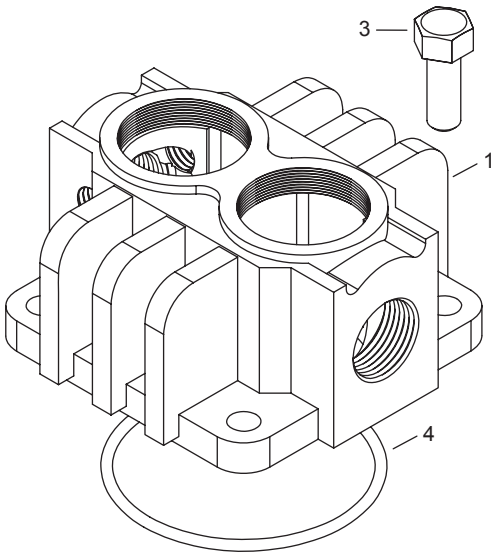
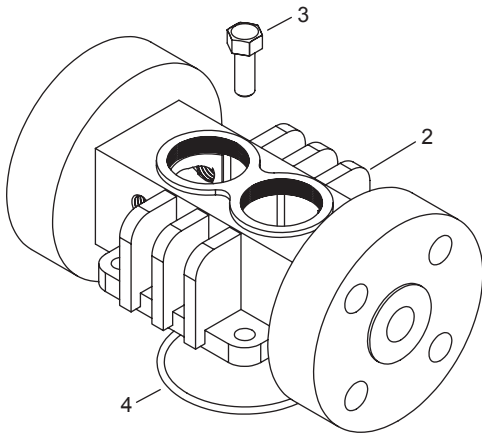


Appendix G—91 and F91 Head and Valve Assembly Details

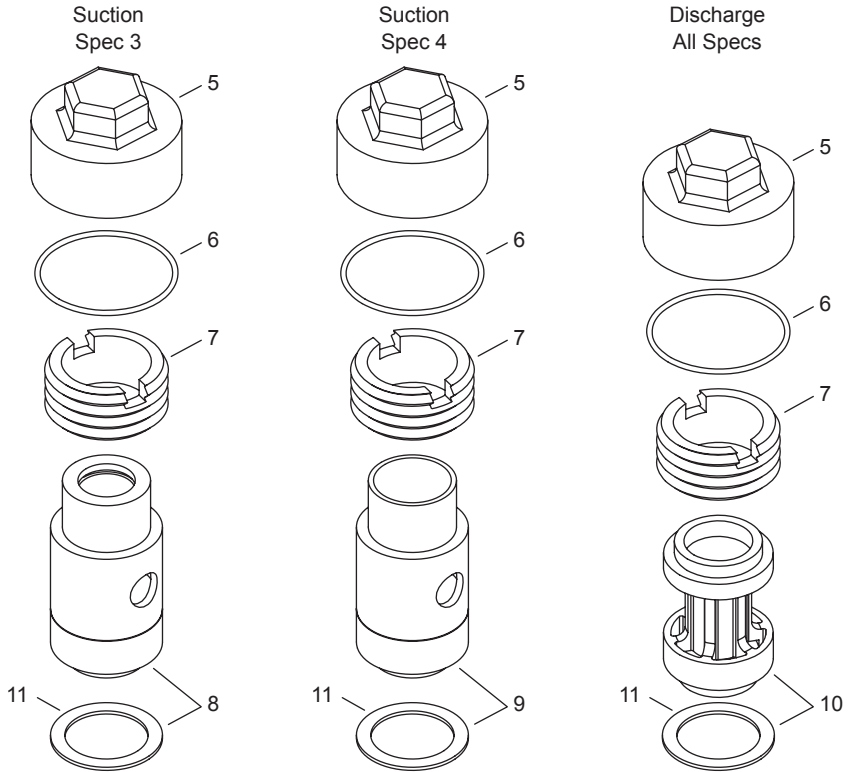
91 Head Assembly



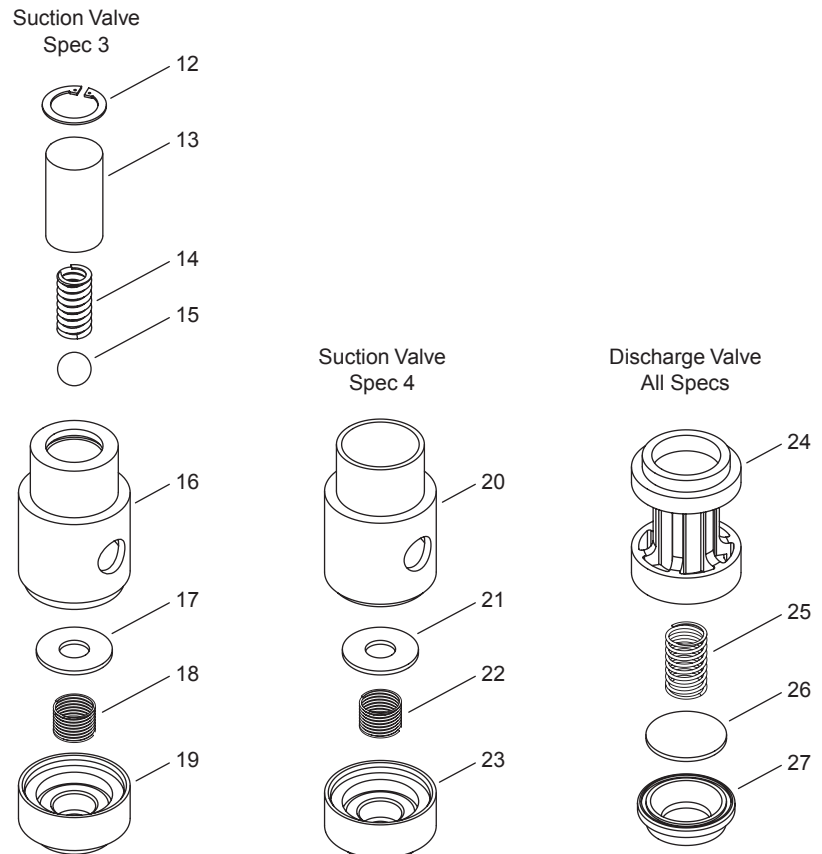
F91 Head Assembly



Valve Holddown Assemblies



Valve Assemblies



Appendix G—91 and F91 Head and Valve Assembly Details

Head and Valve Bill of Materials

Ref No.	Part No.	Description
1.	2374	Head model 91
	2374-X ^a	Head assy. for model 91 (spec 3)
	2374-X1	Head assy. for model 91 (spec 4)
2.	4302	Head model F91 (ANSI flange)
3.	7001-037 NC100A	Bolt, 3/8-16 x 1" Gr.5 hex head
4.	2-235 _c	O-ring
5.	2714-1	Valve cap
6.	2-031 _c	O-ring
7.	2715	Holddown screw
8.	3483-1X	Suction valve assy. (spec 3)
	3483-1X1 ^b	Same as above but with copper gaskets
	3483-1X2 ^b	Same as above but with iron-lead gaskets
9.	3483-X	Suction valve assy. (spec 4)
	3483-X1 ^b	Same as above but with copper gaskets
	3483-X2 ^b	Same as above but with iron-lead gaskets
10.	3485-X	Discharge valve assy. (all specs)
	3485-X1 ^b	Same as above but with copper gaskets
	3485-X2 ^b	Same as above but with iron-lead gaskets
11.	2717	Valve gasket (aluminum)
	2717-1 ^b	Valve gasket (copper)
	2717-2 ^b	Valve gasket (iron-lead)
12.	5000-77	Retainer ring (spec 3)
13.	3977	Suction valve relief housing (spec 3)
14.	1411	Spring (spec 3)
15.	1410	Ball (spec 3)
16.	3483-1	Suction valve seat (spec 3)
17.	3972	Suction valve plate (spec 3)
18.	4009	Suction spring (spec 3)
19.	3484	Suction valve bumper (spec 3)
20.	3483	Suction valve seat (spec 4)
21.	3972	Suction valve plate (spec 4)
22.	4009	Suction spring (spec 4)
23.	3484	Suction valve bumper (spec 4)
24.	3486	Discharge valve bumper
25.	4008	Discharge spring
26.	3973	Discharge valve plate
27.	3485	Discharge valve seat

O-ring Code	
A	Buna-N
B	Neoprene ^{®d}

^a Not shown.

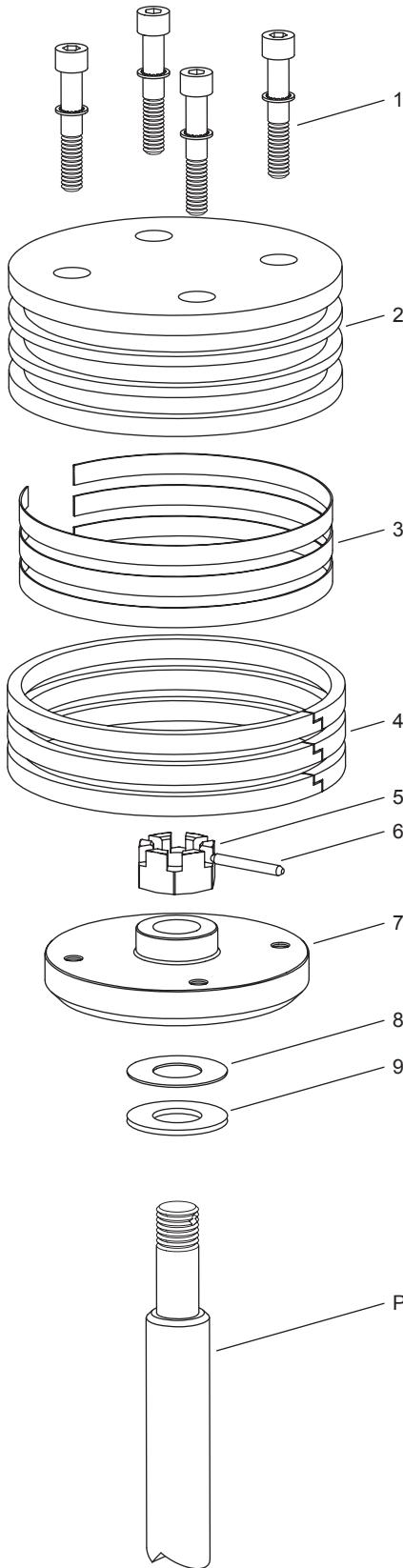
^b Optional

^c _ denotes O-ring code. See O-ring chart to the left for details.

^d Registered trademark of the DuPont company.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix G—91 and F91 Piston Assembly Details



**Piston Assembly Number 1983-X Bill of Materials
Piston Diameter 3" (7.62 cm)**

Ref No.	Part No.	Description	Qty
1.	7002-010OC100A	Screw, socket head	4
	7207-010A	Lock washer	4
2.	1983	Head, iron	1
3.	1775	Ring expander	3
4.	1772	Piston ring	3
5.	1482	Locknut	1
6.	1483	Lock pin	1
7.	1984	Piston platform	1
8.	1528	Shim washer, thick	As Req.
	1528-1	Shim washer, thin	
9.	1527	Thrust washer	1

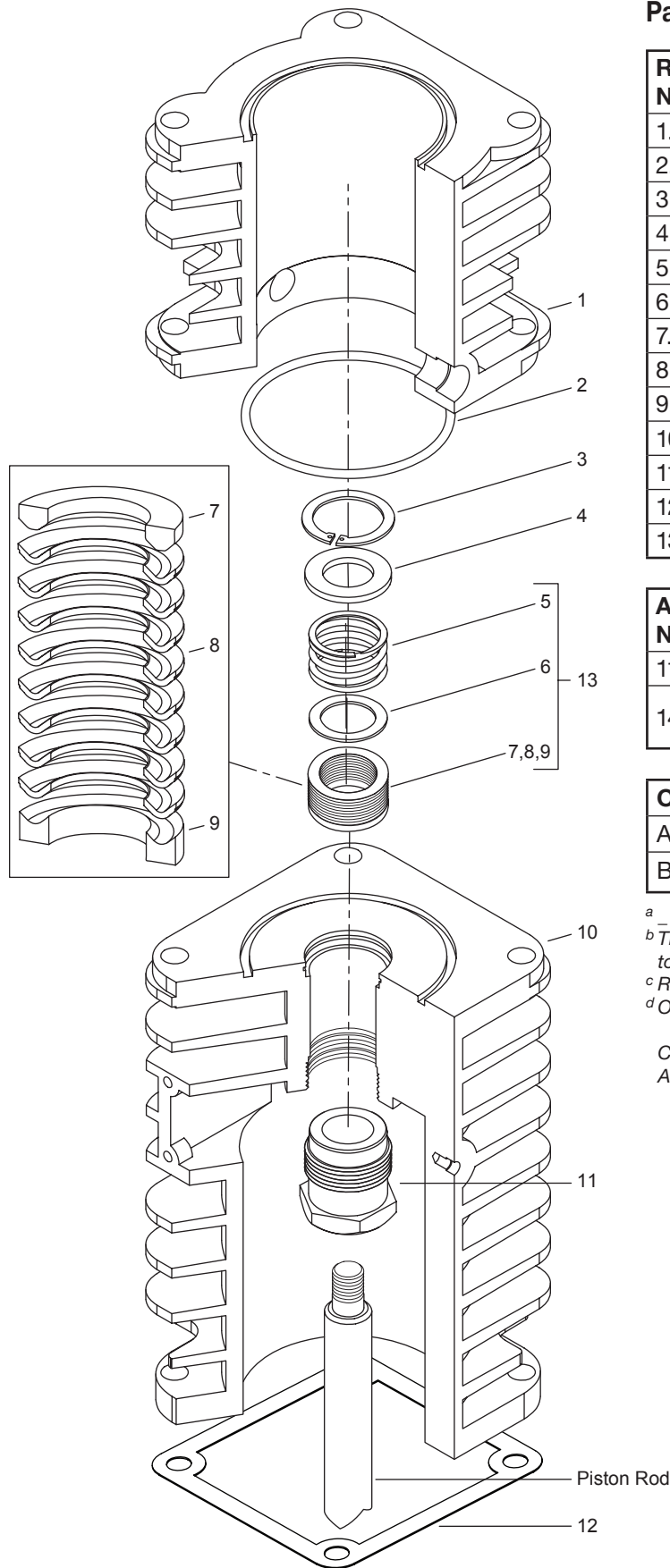
Piston Clearance (Cold)^a

Model	Minimum	Maximum
91	0.020" (0.51 mm)	0.044" (1.12 mm)

^a The distance from the bottom of the head to the top of the piston.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix G—91 and F91 Packing Assembly Details



Packing Assembly Bill of Materials

Ref No.	Part No.	Description	Qty
1.	2242	Cylinder	1
2.	2-235_ ^a	O-ring for cylinder	1
3.	5000-137	Retainer ring	1
4.	1012	Washer	1
5.	1628	Packing spring	1
6.	1714	Packing box washer	1
7.	1453-1	Male packing ring	1
8.	1454 ^b	Packing ring	8
9.	1452-1	Female packing ring	1
10.	2240	Crosshead guides	1
11.	1387	Adjusting screw	1
12.	2526	Crankcase gasket	1
13.	1452-1X1	Packing set	1

Assembly Number	Assembly Name
1132-X2	Crosshead - piston-rod assembly
1452-2X1 ^d	Packing set (alloy 50) with 1452-1, 1453-1, 1454-2 (8), 1626, 1714

O-ring Code	
A	Buna-N
B	Neoprene ^{®c}

^a _ denotes O-ring code. See O-ring chart above for details.

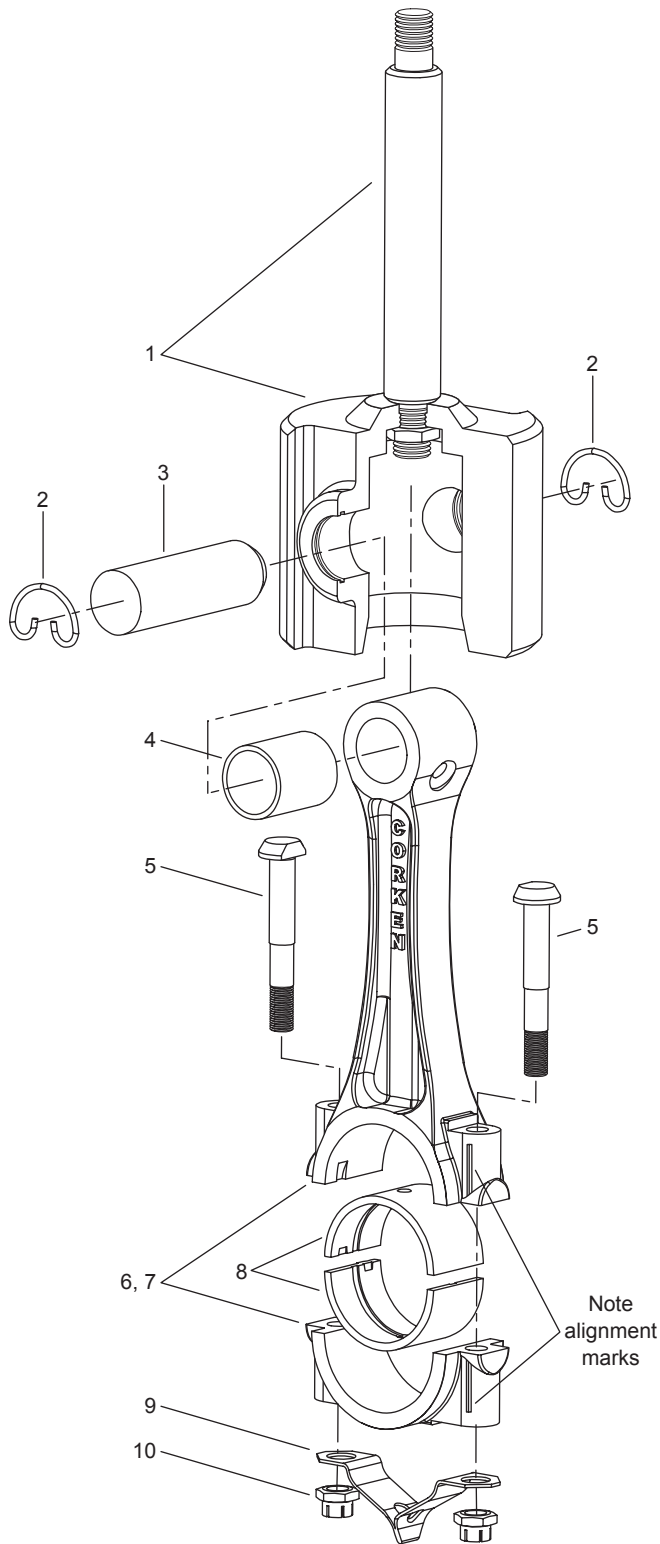
^b The quantity of 1454 packing rings required will vary due to tolerances. Use cone 4005 for installation of packing.

^c Registered trademark of the DuPont company.

^d Optional equipment

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix G—91 and F91 Connecting Rod Assembly Details



Connecting Rod Assembly Bill of Materials

Ref No.	Part No.	Description
1.	1132-X2	Crosshead assembly
2.	1498	Retainer ring
3.	2505	Wrist pin
4.	1846-X ^{a,b}	Wrist pin bushing
5.	1599 ^b	Bolt
6.	1889-1X	Connecting rod assembly
7.	1889-1 ^b	Connecting rod
8.	1367 ^b	Connecting rod bearing
9.	2011 ^b	Dipper
10.	1600 ^{b,c}	Nut

^a Must be rebored after replacing (0.8754/0.8751 dia.)

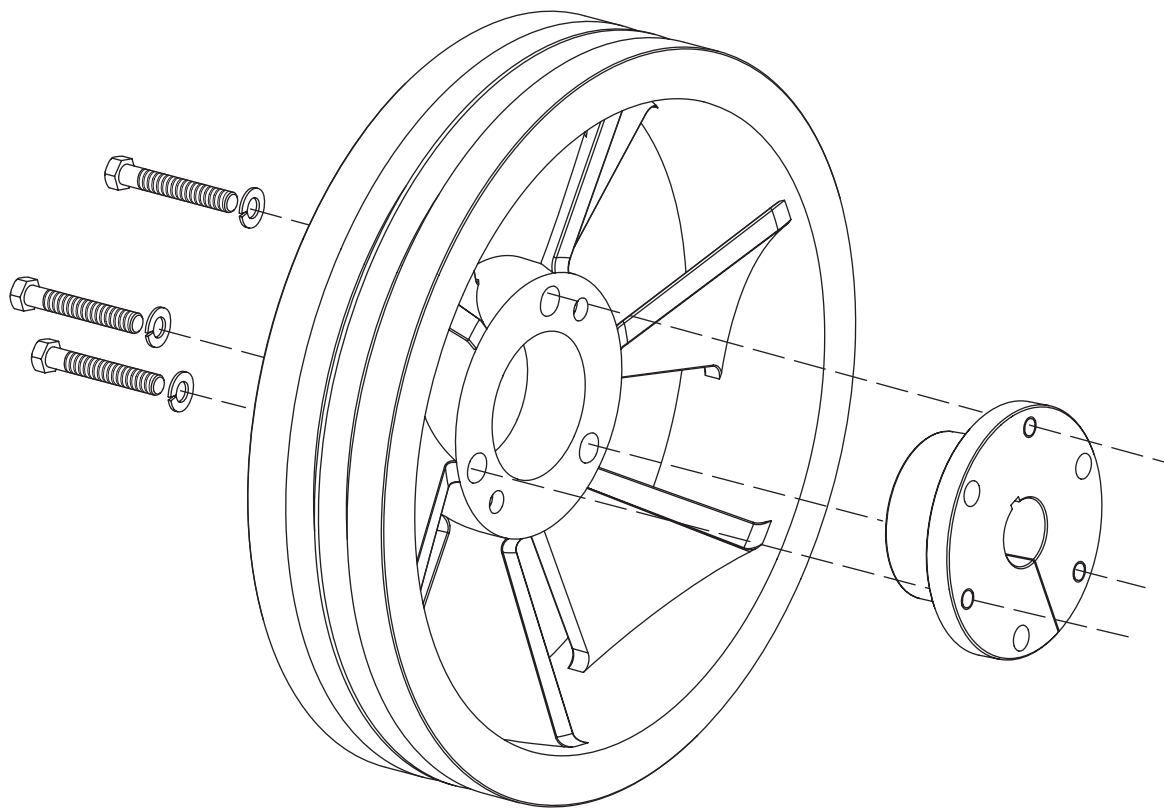
^b Included with connecting rod assembly

^c Torque connecting rod nut to 28 ft. lbs.

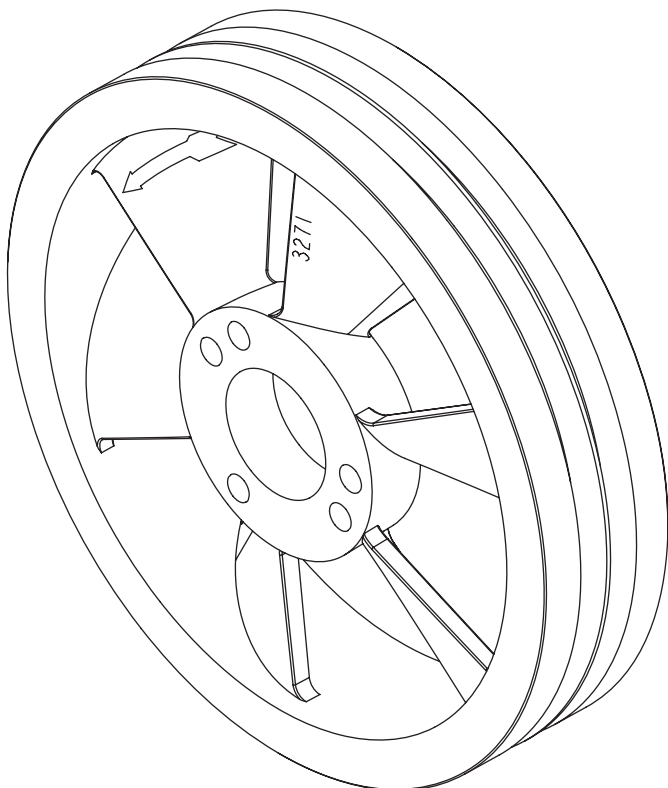
Never attempt to separate the piston rod and crosshead. When repair becomes necessary, the entire crosshead assembly must be replaced.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix G—91 and F91 Flywheel Assembly Details



Back Side

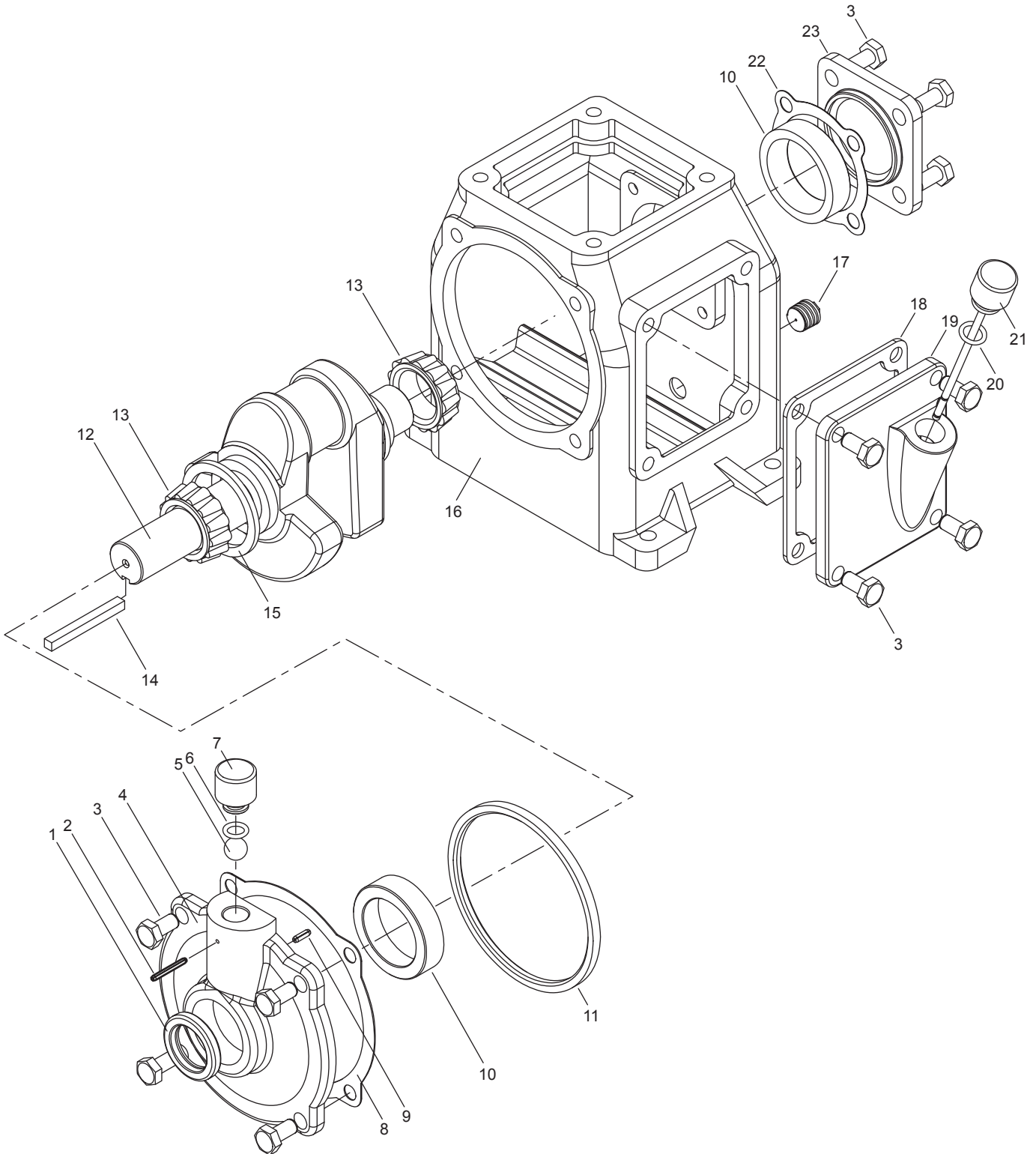


Front Side

Flywheel Assembly Bill of Materials

Assembly Number	Assembly Name
3271-X2	Flywheel assembly (flywheel, hub, and three bolts)
3271	Flywheel: 14" O.D., 2 groove
H SF-1.125	Hub with three bolts and lockwashers

Appendix G—91 and F91 Crankcase Assembly Details



Appendix G—91 and F91 Crankcase Assembly Details

Crankcase Assembly Bill of Materials

Ref No.	Part No.	Description
1.	3259	Oil seal
2.	1483	Roll pin - 1/8 x 1"
3.	7001-037NC075A	Hex head 3/8-16 x 3/4", Gr 5
4.	3260	Bearing carrier
5.	2796	Breather ball
6.	1279-X	O-ring (part of bearing cap assembly)
7.	1279-X	Breather cap assembly (with O-ring - ref. no. 6)
8.	2725	Bearing carrier gasket
9.	1807	Roll pin - 1/8 x 5/8"
10.	2718	Bearing cup
11.	2723	Oil circulating ring
12.	2476	Crankshaft
13.	2719	Bearing cone
14.	2289	Flywheel key
15.	2290	Oil ring retainer washer
16.	2554 ^a	Crankcase
17.	1661	Pipe plug - 3/8 NPT sq. or hex
18.	2729	Inspection plate gasket
19.	2728	Crankcase inspection plate
20.	2-112_ ^c	O-ring
21.	1368-X1	Oil bayonet assembly (with O-ring)
22.	2721	Bearing adjustment shim (0.005)
	2721-1	Bearing adjustment shim (0.007)
	2721-2	Bearing adjustment shim (0.020)
23.	2720	Bearing cap

Other Assemblies

Assembly Number	Assembly Name
2476-X	Crankshaft assembly with 2476, 2290 and 2719
2476-SX ^b	Extended crankshaft assembly with 2719 (2) and 2290, (optional)
3260-X	Bearing carrier assembly with 3260, 2718, 3259, 1279-X, 2-111, 1483, 2796 and 1807
3271-X2 ^b	Flywheel assembly 14" - 2 groove with H SF-1.125 and 3271

O-ring Code	
A	Buna-N
B	Neoprene ^{®c}

^a Crankcase capacity: 0.9 quarts (0.8 liters)

^b Optional

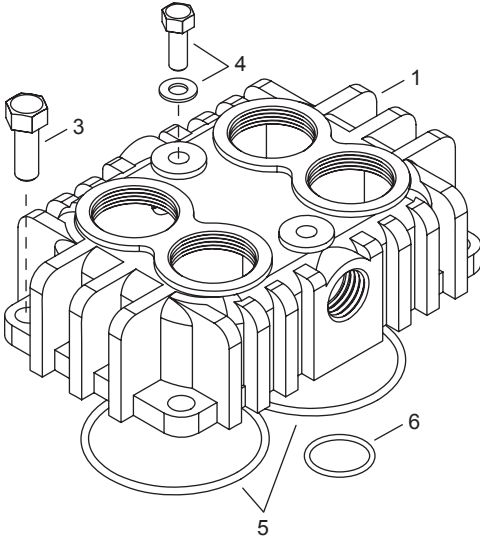
^c _ denotes O-ring code. See O-ring chart above for details.

^d Registered trademark of the DuPont company.

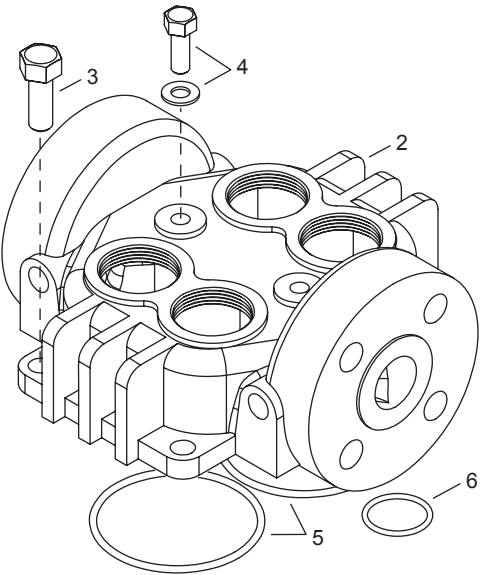
CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix H—291 and F291 Head and Valve Assembly Details

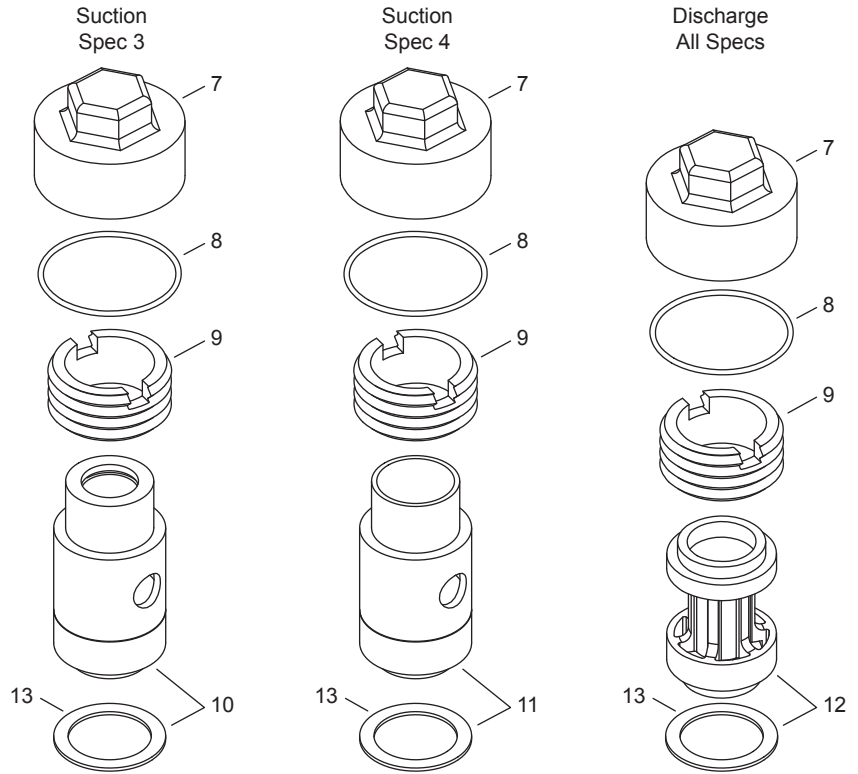
291 Head Assembly



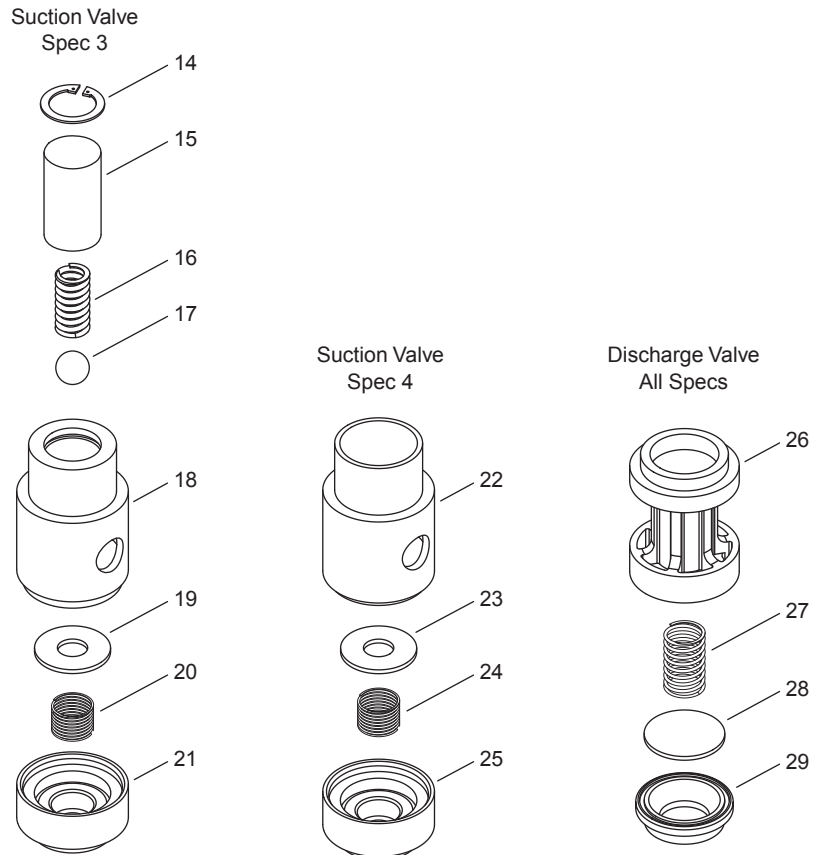
F291 Head Assembly



Valve Holddown Assemblies



Valve Assemblies Details



Appendix H—291 and F291 Head and Valve Assembly Details

Head and Valve Bill of Materials

Ref No.	Part No.	Description
1.	2912	Head model 291
	2912-X1	Head assy. for model 291 (spec 3)
	2912-X2	Head assy. for model 291 (spec 4)
2.	4300	Head model F291 (ANSI flange)
3.	7001-037 NC100A	Bolt, 3/8-16 x 1" Gr.5 hex head
4.	2731	Center headbolt
	2732	Gasket for center headbolt
5.	2-235 _b	O-ring
6.	2-113 _b	O-ring
7.	2714-1	Valve cap
8.	2-031 _b	O-ring
9.	2715	Holddown screw
10.	3483-1X	Suction valve assy. (spec 3)
	3483-1X1 ^a	Same as above but with copper gaskets
	3483-1X2 ^a	Same as above but with iron-lead gaskets
11.	3483-X	Suction valve assy. (spec 4)
	3483-X1 ^a	Same as above but with copper gaskets
	3483-X2 ^a	Same as above but with iron-lead gaskets
12.	3485-X	Discharge valve assy. (all specs)
	3485-X1 ^a	Same as above but with copper gaskets
	3485-X2 ^a	Same as above but with iron-lead gaskets
13.	2717	Valve gasket (aluminum)
	2717-1 ^a	Valve gasket (copper)
	2717-2 ^a	Valve gasket (iron-lead)
14.	5000-77	Retainer ring (spec 3)
15.	3977	Suction valve relief housing
16.	1411	Spring (spec 3)
17.	1410	Ball (spec 3)
18.	3483-1	Suction valve seat (spec 3)
19.	3972	Suction valve plate (spec 3)
20.	4009	Suction spring (spec 3)
21.	3484	Suction valve bumper (spec 3)
22.	3483	Suction valve seat (spec 4)
23.	3972	Suction valve plate (spec 4)
24.	4009	Suction spring (spec 4)
25.	3484	Suction valve bumper (spec 4)
26.	3486	Discharge valve bumper
27.	4008	Discharge spring
28.	3973	Discharge valve plate
29.	3485	Discharge valve seat

O-ring Code	
A	Buna-N
B	Neoprene ^{®c}

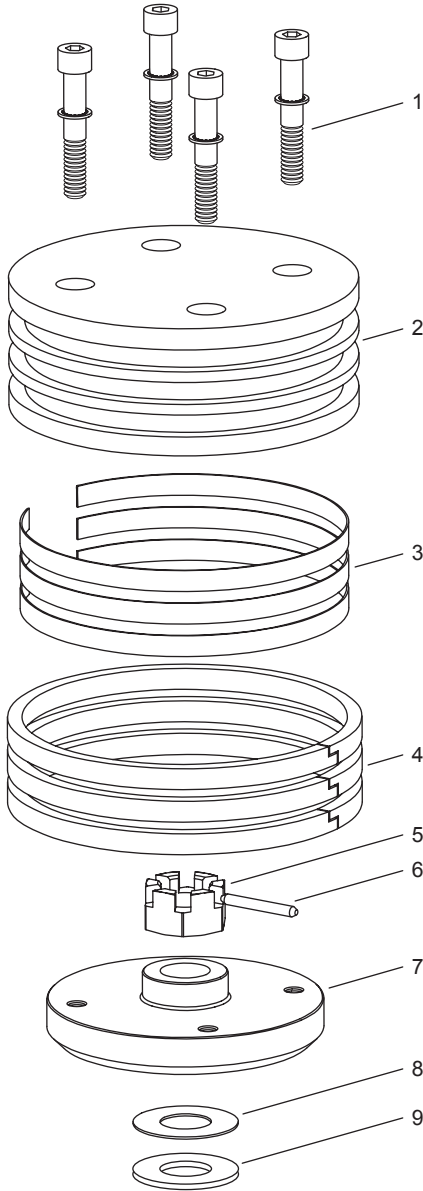
^a Optional

^b _ denotes O-ring code. See O-ring chart to the left for details.

^c Registered trademark of the DuPont company.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix H—291 and F291 Piston Assembly Details



**Piston Assembly Number 1983-X Bill of Materials
Piston Diameter 3" (7.62 cm)**

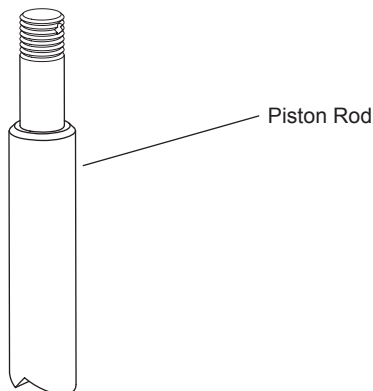
Ref No.	Part No.	Description	Qty
1.	7002-0100C100A	Screw, socket head	4
	7207-010A	Lock washer	4
2.	1983	Head, iron	1
3.	1775	Ring expander	3
4.	1772	Piston ring	3
5.	1482	Locknut	1
6.	1483	Lock pin	1
7.	1984	Piston platform	1
8.	1528	Shim washer, thick	As Req.
	1528-1	Shim washer, thin	
9.	1527	Thrust washer	1

Piston Clearance (Cold)^a

Model	Minimum	Maximum
291	0.020" (0.51 mm)	0.044" (1.12 mm)

^a The distance from the bottom of the head to the top of the piston.

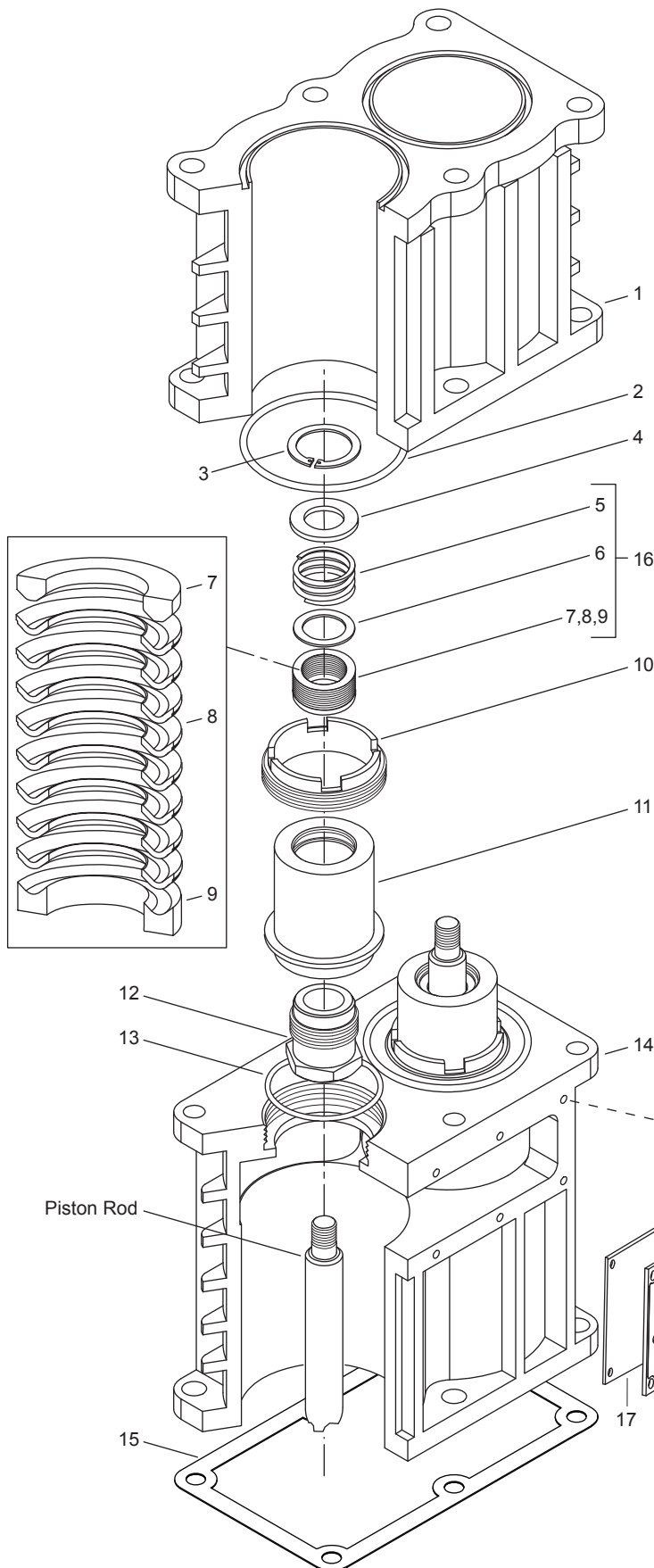
CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.



Appendix H—291 and F291 Packing Assembly Details

Packing Assembly Bill of Materials

Ref No.	Part No.	Description	Qty
1.	2913-1	Cylinder	1
2.	2-235_a	O-ring for cylinder	2
3.	5000-137	Retainer ring	2
4.	1012	Washer	2
5.	1628	Packing spring	2
6.	1714	Packing box washer	2
7.	1453-1	Male packing ring	2
8.	1454 ^b	Packing	6
9.	1452-1	Female packing ring	2
10.	4398	Cartridge holddown screw	2
11.	4394	Packing box cartridge	2
12.	1387	Adjusting screw	2
13.	2-135_a	O-ring (packing cartridge)	2
14.	4393	Crosshead guide	1
15.	2702	Crankcase gasket	1
16.	1452-1X1	Packing set	2
17.	1651	Inspection plate gasket	1
18.	1650	Inspection plate	1
19.	7003-025NC037E	1/4-20x3/8"	4
not shown	1192	Locking device	4



Other Assemblies

Assembly Number	Assembly Name	Qty
1132-X2	Crosshead assembly	2
1452-1X1	Packing set with 1452-1, 1453-1, 1454 (8), 1628, 1714	2

O-ring Code	
A	Buna-N
B	Neoprene ^{®c}

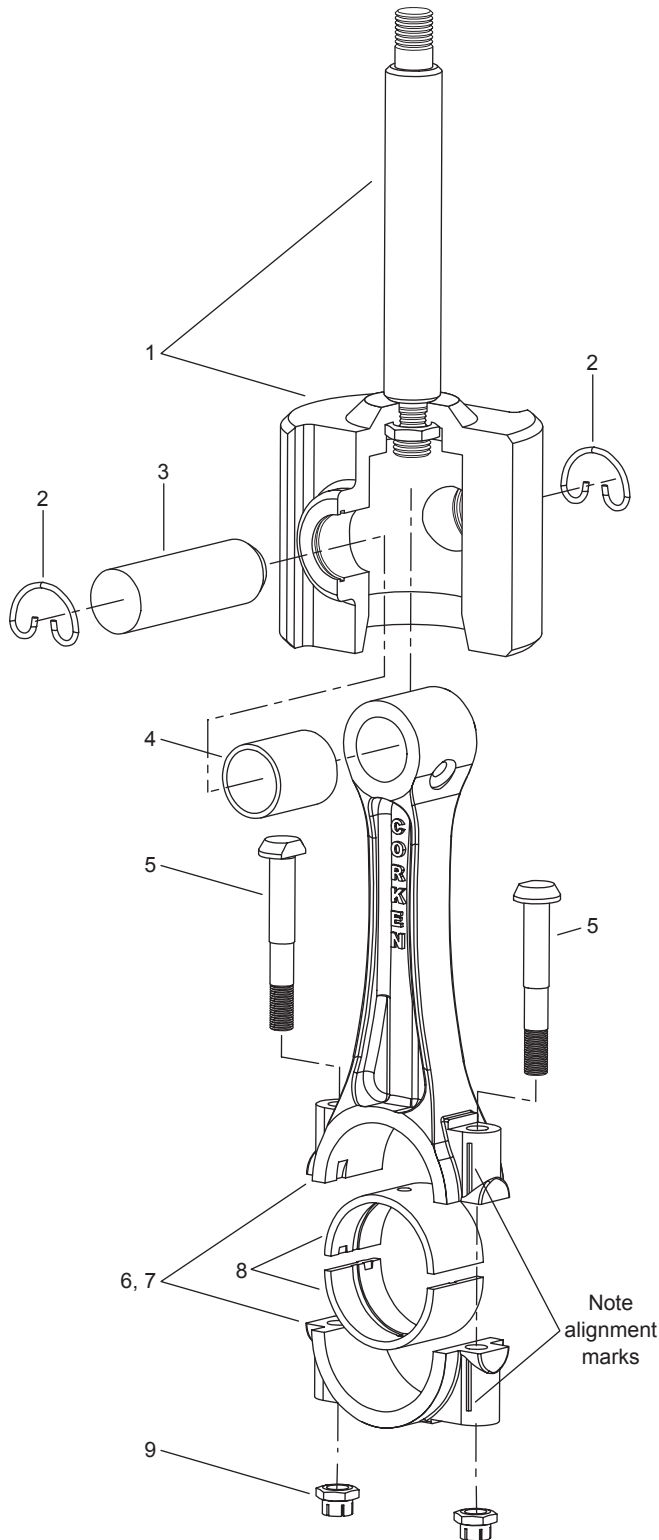
^a _ denotes O-ring code. See O-ring chart above for details.

^b The quantity of 1454 packing rings required will vary due to tolerances. Use Cone 4005 for installation of packing.

^c Registered trademark of the DuPont company.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix H—291 and F291 Connecting Rod Assembly Details



Connecting Rod Assembly Bill of Materials

Ref No.	Part No.	Description
1.	1132-X2 ^a	Crosshead assembly
2.	1498	Retainer ring
3.	2505	Wrist pin
4.	1846-X ^{a,b}	Wrist pin bushing
5.	1599 ^b	Bolt
6.	1889-X	Connecting rod assembly
7.	1889 ^b	Connecting rod
8.	1367 ^b	Connecting rod bearing
9.	1600 ^{b,c}	Nut

^a Must be rebored after replacing (0.8754/0.8751 dia.)

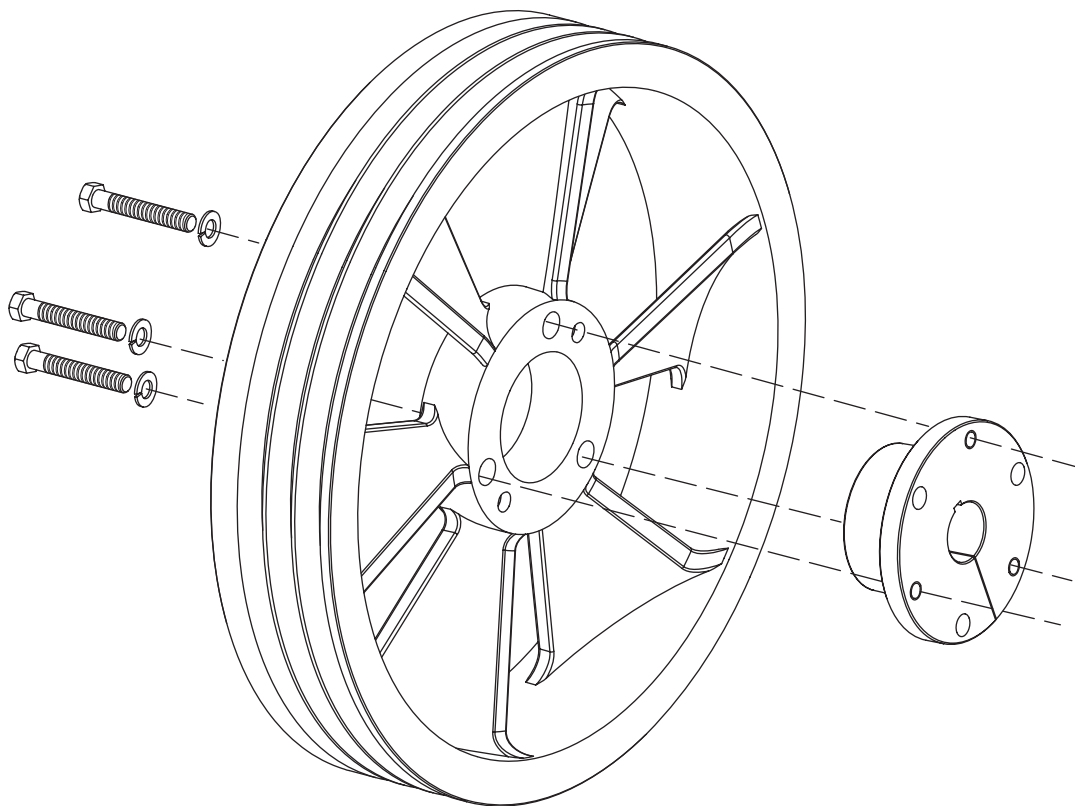
^b Included with connecting rod assembly

^c Torque connecting rod nut to 28 ft. lbs.

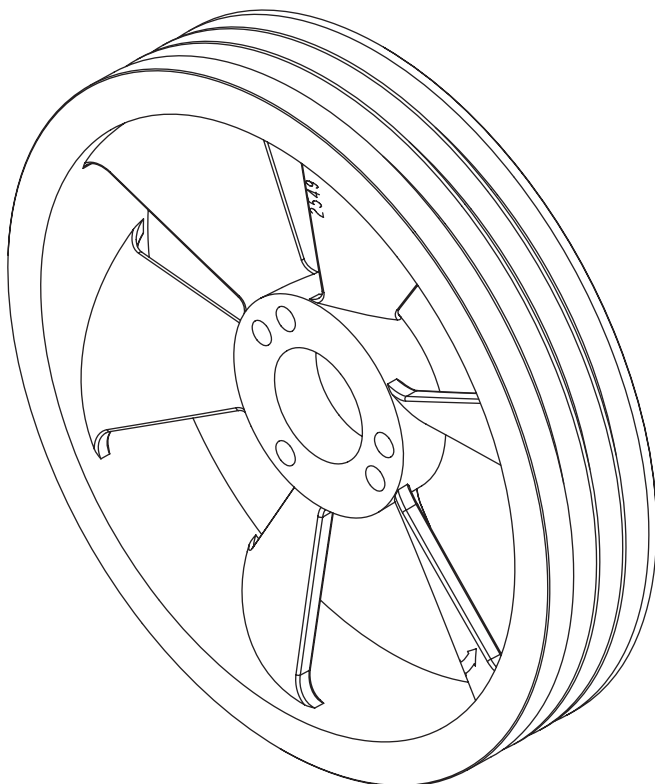
Never attempt to separate the piston rod and crosshead. When repair becomes necessary, the entire crosshead assembly must be replaced.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix H—291 and F291 Flywheel Assembly Details



Back Side

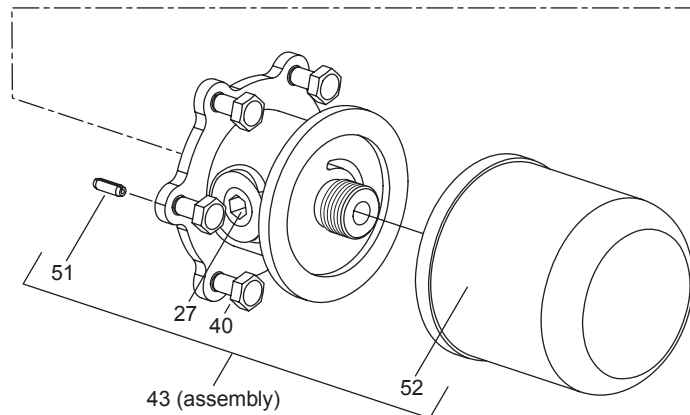
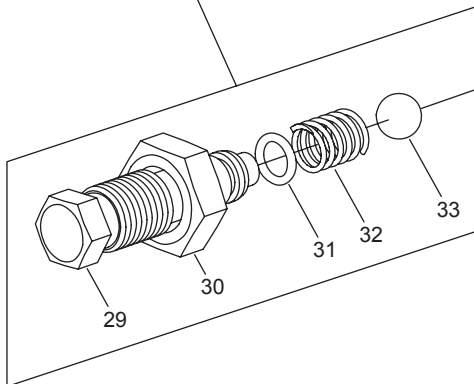
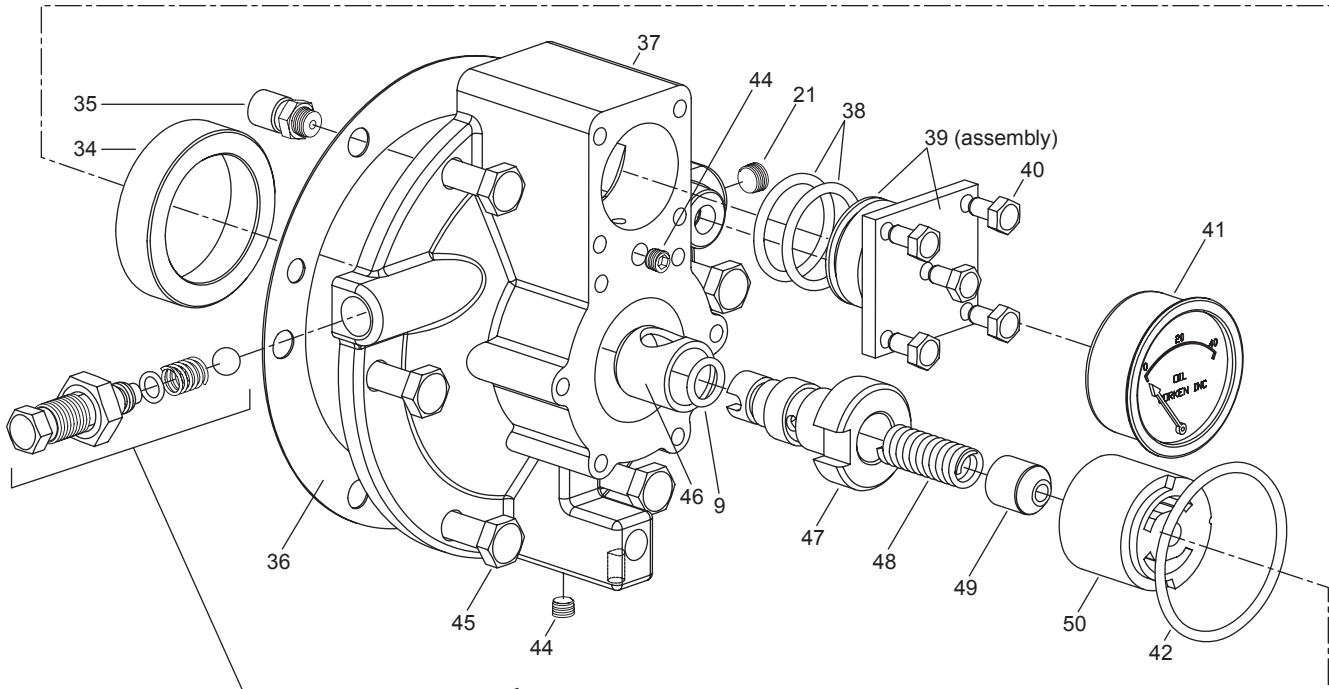
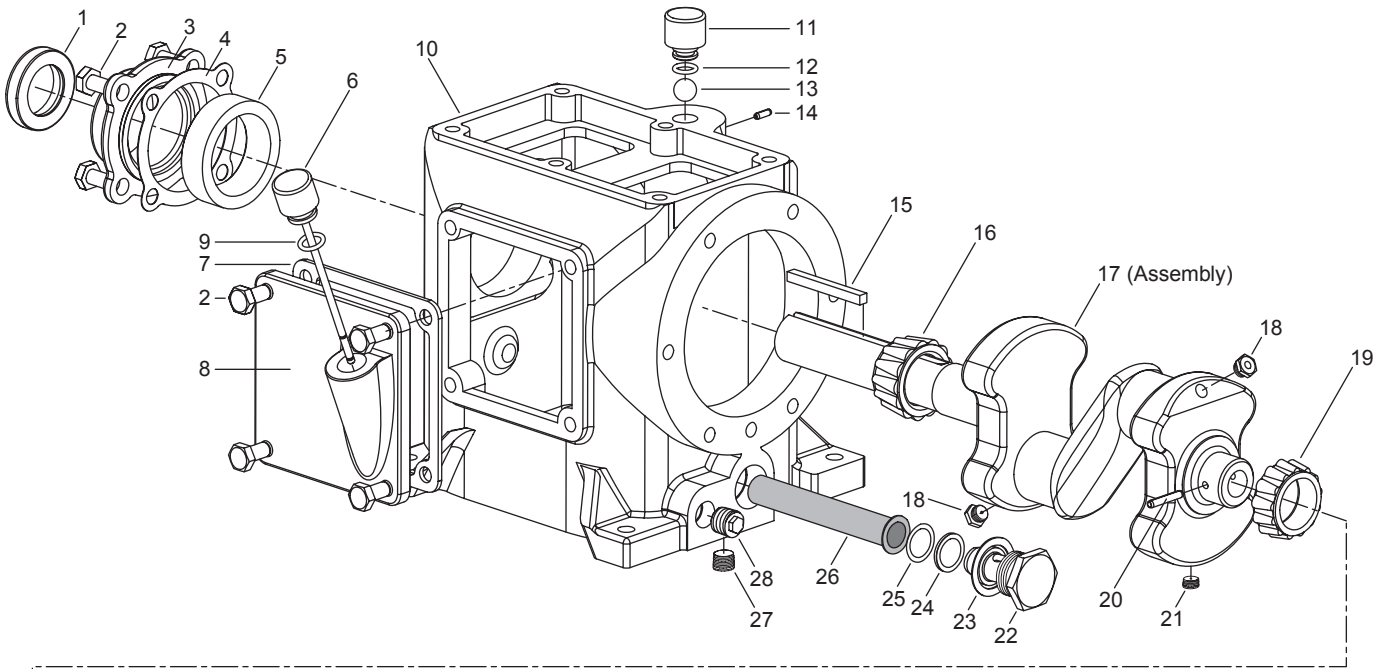


Front Side

Flywheel Assembly Bill of Materials

Assembly Number	Assembly Name
2549-X1	Flywheel assembly (flywheel, hub, and three bolts)
2549	Flywheel: 16" O.D., 3 groove
H SF-1.250	Hub with three bolts and lockwashers

Appendix H—291 and F291 Crankcase Assembly Details



Appendix H—291 and F291 Crankcase Assembly Details

Crankcase Assembly Bill of Materials

Ref No.	Part No.	Description
1.	1278	Oil seal
2.	7001-037NC075A	Bolt, 3/8-16 x 3/4, hex head
3.	2957	Bearing cover
4.	1273	Bearing adjustment shim (0.005")
	1273-1	Bearing adjustment shim (0.007")
	1273-2	Bearing adjustment shim (0.020")
5.	1500	Bearing cup
6.	1368-X	Oil bayonet
7.	2713	Crankcase inspection plate gasket
8.	2958	Crankcase inspection plate
9.	2-112 _c	O-ring
10.	2955 ^{a,b}	Crankcase
11.	1279	Breather cap
12.	2-111 _c	O-ring (breather cap)
13.	2796	Breather ball
14.	1483	Lock pin - 1/8 x 1"
15.	1671	Flywheel key
16.	1501	Bearing cone
17.	1341-X1	Crankshaft assembly with 1284 (2), 1286, 1341, 1501, 2590, 2719
18.	1284	Crankshaft orifice (2)
19.	2719	Bearing cone
20.	1286	Pump shaft drive pin
21.	2590	Pipe plug - 1/8 NPT, flush seal
22.	1280	Filter screen screw
23.	1281	Filter screen screw gasket
24.	2-116 _c	O-ring (filter screen)
25.	1276	Filter screen washer
26.	1275	Oil filter screen
27.	3289	Pipe plug - 1/4 NPT, flush seal
28.	1661	Pipe plug - 3/8 NPT
29.	1290	Relief valve adjusting screw
30.	1291	Adjusting screw locknut
31.	2-011 _c	O-ring (relieve valve adjustment screw)
32.	1292	Relief valve spring
33.	1293	Relief valve ball
34.	2718	Bearing cup
35.	2961-X	Air release valve assembly with 2961, 2962, 2963
36.	1285	Bearing carrier gasket
37.	2956	Bearing carrier
38.	2-218 _c	O-ring (closure body) (2 required) (Spec 3, 4, 8, 9 only)
39.	1515-X	Closure cap assembly including 2-218A(2) (Spec 3, 4, 8, 9 only)
40.	7001-025NC050A	Bolt, 1/4-20 x 1/2, hex head
41.	1302	Oil pressure gauge
42.	2-228 _c	O-ring (pump cover)
43.	4222-X	Oil filter assembly
44.	1629	Pipe plug - 1/16 NPT, flush seal
45.	7001-037NC100A	Bolt, 3/8-16 x 1, hex head
46.	2805	Pump shaft bushing
47.	2850	Pump shaft adapter
48.	2852	Oil pump spring
49.	2851	Spring guide
50.	2849-X	Oil pump assembly (individual pump parts not available)
51.	2798	Pump cover pin with 2848-X
	2848-X	Pump cover (includes pin)
52.	4225	Filter

Other Assemblies

Assembly Number	Assembly Name
1279-X	Breather cap assembly with 1279, 2-111A
1341-X1	Crankshaft assembly with 1284 (2), 1286, 1341, 1501, 2590, 2719
1342-X1 ^a	Extended crankshaft assembly with 1284 (2), 1286, 1342, 1501, 2590, 2719
1368-X1	Oil bayonet assembly with 1368-X, 2-112A
1515-X	Closure cap assembly including 2-218A (2) (Spec 3, 4, 8, 9 only)
2956-X	Bearing carrier assembly with 1285, 1290, 1291, 1292, 1293, 1515-X, 2718, 2805, 2806 (2), 2848-X, 2849-X, 2850, 2851, 2852, 2956, 2961-X, 2011-A, 2-112A, 2-228A.
2957-X	Bearing cover assembly with 2957 and 1278
2961-X	Air release valve assembly with 2961, 2962, 2963
3271-X1 ^a	Flywheel assembly, 14" O.D. 2 groove with 3218 and 3271 (not part of crankcase assembly) (not shown)

O-ring Code

A	Buna-N
B	Neoprene ^{®d}

^a Optional equipment

^b Crankcase capacity: 1.5 quarts (1.4 liters)

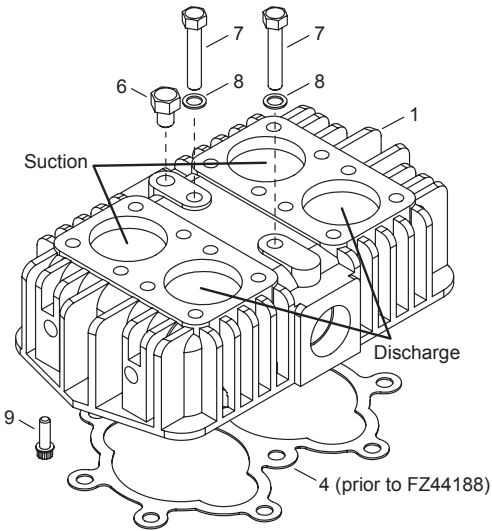
^c _ denotes O-ring code. See O-ring chart above for details.

^d Registered trademark of the DuPont company.

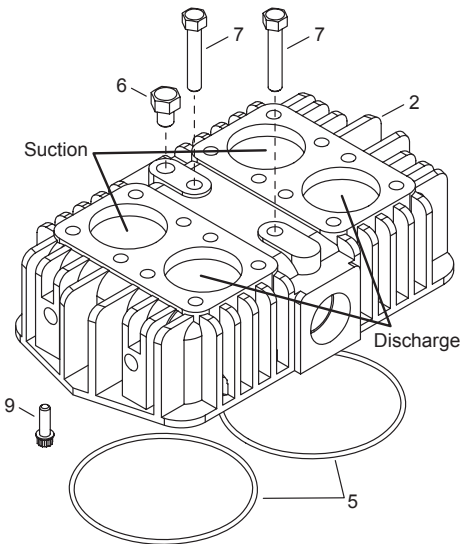
CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix I—490, 491, and F491 Head and Valve Assembly Details

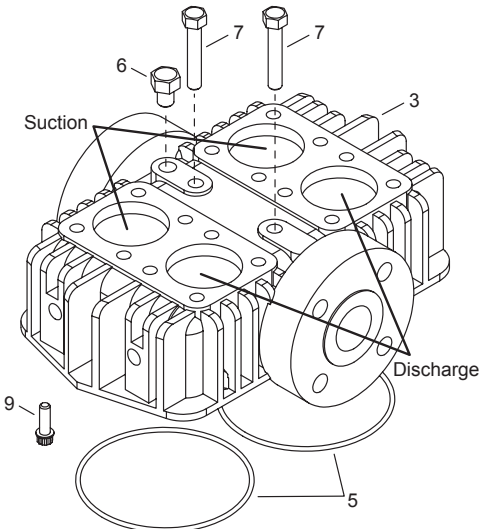
490 and 491 Head Assembly



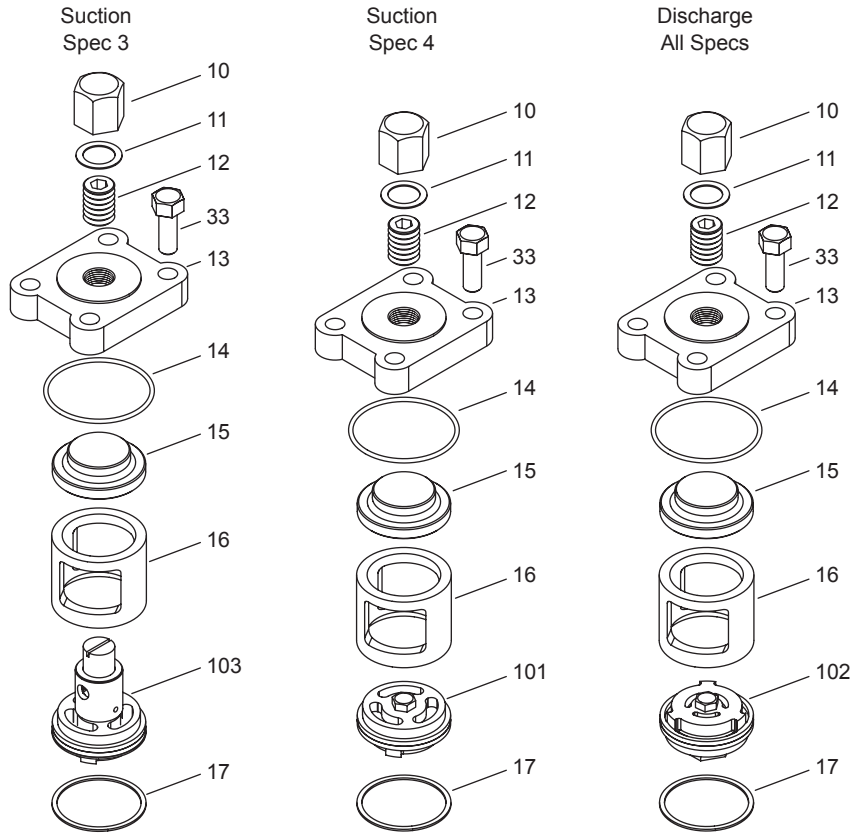
491 Head Assembly



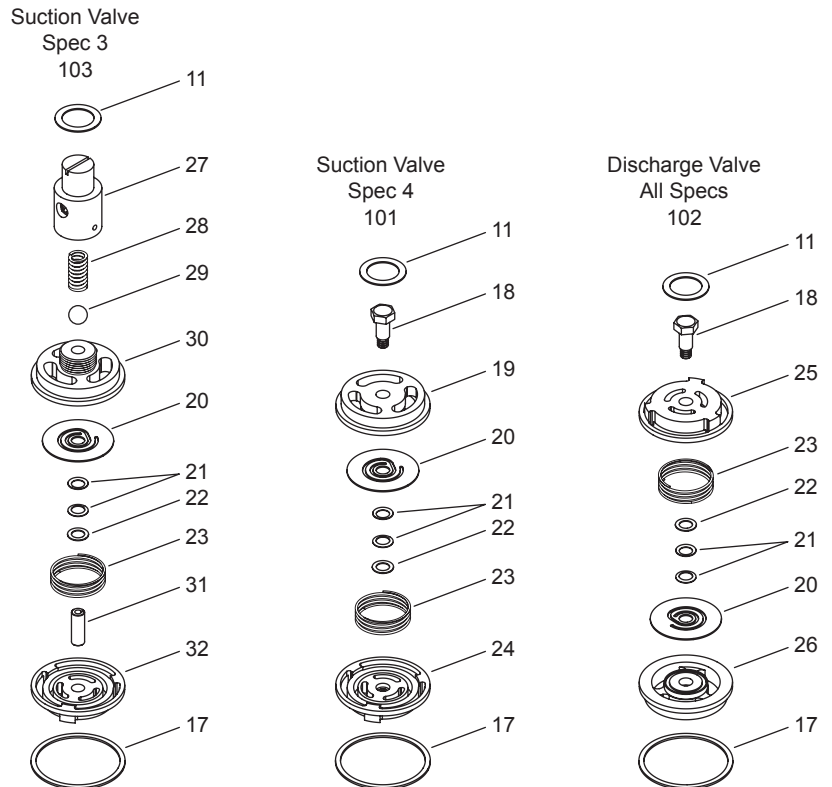
F491 Head Assembly



Valve Holddown Assemblies



Valve Assemblies



Appendix I— 490, 491, and F491 Head and Valve Assembly Details

Compressor Head and Valve Bill of Materials

Ref No.	Part No.	Description
1.	2914 ^d	Head—ductile iron (491)
2.	3712 ^e	Head—ductile iron (491)
3.	4297	Head—ANSI flanged (F491)
	4297-1	Head flanged - Din spec. only (F492)
4.	1481 ^c	Head gasket (490 and 491)
5.	2-253_ ^{b,c,e}	O-ring (491)
6.	3442	Pipe plug—1/4" NPT
7.	1479 ^c	Center head bolt
8.	1480-1 ^c	Center head bolt gasket (copper)
	1480 ^c	Center head bolt gasket (steel)
9.	7005-043NC125A ^c	Bolt, 7/16-14 x 1-1/4" ferry head (490 & 491 prior to serial # FZ44188)
	7005-043NC150A ^c	Bolt, 7/16-14 x 1-1/2" ferry head (491 serial # FZ44188 and later)
10.	1477	Valve screw nut
11.	1478	Gasket (steel)
	1478-1 ^a	Gasket (copper)
	1478-2	Gasket (iron)
12.	1476	Valve holddown screw
13.	1475	Valve cover plate
14.	2-143_ ^b	O-ring for cover plate
15.	1409 ^f	Valve spacer
16.	2448	Cage
17.	1418	Valve gasket (aluminum)
	1418-1 ^a	Valve gasket (copper)
	1418-2 ^a	Valve gasket (iron)
18.	2446	Bolt
19.	2438	Suction valve seat
20.	2442	Valve plate
21.	2445 ^f	Spacer (two per valve)
22.	3355	Washer
23.	1407	Valve spring
24.	2440	Suction valve bumper
25.	2441	Discharge valve bumper
26.	2439	Discharge valve seat
27.	2533-1	Adjusting screw
28.	1411	Relief ball spring
29.	1410	Relief ball
30.	2532-1	Suction valve seat
31.	2534-1	Suction valve post
32.	2447	Suction valve bumper
33.	7001-043NC125A	Bolt (7/16-14 x 1-1/4" hex head)

Ref No.	Valve Assembly No.	Assembly Name
101.	2438-X	Suction valve assembly (see ref. no. 7, 17, 18, 19, 20, 21(2), 22, 23, 24)
	2438-X1 ^a	Same as 2438-X but with copper gaskets
	2438-X2 ^a	Same as 2438-X but with iron-lead gaskets
102.	2439-X	Discharge valve assembly (see ref. no. 7, 17, 18, 20, 21(2), 22, 26, 25)
	2439-X1 ^a	Same as 2439-X but with copper gaskets
	2439-X2 ^a	Same as 2439-X but with iron-lead gaskets
103.	2532-1X	Suction valve assembly (spec. 3) with aluminum
	2532-1X1 ^a	Same as 2532-1X but with copper
	2532-1X2 ^a	Same as 2532-1X but with iron-lead

Head Assembly No.	Model	Valve Specification
2914-X2 ^d	491	4
2914-X4 ^d	491	3
3712-X1 ^e	491	3
3712-X2 ^e	491	4
4297-X1	F491	3
4297-X2	F491	4
4297-1X1	F492	3
4297-1X2	F492	4

O-ring Code

A	Buna-N
B	Neoprene ^{®g}

^a Optional equipment

^b _ denotes O-ring code. See O-ring chart above for details.

^c Not included in Head Assembly.

^d Prior to S/N FZ44188.

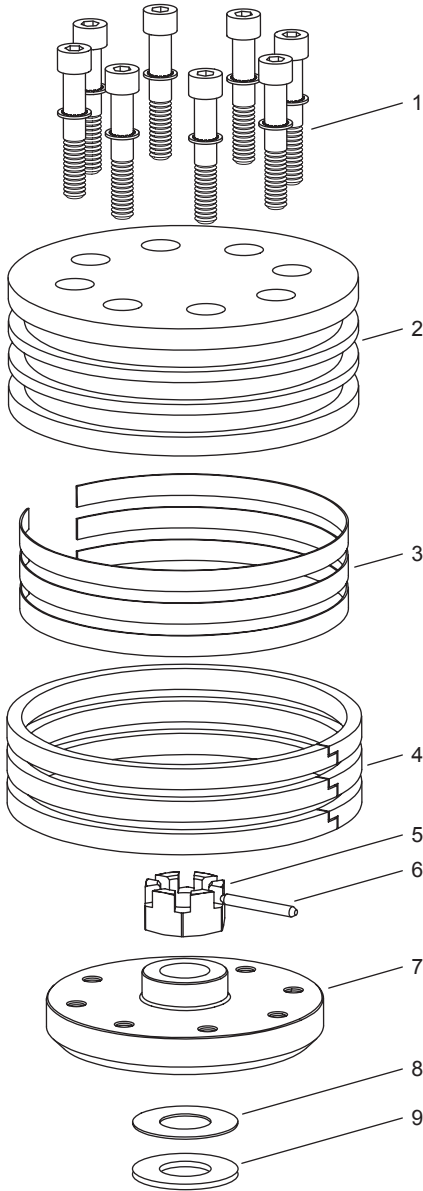
^e S/N FZ44188 and later.

^f Place spacers back to back as shown.

^g Registered trademark of the DuPont company.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix I—490, 491, and F491 Piston Assembly Details



Piston Assembly Number 1985-X Bill of Materials
Piston Diameter 4" (10.16 cm)

Ref No.	Part No.	Description	Qty
1.	7002-025OC125A	Screw, socket head	8
	7207-025A	Lock Washer	8
2.	1985	Head, iron	1
3.	1776	Ring expander	3
4.	1773	Piston ring	3
5.	1482	Locknut	1
6.	1483	Lock pin	1
7.	1986	Piston platform	1
8.	1528	Shim washer, thick	As Req.
	1528-1	Shim washer, thin	
9.	1527	Thrust washer	1

Piston Clearance (Cold)^a

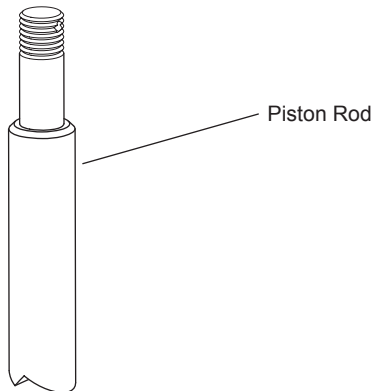
Model	Minimum	Maximum
490	0.000" (0.00 mm)	0.024" (0.61 mm)
491 ^b		
491 ^c	0.020" (0.51 mm)	0.044" (1.12 mm)

^a The distance from the bottom of the head to the top of the piston.

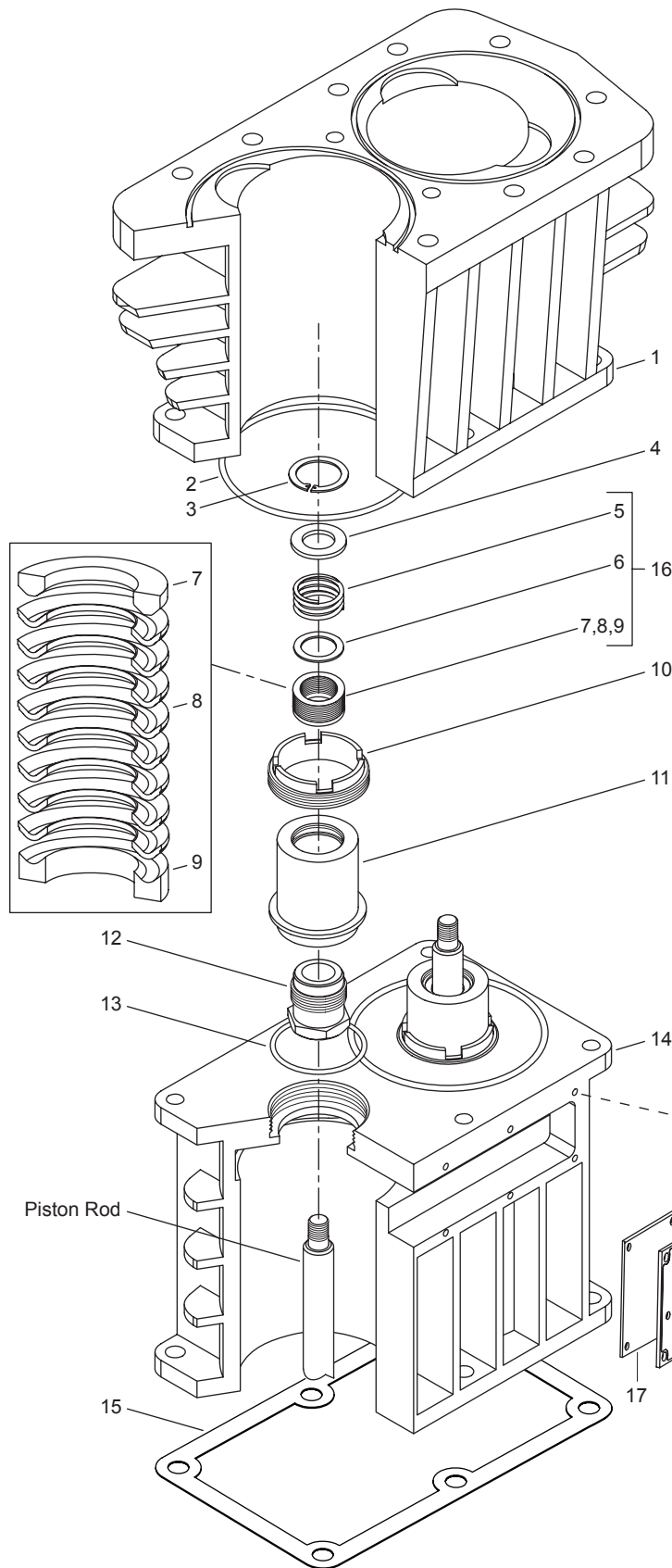
^b For 491 compressor with flat gasket.

^c For 491 compressor with head O-rings.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.



Appendix I—490, 491, and F491 Packing Assembly Details



Packing Assembly Bill of Materials

Ref No.	Part No.	Description	Qty
1.	3713 ^a	Cylinder (491 w/O-ring)	1
2.	2-243 ^b	O-ring for cylinder	2
3.	5000-137	Retainer ring	2
4.	1012	Washer	2
5.	1628	Packing spring	2
6.	1714	Packing box washer	2
7.	1453-1	Male packing ring	2
8.	1454 ^c	Packing ring	6
9.	1452-1	Female packing ring	2
10.	2801	Cartridge holddown screw	2
11.	2799	Packing box cartridge	2
12.	1387	Adjusting screw	2
13.	2-139 ^b	O-ring (packing cartridge)	2
14.	2765 ^d	Crosshead guide	1
15.	1489	Crankcase gasket	1
16.	1452-1X1	Packing set	2
17.	1488	Inspection plate gasket	1
18.	1487	Inspection plate	1
19.	7003-025NC037E	1/4-20x3/8"	4
not shown	1192	Locking device	4

Additional Assembly

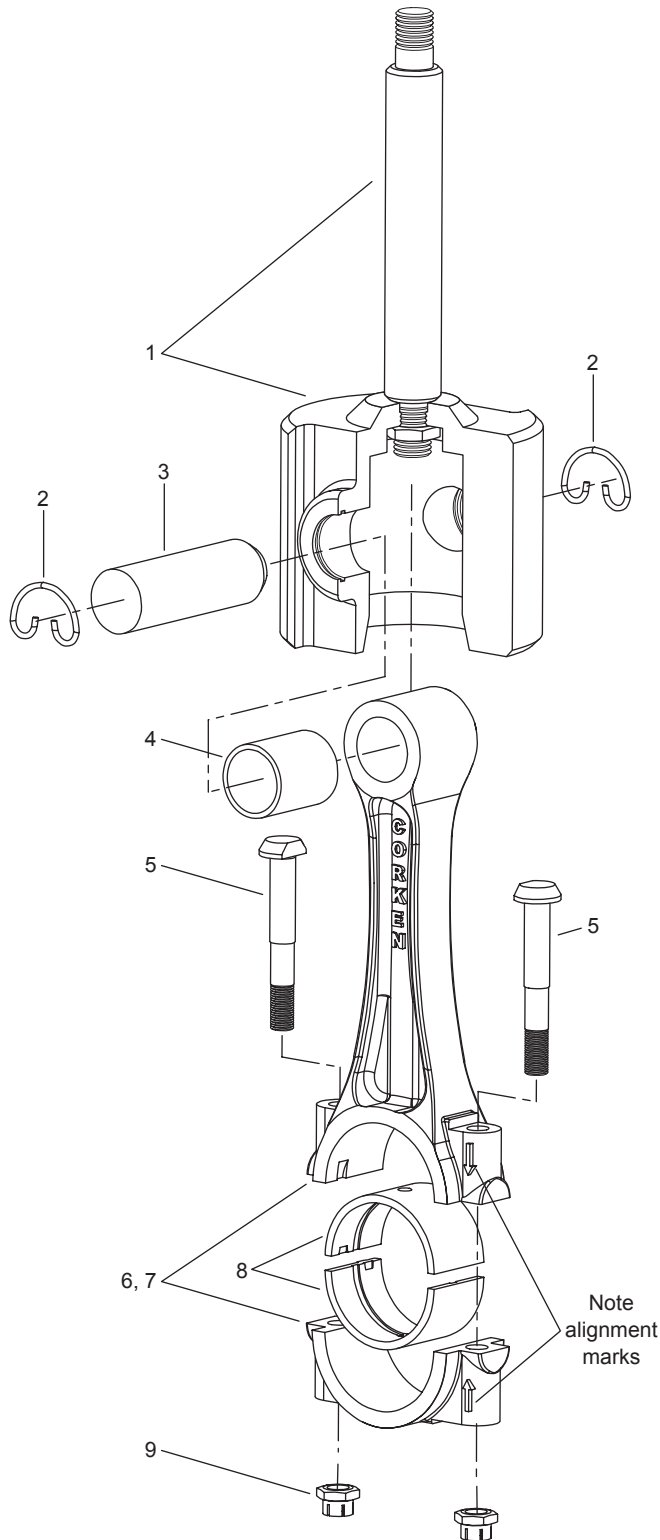
Assembly Number	Assembly Name
1384-X	Crosshead assembly

O-ring Code	
A	Buna-N
B	Neoprene ^{®e}

- ^a S/N FZ44188 and later
^b _ denotes O-ring code. See O-ring chart above for details
^c The quantity of 1454 packing rings required will vary due to tolerances. Use Cone 4005 for packing installation.
^d S/N XC30633 and later
^e Registered trademark of the DuPont company.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix I—490, 491, and F491 Connecting Rod Assembly Details



Connecting Rod Assembly Bill of Materials

Ref No.	Part No.	Description
1.	1384-X	Crosshead assembly
2.	1498	Retainer ring
3.	1496	Wrist pin
4.	1495-X ^{a,b}	Wrist pin bushing
5.	1492 ^b	Bolt
6.	1490-X	Connecting rod assembly
7.	1490 ^b	Connecting rod
8.	1491 ^b	Connecting rod bearing
9.	1493 ^{b,c}	Nut

^a Must be rebored after replacing (0.8754/0.8751 dia.)

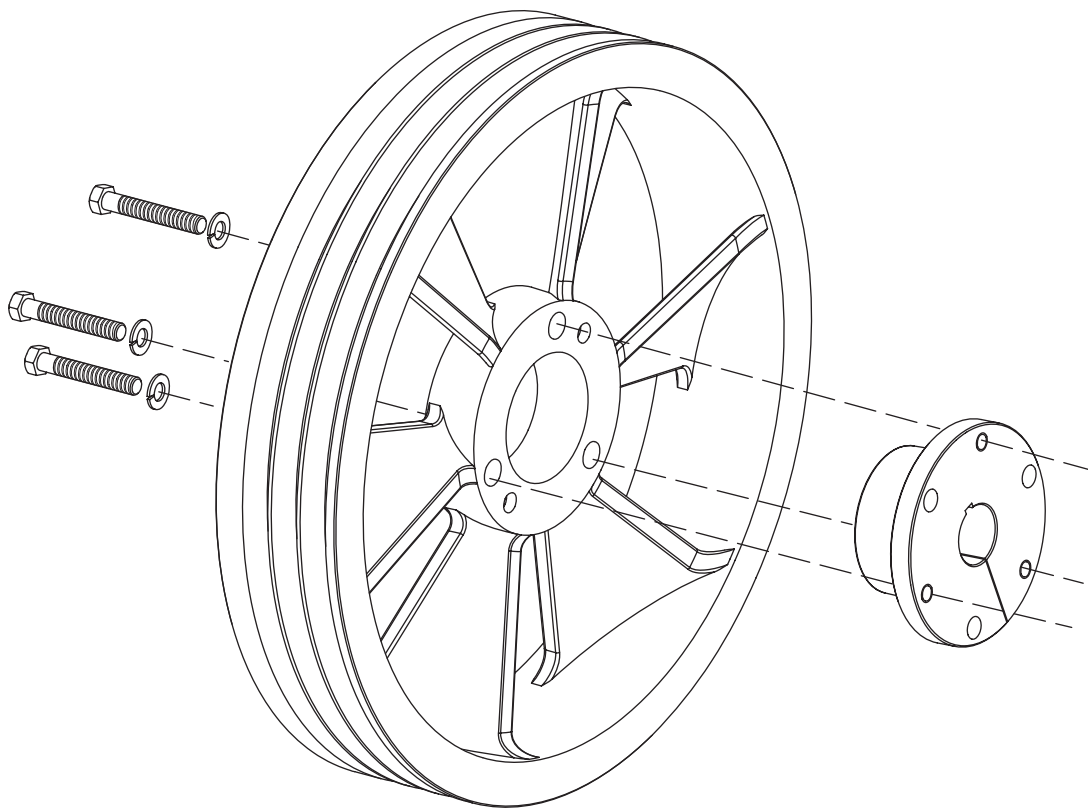
^b Included with connecting rod assembly

^c Torque connecting rod nut to 30 ft. lbs.

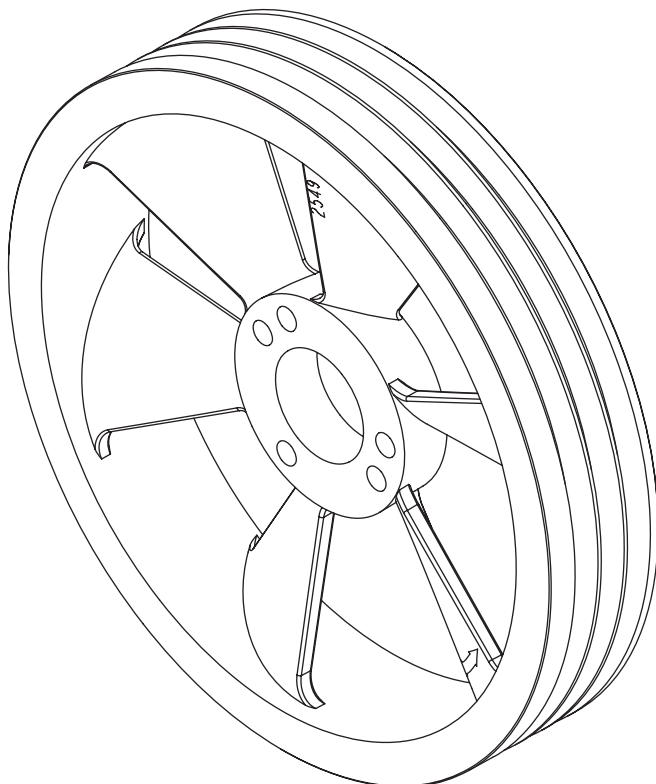
Never attempt to separate the piston rod and crosshead. When repair becomes necessary, the entire crosshead assembly must be replaced.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix I—490, 491, and F491 Flywheel Assembly Details



Back Side

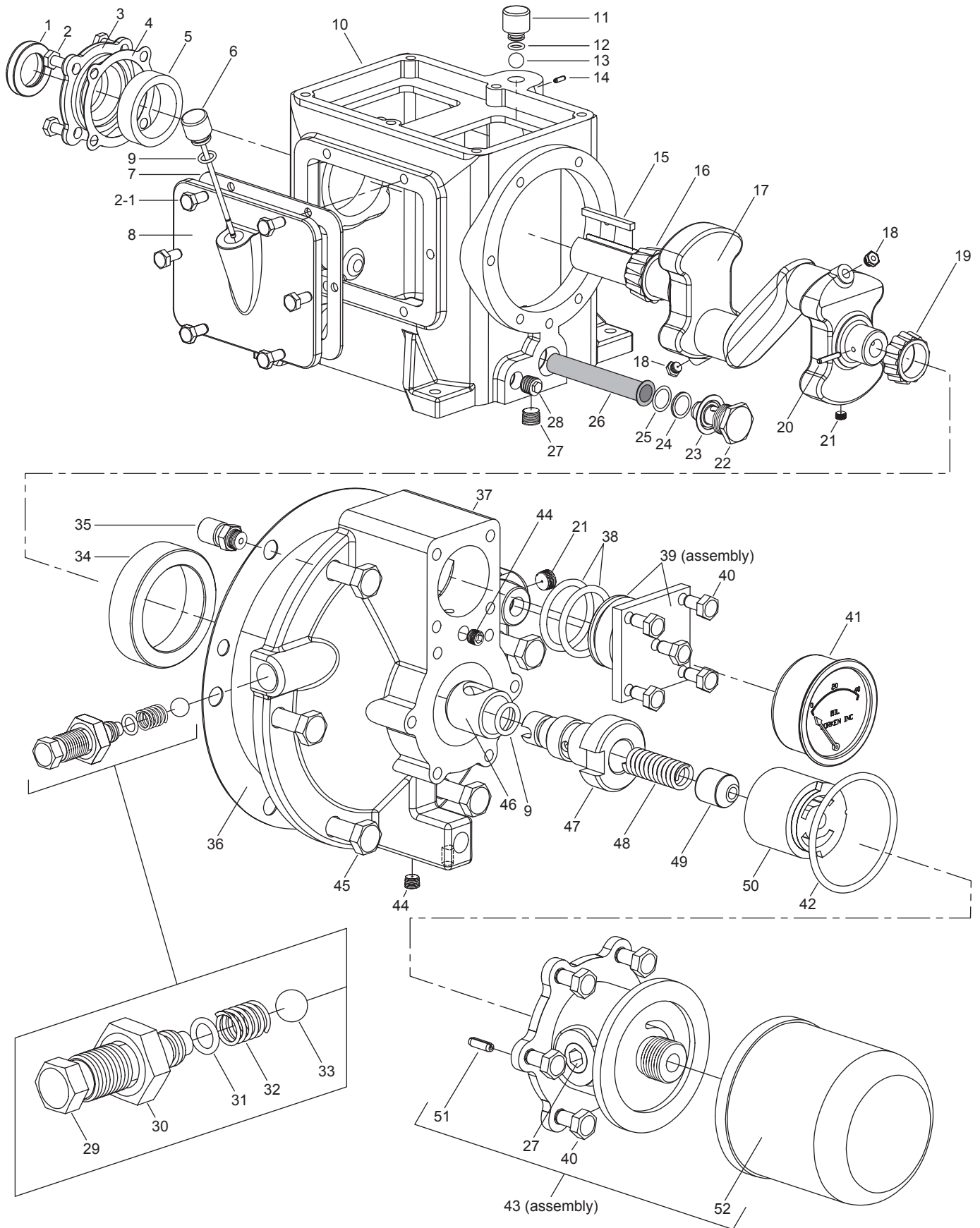


Front Side

Flywheel Assembly Bill of Materials

Assembly Number	Assembly Name
2549-X	Flywheel assembly (flywheel, hub, and three bolts)
2549	Flywheel: 16" O.D., 3 groove
H SF-1.375	Hub with three bolts and lockwashers

Appendix I—490, 491, and F491 Crankcase Assembly Details



Appendix I—490, 491, and F491 Crankcase Assembly Details

Crankcase Assembly Bill of Materials

Ref No.	Part No.	Description
1.	4438	Oil seal
2.	7001-037NC075A	Hex head bolt 3/8-16 x 3/4
2-1.	7001-031NC075A	Hex head bolt 5/16-18 x 3/4
3.	2847-1	Bearing cover
4.	1504	Bearing adjustment shim (0.005")
	1504-1	Bearing adjustment shim (0.007")
	1504-2	Bearing adjustment shim (0.020")
5.	1502	Bearing cup
6.	1508-X	Oil bayonet
7.	1511	Crankcase inspection plate gasket
8.	2853	Crankcase inspection plate
9.	2-112_ ^c	O-ring (oil bayonet & pump shaft)
10.	2803 ^b	Crankcase
11.	1279	Breather cap
12.	2-111_ ^c	O-ring (breather cap)
13.	2796	Breather ball
14.	1483	Lock pin
15.	1663	Flywheel key
16.	1501	Bearing cone
17.	1499-X	Crankshaft assembly with 1284 (2), 1286, 1499, 1501, 1503, 2590
	1499-SX	Extended crankshaft assembly with 1284 (2), 1286, 1499-S, 1501, 1503, 2590
18.	1284	Crankcase orifice (2)
19.	1503	Bearing cone
20.	1286	Pump shaft drive pin
21.	1459	Crankshaft plug (depends on design)
	2590	Pipe plug (depends on design)
22.	1280	Filter screw
23.	1281	Filter screen screw gasket
24.	2-116_ ^c	O-ring (filter screen)
25.	1276	Filter screen washer
26.	1275	Oil filter screen
27.	3289	Pipe plug
28.	1661	Plug 3/8" NPT
29.	1290	Relief valve adjusting screw
30.	1291	Adjusting screw locknut
31.	2-011_ ^c	O-ring (relief valve adjusting screw)
32.	1292	Relief valve spring
33.	1293	Relief valve ball
34.	1500	Bearing cup
35.	2961-X	Air release valve assembly with 2961, 2962, 2963
36.	1513	Bearing carrier gasket
37.	2804	Bearing carrier
38.	2-218_ ^c	O-ring (closure body) (2) (Spec. 3, 4, 8, 9 only)
39.	1515-X	Closure cap assembly
40.	7001-025NC050A	Hex head bolt 1/4-20 x 1/2
41.	1302	Oil pressure gauge

Ref No.	Part No.	Description
42.	2-228_ ^c	O-ring (pump cover)
43.	4222-X	Oil filter assembly - external
44.	1629	1/16" NPT pipe plug, flush seal
45.	7001-037NC100A	Hex head bolt 3/8-16 x 1
46.	2805-X	Pump shaft bushing
47.	2850	Pump shaft adapter
48.	2852	Oil pump spring
49.	2851	Spring guide
50.	2849-X	Oil pump assembly (individual pump parts not available)
51.	2798	Pump cover pin with 2848-X
	2848-X	Pump cover (includes pin)
52.	4225	Oil filter

Other Assemblies

Assembly Number	Assembly Name
1279-X	Breather cap assembly with 1279, 2-111A
1499-X	Crankshaft assembly with 1284 (2), 1286, 1499, 1501, 1503, 2590
1499-SX ^a	Extended crankshaft assembly with 1284 (2), 1286, 1499-S, 1501, 1503, 2590
1508-X1	Oil bayonet assembly with 1508-X, 2-112A
1515-X	Closure cap assembly including 2-218A (2), (Spec. 3, 4, 8, 9 only)
2804-X	Bearing carrier assembly with 1290, 1291, 1292, 1293, 1500, 1513, 1515-X, 1629 (2), 2590, 2804, 2849-X, 2850, 2851, 2852, 2961-X, 2-011A, 2-112A, 2-228A, 4222-X
2847-1X	Bearing cover assembly with 2847-1, 3855
3271-X ^a	Flywheel assembly with 3271, 3217 (not part of crankcase assembly (not shown))

O-ring Code

A	Buna-N
B	Neoprene ^{®d}

^a Optional equipment

^b Crankcase capacity: 3 quarts (2.8 liters)

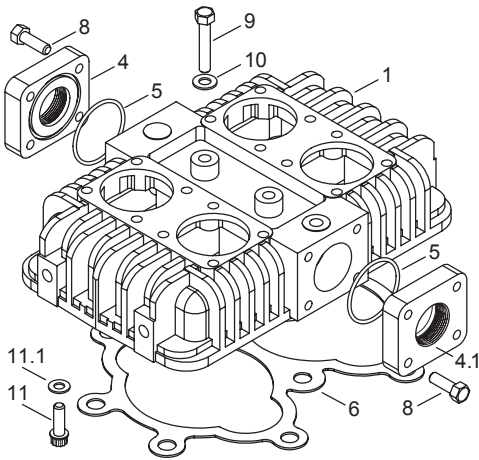
^c _ denotes O-ring code. See O-ring chart above for details.

^d Registered trademark of the DuPont company.

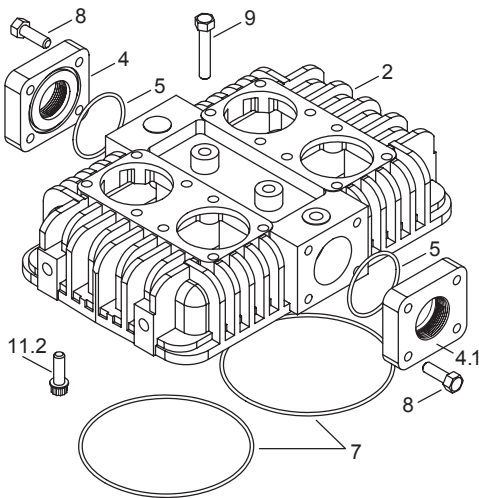
CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix J—691 and F691 Head and Valve Assembly Details

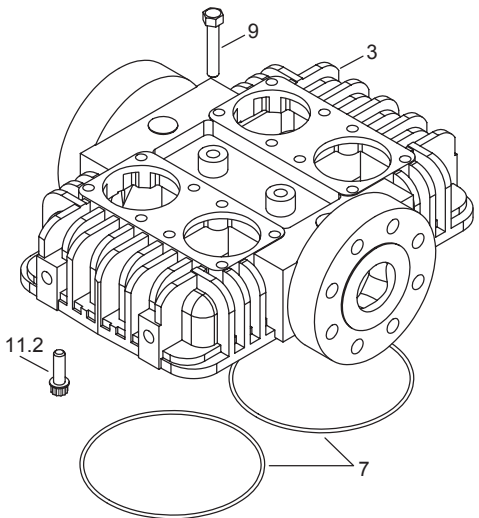
690 Head Assembly



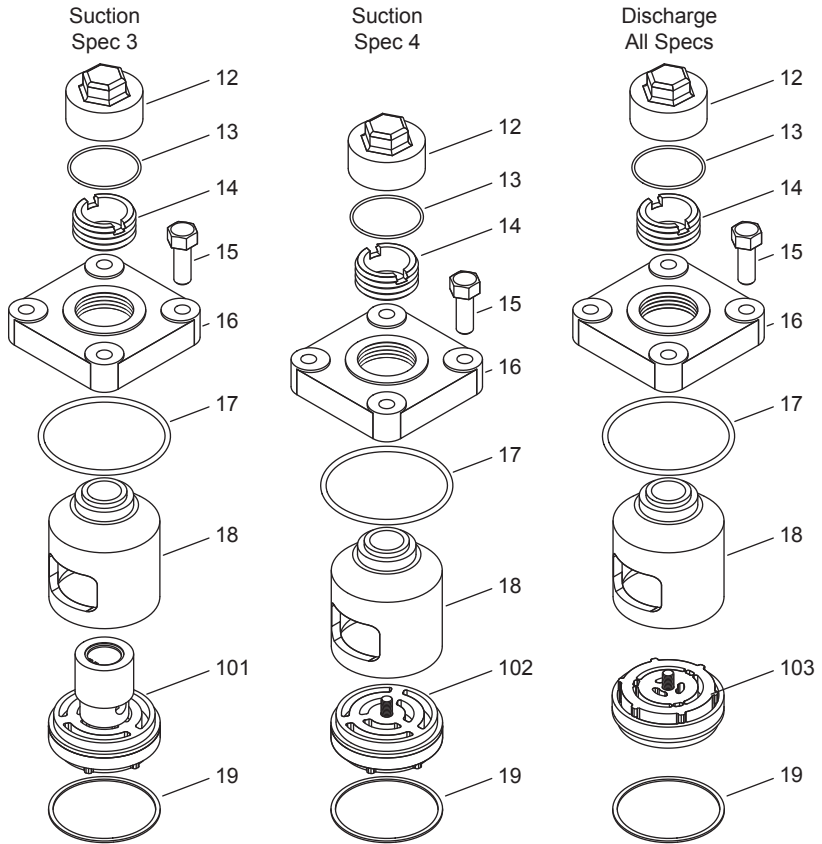
691 Head Assembly



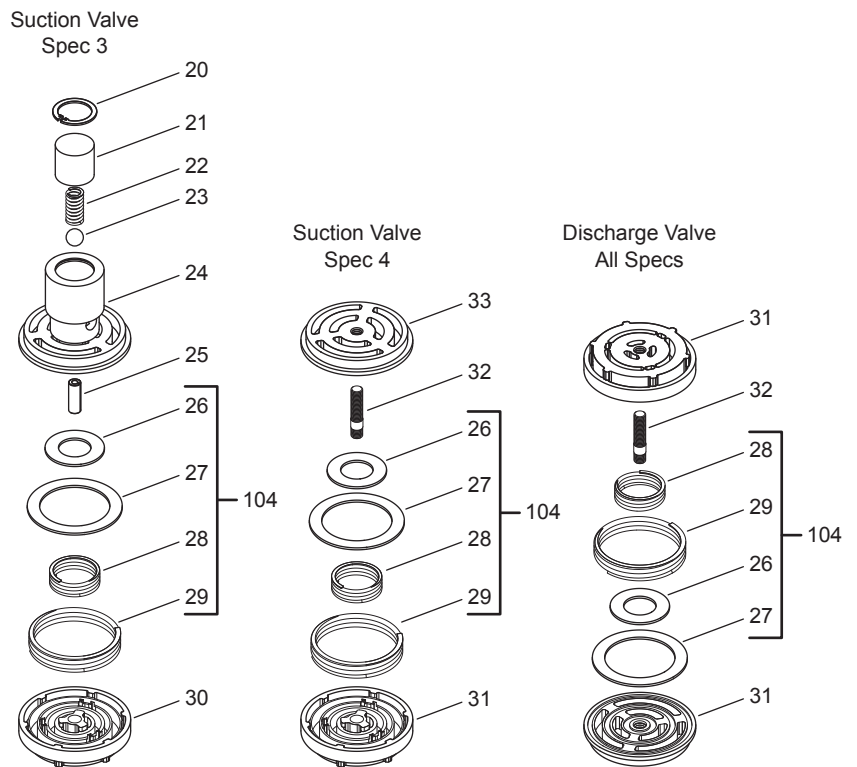
F691 Head Assembly



Valve Holddown Assemblies



Valve Assemblies



Appendix J—691 and F691 Head and Valve Assembly Details

Head and Valve Bill of Materials

Ref No.	Part No.	Description
1.	1743	Head (690)
2.	3458 ^d	Head (691)
3.	4299	F691 head
4.	2144-2	Flange (suction) 2" NPT
	2144-2S ^c	Flange 2" weld
4.1	2144-1.5	Flange (discharge) 1-1/2" NPT
	2144-1.5S ^c	Flange 1-1/2" Weld
5.	2-231_ ^a	O-ring
6.	1744 ^b	Head gasket (690)
	1744-1 ^{b,c}	Head gasket grafoil
7.	2-261_ ^a	O-ring for head (691)
8.	7001-043 NC150A	Bolt, 7/16-14 x 1-1/2" hex head
9.	2136	Center head bolt
10.	1625	Center head bolt gasket (aluminum)
	1625-1 ^c	Center head bolt gasket (copper)
	1625-2 ^c	Center head bolt gasket (iron-lead)
11.	7005-043 NC125A	Bolt, 7/16-14 x 1-1/4" ferry head
11.1	7006-043A	Reg. lockwasher 7/16"
11.2	7005-050 NC150A	Bolt, 1/2-13 x 1-1/2" ferry head
12.	2714	Valve cap
	2714-1	Valve cap, grooved for O-ring
13.	2-031_ ^a	O-ring for valve cap
	2716 ^c	Gasket (aluminum) for valve cap
	2716-1 ^c	Gasket (copper) for valve cap
	2716-2 ^c	Gasket (iron) for valve cap
14.	2715	Holddown screw
15.	7001-043 NC137A	Bolt, 7/16-14 x 1-3/8" hex head
16.	1764	Valve cover plate
17.	2-235_ ^a	O-ring (cover plate)
18.	2797	Valve cage
19.	2114	Valve gasket (aluminum)
	2114-1 ^c	Valve gasket (copper)
	2114-2 ^c	Valve gasket (iron)
20.	5000-77	Retainer ring
21.	3977	Suction valve relief housing (spec 3)
22.	1411	Spring
23.	1410	Relief ball
24.	3948	Valve seat (spec. 3)
25.	2534-1	Suction valve post (spec 3)
26.	3872	Inner valve plate
27.	3871	Outer valve plate
28.	3929	Inner valve spring
29.	3928	Outer valve spring
30.	3949	Valve bumper (spec. 3)
31.	3857	Valve bumper
32.	3920	Valve stud
33.	3856	Valve seat

Ref No.	Valve Assembly No.	Assembly Name
101.	3948-X	Suction valve assembly (spec. 3) (includes valve gasket)
	3948-X1 ^c	Same as above but with copper gasket
	3948-X2 ^c	Same as above but with iron-lead gasket
102.	3856-X	Suction valve assembly (includes valve gasket)
	3856-X1 ^c	Same as above but with copper gasket
	2255-X2 ^c	Same as above but with iron-lead gasket
103.	3857-X	Discharge valve assembly (includes valve gasket)
	3857-X1 ^c	Same as above but with copper gasket
	3857-X2 ^c	Same as above but with iron-lead gasket
104.	3146-X1	Valve repair kit (suction & discharge)

Other Assemblies

Head Assembly Number	Models	Valve Specification
1743-X	690	3
3458-X	691	3

O-ring Code

A	Buna-N
B	Neoprene ^{®e}

^a _ denotes O-ring code. See O-ring chart above for details.

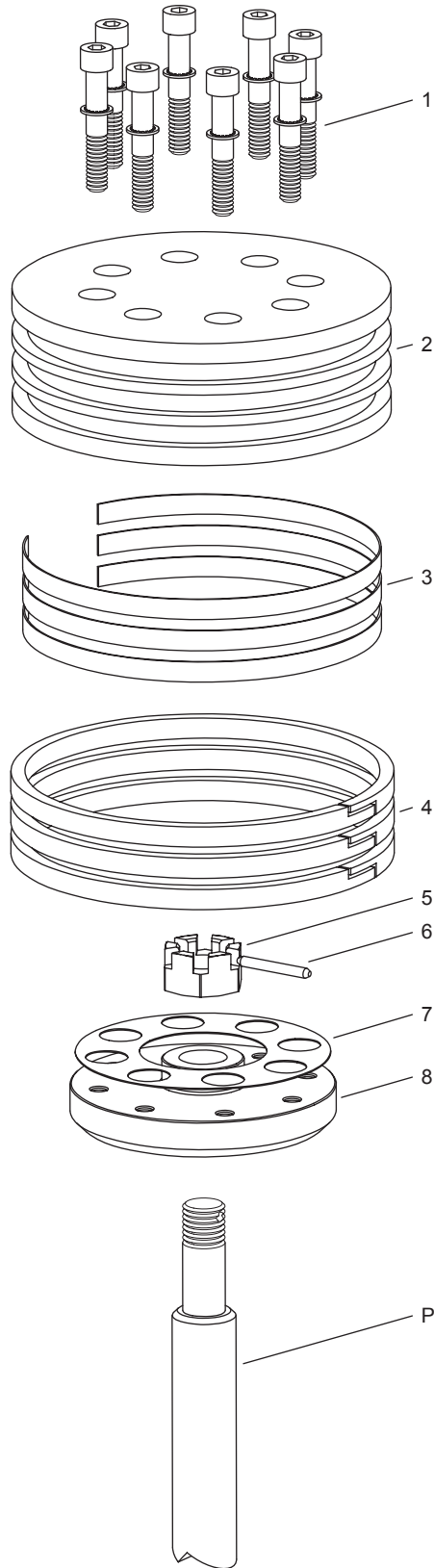
^b Not included in head assembly.

^c Optional.

^d S/N NQ51455 and later. Earlier models use gasket #2177.

^e Registered trademark of the DuPont company.

Appendix J—691 and F691 Piston Assembly Details



Piston Assembly Number 1987-X1 Bill of Materials
Piston Diameter 4.5" (11.43 cm)

Ref No.	Part No.	Description	Qty
1.	7002-025TP125A	Screw, socket head	8
	7207-025A	Lock washer	8
2.	1987	Head, iron	1
3.	1740	Ring expander	3
4.	1739	Piston ring	3
5.	1482	Locknut	1
6.	1483	Lock pin	1
7.	1735	Shim washer, thick	As Req.
	1735-1	Shim washer, thin	
8.	1986	Piston platform	1

Model	Minimum	Maximum
690	0.000" (0.00 mm)	0.012" (0.30 mm)
691	0.015" (0.38 mm)	0.027" (0.68 mm)

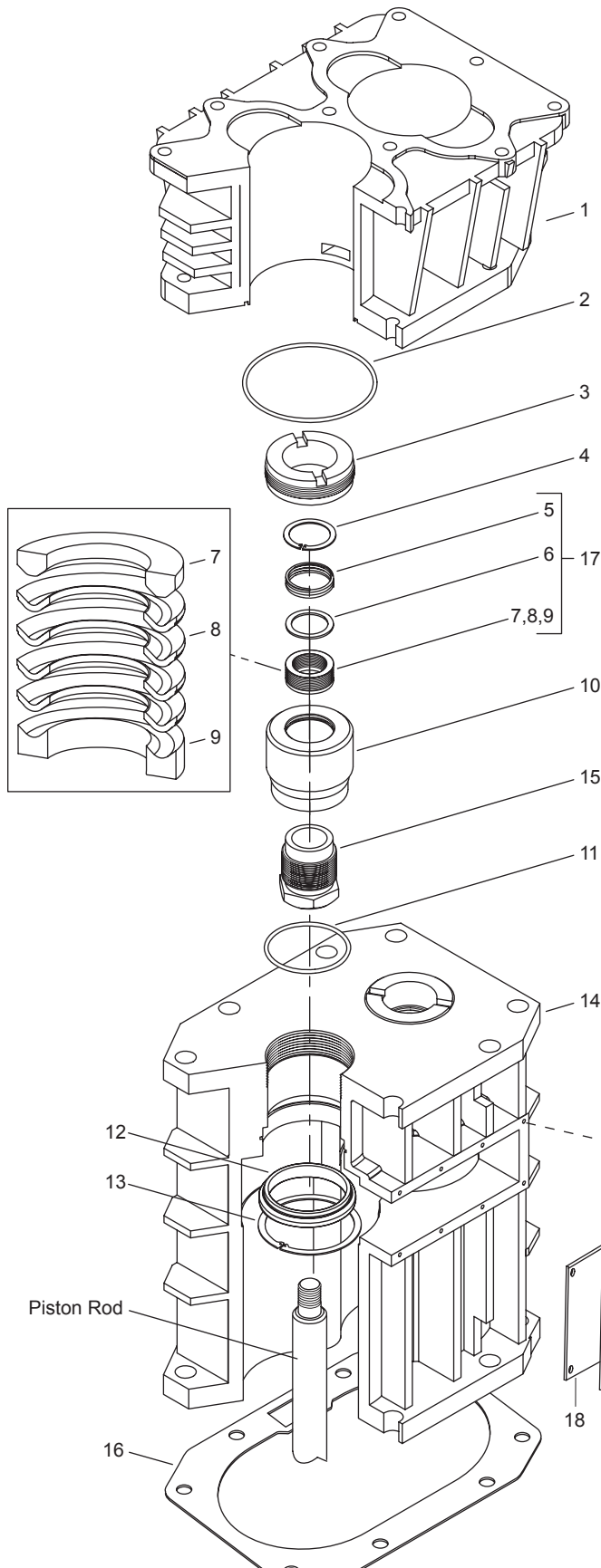
^a The distance from the bottom of the head to the top of the piston.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix J—691 and F691 Packing Assembly Details

Packing Assembly Bill of Materials

Ref No.	Part No.	Description	Qty
1.	3457	Cylinder	1
2.	2-247_a	O-ring for cylinder	2
3.	1749	Cartridge holddown screw	2
4.	5000-175	Retainer ring	2
5.	1731	Packing spring	2
6.	1728	Packing washer	2
7.	1724	Male packing ring	2
8.	1725	Packing ring	4
9.	1723	Female packing ring	2
10.	2407	Packing box cartridge	2
11.	2-233_a	O-ring (packing cartridge)	2
12.	1748	Cartridge plate	2
13.	5000-350	Retainer ring	2
14.	2405	Crosshead guide	1
15.	1722	Adjusting screw	2
16.	1761	Crankcase gasket	1
17.	1725-2X	Packing set	2
18.	1760	Inspection plate gasket	1
19.	1721	Inspection plate	1
20.	7003-025NC037E	Screw-1/4-20x3/8"	4
not shown	1192	Locking device for adj. screw	4
not shown	2893	Locking device cartridge holddown screw	



Other Assemblies

Assembly Number	Assembly Name
1717-X1	Crosshead assembly "P" style
2405-X	Crosshead guide assembly with 1748 (2), 2405, 5000-350 (2)
3544-X4	Crosshead assembly "M" style

O-ring Code

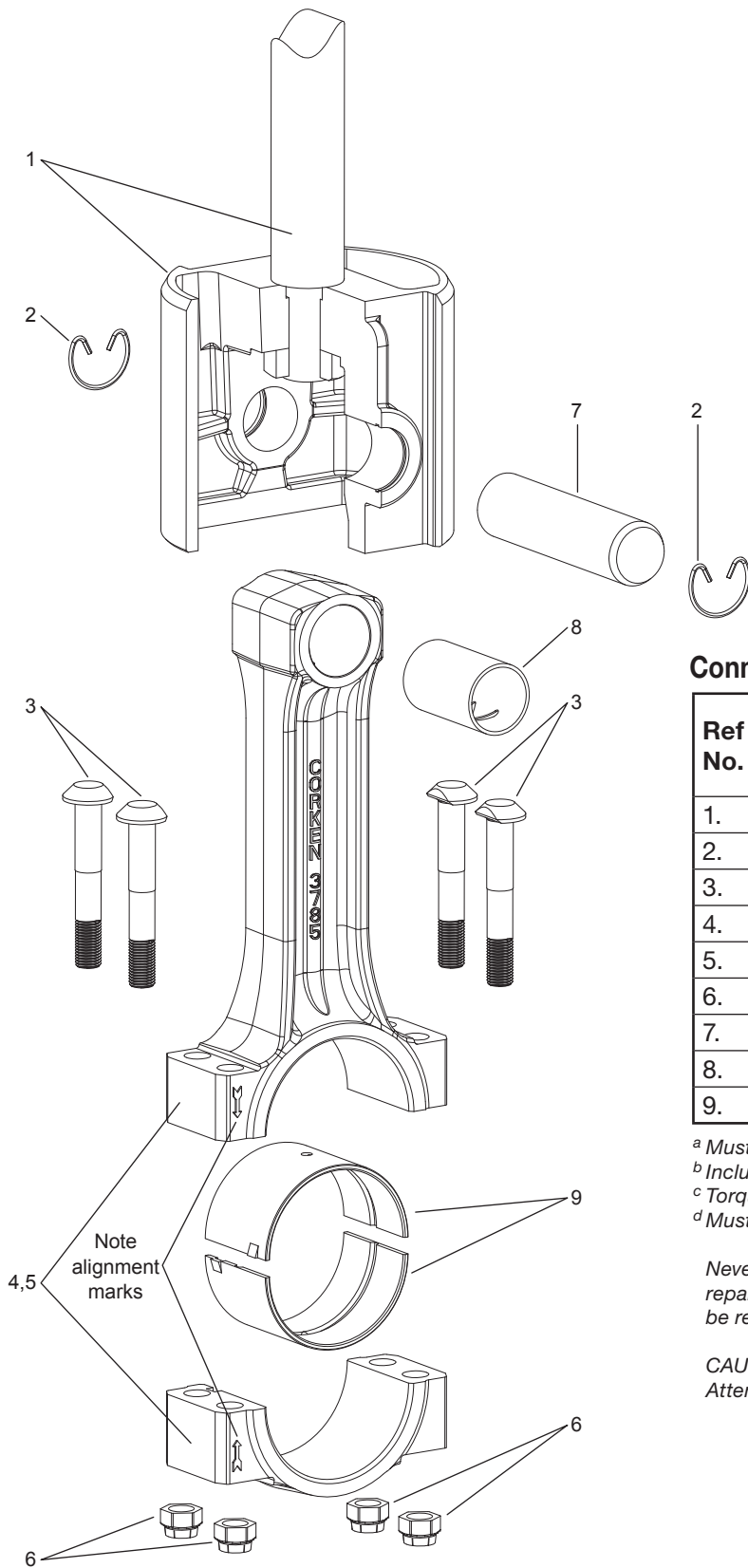
A	Buna-N
B	Neoprene ^{®b}

^a _ denotes O-ring code. See O-ring chart above for details.

^b Registered trademark of the DuPont company.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix J—691 and F691 Connecting Rod Assembly Details



Connecting Rod Assembly Bill of Materials

Ref No.	Part Number		Description
	Spec. K,P Only	Spec. M Only	
1.	1717-X1	3544-X4	Crosshead assy.
2.	1498	3590	Retainer ring
3.	1718	3540	Wrist pin
4.	1495-X ^{a,b}	3541-X ^{b,d}	Wrist pin bushing
5.	1726 ^b	1726 ^b	Bolt
6.	1720-X	3785-X1	Conn. rod assy.
7.	1720 ^b	3785 ^b	Connecting rod
8.	1719 ^b	3542 ^b	Conn. rod bearing
9.	1727 ^{b,c}	1727 ^{b,c}	Nut

^a Must be rebored after replacing (0.8754/0.8751 dia.)

^b Included with connecting rod assembly

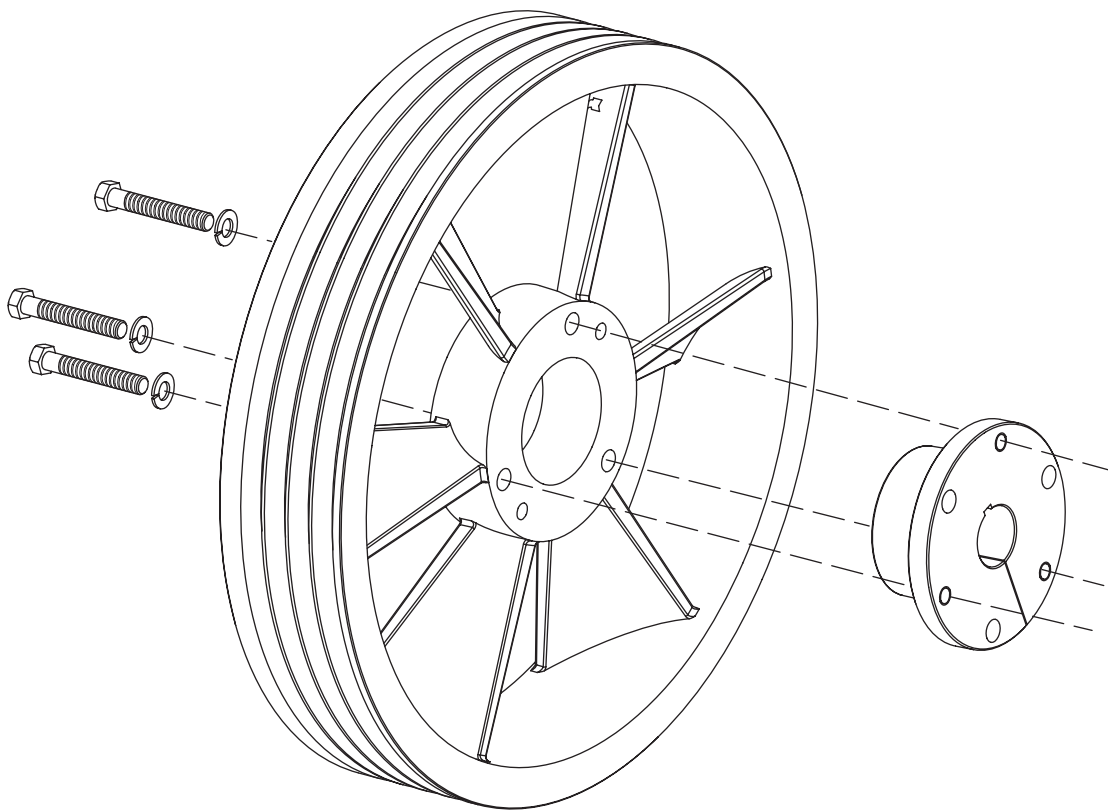
^c Torque connecting rod nut to 40 ft. lbs.

^d Must be rebored after replacing (1.1256/1.252 dia.)

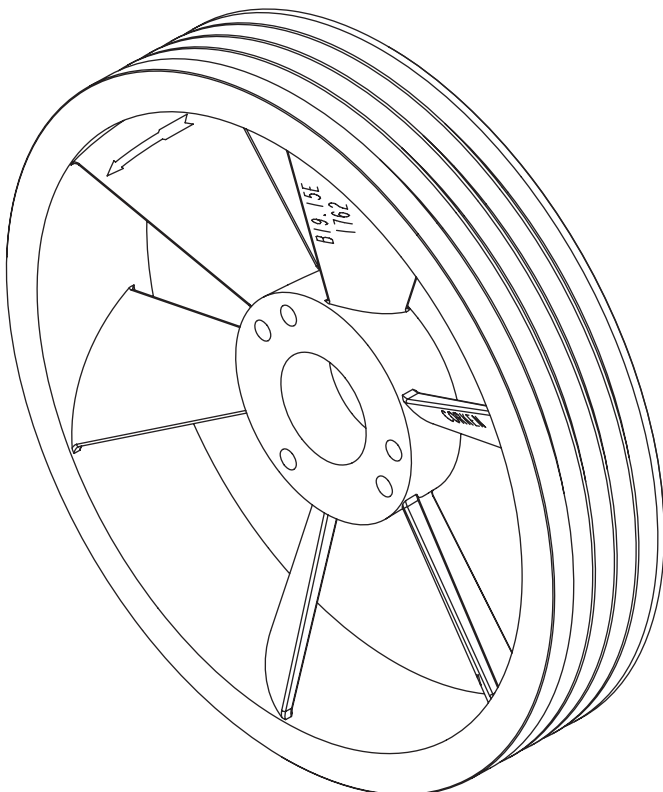
Never attempt to separate the piston rod and crosshead. When repair becomes necessary, the entire crosshead assembly must be replaced.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix J—691 and F691 Flywheel Assembly Details



Back Side

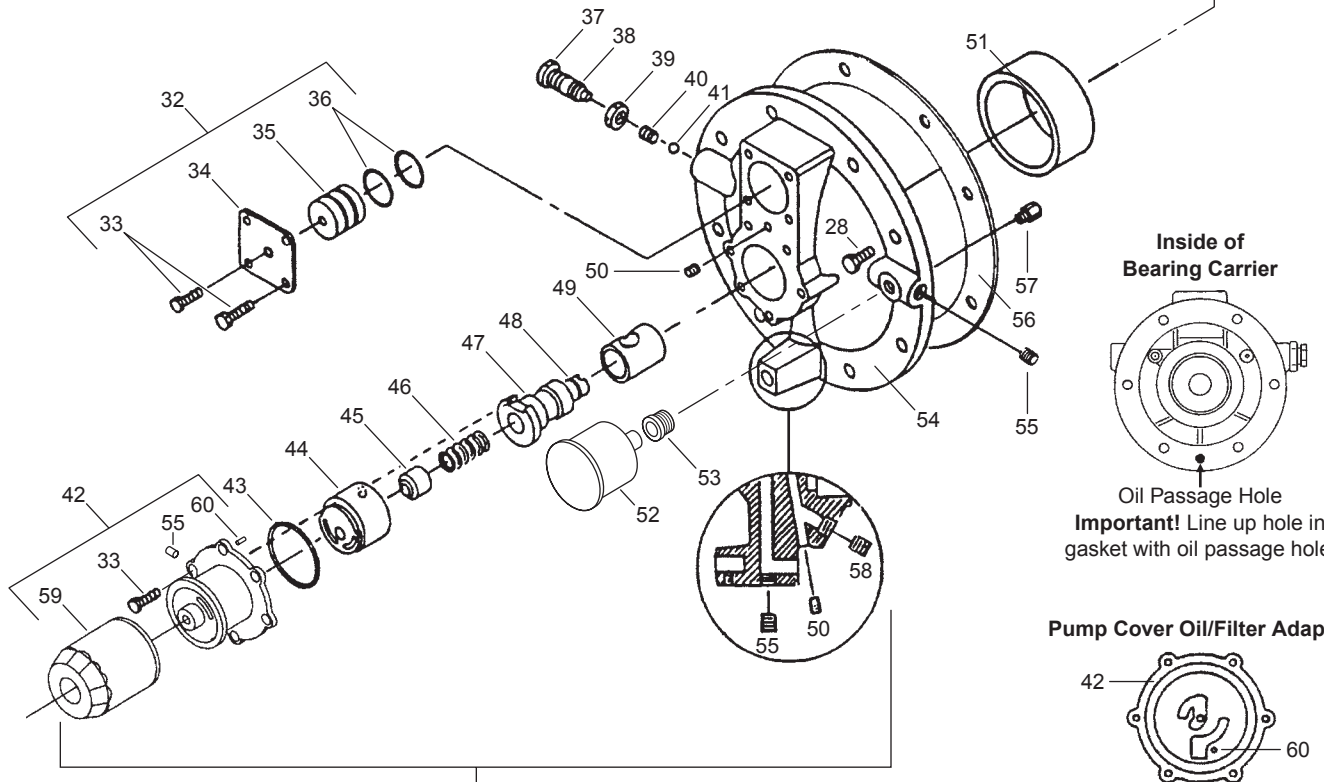
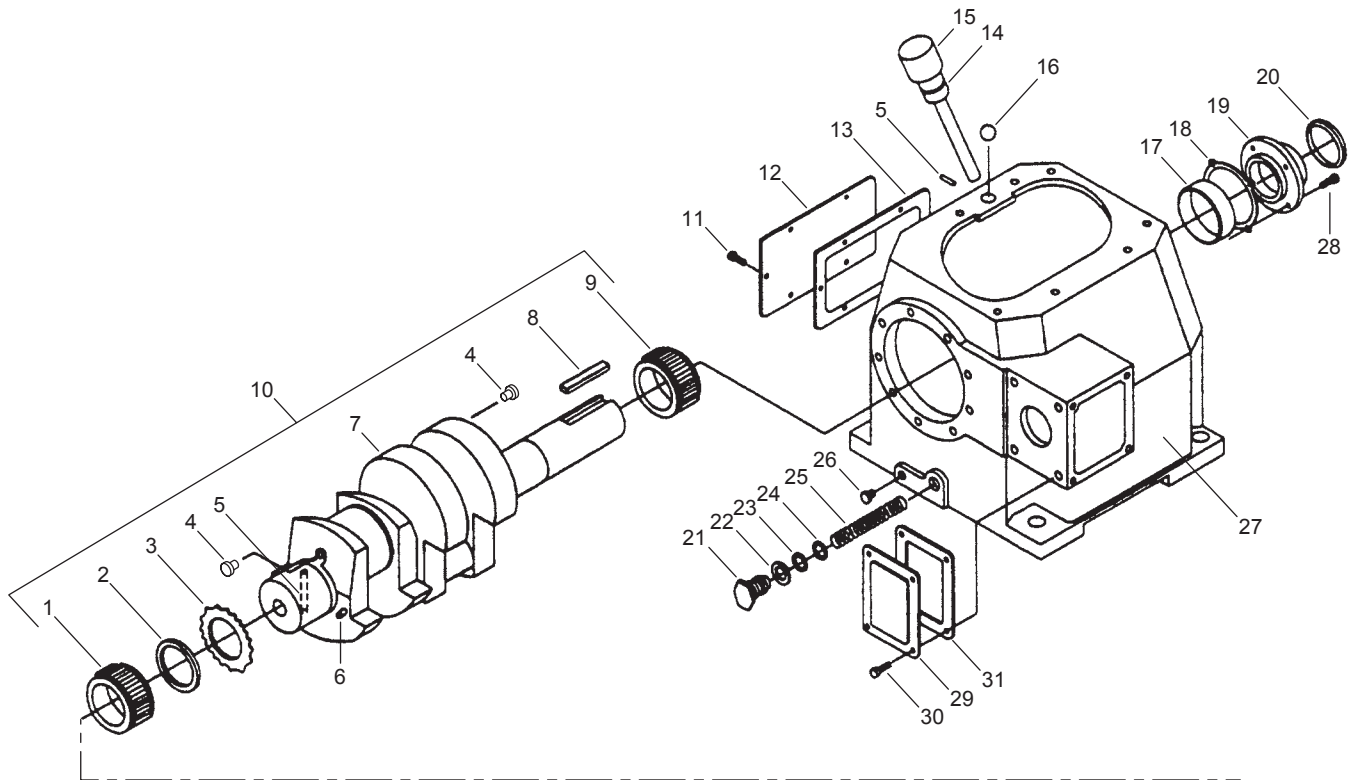


Front Side

Flywheel Assembly Bill of Materials

Assembly Number	Assembly Name
1762-X	Flywheel assembly (flywheel, hub, and three bolts)
1762	Flywheel: 19.5" O.D., 4 groove
H E-2.125	Hub with three bolts and lockwashers

Appendix J—691 and F691 Crankcase Assembly Details



61
 (Includes all parts shown except #52 and #53)

Appendix J—691 and F691 Crankcase Assembly Details

Crankcase Assembly Bill of Materials

Ref No.	Part No.	Description
1.	1737	Bearing cone
2.	3638	Spacer
3.	3635	Drive sprocket
4.	1284	Crankshaft orifice
5.	2135	Drive pin
6.	2933	Link pin
7.	3786	Crankshaft
8.	3503	Flywheel key
9.	3580	Bearing cone
10.	3786-X1	Crankshaft assembly
11.	7001-031NC075A	Bolt, 5/16 - 18 x 3/4" hex head
12.	2122	Inspection cover
13.	2123	Gasket, inspection cover
14.	2-210 ^d	O-ring
15.	3225-X1	Oil bayonet assembly (w/O-ring)
16.	2126	Breather ball
17.	3579	Bearing cup
18.	3589	Bearing adjustment shim (.005")
	3589-1	Bearing adjustment shim (.007")
	3589-2	Bearing adjustment shim (.020")
19.	3539	Bearing cover
20.	3526	Oil seal
21.	1280	Filter screw
22.	1281	Gasket, filter
23.	2-116 ^d	O-ring
24.	1276	Washer
25.	1275	Oil filter screen
26.	3443	Pipe plug, 1/2" NPT steel
27.	3221	Crankcase
28.	7001-037NC100A	Bolt, 3/8 - 16 x 1" hex head Gr. 5
29.	3875	Access cover
30.	7003-025NC037E	Screw, 1/4 - 20 x 3/8"
31.	3874	Gasket, access cover
32.	1515-X	Closure cap assembly
33.	7001-025NC050A	Bolt, 1/4 - 20 x 1/2" hex head
34.	1515	Closure cap
35.	1516	Closure body
36.	2-218 ^d	O-ring
37.	1290	Relief valve adjusting screw
38.	2-011 ^d	O-ring
39.	1291	Adjusting screw locknut
40.	1292	Relief valve spring
41.	1293	Relief valve ball
42.	4222-X ^c	Oil filter adapter assembly (w/pin)
43.	2-228 ^d	O-ring
44.	2849-1X ^c	Oil pump assembly
45.	2851	Spring guide
46.	2852	Oil pump spring
47.	3219	Pump shaft adapter

Ref No.	Part No.	Description
48.	2-112 ^d	O-ring
49.	2805-X ^d	Pump shaft bushing
50.	1629	Pipe plug, 1/16 NPT fl. seal
51.	1736	Bearing cup
52.	1302	Oil pressure gauge
53.	1044	Bushing, 1/8 x 1/4 NPT
54.	3220-2	Bearing carrier
55.	3289	Pipe plug, 1/4 NPT fl. seal
56.	2131	Bearing carrier gasket
57.	2961-X	Air release valve assembly
58.	2590	Pipe plug, 1/8 NPT fl. Seal
59.	4225	Filter
60.	2798	Pump cover pin (included w/4222-X)
61.	3220-2X	Bearing carrier assembly M3 style

Additional Assembly

Assembly Number	Assembly Name
3221-X1 ^a	Crankcase assembly (M3, 4, 8, 9) without lubrication

O-ring Code	
A	Buna-N
B	Neoprene ^{®e}

^a Not shown

^b Must be rebored and honed after replacing (0.876"/0.875" diameter)

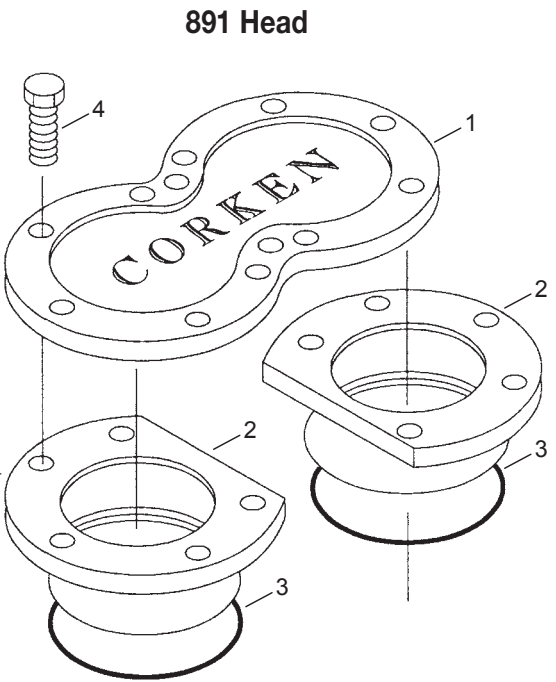
^c Caution: To avoid damage during assembly, refer to installation Instruction Manual IE400.

^d _{denotes O-ring code. See O-ring chart above for details.}

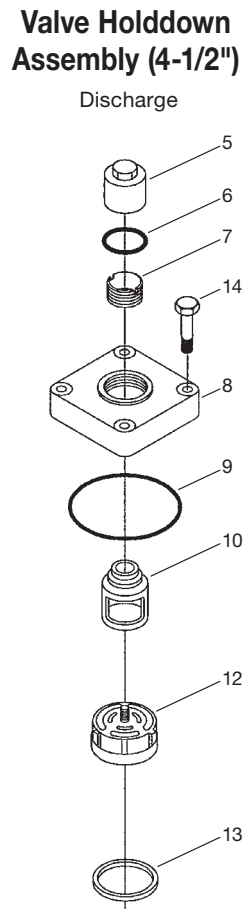
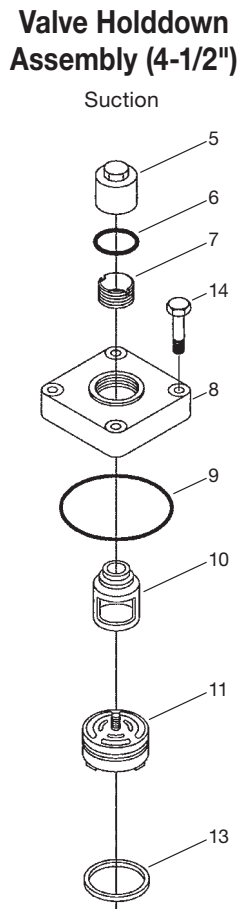
^e Registered trademark of the DuPont company.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix K—D891 Head and Valve Assembly Details



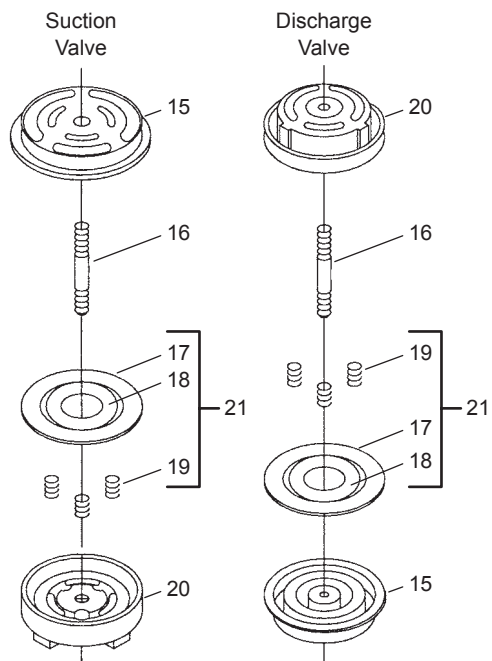
O-ring Code	
A	Buna-N
B	Neoprene ^{®d}



Compressor Head and Valve Bill of Materials

Ref No.	Part No.	Description
1.	3923	Cylinder cap
2.	3924	Cylinder head (4-1/2")
3.	2-246_b	O-ring
4.	7001-050 NC150A	Bolt, 1/2 - 13 x 1-1/2" hex head Gr 5 (Torque to 65 ft•lbs)
5.	2714-1	Valve cap
6.	2-031_b	O-ring
7.	2715	Holddown screw
8.	1764	Valve cover plate
9.	2-235_b	O-ring
10.	3570-1	Valve cage
11.	3732-X	Suction valve assembly (4-1/2")
12.	3733-X	Discharge valve assembly (4-1/2")
13.	2114 ^a	Valve gasket
14.	7001-043 NC150A	Bolt, 7/16 - 14 x 1-1/2" hex head (Torque to 37 ft•lbs)
15.	3827	Valve seat (4-1/2")
16.	3828	Stud
17.	3830 ^c	Valve plate, outer
18.	3831 ^c	Valve plate, inner
19.	3829 ^c	Spring
20.	3826	Valve bumper (4-1/2")
21.	3805-X1 ^c	Valve repair kit (1st stage)

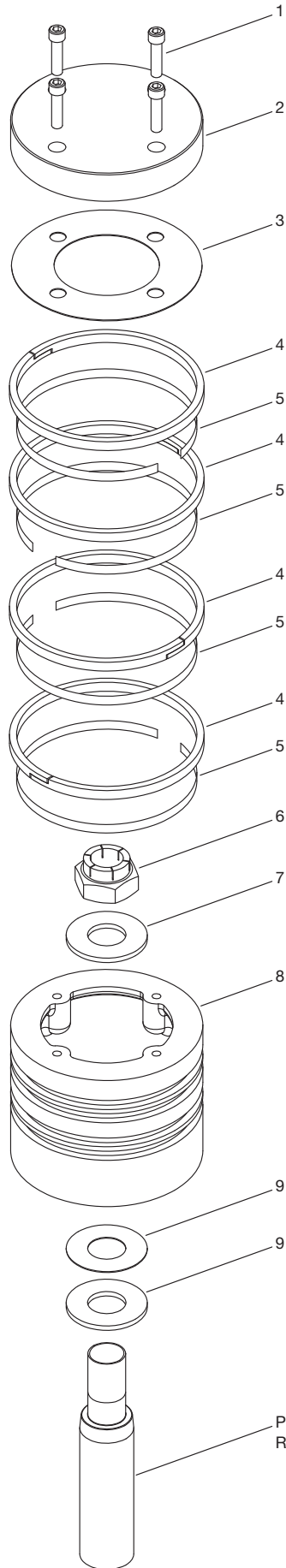
Valve Assemblies (4-1/2")



^a Included with valve assembly
^b _ denotes O-ring code. See O-ring chart above for details.
^c Included with valve repair kit.
^d Registered trademark of the DuPont company.

CAUTION: Always relieve pressure in the unit before attempting any repairs.

Appendix K—D891 Piston Assembly Details



Piston Assembly Bill of Materials

Ref. No.	Part No.	Description	Qty
	D891 3925-X1 (4-1/2")		
1.	7002-025-TP100A	Screw, orlo gr. 8 (torque to 8 ft•lbs)	4
2.	3927	Piston cap	1
3.	2902	Shim washer, thick	As req.
	2902-1	Shim washer, thin	
4.	1739	Piston rings	4
	1739-2	Alloy 50 rings—opt.	
	1739-3	Peek rings—opt.	
5.	1740	Expander ring	4
6.	3604	Lock nut (torque to 150 ft•lbs)	1
7.	3730	Thrust washer	2
8.	3925 (4-1/2" diameter)	Piston	1
9.	3603	Shim washer, thick	As req.
	3603-1	Shim washer, thin	
10.	3812 (not shown)	Loctite tube—620	1

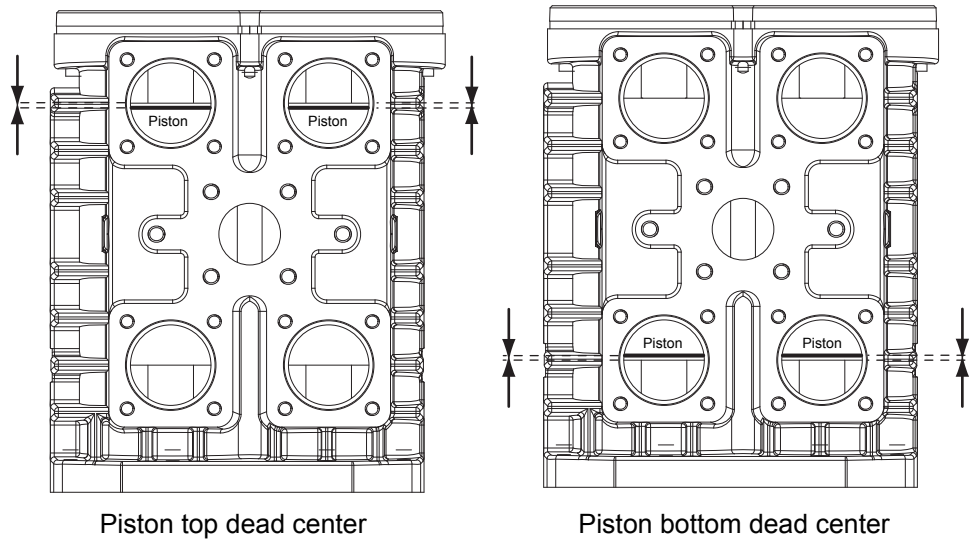
Piston Clearance (Cold)

Model	Top Min. ^a	Top Max. ^a	Bottom Min. ^b	Bottom Max. ^b
D891	0.084" (2.13 mm)	0.104" (2.64 mm)	0.010" (0.25 mm)	0.020" (0.50 mm)

^a The distance from the bottom of the head to the top of the piston.

^b The distance from the bottom of the piston to the top of the packing barrel.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.



Appendix K—D891 Crosshead Guide Assembly Details

Crosshead Guide Bill of Materials

Ref No.	Part No.	Description	Qty
1.	3922	Cylinder	1
2.	1054	Drain valve (lubricated models)	1
3.	1071	Nipple, 1/4" x close	1
4.	2-246 ^a	O-ring for cylinder	2
5.	3442	Pipe plug, 1/4" NPT	3
6.	7001-050NC175A	Bolt, 1/2" 13 x 1-3/4" hex head gr 5	24
7.	3793-2S	Flange (inlet/outlet)	2
8.	2-231 ^a	O-ring for flange	2
9.	3253	Roll pin	1
10.	2405-1	Crosshead guide	1
11.	1064	Elbow, 1/4" NPT	1
12.	3974	Tag	1
13.	1761	Gasket, crankcase	1
14.	1760	Gasket, inspection cover	1
15.	1721	Inspection cover	1
16.	7012-010NC025B	Bolt, 10 - 24 x 1/4" Phillip hd.	10

O-ring Code	
A	Buna-N
B	Neoprene ^{®b}

^a _ denotes O-ring code. See O-ring chart above for details.

^b Registered trademark of the DuPont company.

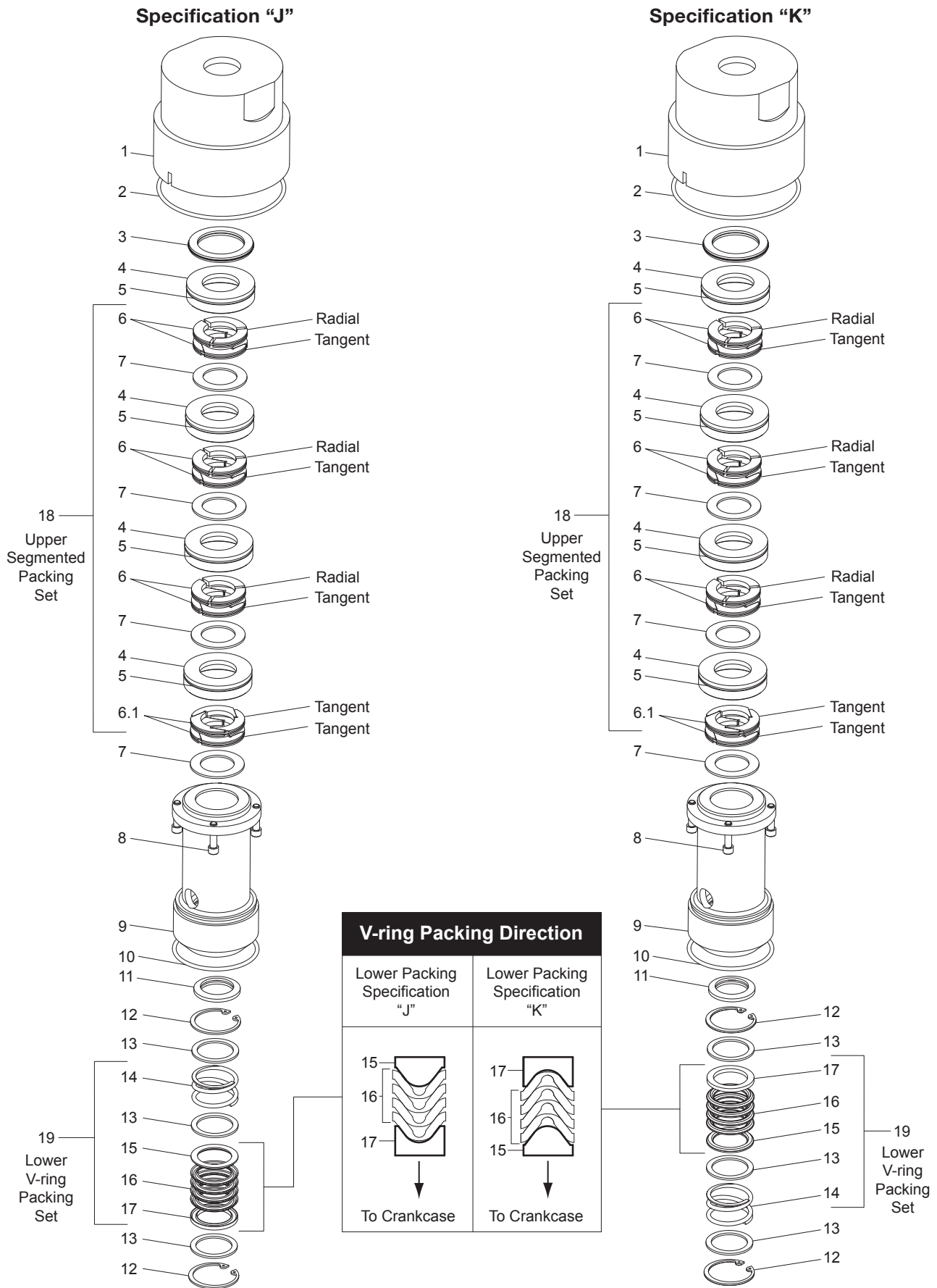
CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

NOTE:

Packing barrel installation:

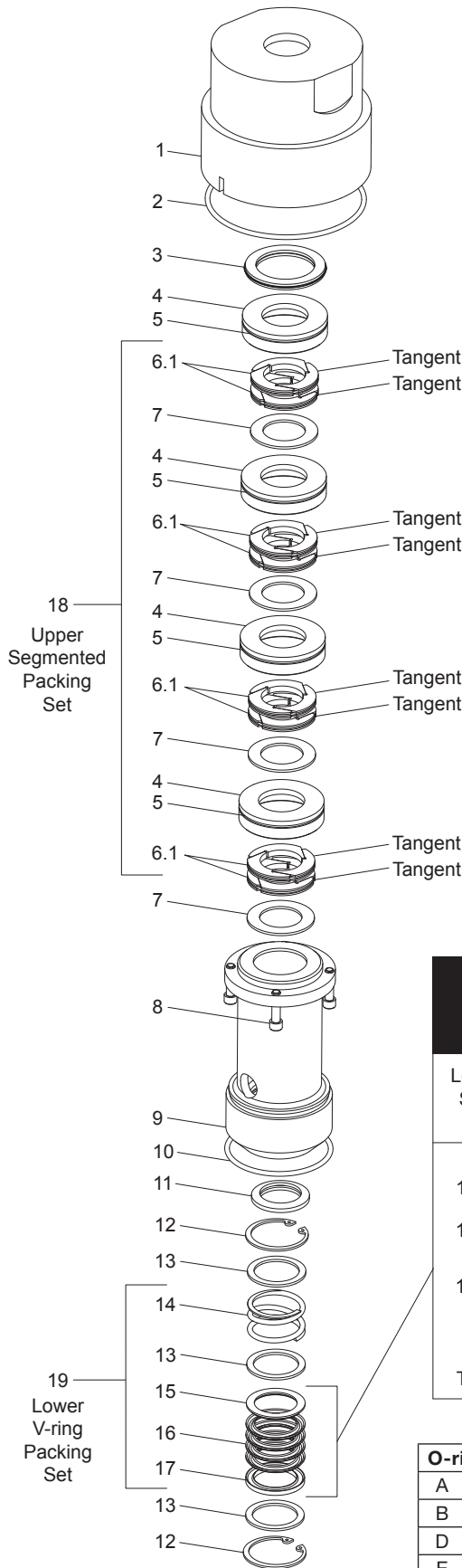
1. Use packing installation cone #905 on the piston rod.
2. Insert small barrel first, use finger holes to align slinger ring on to the rod. Slip the packing barrel into place.
3. Align pin with slot in large packing barrel.
4. Slip large packing barrel in place.

Appendix K—D891 Packing Assembly Details



Appendix K—D891 Packing Assembly Details

Specification "R"



Packing Assembly Bill of Materials

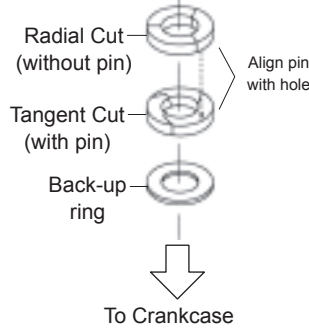
Ref No.	Part No.	Description
1.	3926	Packing barrel (4-1/2")
2.	2-238 ^{a,c}	O-ring
3.	3906	Crush gasket
4.	3817	Packing cup (Not included in 3810-X1 packing set)
5.	2-036 ^{a,d}	Cup O-ring
6.	3810	Segmented packing (radial-tangent) pair
6.1.	3814	Segmented packing (tangent-tangent) pair
7.	3811	Back-up ring
8.	7002-025OC100A	Screw, 1/4-20 x 1" socket head
9.	3885	Cartridge
10.	2-231 ^a	O-ring
11.	1732 ^b	Oil deflector ring
12.	5000-175	Retainer ring
13.	1728	Washer
14.	1731	Spring
15.	1724	Male packing ring
16.	1725	V-ring packing
17.	1723	Female packing ring
18.	3810-X1 ^e	Segmented packing set
19.	1725-2X	V-ring packing set

Identification of Packing Specification

Example: Model Number D891 **J** M4FBA
 Packing Spec. _____

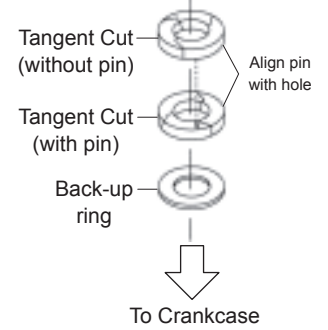
Segmented Packing for Specification "J" & "K"

Piston (Pressure) Side



Segmented packing for Specification "J", "K", & "R"

Piston (Pressure) Side



IMPORTANT: Identify and line up the rings before installing. Be sure they face the way shown here and that the pin and hole are aligned when assembled.

^a _ denotes O-ring code. See O-ring chart for details.

^b Deflector ring is loose within the packing cartridge until fitted on the piston rod. Must be put in from the bottom of the cartridge.

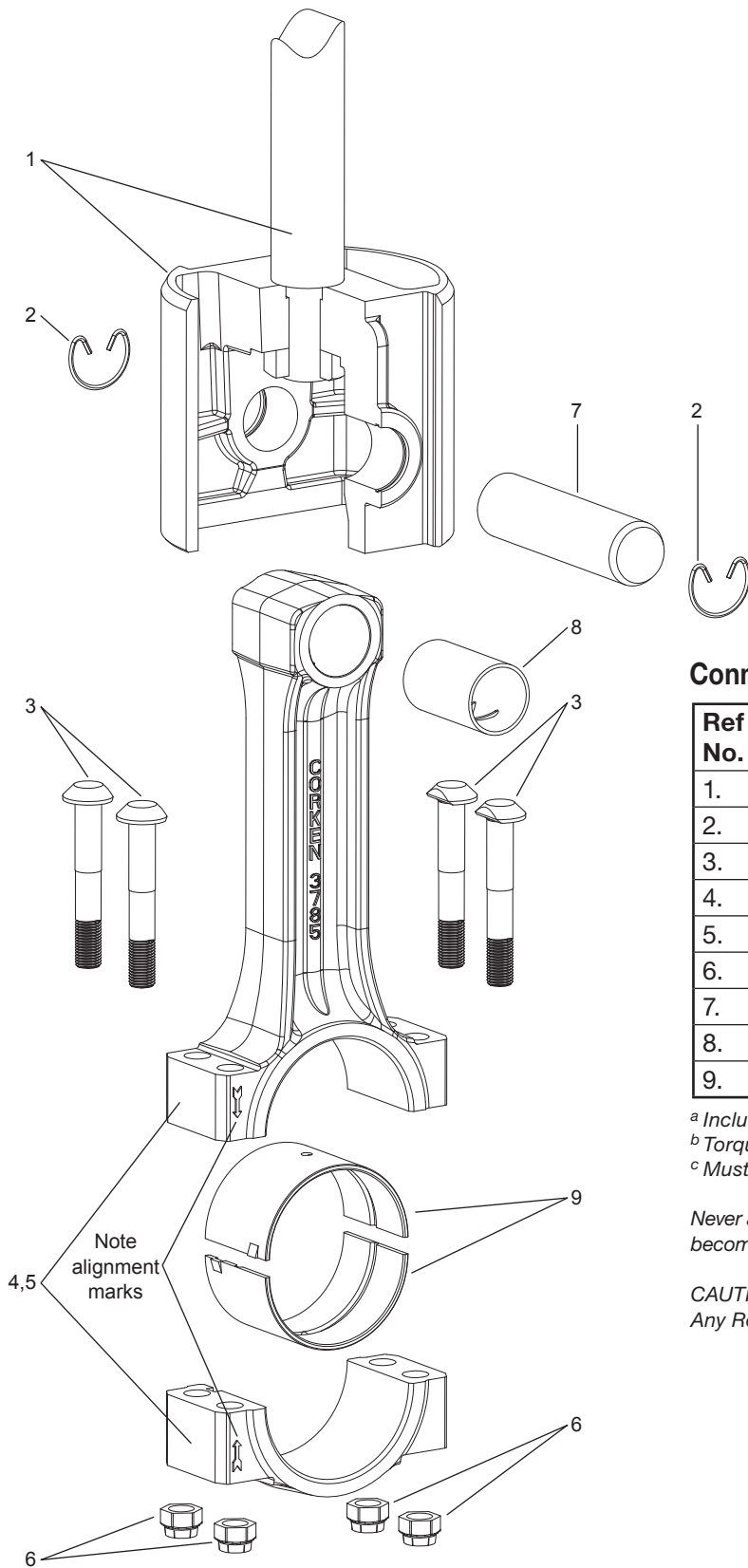
^c Insert O-ring into the groove in the bottom of the barrel.

^d Starting with S.N. NN51397.

^e Packing cup O-ring not included in packing set.

^f Registered trademark of the DuPont company.

Appendix K—D891 Connecting Rod Assembly Details



Connecting Rod Assembly Bill of Materials

Ref No.	Part No.	Description
1.	3544-X3	Crosshead assembly
2.	3590	Retainer ring
3.	3540	Wrist pin
4.	3541-X ^{a,b}	Wrist pin bushing
5.	1726 ^b	Bolt
6.	3785-X ^a	Connecting rod assembly
7.	3785 ^a	Connecting rod
8.	3542 ^a	Connecting rod bearing
9.	1727 ^{a,c}	Nut

^a Included with connecting rod assembly

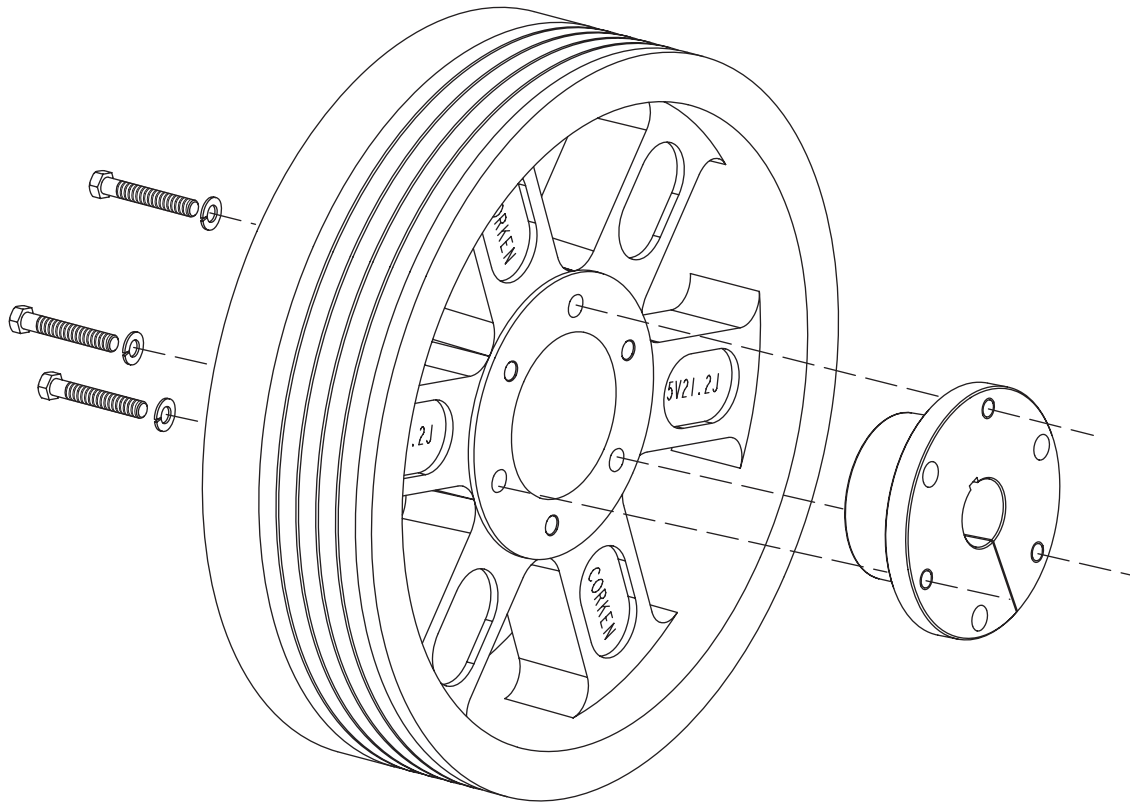
^b Torque connecting rod nut to 40 ft. lbs.

^c Must be rebored after replacing (1.1256/1.252 dia.)

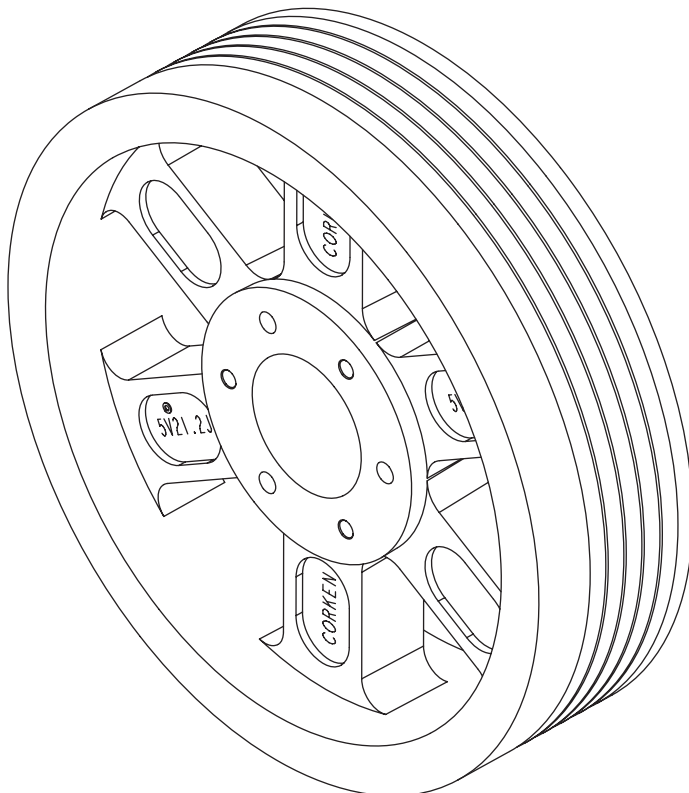
Never attempt to separate the piston rod and crosshead. When repair becomes necessary, the entire crosshead assembly must be replaced.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.

Appendix K—D891 Flywheel Assembly Details



Back Side

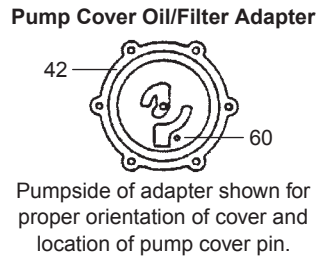
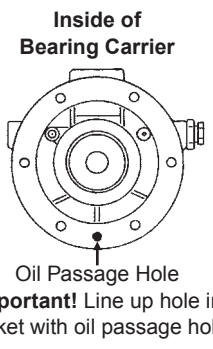
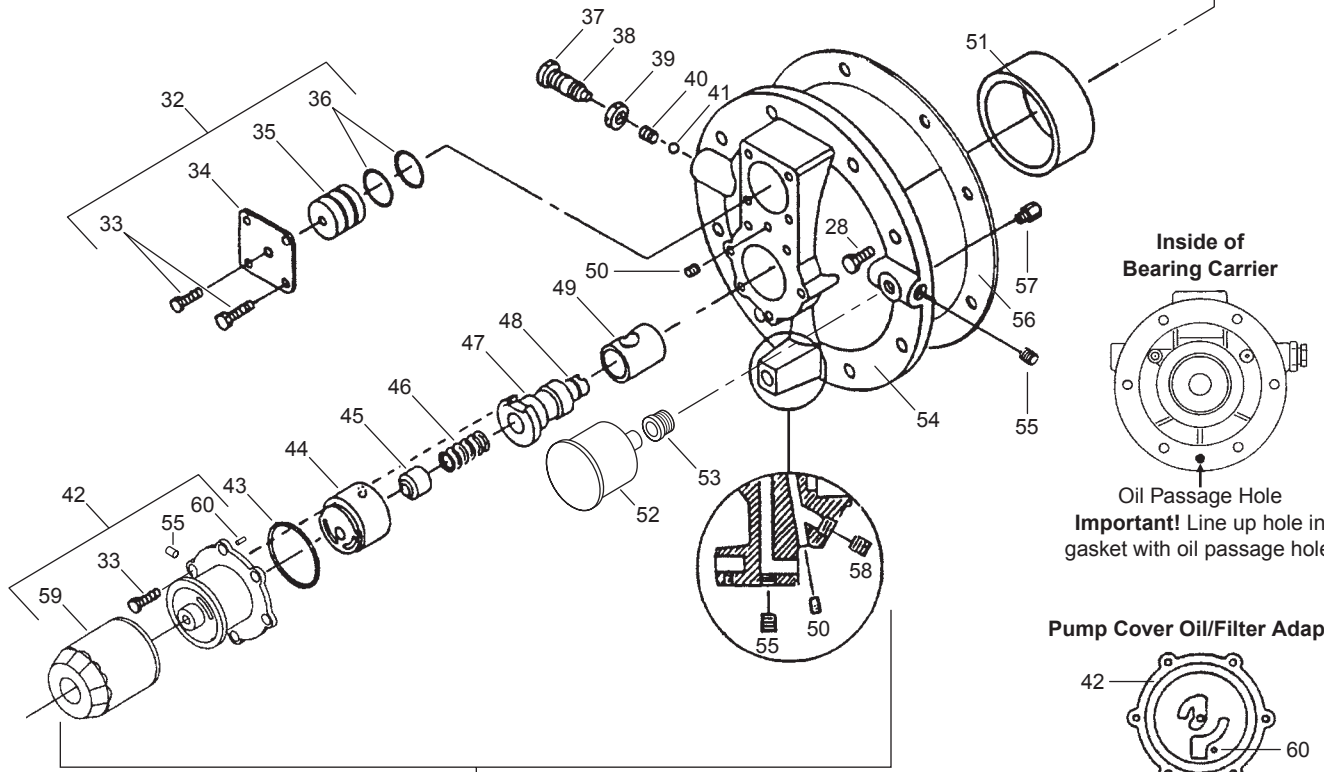
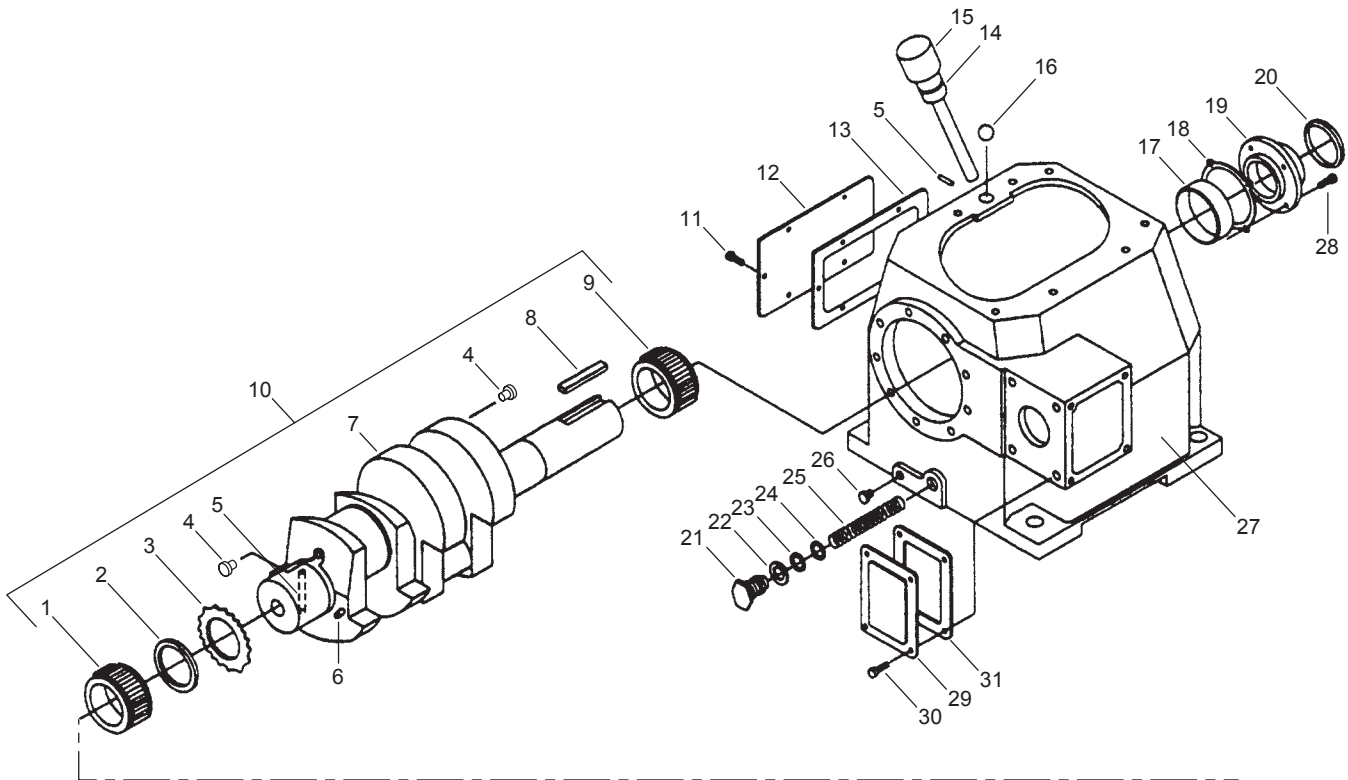


Front Side

Flywheel Assembly Bill of Materials

Assembly Number	Assembly Name
3852-X	Flywheel assembly (flywheel, hub, and three bolts)
3852	Flywheel: 21.2" O.D., 5 groove
H J-2.125	Hub with three bolts and lockwashers

Appendix K—D891 Crankcase Assembly Details



61
(Includes all parts shown except #52 and #53)

Appendix K—D891 Crankcase Assembly Details

Crankcase Assembly Bill of Materials

Ref No.	Part No.	Description
1.	1737	Bearing cone
2.	3638	Spacer
3.	3635	Drive sprocket
4.	1284	Crankshaft orifice
5.	2135	Drive pin
6.	2933	Link pin
7.	3786	Crankshaft
8.	3503	Flywheel key
9.	3580	Bearing cone
10.	3786-X1	Crankshaft assembly
11.	7001-031NC075A	Bolt, 5/16 - 18 x 3/4" hex head
12.	2122	Inspection cover
13.	2123	Gasket, inspection cover
14.	2-210 ^d	O-ring
15.	3225-X1	Oil bayonet assembly (w/O-ring)
16.	2126	Breather ball
17.	3579	Bearing cup
18.	3589	Bearing adjustment shim (.005")
	2589-1	Bearing adjustment shim (.007")
	2589-2	Bearing adjustment shim (.020")
19.	3539	Bearing cover
20.	3526	Oil seal
21.	1280	Filter screw
22.	1281	Gasket, filter
23.	2-116 ^d	O-ring
24.	1276	Washer
25.	1275	Oil filter screen
26.	3443	Pipe plug, 1/2" NPT steel
27.	3221	Crankcase
28.	7001-037NC100A	Bolt, 3/8 - 16 x 1" hex head Gr. 5
29.	3875	Access cover
30.	7003-025NC037E	Screw, 1/4 - 20 x 3/8"
31.	3874	Gasket, access cover
32.	1515-X	Closure cap assembly
33.	7001-025NC050A	Bolt, 1/4 - 20 x 1/2" hex head
34.	1515	Closure cap
35.	1516	Closure body
36.	2-218 ^d	O-ring
37.	1290	Relief valve adjusting screw
38.	2-011 ^d	O-ring
39.	1291	Adjusting screw locknut
40.	1292	Relief valve spring
41.	1293	Relief valve ball
42.	4222-X ^c	Oil filter adapter assembly (w/pin)
43.	2-228 ^d	O-ring
44.	2849-1X ^c	Oil pump assembly
45.	2851	Spring guide
46.	2852	Oil pump spring
47.	3219	Pump shaft adapter

Ref No.	Part No.	Description
48.	2-112 ^d	O-ring
49.	2805-X ^b	Pump shaft bushing
50.	1629	Pipe plug, 1/16 NPT fl. seal
51.	1736	Bearing cup
52.	1302	Oil pressure gauge
53.	1044	Bushing, 1/8 x 1/4 NPT
54.	3220-2	Bearing carrier
55.	3289	Pipe plug, 1/4 NPT fl. seal
56.	2131	Bearing carrier gasket
57.	2961-X	Air release valve assembly
58.	2590	Pipe plug, 1/8 NPT fl. Seal
59.	4225	Filter
60.	2798	Pump cover pin (included w/4222-X)
61.	3220-2X	Bearing carrier assembly

Additional Assembly

Assembly Number	Assembly Name
3221-X1 ^a	Crankcase assembly (M3, 4, 8, 9) without lubrication

O-ring Code	
A	Buna-N
B	Neoprene ^{®e}

^a Not shown

^b Must be rebored and honed after replacing (0.876"/0.875" diameter)

^c Caution: To avoid damage during assembly, refer to installation Instruction Manual IE400.

^d denotes O-ring code. See O-ring chart above for details.

^e Registered trademark of the DuPont company.

CAUTION: Always Relieve Pressure In The Unit Before Attempting Any Repairs.