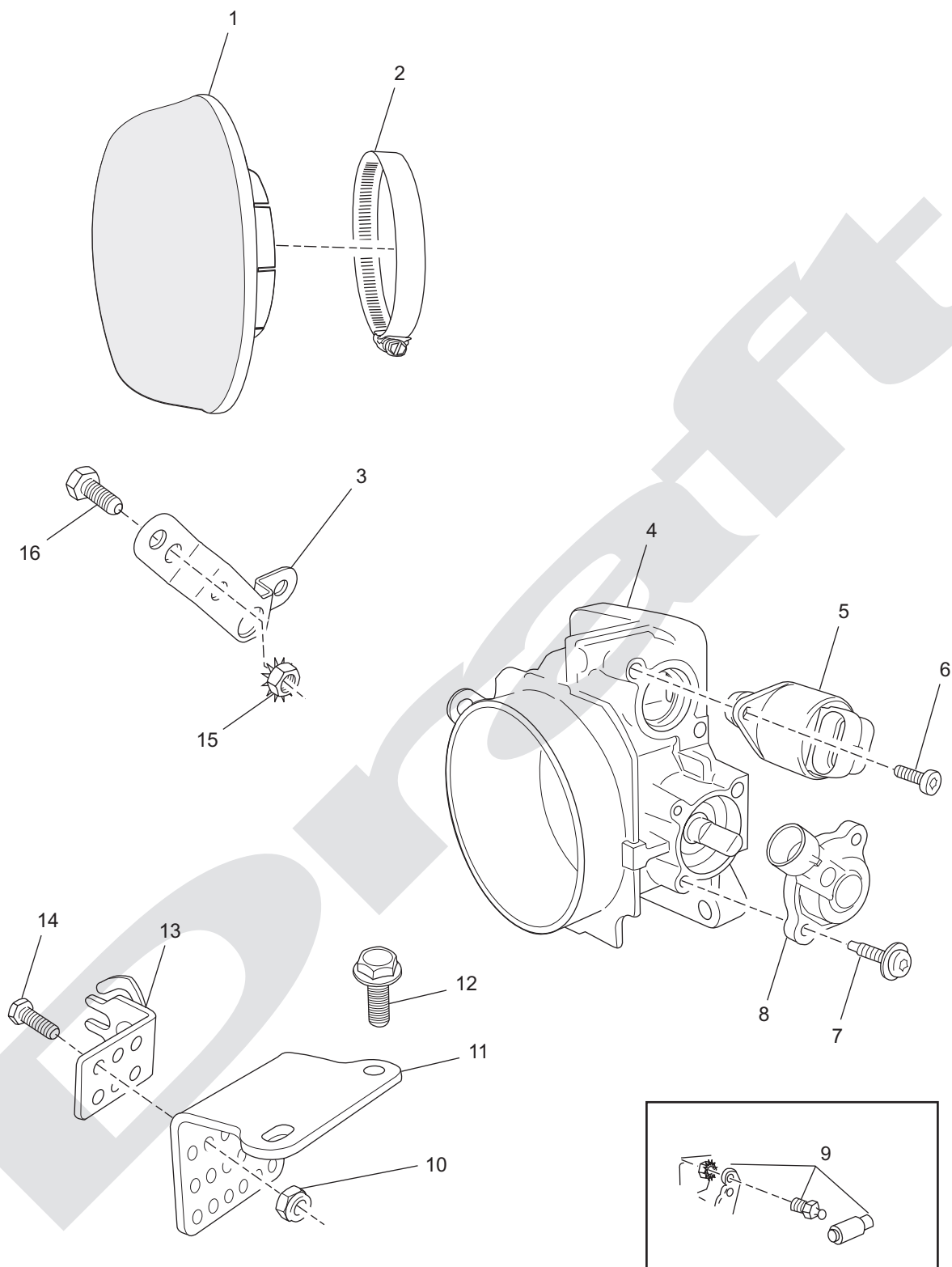


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OIL PAN and OIL PUMP ASSEMBLY - FIGURE 5

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R041079	Tube , oil dipstick	1
2	R041080	Dipstick , oil level (0 to 4 degree)	AR
2	R041081	Dipstick , oil level (12 degree)	AR
3	RS0302	Bolt , oil dipstick tube attaching	1
4	R127015	Clamp , oil dipstick tube attaching	1
5	RS2180	Lockwasher , oil dipstick tube attaching	1
6	RS1028	Nut , oil dipstick tube attaching	1
7	TBD	Bolt , engine rear cover attaching	1
8	R047236	Seal , engine rear cover oil	1
9	TBD	Cover , engine rear	1
10	R074030	Tube , oil pickup	1
11	RM0279	Gasket , oil pan	1
12	R005025	Oil Pan	1
13	TBD	Bolt , oil sending unit adapter attaching	2
14	TBD	Adapter , oil sending unit	1
15	TBD	Gasket , oil sending unit adapter	1
16	TBD	Bolt , oil pan attaching (long)	2
17	TBD	Bolt , oil pan attaching (short)	12
18	TBD	Nut , oil pickup tube attaching	1
19	TBD	Bolt , oil pickup tube attaching	1
20	TBD	Nut , windage tray attaching	10
21	TBD	O-ring , oil pickup tube	1
22	R012027	Tray , windage	1
23	TBD	Bolt , oil pump attaching	4
24	TBD	Oil Pump Assembly	1
25	TBD	Drive , oil pump	1

THROTTLE BODY and RELATED COMPONENTS - FIGURE 6

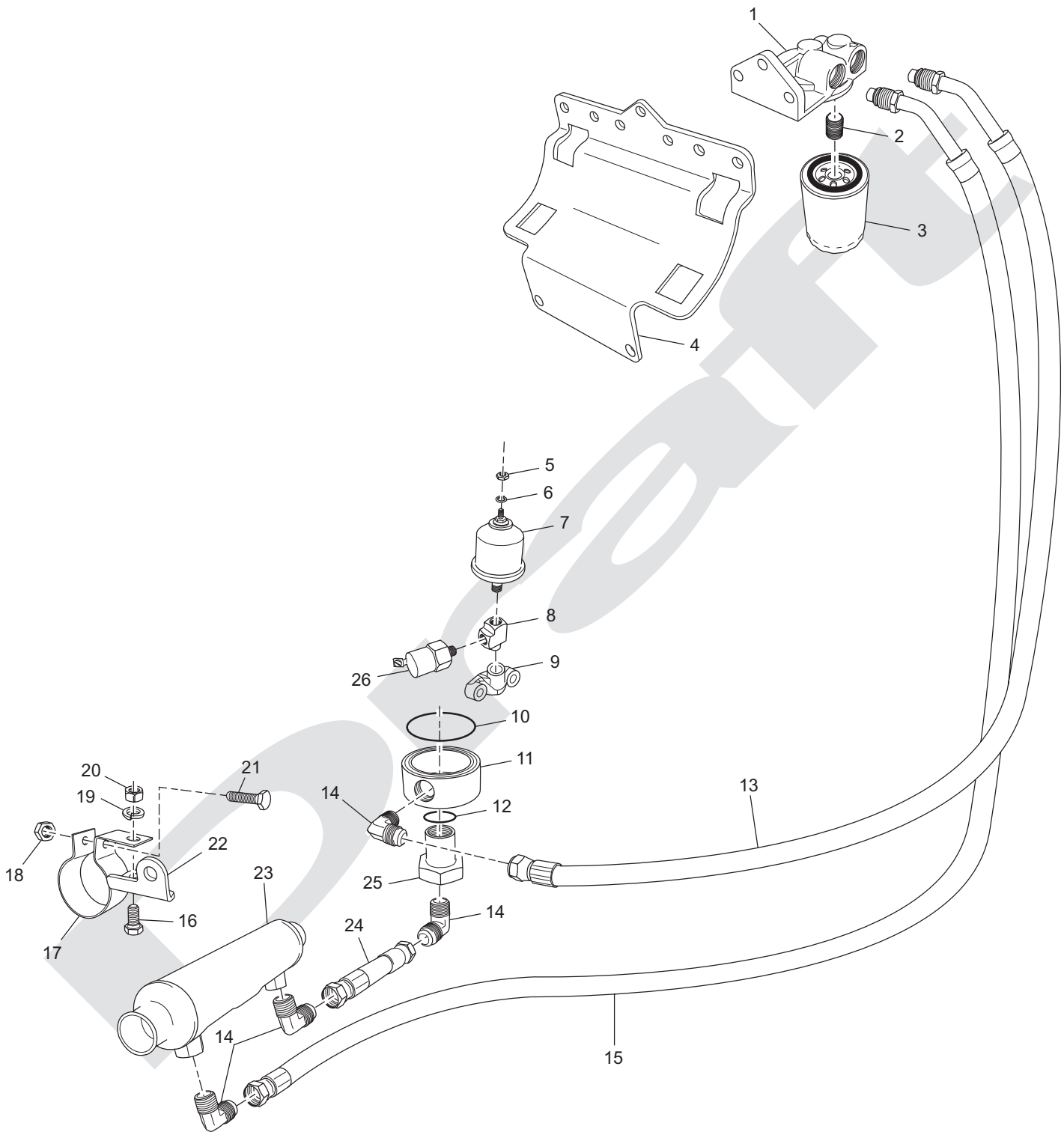


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THROTTLE BODY and RELATED COMPONENTS - FIGURE 6

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R145026	Arrestor , flame	1
2	RS3857	Clamp , flame arrestor	1
3	R081008	Throttle Arm , throttle body	1
4	RA035036B	Throttle Body Assembly	1
5	R084003	Valve , idle air control	1
6	TBD	Screw , IAC valve attaching	2
7	TBD	Screw , TP sensor attaching	2
8	R020041	Sensor , throttle position	1
9	R178003	Ball Joint Assembly , cable attaching	1
10	RS2055	Locking Nut , cable clip mounting bolt	2
11	R090267	Throttle Bracket , intake	1
12	98223015	Bolt , throttle cable bracket attaching	2
NI	93920000	Washer , lock, throttle cable bracket	2
13	R090086	Cable Clip , throttle attaching	1
14	RS5122	Bolt , cable clip mounting	2
15	RS1078	Nut , throttle arm attaching	2
16	RS0251	Bolt , throttle arm attaching	2

REMOTE OIL FILTER COMPONENTS (STANDARD DRIVE) - FIGURE 7

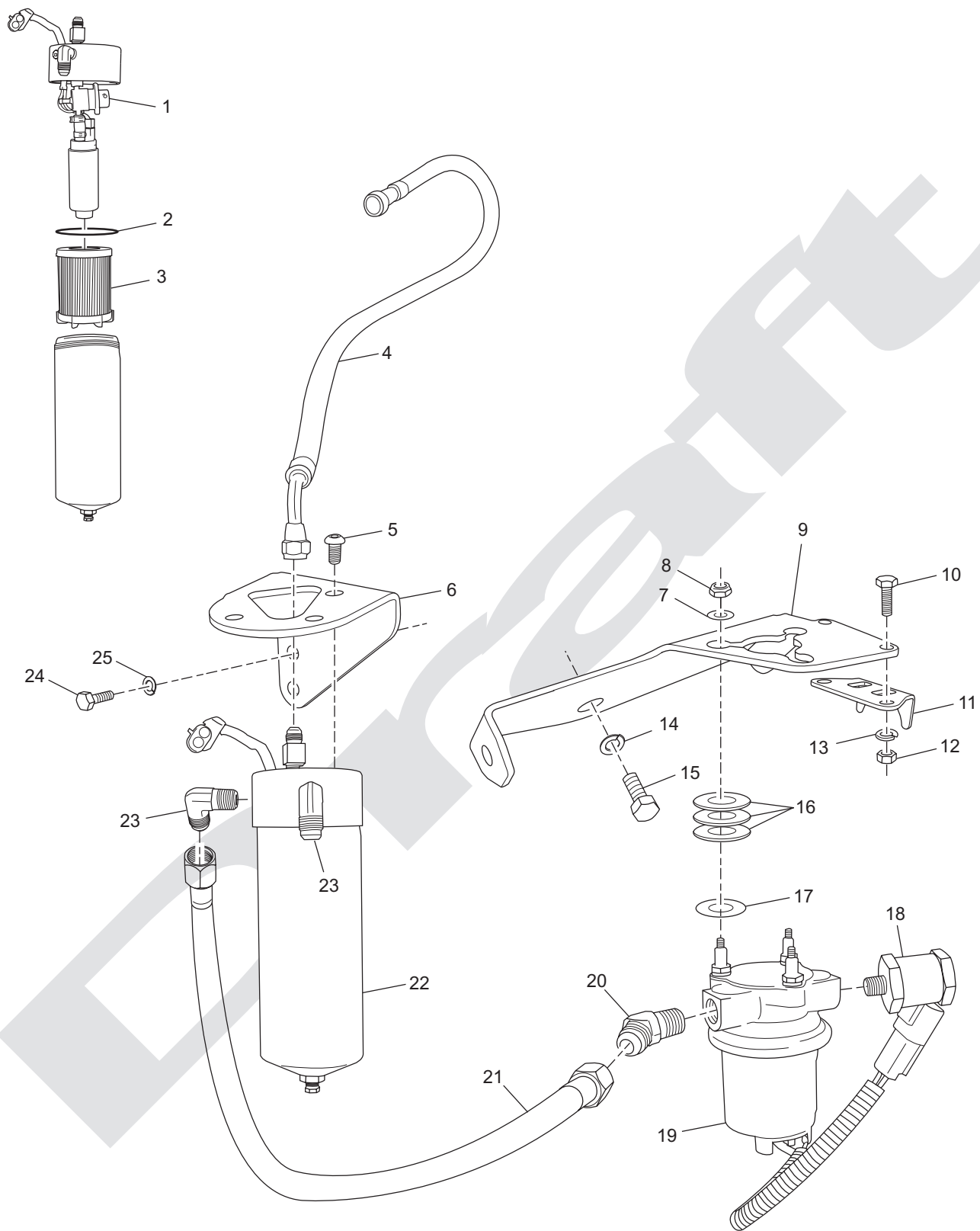


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REMOTE OIL FILTER COMPONENTS (STANDARD DRIVE) - FIGURE 7

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
NI	99333020	Bolt , oil filter header mounting	3
NI	93930000	Lockwasher , oil filter header mounting	3
1	R079066	Oil Filter Header	1
2	R024203	Nipple , header filter adapter	1
3	22679	Filter , oil	1
4	R090258	Bracket , heat exchanger	1
5	95011000	Nut , sender terminal	1
6	95300300	Lockwasher , sender terminal	1
7	R020001	Sender , oil pressure	1
8	R024145	Tee , sender attaching	1
9	TBD	Adapter , oil sending unit	1
10	R047240	O-ring , oil bypass adapter	1
11	R079067	Adapter , oil bypass	1
12	R047202	O-ring , oil bypass adapter attaching fitting	1
13	RA045155	Line , oil, adapter to remote oil filter	1
14	R024184	Fitting , 90 degree	4
15	RA045155A	Line , oil, oil cooler to remote oil filter	1
16	RS0302	Bolt , oil cooler strap attaching	1
17	R090010	Strap , oil cooler	1
18	RS2058	Nut , oil cooler strap	1
19	RS2180	Washer , lock, oil cooler strap attaching	1
20	95300000	Nut , oil cooler strap attaching	1
21	RS0256	Bolt , oil cooler strap	1
22	R090013A	Bracket , oil cooler	1
23	R147049	Cooler , oil	1
24	RA045103D	Line , oil, oil cooler to adapter	1
25	R079068	Nut , oil bypass adapter attaching	1
26	R020015A	Switch , oil pressure	1

FUEL CONTROL CELL (FCC) COMPONENTS (STANDARD DRIVE) - FIGURE 8

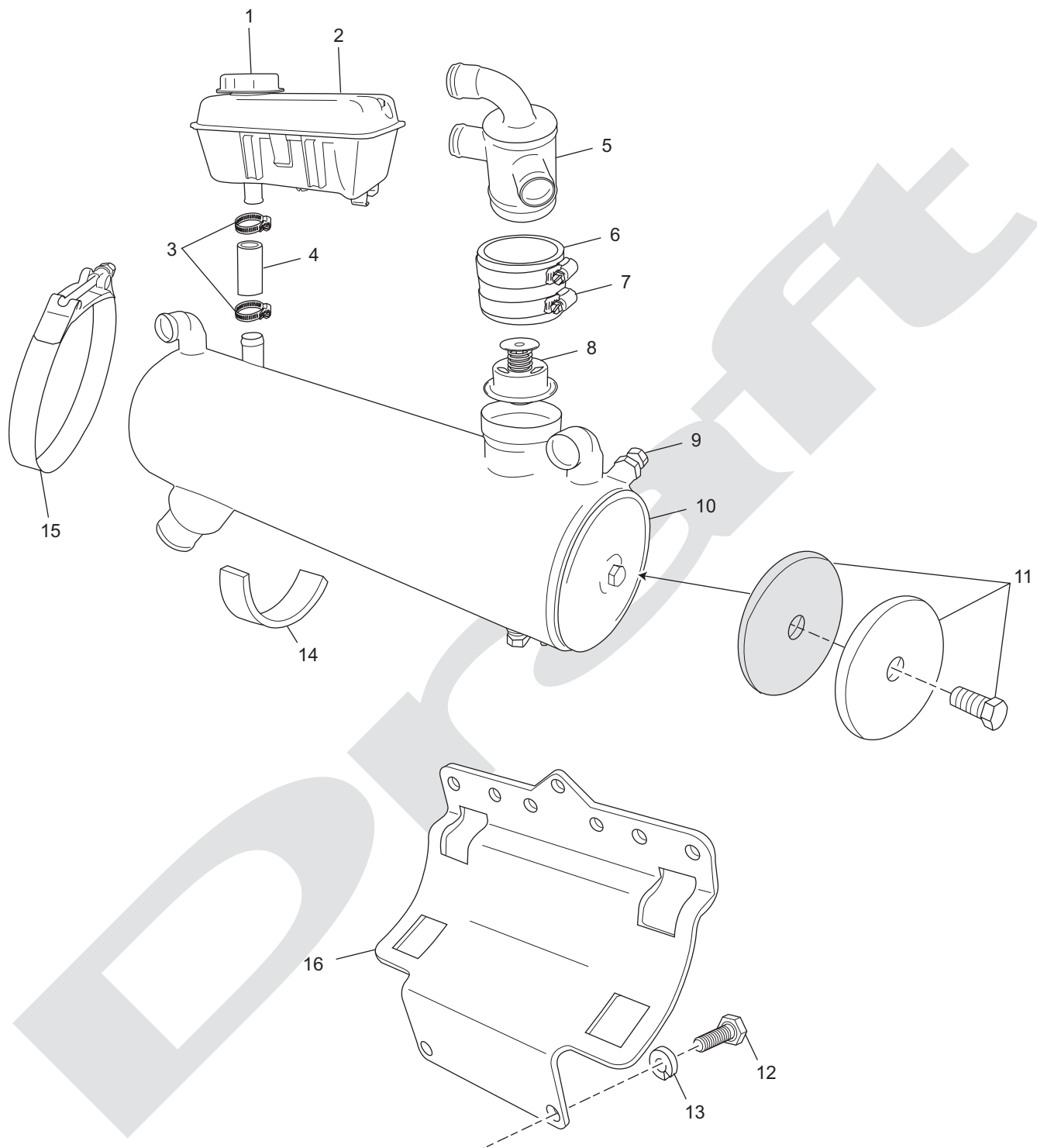


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FUEL CONTROL CELL (FCC) COMPONENTS (STANDARD DRIVE) - FIGURE 8

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R088004	Regulator , fuel pressure	1
2	part of item #3	O-ring , FCC sealing	1
3	RP080026	Filter , FCC fuel	1
4	RA085090C	Hose Assembly , FCC to fuel rail (inlet)	1
5	90384075	Bolt , FCC attaching	3
6	R090276	Bracket , FCC mounting	1
7	R096142	Washer , flat, mounting, upper	3
8	RS1521L	Locking Nut , low-pressure fuel pump	3
9	R090286	Bracket , low-pressure fuel pump mounting	1
10	RS0251	Bolt , pre-filter bracket attaching	2
11	R090272	Bracket , pre-filter mounting	1
NI	RS3858	Clamp , pre-filter 1 1/4"	1
12	RS1078	Nut , pre-filter bracket attaching	2
13	93940000	Lockwasher , pre-filter bracket attaching	2
14	93930000	Lockwasher , L.P. fuel pump bracket attaching	2
15	99333020	Bolt , L.P. fuel pump bracket attaching	2
16	R094035A	Grommet , isolator	3
17	R096141	Washer , fuel pump mounting, lower	3
18	R077012	Pre-filter , fuel	1
19	RA080018	Fuel Pump , low-pressure	1
20	R024197	Fitting , 45 degree	1
21	RA085071	Hose Assembly , low-pressure pump to FCC	1
22	RA080030	Fuel Control Cell Assembly	1
23	R024163	Fitting , 90 degree	2
24	98443025	Bolt , FCC mounting bracket	2
25	RS7070	Lockwasher , FCC mounting bracket	2

HEAT EXCHANGER and COMPONENTS - FIGURE 9

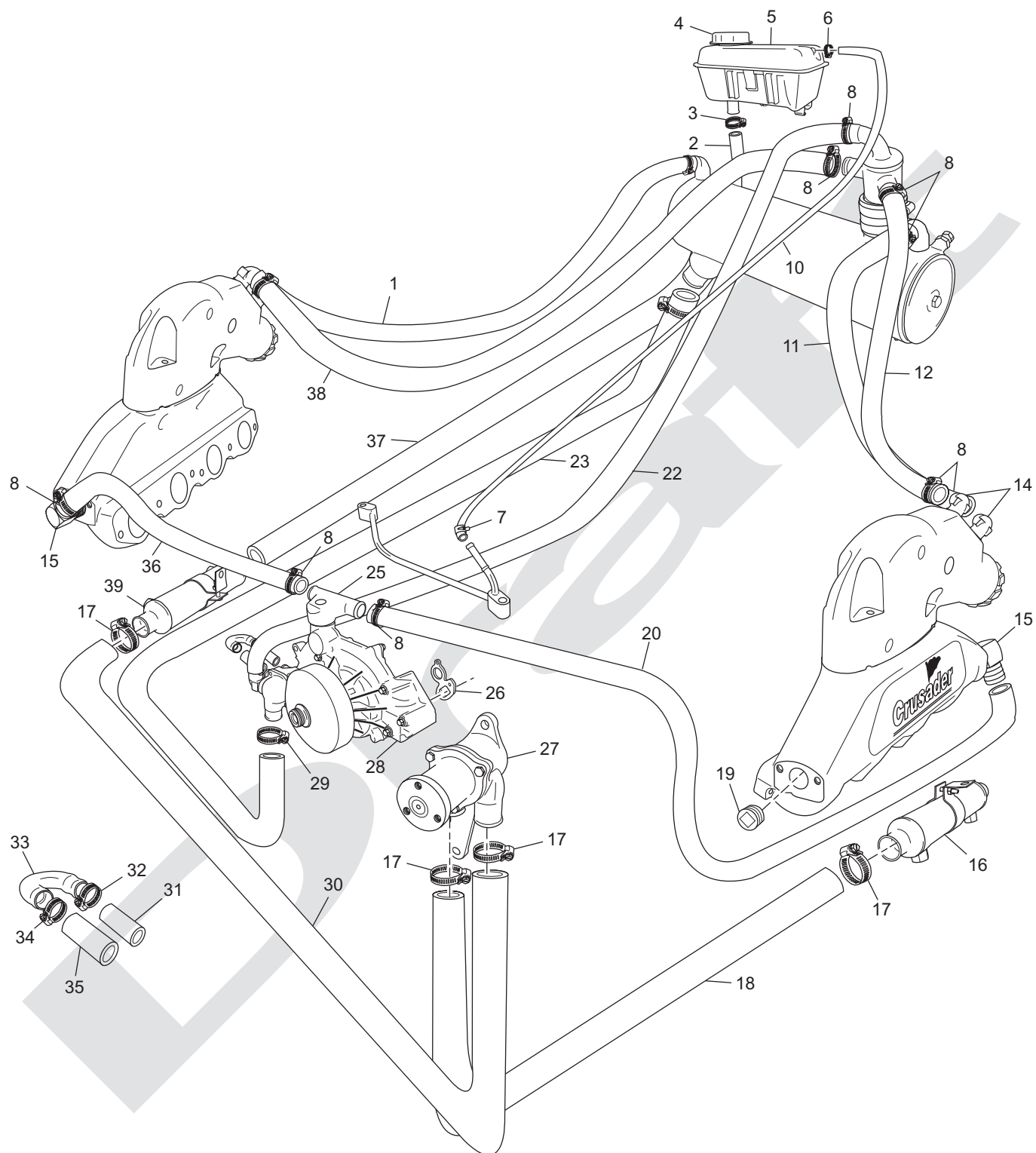


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HEAT EXCHANGER and COMPONENTS - FIGURE 9

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R034045	Cap , degas bottle	1
2	R146001	Bottle , degas	1
3	RS3854	Clamp , hose	2
4	R045153	Hose , degas bottle to heat exchanger	1
5	R025038	Housing , tstat, heat exchanger	1
6	98204	Hose , tstat housing	1
7	RS3860	Clamp , tstat housing	2
8	98203	Thermostat , 170° F	1
NI	RS1078	Nut , ground wire stud	1
NI	R101013	Wire , grounding	1
9	TBD	Anode , sacrificial zinc	AR
10	RA147048	Heat Exchanger Assembly	1
11	R034034	End Cap Kit , exchanger	AR
12	RS0304	Bolt , heat exchanger bracket attaching	2
13	RS2180	Lockwasher , h.e. bracket attaching	2
14	R094040	Isolator , rubber, adhesive	1
14	R094041	Isolator , rubber	2
15	R171009	Clamp , exchanger mounting	2
16	R090258	Bracket , heat exchanger	1
NI	TBD	Bracket , degas bottle	1
NI	RS6529	Bolt , degas bottle bracket attaching	2
NI	93930000	Lockwasher , degas bottle brkt. attaching	2

FRESH WATER COOLING SYSTEM COMPONENTS - FIGURE 10

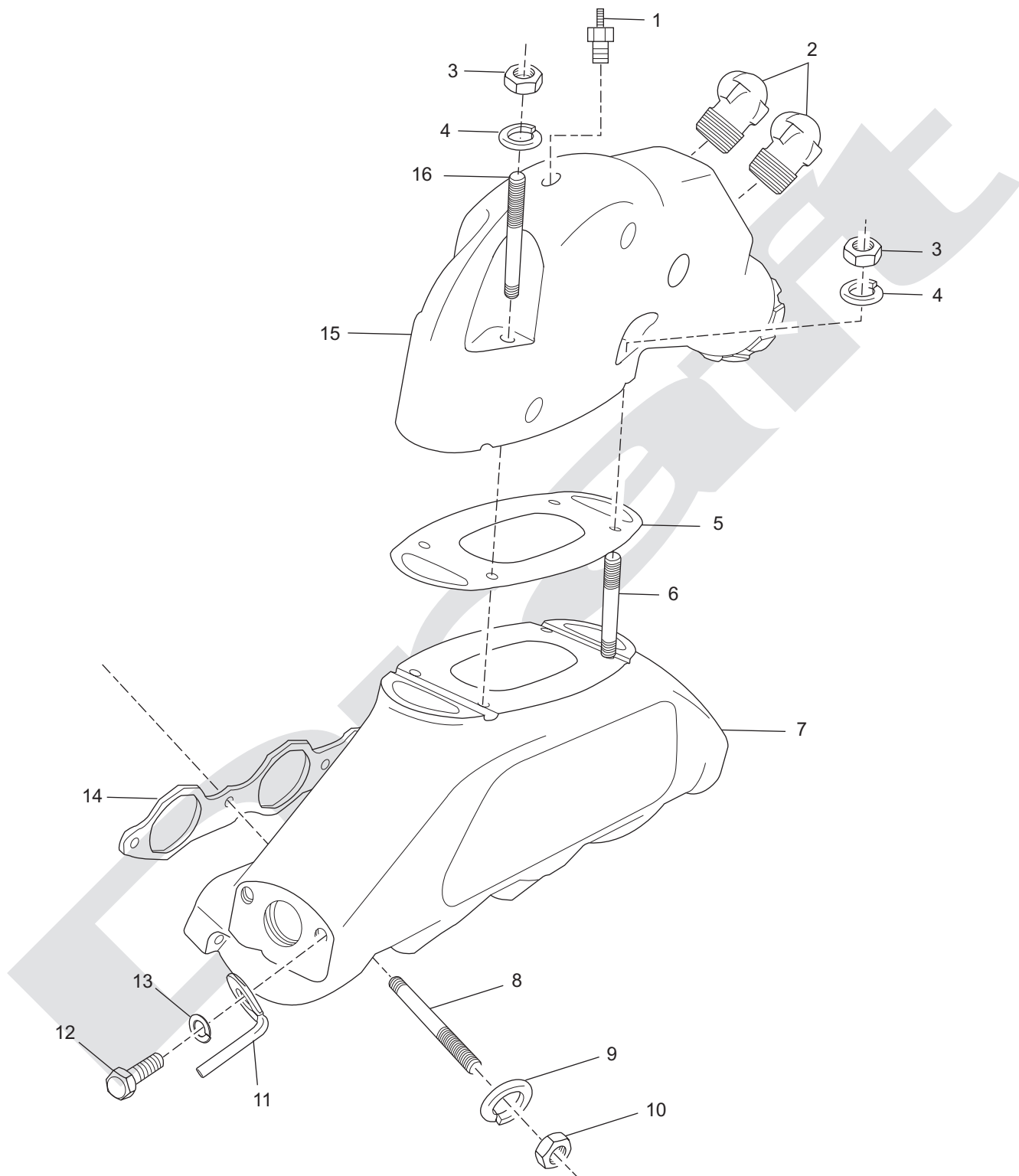


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FRESH WATER COOLING SYSTEM COMPONENTS - FIGURE 10

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R045107	Hose , exchanger to exhaust manifold (Starboard STD)	AR
2	R045153	Hose , degas bottle to heat exchanger	1
3	RS3854	Clamp , hose, 3/4"	2
4	R034045	Cap , degas bottle	1
5	R146001	Bottle , degas	1
6	R127087	Clamp , hose (5/8" - degas bottle)	1
7	RS3870	Clamp , hose, vent (1/4")	1
8	RS3851	Clamp , hose (1")	14
10	R045132	Hose , vent to degas bottle	1
11	R045107	Hose , exchanger to exhaust manifold (Port STD)	AR
12	R045107	Hose , F/W, elbow to tstat, port 1"	AR
14	727003	Fitting , 90 degree, bronze	4
15	R024006A	Fitting , 90 degree, bronze	2
16	R147049	Cooler , oil	1
17	RS3858	Clamp , hose (1 1/4")	6
18	18401	Hose , R/W, oil cooler to r/w pump 1 1/4" formed	1
19	113186	Plug , manifold	2
20	R045156	Hose , F/W inlet to exhaust manifold, (Port), 1" formed	1
21	TBD	Tube , coolant air bleed	1
22	R045107	Hose , bypass, tstat to circulating pump 1"	AR
23	R045148	Hose , circulating pump to heat exchanger	1
25	R025035	Waterneck , tee, F/W outlet	1
26	RM0281	Gasket , water pump to engine block	2
27	RA057032	Raw Water Pump	1
28	RA057033	Water Pump Assembly	1
29	RS3868	Clamp , hose (1 1/2")	2
30	R045147	Hose , R/W pump to transmission cooler 1 1/4" formed	1
31	R045086	Hose , U-tube, bypass (5/8")	AR
32	R127087F	Clamp , U-tube, 5/8" hose (1" oetiker)	2
33	R024210	U-tube , heater bypass	1
34	R127087G	Clamp , U-tube, 3/4" hose (1 1/16" oetiker)	2
35	R045153	Hose , U-tube, bypass (3/4")	AR
36	R045107	Hose , F/W inlet to exhaust manifold (STBD) 1"	1
37	R045147	Hose , R/W, transmission cooler to H.E. 1 1/4" formed	1
38	R045107	Hose , F/W, elbow to tstat, stbd 1"	AR
39	R147005	Cooler , transmission oil	1

EXHAUST MANIFOLD and COMPONENTS - FIGURE 11

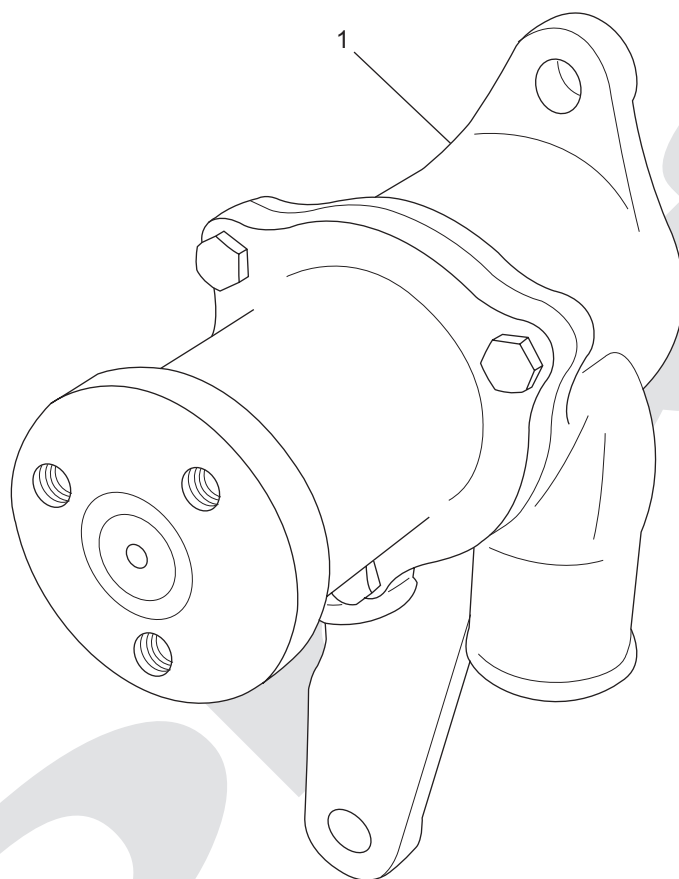


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7-2-03

EXHAUST MANIFOLD and COMPONENTS - FIGURE 11

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	TBD	Switch , exhaust temperature	2
2	727003	Fitting , 90 degree, bronze	4
3	95310000	Nut , exhaust elbow attaching	8
4	93300000	Lockwasher , exhaust elbow attaching	8
5	RM0274	Gasket , manifold to exhaust elbow	2
6	R031036	Stud , exhaust elbow attaching (short)	4
7	R028023	Exhaust Manifold Assembly	2
8	R031035	Stud , manifold to cylinder head attaching	12
9	93930000	Lockwasher , manifold to cylinder head attaching	12
10	97330000	Nut , manifold to cylinder head attaching	12
11	R096144	Retainer , spark plug wire clip	2
12	RS0280	Bolt , retainer attaching	2
13	RS2179	Lockwasher , retainer attaching	2
14	RM0276	Gasket , manifold to cylinder head	2
15	R029016A	Exhaust Elbow Assembly	2
16	R031037	Stud , exhaust elbow attaching (long)	4
NI	922200020	Washer , retainer attaching	2
NI	R127090	Clip , spark plug wires	2
NI	RS3557	Fitting , plug, manifold drain	2
<p>*NOTE: See Fresh Water Cooling section for parts used on Fresh Water Cooled engines.</p>			

RAW WATER COOLING PUMP - FIGURE 12



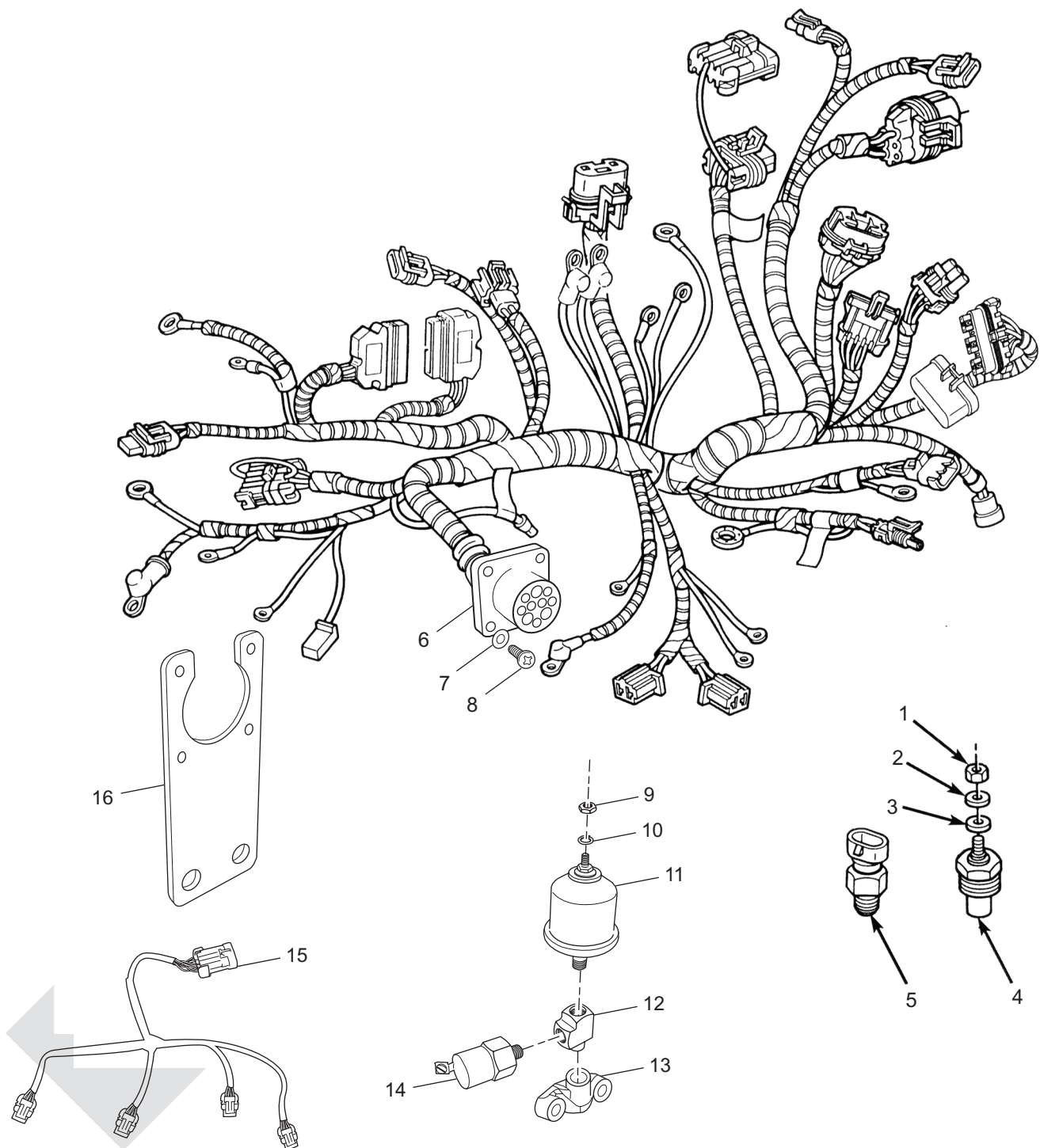
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RAW WATER COOLING PUMP - FIGURE 12

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RA057032	Raw Water Pump Assembly	1
NS	RP061022	Kit, impeller	1



WIRING HARNESS ASSEMBLIES and SENDERS - FIGURE 13

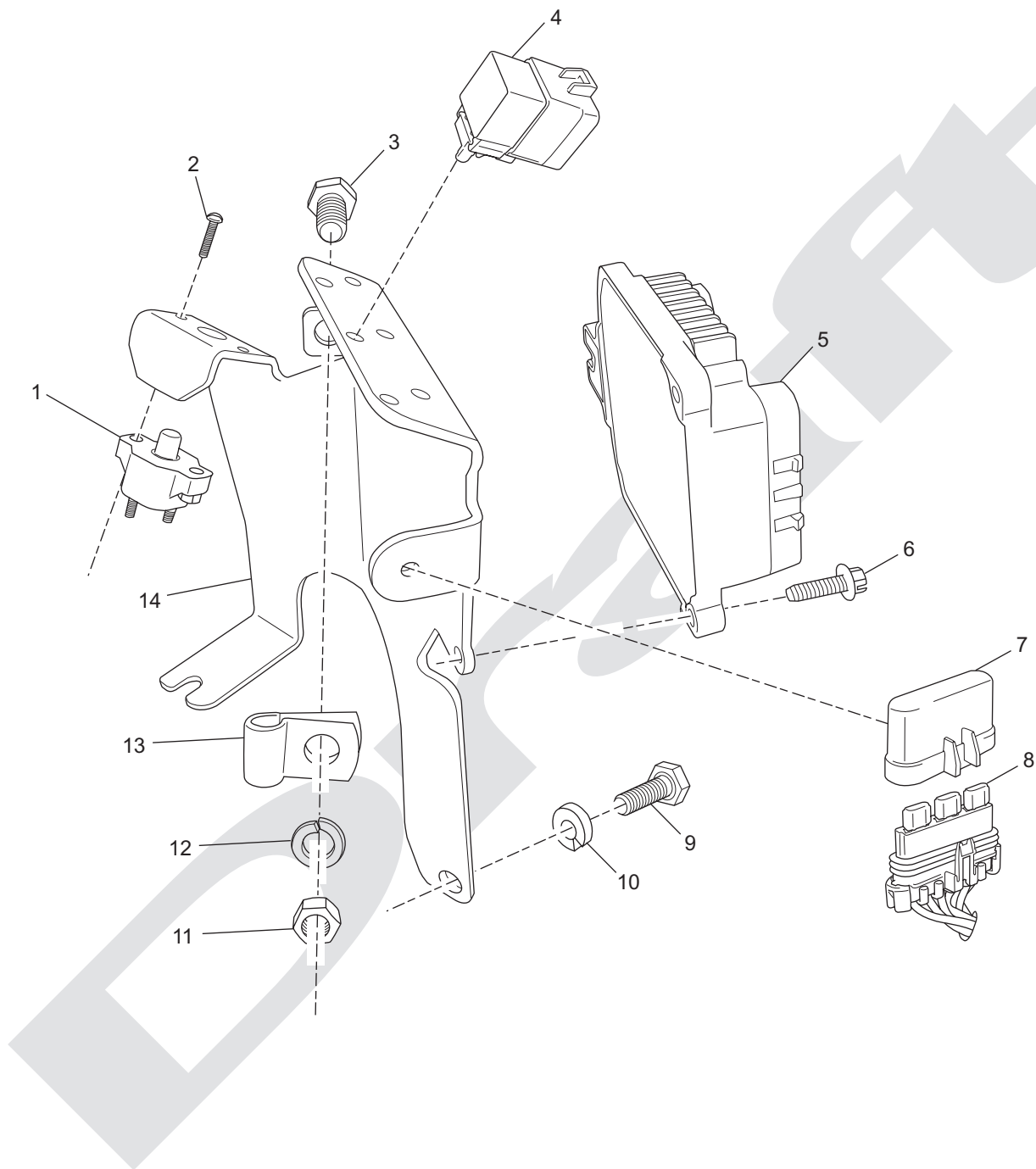


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7-2-03

WIRING HARNESS ASSEMBLIES and SENDERS - FIGURE 13

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	95011000	Nut , sender terminal	1
2	95300300	Lockwasher , sender terminal	1
3	92300200	Washer , sender terminal	1
4	R020002	Sender , temperature	1
5	R020019	Sensor , engine coolant temperature (ECT)	1
6	RA121076	Engine Wiring Harness Assembly	1
7	R096142	Washer , main harness attaching	4
8	RS5115	Screw , main harness attaching	4
9	95011000	Nut , sender terminal	1
10	95300300	Lockwasher , sender terminal	1
11	R020001	Sender , oil pressure	1
12	R024145	Tee , sender attaching	1
13	TBD	Adapter , oil sending unit	1
14	R020015A	Switch , oil pressure	1
15	TBD	Harness , ignition coil	2
16	R090291	Bracket , 10-pin mounting	1

ECM and RELAYS - FIGURE 14

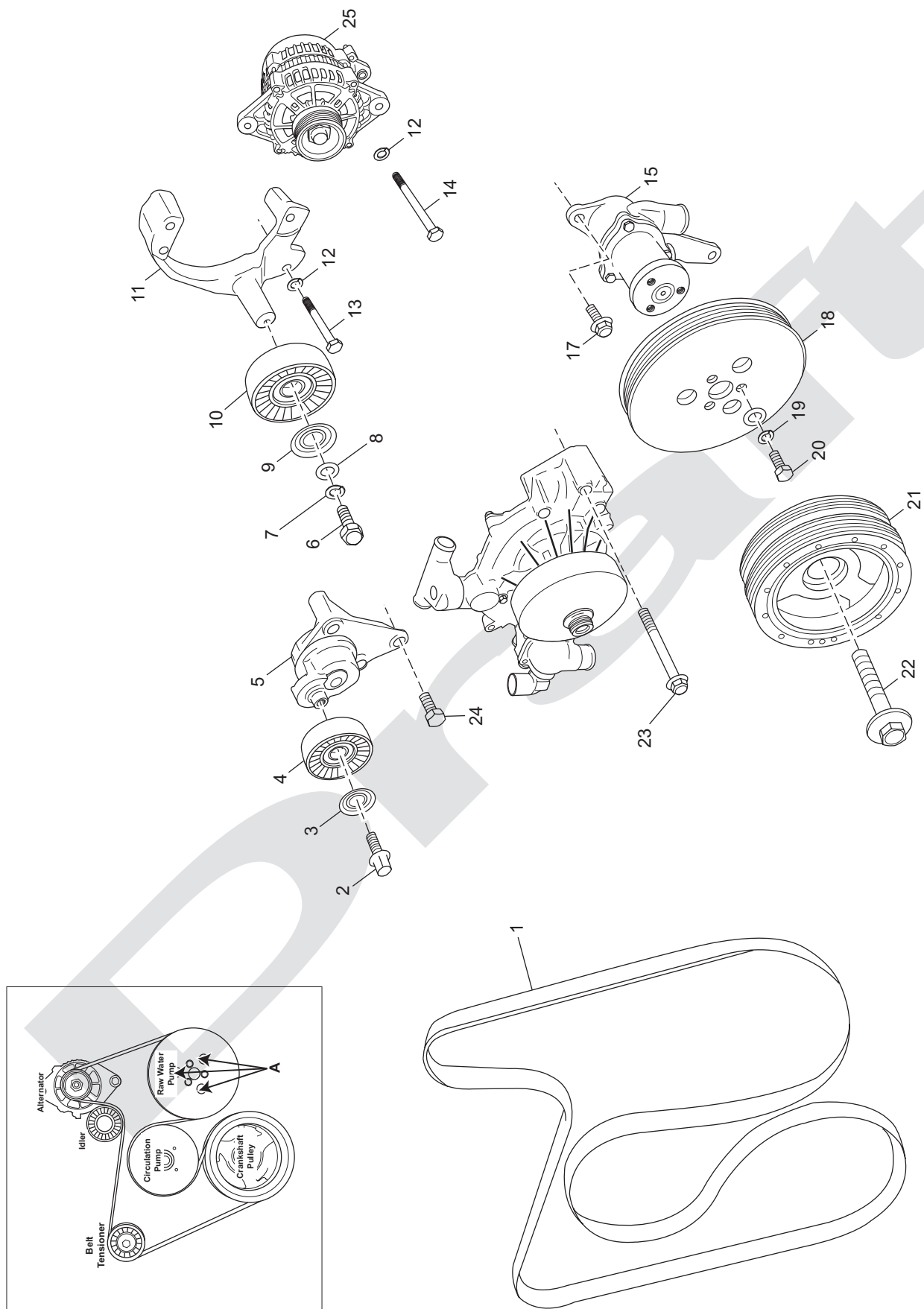


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ECM and RELAYS - FIGURE 14

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R153006C	Circuit Breaker Assembly (60 amp)	1
2	RS5084	Bolt , circuit breaker mounting	2
3	RS0302	Bolt , oil dipstick tube attaching	1
4	R130012	Relay , fuel pump, ignition, starter	3
5	R116021	Engine Control Module	1
6	91107075	Bolt , ECM attaching	3
7	R126014	Cover , fuse holder	1
8	R153017B	Fuses , 20 amp	3
9	RS0304	Bolt , bracket attaching	2
10	RS2180	Lockwasher , bracket attaching bolt	2
11	RS1028	Nut , oil dipstick tube attaching	1
12	RS2180	Lockwasher , oil dipstick tube attaching	1
13	R127015	Clamp , oil dipstick tube attaching	1
14	R090283	Bracket , ECM/relay mounting	1

ACCESSORY DRIVE SYSTEM COMPONENTS - FIGURE 15



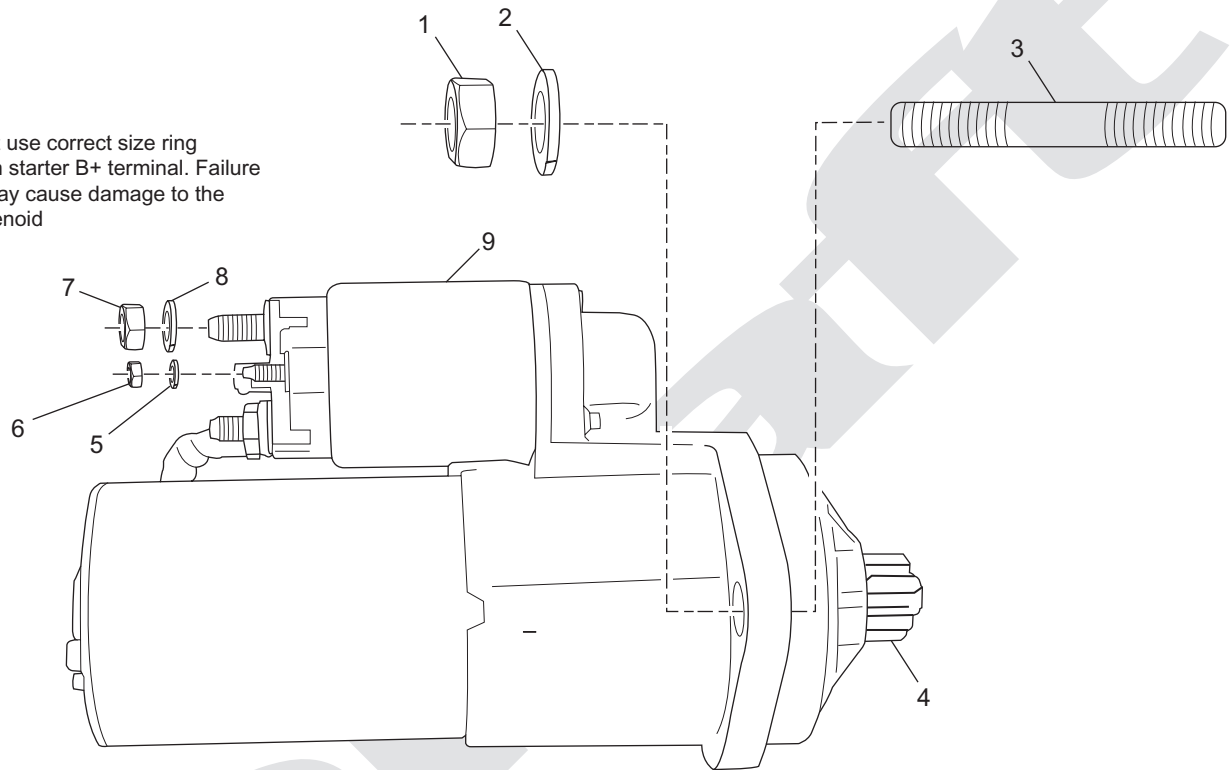
CR60010
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ACCESSORY DRIVE SYSTEM COMPONENTS - FIGURE 15

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R066027	Belt , serpentine drive	1
2	part of item #5	Bolt , tensioner pulley attaching	1
3	part of item #5	Washer , tensioner pulley attaching bolt	1
4	part of item #5	Pulley , tensioner	1
5	RA068001	Tensioner , belt	1
6	TBD	Bolt , idler pulley attaching	1
7	TBD	Lockwasher , idler pulley attaching bolt	1
8	TBD	Washer , idler pulley attaching bolt (small)	1
9	R096145	Washer , idler pulley attaching bolt (large)	1
10	R065040	Pulley , idler	1
11	R090269	Bracket , idler pulley mounting / alternator	1
12	RS7070	Lockwasher , idler pulley bracket attaching bolt	2
13	98443110	Bolt , alternator/pulley bracket attaching, upper	1
14	98446070	Bolt , alternator/bracket attaching, lower	1
NI	98339070	Bolt , alternator attaching	1
NI	92930000	Washer , alternator attaching	1
NI	93930000	Lockwasher , alternator attaching	1
15	RA057032	Raw Water Pump Assembly	1
17	98442030	Bolt , raw water pump mounting	2
18	R065050	Pulley , raw water pump	1
NI	92934000	Washer , raw water pump pulley attaching	3
19	93934000	Lockwasher , raw water pump pulley attaching bolt	3
20	99335016	Bolt , raw water pump pulley attaching	3
21	R064016	Balancer , crankshaft	1
22	TBD	Bolt , crankshaft balancer	1
23	TBD	Bolt , water circulation pump attaching	6
24	TBD	Bolt , belt tensioner mounting	3
25	RA097007C	Alternator Assembly	1

STARTER ASSEMBLY COMPONENTS - FIGURE 16

Note: Must use correct size ring terminal on starter B+ terminal. Failure to do so may cause damage to the starter solenoid



CR60012
7-2-03

STARTER ASSEMBLY COMPONENTS - FIGURE 16

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RS1029	Nut , starter attaching	2
2	RS2181	Lockwasher , starter attaching	2
3	R009203	Bolt , starter attaching	2
4	RA122019	Starter Motor Assembly	1
5	93003000	Lockwasher , solenoid terminal	1
6	RS7036	Nut , solenoid terminal	1
7	RS7019	Nut , solenoid terminal	1
8	TBD	Lockwasher , solenoid terminal	1
9	TBD	Solenoid , starter	1

Contents:

Symbols	2
Gasket and Decal Kit Numbers	3
Maintenance Item Part Numbers	3
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Cylinder Block Assembly (cont'd) - Figure 1	6
Cylinder Head Assembly - Figure 2	8
Intake Manifold Assembly - Figure 3	10
Oil Pan and Oil Pump Assembly - Figure 4	12
Throttle Body Assemblies and Related Components - Figure 5	14
Remote Oil Filter Components - Figure 6	16
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OLD Returnless Fuel System Components - Figure 8 (thru S/N 630206)	20
NEW Returnless Fuel System Components - Figure 8A (S/N 630207 thru present)	24
Heat Exchanger and Components - Figure 9	28
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Transmission and Related Parts (Velvet Drive 5000) - Figure 22	58
Transmission and Related Parts (Hurth Gear) - Figure 23	60

"TYPICAL VIEWS ARE SHOWN"**ENGINE ROTATION**

Engine Rotation is identified as "RH" or "LH" with the engine model number. Rotation always is determined from the flywheel end looking toward the front of the engine. In some instances, propeller shaft rotation may be opposite to that of the engine.

When ordering a replacement engine, production block or parts for the engine, be certain to check engine rotation. **DO NOT rely on propeller rotation in order to determine engine rotation.**

LEFT-HAND ROTATION is STANDARD ROTATION.

(Flywheel turns counterclockwise when viewed from flywheel end of the engine.)

RIGHT-HAND ROTATION is OPPOSITE ROTATION.

(Flywheel turns clockwise when viewed from flywheel end of the engine.)

HOW TO READ THIS PARTS BOOK:

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RB001018	Base Engine Assembly, 8.1L	1

①

②

③

④

- ① ITEM NUMBER - This number corresponds with the number in the exploded view on the facing page.
- ② PART NUMBER - This is the designated part number for the particular component or assembly.
- ③ DESCRIPTION - This identifies what the component or assembly is.
- ④ QUANTITY - This refers to the number of pieces used.

=====

Symbols shown throughout parts list are defined here or on the bottom of the individual parts list page.

- AR = As Required
- OPT = Optional
- NSS = Not Serviced Separately
- NA = Not Available
- SS = Single Station Control
- DS = Dual Station Control
- OS = Oversize
- US = Undersize
- NS = Not Shown
- TBD = To Be Determined
- NI = Not Illustrated

REPLACEMENT PARTS:



WARNING:

Electrical, ignition and fuel system components on Crusader Engines are designed and manufactured to comply with U.S. Coast Guard rules and regulations to minimize risks of fire or explosion.

Use of replacement electrical, ignition and fuel system components which do not comply with these rules and regulations could result in a fire or explosion hazard and should be avoided.

GASKET AND DECAL KIT NUMBERS:

Description	Part Number
Complete Engine Overhaul Gasket Set	TBD
Valve Grind Gasket Set	TBD
Oil Pan Gasket Set	TBD
Intake Manifold Gasket Set	TBD
On Board Spare Parts Kit	RK173087

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MAINTENANCE ITEM PART NUMBERS:

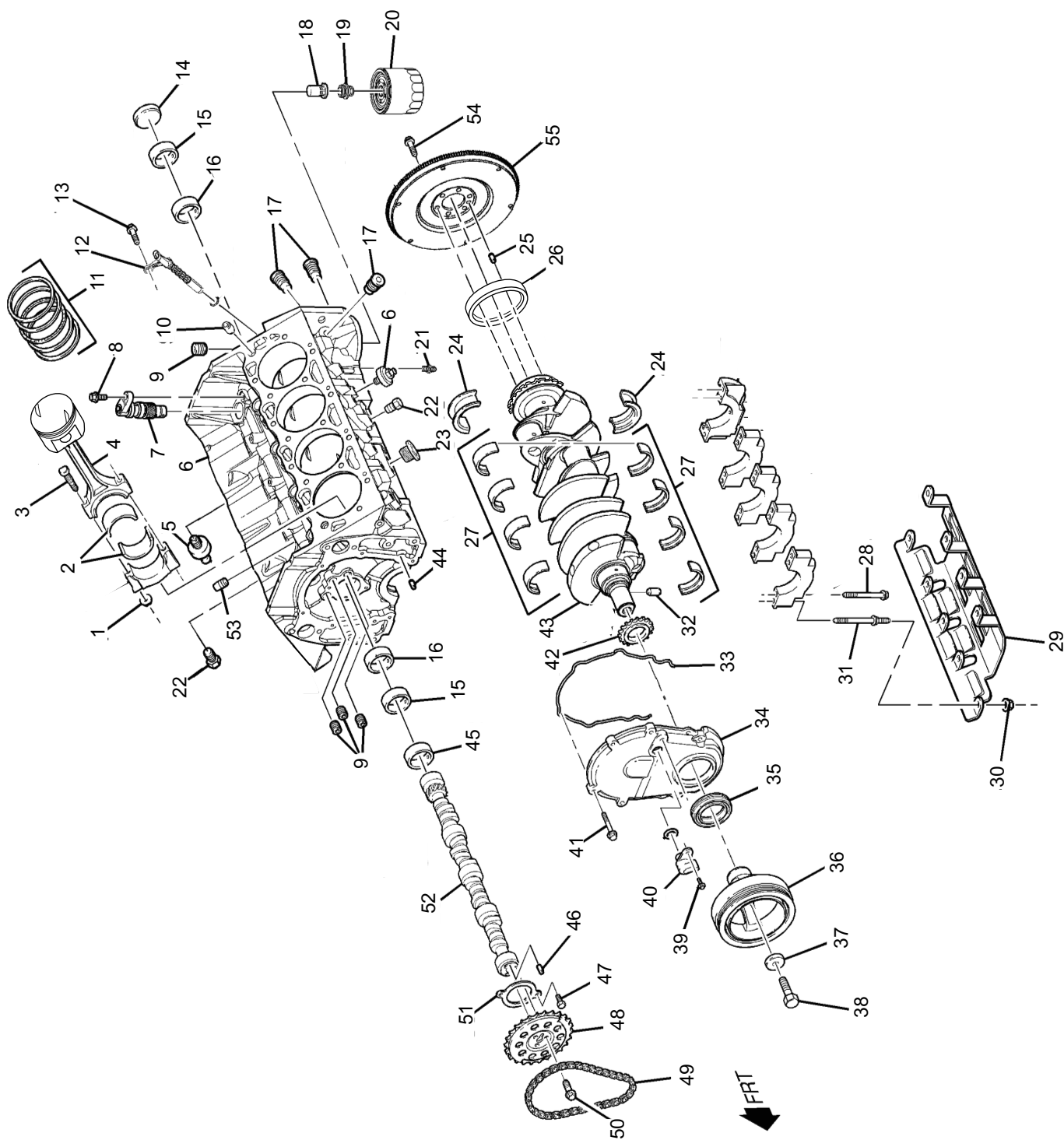
Description	Part Number
Oil Filter	22679
Fuel Filter	47038
Spark Plugs	R030009
Spark Plug Wire Set	RK120019
Accessory Drive Belt	R066024

MARINE TRANSMISSIONS:

Crusader Engines are equipped with Velvet Drive or Hurth Transmissions or “V”-drives. If transmission parts are required, contact your dealer or closest Crusader Parts Distributor for required parts.

Parts manuals and overhaul manuals are available through Crusader Distributors.

CYLINDER BLOCK ASSEMBLY - FIGURE 1

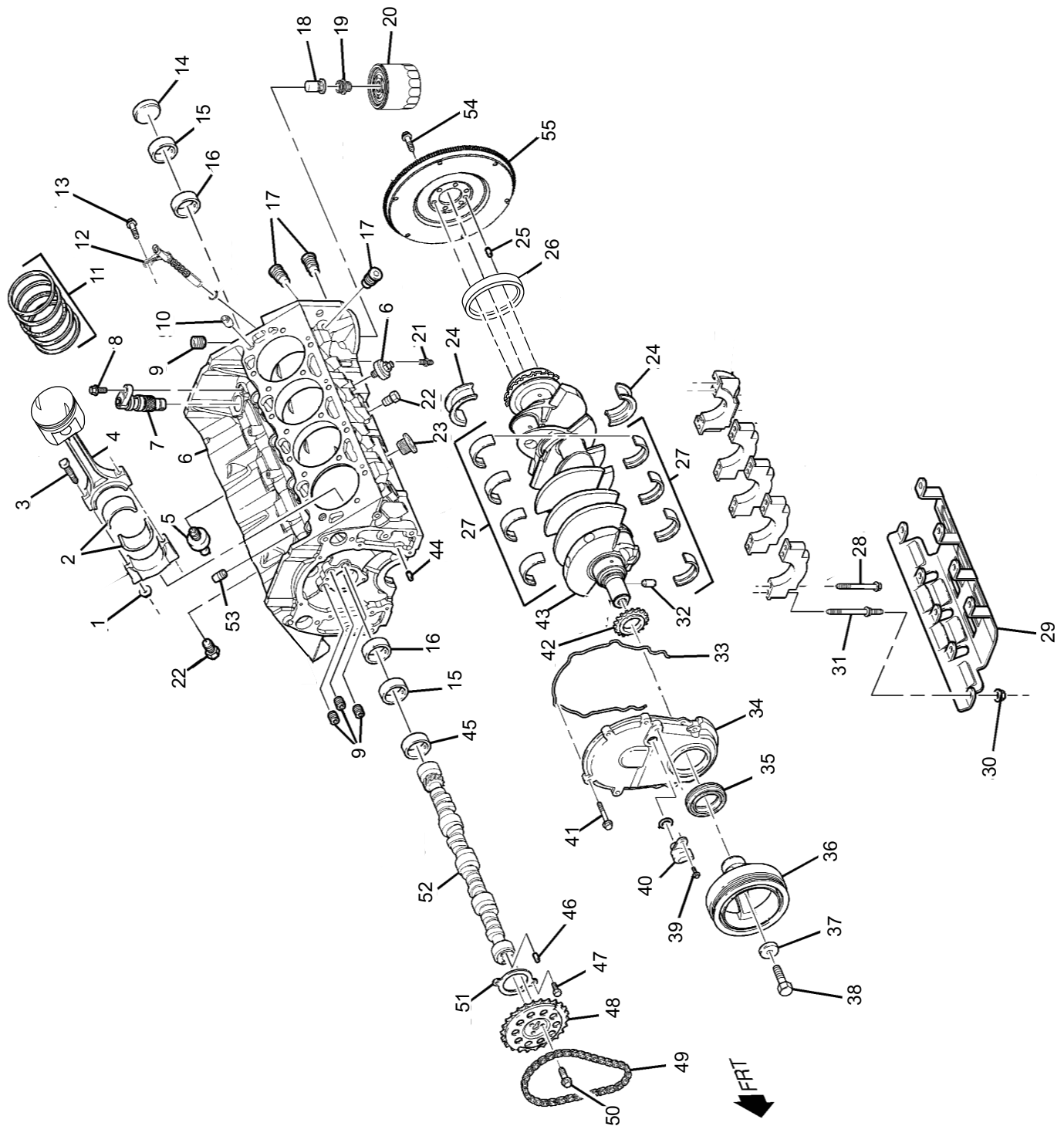


PC81001

CYLINDER BLOCK ASSEMBLY - FIGURE 1

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
*	RB001018	Base Engine Assembly	
1	R017080	Nut , connecting rod cap	16
2	R007026	Bearing Set , connecting rod (STD)	8
3	R009195	Bolt , connecting rod cap	16
4	RA013015A	Piston and Connecting Rod Assembly (LH/STD)	4
4	RA013015B	Piston and Connecting Rod Assembly (RH/STD)	4
5	R020033	Sensor , knock	2
6	NSS	Cylinder Block	
7	RA073001	Drive , oil pump	1
8	TBD	Bolt , oil pump drive	1
9	TBD	Plug , oil gallery	
10	R022021	Pin , cylinder head locating	4
11	R015012	Ring Set , piston (STD)	8
12	R020034	Sensor , crankshaft position	1
13	TBD	Bolt , crankshaft position sensor	1
14	R069065	Plug , camshaft	1
15	R051039B	Bearing , camshaft #2 and #5	2
16	R051039A	Bearing , camshaft #3 and #4	2
17	TBD	Plug , engine block oil gallery	4
18	TBD	Valve , oil bypass	1
19	R079048	Fitting , oil bypass adapter	1
20	R079065	Adapter , oil bypass 8.1L	1
21	R024183	Connector , engine oil cooler hose	2
22	R069070	Plug , engine block coolant drain hole	2
23	TBD	Plug , engine block coolant drain hole	1
24	R007028	Bearing , crankshaft (thrust)	1
25	TBD	Pin , flywheel locating	2
26	R047224	Seal , crankshaft rear oil	1
27	R007027	Bearing , crankshaft (STD)	4
28	R009196	Bolt , crankshaft bearing cap	10
29	R012023	Deflector , crankshaft oil	1
30	TBD	Nut , crankshaft oil deflector	
31	R031032	Stud , crankshaft bearing cap	9
32	TBD	Pin , crankshaft balancer locating	1
33	RM0264	Gasket , engine front cover	1
34	R004011	Cover , engine front cover (includes gasket and seal)	1
35	R047225	Seal , crankshaft front oil	1

CYLINDER BLOCK ASSEMBLY - FIGURE 1

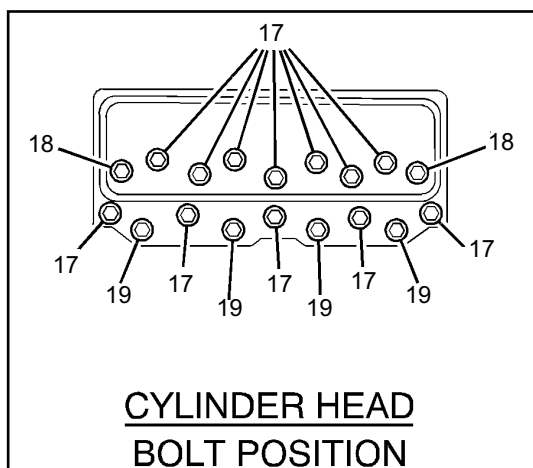
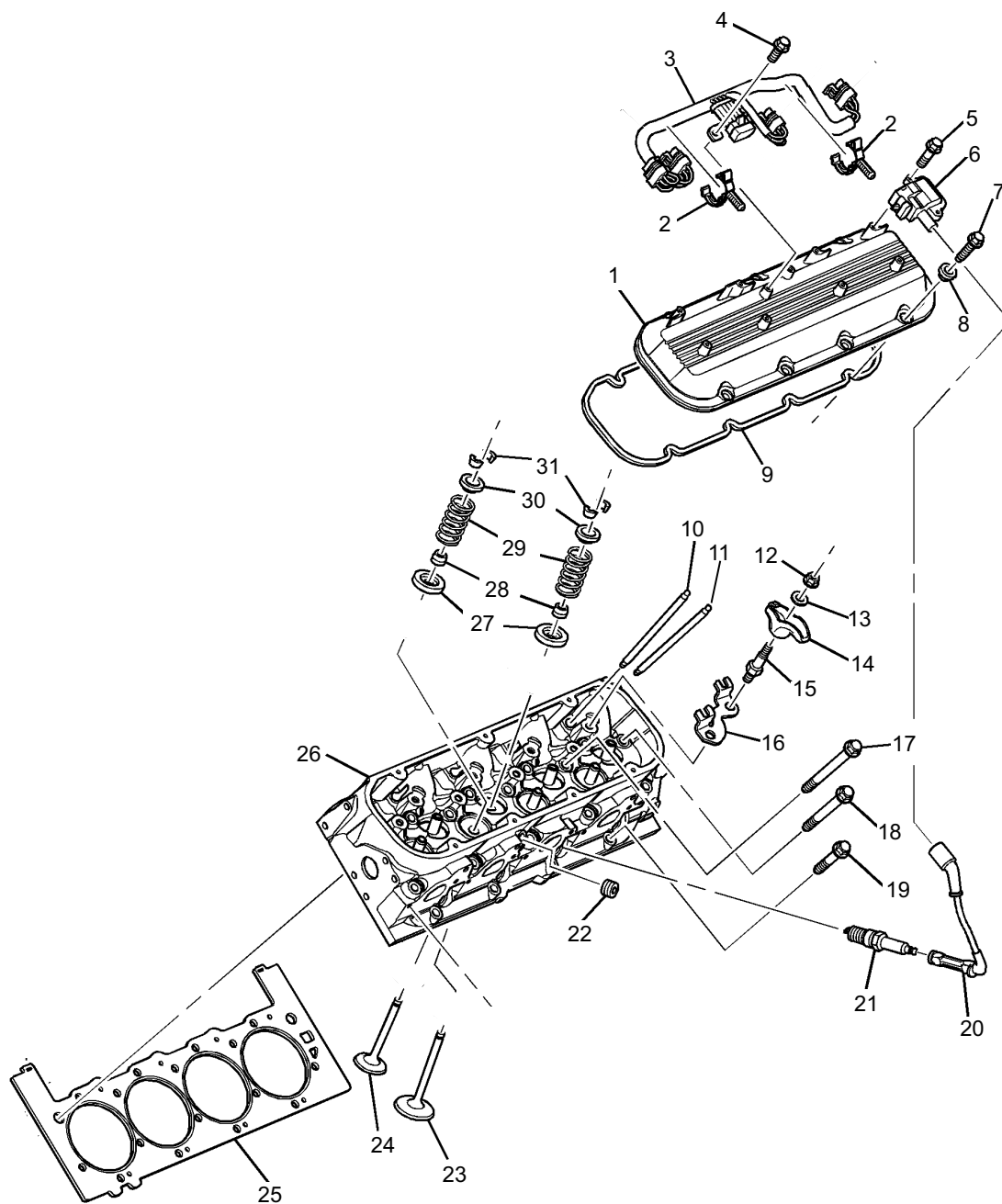


PC81001

CYLINDER BLOCK ASSEMBLY - FIGURE 1

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
36	R064015	Balancer , crankshaft (STD)	1
36	R064015A	Balancer , crankshaft (HO)	1
37	R096146	Washer , crankshaft balancer	1
38	TBD	Bolt , crankshaft balancer	1
39	TBD	Bolt , camshaft position sensor	1
40	R020035	Sensor , camshaft position sensor	1
41	TBD	Bolt , engine front cover	6
42	R054039	Sprocket , crankshaft	1
43	R006029	Crankshaft (LH STD)	1
43	R006030	Crankshaft (LH HO)	1
44	R022022	Pin , engine front cover locating	1
45	R051039A	Bearing , camshaft #1	1
46	R022022	Pin , camshaft sprocket locating	1
47	TBD	Bolt , camshaft retaining	2
48	R054040	Sprocket , camshaft	1
49	R055016	Chain , camshaft timing	1
50	TBD	Bolt , camshaft sprocket	3
51	R109050	Retainer , camshaft	1
52	RA050023	Camshaft , engine (STD)	1
52	RA050024	Camshaft , engine (HO)	1
53	TBD	Plug , engine block oil gallery	3
54	TBD	Bolt , flywheel to crankshaft	6
55	RA138015	Flywheel Assembly , (FRT)	1
55	RA138014	Flywheel Assembly , (REAR)	1

CYLINDER HEAD ASSEMBLY - FIGURE 2

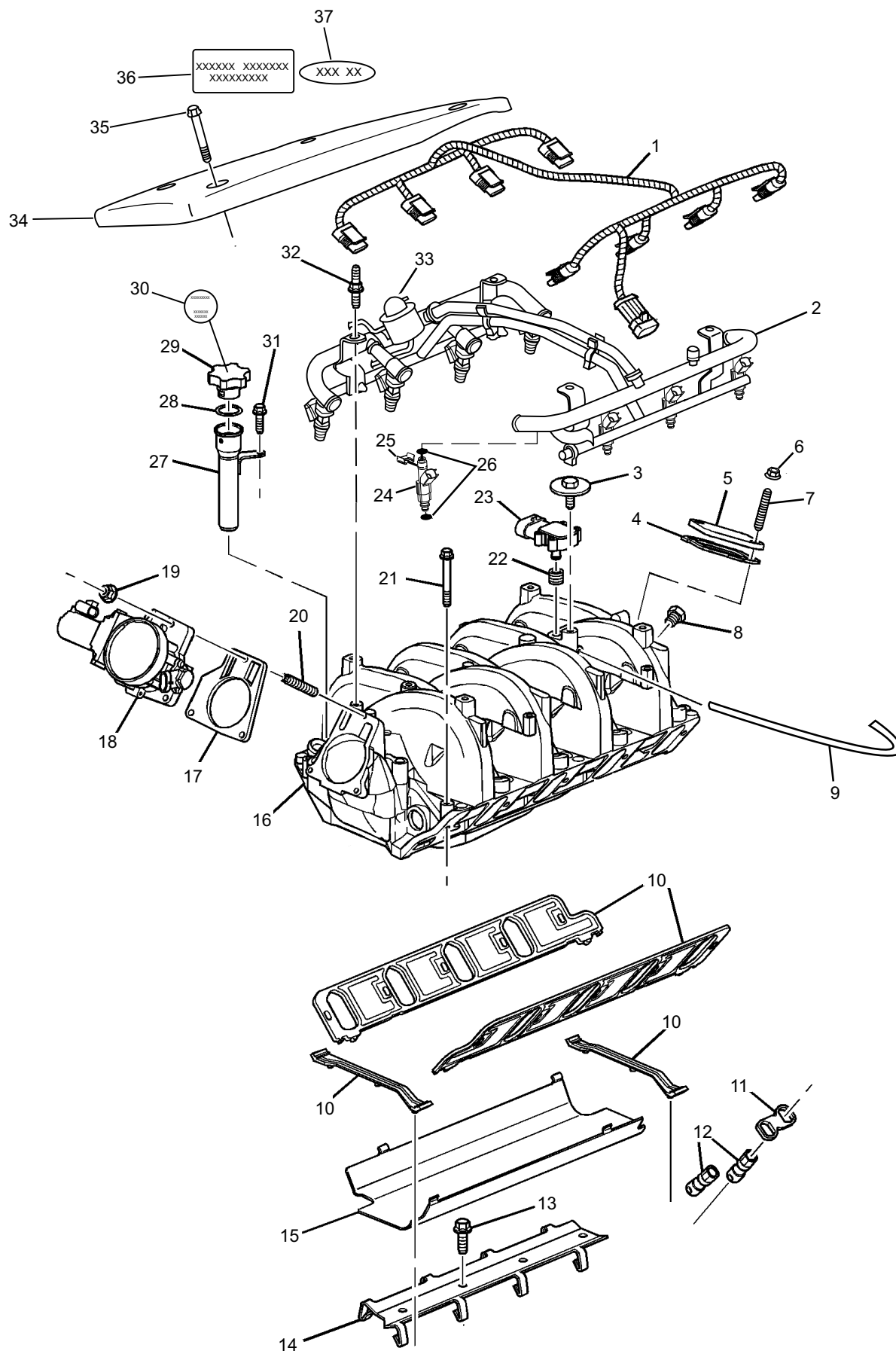


PC81002

CYLINDER HEAD ASSEMBLY - FIGURE 2

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R033013	Cover , rocker	2
2	R127096	Retainer , ignition coil wire harness	4
3	R121074	Wire Harness , ignition coils	2
4	TBD	Bolt , ignition coil wire harness retaining	2
5	TBD	Bolt , ignition coil retaining	16
6	R117012	Coil , ignition	8
7	R009200	Bolt , rocker cover retaining	14
8	R094039	Grommet , rocker cover retaining	14
9	RM0261	Gasket , rocker cover	2
10	R039021	Push Rod , intake	8
11	R039022	Push Rod , exhaust	8
12	R017079	Nut , rocker arm attaching	16
13	TBD	Ball , rocker arm	16
14	R038018	Rocker Arm , valve	16
15	R095039	Stud , push rod guide attaching	16
16	R037003	Guide , pushrod	8
17	R009197	Bolt , cylinder head to block (long)	24
18	R009198	Bolt , cylinder head to block (medium)	4
19	R009199	Bolt , cylinder head to block (short)	8
20	RK120019	Spark Plug Wire Set	1
21	R030009	Spark Plug	8
22	TBD	Plug , pipe (1/2")	2
23	R043033	Valve , intake (STD)	8
24	R043034	Valve , exhaust (STD)	8
25	RM0262B	Gasket , cylinder head (RH)	1
25	RM0262A	Gasket , cylinder head (LH)	1
26	R003014	Cylinder Head Assembly (RH)	1
26	R003015	Cylinder Head Assembly (LH)	1
27	R049013	Rotator , valve	16
28	R047226	Seal , valve stem	16
29	R046049	Valve Spring Assembly	16
30	R049014	Cap , valve spring	16
31	R049010	Retainer , valve stem	32

INTAKE MANIFOLD ASSEMBLY - FIGURE 3

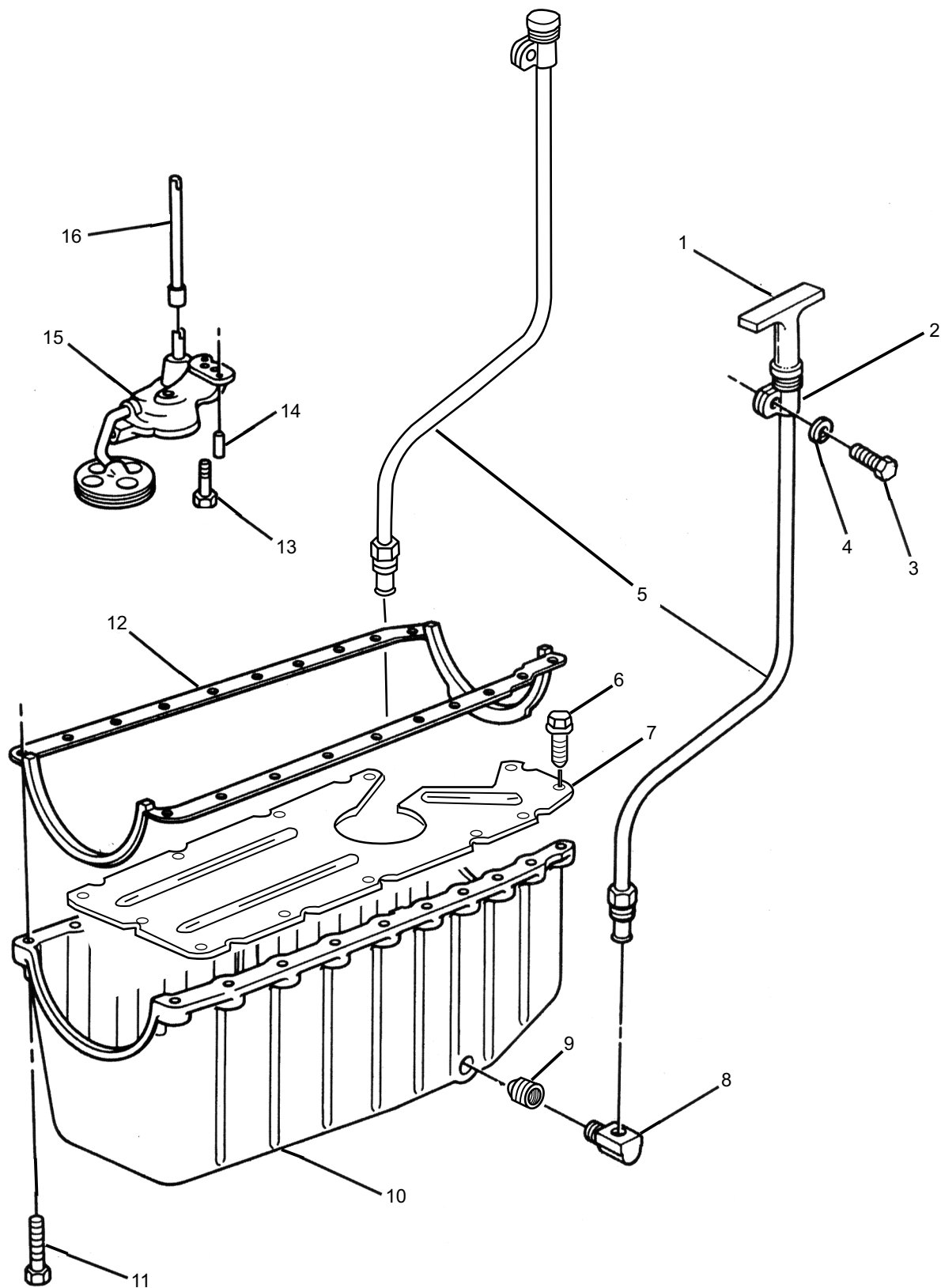


PC81003

INTAKE MANIFOLD ASSEMBLY - FIGURE 3

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R121075	Wire Harness , fuel injectors	1
2	RA086001	Fuel Rail Assembly	1
3	TBD	Bolt , MAP sensor retaining	1
4	RM0265	Gasket , EGR blockoff cover	1
5	TBD	Cover , EGR blockoff	1
6	TBD	Nut , EGR blockoff cover attaching	2
7	TBD	Stud , EGR blockoff cover attaching	2
8	TBD	Plug , intake manifold core hole	1
9	20237	Hose , fuel pressure regulator vacuum	1
10	RM0267	Gasket Set , intake manifold	1
11	R037004	Guide , valve lifter	8
12	R040004	Lifter , valve	16
13	TBD	Bolt , valve lifter retainer	4
14	R090253	Retainer , valve lifter	1
15	R012025	Guard , oil splash - lifter	1
16	R002022	Intake Manifold	1
17	RM0251	Gasket , throttle body mounting	1
18	RA035036	Throttle Body , mechanical throttle (STD)	1
18	RA035036A	Throttle Body , mechanical throttle (HO)	1
18	TBD	Throttle Body , electronic throttle	1
19	TBD	Nut , throttle body attaching	3
20	TBD	Stud , throttle body mounting	3
21	R009201	Bolt , intake manifold to cylinder head	10
22	TBD	Seal , MAP sensor	1
23	R020036	MAP Sensor	1
24	RA087006	Fuel Injector Assembly	8
25	R127097	Retainer , fuel injector to fuel rail	8
26	RK047227	O-Ring , kit fuel injector	8
27	R034046	Riser , oil fill	1
28	NSS	O-Ring , oil fill riser cap	1
29	R034038A	Cap , oil fill riser	1
30	R143137	Decal , oil fill riser cap	1
31	TBD	Bolt , oil fill riser attaching	1
32	TBD	Stud , fuel rail assembly attaching	4
33	R088001	Regulator , fuel pressure	1
34	R060057	Cover , engine	1
35	99225030	Bolt , engine cover attaching	4
36	R143130	Decal , "CAPTAIN'S CHOICE"	AR
36	R143130A	Decal , "CRUSADER ENGINES"	AR
37	R143133	Decal , "8.1 MPI" (red/silver)	AR
37	R143134	Decal , "8.1 HO" (red/silver)	AR

OIL PAN and OIL PUMP ASSEMBLY - FIGURE 4

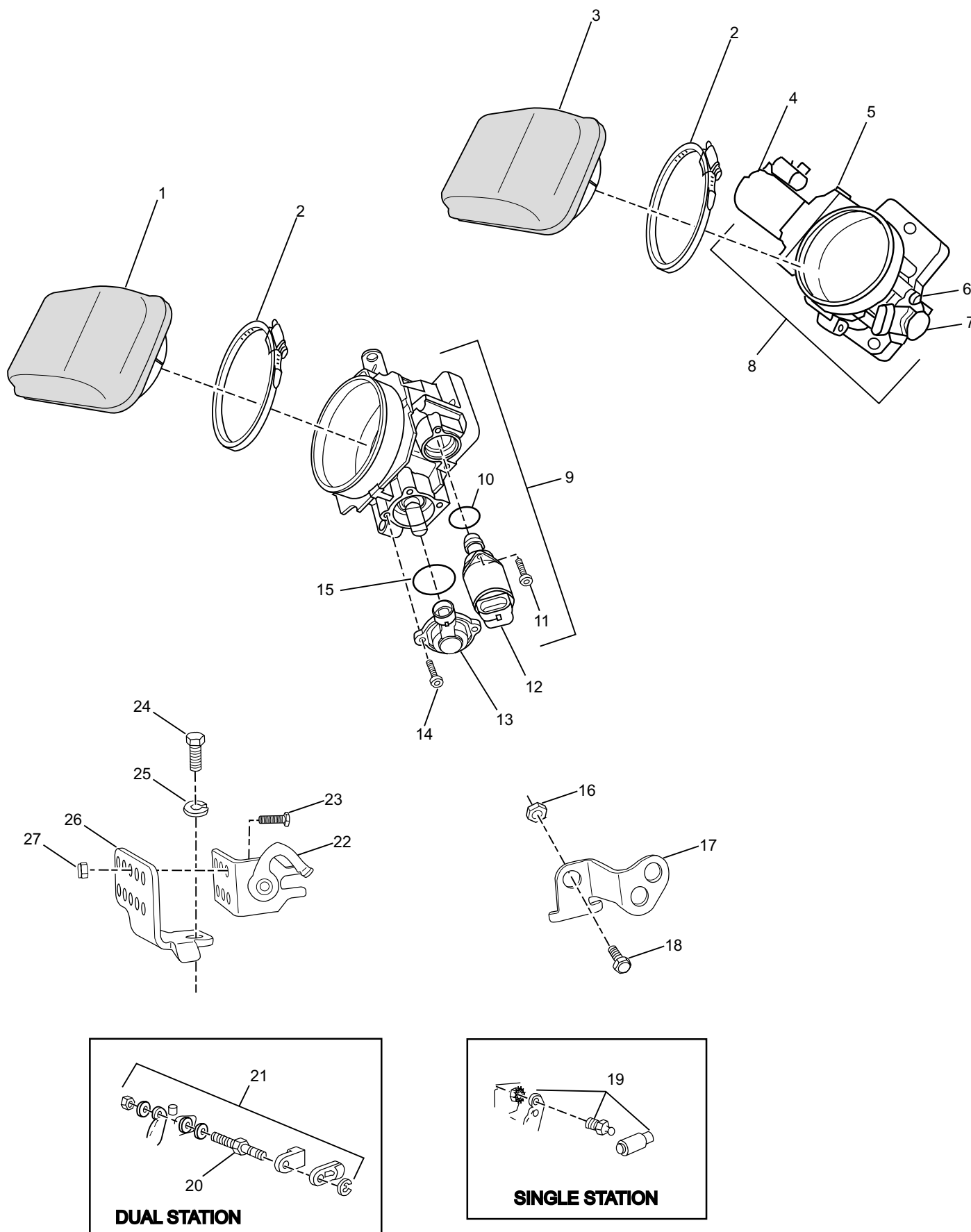


PC81004

OIL PAN and OIL PUMP ASSEMBLY - FIGURE 4

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R041068	Dipstick , oil level (Level)	1
1	R041069	Dipstick , oil level (Angled)	1
2	R127015	Clamp , dipstick tube attaching	2
3	98443025	Bolt , dipstick tube attaching	2
4	93940000	Lockwasher , dipstick tube attaching bolt	2
5	R041072	Dipstick Tube	2
6	TBD	Bolt , oil pan baffle	12
7	R012026	Baffle , oil pan	1
8	R024017	Elbow , dipstick tube to oil pan	2
9	R024200	Adapter , dipstick elbow to oil pan	2
10	R005023	Oil Pan	1
11	TBD	Bolt , oil pan mounting	20
12	RM0263	Gasket , oil pan	1
13	TBD	Bolt , oil pump mounting	2
14	R022022	Pin , dowel - oil pump aligning	1
15	RA070017	Oil Pump Assembly	1
16	R058055	Shaft , oil pump to oil drive	1
NI		Kit , oil drain	1

THROTTLE BODY and RELATED COMPONENTS - FIGURE 5

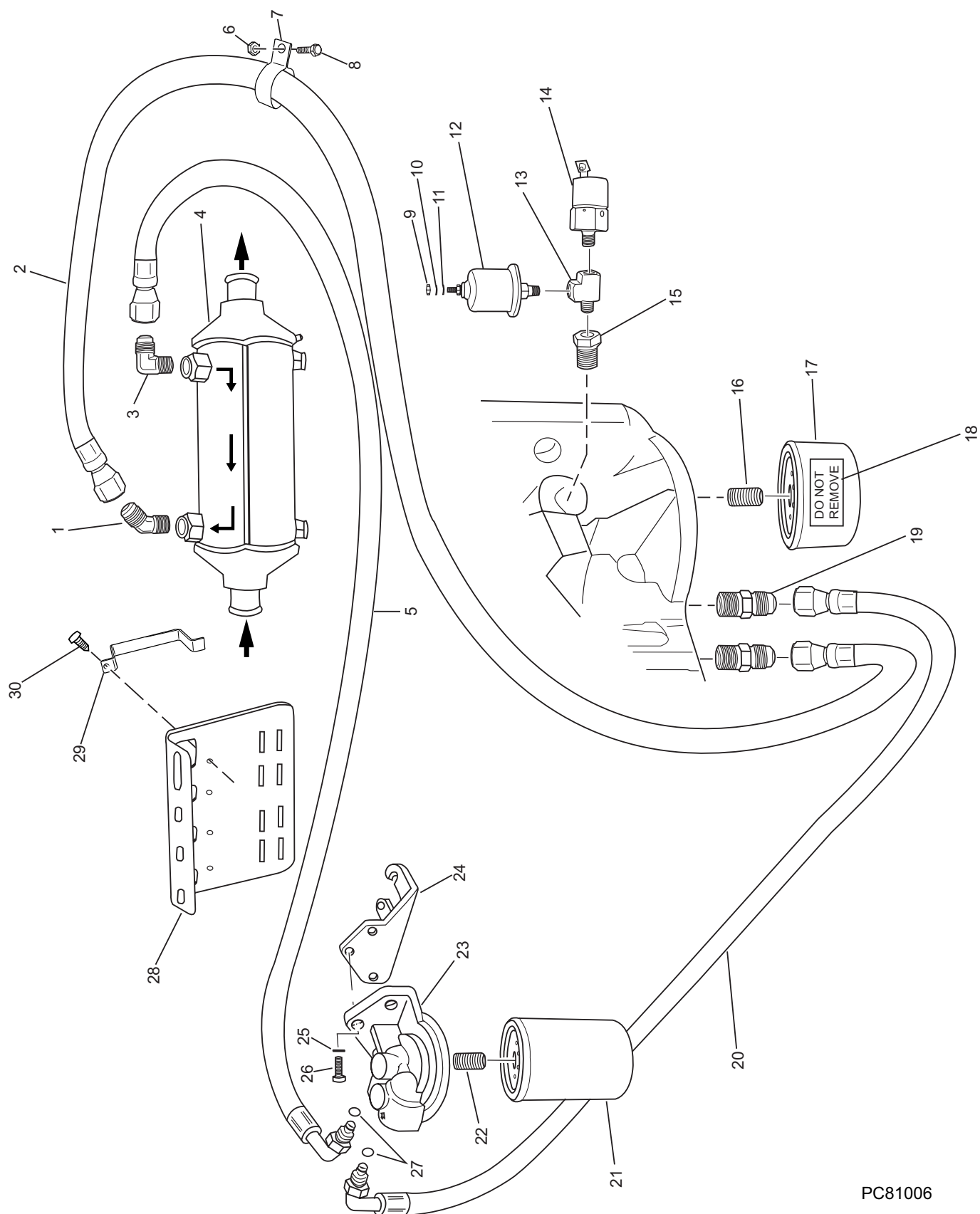


PC81005

THROTTLE BODY and RELATED COMPONENTS - FIGURE 5

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R145021	Flame Arrestor , (mechanical throttle body)	1
2	RS3857	Clamp , retaining	1
3	TBD	Flame Arrestor , (electronic throttle body)	1
4	TBD	Motor , throttle actuator (electronic throttle body)	1
5	TBD	Screw , throttle actuator motor attaching (electronic throttle body)	2
6	TBD	Screw , TP sensor attaching (electronic throttle body)	2
7	TBD	Sensor , throttle position (electronic throttle body)	1
8	TBD	Throttle Body Assembly , (electronic throttle body)	1
9	RA035036	Throttle Body Assembly , (mechanical throttle body)	1
10	49067	O-Ring Seal , idle air control valve (mechanical throttle body)	1
11	TBD	Screw , IAC valve attaching (mechanical throttle body)	2
12	49060	Valve , idle air control (mechanical throttle body)	1
13	49061	Sensor , throttle position (mechanical throttle body)	1
14	TBD	Screw , TP sensor attaching (mechanical throttle body)	2
15	TBD	O-Ring Seal , throttle position sensor (mechanical throttle body)	1
16	RS1078	Nut , retaining bolt	1
17	R090230	Throttle Arm , throttle body	1
18	RS0251	Bolt , throttle arm retaining	1
19	R178014	Ball Joint Assembly , cable attaching (single)	1
20	22978	Pivot Pin , cable attaching (dual)	1
21	23235	Cable Attaching Kit , (dual)	AR
22	R090086	Cable Clip , throttle attaching (single)	1
22		Cable Clip , throttle attaching (dual)	AR
23		Bolt , cable clip mounting	2
24	98223016	Bolt , bracket mounting	1
25	93920000	Lockwasher , bracket mounting	1
26	R090229	Throttle Bracket , intake	1
27		Locking Nut , cable clip mounting bolt	2

REMOTE OIL FILTER COMPONENTS - FIGURE 6

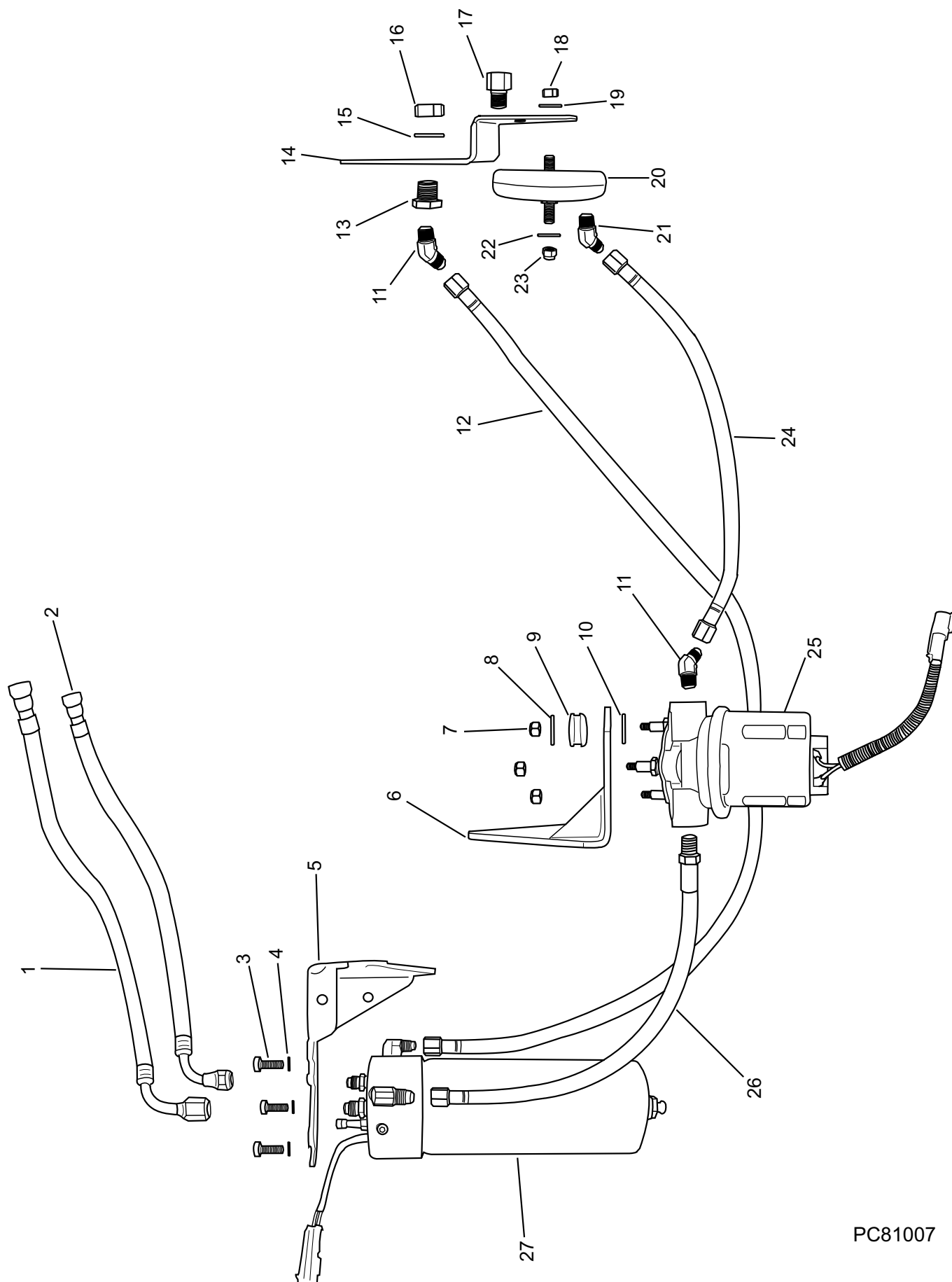


PC81006

REMOTE OIL FILTER COMPONENTS - FIGURE 6

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R024150	Fitting , 45 degree	1
2	RA045121	Hose Assembly , cooler to filter header	1
3	R024184	Fitting , 90 degree	1
4	R147035A	Cooler Assembly	1
5	RA045120A	Hose Assembly , adapter to cooler	1
6	RS1078	Nut , strap clamp attaching	1
7	98315	Clamp , strap	1
8	90105125	Bolt , strap clamp attaching	1
9	95011000	Nut , sender terminal	1
10	95300300	Lockwasher , sender terminal	1
11	92300200	Washer , sender terminal	1
12	R020001	Sender , oil pressure (SS)	1
12	727046	Sender , oil pressure (DS)	AR
13	R024145	Tee , sender attaching	1
14	R020015A	Switch , oil pressure (SS)	1
15	RS3677	Adapter , sender attaching tee	1
16	R079048	Fitting , oil bypass adapter	1
17	R079065	Adapter , oil bypass	1
18	R143135	Decal , oil bypass adapter	1
19	R024183	Fitting , remote oil filter hose	2
20	RA045120	Hose Assembly , adapter to filter header	1
21	22679	Filter , oil	1
22	R024203	Nipple , header filter adapter	1
23	R079066	Oil Filter Header	1
24	R090226	Bracket , oil filter mounting	1
25	93930000	Lockwasher , header mounting bolt	3
26	99333020	Bolt , header mounting	3
27	22897	O-Ring , oil line	2
28	R090194	Bracket , oil cooler mounting	1
29	R171007	Strap , cooler mounting	2
30	RS5115	Bolt , cooler mounting strap	2

FUEL CONTROL CELL (FCC) COMPONENTS- FIGURE 7

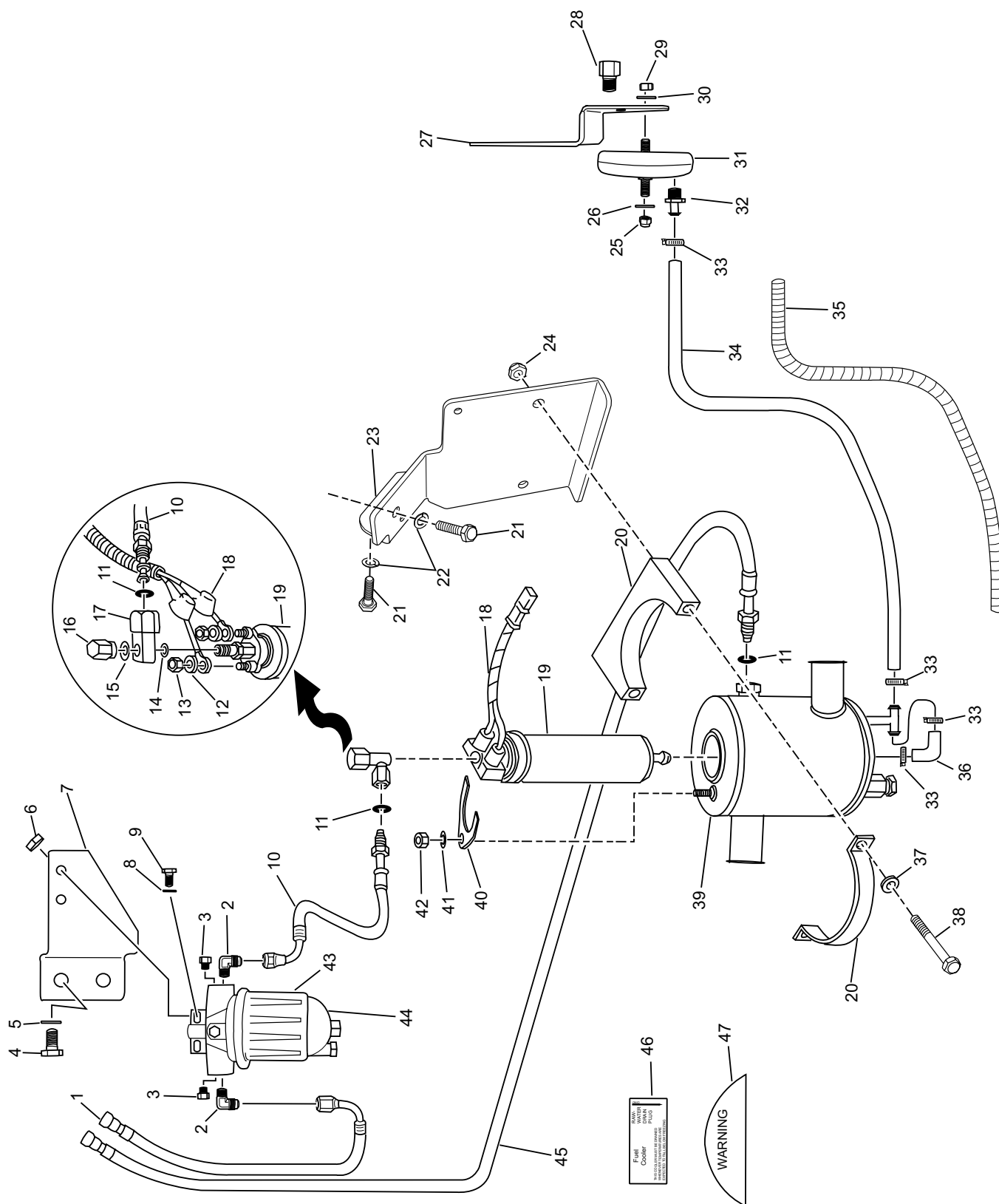


PC81007

FUEL CONTROL CELL (FCC) COMPONENTS- FIGURE 7

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RA085090	Hose Assembly , FCC to fuel rail (inlet)	1
2	RA085091	Hose Assembly , fuel rail to FCC (return)	1
3	RS0302	Bolt , FCC mounting	3
4	RS2180	Lockwasher , FCC mounting	3
5	R090227	Bracket , FCC mounting	1
6	R090228	Bracket , low-pressure fuel pump mounting	1
7	RS1521L	Locking Nut , fuel pump terminal	3
8	R096141	Washer , fuel pump mounting	3
9	R094035	Grommet , mounting bracket	3
10	R096142	Washer , fuel pump mounting	3
11	R024197	Fitting , 45 degree	2
12	RA085071B	Hose Assembly , FCC to fuel return line adapter	1
13	R024062A	Adapter , fuel return line	1
14	R090234	Bracket , fuel filter mounting	1
15	TBD	Washer , adapter mounting	1
16	TBD	Nut , adapter mounting	1
17	R024196	Fitting , fuel inlet	1
18	TBD	Nut , fuel filter mounting	1
19	TBD	Washer , fuel filter mounting	1
20	47038	Filter , fuel	1
21	R024198	Fitting , 45 degree	1
22	TBD	Washer	1
23	TBD	Locking Nut	1
24	RA085071	Hose Assembly , filter to low-pressure pump	1
25	RA080018	Fuel Pump , low-pressure	1
26	RA085070	Hose Assembly , low-pressure pump to FCC	1
27	RA080029	Fuel Control Cell (FCC) Assembly	1
NI	RP080026	Fuel Filter , FCC Assembly	1

OLD RETURNLESS FUEL SYSTEM COMPONENTS - FIGURE 8 (thru S/N 630206)

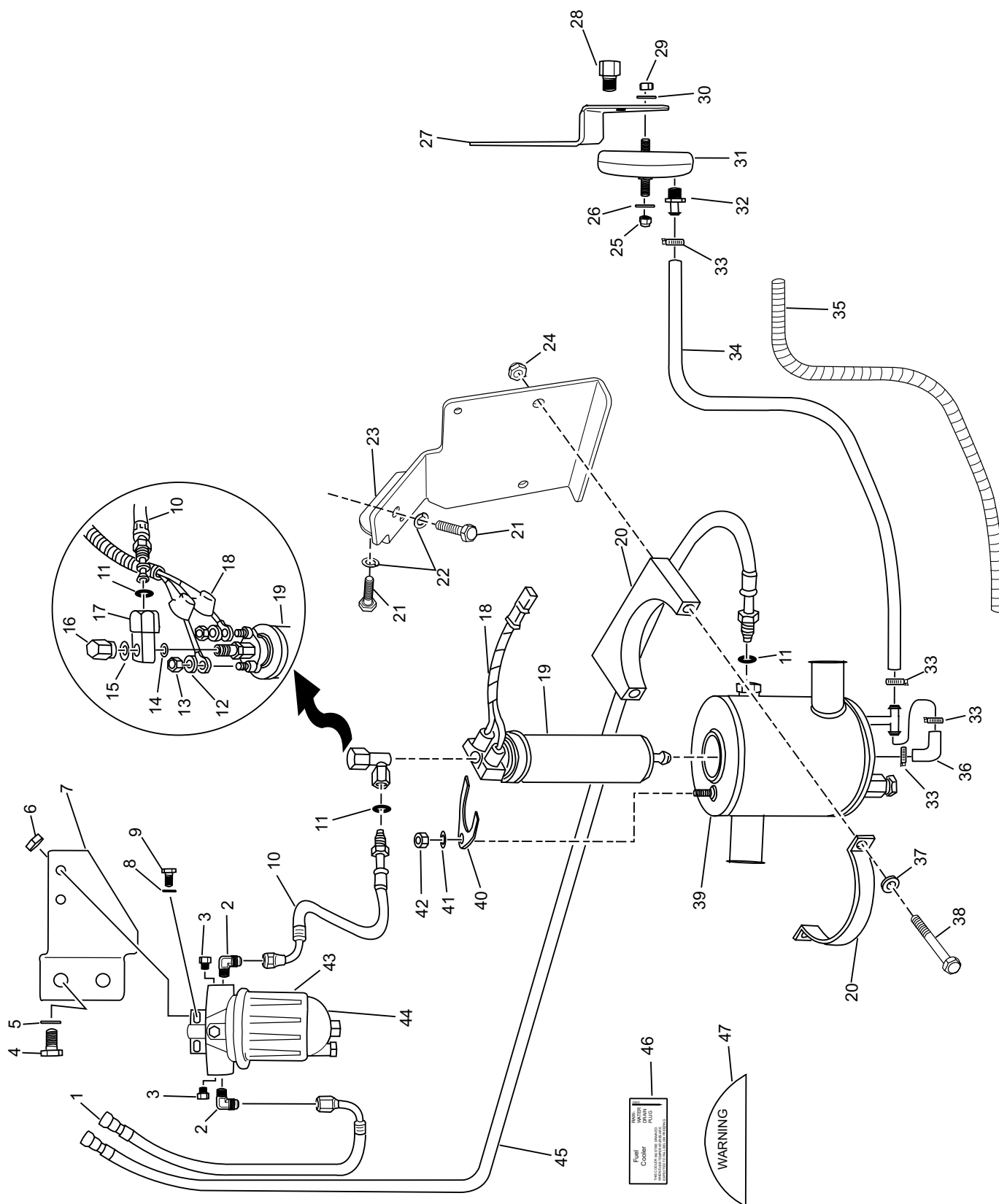


PC81008

OLD RETURNLESS FUEL SYSTEM COMPONENTS - FIGURE 8 (thru S/N 630206)

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RA085090	Fuel Line Assembly , filter to fuel rail	1
2	R024163	Fitting , 90 degree	2
3	RS3552	Fitting , blockoff	2
4	98443025	Bolt , filter bracket mounting	2
5	93940000	Lockwasher , mounting bolt	2
6	RS2060	Nut , mounting bolt	2
7	R090237	Bracket , filter mounting	1
8	92200000	Washer , mounting bolt	2
9	RS0282	Bolt , filter mounting	2
10	RA085092	Fuel Line Assembly , fuel pump to filter	1
11	TBD	O-Ring , fuel line assembly	2
12	NSS	Lockwasher , retaining nut	2
13	NSS	Nut , wire retaining	2
14	23516	O-Ring , fuel pump sealing (large)	1
15	23515	O-Ring , fuel pump sealing (small)	1
16	98442	Nut , fitting to fuel pump	1
17	98440	Fitting , fuel line to fuel pump	1
18	49038	Wire Harness , fuel pump to engine harness	1
19	47039	Electric Fuel Pump Assembly	1
20	23554	Retainer , fuel cooler rubber	1
21	98443025	Bolt , fuel cooler mounting bracket	2
22	93940000	Lockwasher , mounting bolt	2
23	R090238	Bracket , fuel cooler mounting	1
24	95310300	Locking Nut , fuel cooler mounting	2
25	TBD	Locking Nut , fuel filter	1
26	TBD	Washer , fuel filter	1
27	R090234	Bracket , fuel filter mounting	1
28	R024196	Fitting , fuel inlet	1
29	TBD	Nut , fuel filter mounting	1
30	TBD	Washer , fuel filter mounting	1
31	47038	Filter , fuel	1
32	30636	Fitting , fuel outlet	1
33	RS3864	Clamp , fuel line	2
34	98431	Fuel Line Assembly , filter to fuel pump	1
35	47064	Conduit , protective	1
36	49041	Fuel Line Assembly , 90 degree elbow	1

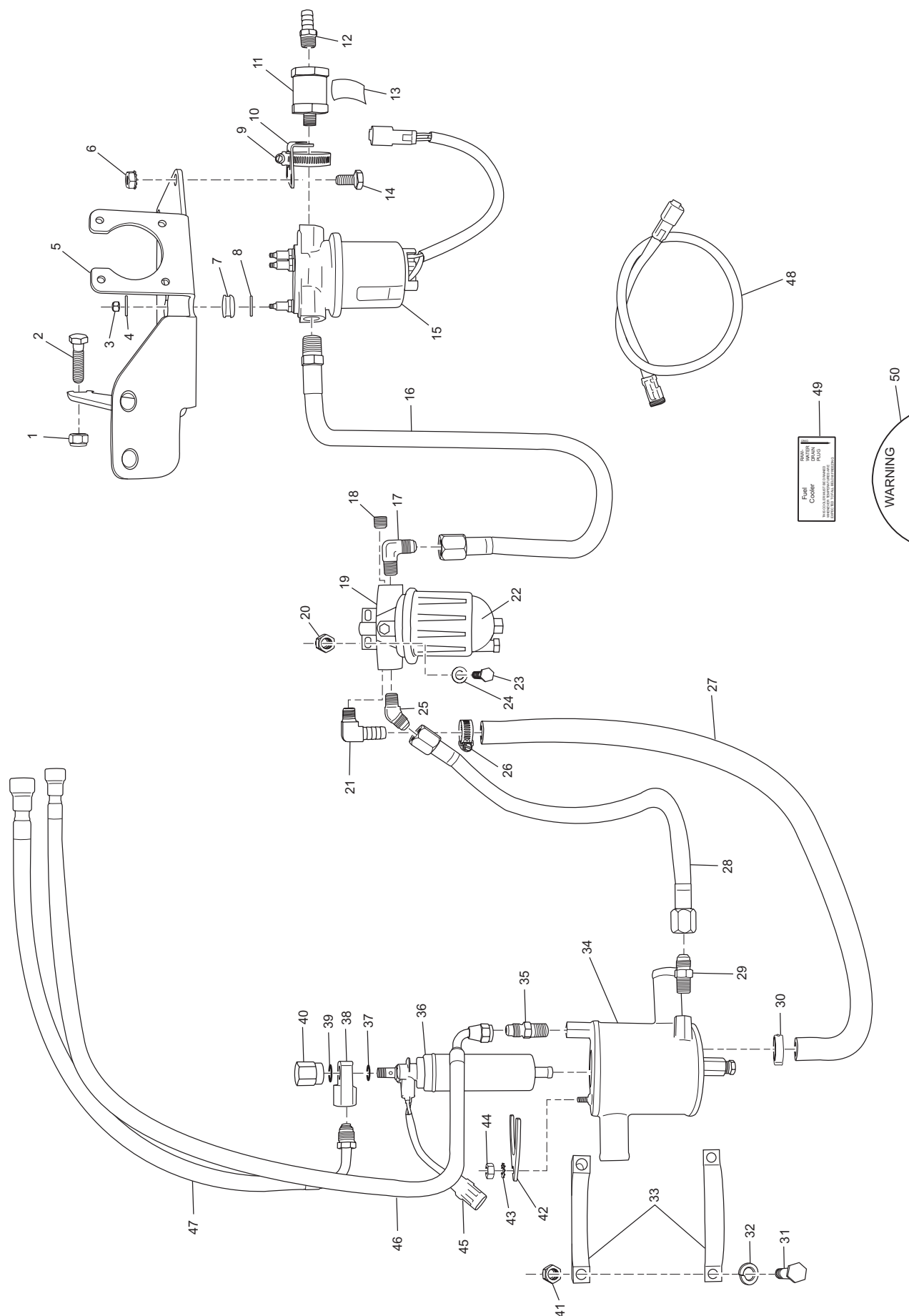
OLD RETURNLESS FUEL SYSTEM COMPONENTS - FIGURE 8 (cont'd) (thru S/N 630206)



OLD RETURNLESS FUEL SYSTEM COMPONENTS - FIGURE 8 (cont'd) (thru S/N 630206)

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
37	RS2180	Lockwasher , mounting bolt	2
38	90318325	Bolt , fuel cooler mounting	2
39	R147041	Fuel Cooler Assembly	1
40	98642	Retainer , fuel pump	1
41	TBD	Starwasher , retaining nut	1
42	TBD	Nut , fuel pump retainer attaching	1
43	47046	Fuel Filter , racor water separating	1
44	47047	Element , racor fuel filter (not shown)	1
45	RA085093	Fuel Line Assembly , fuel rail to fuel cooler	1
46	23645	Decal , fuel cooler system warning	1
47	23649	Decal , fuel system warning	1

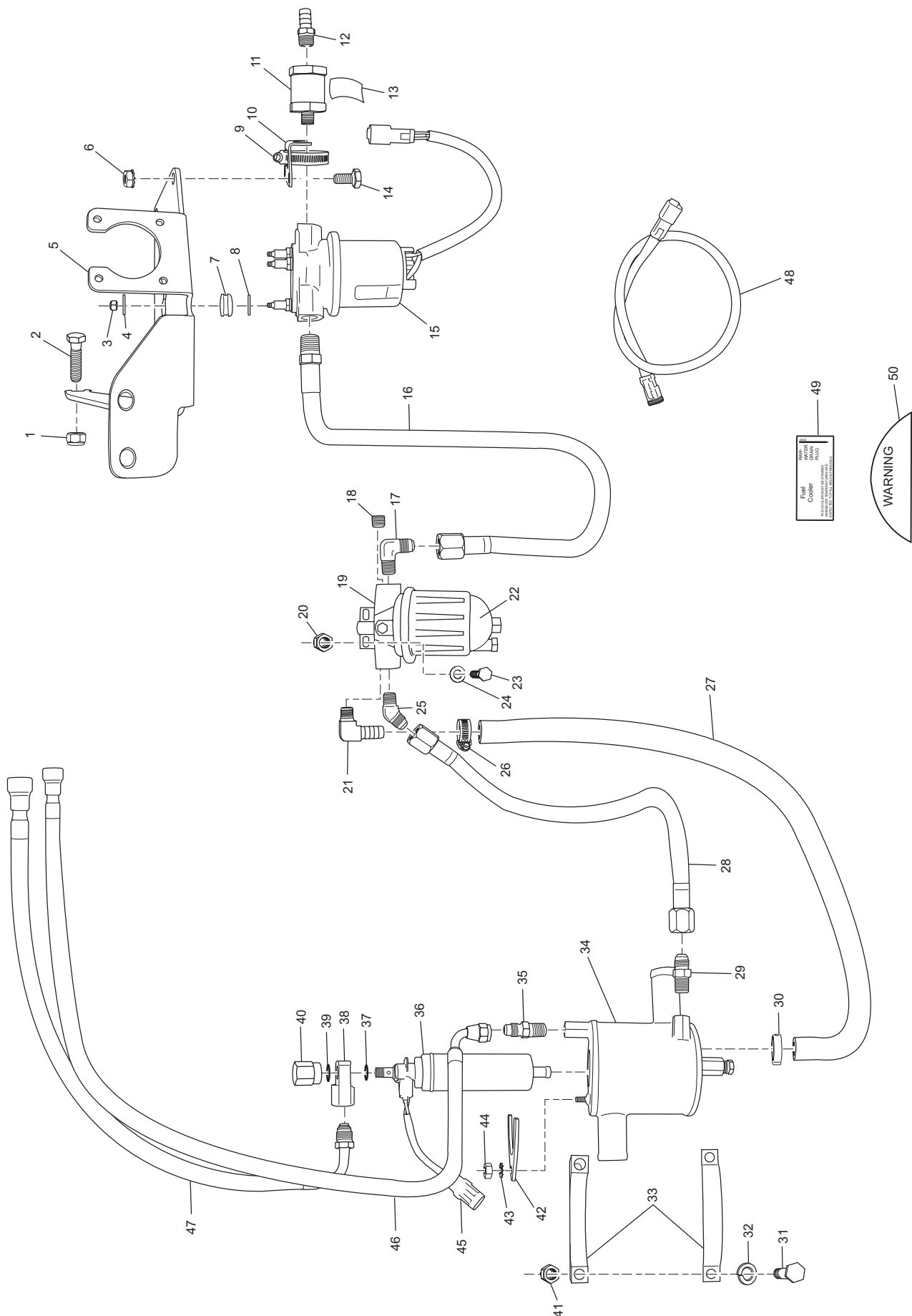
NEW RETURNLESS FUEL SYSTEM COMPONENTS - FIGURE 8A (S/N 630207 thru present)



NEW RETURNLESS FUEL SYSTEM COMPONENTS - FIGURE 8A (S/N 630207 thru present)

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RS2060	Nut , locking	1
2	90205125	Bolt , bracket mounting	1
3	RS1521L	Nut , locking	3
4	R096142	Flatwasher , mounting	3
5	R090270	Bracket , L.P. pump/racor water separating	1
6	RS1078	Nut , Oetiker filter bracket mounting	2
7	R094035A	Grommet , rubber	3
8	R096141	Flatwasher , mounting	3
9	RS3858	Clamp , Oetiker filter mounting	1
10	R090272	Bracket , Oetiker filter mounting	1
11	R077012	Filter , Oetiker fuel	1
12	30636	Fitting , fuel inlet	1
13	R094040	Adhesive , rubber strip	1
14	RS0251	Bolt , Oetiker filter bracket mounting	2
15	RA080018	Fuel Pump , low-pressure	1
16	RA085070	Fuel Line Assembly , L.P. fuel pump to racor filter	1
17	R024163	Fitting , 90 degree	1
18	RS3550	Fitting , blockoff	1
19	47046	Fuel Filter , racor water separating	1
20	RS2060	Nut , racor filter locking	2
21	R024207	Fitting , 90 degree	1
22	47047	Element , racor fuel filter (not shown)	1
23	RS0282	Bolt , racor filter mounting	2
24	92200000	Flatwasher , racor filter mounting	2
25	R024197	Fitting , 45 degree	1
26	RS3864	Clamp ,	1
27	98431	Fuel Line Assembly , racor filter to high pressure fuel pump	1
NS	47064	Conduit , protective (not shown)	1
28	RP085071	Fuel Line Assembly , fuel cooler to racor filter	1
29	R024163A	Fitting , cooler to hose assembly	1
30	R127087E	Clamp , crimp	1
31	90318325	Bolt , fuel cooler mounting	2
32	RS2180	Lockwasher , fuel cooler mounting	2
33	23554	Retainer , fuel cooler mounting	1
34	RA147041A	Fuel Cooler Assembly	1

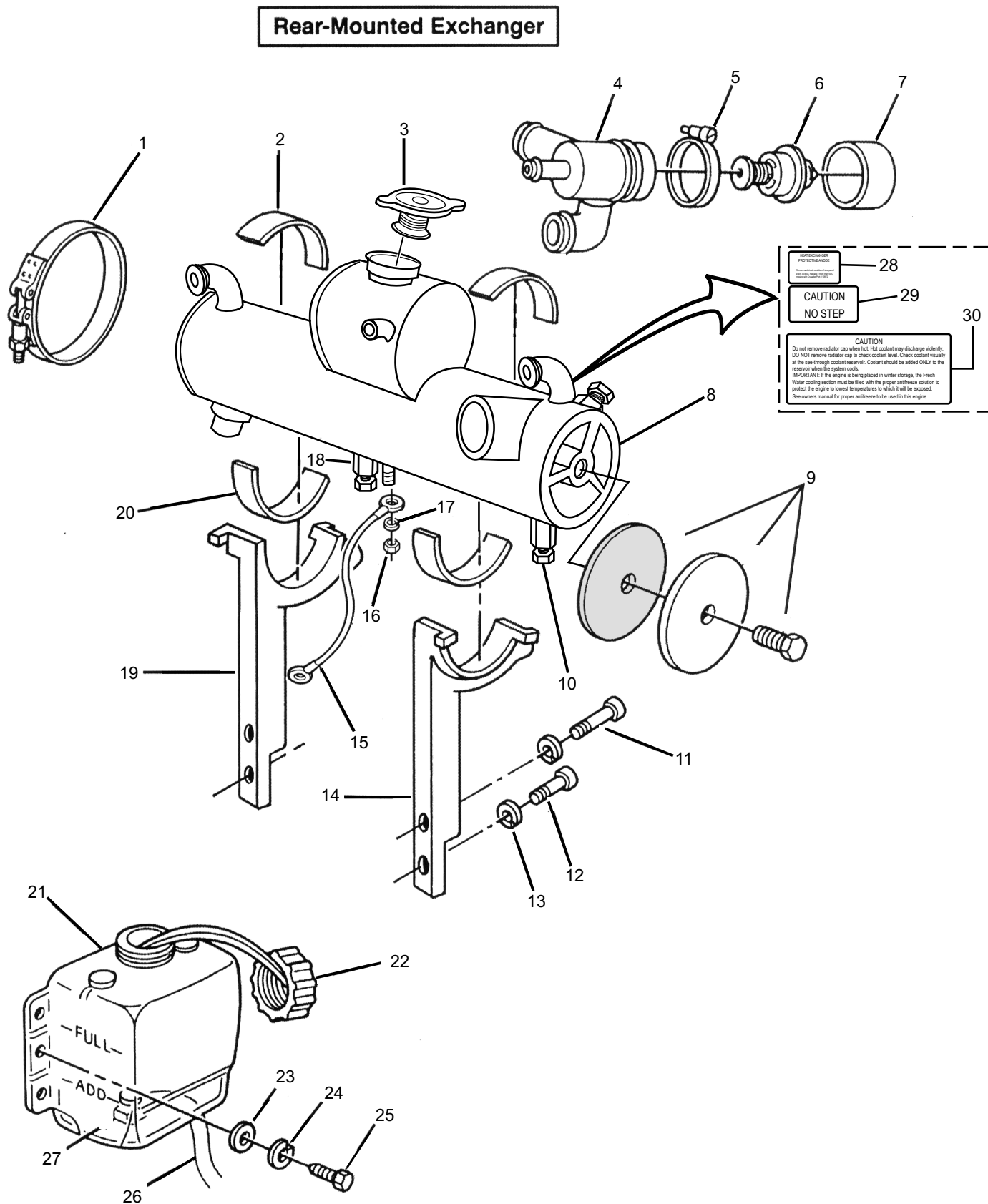
NEW RETURNLESS FUEL SYSTEM COMPONENTS - FIGURE 8A (cont'd) (S/N 630207 thru present)



NEW RETURNLESS FUEL SYSTEM COMPONENTS - FIGURE 8A (cont'd) (S/N 630207 thru present)

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
35	R024175	Fitting , hose assembly to cooler	1
36	47039	Electric Fuel Pump Assembly	1
37	23515	O-ring , fuel fitting sealing	1
38	98440	Fitting , fuel line to fuel pump	1
39	23516	O-ring , fuel fitting sealing	1
40	98442	Nut , fitting to fuel pump	1
41	95310300	Locking Nut , fuel cooler mounting	2
42	98642	Retainer , fuel pump	1
43	TBD	Starwasher , retaining nut	1
44	TBD	Nut , fuel pump retainer attaching	1
45	49038	Harness , fuel pump	1
46	RA085091A	Fuel Line Assembly , fuel rail to fuel cooler	1
47	RA085098	Fuel Line Assembly , fuel pump to fuel rail	1
48	R121077	Jumper Harness , low-pressure fuel pump	1
49	23645	Decal , fuel cooler system warning	1
50	23649	Decal , fuel system warning	1

HEAT EXCHANGER and COMPONENTS - FIGURE 9

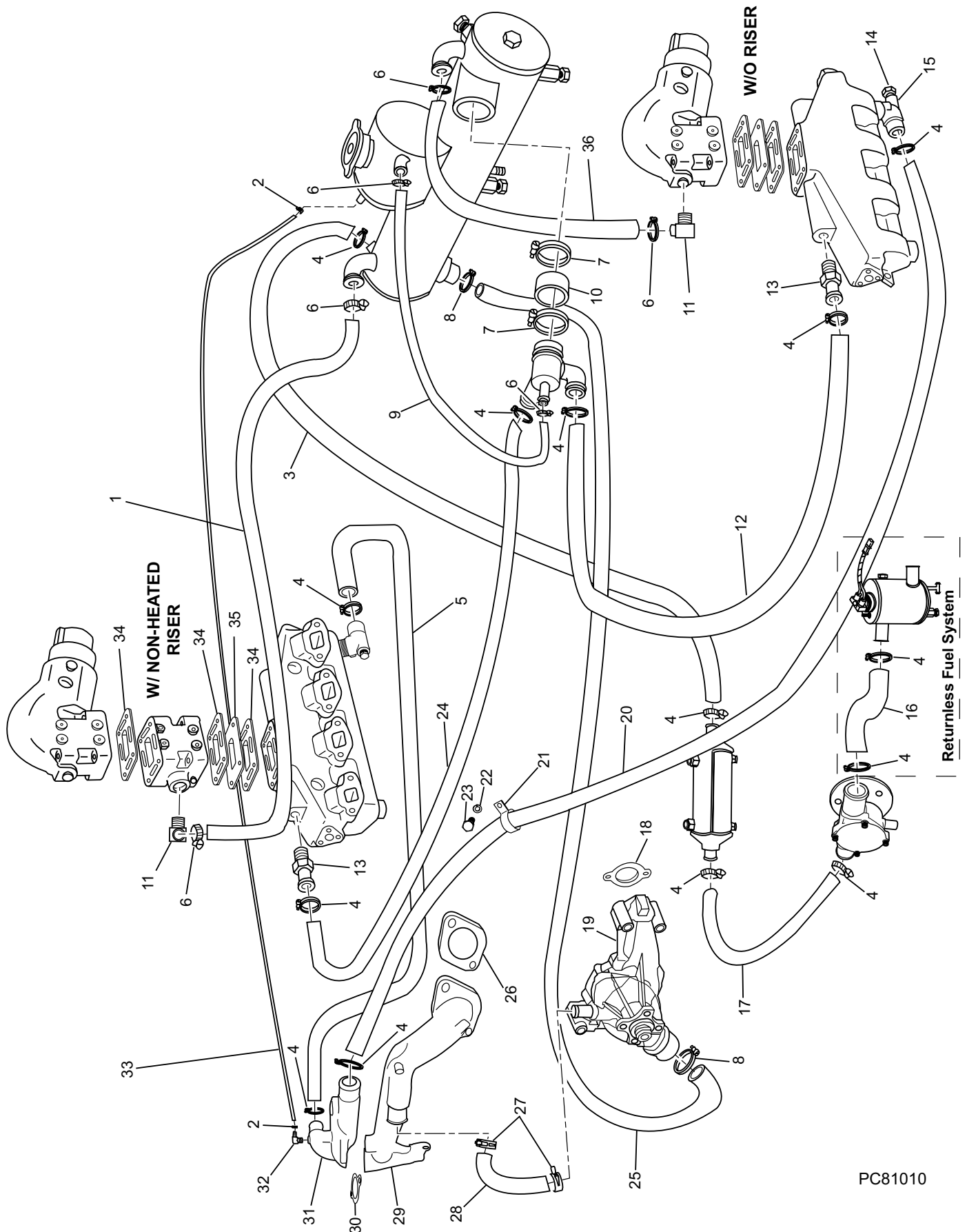


PC81009

HEAT EXCHANGER and COMPONENTS - FIGURE 9

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R171009	Clamp , exchanger mounting	2
2	R094041	Isolator , top	2
3	R034006A	Pressure Cap (7 lb) , exchanger	1
4	R025027	Thermostat Housing	1
5	RS3860	Clamp , thermostat housing (#36)	2
6	98203	Thermostat (170 degree)	1
7	98204	Hose , thermostat housing attaching	1
8	RA147039	Heat Exchanger Assembly	1
9	23540	End Cap Kit , exchanger	AR
10	RS3552	Plug , drain (1/4")	1
11	90368175	Bolt , support attaching (1 3/4")	2
12	90368100	Bolt , support attaching (1")	2
13	RS2180	Lockwasher , support attaching bolt	4
14	R090254	Support , exchanger (port)	1
15	R101013	Wire , grounding	1
16	TBD	Nut , ground wire stud	1
17	TBD	Lockwasher , ground wire stud	1
18	R168008	Zinc , sacrificial	1
19	R090225	Support , exchanger (starboard)	1
20	R094040	Isolator , bottom	2
21	R146002	Bottle , coolant overflow	1
22	23527	Cap , coolant fill	1
23	92200000	Washer , mounting bolt	2
24	RS2179	Lockwasher , mounting bolt	2
25	RS0280	Bolt , coolant overflow mounting (3/4")	2
26	R045139	Tube , overflow (48")	1
27	R127084	Clamp , overflow tube	2
28	23267	Decal , exchanger	1
29	22847	Decal , exchanger	1
30	23657	Decal , exchanger	1

FRESH WATER COOLING SYSTEM COMPONENTS (NON-HEATED RISERS) - FIGURE 10

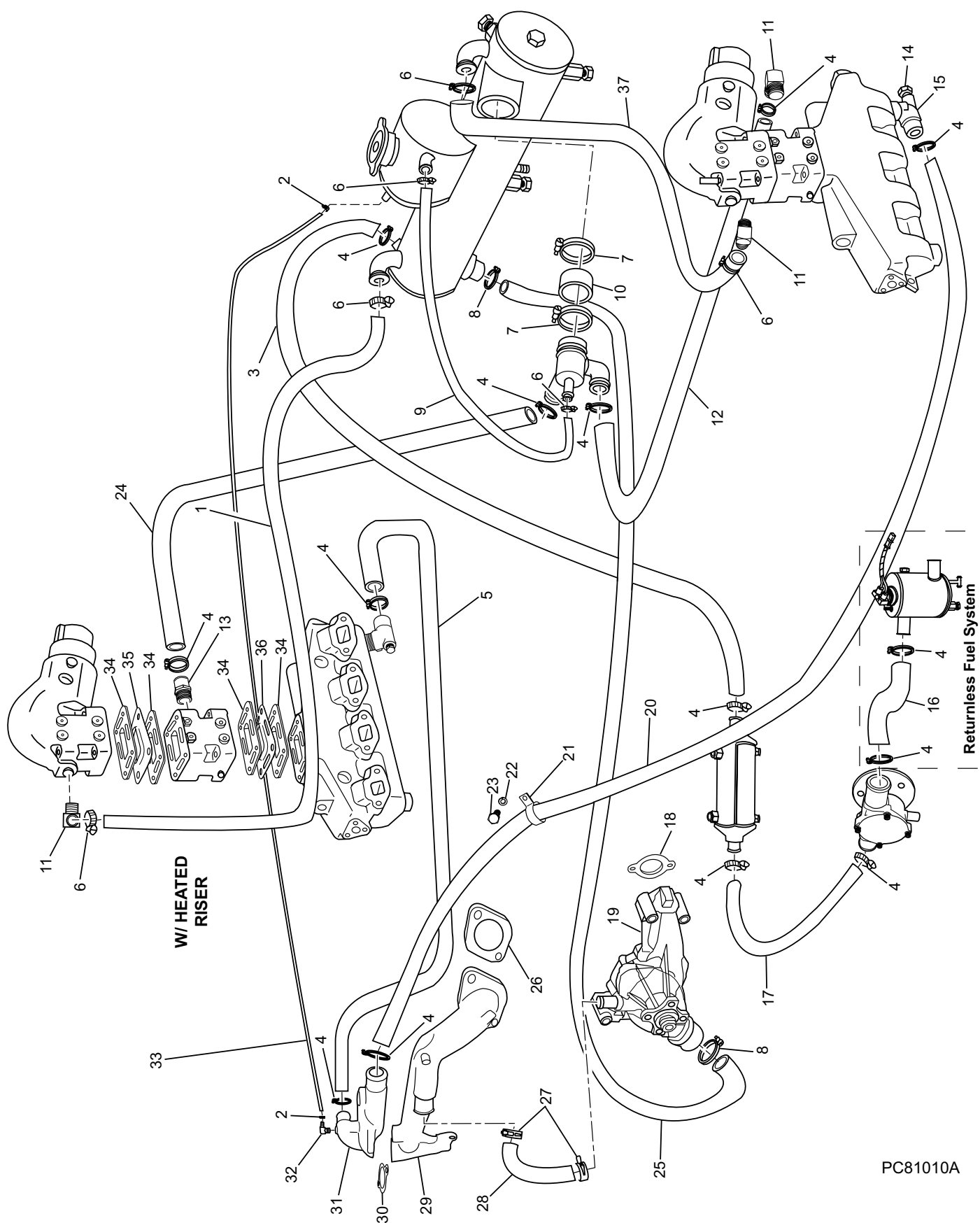


PC81010

FRESH WATER COOLING SYSTEM COMPONENTS (NON-HEATED RISERS) - FIGURE 10

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R045124	Hose , exchanger to exhaust elbow (Port STD)	1
1	R045125	Hose , exchanger to exhaust elbow (Starboard STD)	1
2	RS3870	Clamp , hose	2
3	R045123	Hose , oil cooler to exchanger	1
4	RS3858	Clamp , hose (#20)	14
5	R045127	Hose , fill riser to exhaust manifold (Starboard)	1
6	RS3851	Clamp , hose (#16)	6
7	RS3860	Clamp , thermostat housing (#36)	2
8	RS3855	Clamp , hose (#32)	2
9	20806	Hose , bypass - thermostat housing to expansion tank	1
10	98204	Hose , thermostat housing attaching	1
11	R024006A	Fitting , 90 degree	2
12	18307	Hose , thermostat housing to exhaust manifold (LH)	1
13	97852	Fitting , exhaust elbow (1" hose)	2
14	RS3554	Plug , drain	2
15	30624	Fitting , exhaust manifold (90 degree)	2
16	R045129	Hose , raw water pump to fuel cooler assembly (returnless fuel system only)	1
17	R045122	Hose , raw water pump to oil cooler	1
18	RM0266	Gasket , water pump to engine block	2
19	RA057030	Water Pump Assembly	1
20	R045128	Hose , fill riser to exhaust manifold (Port)	1
21	R090082	Clamp , strap	1
22	93920000	Lockwasher , strap clamp attaching	1
23	98223016	Bolt , strap clamp attaching	1
24	18308	Hose , thermostat housing to exhaust manifold (RH)	1
25	R045126	Hose , circulation pump to exchanger	1
26	RM0268	Gasket , water crossover	1
27	RS3864	Clamp , hose	2
28	R045116A	Hose , circulation pump to water crossover	1
29	R025034	Water Crossover	1
30	RM0121	Gasket , distribution housing to water crossover	1
31	R025030	Housing , coolant distribution	1
32	R024055	Fitting , fill riser (90 degree)	1
33	R045132	Hose , fill riser to expansion tank	1
34	98127	Gasket , elbow to riser / elbow to manifold / riser to manifold	6
35	98124	Plate , blockoff	2
36	R045124A	Hose , exchanger to exhaust elbow (Port "V"-Drive)	1
36	R045124	Hose , exchanger to exhaust elbow (Port STD)	1

FRESH WATER COOLING SYSTEM COMPONENTS (HEATED RISERS) - FIGURE 10A

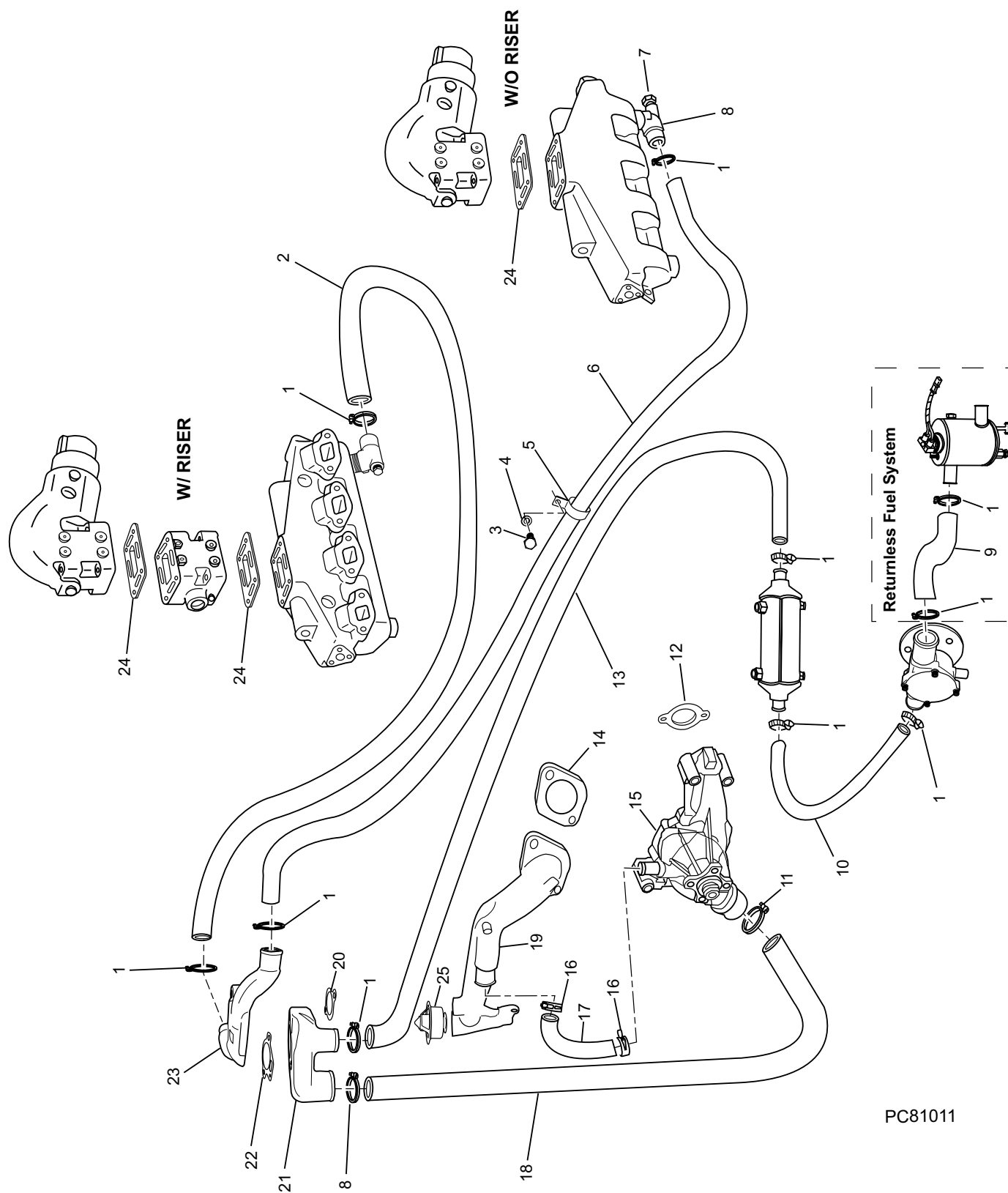


PC81010A

FRESH WATER COOLING SYSTEM COMPONENTS (HEATED RISERS) - FIGURE 10A

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R045125A	Hose , exchanger to exhaust elbow (Starboard "V"-Drive)	1
1	R045125	Hose , exchanger to exhaust elbow (Starboard STD)	1
2	RS3870	Clamp , hose	2
3	R045123	Hose , oil cooler to exchanger	1
4	RS3858	Clamp , hose (#20)	14
5	R045127	Hose , fill riser to exhaust manifold (Starboard)	1
6	RS3851	Clamp , hose (#16)	6
7	RS3860	Clamp , thermostat housing (#36)	2
8	RS3855	Clamp , hose (#32)	2
9	20806	Hose , bypass - thermostat housing to expansion tank	1
10	98204	Hose , thermostat housing attaching	1
11	R024006A	Fitting , 90 degree	3
12	R045136	Hose , thermostat housing to exhaust manifold (LH)	1
13	97852	Fitting , exhaust elbow (1" hose)	1
14	RS3554	Plug , drain	2
15	30624	Fitting , exhaust manifold (90 degree)	2
16	R045129	Hose , raw water pump to fuel cooler assembly (returnless fuel system only)	1
17	R045122	Hose , raw water pump to oil cooler	1
18	RM0266	Gasket , water pump to engine block	2
19	RA057030	Water Pump Assembly	1
20	R045128	Hose , fill riser to exhaust manifold (Port)	1
21	R090082	Clamp , strap	1
22	93920000	Lockwasher , strap clamp attaching	1
23	98223016	Bolt , strap clamp attaching	1
24	18414	Hose , thermostat housing to exhaust manifold (RH)	1
25	R045126	Hose , circulation pump to exchanger	1
26	RM0268	Gasket , water crossover	1
27	RS3864	Clamp , hose	2
28	R045116A	Hose , circulation pump to water crossover	1
29	R025034	Water Crossover	1
30	RM0121	Gasket , distribution housing to water crossover	1
31	R025030	Housing , coolant distribution	1
32	R024055	Fitting , fill riser (90 degree)	1
33	R045132	Hose , fill riser to expansion tank	1
34	98127	Gasket , elbow to riser / elbow to manifold / riser to manifold	8
35	98124	Wing Plate , blockoff	2
36	98124A	Wing Plate , pass thru	2
37	R045124A	Hose , exchanger to exhaust elbow (Port "V"-Drive)	1
37	R045124	Hose , exchanger to exhaust elbow (Port STD)	1

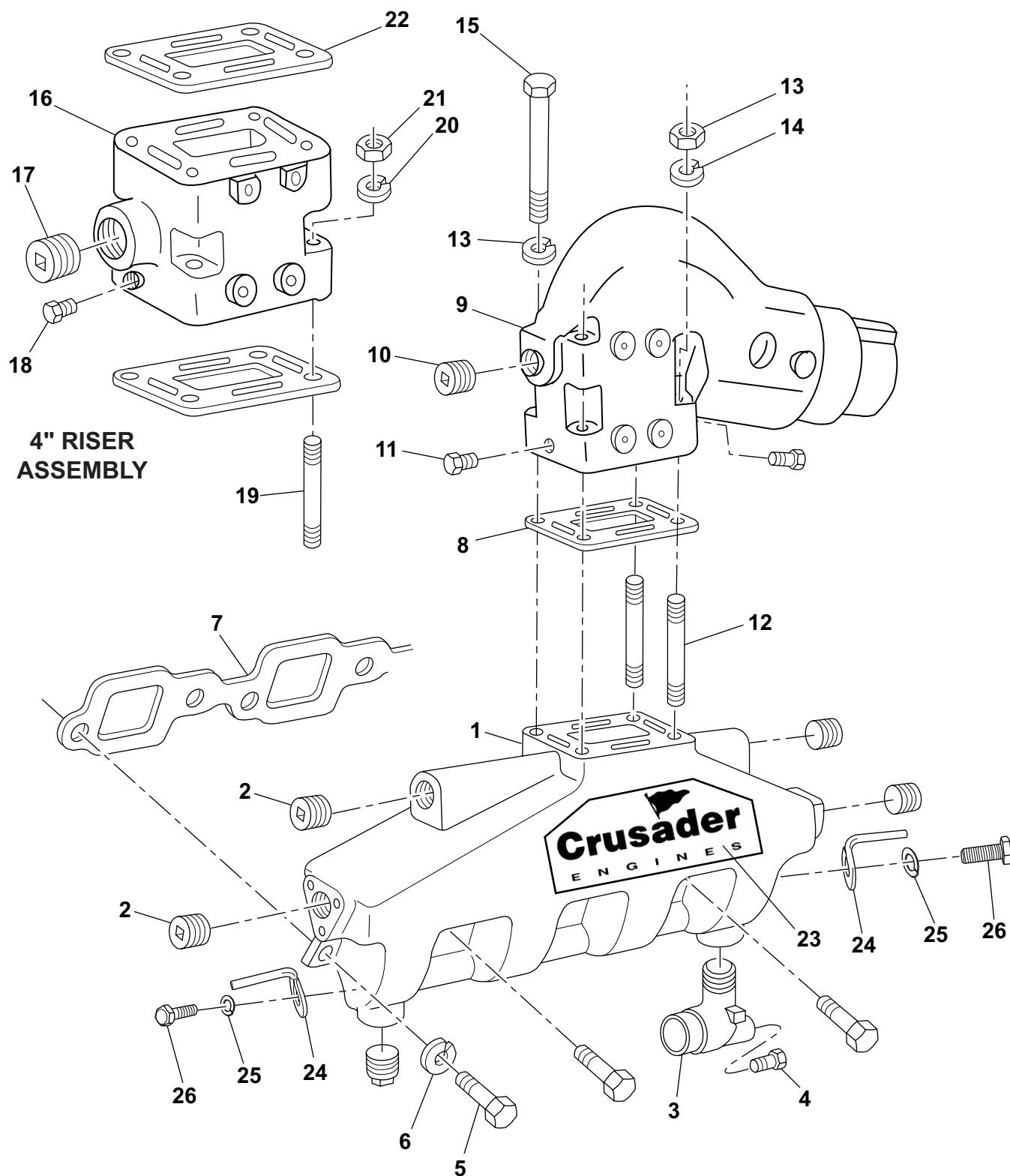
RAW WATER COOLING SYSTEM COMPONENTS - FIGURE 11



RAW WATER COOLING SYSTEM COMPONENTS - FIGURE 11

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RS3858	Clamp , hose (#20)	10
2	R045131	Hose , fill riser to exhaust manifold (Starboard)	1
3	98223016	Bolt , strap clamp attaching	1
4	93920000	Lockwasher , strap clamp attaching	1
5	R090082	Clamp , strap	1
6	R045128	Hose , fill riser to exhaust manifold (Port)	1
7	RS3554	Plug , drain	2
8	30624	Fitting , exhaust manifold (90 degree)	2
9	R045129	Hose , raw water pump to fuel cooler assembly (returnless fuel system only)	AR
10	R045122	Hose , raw water pump to oil cooler	1
11	RS3855	Clamp , hose (#32)	2
12	RM0266	Gasket , water pump to engine block	2
13	R045137	Hose , fill riser to oil cooler	1
14	RM0268	Gasket , water crossover	2
15	RA057030	Water Pump Assembly	1
16	RS3864	Clamp , hose	2
17	R045116A	Hose , circulation pump to water crossover	1
18	R045138	Hose , circulation pump to fill riser	1
19	R025034	Water Crossover	1
20	RM0121	Gasket , distribution housing to water crossover	1
21	R025028	Fill Riser , lower	1
22	RM0256	Gasket , upper fill riser to lower fill riser	1
23	R025029	Fill Riser , upper	1
24	98127	Gasket , elbow to riser / elbow to manifold / riser to manifold	4
25	R026002	Thermostat (160 degree)	1

EXHAUST MANIFOLD and COMPONENTS - FIGURE 12

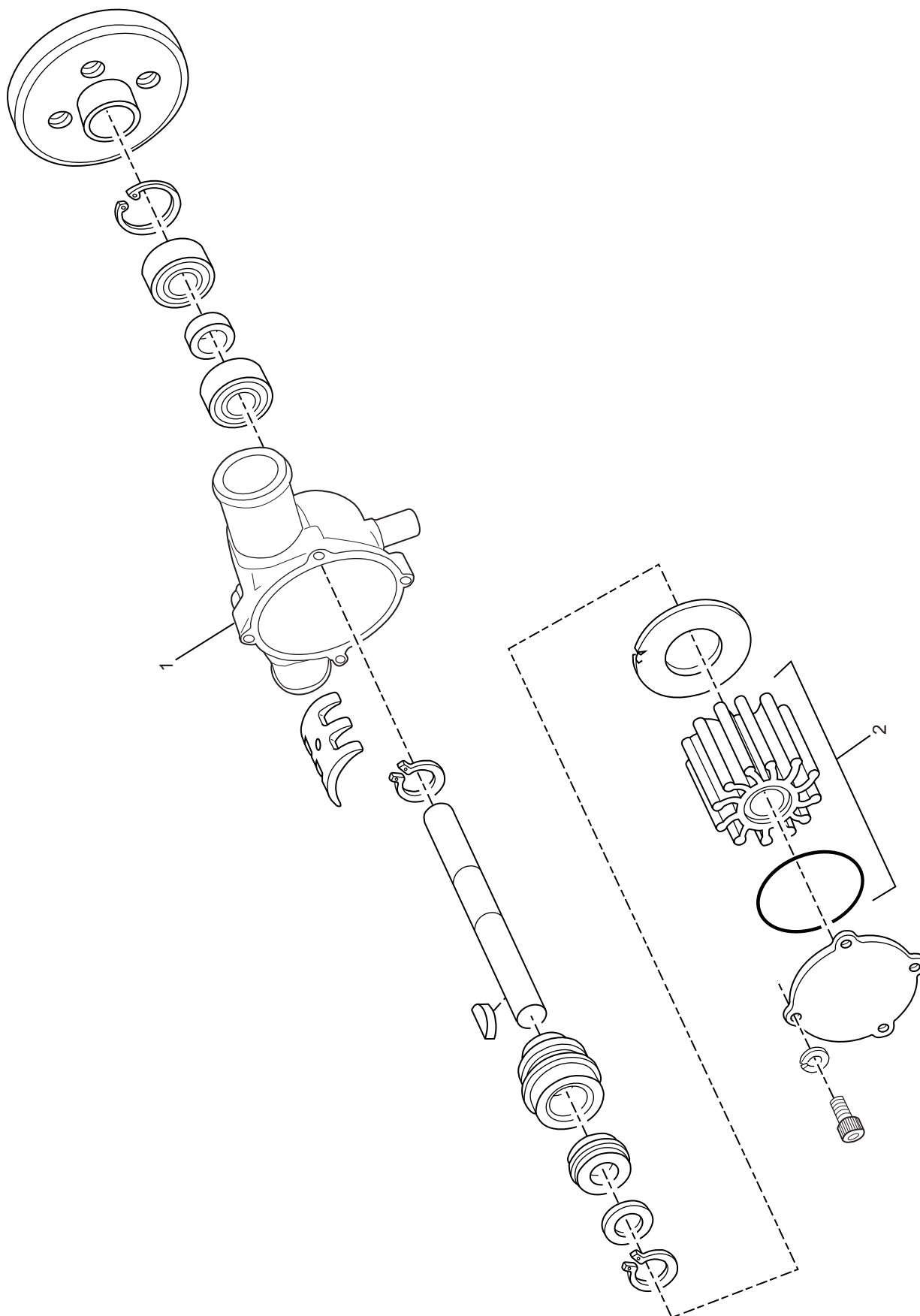


PC81012

EXHAUST MANIFOLD and COMPONENTS - FIGURE 12

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R028021	Exhaust Manifold	2
2	103876	Plug , exhaust manifold (1")	8
3	30624	Fitting , water elbow (90 degree)	2
4	RS3552	Plug , drain	2
5	98333035	Bolt , manifold to cylinder head	16
6	93930000	Lockwasher , manifold to head bolt	16
7	96653	Gasket , manifold to cylinder head	2
8	98127	Gasket , manifold to exhaust elbow	2
9	98126	Exhaust Elbow Assembly ,	2
9	R029015	Exhaust Elbow Assembly ,	2
10	RS3556	Plug , exhaust elbow (3/4")	2
11	RS3554	Plug , drain	4
12	20827	Stud , exhaust elbow attaching (T)	4
13	93300000	Lockwasher , elbow attaching stud	8
14	95300000	Nut , elbow attaching stud	4
15	90305475	Bolt , exhaust elbow attaching (4 3/4")	4
*	22818	4-Inch Riser Kit	1
16	98128	Exhaust Riser	2
17	RS3556	Plug , exhaust riser (3/4")	2
18	RS3554	Plug , drain	4
19	20783	Stud , riser mounting (2 3/4")	8
20	93300000	Lockwasher , riser mounting stud	8
21	95300000	Nut , riser mounting stud	8
22	98127	Gasket , riser mounting	4
23	R143129	Decal , exhaust manifold	2
24	R096144	Bracket , spark plug wire loom	4
25	RS0302	Lockwasher , attaching bolt	4
26	RS2180	Bolt , wire loom attaching	4
*NOTE: See Fresh Water Cooling section for parts used on Fresh Water Cooled engines.			

RAW WATER COOLING PUMP - FIGURE 13

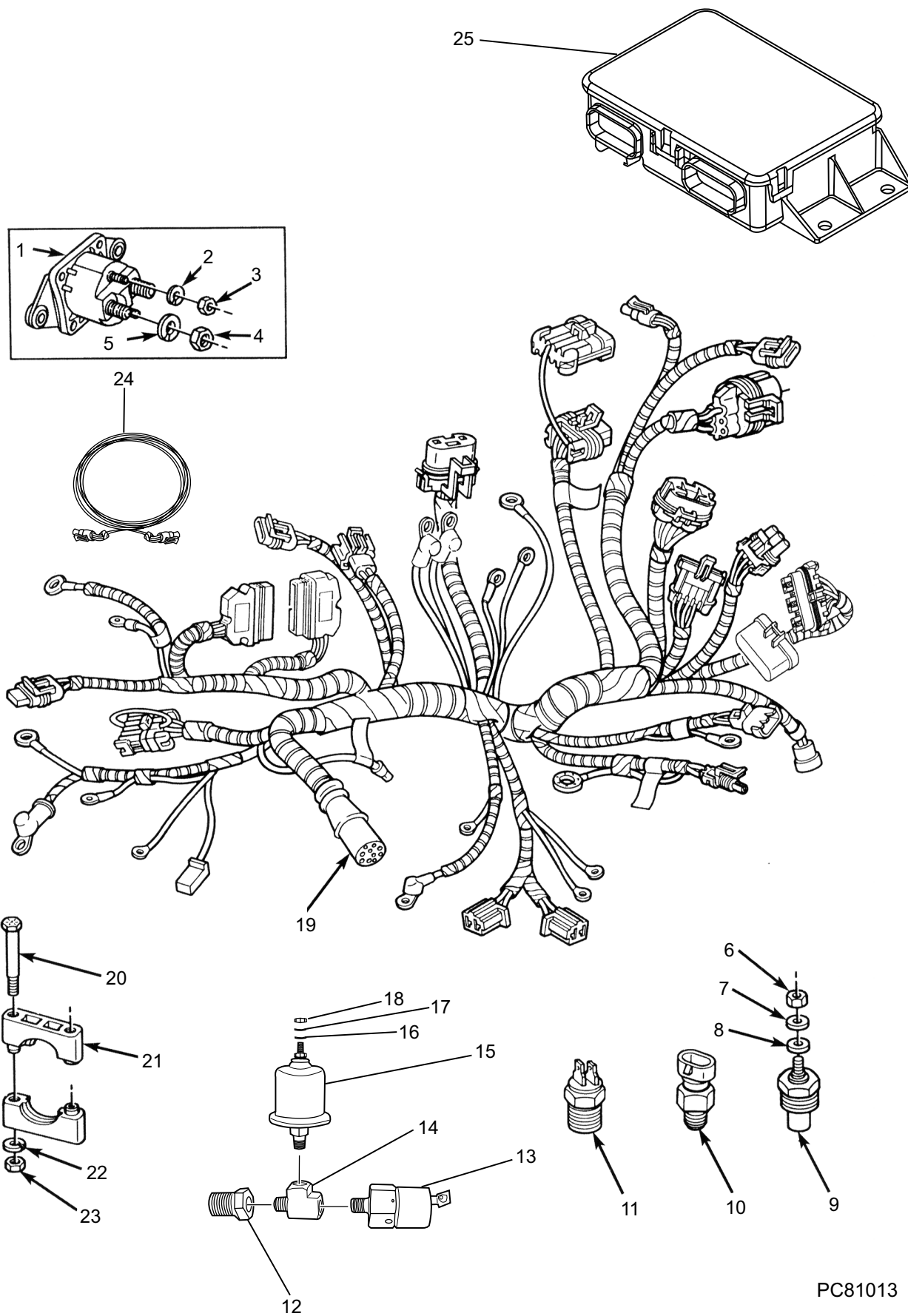


PC81023

RAW WATER COOLING PUMP - FIGURE 13

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RA057028	Raw Water Pump Assembly	1
2	RP061017	Kit , impeller	1

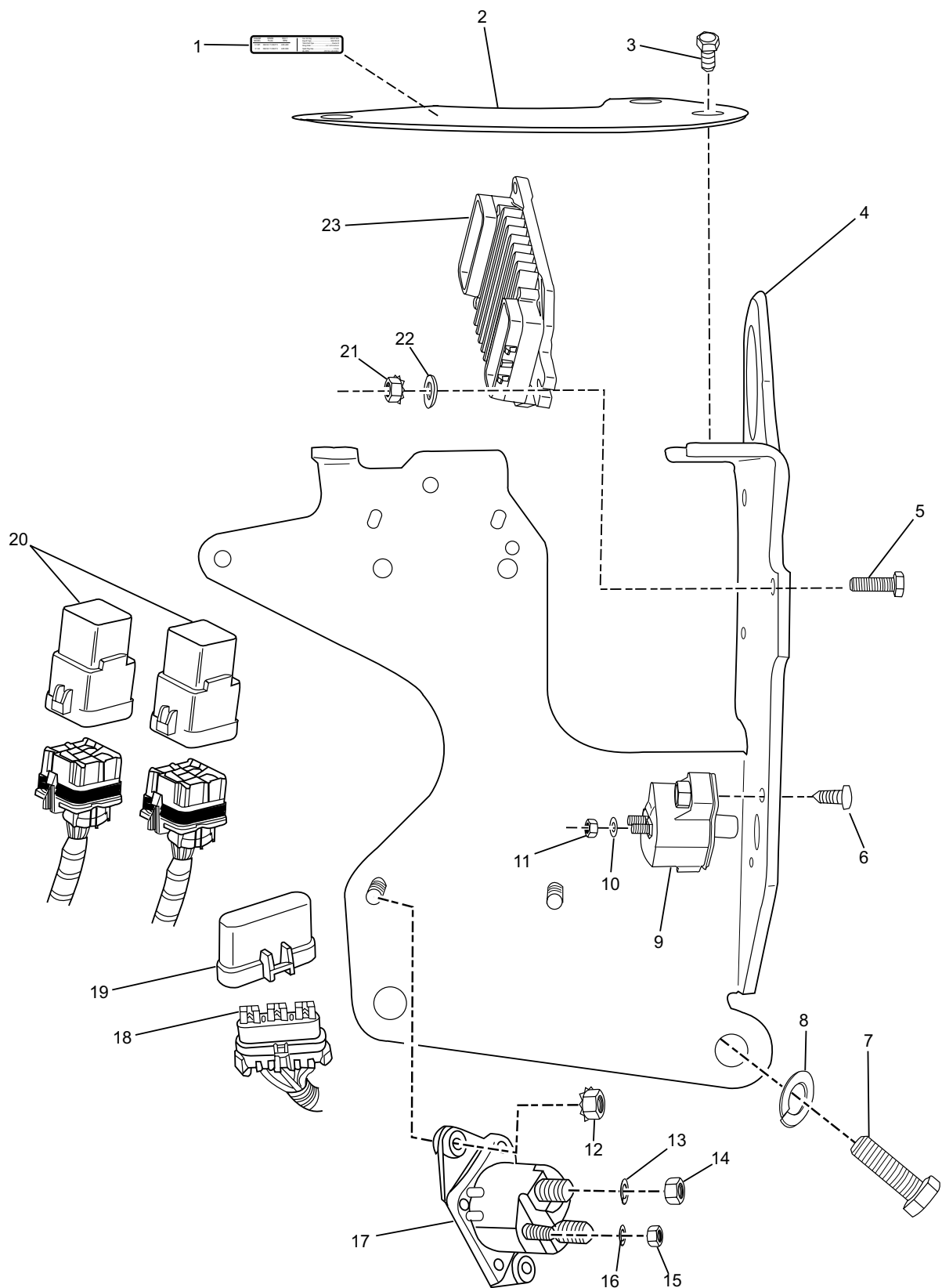
WIRING HARNESS ASSEMBLIES and SENDERS - FIGURE 14



WIRING HARNESS ASSEMBLIES and SENDERS - FIGURE 14

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R130014	Solenoid , starter slave	1
2	95011000	Nut , solenoid terminal (#10)	1
3	93003000	Lockwasher , solenoid terminal (#10)	1
4	95201000	Nut , solenoid terminal (5/16")	2
5	93203000	Lockwasher , solenoid terminal (5/16")	2
6	95011000	Nut , sender terminal	1
7	95300300	Lockwasher , sender terminal	1
8	92300200	Washer , sender terminal	1
9	R020003	Sender , temperature (SS)	1
9	727046	Sender , temperature (DS)	AR
9	22701	Sender , temperature (SS-VDO)	AR
9	22703	Sender , temperature (DS-VDO)	AR
10	R020019	Sensor , engine coolant temperature (ECT)	1
11	R020037	Switch , transmission alarm	1
12	RS3677	Adapter , sender attaching tee	1
13	R020015A	Switch , oil pressure (SS)	1
14	R024145	Tee , sender attaching	1
15	R020001	Sender , oil pressure (SS)	1
15	R020006	Sender , oil pressure (DS)	AR
15	22702	Sender , oil pressure (SS-VDO)	AR
15	22704	Sender , oil pressure (DS-VDO)	AR
16	92300200	Washer , sender terminal	1
17	95300300	Lockwasher , sender terminal	1
18	95011000	Nut , sender terminal	1
19	RA121071	Engine Wiring Harness Assembly , mechanical throttle body	1
19	TBD	Engine Wiring Harness Assembly , electronic throttle body	AR
20	90105300	Bolt , clamp attaching	2
21	R127093	Clamp , main connector mounting	2
22	92100000	Lockwasher , attaching bolt	2
23	95104300	Nut , attaching bolt	2
24	RA121072	Harness , slave 3-pin connector (twin applications only)	AR
25	TBD	Throttle Actuator Control (TAC) Module (electronic throttle control only)	AR

ECM and RELAYS - FIGURE 15

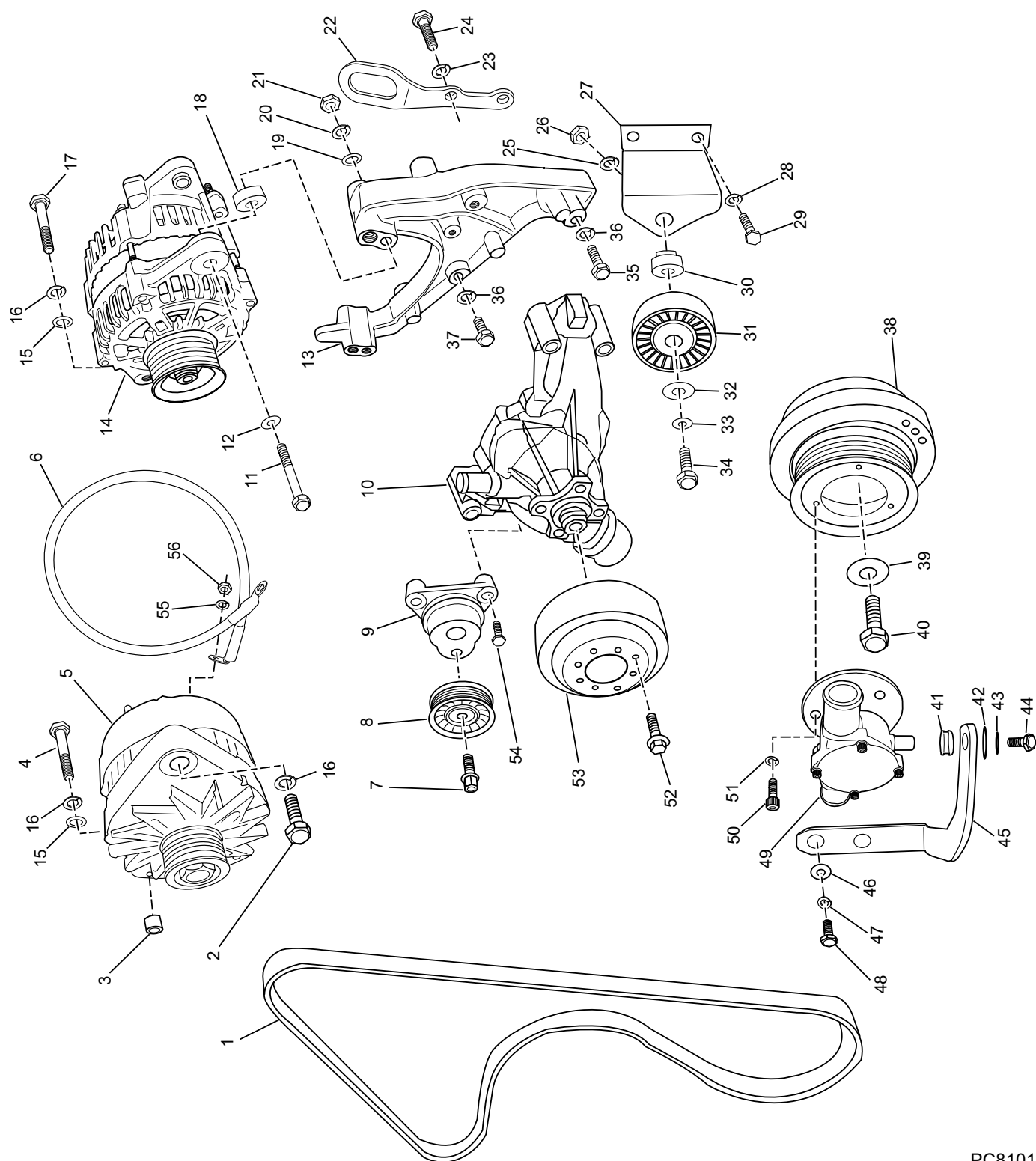


PC81014

ECM and RELAYS - FIGURE 15

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R143128	Decal , ECM cover	1
2	R126015	Cover , ECM	1
3	RS5126	Screw , ECM cover attaching	3
4	R090231	Bracket , ECM/relay mounting	1
5	RS0254	Bolt , ECM mounting	3
6	RS5084	Bolt , circuit breaker mounting	2
7	98443025	Bolt , ECM/relay mounting bracket attaching	2
8	93940000	Lockwasher , bracket mounting bolt	2
9	R153006B	Circuit Breaker Assembly (50 amp)	1
10	TBD	Washer , circuit breaker terminal	2
11	TBD	Nut , circuit breaker terminal	2
12	RS1078	Nut , circuit breaker mounting starwasher	2
13	RS2200	Lockwasher , solenoid terminal (5/16")	1
14	RS1046	Nut , solenoid terminal (5/16")	1
15	RS1540	Nut , solenoid terminal (#10)	1
16	RS2197	Lockwasher , solenoid terminal (#10)	1
17	R130014	Solenoid , starter slave	1
18	R153017B	Fuses , 20 amp	3
19	R126014	Cover , fuse holder	1
20	R130012	Relay Assembly , fuel pump and ignition	2
21	RS1078	Nut , ECM mounting starwasher	3
22	92100000	Washer , ECM mounting	1
23	R116019	Electronic Control Module (ECM)	1

ACCESSORY DRIVE SYSTEM COMPONENTS - FIGURE 16

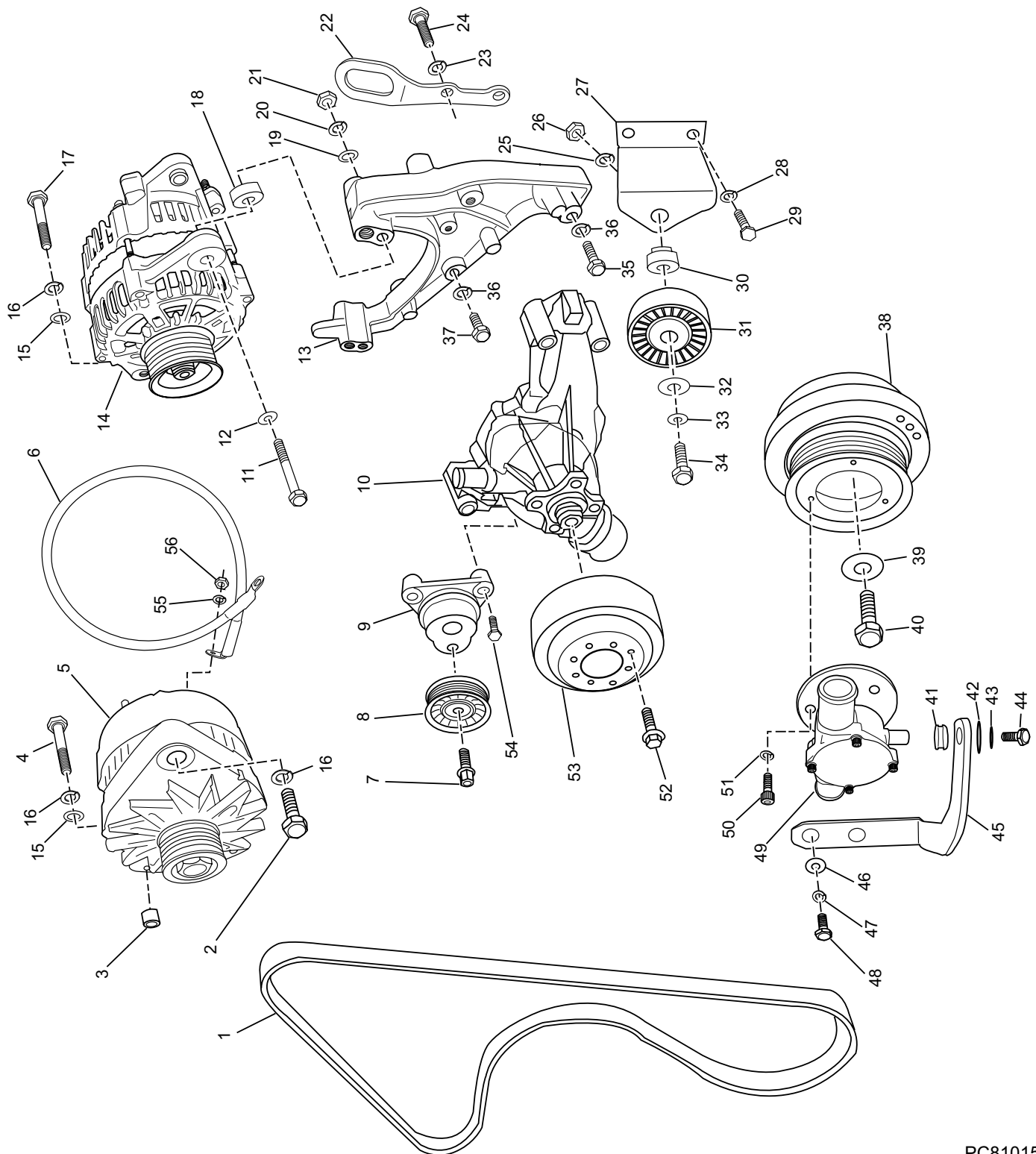


PC81015

ACCESSORY DRIVE SYSTEM COMPONENTS - FIGURE 16

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R066024	Belt , accessory drive	1
2	90505200	Bolt , mounting (100 amp alternator only)	AR
3	R062082	Spacer , mounting (100 amp alternator only)	AR
4	90205300	Bolt , mounting (100 amp alternator only)	AR
5	RA097008	Alternator Assembly , (100 amp)	AR
6	R101012	Cable , ground (100 amp alternator only)	AR
7	TBD	Bolt , tensioner attaching	1
8	TBD	Pulley , belt tensioner	1
9	RA068001	Tensioner , belt	1
10	RA057030	Water Pump Assembly	1
11	98333110	Bolt , alternator attaching (65 amp)	1
12	92930000	Washer , alternator attaching bolt (65 amp)	1
13	R090225	Bracket , alternator mounting	1
14	RA097007	Alternator Assembly , (65 amp)	1
15	92930000	Washer , alternator attaching bolt	1
16	93930000	Lockwasher , alternator attaching bolt	1
17	90205300	Bolt , alternator attaching (65 amp)	1
18	R062081	Spacer , alternator mounting (65 amp)	1
19	92930000	Washer , alternator mounting bolt	1
20	93930000	Lockwasher , alternator mounting bolt	1
21	97330000	Nut , alternator mounting	1
22	R042009	Bracket , lift	1
23	93940000	Lockwasher , lift bracket attaching bolt	2
24	98443025	Bolt , lift bracket attaching	2
25	93940000	Lockwasher , idler pulley attaching bolt	1
26	97440000	Nut , idler pulley attaching bolt	1
27	R090232	Bracket , idler pulley mounting	1
28	93940000	Lockwasher , idler pulley mounting bracket bolt	2
29	98443025	Bolt , idler pulley mounting bracket	2
30	R062083	Spacer , idler pulley	1
31	R065040	Pulley , idler	1
32	R096145	Washer , idler pulley attaching bolt large	1
33	92940000	Washer , idler pulley attaching bolt small	1
34	98443050	Bolt , idler pulley attaching	1
35	98449055	Bolt , alternator bracket attaching bolt (long)	1
36	93940000	Lockwasher , alternator bracket attaching bolt	2
37	98449050	Bolt , alternator bracket attaching (short)	1
38	R064015	Balancer , crankshaft (STD)	1
38	R064015A	Balancer , crankshaft (HO)	1
39	TBD	Washer , crankshaft balancer	1
40	TBD	Bolt , crankshaft balancer	1
41	R094038	Grommet , rubber	1

ACCESSORY DRIVE SYSTEM COMPONENTS - FIGURE 16

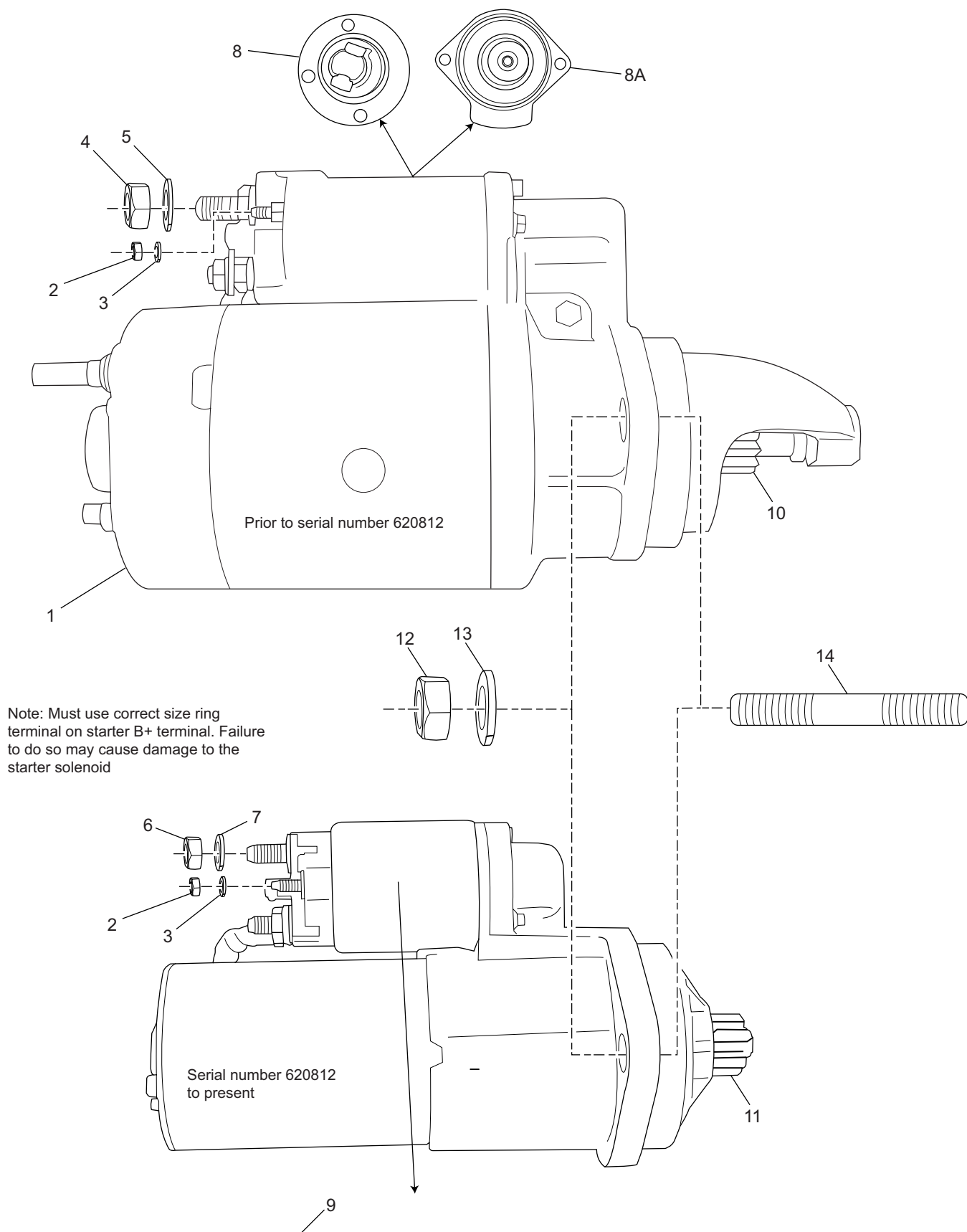


PC81015

ACCESSORY DRIVE SYSTEM COMPONENTS - FIGURE 16

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
42	RS2673	Washer , mounting bolt large	1
43	RS2179	Washer , mounting bolt small	1
44	RS0280	Bolt , raw water pump mounting	1
45	R090216	Bracket , raw water pump mounting	1
46	92940000	Washer , raw water pump mounting bracket	2
47	93940000	Lockwasher , raw water pump mounting bracket	2
48	98443025	Bolt , raw water pump mounting bracket	2
49	RA057028	Raw Water Pump Assembly	1
50	99443030	Bolt , raw water pump-to-balancer mounting	3
51	93940000	Lockwasher , raw water pump-to-balancer mounting	3
52	TBD	Bolt , engine circulating pump pulley mounting	4
53	R065044	Pulley , engine circulating pump	1
54	98443050	Bolt , belt tensioner mounting	2
55	TBD	Lockwasher , ground cable attaching (100 amp only)	1
56	TBD	Nut , ground cable attaching (100 amp only)	1

STARTER ASSEMBLY COMPONENTS - FIGURE 17

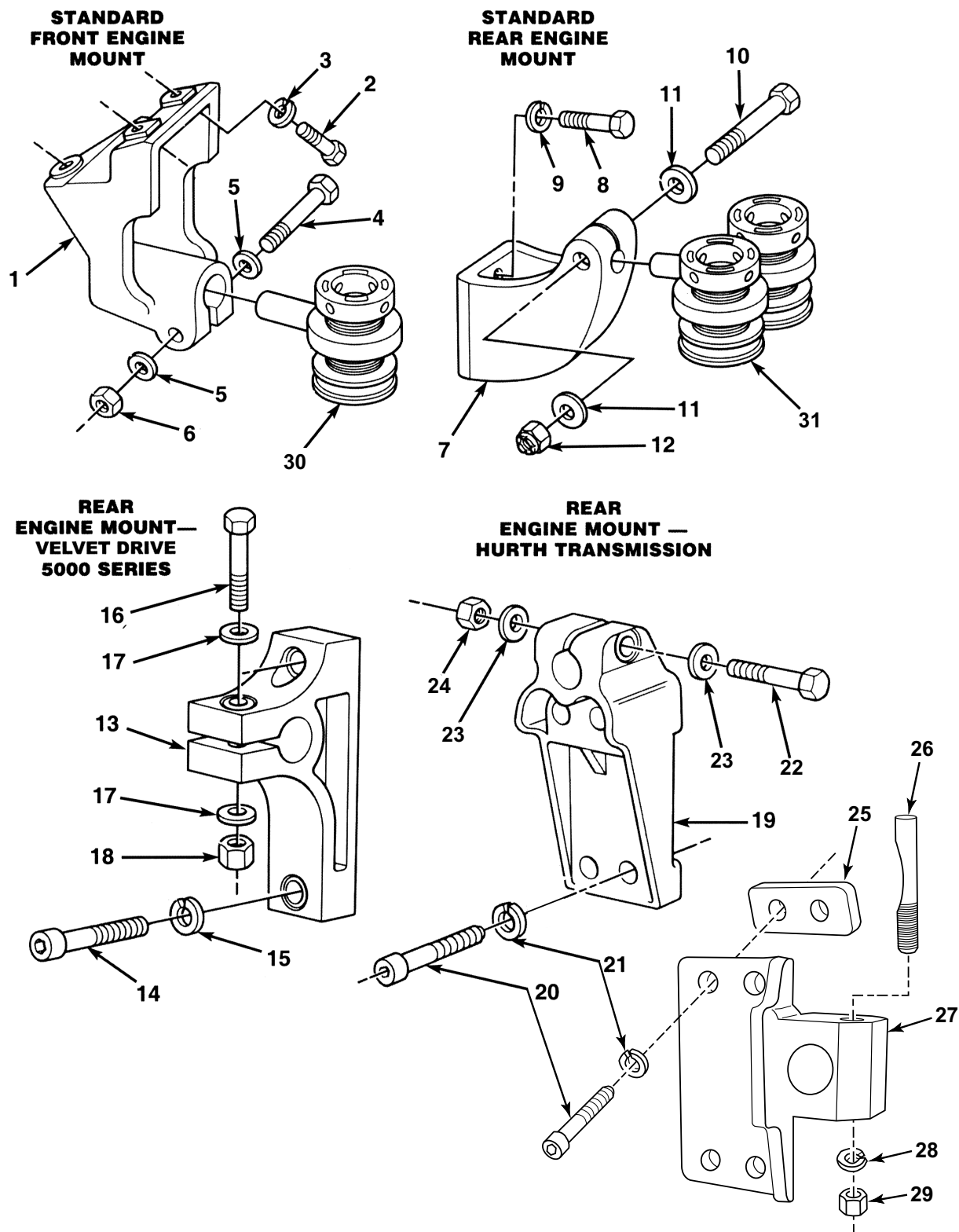


PC81016r

STARTER ASSEMBLY COMPONENTS - FIGURE 17

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	RA122009	Starter Motor Assembly (starter up position)	1
2	RS7036	Nut , solenoid terminal	1
3	93003000	Lockwasher , solenoid terminal	1
4	RS7019	Nut , solenoid terminal	1
5	TBD	Lockwasher , solenoid terminal	1
6	RS7019	Nut , solenoid terminal	1
7	R031018	Stud , starter mounting	2
8	RU0050	Solenoid , starter	1
9	TBD	Solenoid , starter	1
10	RU0051	Drive , starter	1
11	TBD	Drive , starter	1
12	RS1029	Nut , starter mounting	2
13	RS2181	Lockwasher , starter mounting	2
14	R031018	Stud , starter mounting	2

ENGINE and TRANSMISSION MOUNTS - FIGURE 18

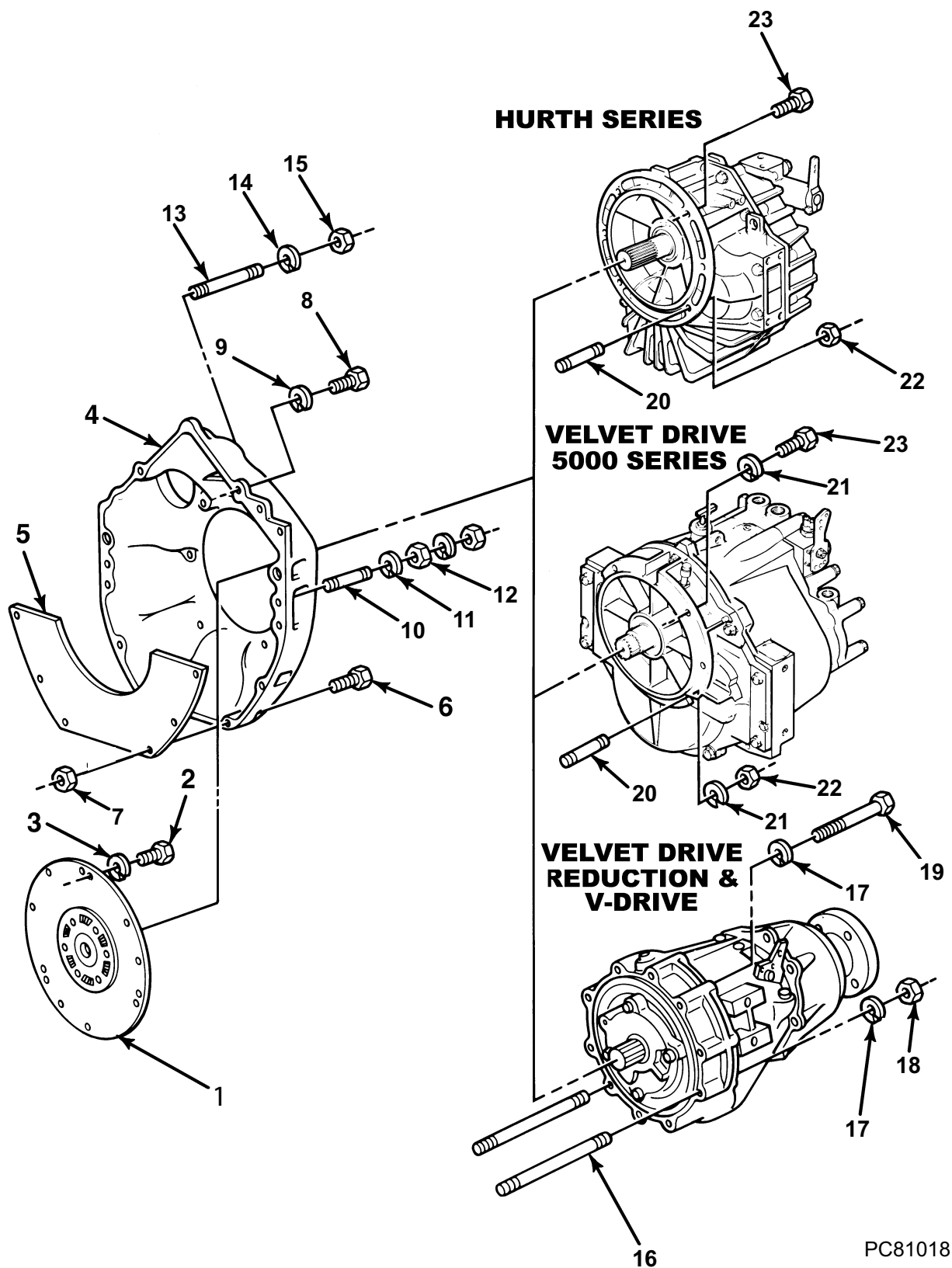


PC81017

ENGINE and TRANSMISSION MOUNTS - FIGURE 18

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
		Standard Front Engine Mount	
1	97938	Bracket , engine mounting (front)	2
2	99443030	Bolt , socket head (30 mm)	4
2	98446030	Bolt , hex head (30 mm)	2
3	93940000	Lockwasher , bracket mounting bolt	6
4	90318225	Bolt , trunnion shaft (2 1/4")	2
5	92300000	Washer , trunnion bolt	4
6	95310300	Nut , trunnion bolt - locking	2
		Standard Rear Engine Mount	
7	97917	Bracket , engine mounting (Rear)	2
8	RS0328	Bolt , bracket to transmission (1 1/4")	4
9	RS2181	Lockwasher , bracket mounting bolt	4
10	90318325	Bolt , trunnion shaft (3 1/4")	2
11	92300000	Washer , trunnion bolt	4
12	95310300	Nut , trunnion bolt - locking	2
		Rear Engine Mount - Velvet Drive 5000 Series	
13	98224	Bracket , transmission mounting (Starboard)	1
13	98225	Bracket , transmission mounting (Port)	1
14	RS6336	Bolt , bracket to transmission (12 mm x 60 mm)	4
15	RS7071	Lockwasher (12 mm)	4
16	90318325	Bolt , trunnion shaft (3 1/4")	2
17	92300000	Washer , trunnion bolt	4
18	95310300	Nut , trunnion bolt - locking	2
		Rear Engine Mount - Hurth Transmission	
19	98077	Bracket , engine mounting (rear)	2
20	RS6331	Bolt , bracket to transmission (12 mm x 35 mm)	4
20	RS6336	Bolt , bracket to transmission (12 mm x 60 mm)	4
21	RS7071	Lockwasher (12 mm)	8
22	90318325	Bolt , trunnion shaft (3 1/4")	2
23	92300000	Washer , trunnion bolt	4
24	95310300	Nut , trunnion bolt - locking	2
25	R109049	Spacer , bracket to transmission	2
26	R095020	Bolt , trunnion shaft	2
27	R090217	Bracket , engine mounting (port)	1
27	R090218	Bracket , engine mounting (starboard)	1
28	RS2181	Lockwasher , trunnion bolt	2
29	RS1529	Nut , trunnion bolt - locking	2
		Mount Supports	
30	97926	Mount , engine support (single front)	2
31	97905	Mount , engine support (dual rear)	2

BELL HOUSING ASSEMBLY - FIGURE 19



BELL HOUSING ASSEMBLY - FIGURE 19

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R140018	Drive Damper Assembly , (Hurth and 5000 series only)	1
1	98511	Drive Damper Assembly , (Standard Velvet Drive)	1
2	98446030	Bolt , damper to flywheel (1")	6
3	93940000	Lockwasher , damper bolt	6
4	R142014	Bellhousing , flywheel	1
5	R019008	Cover , bellhousing	1
6	RS0256	Bolt , cover to bellhousing (1")	5
6	90105125	Bolt , cover to bellhousing (1 1/4")	1
7	RS1078	Nut , cover bolt	6
8	98443050	Bolt , bellhousing to block	2
8	99443030	Bolt , SHCS (behind starter)	1
9	93940000	Lockwasher , bellhousing bolt	2
10	R031031	Stud , bellhousing mounting	2
11	93940000	Lockwasher , mounting stud	4
12	97440000	Nut , mounting stud	4
13	R031018	Stud , starter mounting (1 5/8")	2
14	RS2181	Lockwasher , starter mounting stud	2
15	RS1029	Nut , starter mounting stud	2
Velvet Drive Reduction & "V"-Drive			
16	96541	Stud , transmission mounting (4")	2
17	RS2181	Lockwasher , transmission mounting	6
18	RS1029	Nut , transmission mounting stud	2
19	RS0337	Bolt , transmission mounting	4
Velvet Drive 5000 & Hurth Gears			
20	R031018	Stud , transmission mounting (1 5/8")	2
21	RS2180	Lockwasher , transmission mounting	6
22	RS1029	Nut , transmission mounting stud	2
23	RS0329	Bolt , transmission mounting	4

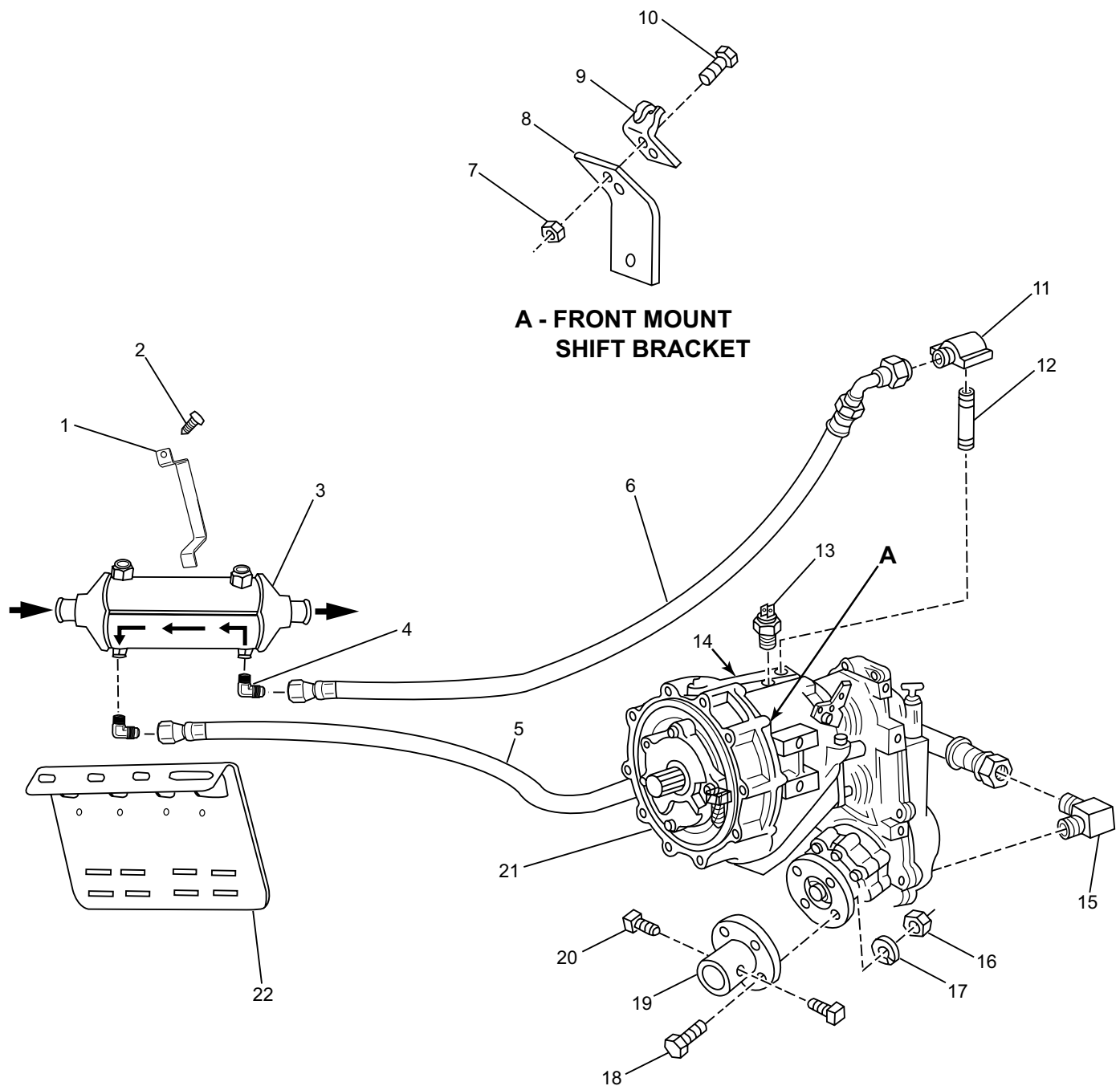


PC81019

TRANSMISSION AND RELATED COMPONENTS (VELVET DRIVE IN-LINE) - FIGURE 20

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R171007	Strap , cooler mounting	2
2	RS5115	Screw , cooler mounting	2
3	R147035A	Oil Cooler Assembly	1
4	R024010	Fitting , 90 degree	2
5	RA045007P	Hose Assembly , transmission to cooler (45")	1
6	RA045007T	Hose Assembly , transmission to cooler (46")	1
7	RS2055	Nut , attaching bolt	2
8	96341	Shift Bracket (front mount)	1
9	R090086	Cable Clip , single cable	1
9	22232	Cable Clip , dual cable clip (not shown)	OPT
10	RS5122	Bolt , clip attaching (1/2")	2
11	R024008	Elbow , hose - transmission (90 degree)	1
12	RS4674	Nipple , pipe (3")	1
13	2000090	Screw , set - coupler	2
14	R148001	Coupler , prop shaft (1" shaft)	OPT
14	R148002	Coupler , prop shaft (1 1/8" shaft)	OPT
14	R148003	Coupler , prop shaft (1 1/4" shaft)	OPT
14	R148004	Coupler , prop shaft (1 3/8" shaft)	OPT
14	R148005	Coupler , prop shaft (1 1/2" shaft)	OPT
14	R148007	Coupler , prop shaft (1 3/4" shaft)	OPT
14	R148008	Coupler , prop shaft (2" shaft)	OPT
15	22136	Bolt , coupling (1 1/2")	4
16	RS2181	Lockwasher , coupling bolt	4
17	RS1529	Nut , coupling bolt	4
18	R020037	Sender , temperature alarm	1
19	R153002	Switch Kit , neutral start (not shown)	1
19A	25542	Switch & O-Ring Assembly (not shown)	1
20	RA157003	Transmission (1:1 Direct Drive)	1
20	RA157004	Transmission (1.52:1 Reduction)	1
20	RA157004A	Transmission (1.88:1 Reduction)	1
20	RA157004D	Transmission (2.57:1 Reduction)	1
20	RA157004E	Transmission (2.91:1 Reduction)	1
21	R024010	Elbow , hose - transmission (90 degree)	1
22	R090194	Bracket , cooler	1

TRANSMISSION AND RELATED COMPONENTS (VELVET DRIVE "V"-DRIVE) - FIGURE 21

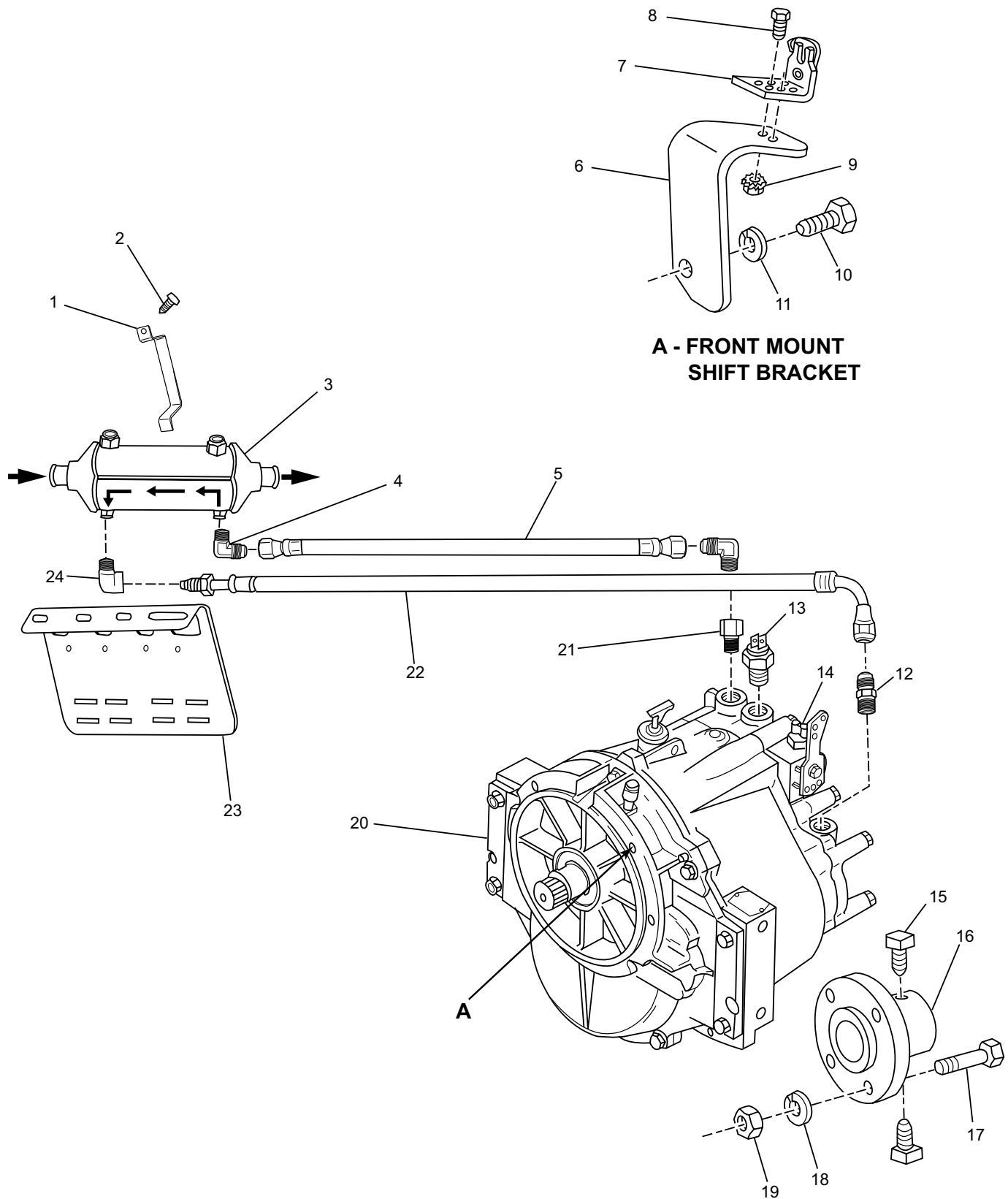


PC81020

TRANSMISSION AND RELATED COMPONENTS (VELVET DRIVE "V"-DRIVE) - FIGURE 21

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R171007	Strap , cooler mounting	2
2	RS5115	Screw , cooler mounting	2
3	R147035A	Oil Cooler Assembly	1
4	R024010	Fitting , 90 degree	2
5	RA045007P	Hose Assembly , transmission to cooler (60")	1
6	RA045007T	Hose Assembly , transmission to cooler (46")	1
7	RS2055	Nut , attaching bolt	2
8	96341	Shift Bracket (front mount)	1
9	R090086	Cable Clip , single cable	1
9	22232	Cable Clip , dual cable clip (not shown)	OPT
10	RS5122	Bolt , clip attaching (1/2")	2
11	R024008	Elbow , hose - transmission (90 degree)	1
12	RS4674	Nipple , pipe (3")	1
13	R020037	Sender , temperature alarm	1
14	R153002	Switch Kit , neutral start (not shown)	1
14A	25542	Switch & O-Ring Assembly (not shown)	1
15	R024010	Elbow , hose - transmission (90 degree)	1
16	RS1529	Nut , coupling bolt	4
17	RS2181	Lockwasher , coupling bolt	4
18	22136	Bolt , coupling (1 1/2")	4
19	R148001	Coupler , prop shaft (1" shaft)	OPT
19	R148002	Coupler , prop shaft (1 1/8" shaft)	OPT
19	R148003	Coupler , prop shaft (1 1/4" shaft)	OPT
19	R148004	Coupler , prop shaft (1 3/8" shaft)	OPT
19	R148005	Coupler , prop shaft (1 1/2" shaft)	OPT
19	R148007	Coupler , prop shaft (1 3/4" shaft)	OPT
19	R148008	Coupler , prop shaft (2" shaft)	OPT
20	2000090	Screw , set - coupler	2
21	RA156002B	Transmission (1.51:1 Reduction)	1
21	RA156002D	Transmission (1.99:1 Reduction)	1
21	RA156002E	Transmission (2.49:1 Reduction)	1
22	R090194	Bracket , cooler	1

TRANSMISSION AND RELATED COMPONENTS (VELVET DRIVE 5000) - FIGURE 22

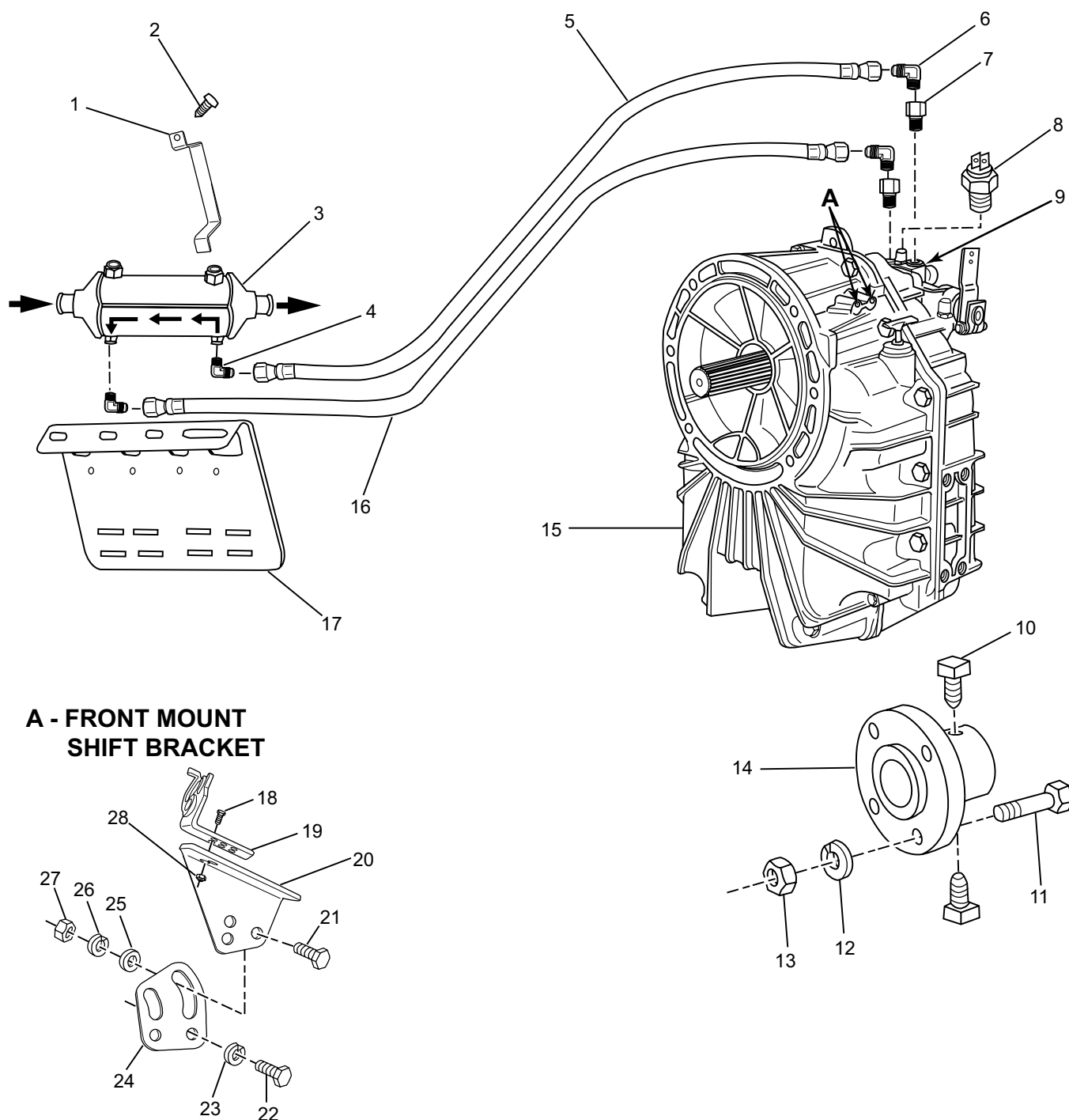


PC81021

TRANSMISSION AND RELATED COMPONENTS (VELVET DRIVE 5000) - FIGURE 22

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R171007	Strap , cooler mounting	2
2	RS5115	Screw , cooler mounting	2
3	R147035A	Oil Cooler Assembly	1
4	R024010	Fitting , 90 degree	2
5	RA045007H	Hose Assembly , transmission to cooler (63")	1
6	98227	Shift Bracket , (front entry)	1
7	R090086	Cable Clip , single cable	1
7	22232	Cable Clip , dual cable clip (not shown)	OPT
8	RS5122	Bolt , clip attaching (1/2")	2
9	RS2055	Nut , attaching bolt	2
10	TBD	Bolt , shift bracket attaching	2
11	TBD	Washer , shift bracket attaching bolt	2
12	30603	Fitting , adapter	1
13	R020037	Sender , temperature alarm	1
14	25542	Switch & O-Ring Assembly (not shown)	1
15	2000090	Screw , set - coupler	2
16	R148001	Coupler , prop shaft (1" shaft)	OPT
16	R148002	Coupler , prop shaft (1 1/8" shaft)	OPT
16	R148003	Coupler , prop shaft (1 1/4" shaft)	OPT
16	R148004	Coupler , prop shaft (1 3/8" shaft)	OPT
16	R148005	Coupler , prop shaft (1 1/2" shaft)	OPT
16	R148007	Coupler , prop shaft (1 3/4" shaft)	OPT
16	R148008	Coupler , prop shaft (2" shaft)	OPT
17	22136	Bolt , coupling (1 1/2")	4
18	RS2181	Lockwasher , coupling bolt	4
19	RS1529	Nut , coupling bolt	4
20	RA157020B	Transmission (1.50:1 Reduction) Down Angle	1
20	RA157020C	Transmission (2:1 Reduction) Down Angle	1
20	RA157020D	Transmission (2.45:1 Reduction) Down Angle	1
20	RA157020E	Transmission (2.80:1 Reduction) Down Angle	1
20	RA156008	Transmission (1.25:1 Reduction) V-Drive	1
20	RA156008A	Transmission (1.50:1 Reduction) V-Drive	1
20	RA156008B	Transmission (2:1 Reduction) V-Drive	1
20	RA156008C	Transmission (2.50:1 Reduction) V-Drive	1
21	R024196	Adapter , 90 degree to transmission	1
22	18203	Hose Assembly , transmission to cooler (50 1/2")	1
23	R090194	Bracket , cooler	1
24	137425	Fitting , 90 degree	1

TRANSMISSION AND RELATED COMPONENTS (HURTH GEAR) - FIGURE 23



PC81022

TRANSMISSION AND RELATED COMPONENTS (HURTH GEAR) - FIGURE 23

ITEM	PART NUMBER	DESCRIPTION	QUANTITY
1	R171007	Strap , cooler mounting	2
2	RS5115	Screw , cooler mounting	2
3	R147035A	Oil Cooler Assembly	1
4	R024010	Fitting , 90 degree	2
5	RA045007H	Hose Assembly , transmission to cooler (63")	1
6	R024010	Fitting , 90 degree	2
7	R024196	Adapter , 90 degree to transmission	2
8	R020037	Sender , temperature alarm	1
9	25542	Switch & O-Ring Assembly (not shown)	1
10	2000090	Screw , set - coupler	2
11	90418138	Bolt , coupling (1 3/8")	4
12	RS2181	Lockwasher , coupling bolt	4
13	RS1529	Nut , coupling bolt	4
14	R148001	Coupler , prop shaft (1" shaft)	OPT
14	R148002	Coupler , prop shaft (1 1/8" shaft)	OPT
14	R148003	Coupler , prop shaft (1 1/4" shaft)	OPT
14	R148004	Coupler , prop shaft (1 3/8" shaft)	OPT
14	R148005	Coupler , prop shaft (1 1/2" shaft)	OPT
14	R148007	Coupler , prop shaft (1 3/4" shaft)	OPT
14	R148008	Coupler , prop shaft (2" shaft)	OPT
15	RA157022	Transmission 630A (1.22:1 Reduction)	1
15	RA157022A	Transmission 630A (1.55:1 Reduction)	1
15	RA157022B	Transmission 630A (2.00:1 Reduction)	1
15	RA157022C	Transmission 630A (2.50:1 Reduction)	1
15	RA157022D	Transmission 630A (2.70:1 Reduction)	1
15	RA157023F	Transmission 800A (2.85:1 Reduction)	1
15	RA156009	Transmission 630V (1.29:1 Reduction)	1
15	RA156009A	Transmission 630V (1.50:1 Reduction)	1
15	RA156009B	Transmission 630V (2.00:1 Reduction)	1
15	RA156009C	Transmission 630V (2.50:1 Reduction)	1
16	RA045007N	Hose Assembly , transmission to cooler (50 1/2")	1
17	R090194	Bracket , cooler	1
18	RS5122	Bolt , cable clip attaching	2
19	R090086	Cable Clip , single cable	1
19	22232	Cable Clip , dual cable clip (not shown)	OPT
20	R090202	Shift Bracket , cable clip attaching	1
21	RS0282	Bolt , shift bracket attaching	2
22	RS6529	Bolt , shift bracket attaching	2
23	93930000	Lockwasher , shift bracket attaching bolt	2
24	R090235	Bracket , shift	1
25	RS2674	Washer , shift bracket attaching bolt	2
26	RS2179	Lockwasher , attaching bolt	2
27	RS1027	Nut , shift bracket attaching bolt	2
28	RS2055	Nut , cable clip attaching bolt	2