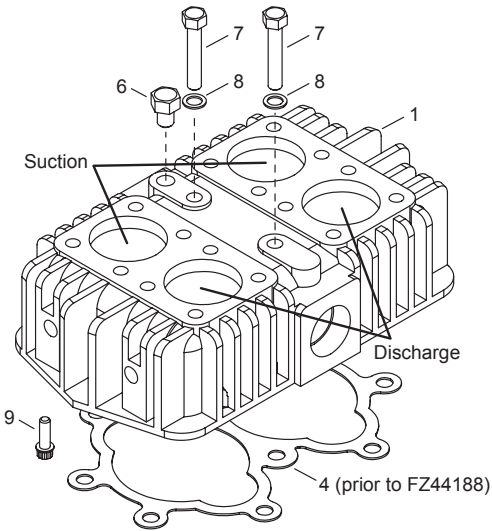
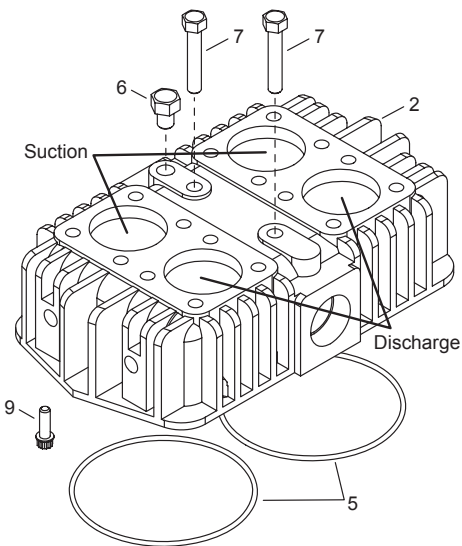


Appendix I—490, 491, and F491 Head and Valve Assembly Details

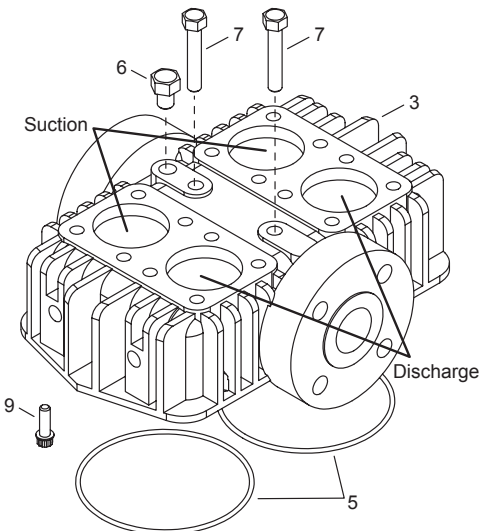
490 and 491 Head Assembly



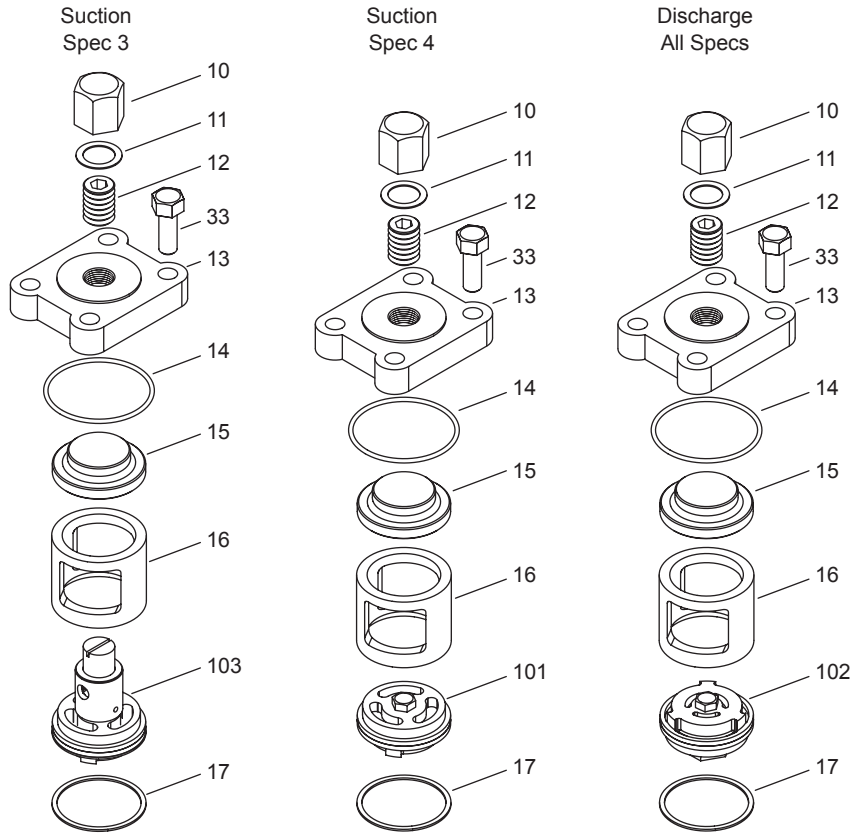
491 Head Assembly



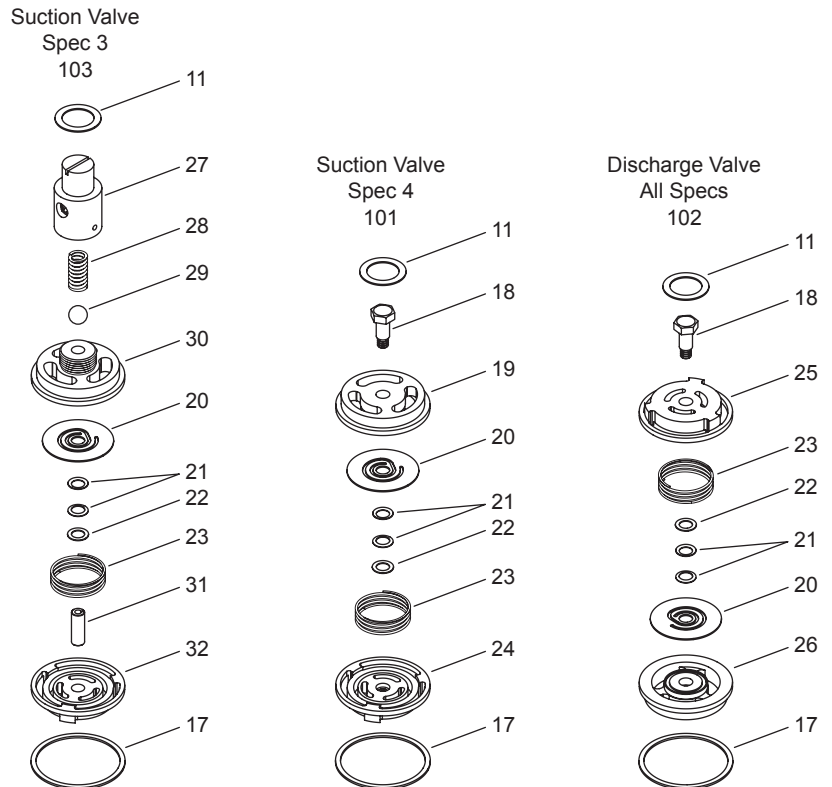
F491 Head Assembly



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.

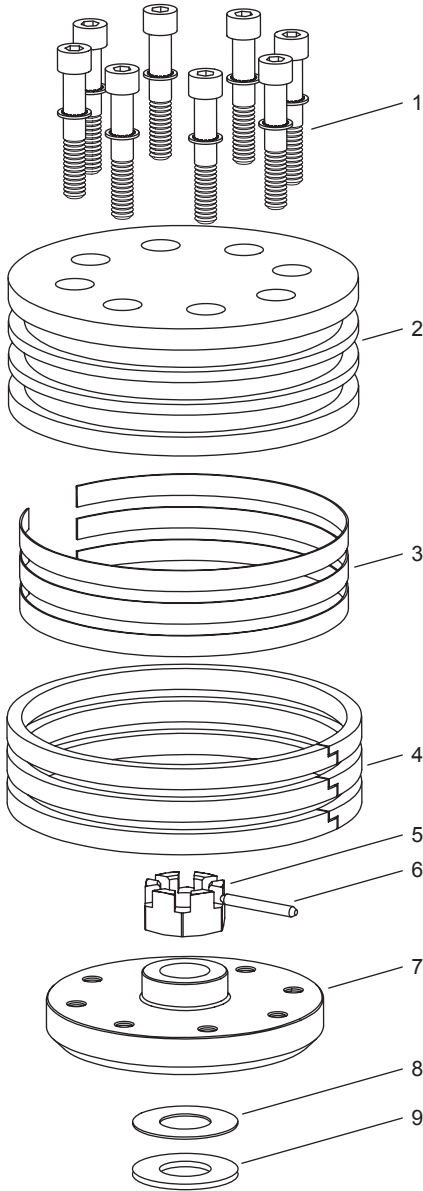
^e S/N FZ44188 and later.

^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

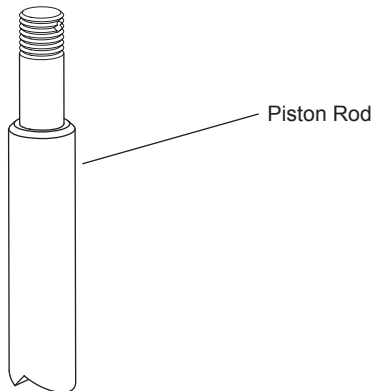
Model	Minimum	Maximum
490	0.000" (0.00 mm)	0.024" (0.61 mm)
491 ^b		
491 ^c	0.020" (0.51 mm)	0.044" (1.12 mm)

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

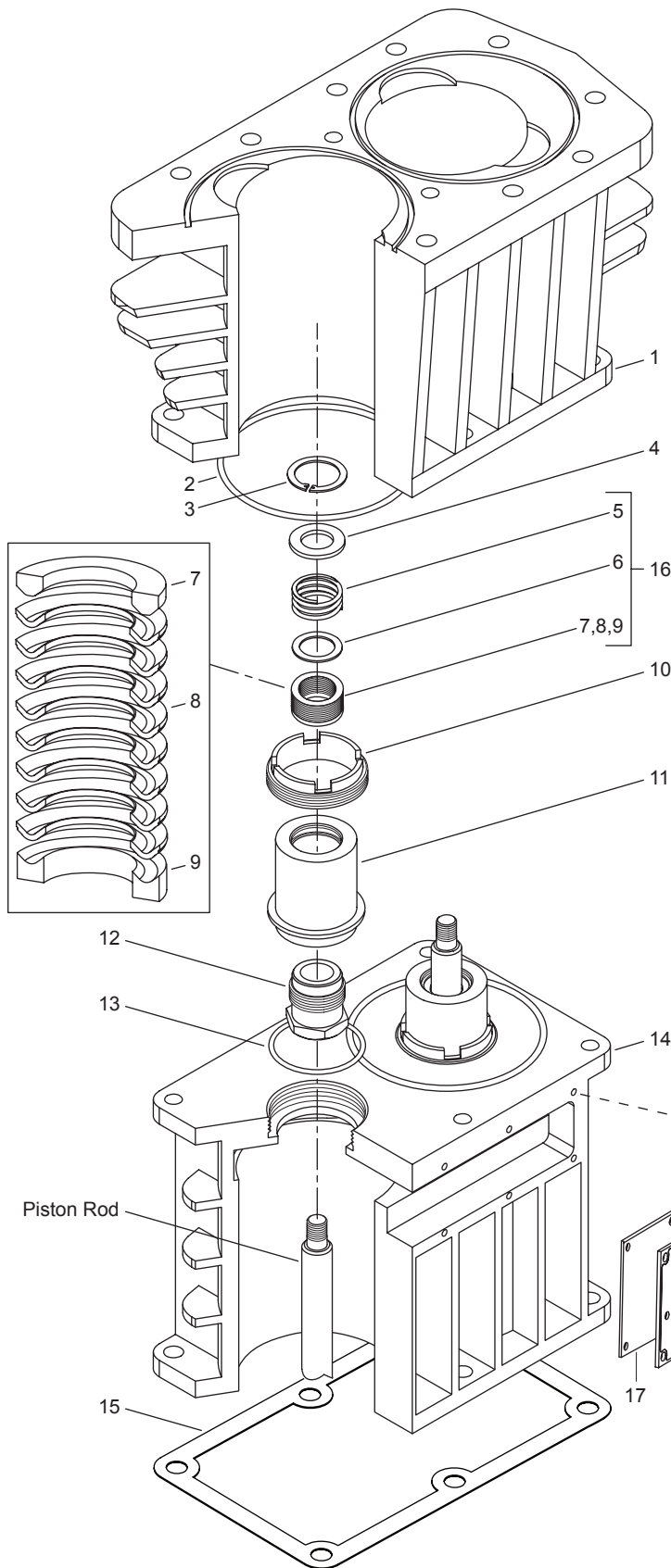
^b For 491 compressor with flat gasket.

^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

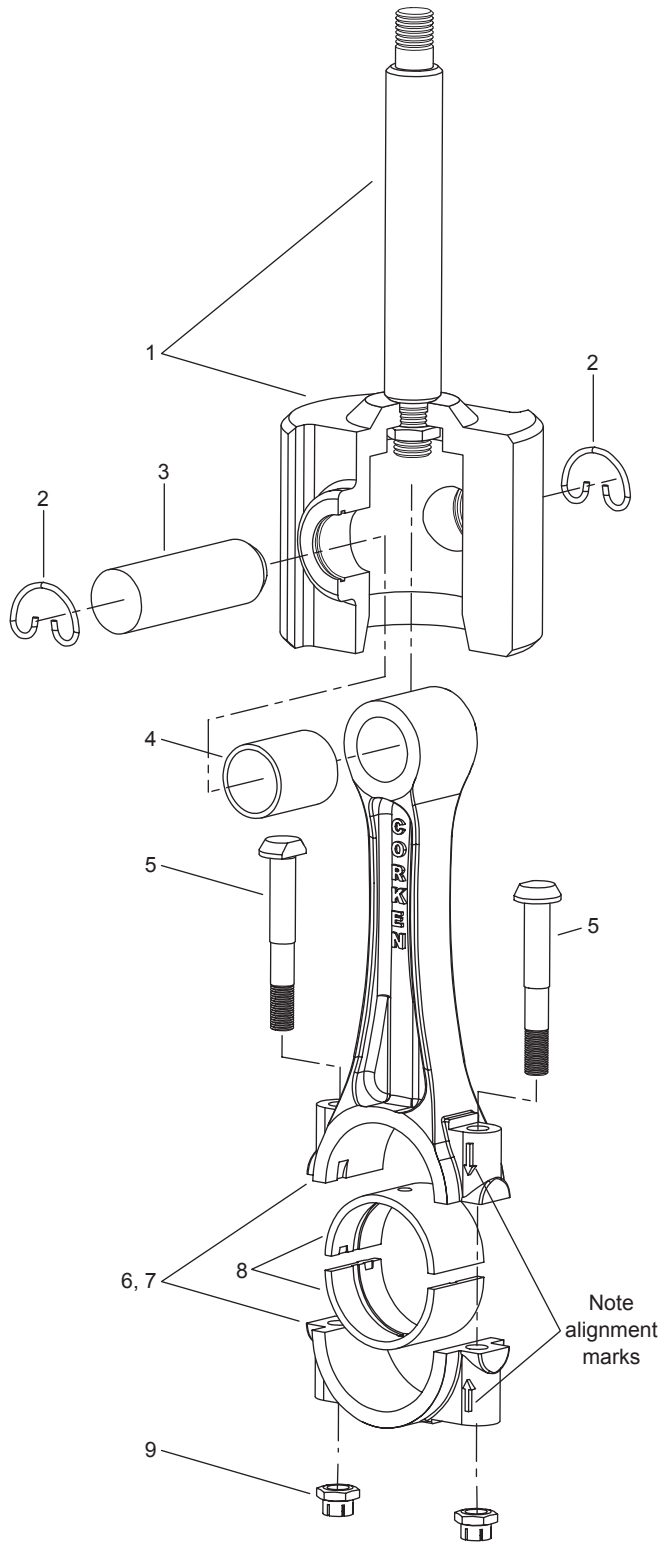
Assembly Number	Assembly Name
1384-X	Crosshead assembly

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.)

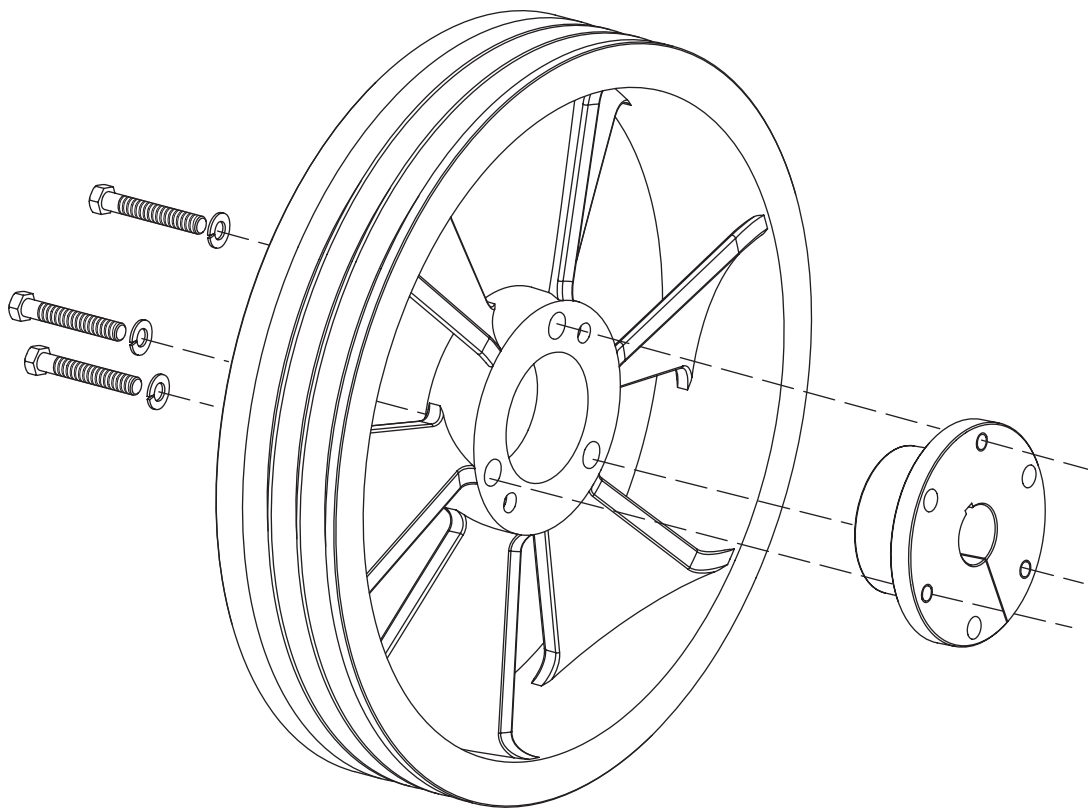
^b Included with connecting rod assembly

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

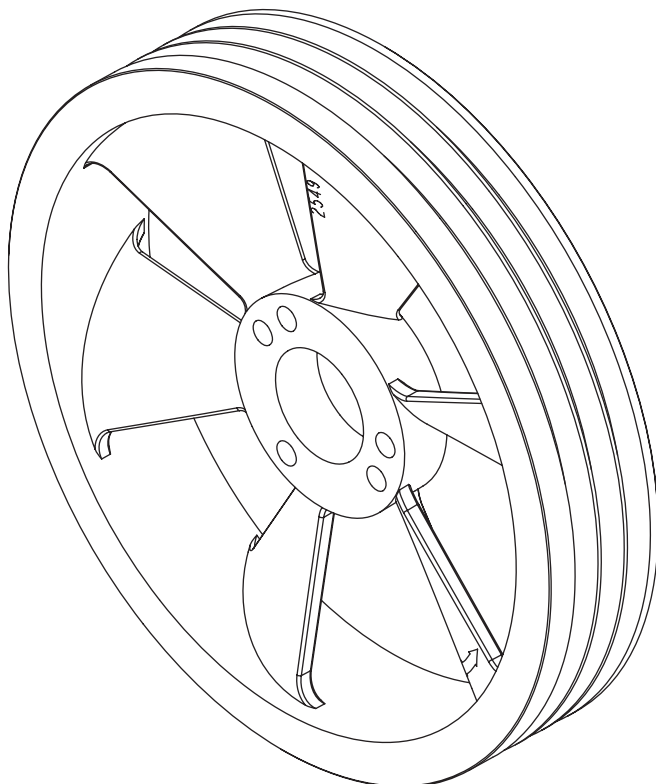
Never attempt to separate the piston rod and crosshead. When repair becomes necessary, the entire crosshead assembly must be replaced.

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

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



Back Side

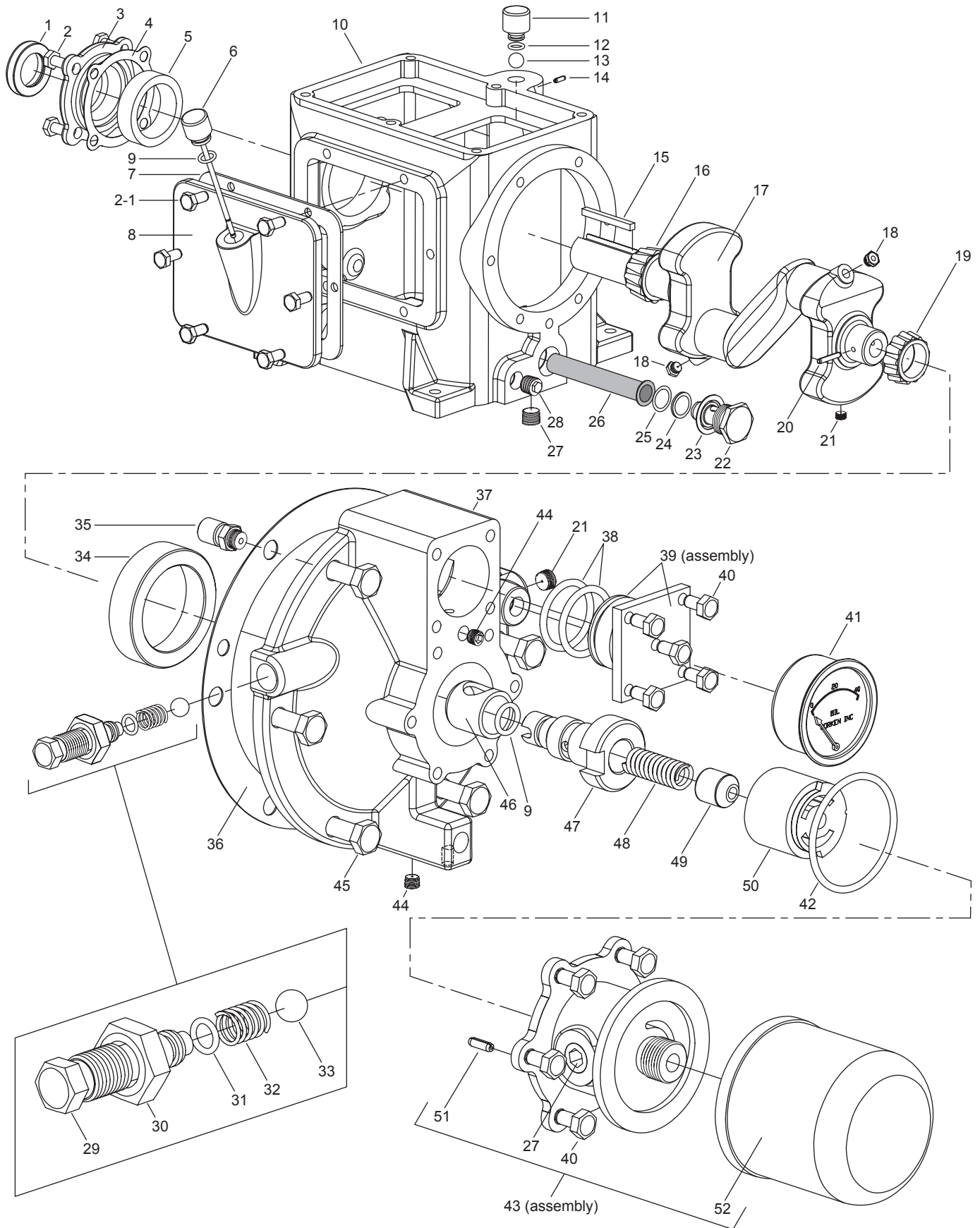


Front Side

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.