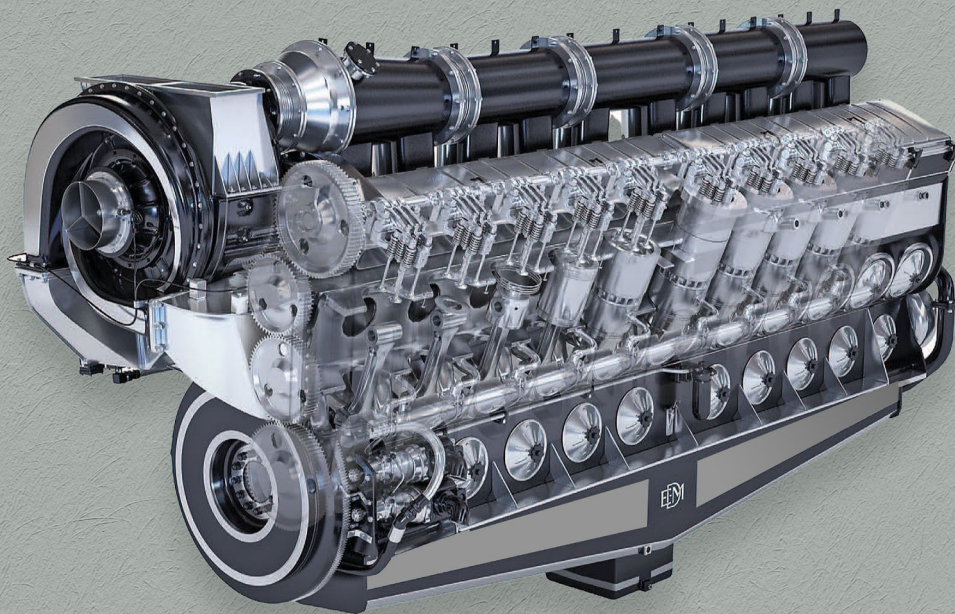
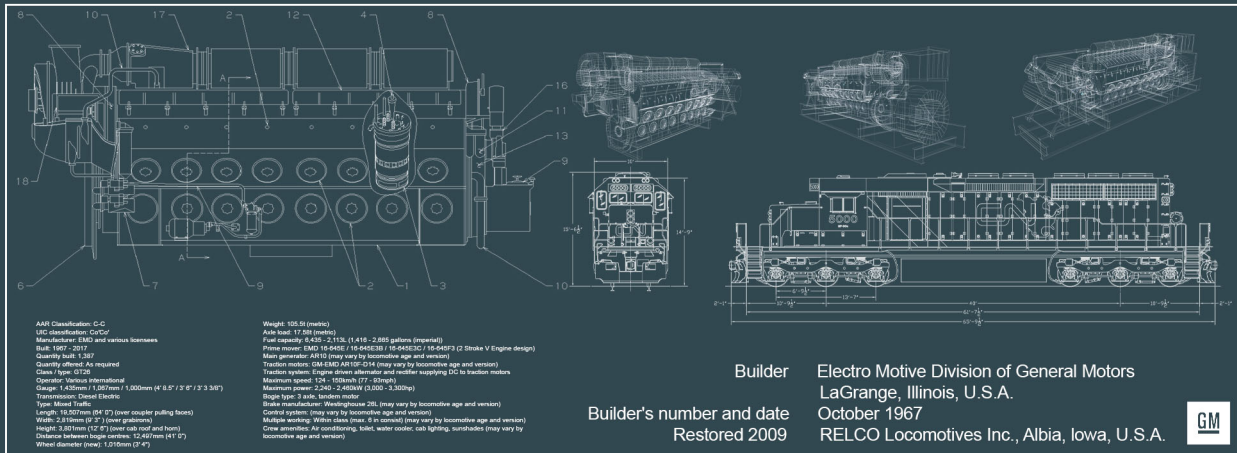


EMD DIESEL ENGINE SPARE PARTS



HALTIC ENDUSTRY CO.

WABCO

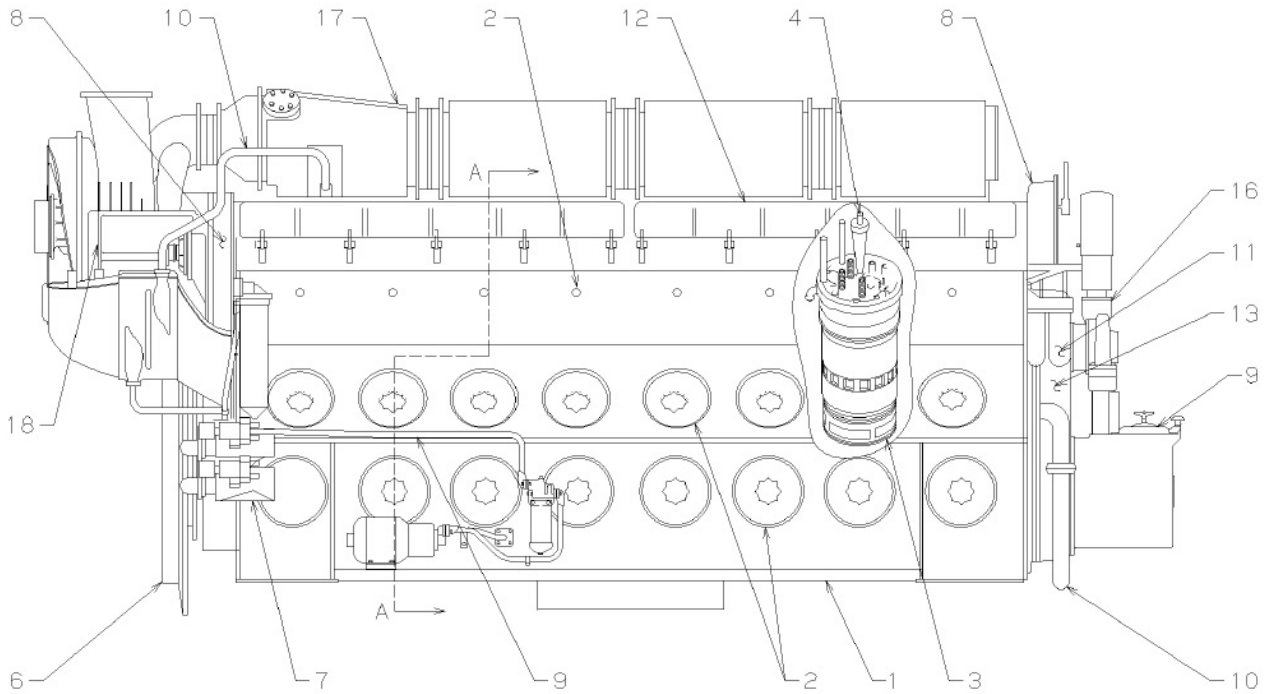


Gardner
Denver



16-645 E3B ENGINE EQUIPPED PARTS LIST

1- 16-645E3B ENGINE



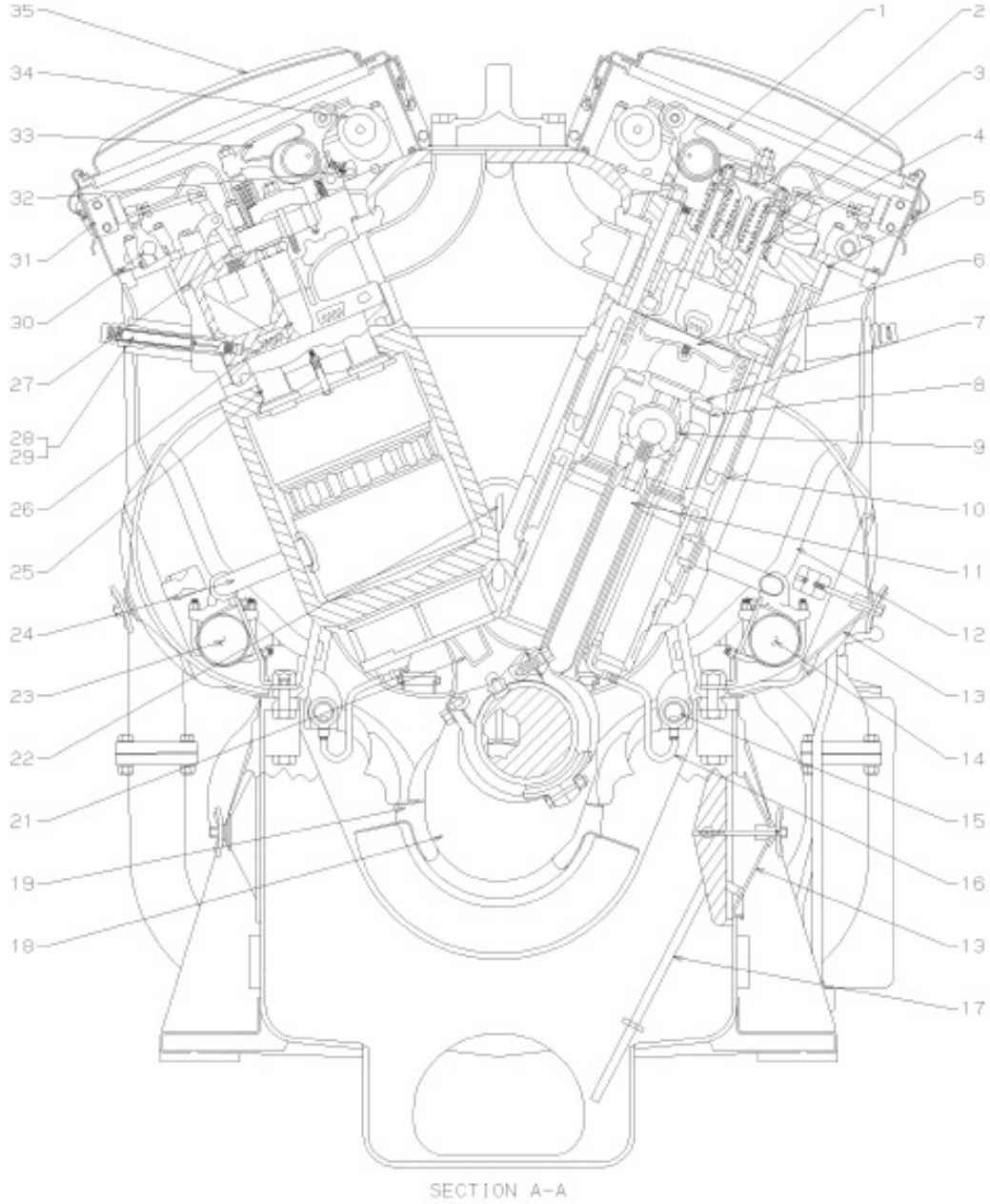
Reference	Description
1	CRANKCASE AND OIL PAN ASSEMBLY
2	HANDHOLE COVER AND CYLINDER TEST VALVE
3	POWER ASSEMBLY
4	FUEL INJECTOR
5	ROCKER ARMS AND INJECTOR LINKAGE (not shown)
6	CRANKSHAFT AND BOLT-ON EQUIPMENT



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7	STARTER MOTOR
8	CAMSHAFT EQUIPMENT
9	LUBE OIL SYSTEM AND PUMPS
10	COOLING SYSTEM AND PUMPS
11	FUEL PIPING AND FILTER
12	CYLINDER HEAD COVERS AND SUPPORT FRAMES
13	ACCESSORY DRIVE HOUSING
14	ENGINE PRESSURE DETECTOR (not shown)
15	AUXILIARY GENERATOR DRIVE (not shown)
16	GOVERNOR DRIVE EQUIPMENT
17	EXHAUST CHAMBER AND HEAT SHIELD
18	TURBOCHARGER

O- ENGINECROSS-SECTION



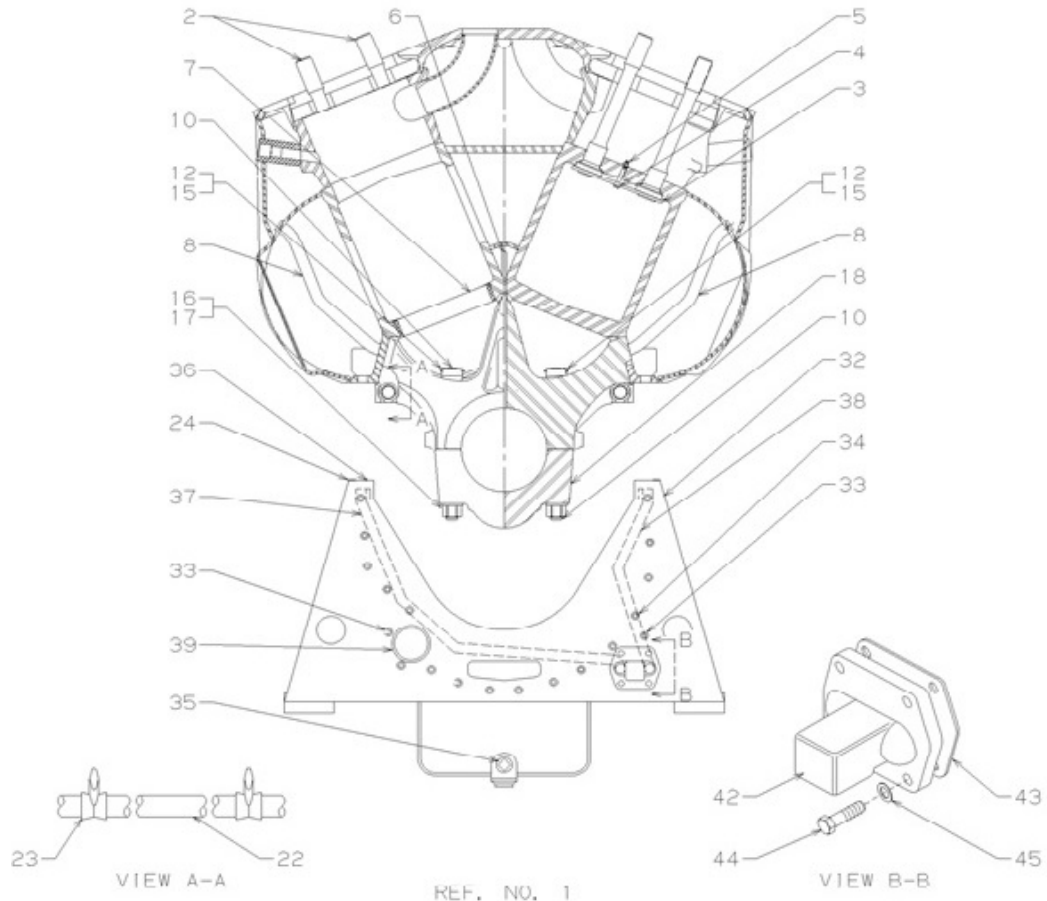


Haltic Endüstri İthalat İhracat ve Ticaret limited Sirketi.

Ref.	Part Number	QTY	Description
1-1	6990961	1	ENGINE EQUIPPED .. 16-645E3B
-1	9319505	32	ARM ASSEMBLY .. Rocker - Exhaust valve
-2	8085260	32	BRIDGE ASSEMBLY .. Exhaust valve - Utex No. 8361504
-3	8068791	32	SPRING .. Bridge
-4	9319735	64	VALVE .. Exhaust - Inconel
-5	9556060	16	HEAD ASSEMBLY .. Cylinder - Diamond6
-6	9523619	16	PISTON .. Bare - Engine - Standard diameter
-7	8135330	16	WASHER .. Thrust - Piston carrier
-8	40039258	16	CARRIER .. Piston - Utex No. 40077230
-9	40078951	16	PIN .. Piston - Rocking
-10	9318833	16	LINER ASSEMBLY .. Cylinder
-11	9544257	8	ROD .. Connecting - Blade
-12	8346155	4	TUBE .. Breather
-13	9314870	31	COVER ASSEMBLY .. Handhole
-13	9314869	1	COVER ASSEMBLY .. Handhole - Starter motor location
-14	8441949	1	MANIFOLD ASSEMBLY .. Water - Right bank
-15	8032693	2	TUBE .. Piston cooling manifold
-16	9549578	16	TUBE ASSEMBLY .. Piston cooling
-17	8468174	1	GAUGE .. Oil level - Dipstick - Standard capacity pan
-18	8034708	1	CRANKSHAFT .. Engine
-19	8476509	7	CAP .. Main bearing - Location1, 2, 3, 4, 7, 8 and 9
-19	8476507	2	CAP .. Main bearing - Location 5 and 6
-19	8476510	1	CAP .. Main bearing - Location 10
-20	REF	10	BEARING .. Main - Upper (not shown)
-20	REF	10	BEARING .. Main - Lower (not shown)
-21	40060841	8	ROD ASSEMBLY .. Connecting - Fork - Utex No. 40074212
-22	9541517	10	TUBE .. Lube oil - Crankshaft and main bearings
-23	8441950	1	MANIFOLD ASSEMBLY .. Water - Left bank
-24	9093027	16	TUBE ASSEMBLY .. Water inlet
-25	9085894	40	BOLT .. Crab - Cylinderhead - 1-3/4-12 x 15-5/8

-26	5229250	16	INJECTOR ASSEMBLY .. Fuel - Utex No. 8478055
-27	8305892	16	LINK ASSEMBLY .. Injector
-28	8048880	16	VALVE ASSEMBLY .. Cylinder test
-29	40017341	16	SEAL .. O-ring - Valvenut - Cylinder test
-30	8196856	1	SHAFT ASSEMBLY .. Injector control - Left bank
-31	8163891	1	MANIFOLD ASSEMBLY .. Fuel line - Left bank
-32	8320750	1	CAMSHAFT ASSEMBLY .. Pawl - Left bank
-33	9319504	16	ARM ASSEMBLY .. Rocker - Injector
-34	8419910	1	CAMSHAFT ASSEMBLY .. Engine - Left bank
-35	8487945	4	COVER ASSEMBLY .. Cylinder head

1- CRANKCASE AND OIL PAN ASSEMBLY



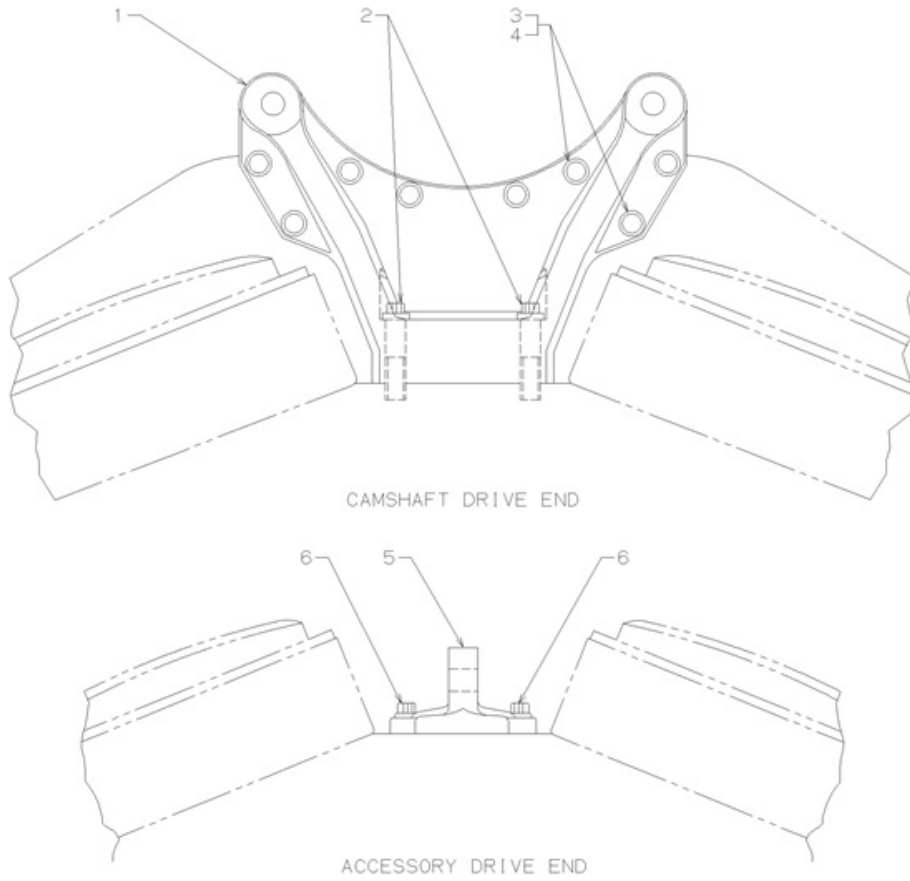


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RE F	Part Number	QTY	Description
-1	REF	1	CRANKCASE ASSEMBLY .. Includes oil pan - The part number will be assigned upon customer request
-2	9085894	40	BOLT .. Crab - For crab plates and nuts
-3	8133575	20	BRACKET .. Crab bolt
-4	8348556	20	BOLT .. Hex head 3/8-24 x 3
-5	8089200	20	NUT .. Spline 3/8-24
-6	9541517	10	TUBE .. Lube oil - Crankshaft and main bearings
-7	8268641	16	INSERT .. Lower liner
-8	8346155	4	TUBE .. Breather
-9	9311575	1	BASE .. Anchor shackle - Bolts to crankcase and camshaft drive housing (not shown)
-10	8271449	32	STUD .. Main bearing cap
-11	8473541	4	STUD .. Main bearing cap - Ground ends (not shown)
-12	8213064	36	NUT .. Slotted head 1-1/4-12 - Special - Main bearing stud - Upper
-13	186266	4	BOLT .. Hex head 1/4-20x3-1/4 - Retainer mounting (not shown)
-14	8213347	2	RETAINER .. Center main bearing stud (not shown)
-15	8035130	4	NUT .. Hex lock 1/4-20
-16	8408684	36	NUT .. Slotted head 1-1/4-12 - Special - Main bearing stud - Lower
-17	8412532	36	WASHER .. Special - Lower main bearing stud nut
-18	REF	10	CAP .. Main bearing
-19	8433263	2	SLEEVE .. Water manifold (not shown)
-20	8290819	1	NAMEPLATE .. Injector timing (not shown)
-21	193933	4	RIVET .. Flathead 3/32x1/2 (not shown)
-22	8032693	2	TUBE .. Piston cooling manifold - Drill at assembly
-23	8140865	16	BRACKET .. Piston cooling manifold - Onepiece - Not drilled or tapped
-24	8187010	2	SEAL .. O-ring - Crankcase to oil pan
-25	272511	34	BOLT .. Hex head 1-14x2-3/4 - Crankcase to oil pan (not shown)
-26	272512	4	BOLT .. Hex head 1-14x9 - Crankcase to oil pan (not shown)
-27	131019	38	WASHER .. Flat 1 inch (not shown)

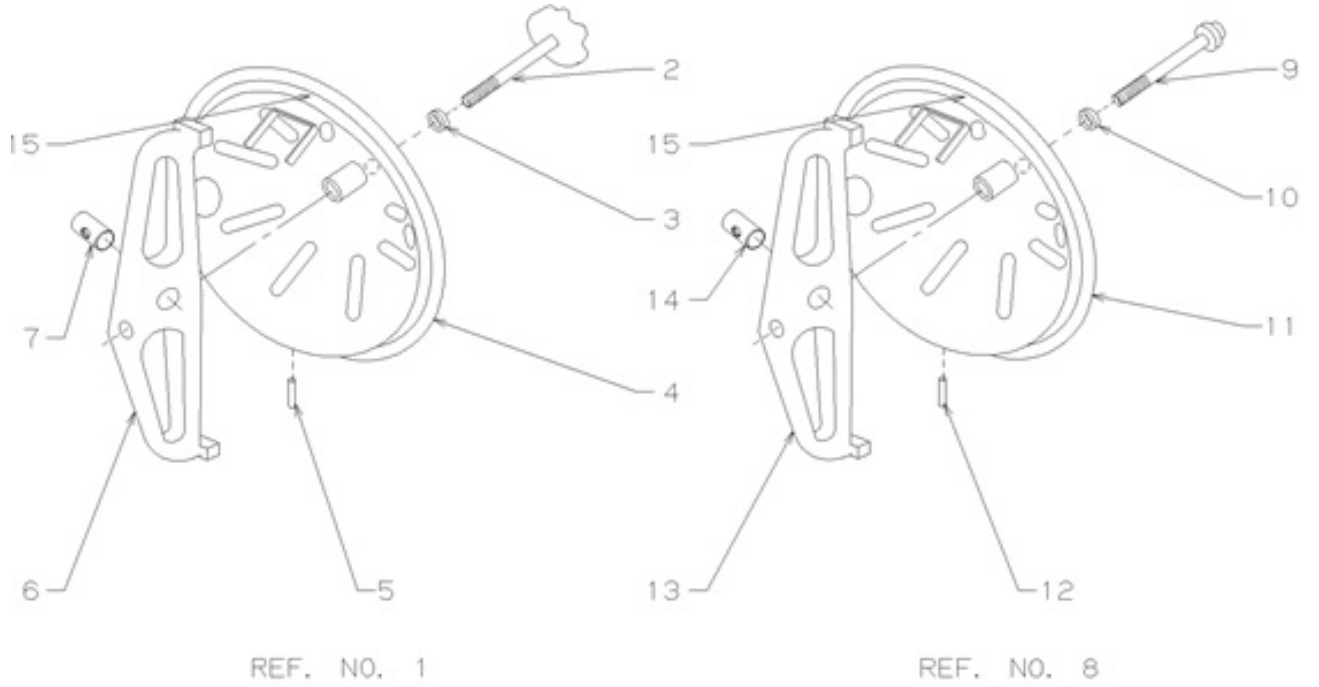
-28	8032724	38	NUT .. Hex lock 1-14 (not shown)
-29	8054189	4	DOWEL .. Tapered and threaded 0.706 dia. x 1/2-20 x 2 inches (not shown)
-29	8126991	4	DOWEL .. Tapered and threaded - 0.716 dia. (not shown) (Optional)
-29	8126992	4	DOWEL .. Tapered and threaded - 0.736 dia. (not shown) (Optional)
-30	103343	4	WASHER .. Flat 1/2 (not shown)
-31	8032719	4	NUT .. Hex lock 1/2-20 (not shown)
-32	REF	1	OIL PAN ASSEMBLY .. Engine - Not serviceable as a separate assembly - Available as Crankcase and Oil Pan Assembly, Ref.No.1
-33	8081234	21	NUT .. Spline 1/2-20
-34	103879	1	PLUG .. Pipe 3/8MPT
-35	106643	2	PLUG .. Pipe 1-1/2MPT
-36	8198078	2	SEAL .. O-ring - Airboxdrain
-37	9315261	1	TUBE .. Airbox drain
-38	9315262	1	TUBE .. Airbox drain
-39	8477713	1	TUBE .. Oil suction
-40	8468174	1	GAUGE .. Oil level - Dipstick - Standard capacity pan (not shown)
-41	8071849	1	SEAL .. Felt - Oil level gauge (not shown)
-42	8364299	1	FLANGE .. Airbox drain - 3/4FPT
-43	8356239	1	GASKET .. Airbox drain flange mounting
-44	181429	4	BOLT .. Hex head 1/2-20 x 1-1/4
-45	6101229	4	WASHER .. Flat 1/2

2- ANCHOR SHACKLE BASE APPLICATION



REF	Part Number	QTY	Description
	9311575	1	BASE .. Anchor shackle - Bolts to crankcase and camshaft drive housing
-2	9096320	4	BOLT .. 12 point 1-14 x 4-1/2
-3	426447	8	BOLT .. Hex head 5/8-11 x 1-1/4
-4	6101233	8	WASHER .. Flat 5/8
-5	8344365	1	BASE ..Anchor shackle - Removed after engine installation
-6	9096428	4	BOLT .. 12 point 1-14 x 2
-7	8307731	AR	LUBRICANT .. Thread - 70 pounds - Not available from EMD (not shown)

3- HANDHOLE COVER AND CYLINDER TEST VALVE

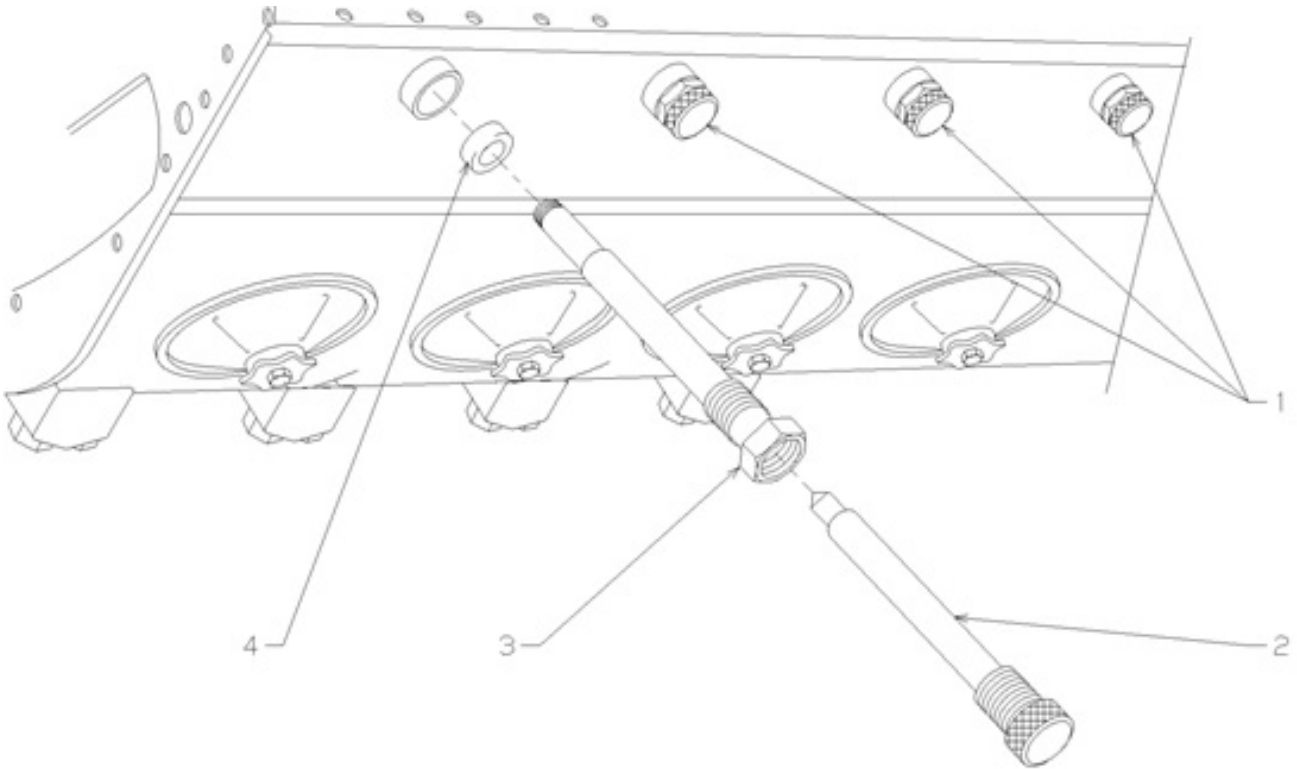


REF	Part Number	QTY	Description
	9314870	1	COVER ASSEMBLY .. Handhole
-2	8262322	1	HANDWHEELASSEMBLY .. Cover - Includes stem
-3	8247063	1	GASKET .. Handwheel - Nylon
-4	9314871	1	COVER .. Handhole
-5	273337	1	PIN .. Retaining - 1/8 diameter * 5/8 inch long
-6	9314872	1	CROSS BAR ASSEMBLY .. Cover
-7	8262316	1	PIN .. Cross bar to handwheel stem
-8	9314869	1	COVER ASSEMBLY .. Handhole - Starter motor location
-9	8391429	1	BOLT ASSEMBLY .. Includes washer
-10	8247063	1	GASKET .. Handwheel - Nylon
-11	9314871	1	COVER .. Handhole
-12	273337	1	PIN .. Retaining - 1/8 diameter * 5/8 inch long

-13	9314872	1	CROSSBAR ASSEMBLY .. Cover
-14	8262316	1	PIN .. Crossbar to handwheel stem
-15	8291349	1	GASKET .. Handhole cover

Shown quantities in the above table are per handhole cover. Please notice that each cylinder has 2 inspection covers.

4- CYLINDER TEST VALVE

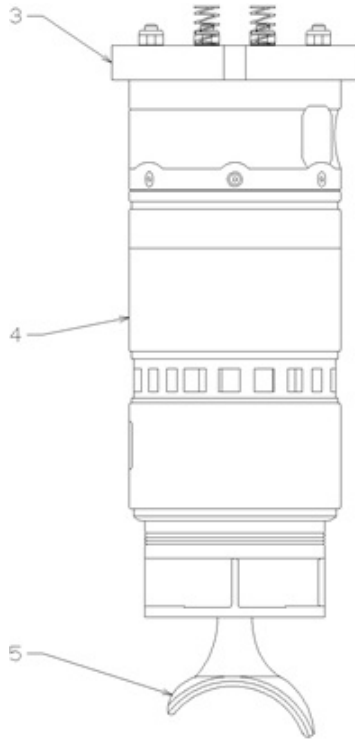


REF	Part Number	QTY	Description
	8048880	1	VALVE ASSEMBLY .. Cylindertest

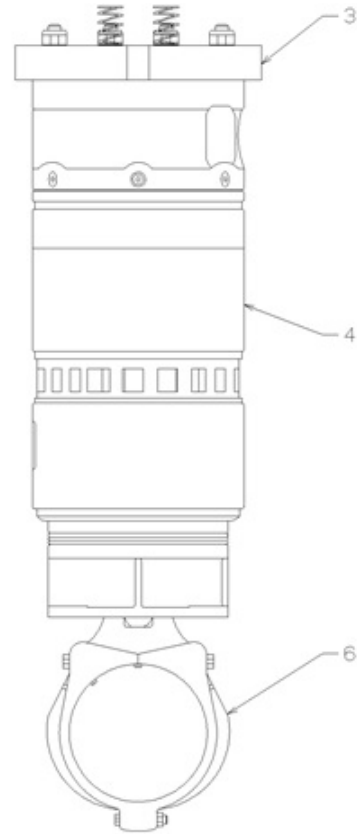
-2	8024846	1	VALVE .. Needle
-3	8048883	1	BODY .. Valve
-4	40017341	1	SEAL .. Valve nut
-5	40036607	AR	KIT .. Cylinder test valve (not shown)
-6	8024846	1	VALVE .. Needle
-7	8048883	1	BODY .. Valve
-8	40017341	1	SEAL .. Valve nut

Quantities are shown as per each valve.

5- POWER ASSEMBLY



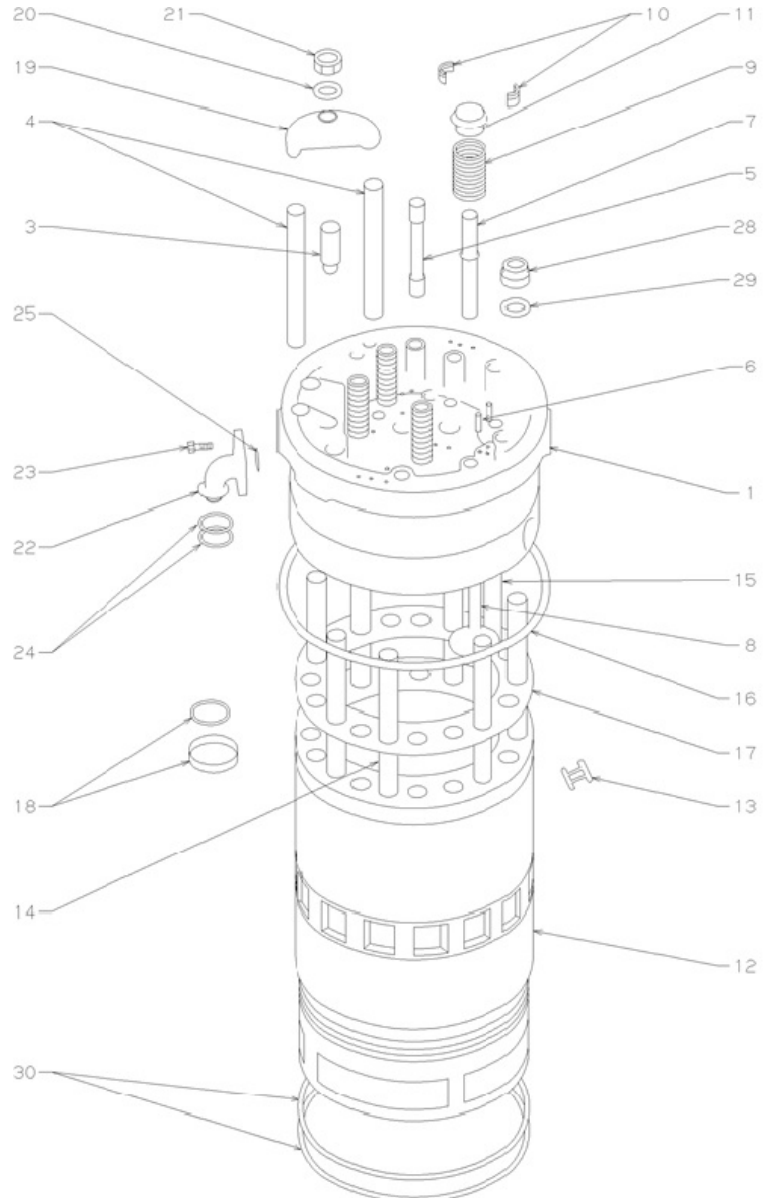
REF. NO. 1



REF. NO. 2

Ref	Part Number	QTY	Description
	9527319	8	POWERPACK .. Blade rod - Packed in expendable container
-2	9527317	8	POWERPACK .. Fork rod - Packed in expendable container
-3	9556060	16	HEAD ASSEMBLY .. Cylinder - Diamond6
-4	9090233	16	LINER ASSEMBLY .. Cylinder
-5	9544257	8	ROD .. Connecting - Blade
-6	40060841	8	ROD ASSEMBLY .. Connecting - Fork
-7	9523619	16	PISTON .. Bare-Standard diameter (not shown)
-8	9583683	16	KIT .. Gasket - Powerpack installation (not shown)

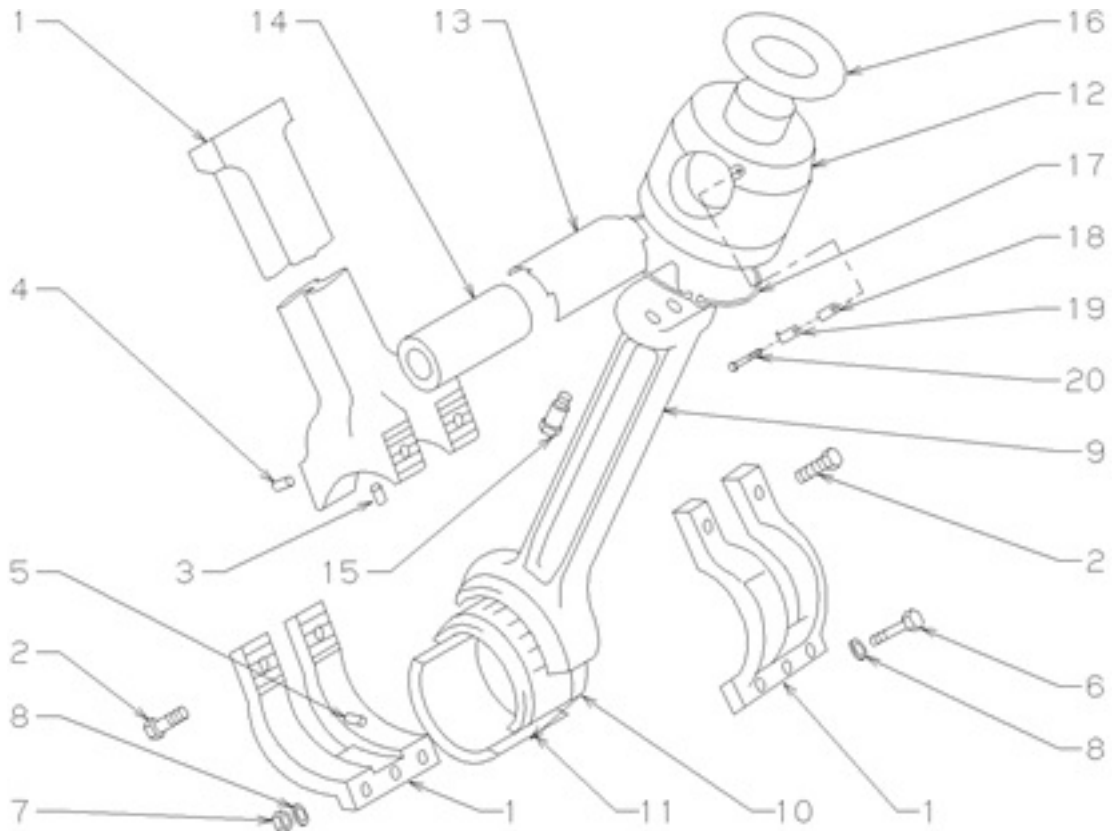
6- CYLINDER HEAD AND LINER



Ref	P/Number	QTY	Description
	9556060	1	HEAD ASSEMBLY .. Cylinder - Diamond6
-2	40021328	1	HEAD .. Cylinder - Less valves
-3	8028097	1	SUPPORT .. Injector crab
-4	8035930	2	STUD .. 1-8 x 1-14 x 7-3/4 -Rocker arm shaft 80799220.002-80799230.004 O.S. (Optional) 80799240.015 - 81152420.017 O.S. (Optional) 81152430.019 O.S.(Optional)
-5	8028701	1	STUD .. 5/8 - 11 x 5/8 - 18 x 4-15/16 - Injector crab
-6	8028366	4	DOWEL .. Valve pin - 3/8 x 7/8 inches
-7	8310840	4	GUIDE .. Exhaust valve
-8	9319735	4	VALVE .. Exhaust - Inconel
-9	8068791	4	SPRING .. Exhaust valve
-10	8383293	8	LOCK .. Valve seat - Half
-11	8081795	4	SEAT .. Valve spring
-12	9318831	1	LINER ASSEMBLY .. Cylinder
-13	8348964	1	DEFLECTOR .. Tube - Water
-14	8411641	7	STUD .. 3/4 - 10 x 3/4-16 x 10-3/4 84116420.002 - 84116430.004 O.S.(Optional) 84139160.015 - 84139170.017 O.S.(Optional) 84139180.019 O.S. (Optional)
-15	8411644	1	STUD .. Pilot 3/4 - 10 x 3/4-16 x 10-3/4 95478470.002 - 95478480.004 O.S. (Optional) 95478490.015 - 95478500.017 O.S. (Optional) 95478510.019 O.S. (Optional)
-16	9581924	1	RING .. Cylinderhead seat - Viton seal
-17	8476400	1	GASKET .. Head to liner - With integrated grommet seals
-18	8392118	1	KIT .. Seal - Water - Consists of (12) heat dam insulators (12) grommet type seals - To be applied as an assembly - Not required with 8476400 gasket
-19	9092979	1	CRAB .. Fuel injector
-20	8044832	1	WASHER .. Spherical 5/8
-21	103030	1	NUT .. Spherical 5/8-18
-22	8414444	1	ELBOW .. Water outlet
-23	217911	2	SCREW .. Sockethead3/8-16x7/8
-24	9317972	2	SEAL .. O-ring - Water outlet elbow to the crankcase
-25	8305815	1	SEAL .. O-ring - Water outlet elbow to the cylinder head
-26	8425724	AR	GREASE .. Silicon-Water tube seal-5.3 ounce tube (not shown)
-27	8427111	1	KIT .. Gasket - Cylinderhead - (not shown-Optional)

-27	8479836	1	KIT .. Gasket - Cylinderhead - (not shown-Optional)
-28	8060089	8	NUT .. Hex lock 3/4-16
-29	8140912	8	WASHER .. Special 3/4
-30	9316850	2	SEAL .. O-ring - Liner
-31	8305815	1	SEAL .. O-ring - Water inlet tube to the liner
-32	40048968	1	GASKET .. Piston cooling tube to lube oil manifold (not shown)
-33	40040025	1	GASKET .. Water inlet tube to water manifold (not shown)
-34	9320844	1	KIT .. Liner installation (not shown)
-35	8494711	AR	COMPOUND .. Thread sealing - Liner stud - 250cc bottle - Not available from EMD (not shown)

7- CONNECTING ROD, CARRIER, BEARINGS, AND PISTON PIN

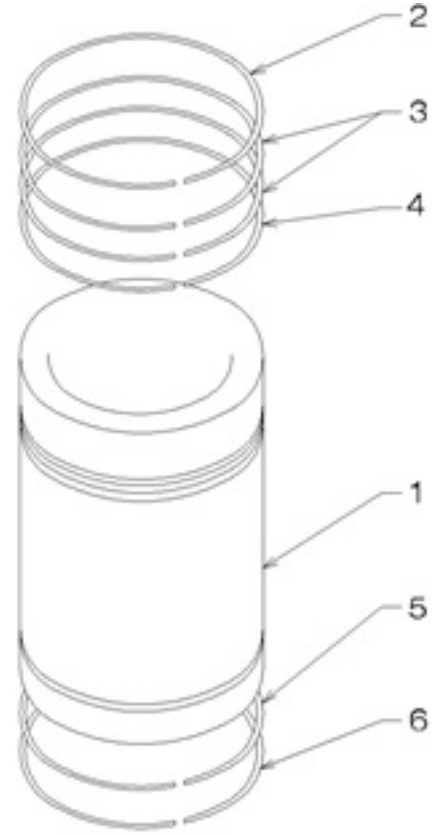




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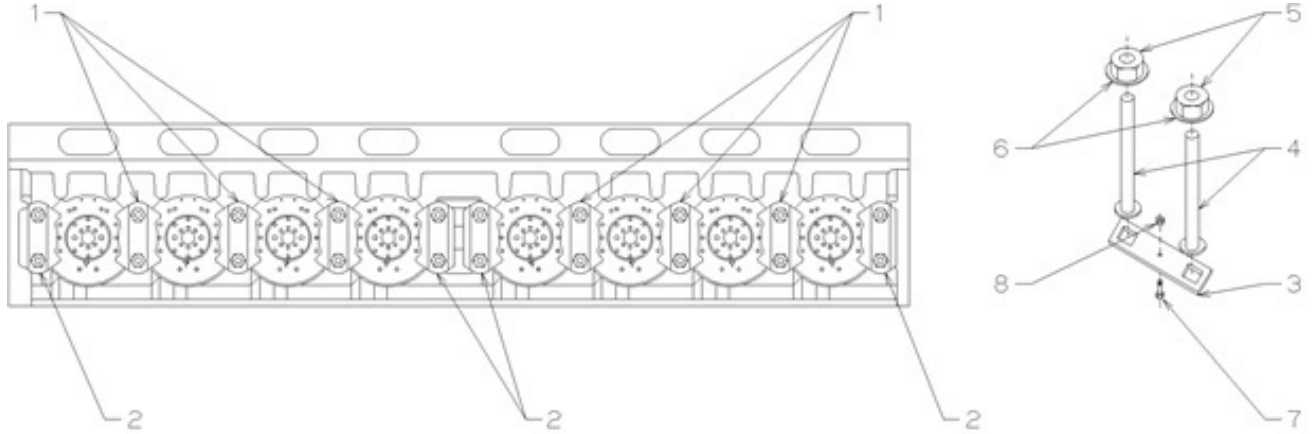
Ref	P/Number	QTY	Description
	40060841	8	ROD ASSEMBLY .. Connecting - Fork - Includes basket - Utex No. 40074212
-2	8127868	32	BOLT ASSEMBLY .. Hex head 5/8-18 x 1-3/4 - Includes washer
-3	40043600	16	DOWEL .. 0.500 x 3/4 - Upper bearing 81888330.001 - 81888340.002 O.S. (Optional) 84307070.004 - 84307080.006 O.S. (Optional) 84307090.008 - 81888350.010 O.S. (Optional) 83853740.020 - 83853750.040 O.S. (Optional)
-4	8031947	8	DOWEL .. 0.3125 x 13/16 - Basket to rod
-5	8029147	8	DOWEL .. 0.3125 x 9/16 - Bearing locating
-6	8259128	24	BOLT .. Hex head 1/2-20 x 2-3/4
-7	8487883	24	NUT .. Hex lock 1/2-20
-8	8260114	48	WASHER .. Special 1/2
-9	9544257	8	ROD .. Connecting - Blade - Utex No. 9569742
-10	8354118	8	BEARING .. Connecting rod - Upper 83541190.031 - 83541200.062 U.S. (Optional)
-11	8136114	8	BEARING .. Connecting rod - Lower 81378070.031 - 81378080.062 U.S. (Optional)
-12	40039258	16	CARRIER .. Piston - Utex No. 40077230
-13	8442226	16	BEARING .. Insert
-14	40078951	16	PIN .. Piston - Rocking
-15	8159340	32	BOLT ASSEMBLY .. Hex head - Includes spacer
-16	8135330	16	WASHER .. Thrust
-17	8059699	16	RING .. Snap
-18	40039257	32	RETAINER .. Bearing
-19	40039256	32	BOLT .. Hex head 1/4-20 x 1/2 - Special locking
-20	8409745	8	KIT .. Hardware - Fork rod - Contains (4) Ref. No. 2,(3) Ref. No. 6 (3) Ref. No. 7 and (6) Ref. No. 8 (not shown)

8- PISTON AND RINGS



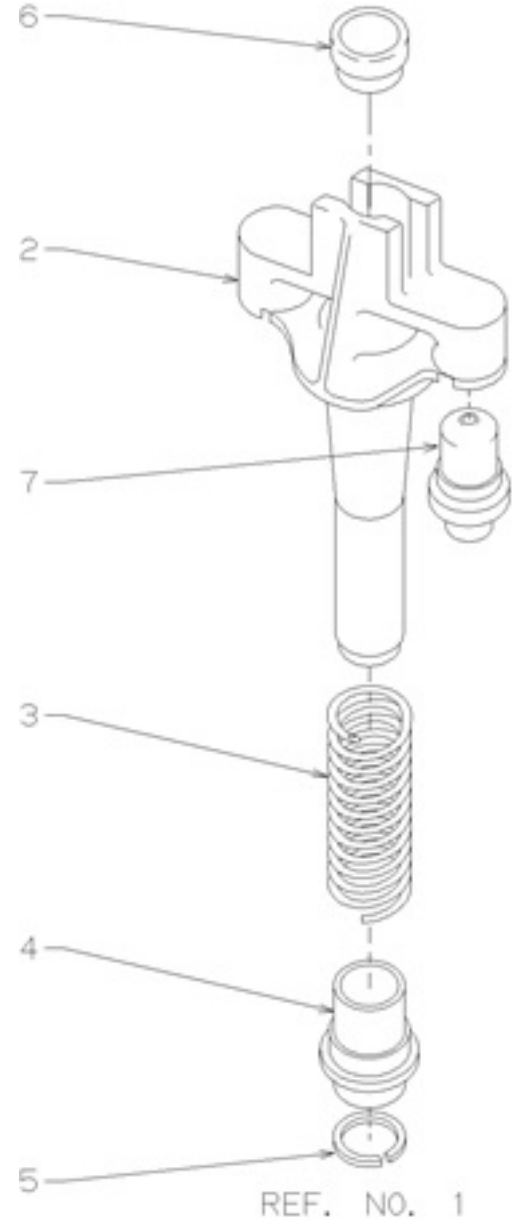
Ref	Part Number	QTY	Description
	9533162	1	PISTON ASSEMBLY .. Engine - Includes ring
-1	9523619	1	PISTON .. Bare - Standard
-1	8323296	1	RING SET .. Standard diameter
-2	9323293	1	RING .. Compression -Barrel face - Ductile iron - Thick chrome-plated sides - S.S.C. - 0.190 thick - No.1 groove
-3	8388418	2	RING .. Compression - Ferrox filled - Ductile iron - I.S.C. - 0.186 thick - No. 2 and No. 3 groove
-4	8347100	2	RING .. Compression - Tapered faced - Ferrox filled - Ductile iron - I.S.C. - 0.186 thick - No. 4 groove
-5	8347103	1	RING .. Oil-control - Double hooks crapper - No. 5 groove
-6	8464953	1	RING .. Oil-control - Spring-loaded - Slotted lower land - No.6 groove

9- CYLINDER HEAD CRABS



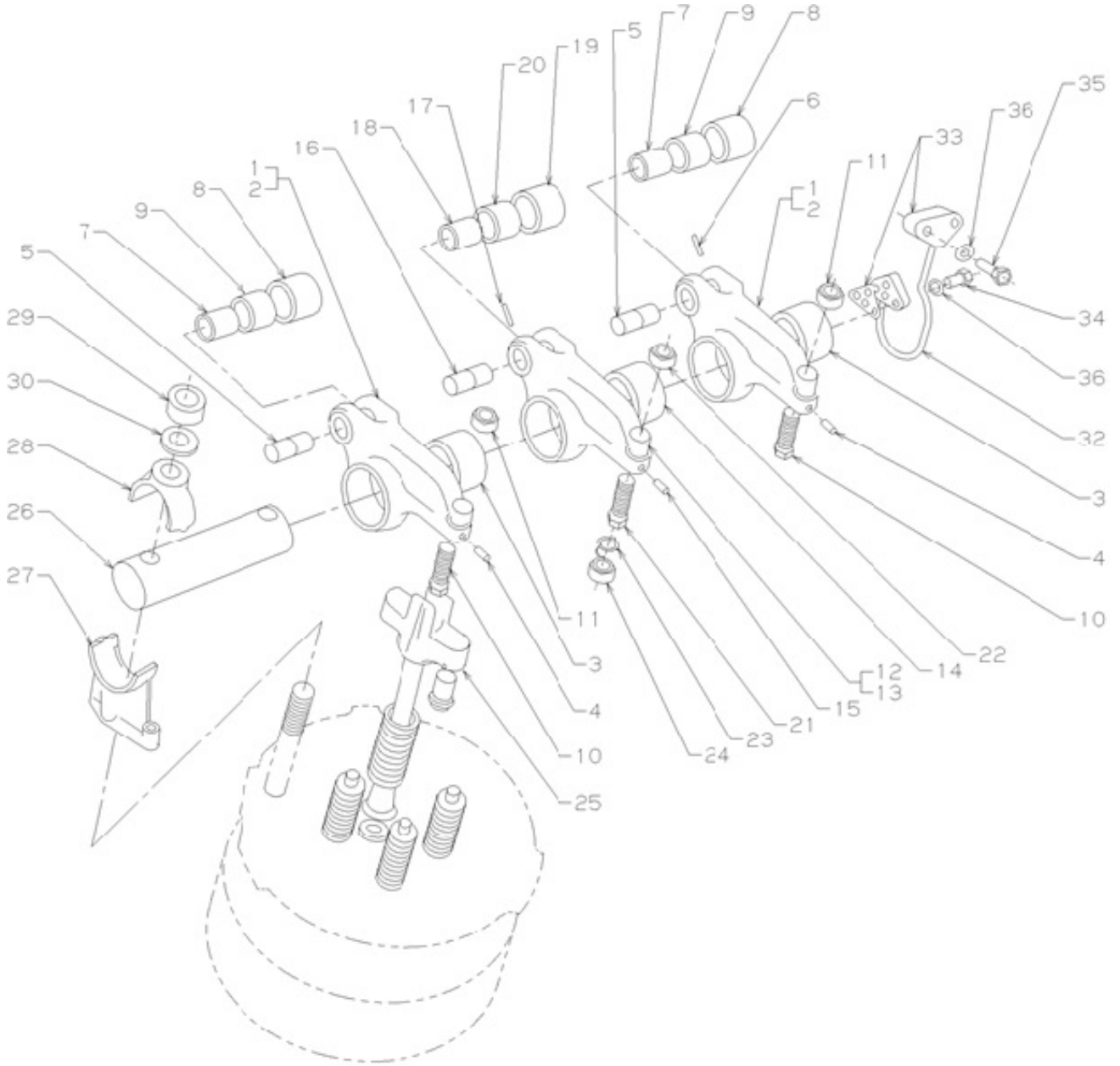
Ref	Part Number	QTY	Description
	40028824	12	CRAB .. Cylinderhead - Intermediate
-2	9523067	8	CRAB .. Cylinder head-End
-3	8133575	20	BRACKET .. Crab bolt
-4	9085894	40	BOLT .. Crab
-5	9571494	40	NUT .. Crab bolt
-6	9319172	40	WASHER .. Special
-7	8348556	20	BOLT .. Hex head 3/8 - 24 x 3
-8	8089200	20	NUT .. Spline 3/8-24

10- EXHAUST VALVE BRIDGE, ROCKER ARMS, AND OIL LINES



Ref	Part Number	QTY	Description
	8085260	2	BRIDGE ASSEMBLY .. Exhaust valve - Utex No. 8361504
-2	8054088	2	BRIDGE .. Exhaust valve
-3	8068791	2	SPRING .. Valve bridge
-4	8028126	2	SEAT .. Spring
-5	8028136	2	RING .. Locking
-6	8052307	2	BUTTON .. Valve bridge
-7	8085254	4	ADJUSTER ASSEMBLY .. Hydraulic - Valve bridge

11- EXHAUST VALVE ROCKER ARM



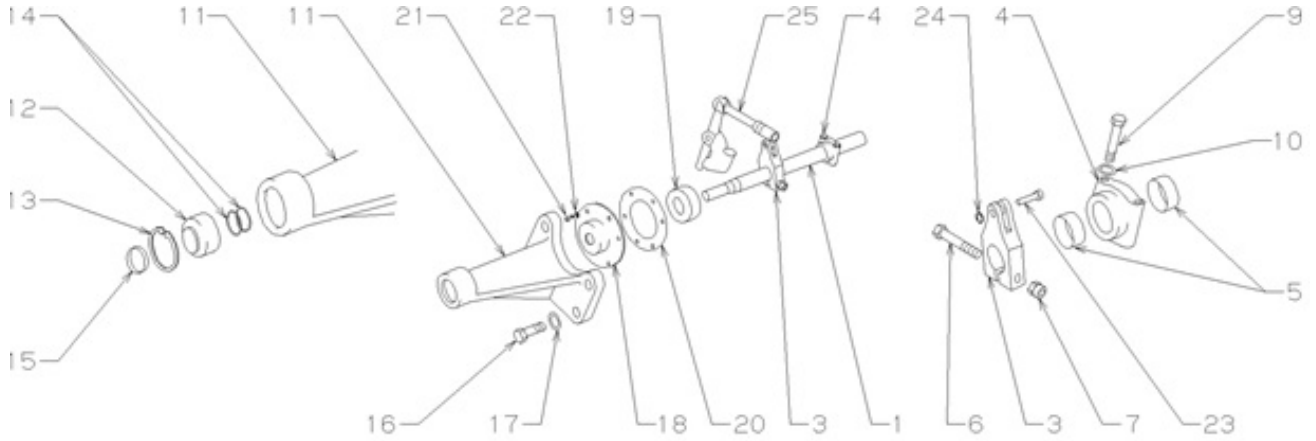
Ref	Part Number	QTY	Description
			ARM ASSEMBLY .. Rocker - Exhaust valve
-2	8328695	2	ARM .. Rocker - Exhaust valve
-3	9571921	2	BUSHING .. Arm
-4	141126	2	PIN .. Dowel 5/32 x 1/4
-5	8146111	2	PIN .. Cam follower
-6	442919	2	PIN .. Groove 1/8 x 7/8
-7	8135970	2	RACE .. Inner
-8	9319503	2	ROLLER ASSEMBLY .. Cam follower
-9	8135971	2	BUSHING .. Roller
-10	8052327	2	SCREW .. Adjusting
-11	8028723	2	NUT .. Hex jam 5/8 - 18
-12	9319504	1	ARM ASSEMBLY .. Rocker - Injector
-13	8456127	1	ARM .. Rocker - Injector
-14	9571921	1	BUSHING .. Arm
-15	141126	1	PIN .. Dowel 15/32 x 1/4
-16	8146111	1	PIN .. Cam follower
-17	442919	1	PIN .. Groove 1/8 x 7/8
-18	9563714	1	RACE .. Inner
-19	9319503	1	ROLLER ASSEMBLY .. Cam follower
-20	8135971	1	BUSHING .. Roller
-21	8052327	1	SCREW .. Adjusting
-22	8028723	1	NUT .. Hex jam 5/8 - 18
-23	8031925	1	SPRING .. Button retaining
-24	8052307	1	BUTTON .. Injector
-25	8085260	2	BRIDGE ASSEMBLY .. Exhaust valve - Utex No. 8361504
-26	8028460	1	SHAFT .. Rocker arm
-27	9090607	2	SUPPORT .. Shaft
-28	9090608	2	CAP .. Support
-29	8487866	2	NUT .. Hex 1-14



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-30	8421965	2	WASHER .. Special
-31	8307731	AR	LUBRICANT .. Thread - 70 pounds - Not available from EMD (not shown)
-32	8039842	1	LINE ASSEMBLY .. Lube oil
-33	8029167	2	GASKET .. Lube oil line
-34	181311	2	BOLT .. Hex head 1/4-28 x 5/8 - Oil line to rocker arm shaft
-35	179795	2	BOLT .. Hex head 1/4-20 x 3/4 - Oil line to camshaft bearing
-36	103319	4	WASHER .. Lock 1/4

12- INJECTOR CONTROL LINKAGE



Ref	Part Number	QTY	Description
	8196855	1	SHAFT ASSEMBLY .. Injector control - Left bank
-2	8196856	1	SHAFT ASSEMBLY .. Injector control - Right bank (not shown)
-3	8360051	16	LEVER .. Injector control shaft
-4	8443643	16	BEARING AND SUPPORT ASSEMBLY .. Injector control
-5	8443644	32	BUSHING .. Support
-6	181379	16	BOLT .. Hex head 3/8-24 x 2 - Lever mounting
-7	8032717	16	NUT .. Hex lock 3/8-24
-8	9411615	16	PIN .. Spring 7/32 x 1-1/2 inches long - Lever to shaft (not shown)
-9	181381	32	BOLT .. Hex head 3/8-24 x 2-1/2
-10	6101225	32	WASHER .. Flat 3/8
-11	8451755	2	BRACKET ASSEMBLY .. Injector support
-12	40036564	2	BEARING .. Ball
-13	8054053	2	RING .. Snap - Bearing retaining
-14	8061581	AR	SHIM .. Bearing to bracket - 0.015 thick

-15	8054047	2	SPACER .. Control lever - 5/32
-16	181428	8	BOLT .. Hex head 1/2-20 x 1-1/8
-17	6101229	8	WASHER .. Flat 1/2
-18	8070619	2	RETAINER ASSEMBLY .. Oil seal
-19	8028752	2	SEAL .. Oil
-20	40039280	2	GASKET .. Retainer
-21	181313	10	BOLT .. Hex head 1/4-28 x 3/4 - Retainer mounting
-22	9414320	10	WASHER .. Flat 1/4
-23	8028103	16	PIN .. Clevis - Control lever to adjusting link
-24	148147	16	RETAINER .. Clevis pin - Spring type
-25	8070027	16	LINK ASSEMBLY .. Adjusting - Injector control

13- TWO PIECES CONTROL SHAFT KITS

As a service option to the one-piece injector control shafts shown on the previous page, two-piece control shaft kits are available for 16-cylinder engines. These kits eliminate the need for removal of the cylinder head cover support frames when replacement is required.

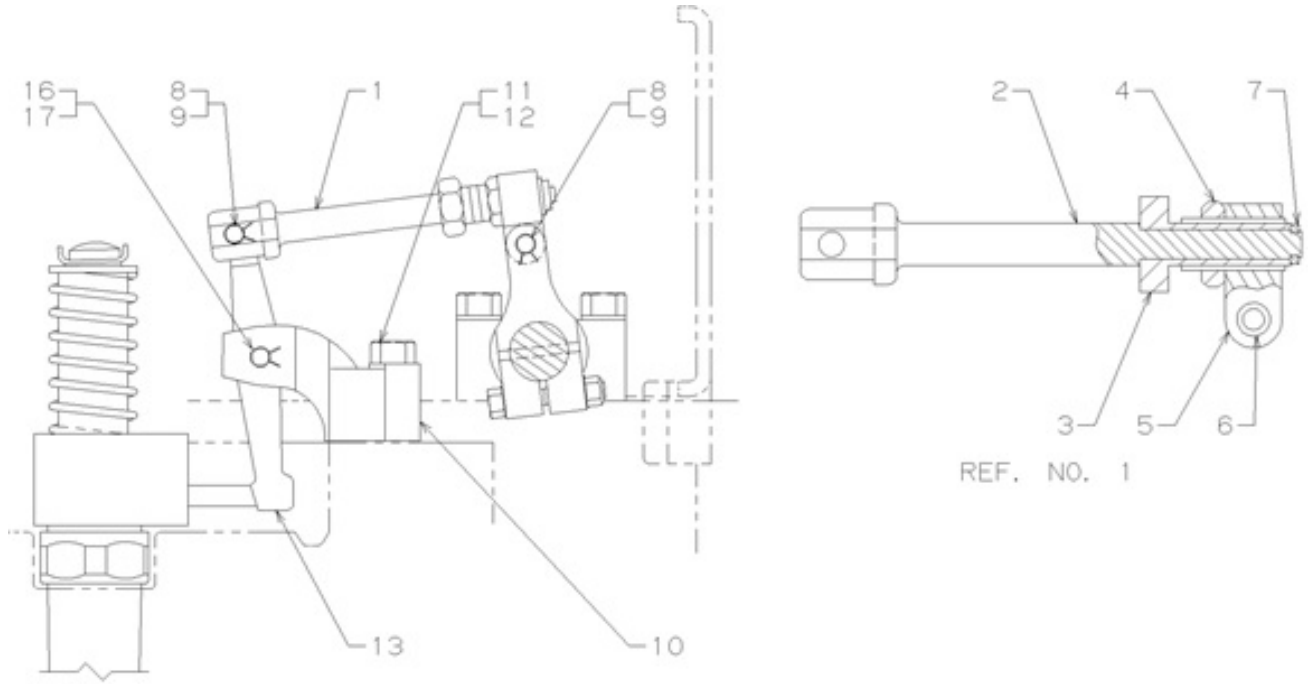
Ref	Part Number	QTY	Description
	9084412	1	KIT .. Control shaft - Left bank - Service option for 8196855 Shaft Assembly
-2	9084413	1	SHAFT ASSEMBLY .. Left bank - Rear
-3	8360051	4	LEVER .. Injector control shaft
-4	8443643	4	BEARING AND SUPPORT ASSEMBLY .. Injector - Includes bushings
-5	181379	4	BOLT .. Hex head 3/8-24 x 2 - Lever mounting
-6	8032717	4	NUT .. Hex lock 3/8-24
-7	9411615	4	PIN .. Spring 7/32 x 1-1/2 inches long
-7	9084414	1	SHAFT ASSEMBLY .. Left bank - Front
-8	8360051	4	LEVER .. Injector control shaft
-9	8443643	4	BEARING AND SUPPORT ASSEMBLY .. Injector - Includes bushings
-10	181379	4	BOLT .. Hex head 3/8-24 x 2 - Lever mounting



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-11	8032717	4	NUT .. Hex lock 3/8-24
-12	9411615	4	PIN .. Spring 7/32 x 1-1/2 inches long
-13	181379	2	BOLT .. Hex head 3/8-24 x 2 - Front shaft to rear shaft connecting
-14	8032717	2	NUT .. Hex lock 3/8-24
-15	9084409	1	KIT .. Control shaft - Right bank - Service option for 8196856 Shaft Assembly
-16	9084410	1	SHAFT ASSEMBLY .. Right bank - Rear
-17	8360051	4	LEVER .. Injector control shaft
-18	8443643	4	BEARING AND SUPPORT ASSEMBLY .. Injector - Includes bushings
-19	181379	4	BOLT .. Hex head 3/8-24 x 2 - Lever mounting
-20	8032717	4	NUT .. Hex lock 3/8-24
-21	9411615	4	PIN .. Spring 7/32 x 1-1/2 inches long
-22	9084411	1	SHAFT ASSEMBLY .. Right bank - Front
-23	8360051	4	LEVER .. Injector control shaft
-24	8443643	4	BEARING AND SUPPORT ASSEMBLY .. Injector - Includes bushings
-25	181379	4	BOLT .. Hex head 3/8-24 x 2 - Lever mounting
-26	8032717	4	NUT .. Hex lock 3/8-24
-27	9411615	4	PIN .. Spring 7/32 x 1-1/2 inches long
-28	181379	2	BOLT .. Hex head 3/8-24 x 2 - Front shaft to rear shaft connecting
-29	8032717	2	NUT .. Hex lock 3/8-24

14- ADJUSTING LINK AND INJECTOR CONTROL LEVER

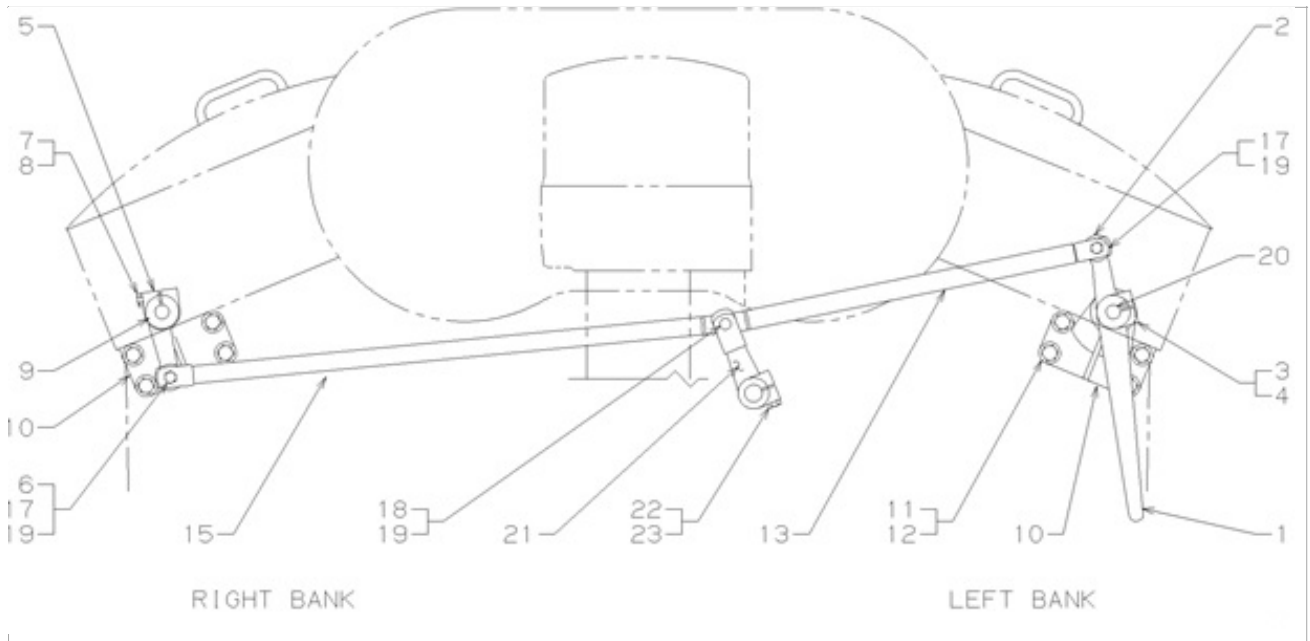


Ref	Part Number	QTY	Description
	8070027	1	LINK ASSEMBLY .. Adjusting
-2	8069697	1	SHAFT .. Link
-3	8034849	1	COLLAR .. Adjusting
-4	8034846	1	NUT .. Collar
-5	8359417	1	LINK .. Adjusting
-6	148401	1	BEARING .. Needle
-7	8034847	1	WASHER .. Peened to shaft
-8	8028103	2	PIN .. Clevis 1/4x1-1/8
-9	148147	2	RETAINER .. Spring clip
-10	9541016	1	BRACKET .. Control lever - Sintered metal

-11	179890	1	BOLT .. Hex head 1/2-13 x 2-1/4
-12	6101229	1	WASHER .. Flat 1/2
-13	9522625	2	LEVER ASSEMBLY .. Injector control
-14	148401	1	BEARING .. Needle - Link
-15	148402	1	BEARING .. Needle - Bracket
-16	8028098	1	PIN .. Clevis 1/2 x 1-3/32
-17	148151	1	RETAINER .. Spring clip

QuantitiesshownareforoneCylinderHeadAssembly.

15- GOVERNOR CONTROL LINKAGE WITH MANUAL LAYSHAFT ON LEFT BANK

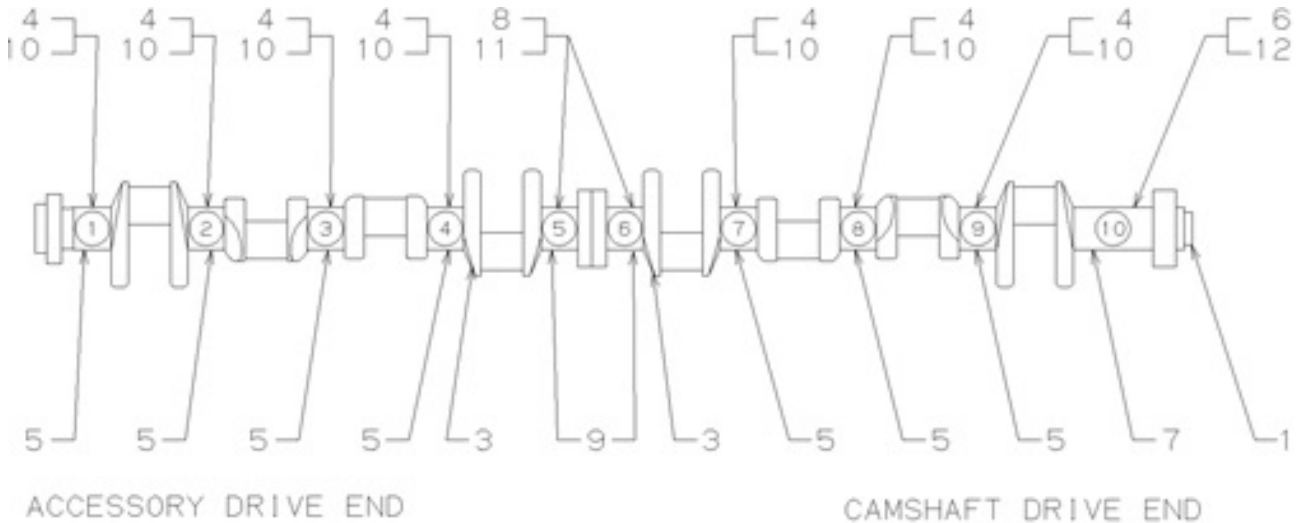




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Ref	Part Number	QTY	Description
	8451739	1	LEVER ASSEMBLY .. Hand control - Injector control shaft -Left bank
-2	40036565	1	BEARING .. Ball
-3	181377	1	BOLT .. Hex head 3/8-24 x 1-3/4 - Lever clamping
-4	6101225	1	WASHER .. Flat 3/8
-5	8451749	1	LEVER ASSEMBLY .. Injector control shaft - Right bank
-6	40036565	1	BEARING .. Ball
-7	181377	1	BOLT .. Hex head 3/8-24 x 1-3/4 - Lever clamping
-8	6101225	1	WASHER .. Flat 3/8
-9	103608	2	PIN .. Taper - No. 4 x 2 inches long
-10	8451755	2	BRACKET ASSEMBLY .. Support - Outer end bearing
-11	181428	8	BOLT .. Hex head 1/2-20 x 1-1/8 - Bracket to the crankcase
-12	6101229	8	WASHER .. Flat 1/2
-13	8451757	1	LINK ASSEMBLY .. Control - Left bank
-14	40036565	1	BEARING .. Ball
-15	8451756	1	LINK ASSEMBLY .. Control - Right bank
-16	40036565	1	BEARING .. Ball
-17	8080078	2	BOLT .. Hex head 5/16-24 x 17/32
-18	8194650	1	BOLT .. Hex head 5/16-24 x 2
-19	8032716	3	NUT .. Hex lock 5/16-24
-20	8054047	2	SPACER .. Control lever
-21	8215509	1	LEVER .. Governor to control rod
-22	181377	1	BOLT .. Hex head 3/8-24 x 1-3/4
-23	6101225	1	WASHER .. Flat 3/8
-24	124548	1	KEY .. Woodruff - No.8 (not shown)

16- CRANKSHAFT, MAIN BEARINGS AND BEARING CAP



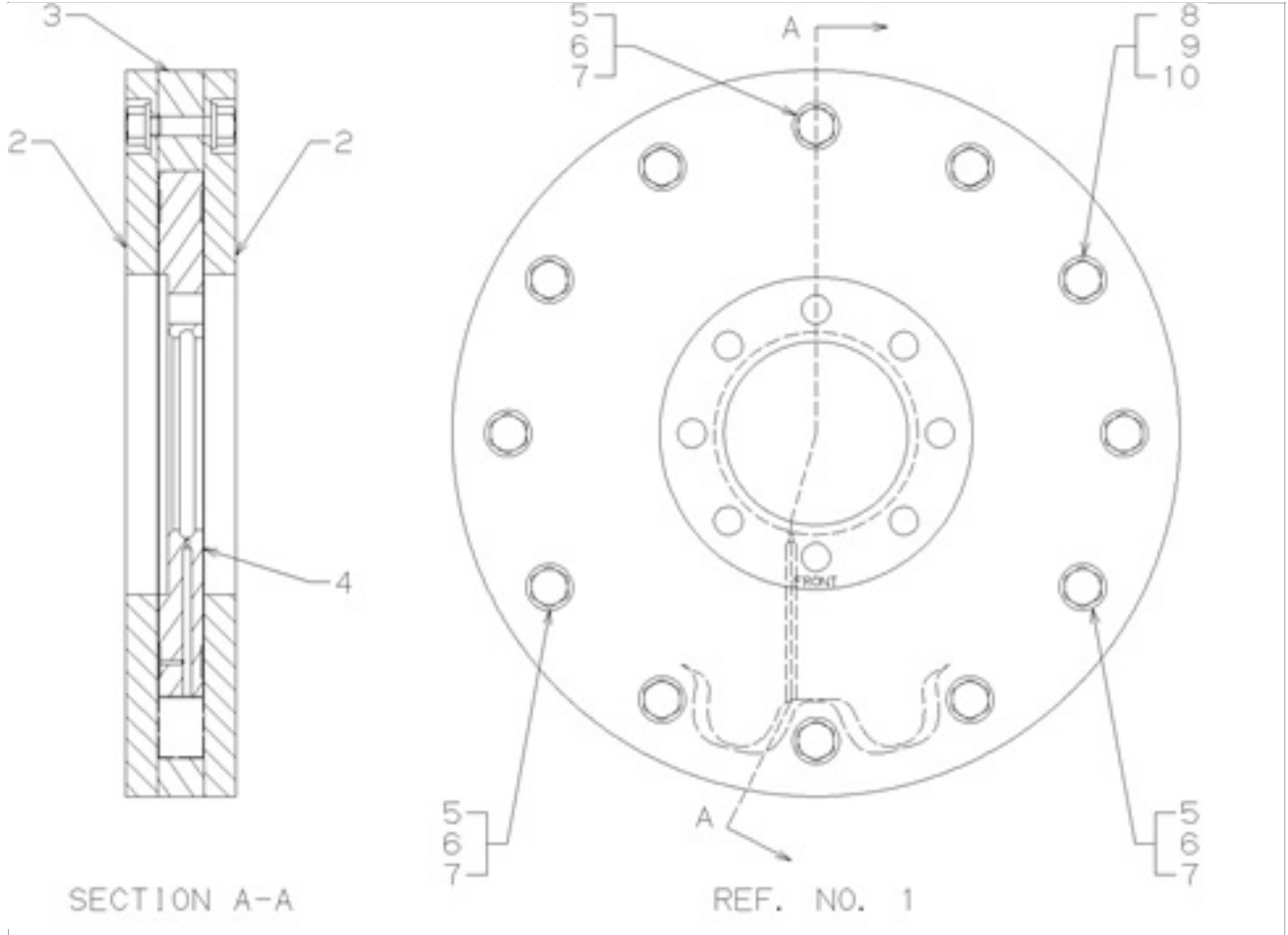
Ref	Part Number	QTY	Description
	8034708	1	CRANKSHAFT .. Engine - Standard two halves
-2	223784	6	BOLT .. Hex head 1-14 x 2-3/4 - Crankshaft connecting (not shown)
-3	8028006	2	COLLAR .. Thrust - Standard thickness - Consists of two halves 8081195 .. 0.015 O.S. - 8141702 .. 0.030 O.S.
-4	8455862	7	BEARING .. Main - Front and intermediate - Upper - Standard I.D. 8455863 .. 0.031 U.S. - 8455865 .. 0.093 U.S. 8455864 .. 0.062 U.S. - 8455866 .. 0.125 U.S.
-5	8455666	7	BEARING .. Main - Front and intermediate - Lower - Standard I.D. 8455683 .. 0.031 U.S. - 8455685 .. 0.093 U.S. 8455684 .. 0.062 U.S. - 8455686 .. 0.125 U.S.
-6	8455844	1	BEARING .. Main - Rear - Upper - Standard I.D. 8455845 .. 0.031 U.S. - 8455847 .. 0.093 U.S. 8455846 .. 0.062 U.S. - 8455848 .. 0.125 U.S.
-7	8455665	1	BEARING .. Main - Rear - Lower - Standard I.D. 8455679 .. 0.031 U.S. - 8455681 .. 0.093 U.S. 8455680 .. 0.062 U.S. - 8455682 .. 0.125 U.S.
-8	8455856	2	BEARING .. Main - Center - Upper - Standard I.D. 8455857 .. 0.031 U.S. - 8455859 .. 0.093 U.S. 8455858 .. 0.062 U.S. - 8455860 .. 0.125 U.S.



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-9	8455668	2	BEARING .. Shell - Center - Lower - Standard I.D. 8455691 .. 0.031 U.S. - 8455693 .. 0.093 U.S. 8455692 .. 0.062 U.S. Bearing caps have a rough bore and must be line-bored at assembly. For main bearing cap studs, nuts, and washers.
-10	8476509	7	CAP .. Main bearing - Location 1, 2, 3, 4, 7, 8 and 9
-11	8476507	2	CAP .. Main bearing - Location 5 and 6
-12	8476510	1	CAP .. Main bearing - Location 10
-13	8452186	1	KIT .. Main Bearing - Includes Ref. Nos. 4, 6 and 8
-14	8452210	1	KIT .. Main Bearing - Includes Ref. Nos. 5, 7 and 9

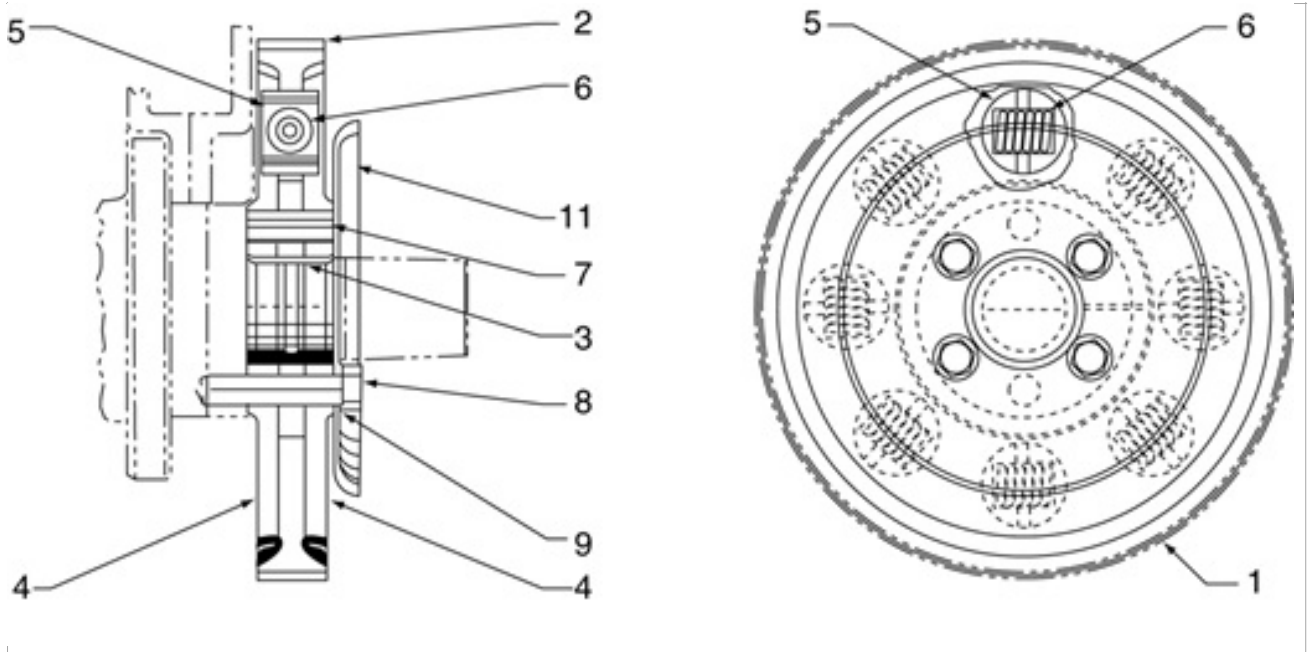
17- GEAR DAMPER ASSEMBLY



Ref	Part Number	QT Y	Description
	9323945	1	DAMPER ASSEMBLY .. Gear
-2	9323944	2	RING .. Damper outer
-3	9323943	1	RING .. Damper intermediate
-4	9323942	1	SPIDER .. Gear damper
-5	9338722	3	BOLT .. Hex head 5/8-11 x 2.938
-6	9319830	6	WASHER .. Flat 5/8
-7	102639	3	NUT .. Hex 5/8-11
-8	271615	9	BOLT .. Hex head 3/4-10 x 3
-9	9319829	18	WASHER .. Flat 3/4

-10	220081	9	NUT .. Hex 3/4-10
-11	8168822	AR	COATING .. 1 quart (not shown) - Used on all internal rubbing surfaces - No longer available from EMD
-12	223771	8	BOLT .. Hex head 7/8-14 x 3-1/4 - Damper mounting (not shown)
-13	8174659	8	WASHER .. Special 7/8 (not shown)

18- ACCESSORY DRIVE GEAR ASSEMBLY (INTEGRALSHAFT)

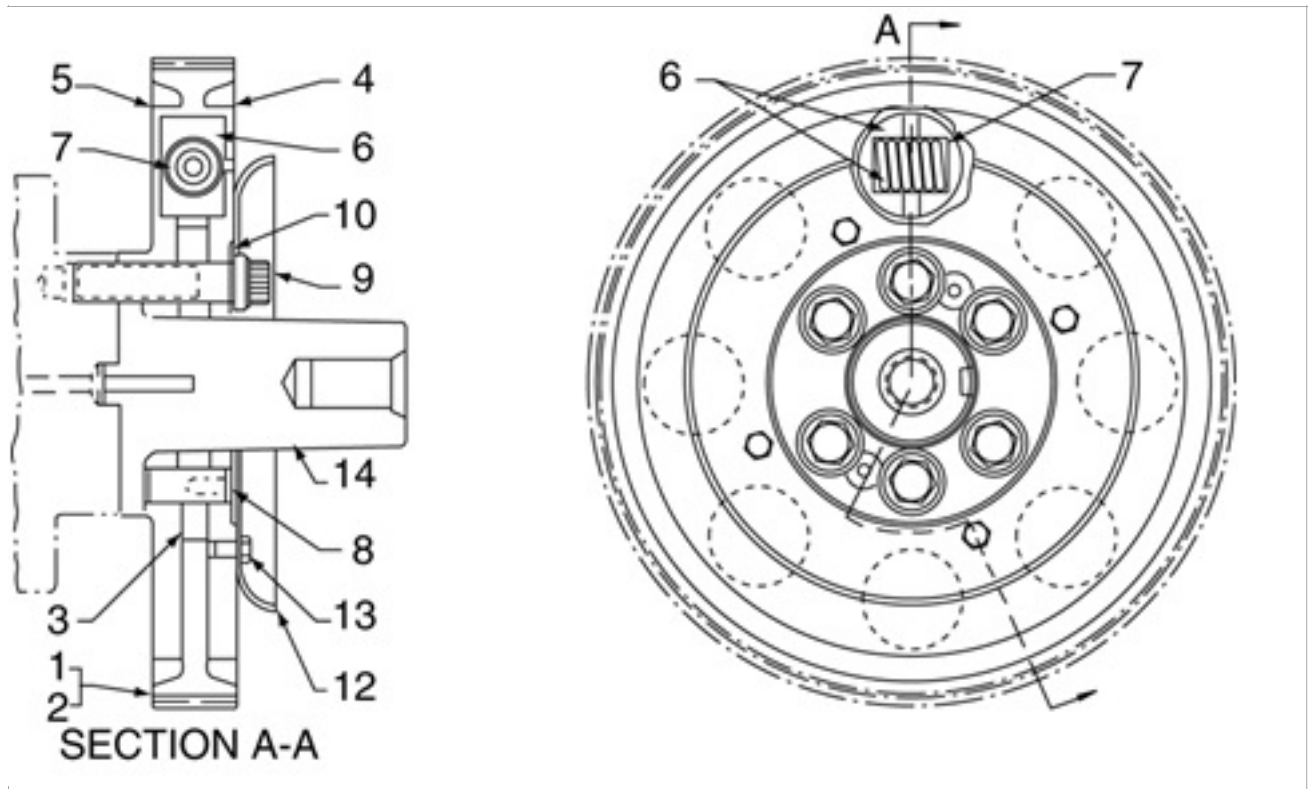


Ref	Part Number	QTY	Description
	8365300	1	GEAR ASSEMBLY .. Accessory drive - Eight spring type
-2	8360839	1	GEAR .. Drive - Spur
-3	8141907	1	HUB .. Drivegear
-4	8360838	2	DISC .. Front and rear
-5	9091463	16	SEGMENT .. Spring
-6	8360837	8	SPRING .. Coil
-7	8031883	2	DOWEL .. Alignment - 0.876 diameter x 2-7/16 inches long 8082445 .. 0.005 O.S. 8082446 .. 0.010 O.S. 8052996 .. 0.015 O.S.

-8	223759	4	BOLT .. Hex head 3/4-16 x 3-3/4
-9	8140912	4	WASHER .. Hardened 3/4
-10	218197	4	NUT .. Hex 3/4-16 - Used to keep the assembly together during shipping
-11	8084763	1	SLINGER .. Oil

Quantities shown are for one Engine

19- ACCESSORY DRIVE GEAR ASSEMBLY (BOLT-ONSTUBSHAFT)



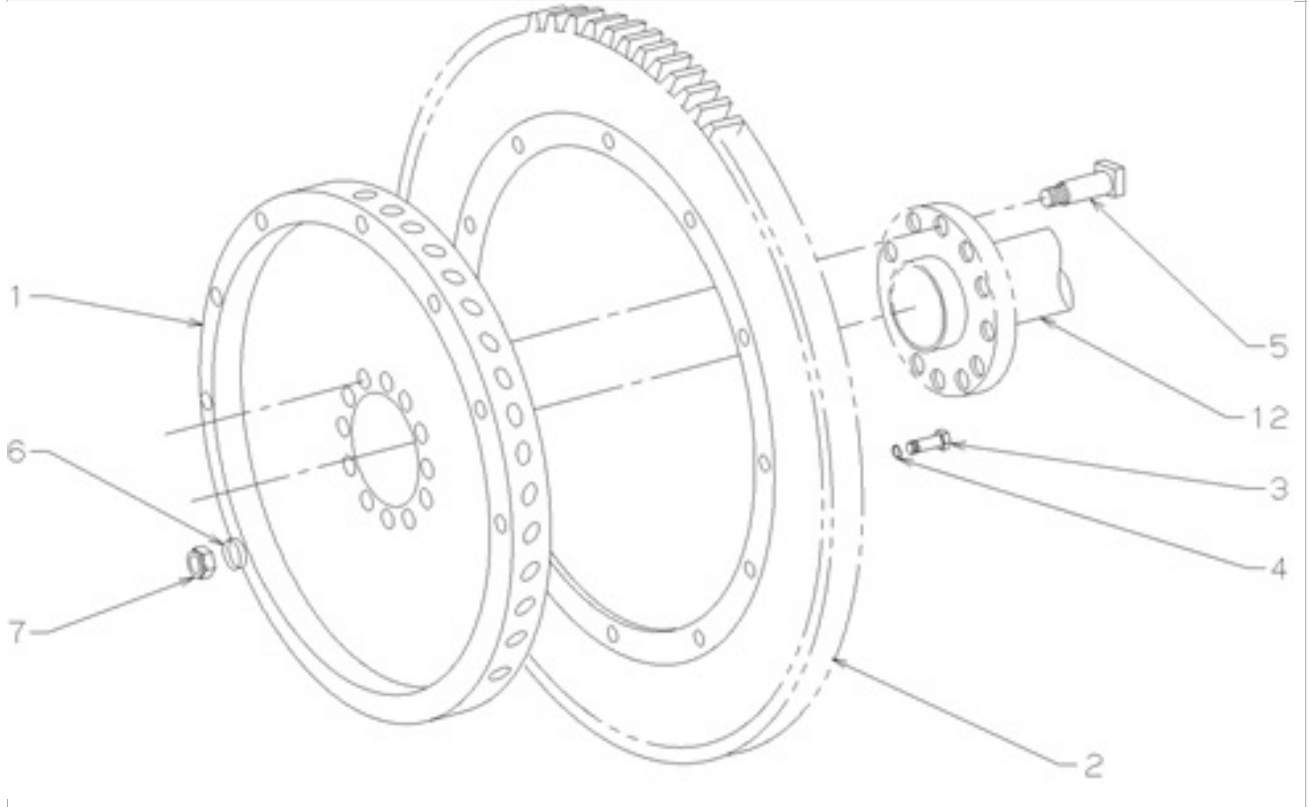
Ref	Part Number	QTY	Description
	8485722	1	GEAR ASSEMBLY .. Accessory drive
-2	8360839	1	GEAR .. Drive - Spur



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-3	8472990	1	HUB .. Accessory - Spur
-4	8481449	1	DISC .. Accessory drive gear - Outer
-5	8481450	1	DISC .. Accessory drive gear - Inner
-6	9091463	16	SEGMENT .. Spring
-7	8360837	8	SPRING .. Coil
-8	8459971	2	DOWEL .. 7/8 x 2 inches long 8459972 .. 0.05 O.S. 8459973 .. 0.010 O.S. 8459974 .. 0.015 O.S.
-9	9434217	6	BOLT .. Type C spine - 7/8-9 x 4 inches long
-10	8489072	6	WASHER .. Hard
-11	220082	6	NUT .. Hex 7/8-9 - Used in shipping only - (Not shown)
-12	8481417	1	SLINGER .. Oil
-13	9434218	4	BOLT .. Hex head 3/8-16 x 5/8 - Slinger to disc
-14	8481374	1	STUBSHAFT .. Tapered - Accessory drive coupling NOTE: When applying 8481374 stubshaft as a repair to the tapered end of a standard crankshaft, the crankshaft must be re-worked and additional material should be purchased. Contact Purchase Agent for details.
-15	179881	2	BOLT .. Hex head 1/2-13 x 1 - Stubshaft to the crankshaft - (Not shown)

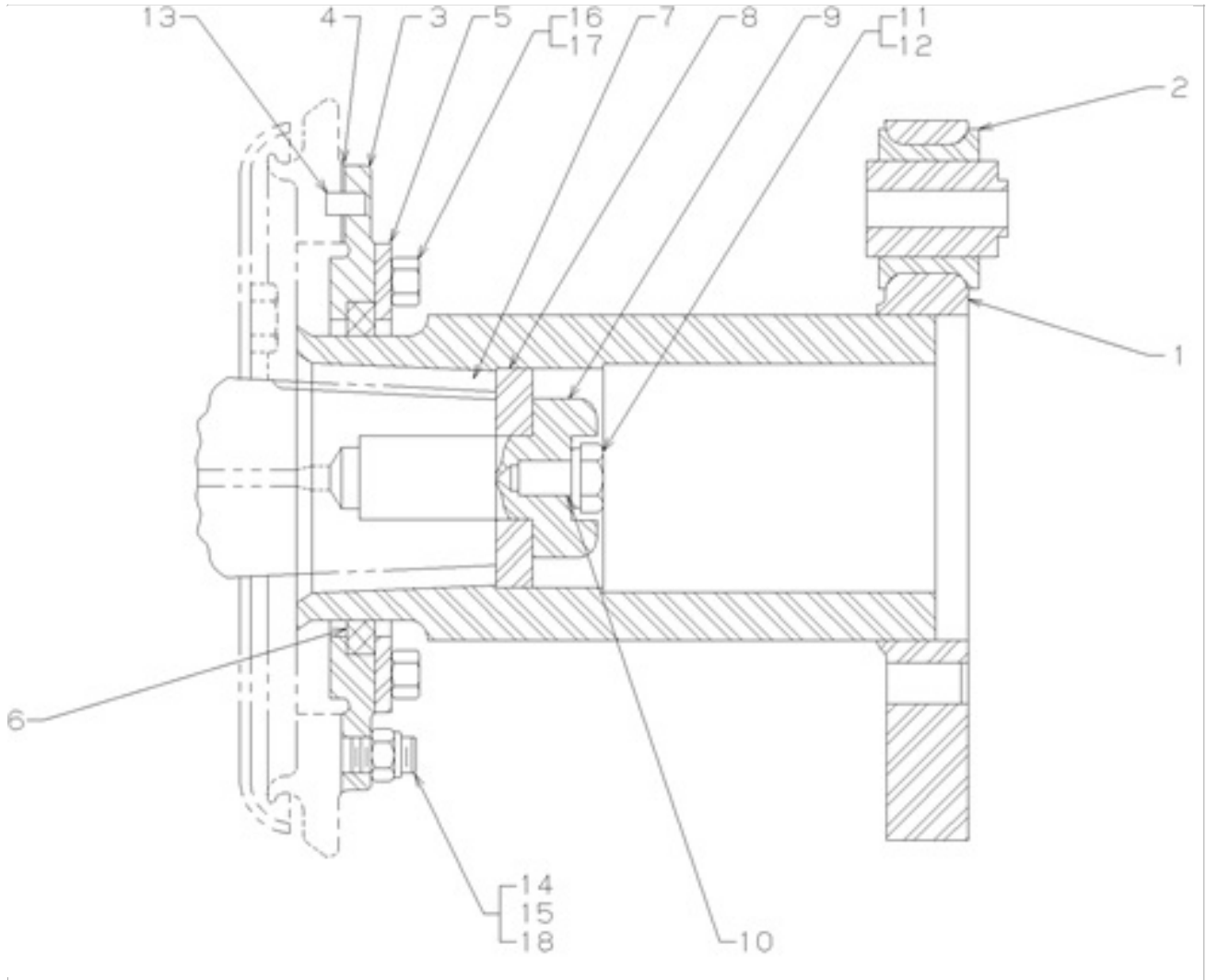
20- CRANKSHAFT COUPLINGS



Ref.	Part Number	QTY	Description
	9552505	1	DISC .. Engine coupling
-2	8416930	1	GEAR .. Ring - Starter motor - Phosphate coated
-3	181370	3	BOLT .. Hex head 3/8-24 x 1-1/4 - Ring gear to disc
-4	103321	3	WASHER .. Lock 3/8
-5	8245294	6	BOLT .. Special square head 1-1/2-12 x 4-9/16 - 45° chamfer on one side - Mount coupling disc to the crankshaft
-6	8336210	2	WASHER .. Special 2-7/10 O.D. x 1-17/32 I.D.
-7	8334366	6	NUT .. Hex lock 1-1/2 x 12
-8	9551557	2	BRACKET .. Indicator - Generator alignment (not shown)
-9	9552506	1	DISC .. Coupling - Generator to the engine (not shown)
-10	8363312	12	BOLT .. Offset head - 1-1/4-12 x 4-1/16 - Couplingdisc(not shown)
-11	8360846	12	WASHER .. Special hardened - 1-9/32 I.D. x 2-7/16 O.D. x 3/8 inch thick (not shown)

-11	8360845	12	NUT .. Hex lock 1-1/4-12 (not shown)
-12	8034708	1	CRANKSHAFT .. Engine
-13	8354872	1	INDICATOR .. Flywheel engine timing -Pointer (not shown)

21- FRONT END ACCESSORY COUPLING



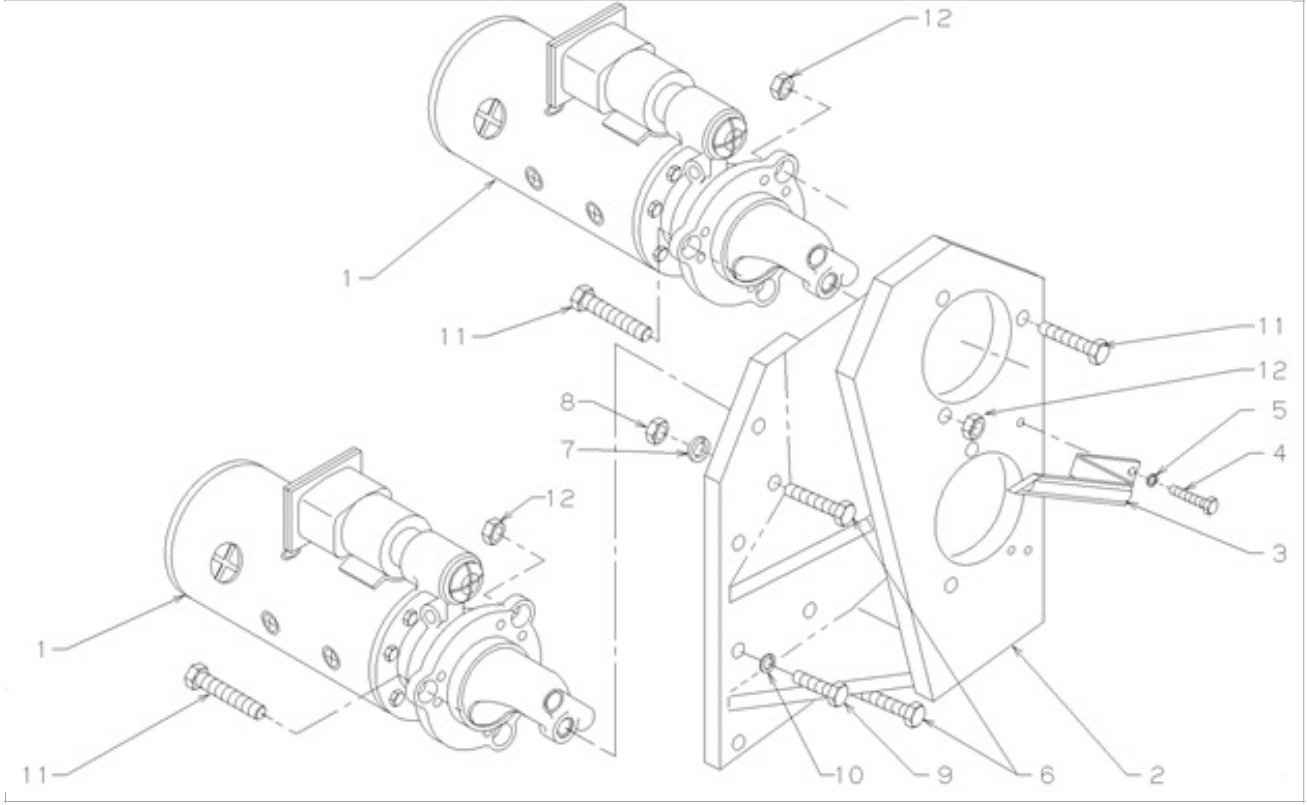
Ref.	Part Number	QTY	Description
	8323180	1	COUPLING ASSEMBLY .. Accessory drive



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-2	8234958	10	JOINT .. Center bonded - Rubber bushing
-3	8041658	1	COVER .. Accessory drive
-4	40048967	1	GASKET .. Accessory drive cover
-5	8041657	1	RETAINER .. Oil seal
-6	8055158	1	SEAL .. Accessory drive oil
-7	8029538	1	KEY .. Coupling
-8	8029555	1	WASHER .. Retaining
-9	8029567	1	BOLT .. Special hex head 1-1/4-12 x 2-3/4
-10	8029569	1	SPRING .. Lock
-11	181427	1	BOLT .. Hex head 1/2-20 x 1
-12	103323	1	WASHER .. Lock 1/2
-13	8028366	2	DOWEL .. Cover alignment
-14	8032719	8	NUT .. Hex lock 1/4-20
-15	6101229	8	WASHER .. Flat 1/2
-16	179839	6	BOLT .. Hex head 3/8-16 x 1
-17	6101225	6	WASHER .. Flat 3/8
-18	8084871	8	STUD .. 1/2-13-20 x 2-7/16 inches long

22- STARTER MOTOR APPLICATION



Ref	Part Number	QTY	Description
	10478829	2	MOTOR ASSEMBLY .. Starter
-2	8358874	1	BRACKET ASSEMBLY .. Motor mounting
-3	8354872	1	INDICATOR .. Flywheel timing
-4	179793	2	BOLT .. Hex head 1/4-20 x 5/8
-5	103319	2	WASHER .. Lock 1/4
-6	8249889	2	BOLT .. Hex head 3/4-16 x 2-5/8
-7	8140912	2	WASHER .. Special 3/4
-8	8060089	2	NUT .. Hex lock 3/4-16
-9	271585	6	BOLT .. Hex head 5/8-18 x 1-3/4
-10	103325	6	WASHER .. Lock 5/8
-11	271589	6	BOLT .. Hex head 5/8-18 x 2-1/4 - Motor mounting
-12	8032721	6	NUT .. Hex lock 5/8-18



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