

# CLARK

# Service gram

June 14, 1972

MICHIGAN SG-436  
Group Ref. No. 1100

SUBJECT: Boom Cylinder Base Reinforcement  
Model 175B Tractor Shovel

An improvement change has been made on subject model machines, consisting of a support ring, welded to the base of the boom cylinders providing additional strength in this area. This change became effective on Model 175B Tractor Shovels shipped from the factory with serial numbers 427A214, 427A215, 427A224, 427A234, 427A235, 427A240, 427A250 thru 427A263, 427A270 and after.

This improvement may be added to machines in the field bearing serial numbers prior to the above by using parts listed below and installing them in accordance with the following instructions.

PARTS REQUIRED (per machine):

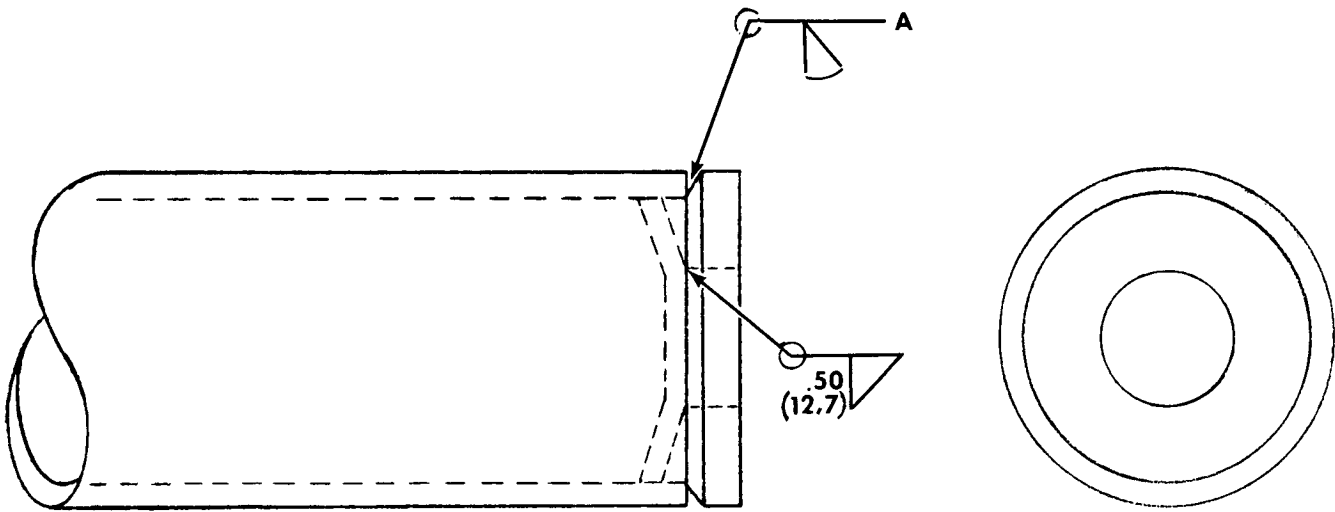
2 - 1518330 Support Plate

INSTALLATION:

1. Locate support plate on base of boom cylinder as shown in Figure 1.
2. Using a 3/16" AWS-E-7014 electrode or equivalent, weld support plate in place as shown in Figure 1, with a .50 fillet weld around circumference of center hole in support plate, and a convex fillet weld around outside circumference as illustrated.

ED-41172

DW



TS-11608 B

Figure 1

A - Fill this groove

# CLARK

## *Service gram*

5 December 1973

MICHIGAN SG-487  
Group Ref. No. 1100

SUBJECT: Boom Cylinder Piston Rod Nut Retainment  
Model 175B & 275B

Up to the present time, the boom cylinder piston rod nut on the subject models was retained in place, after initial tightening, by use of a nylon locking insert and set screw (Items 3 & 4 in Fig. 1 herein). The nylon locking insert was used to prevent the set screw from damaging the threads on the piston rod. This feature became effective in the boom cylinders used on Model 175B, S/N 427A101 & after, and on Model 275B, S/N 425B101 & after.

Subsequent to the introduction of the above described feature, extensive tests have been run utilizing boom cylinder assemblies wherein the nylon locking insert was omitted, using only the set screw to retain the piston rod nut in place. As a result of such tests it has been determined that the use of the set screw only, without the nylon insert, will not damage the threads on the piston rod, therefore, effective immediately all boom cylinders for the subject model machines will be built without the use of the nylon insert.

In view of the above, it is recommended, whenever rebuilding or overhauling a boom cylinder assembly having the nylon locking inserts incorporated, that such nylon inserts be omitted when reassembling the cylinder assembly.

ECN 442-73

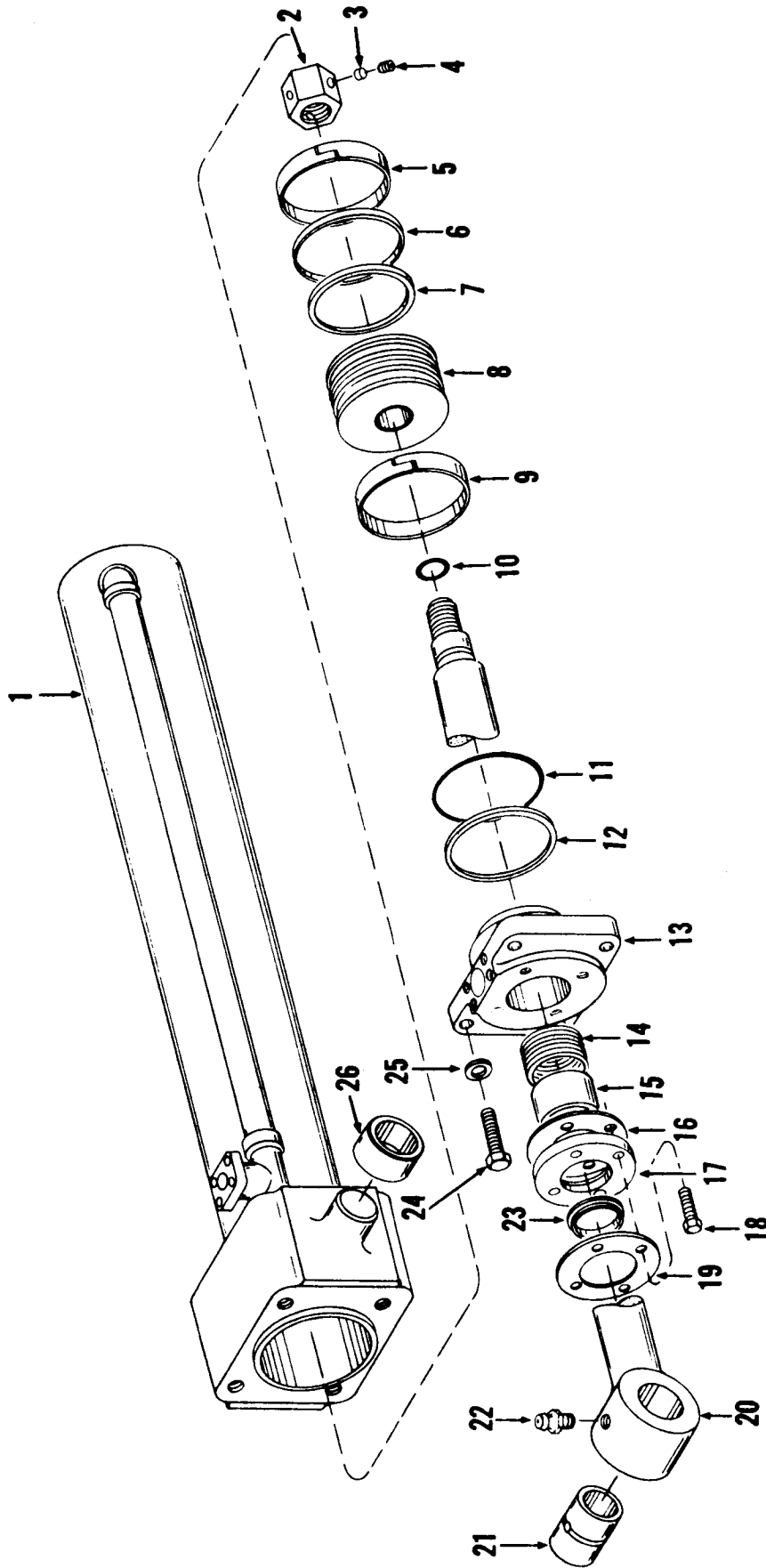


Figure 1

# CLARK

# Service gram

29 January 1979

MICHIGAN SG-578D  
Group Ref. No. 1100

(This bulletin replaces SG-578C, dated 18 October 1978.  
REASON: To correct serial number information.)

SUBJECT: Improved Boom and Bucket Cylinder Cap and Packing  
Model 55B, 75B, 125B, 175B, 275B & 475B

An improved cylinder cap and packing was installed on boom and bucket cylinders of machines shipped from the factory with serial numbers shown on the list below.

<u>MODEL</u>	<u>BOOM CYLINDER P/N</u>	<u>EFFECTIVE SERIAL NUMBER</u>
55B	L.H. 2514111, R.H. 2514122	433B700CAC, 416C857CAC
75B	L.H. 2518076, R.H. 2518075	443C101CAC, 447C101CAC
125B	L.H. 2517389, R.H. 2517390	439B174C, 439C151FSC, 441B192C, 441C101FSC
175B	2518119	427C246C, 427C115FSC, 438C259C, 438C159FSC
275B	2504218	425C487C, 425C218FSC
475B	2514095	420B122C, 421J281C

<u>MODEL</u>	<u>BUCKET CYLINDER P/N</u>	<u>EFFECTIVE SERIAL NUMBER</u>
55B	2514258	433B706CAC, 416C965CAC
75B	2518071	443C101CAC, 447C101CAC
75B	2520412	443D101CAC, 443D101FSC, 447D101CAC, 447D101FSC
125B	2517395	439B174C, 439B151FSC, 441B192C, 441C101FSC
175B	2518125	427C246C, 427C115FSC, 438C259C, 438C159FSC
275B	2516176	425D101C, 425D101FSC
475B	2514104	420B122C, 421J281C

The new cap gives an improved bearing surface for the rod of the cylinder. The new packing makes an improved seal. When you install the new cap, packing, flange and bolts, the part number of the cylinder assembly is changed.

If you change cap and/or packing on boom or bucket cylinder of machines prior to these serial numbers, you must change the machine record cards to show the change in part number of the cylinder assemblies. If you do not change the machine record cards, you will try to use the wrong cap or packing in the future. See the previous list for new cylinder assembly part numbers.

To make this improvement on machines in the field, make an order for parts using one of the following lists. Install the parts as shown in this bulletin.

PARTS LIST FOR ONE CYLINDER:

55B BOOM CYLINDER

1 - 2514110 Cap  
1 - 2514109 Flange  
1 - 2517363 Packing  
4 - 34C-624 Bolt

75B BOOM CYLINDER

1 - 2517601 Cap  
1 - 2519902 Flange  
1 - 2517363 Packing  
4 - 34C-624 Bolt

125B BOOM CYLINDER

1 - 2517386 Cap  
1 - 2505248 Flange  
1 - 2517364 Packing  
4 - 34C-828 Bolt

175B BOOM CYLINDER

1 - 2518120 Cap  
1 - 2505248 Flange  
1 - 2517364 Packing  
4 - 34C-828 Bolt

275B BOOM CYLINDER

1 - 2504217 Cap  
1 - 2504216 Flange  
1 - 2517365 Packing  
4 - 34C-832 Bolt

475B BOOM CYLINDER

1 - 2514105 Cap  
1 - 2514093 Flange  
1 - 2517366 Packing  
4 - 34C-832 Bolt

55B BUCKET CYLINDER

1 - 2514259 Cap  
1 - 2514255 Flange  
1 - 2517362 Packing  
4 - 33C-520 Bolt

75B BUCKET CYLINDER (2518071)

1 - 2518070 Cap  
1 - 2511993 Flange  
1 - 2517362 Packing  
4 - 34C-620 Bolt

75B BUCKET CYLINDER (2520412)

1 - 2523387 Cap  
1 - 2519902 Flange  
1 - 2517363 Packing  
4 - 34C-624 Bolt

125B BUCKET CYLINDER

1 - 2517392 Cap  
1 - 2519902 Flange  
1 - 2517363 Packing  
4 - 34C-624 Bolt

175B BUCKET CYLINDER

1 - 2516029 Cap  
1 - 2505248 Flange  
1 - 2517364 Packing  
4 - 34C-828 Bolt

275B BUCKET CYLINDER

1 - 2516173 Cap  
1 - 2516171 Flange  
1 - 2517364 Packing  
4 - 34C-828 Bolt

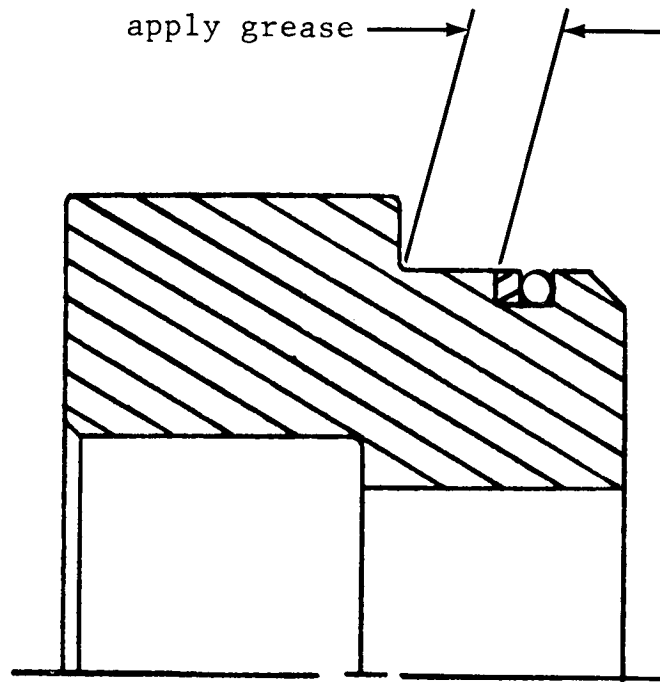
475B BUCKET CYLINDER

1 - 2514103 Cap  
1 - 2414093 Flange  
1 - 2517366 Packing  
4 - 34C-832 Bolt

NOTE: It is recommended procedure to rework both boom cylinders or both bucket cylinders at the same time.

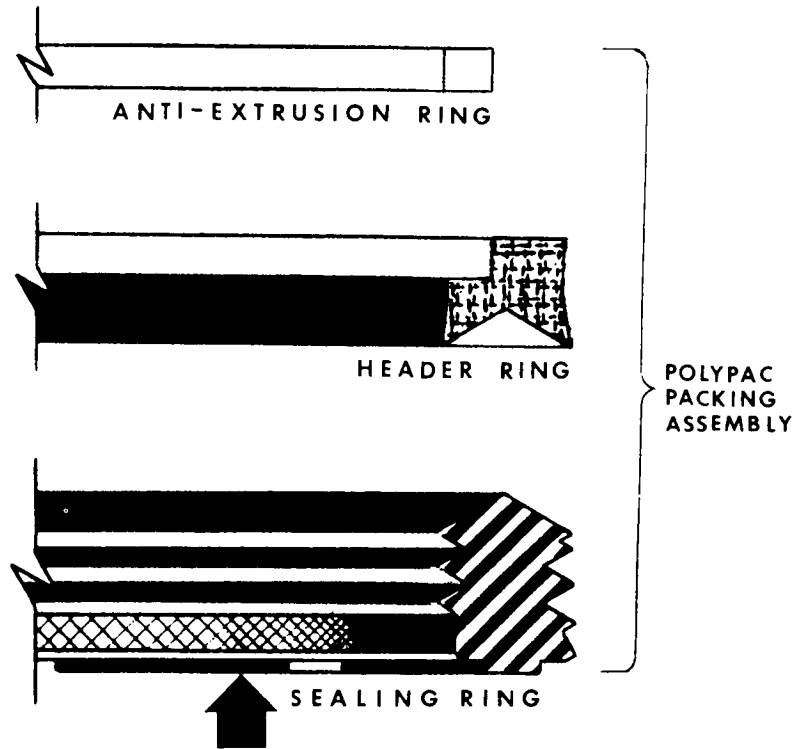
INSTALLATION: (See Figures 1, 2 & 3.)

1. Remove the piston rod assembly from the cylinder.
2. Remove the piston rod nut, piston, cylinder cap, packing, sleeve, spacers, flange and wiper seal from the piston rod. Discard the cap, flange, packing, sleeve, spacers, and bolts for the flange.
3. Clean all remaining parts thoroughly. Check the piston rod for surface damage. Remove any surface damage with a crocus cloth or fine hone.
4. Push the wiper seal (Item 8) into the new flange (Item 11) with the lip of the seal facing outward.
5. Install the retaining ring (Item 9) on the piston rod.
6. Lubricate the wiper seal and the piston rod with clean hydraulic oil. Install the flange (Item 11) with the wiper seal (Item 8) on the piston rod.
7. Spray the new packing assembly with silicone for easy assembly. Install the packing assembly (Item 7) on the rod with the sealing ring end of the packing toward the piston end of the rod.
8. Install the cap (Item 13) on the rod and seat the packing into the cap. Make sure you do not damage the packing. The splits in the packing must be staggered approximately 180 degrees.
9. Align the holes in the retaining ring, flange and cap. Install the four new bolts (Item 10). Tighten the bolts to the specified torque. See the torque chart.
10. Install a new o-ring (Item 14), and install the piston on the cylinder rod. Install the piston rod nut (Item 2). Tighten the nut to the specified torque. See the torque chart.
11. Install the locking device (Item 1) through the piston rod nut. This device can be a cotter pin, a set screw, or a bolt and nut, depending upon the cylinder. The torque of the piston rod nut can vary plus or minus 10% to align the holes in the piston rod and nut for the locking device. If the locking device is a bolt and nut, use the ball end of a ball peen hammer to cause distortion to the threads of the lock bolt after you tighten the nut.
12. Install new wear rings (Item 3) and inner and out seal rings (Items 4 & 15) if required. Install a new o-ring (Item 5) and back-up ring (Item 6) on the cylinder cap.



TS-15267

Figure 1.



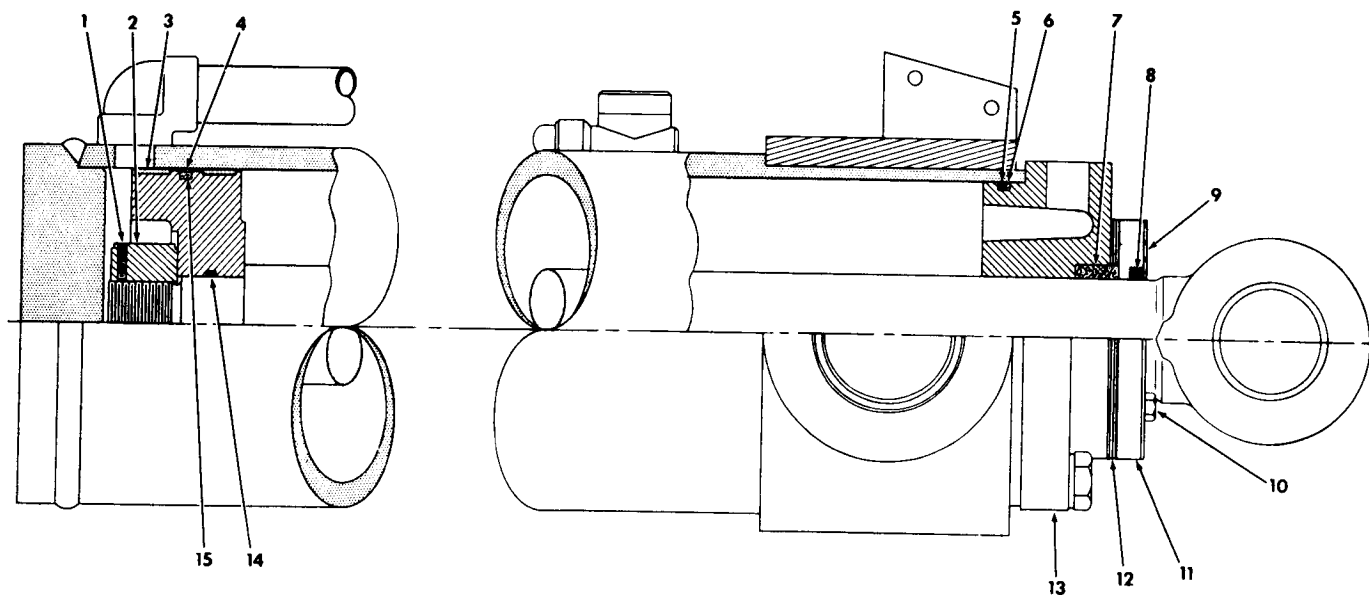
TS-14977

Figure 2.

NOTE: Compression of POLYPAC packing assembly is not necessary. There will be approximately .063 (1,6) clearance after tightening bolts on the cylinder cap.



13. Apply a Lithium base, multi-purpose grease to the pilot area of the cylinder cap as shown in Figure 1.
14. Carefully install the piston rod assembly in the cylinder. Make sure that you do not damage the wear rings or sealing rings on the piston. Install the hardware for the cylinder cap. Tighten the bolts or nuts to the specified torque. See the torque chart.



TS-14474

Figure 3. Typical Cylinder Assembly

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>ITEM</u>	<u>DESCRIPTION</u>
1.	Locking Device	9.	Ring, Retaining
2.	Nut, Piston Rod	10.	Bolt
3.	Ring, Wear	11.	Flange
4.	Ring, Wear	12.	Spacer - OMIT
5.	O-Ring	13.	Cap
6.	Ring, Back-Up	14.	O-Ring
7.	Packing	15.	Ring, Back-Up
8.	Wiper		

TORQUE CHART LBF•FT See Figure 3

MODEL	ITEM #10 BUCKET CYL.	ITEM #10 BOOM CYL.	ITEM #2 BUCKET CYL.	ITEM #2 BOOM CYL.	CYL. CAP BOLT (Nut) BUCKET CYL.	CYL. CAP BOLT (Nut) BOOM CYL.
55B	7	17	400	750	210	90
75B	17	17	400	750	210	90
125B	17	42	1000	1000	320	168
175B	42	42	1000	1000	505	300
275B	42	42	1000	1000	505	545
475B	100	100	2000	2000	1475	1625

TORQUE CHART N•m See Figure 3

MODEL	ITEM #10 BUCKET CYL.	ITEM #10 BOOM CYL.	ITEM #2 BUCKET CYL.	ITEM #2 BOOM CYL.	CYL. CAP BOLT (Nut) BUCKET CYL.	CYL. CAP BOLT (Nut) BOOM CYL.
55B	9,5	23	542	1017	285	122
75B	23	23	542	1017	285	122
125B	23	57	1356	1356	434	228
175B	57	57	1356	1356	685	407
275B	57	57	1356	1356	685	739
475B	136	136	2712	2712	2000	2203

12 JULY 1978

MICHIGAN SG-597C  
Group Ref. No. 1100  
1200

(This bulletin supersedes SG-597B, dated 22 March 1978.  
REASON: Updated to include the latest cylinder repack kits.)

## SUBJECT: Cylinder Repack Kits

Cylinder packing, seals and o-ring, which were previously available only as individual parts on tractor shovels, dozers and scrapers are now available in cylinder repack kits.

The piston packings and seals for the various cylinders will be available in the repack kits only, however, the rod packings and seals will still be available as individual items as well as in the repack kits.

**NOTE:** It is recommended that the entire cylinder be serviced when it is necessary to replace the piston packing and seals on any cylinder.

The following three lists contain the new cylinder repack kit part numbers and the corresponding model numbers and cylinder part numbers.

**List #1** gives the subject cylinder number, the model number that the cylinder is used on and the applicable cylinder repack kit.

**List #2** gives the same information in model order going from the smallest to the largest models.

**List #3** gives the new cylinder repack kits in numerical order with the applicable models and cylinder numbers.

**IMPORTANT:** Many cylinders in the field have been updated to the current piston design. If the piston has been changed, the following kit substitutions must be made.

2516052 Use kit	..... 2516148	2523429 Use kit	..... 2516070	2523427 Use kit	..... 2516088
2523432 Use kit	..... 2516148	2523428 Use kit	..... 2516069	2516095 Use kit	..... 2516094
2523430 Use kit	..... 2516059	2523425 Use kit	..... 2516071	2516234 Use kit	..... 2516232
2523431 Use kit	..... 2516065	2523426 Use kit	..... 2516073	2516241 Use kit	..... 2516079
2516063 Use kit	..... 2516065	2523433 Use kit	..... 2516078	2516261 Use kit	..... 2516084
2516066 Use kit	..... 2516070	2523434 Use kit	..... 2516232		

CYLINDER PART NO.	MODEL	KIT PART NO.	CYLINDER PART NO.	MODEL	KIT PART NO.
509569	55B-I	2523424	531775	85A	2523428
512782	12B	2523425	532716	125A-II	2523432
513366	380	2523431	532919	55A-II	2523426
513366	480	2523431	532943	55A	2523424
513366	380-II	2523431	532943	55A-II	2523424
513374	380TD	2523433	533113	125A	2523425
513382	380TD	2523433	533113	125A-II	2523425
513548	280	2523432	533466	125A-II	2523432
513560	280	2523431	533489	75A-II	2523424
513560	280-III	2523431	533489	85A-II	2523424
513569	280	2523428	533489	55-III	2523424
514158	175A	2523432	533634	175A-II	2523433
514162	125A	2523431	533645	175A-II	2523425
514166	75A	2523428	533645	180-III	2523425
514166	75B	2523428	533654	55A	2523425
514166	75R	2523428	533659	75A	2523428
514166	85A	2523428	533663	85A	2523430
514629	75APL	2523428	533669	125A	2523431
515732	75APL	2523428	533676	175A	2523432
515743	75APL	2523428	533683	275A	2523433
517192	12B	2523425	533690	375A	2516083
517509	375A	2523425	533783	75A-II	2523430
517509	380	2523425	534993	275A-II	2523434
517993	280	2523425	535052	275A-II	2523425
518823	75PL	2523428	535052	280	2523425
518947	75TT	2523425	535052	280-III	2523425
519099	375A	2523434	535052	275-III	2523425
519198	275A	2523433	537129	175A-II	2523433
519456	375A	2523433	537141	75A-II	2523430
519920	275A	2523432	537204	55A-II	2523425
520351	380	2523433	537242	275A-II	2523433
520351	480	2523433	537479	380-II	2523432
520374	380	2523433	537479	480	2523432
520374	480	2523433	537479	380-III	2523432
521589	480	2523428	539176	280	2523431
521589	380-II	2523428	539392	180-III	2523430
521589	380-III	2523428	541287	380-II	2523433
521590	480	2523428	541287	480	2523433
521590	380-II	2523428	541287	380-III	2523433
521590	380-III	2523428	544724	75A	2523428
521825	175A	2523425	544724	85A	2523428
521825	180	2523425	544781	175A	2523424
522277	180	2523425	549204	280-III	2523431
522277	180-III	2523425	551973	175A	2523432
523110	55A	2523425	551977	175A	2523432
523118	55A	2523425	551984	125A	2523431
523639	12B	2523425	551987	75A	2523428
524580	375A	2516083	551987	75B	2523428
524683	375A	2523428	551987	75R	2523428
524683	380	2523428	551991	75A	2523428
524928	275A	2523432	551991	75B	2523428
525171	125A	2523425	551991	75R	2523428
525172	125A	2523425	551991	85A	2523428
525256	280	2523432	552755	12B	2516075
525294	375A	2523434	552775	12B	2516075
526406	55A	2523424	553445	175A	2523428
527286	85A	2523430	553445	175TL	2523428
528550	75TT	2523430	553445	75TL	2523428
529457	75A	2523428	553445	75A	2523428
529457	85A	2523428	555274	75A-II	2523430
530768	175A	2523432	556192	175-III	2523431
530769	175A	2523432	556192	175-III	2523431
531182	75TT	2523428	556230	175-III	2523428
531661	85A	2523430	559651	280-III	2523428
531774	75A	2523428	561112	410	2523433
531774	85A	2523428	561157	290M	2516281
531775	75A	2523428	561226	290M	2516280
				290M	2516282

CYLINDER PART NO.	MODEL	KIT PART NO.	CYLINDER PART NO.	MODEL	KIT PART NO.
562309	125-III A	2523425	594796	110RD	2523431
562529	75-III	2523427	595099	380TD-III	2523431
562529	85-III	2523427	947551	BL-700	2518472
562564	85A-II	2523424	947552	BL-700	2518472
562564	85-III	2523424	947553	BL-700	2518490
563848	55-III	2523426	947554	BL-700	2518490
563854	55-III	2523426	947594	BL-700	2518485
564356	125A-II	2523431	947605	BL-700	2518474
564363	125A-II	2523431	947612	BL-700	2518473
564393	275-III	2523433	947621	BL-700	2518486
564394	275-III	2523433	947652	BL-700	2518473
565283	290M	2516281	948634	BL-700	2518485
565512	290M	2516063	948712	BL-700	2518490
565930	125-III A	2523431	948713	BL-700	2518490
566885	175-III	2523432	948714	BL-700	2518472
566885	175-III A	2523432	948715	BL-700	2518472
567855	125-III A	2523428	949716	BL-700	2518486
567855	175-III A	2523428	1502853	85-III A	2516065
567904	55A-II	2523425	1502854	85-III A	2516065
567904	55-III	2523425	1503231	275-III	2516148
567904	75-II	2523425	1503231	275-III A	2516148
567983	125-III A	2523429	1503232	125-III A	2516069
569968	275-III A	2516095	1503232	175-III A	2516069
569968	280-III A	2516095	1503233	75-III	2516088
570524	275-III A	2516052	1503233	85-III	2516088
570524	275-III	2516052	1503234	175-III A	2516065
570696	210RD	2523433	1503234	175-III	2516065
570697	210RD	2523433	1503234	380-III	2516065
570709	175-III	2523425	1503235	125-III A	2516065
574274	280	2516063	1503236	175-III A	2516148
574274	280-III	2516063	1503236	175-III	2516148
574727	280-III A	2516063	1503237	475-III A	2516084
580107	180	2523431	1503238	275-III A	2516232
580124	180	2523431	1503239	275-III A	2516232
580124	180-III	2523431	1503240	125-III A	2516070
580789	210RD	2523433	1503240	125-III	2516070
580794	210RD	2523433	1503241	275-III	2516094
582542	110RD	2523431	1503241	275-III A	2516094
582551	110RD	2523431	1503462	475-III A	2516079
584551	210-II	2516052	1503598	180	2516065
585139	35A	2523431	1503598	180-III	2516065
585145	35A	2523428	1503598	480	2516065
585298	35	2523424	1503599	380-II	2516078
585298	45	2523424	1503599	380-III	2516078
585298	35AWS	2523424	1503599	480	2516078
585302	35	2523424	1503600	380-II	2516069
585302	45	2523424	1503600	380-III	2516069
585302	35AWS	2523424	1503600	480	2516069
586145	35	2523431	1503601	380-II	2516069
586145	35B	2523431	1503601	380-III	2516069
586145	35AWS	2523431	1503601	480	2516069
586151	35	2523430	1503602	280-III	2516069
586151	35B	2523430	1503602	180-III	2516069
586151	45	2523430	1503603	380-III	2516065
586151	35AWS	2523430	1503604	280-III	2516065
586190	45	2523432	1503604	280-III A	2516065
587950	75-II	2523429	1503604	280	2516065
587950	85-III	2523429	1503605	280-III A	2516094
588188	125A-II	2523432	1503605	LF-280	2516094
588190	125A-II	2523432	1503606	280-III A	2516094
588192	85A-II	2523431	1503607	280	2516065
588194	85A-II	2523431	1503607	280-III	2516065
588613	275-III	2523432	1503607	280-III A	2516065
588745	12B	2516075	1503608	180-III	2516059
590191	110TS	2523431	1503609	280-III A	2516069
591653	210	2523431	1503610	380-II	2516148
594793	110RD	2523431	1503610	380-III	2516148

List 1 (cont.)

CYLINDER PART NO.	MODEL	KIT PART NO.	CYLINDER PART NO.	MODEL	KIT PART NO.
1503610	480	2516148	1509222	475-III A	2516080
1503659	475-III A	2516148	1509395	275B	2516154
1503659	475B	2516148	1509802	75-III A	2516070
1503797	CKL-340	2516072	1509813	85-III A	2516070
1503797	12B	2516072	1509846	125-III A	2516070
1503798	110	2516094	1510225	380-III A	2516065
1503799	210	2516065	1511035	475-III A	2516080
1503801	210	2516148	1511041	475-III A	2516266
1503802	310	2516148	1511406	275B	2516155
1503803	310	2516078	1511407	275-IV	2516242
1503804	310	2516078	1511408	275-IV	2516242
1503805	310	2516078	1511554	75B	2516054
1503806	310	2516148	1511554	LF-75B	2516054
1503828	75-II	2516055	1511622	175B	2516065
1503828	85-II	2516055	1511641	175B	2516151
1503828	55-III	2516055	1511749	275B	2516274
1503828	75-III	2516055	1512049	675B	2516187
1503875	85-II	2516055	1512261	175B	2516155
1503875	85-III	2516055	1512294	275B	2516242
1503887	75-III	2516070	1512878	475-III A	2516080
1503887	85-III	2516070	1513011	475-III A	2516230
1503986	180	2516071	1513011	475B	2516230
1503986	180-III	2516071	1513624	675B	2516249
1503987	175-II	2516071	1513625	675B	2516249
1503987	180-III	2516071	1513815	275B	2518494
1503988	275-II	2516071	1514246	675B	2516249
1503988	280	2516071	1515037	475B	2516249
1503988	275-III	2516071	1515236	275-III	2516094
1503988	280-III	2516071	1515236	275-III A	2516094
1504075	75-III A	2516070	1517851	175B	2518493
1504470	35	2516059	1518399	275B	2516242
1504470	35B	2516059	1518400	175B	2516155
1504470	35AWS	2516059	1518699	475B	2516249
1504470	45	2516059	1518977	75B	2516058
1504470	35R	2516059	1518978	75B	2516058
1504471	35	2516065	1519173	125B	2516152
1504471	35B	2516065	1519174	125B	2518493
1504471	35AWS	2516065	1519175	125B	2518493
1504471	35R	2516065	1520119	275-III	2523434
1504472	45	2516148	1520120	275-III	2523434
1504836	75-III A	2516071	1520751	380	2516063
1504855	55-III	2516073	1520751	480	2516063
1504856	55-III	2516073	1520751	380-II	2516063
1504857	210-III	2520202	1520836	180	2516063
1504858	210-III	2520202	1520836	180-III	2516063
1505362	275-III A	2516078	1520851	380-III	2516063
1505363	275-III A	2516078	1520870	180	2523425
1505457	380-III A	2516094	1520870	180-III	2523425
1506149	210-III RD	2516078	1520946	280-III	2523428
1506150	210-III RD	2516078	1521009	380-II	2523432
1506647	275-III A	2516065	1521009	480	2523432
1507711	55-III	2516073	1521009	380-III	2523432
1507808	75-III	2516088	1521236	85-III A	2516066
1507808	85-III	2516088	1521612	475-III A	2516084
1507822	55-III A	2516060	1521794	380-II	2523428
1507823	55-III A	2516060	1521794	380-III	2523428
1507835	55-III A	2516090	1521794	480	2523428
1508377	55-III	2516073	1521795	380-II	2523428
1508554	275-III A	2516065	1521795	380-III	2523428
1508810	410-IV	2516148	1521795	480	2523428
1508811	410-IV	2516148	1521837	75-III A	2523425
1508812	410-IV	2516078	1522688	275-III A	2516234
1508813	410-IV	2516078	1522689	275-III A	2516234
1508904	55-III A	2516072	1522936	475-III A	2516052
1508904	75B	2516072	1523599	210-III	2520202
1508904	LF-75B	2516072	1523600	210-III	2520202
1509175	475-III A	2516266	1523864	475-III A	2516186

CYLINDER PART NO.	MODEL	KIT PART NO.	CYLINDER PART NO.	MODEL	KIT PART NO.
1524035	280-III A	2516064	1545056	LF-75B	2516060
1524562	35	2516055	1545057	55-III A	2516060
1524562	45	2516055	1545057	75B	2516060
1524562	35AWS	2516055	1545057	LF-75B	2516060
1524562	35R	2516055	1546112	35AWS	2516071
1524563	35	2516055	1548059	475-III A	2516266
1524563	45	2516055	1549538	475-III A	2516078
1524563	35AWS	2516055	1549758	55-III A	2516090
1524563	35R	2516055	2500598	675B	2516249
1524877	480-III A	2516052	2500599	675B	2516249
1526219	125-III A	2516063	2500602	675B	2516249
1526262	125-III A	2516066	2500603	675B	2516249
1527870	280-III A	2516153	2501171	125B	2516072
1527905	110-III	2516095	2503915	675B	2516249
1528090	310-II	2516052	2503916	675B	2516249
1528145	210	2516063	2504218	275B	2516242
1528437	380-III A	2516078	2509051	675B	2516249
1528462	380-III	2516095	2509052	675B	2516249
1530276	CKL-340	2516267	2511942	35C	2519973
1530505	280-III A	2516095	2511942	45C	2519973
1530605	275-III	2516052	2512955	35AWS	2516071
1530605	275-III A	2516052	2514095	475-III A	2516249
1530664	85-III A	2516070	2514095	475B	2516249
1530853	280-III A	2516095	2514101	475-III A	2518494
1531615	380-III A	2516065	2514101	475B	2518494
1531950	85-III A	2516071	2514104	475-III A	2516230
1532052	380-III A	2516064	2514104	475B	2516230
1533413	475-III A	2516185	2514111	55-III A	2516058
1533805	125-III A	2516066	2514111	75B	2516058
1533805	125-III	2516066	2514122	55B	2516058
1534089	35AWS	2523425	2514258	55B	2520205
1534204	475-III A	2516261	2515478	675B	2516237
1534516	210	2516153	2516160	275B	2516274
1534517	210	2516153	2516176	275B	2518494
1535641	175-III	2516063	2517389	125B	2518493
1535641	175-III A	2516063	2517390	125B	2518493
1535946	75-III A	2516061	2518071	75B	2516054
1536064	75-III A	2516070	2518071	LF-75	2516054
1536117	475-III A	2516261	2518075	75B	2516058
1536166	475-III A	2516241	2518076	75B	2516058
1537215	275-IV	2516228	2518117	175B	2516151
1537216	275-IV	2516228	2518119	175B	2518494
1538181	275B	2516156	2518125	175B	2518493
1539180	175-IV	2516149	2518125	275B	2518493
1539180	275-IV	2516149	2518199	35C	2519972
1539308	55-II	2516071	2518201	35C	2519972
1539308	75-III A	2516071	2518204	45C	2519987
1539308	55-III A	2516071	2518206	45C	2519987
1539308	45B	2516071	2518513	35C	2519973
1539308	75B	2516071	2518513	45C	2519973
1539442	175-IV	2516194	2518802	55-III A	2521999
1539910	175-IV	2516111	2518802	55B	2521999
1542601	35AWS	2516071	2518802	75B	2521999
1543215	125-III A	2516065	2518871	125B	2521999
1543215	175-III	2516065	2520412	75B	2516058
1543215	175-III A	2516065	2521041	35C	2519971
1543216	125-III A	2516065	2521041	45C	2519971
1543216	175-III A	2516065	2521042	35C	2519971
1543216	175-III	2516065	2521042	45C	2519971
1543216	380-III	2516065	2521043	35C	2519971
1543895	275-III	2516148	2521043	45C	2519971
1543895	275-III A	2516148	2521044	35C	2519971
1545412	55-III A	2516090	2521044	45C	2519971
1545577	55-III A	2516073	3980095	45B	2516271
1545577	75B	2516073	3980108	45B	2516270
1545056	55-III A	2516060	3980125	45B	2516270
1545056	75B	2516060	3980906	45B	2516272

LIST 2

MODEL	CYLINDER PART NO.	KIT PART NO.	MODEL	CYLINDER PART NO.	KIT PART NO.
12B	1503797	2516072	55A	532943	2523424
12B	512782	2523425	55A	523110	2523425
12B	517192	2523425	55A	523118	2523425
12B	523639	2523425	55A	533654	2523425
12B	552755	2516075	55A-II	532943	2523424
12B	552775	2516075	55A-II	537204	2523425
12B	588745	2516075	55A-II	567904	2523425
35	1524562	2516055	55A-II	532919	2523426
35	1524563	2516055	55B	2514122	2516058
35	585298	2523424	55B	2514258	2520205
35	585302	2523424	55B	2518802	2521999
35	586151	2523430	55B-I	509569	2523424
35	1504470	2516059	55-II	1539308	2516071
35	586145	2523431	55-III	1503828	2516055
35	1504471	2523428	55-III	533489	2523424
35A	585139	2523431	55-III	1504855	2516073
35A	585145	2523428	55-III	1504856	2516073
35AWS	1524562	2516055	55-III	1507711	2516073
35AWS	1524563	2516055	55-III	1508377	2516073
35AWS	585298	2523424	55-III	567904	2523425
35AWS	585302	2523424	55-III	563848	2523426
35AWS	586151	2523430	55-III	563854	2523426
35AWS	1504470	2516059	55-III A	1507822	2516060
35AWS	586145	2523431	55-III A	1507823	2516060
35AWS	1504471	2516065	55-III A	1546056	2516060
35AWS	1542601	2516071	55-III A	1546057	2516060
35AWS	1546112	2516071	55-III A	1539308	2516071
35AWS	2512955	2516071	55-III A	1508904	2516072
35AWS	1534089	2523425	55-III A	1545577	2516073
35B	568151	2523430	55-III A	1507835	2516090
35B	1504470	2516059	55-III A	1545412	2516090
35B	586145	2523431	55-III A	1549758	2516090
35B	1504471	2516065	55-III A	2518802	2521999
35C	2521041	2519971	75A	514166	2523428
35C	2521042	2519971	75A	529457	2523428
35C	2521043	2519971	75A	531774	2523428
35C	2521044	2519971	75A	531775	2523428
35C	2518199	2519972	75A	533659	2523428
35C	2518201	2519972	75A	544724	2523428
35C	2511942	2519973	75A	551987	2523428
35C	2518513	2519973	75A	551991	2523428
35R	1524562	2516055	75A	553445	2523428
35R	1524563	2516055	75A-II	533489	2523424
35R	1504470	2516059	75A-II	533783	2523430
35R	1504471	2516065	75A-II	537141	2523430
45	586190	2523432	75A-II	555274	2523430
45	1524562	2516055	75APL	514629	2523428
45	1524563	2516055	75APL	515732	2523428
45	585298	2523424	75APL	515743	2523428
45	585302	2523424	75B	1511554	2516054
45	586151	2523430	75B	551987	2523428
45	1504470	2516059	75B	551991	2523428
45	1504472	2516148	75B	2518071	2516054
45B	1539308	2516071	75B	1518977	2516058
45B	3980108	2516270	75B	1518978	2516058
45B	3980125	2516270	75B	2518075	2516058
45B	3980095	2516271	75B	2520412	2516058
45B	3980906	2516272	75B	1546056	2516060
45C	2521041	2519971	75B	1546057	2516060
45C	2521042	2519971	75B	514166	2523428
45C	2521043	2519971	75B	1539308	2516071
45C	2521044	2519971	75B	1508904	2516072
45C	2511942	2519973	75B	1545577	2516073
45C	2518513	2519973	75B	2518802	2521999
45C	2518204	2519987	75PL	518823	2523428
45C	2518206	2519987	75R	514166	2523428
55A	526406	2523424	75R	551987	2523428



MODEL	CYLINDER PART NO.	KIT PART NO.	MODEL	CYLINDER PART NO.	KIT PART NO.
75R	551991	2523428	125A-II	533466	2523432
75TL	553445	2523428	125A-II	588188	2523432
75TT	528550	2523430	125A-II	588190	2523432
75TT	531182	2523428	125A-II	564356	2523431
75TT	518947	2523425	125A-II	564363	2523431
LF-75B	1511554	2516054	125A-II	533113	2523425
LF-75B	2518071	2516054	125B	1519174	2518493
LF-75B	1546056	2516060	125B	1519175	2518493
LF-75B	1546057	2516060	125B	2501171	2516072
LF-75B	1508904	2516072	125B	1519173	2516152
75-II	1503828	2516055	125B	2517389	2518493
75-II	587950	2523429	125B	2517390	2518493
75-II	567904	2523425	125B	2518871	2521999
75-III	1503828	2516055	125-III	1533805	2516066
75-III	1503887	2516070	125-III	1503240	2516070
75-III	1503233	2516088	125-III A	565930	2523431
75-III	1503808	2516088	125-III A	1526219	2516063
75-III	562529	2523427	125-III A	1503235	2516065
75-III A	1535946	2516061	125-III A	1543216	2516065
75-III A	1504075	2516070	125-III A	1526262	2516066
75-III A	1509802	2516070	125-III A	1533805	2516066
75-III A	1536064	2516070	125-III A	567983	2523429
75-III A	1504836	2516071	125-III A	567855	2523428
75-III A	1539308	2516071	125-III A	1503232	2516069
75-III A	1521837	2523425	125-III A	1503240	2516070
85A	527286	2523430	125-III A	1509846	2516070
85A	531661	2523430	125-III A	562309	2523425
85A	533663	2523430	175A	514158	2523432
85A	514166	2523428	175A	530768	2523432
85A	529457	2523428	175A	530769	2523432
85A	531774	2523428	175A	533676	2523432
85A	531775	2523428	175A	551977	2523432
85A	544724	2523428	175A	544781	2523424
85A	551991	2523428	175A	553445	2523428
85A-II	533489	2523424	175A	521825	2523425
85A-II	562564	2523424	175A-II	533645	2523425
85A-II	588192	2523431	175A-II	533634	2523433
85A-II	588194	2523431	175A-II	537129	2523433
85-II	1503828	2516055	175B	1511622	2516065
85-II	1503875	2516055	175B	1517851	2518493
85-III	1503875	2516055	175B	1511641	2516151
85-III	562564	2523424	175B	1512261	2516155
85-III	587950	2523429	175B	2518125	2518493
85-III	1503887	2516070	175B	1518400	2518494
85-III	1503233	2516088	175B	2518119	2518494
85-III	1507808	2516088	175-II	1503987	2516071
85-III	562529	2523427	175-III	566885	2523432
85-III A	1502853	2516065	175-III	556192	2523431
85-III A	1502854	2516065	175-III	1535641	2516063
85-III A	1521236	2516066	175-III	1503234	2516065
85-III A	1509813	2516070	175-III	1543216	2516065
85-III A	1530664	2516070	175-III	570709	2523425
85-III A	1531950	2516071	175-III	1503236	2516148
110	1503798	2516094	175-III A	566885	2523432
110-III	1527905	2516095	175-III A	556192	2523431
110RD	582542	2523431	175-III A	1535641	2516063
110RD	582551	2523431	175-III A	1503234	2516065
110RD	594793	2523431	175-III A	1543216	2516065
110RD	594796	2523431	175-III A	567855	2523428
110TS	590191	2523431	175-III A	1503232	2516069
125A	514162	2523431	175-III A	1503236	2516148
125A	533669	2523431	175-IV	1539910	2516111
125A	551984	2523431	175-IV	1539180	2516149
125A	525171	2523425	175-IV	1539442	2516194
125A	525172	2523425	175TL	553445	2523428
125A	533113	2523425	180	580107	2523431
125A-II	532716	2523432	180	580124	2523431

List 2 (cont.)

MODEL	CYLINDER PART NO.	KIT PART NO.	MODEL	CYLINDER PART NO.	KIT PART NO.
180	1520836	2516063	275-III A	570524	2516052
180	1503598	2516065	275-III A	1530605	2516052
180	1503986	2516071	275-III A	1506647	2516065
180	521825	2523425	275-III A	1508554	2516065
180	522277	2523425	275-III A	1505362	2516078
180	1520870	2523425	275-III A	1505363	2516078
180-III	539392	2523430	275-III A	1503241	2516094
180-III	1503608	2516059	275-III A	1515236	2516094
180-III	580124	2523431	275-III A	569968	2516095
180-III	1520836	2516063	275-III A	1503231	2516148
180-III	1503598	2516065	275-III A	1543895	2516148
180-III	1503602	2516069	275-III A	1503238	2516232
180-III	1503986	2516071	275-III A	1503239	2516232
180-III	1503987	2516071	275-III A	1522688	2516234
180-III	522277	2523425	275-III A	1522689	2516234
180-III	533645	2523425	275-IV	1539180	2516149
180-III	1520870	2523425	275-IV	1537215	2516228
210	591653	2523431	275-IV	1537216	2516228
210	1528145	2516063	275-IV	1511407	2516242
210	1503799	2516065	275-IV	1511408	2516242
210	1503801	2516148	280	513548	2523432
210	1534516	2516153	280	525256	2523432
210	1534517	2516153	280	513560	2523431
210-II	584551	2516052	280	539176	2523431
210-III	1523599	2520202	280	574274	2516063
210-III	1523600	2520202	280	1503604	2516065
210-III	1504857	2520202	280	1503607	2516065
210-III	1504858	2520202	280	513569	2523428
210-III RD	1506148	2516078	280	1503988	2516071
210-III RD	1506149	2516078	280	517993	2523425
210 RD	570696	2523433	280	535052	2523425
210 RD	570697	2523433	LF-280	1503605	2516094
210 RD	580789	2523433	280-III	513560	2523431
210 RD	580794	2523433	280-III	539204	2523431
275A	519920	2523432	280-III	574274	2516063
275A	524928	2523432	280-III	1503604	2516065
275A	517993	2523425	280-III	1503607	2516065
275A	519198	2523433	280-III	556230	2523428
275A	533683	2523433	280-III	1520946	2523428
275A-II	535052	2523425	280-III	1503602	2516069
275A-II	537242	2523433	280-III	1503988	2516071
275A-II	534993	2523434	280-III	535052	2523425
275B	1509395	2516154	280-III A	574727	2516063
275B	1511406	2516155	280-III A	1524035	2516064
275B	1513815	2518494	280-III A	1503604	2516065
275B	1538181	2516156	280-III A	1503607	2516065
275B	1512294	2516242	280-III A	1503609	2516069
275B	1518399	2516242	280-III A	1503605	2516094
275B	2504218	2516242	280-III A	1503606	2516094
275B	1511749	2516274	280-III A	569968	2516095
275B	2516160	2516274	280-III A	1530505	2516095
275B	2516176	2518494	280-III A	1530853	2516095
275B	2518125	2518493	280-III A	1527870	2516153
275-II	1503988	2516071	290M	565512	2516063
275-III	570524	2516052	290M	561157	2516280
275-III	1530605	2516052	290M	561112	2516281
275-III	588613	2523432	290M	565283	2516281
275-III	1503988	2516071	290M	561226	2516282
275-III	535052	2523425	310	1503803	2516078
275-III	564393	2523433	310	1503804	2516078
275-III	564394	2523433	310	1503805	2516078
275-III	1520119	2523434	310	1503802	2516148
275-III	1520120	2523434	310	1503806	2516148
275-III	1503241	2516094	310-II	1528090	2516052
275-III	1515236	2516094	CKL-340	1503797	2516072
275-III	1503231	2516148	CKL-340	1530276	2516267
275-III	1543895	2516148	375A	524683	2523428

MODEL	CYLINDER PART NO.	KIT PART NO.	MODEL	CYLINDER PART NO.	KIT PART NO.
375A	517509	2523425	475-III A	1503237	2516084
375A	519456	2523433	475-III A	1521612	2516084
375A	519099	2523434	475-III A	1503659	2516148
375A	525294	2523434	475-III A	1533413	2516185
375A	524580	2516083	475-III A	1523864	2516186
375A	533690	2516083	475-III A	1513011	2516230
380	513366	2523431	475-III A	1536166	2516241
380	1520751	2516063	475-III A	1534204	2516261
380	524683	2523428	475-III A	1536117	2516261
380	517509	2523425	475-III A	1511041	2516266
380	520351	2523433	475-III A	1509175	2516080
380	520374	2523433	475-III A	1509222	2516080
380-II	573479	2523432	475-III A	2514104	2516230
380-II	1521009	2523432	475-III A	2514095	2516249
380-II	513366	2523431	475-III A	2514101	2518494
380-II	1520751	2516063	480	537479	2523432
380-II	521589	2523428	480	1521009	2523432
380-II	521590	2523428	480	513366	2523431
380-II	1521794	2523428	480	1520751	2516063
380-II	1521795	2523428	480	1503598	2516065
380-II	1503600	2516069	480	521589	2523428
380-II	1503601	2516069	480	521590	2523428
380-II	541287	2523433	480	1521794	2523428
380-II	1503599	2516078	480	1521795	2523428
380-II	1503610	2516148	480	1503600	2516069
380-III	537479	2523432	480	1503601	2516069
380-III	1521009	2523432	480	520351	2523433
380-III	1520851	2516063	480	520374	2523433
380-III	1503234	2516065	480	541287	2523433
380-III	1503603	2516065	480	1503599	2516078
380-III	1543216	2516065	480	1503610	2516148
380-III	521589	2523428	480-III A	1524877	2516052
380-III	521590	2523428	675B	1512049	2516187
380-III	1521794	2523428	675B	2515478	2516237
380-III	1521795	2523428	675B	1513624	2516249
380-III	1503600	2516069	675B	1513625	2516249
380-III	1503601	2516069	675B	1514246	2516249
380-III	541287	2523433	675B	2500598	2516249
380-III	1503599	2516078	675B	2500599	2516249
380-III	1528462	2516095	675B	2500602	2516249
380-III	1503610	2516148	675B	2500603	2516249
380-III A	1532052	2516064	675B	2503915	2516249
380-III A	1510225	2516065	675B	2503916	2516249
380-III A	1531615	2516065	675B	2509051	2516249
380-III A	1528437	2516078	675B	2509052	2516249
380-III A	1505457	2516094	BL-700	947551	2518472
380TD	513374	2523433	BL-700	947552	2518472
380TD	513382	2523433	BL-700	948714	2518472
380TD-III	595099	2523431	BL-700	948715	2518472
410	559651	2523433	BL-700	947612	2518473
410-IV	1508812	2516078	BL-700	947652	2518473
410-IV	1508813	2516078	BL-700	947605	2518474
410-IV	1508810	2516148	BL-700	947594	2518485
410-IV	1508811	2516148	BL-700	948634	2518485
475B	1503659	2516148	BL-700	947621	2518486
475B	1513011	2516230	BL-700	949716	2518486
475B	2514104	2516230	BL-700	947553	2518490
475B	1515057	2516249	BL-700	947554	2518490
475B	1518699	2516249	BL-700	948712	2518490
475B	2514095	2516249	BL-700	948713	2518490
475B	2514101	2518494			
475-III A	1522963	2516052			
475-III A	1549538	2516078			
475-III A	1503462	2516079			
475-III A	1511035	2516080			
475-III A	1512878	2516080			
475-III A	1509222	2516082			

LIST 3

KIT PART NO.	MODEL	CYLINDER PART NO.	KIT PART NO.	MODEL	CYLINDER PART NO.
2516052	275-III A	570524	2516065	85-III A	1502853
2516052	275-III	570524	2516065	85-III A	1502854
2516052	210-II	584551	2516065	175-III A	1503234
2516052	475-III A	1522963	2516065	175-III	1503234
2516052	480-III A	1524877	2516065	380-III	1503234
2516052	310-II	1528090	2516065	125-III A	1503235
2516052	275-III	1530605	2516065	180	1503598
2516052	275-III A	1530605	2516065	180-III	1503598
2516054	75B	1511554	2516065	480	1503598
2516054	LF-75B	1511554	2516065	380-III	1503603
2516054	75B	2518071	2516065	280-III	1503604
2516054	LF-75	2518071	2516065	280-III A	1503604
2516055	75-II	1503828	2516065	280	1503604
2516055	55-III	1503828	2516065	280	1503607
2516055	75-III	1503828	2516065	280-III	1503607
2516055	85-II	1503875	2516065	280-III A	1503607
2516055	85-III	1503875	2516065	210	1503799
2516055	35	1524562	2516065	35	1504471
2516055	45	1524562	2516065	35B	1504471
2516055	35AWS	1524562	2516065	35AWS	1504471
2516055	35R	1524562	2516065	35R	1504471
2516055	35	1524563	2516065	275-III A	1506647
2516055	45	1524563	2516065	275-III A	1508554
2516055	35AWS	1524563	2516065	380-III A	1510225
2516055	35R	1524563	2516065	175B	1511622
2516055	85-II	1503828	2516065	380-III A	1531615
2516058	75B	1518977	2516065	125-III A	1543215
2516058	75B	1518978	2516065	175-III	1543215
2516058	55-III A	2514111	2516065	175-III A	1543215
2516058	75B	2514111	2516065	125-III A	1543216
2516058	55B	2514122	2516065	175-III	1543216
2516058	75B	2518075	2516065	175-III A	1543216
2516058	75B	2518076	2516065	380-III	1543216
2516058	75B	2520412	2516066	85-III A	1521236
2516059	180-III	1503608	2516066	125-III A	1526262
2516059	35	1504470	2516066	125-III A	1533805
2516059	35B	1504470	2516066	125-III	1533805
2516059	35AWS	1504470	2516069	125-III A	1503232
2516059	35R	1504470	2516069	175-III A	1503232
2516059	45	1504470	2516069	380-II	1503600
2516060	55-III A	1507822	2516069	380-III	1503600
2516060	55-III A	1507823	2516069	480	1503600
2516060	55-III A	1546056	2516069	380-II	1503601
2516060	75B	1546056	2516069	380-III	1503601
2516060	55-III AGRR	1546056	2516069	480	1503601
2516060	LF-75B	1546056	2516069	280-III	1503602
2516060	55-III A	1546057	2516069	180-III	1503602
2516060	75B	1546057	2516069	280-III A	1503609
2516060	55-III AGRR	1546057	2516070	125-III A	1503240
2516060	LF-75B	1546057	2516070	125-III	1503240
2516061	75-III A	1535946	2516070	75-III	1503887
2516063	290M	565512	2516070	85-III	1503887
2516063	280	574274	2516070	75-III A	1504075
2516063	280-III	574274	2516070	75-III A	1509802
2516063	280-III A	574727	2516070	85-III A	1509813
2516063	380	1520751	2516070	125-III A	1509846
2516063	480	1520751	2516070	85-III A	1530664
2516063	380-II	1520751	2516070	75-III A	1536064
2516063	180	1520836	2516071	180	1503986
2516063	180-III	1520836	2516071	180-III	1503986
2516063	380-III	1520851	2516071	175-II	1503987
2516063	125-III A	1526219	2516071	180-III	1503987
2516063	210	1528145	2516071	275-II	1503988
2516063	175-III	1535641	2516071	280	1503988
2516063	175-III A	1535641	2516071	275-III	1503988
2516064	280-III A	1524035	2516071	280-III	1503988
2516064	380-III A	1532052	2516071	75-III A	1504836

KIT PART NO.	MODEL	CYLINDER PART NO.	KIT PART NO.	MODEL	CYLINDER PART NO.
2516071	85-III A	1531950	2516148	275-III A	1503231
2516071	55-II	1539308	2516148	175-III A	1503236
2516071	75-III A	1539308	2516148	175-III	1503236
2516071	55-III A	1539308	2516148	380-II	1503610
2516071	45B	1539308	2516148	380-III	1503610
2516071	75B	1539308	2516148	480	1503610
2516071	35AWS	1542601	2516148	475-III A	1503659
2516071	35AWS	1546112	2516148	475B	1503659
2516071	35AWS	2512955	2516148	210	1503801
2516072	CKL340	1503797	2516148	310	1503802
2516072	12B	1503797	2516148	310	1503806
2516072	55-III A	1508904	2516148	45	1504472
2516072	75B	1508904	2516148	410-IV	1508810
2516072	55-III A GRR	1508904	2516148	410-IV	1508811
2516072	LF-75B	1508904	2516148	275-III	1543895
2516072	125B	2501171	2516148	275-III A	1543895
2516073	55-III	2504855	2516149	175-IV	1539180
2516073	55-III	1504856	2516149	275-IV	1539180
2516073	55-III	1507711	2516151	175B	1511641
2516073	55-III	1508377	2516151	175B	2518117
2516073	55-III A	1545577	2516152	125B	1519173
2516073	75B	1545577	2516153	280-III A	1527870
2516075	12B	552755	2516153	210	1534516
2516075	12B	588745	2516153	210	1534517
2516075	12B	517439	2516154	275B	1509395
2516078	380-II	1503599	2516155	275B	1511406
2516078	380-III	1503599	2516155	175B	1512261
2516078	480	1503599	2516156	275B	1538181
2516078	310	1503803	2516185	475-III A	1533413
2516078	310	1503804	2516186	475-III A	1523864
2516078	310	1503805	2516187	675B	1512049
2516078	275-III A	1505362	2516194	175-IV	1539442
2516078	275-III A	1505363	2516228	275-IV	1537215
2516078	210-III RD	1506149	2516228	275-IV	1537216
2516078	210-III RD	1506150	2516230	475-III A	1513011
2516078	410-IV	1508812	2516230	475B	1513011
2516078	410-IV	1508813	2516230	475B	2514104
2516078	380-III A	1528437	2516230	475-III A	2514104
2516078	475-III A	1549538	2516232	275-III A	1503238
2516079	475-III A	1503462	2516232	275-III A	1503239
2516080	475-III A	1509222	2516234	275-III A	1522688
2516080	475-III A	1511035	2516234	275-III A	1522689
2516080	475-III A	1512878	2516237	675B	2515478
2516083	375A	524580	2516241	475-III A	1536166
2516083	375A	533690	2516242	275-IV	1511407
2516084	475-III A	1503237	2516242	275-IV	1511408
2516084	475-III A	1521612	2516242	275B	1512294
2516088	75-III	1503233	2516242	275B	1518399
2516088	85-III	1503233	2516242	275B	2504218
2516088	75-III	1507808	2516249	675B	1513624
2516088	85-III	1507808	2516249	675B	1513625
2516090	55-III A	1507835	2516249	675B	1514246
2516090	55-III A	1545412	2516249	475B	1515037
2516090	55-III A	1549758	2516249	475B	1518699
2516090	55-III A GRR	1549758	2516249	675B	2500598
2516094	275-III	1503241	2516249	675B	2500599
2516094	275-III A	1503241	2516249	675B	2500602
2516094	280-III A	1503605	2516249	675B	2500603
2516094	LF280	1503605	2516249	675B	2503915
2516094	280-III A	1503606	2516249	675B	2503916
2516094	110	1503798	2516249	675B	2509051
2516094	380-III A	1505457	2516249	675B	2509052
2516094	275-III	1515236	2516249	475B	2514095
2516094	275-III A	1515236	2516249	475-III A	2514095
2516095	275-III A	569968	2516251	475-III A	1534204
2516095	280-III A	569968	2516251	475-III A	1536117
2516148	275-III	1503231	2516266	475-III A	1511041

List 3 (cont.)

KIT PART NO.	MODEL	CYLINDER PART NO.	KIT PART NO.	MODEL	CYLINDER PART NO.
2516266	475-III A	1509175	2523424	55A	526406
2516266	475-III A	1548059	2523424	55A	532943
2516267	CKL340	1530276	2523424	55A-II	532943
2516270	45B	3980108	2523424	75A-II	533489
2516270	45B	3980125	2523424	85A-II	533489
2516271	45B	3980095	2523424	55-III	533489
2516272	45B	3980906	2523424	175A	544781
2516274	275B	1511749	2523424	85A-II	562564
2516274	275B	2516160	2523424	85-III	562564
2516280	290M	561157	2523424	35	585298
2516281	290M	561112	2523424	45	585298
2516281	290M	656283	2523424	35AWS	585298
2516282	290M	561226	2523424	35	585302
2518472	BL-700	947551	2523424	45	585302
2518472	BL-700	947552	2523424	35AWS	585302
2518472	BL-700	948714	2523425	12B	512782
2518472	BL-700	948715	2523425	12B	517192
2518473	BL-700	947612	2523425	375A	517509
2518473	BL-700	947652	2523425	380	517509
2518474	BL-700	947602	2523425	275A	517993
2518485	BL-700	947594	2523425	280	517993
2518485	BL-700	948634	2523425	75TT	518947
2518486	BL-700	947621	2523425	175A	521825
2518486	BL-700	949716	2523425	180	521825
2518490	BL-700	947553	2523425	180	522277
2518490	BL-700	947554	2523425	180-III	522277
2518490	BL-700	948712	2523425	55A	523110
2518490	BL-700	948713	2523425	55A	523118
2518493	175B	1517851	2523425	12B	523639
2518493	125B	1519174	2523425	125A	525171
2518493	125B	1519175	2523425	125A	525172
2518493	125B	2517389	2523425	125A	533113
2518493	125B	2517390	2523425	125A-II	533113
2518493	175B	2518125	2523425	175A-II	533645
2518493	275B	2518125	2523425	180-III	533645
2518494	175B	1518400	2523425	55A	533654
2518494	275B	1513815	2523425	275A-II	535052
2518494	475B	2514101	2523425	280	535052
2518494	475-III A	2514101	2523425	280-III	535052
2518494	275B	2516176	2523425	275-III	535052
2518494	175B	2518119	2523425	55A-II	537204
2519971	35C	2521041	2523425	125-III A	562309
2519971	45C	2521041	2523425	55A-II	567904
2519971	35C	2521042	2523425	55-III	567904
2519971	45C	2521042	2523425	75-II	567904
2519971	35C	2521043	2523425	175-III	570709
2519971	45C	2521043	2523425	180	1520870
2519971	35C	2521044	2523425	180-III	1520870
2519971	45C	2521044	2523425	75-III A	1521837
2519972	35C	2518199	2523425	35AWS	1534089
2519972	35C	2518201	2523425	12B	552775
2519973	35C	2511942	2523426	55A-II	532919
2519973	45C	2511942	2523426	55-III	563843
2519973	35C	2518513	2523426	55-III	563854
2519973	45C	2518513	2523427	75-III	562529
2519987	45C	2518204	2523427	85-III	562529
2519987	45C	2518206	2523428	280	513569
2520202	210-III	1504857	2523428	75A	514166
2520202	210-III	1504858	2523428	75B	514166
2520202	210-III	1523599	2523428	75R	514166
2520202	210-III	1523600	2523428	85A	514166
2520205	55B	2514258	2523428	75APL	514629
2521999	55B	2518802	2523428	75APL	515732
2521999	55-III A	2518802	2523428	75APL	515743
2521999	75B	2518802	2523428	75PL	518823
2521999	125B	2518871	2523428	480	521589
2523424	55B-I	509569	2523428	380-II	521589

KIT PART NO.	MODEL	CYLINDER PART NO.	KIT PART NO.	MODEL	CYLINDER PART NO.
2523428	380-III	521589	2523431	125-III A	565930
2523428	480	521590	2523431	180	580107
2523428	380-II	521590	2523431	180	580124
2523428	380-III	521590	2523431	180-III	580124
2523428	375A	524683	2523431	110RD	582542
2523428	380	524683	2523431	110RD	582551
2523428	75A	529457	2523431	35A	585139
2523428	85A	529457	2523431	35	586145
2523428	75TT	531182	2523431	35B	586145
2523428	75A	531774	2523431	35AWS	586145
2523428	85A	531774	2523431	85A-II	588192
2523428	75A	531775	2523431	85A-II	588194
2523428	85A	531775	2523431	110TS	590191
2523428	75A	533659	2523431	110RD	594793
2523428	75A	544724	2523431	110RD	594796
2523428	85A	544724	2523431	210	591653
2523428	75A	551987	2523431	380TD-III	595099
2523428	75B	551987	2523432	280	513548
2523428	75R	551987	2523432	175A	514158
2523428	75A	551991	2523432	275A	519920
2523428	75B	551991	2523432	275A	524928
2523428	75R	551991	2523432	280	525256
2523428	85A	551991	2523432	175A	530768
2523428	175A	553445	2523432	175A	530769
2523428	175TL	553445	2523432	125A-II	532716
2523428	75TL	553445	2523432	125A-II	533466
2523428	75A	553445	2523432	175A	533676
2523428	280-III	556230	2523432	380-II	537479
2523428	125-III A	567855	2523432	480	537479
2523428	175-III A	567855	2523432	380-III	537479
2523428	35A	585145	2523432	175A	551973
2523428	280-III	1520946	2523432	175A	551977
2523428	380-II	1521794	2523432	175-III	566885
2523428	380-III	1521794	2523432	175-III A	566885
2523428	480	1521794	2523432	45	586190
2523428	380-II	1521795	2523432	125A-II	588188
2523428	380-III	1521795	2523432	125A-II	588190
2523428	480	1521795	2523432	275-III	588613
2523429	125-III A	567983	2523432	380-II	1521009
2523429	75-II	587950	2523432	480	1521009
2523429	85-III	587950	2523432	380-III	1521009
2523430	85A	527286	2523433	380TD	513374
2523430	75TT	528550	2523433	380TD	513382
2523430	85A	531661	2523433	375A	519456
2523430	85A	533663	2523433	380	520351
2523430	75A-II	533783	2523433	480	520351
2523430	75A-II	537141	2523433	380	520374
2523430	180-III	539392	2523433	480	520374
2523430	75A-II	555274	2523433	175A-II	533634
2523430	35	586151	2523433	275A	533683
2523430	35B	586151	2523433	175A-II	537129
2523430	45	586151	2523433	275A-II	537242
2523430	35AWS	586151	2523433	380-II	541287
2523431	380	513366	2523433	480	541287
2523431	480	513366	2523433	380-III	541287
2523431	380-II	513366	2523433	410	559651
2523431	280	513560	2523433	275-III	564393
2523431	280-III	513560	2523433	275-III	564394
2523431	125A	514162	2523433	210RD	570696
2523431	125A	533669	2523433	210RD	570697
2523431	280	539176	2523433	210RD	580789
2523431	280-III	549204	2523433	210RD	580794
2523431	125A	551948	2523434	375A	519099
2523431	175-III	556192	2523434	375A	525294
2523431	175-III A	556192	2523434	275A-II	534993
2523431	125A-II	564356	2523434	275-III	1520119
2523431	125A-II	564363	2523434	275-III	1520120

# CLARK

# Service gram

31 May 1978

MICHIGAN SG-632B  
Group Ref. No. 1100  
1200

(This bulletin supersedes and replaces SG-632A dated 8 June 1977.  
REASON: Correction to part numbers).

SUBJECT: Improvement of Hydraulic Cylinder Piston Rod Packings  
Models 55B, 75B, 125B, 175B, 275B, 475B and 675B

Improved piston rod packings are now available for boom and bucket cylinders on Models 55B, 75B, 125B, 175B, 275B, 475B and 675B, and for steering cylinders on Models 175B, 275B and 675B. POLYPAC packing assemblies supersede "V" packings and shims for all applications listed. Compression of POLYPAC packings is not necessary. Omit shims and old packings and install new packings with sealing ring TOWARD OIL PRESSURE SIDE of cylinder. Tighten cylinder cap retaining bolts to same torque value called for.

## PARTS REQUIRED:

<u>Model</u>	<u>Cylinder Application</u>	<u>POLYPAC Packing Assy</u>	<u>Replaces "V" Packing and Shim</u>	
55B	Bucket	2517362	2514254	2514257
55B	Boom	2517363	2505233	2514106
75B	Bucket	2517362	1511537	1511543
75B	Boom	2517363	1514090	1514098
125B	Boom	2517364	1511229	1511230
125B	Bucket	2517363	1514090	1514098
175B	Steering	2517362	1511537	1511543
175B	Boom	2517364	1511229	1511230
175B	Bucket	2517364	1511229	1511230
275B	Steering	2517363	1514090	1514098
275B	Bucket	2517364	1511229	1511230
275B	Boom	2517365	2504215	1511385
275B	Boom	2517365	1511378	1511385
475B	Bucket	2517366	1513474	1513472
475B	Boom	2517366	1513474	1514372
675B	Bucket	2517366	2500592	2500591
675B	Steering (Lot 1, 2 & 3)	2517365	1511378	1511385
675B	Steering (Lot 4)	2517364	2505243	1511230
675B	Boom	2517366	2500592	2500591

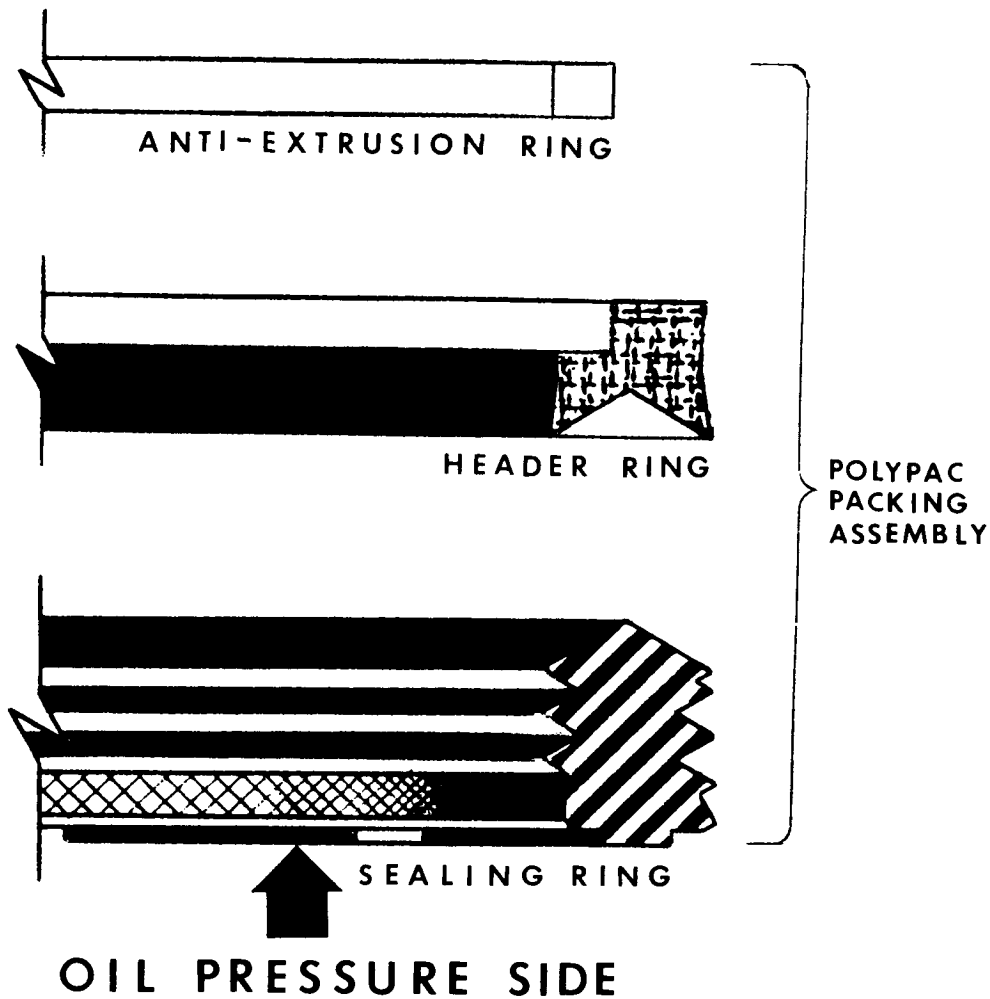
(6K11)



INSTALLATION INSTRUCTIONS:

1. Be sure to remove shims as well as obsolete "V" packings.
2. Spray new parts with silicone for ease of assembly.
3. Install packing assembly in cap with cupped face of header ring (sealing ring end of assembly) toward piston head (opposed to oil pressure direction) when assembly is complete.
4. Stagger the splits approximately 180 degrees during installation.
5. Seat anti-extrusion ring, header ring and sealing ring in cap groove with splits reunited evenly.
6. Install cylinder cap, tightening retaining bolts to same torque as before.

NOTE: Compression of POLYPAC packing assembly is not necessary. There will be approximately .063 (1,6) clearance after tightening bolts on cylinder cap.



TS-14977

# CLARK

# Service gram

28 June 1978

MICHIGAN SG-704  
Group Ref. No. 1100  
1200

**SUBJECT:** Assembly of Piston Rod Nut on Hydraulic Cylinder Assemblies Model 55-111A, 55B, 75B, 85-111A, 175B, 180-111, 380-111A and 675B

Correct assembly of the piston rod nut gives maximum strength to the cylinder rod by putting the hole for the cotter pin or lock bolt as far as possible from the piston. This assembly procedure is for the cylinders on the following list.

MODEL	PART NO.	CYLINDER IDENTIFICATION	TORQUE FOR ROD NUT	
			lbf. ft.	N·m
55-111A, 55B, 75B	1545577	Dump Cylinder, Side Dump	400	542
55B	2514258	Bucket Cylinder	400	542
55B	2514111	Boom Cylinder L.H.	750	1017
55B	2514122	Boom Cylinder R.H.	750	1017
75B	1511554	Bucket Cylinder	400	542
75B	2518071	Bucket Cylinder	400	542
85-111A	1531950	Steering Cylinder	400	542
85-111A	1502853	Boom Cylinder L.H.	1000	1356
85-111A	1502854	Boom Cylinder R.H.	1000	1356
175B	2518125	Bucket Cylinder	1000	1356
180-111	1503986	Tilt Cylinder	810	1098
180-111	1503987	Steering Cylinder	400	542
380-111A	1528437	Steering Cylinder	1000	1356
675B	2515478	Steering Cylinder	1000	1356

### ASSEMBLY PROCEDURE:

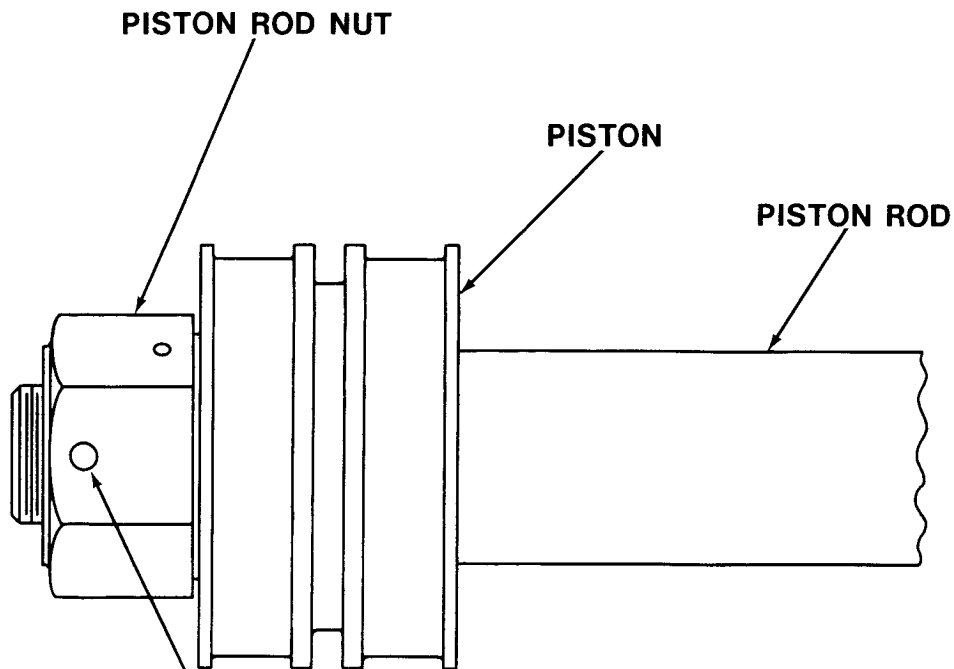
1. Make sure that the piston rod nut is installed so that the hole in the side of the nut is as far as possible from the piston. See Figure 1.
2. Tighten the piston rod nut to the correct torque. You can vary ten percent plus or minus on the torque specification so that you can reuse the existing hole in the cylinder rod for the cotter pin or lock bolt.

3. If you cannot use the existing hole in the cylinder rod, drill a hole half way through the piston rod. Finish drilling from the opposite side using the existing hole in the piston rod nut as a pilot. See Figure 1.

NOTE: Drill sizes will be variable according to the size of the piston rod and nut.

4. Install the lock bolt or cotter pin as required according to the cylinder specification.

ECN 26977, 02278, 12878  
SPC 13078



**DRILL HALF WAY THROUGH THE PISTON ROD.  
FINISH DRILLING FROM THE OPPOSITE SIDE.  
USE THE EXISTING HOLE IN THE NUT AS A PILOT.**

Figure 1. Installation of Piston Rod Nut

TS-20280

# CLARK

# Service gram

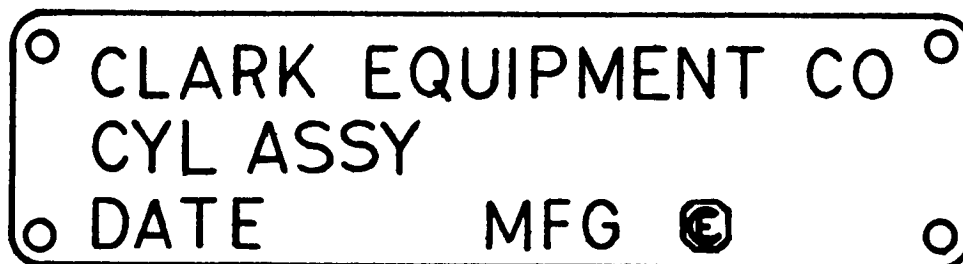
1 November 1978

MICHIGAN SG-727  
Group Ref. No. 1100

SUBJECT: Identification of Cylinder Assemblies  
All Models of Tractor Shovels and Dozers

All new cylinder assemblies shipped from the factory are equipped with a metal identification plate, part number 2520843. This identification plate is fastened in place by drive screws. The plate is located on the side of the cylinder assembly at the rod end.

Each identification plate is stamped to show the part number of the cylinder assembly and manufacturing coding. See Figure 1.



TS-15328

Figure 1. Identification Plate.

(8D7)

The location of the identification plate will vary according to the type of cylinder. See Figure 2 for plate location according to cylinder type.

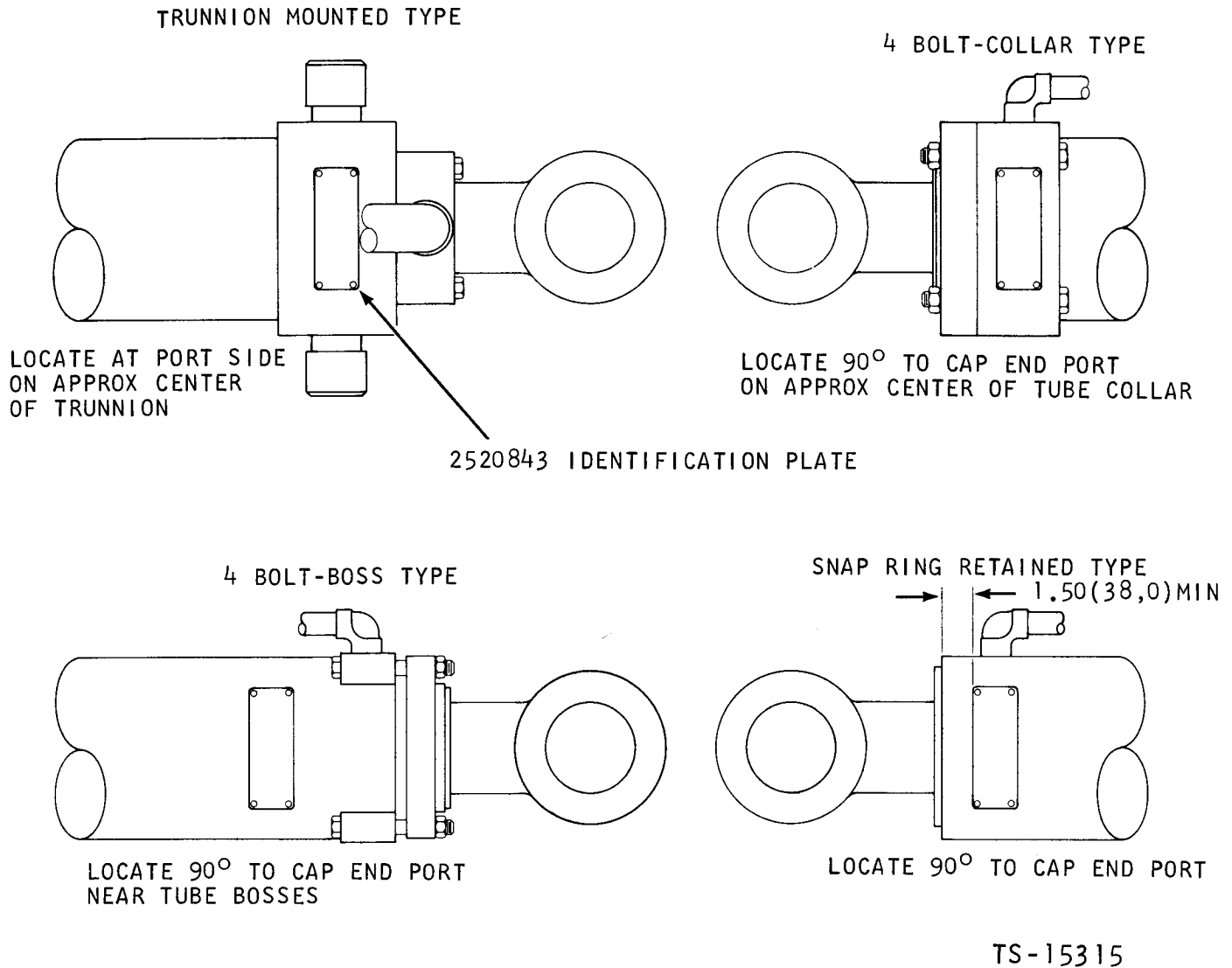


Figure 2.

When you install a new tube and base assembly, install an identification plate, part number 2520843. Make sure that the plate is stamped with the correct part number of the cylinder assembly. This will be helpful for ordering service parts in the future.

# CLARK

# Service gram

February 1981

MICHIGAN SG-763A  
Group Ref. No. 1100

(This bulletin replaces SG-763, dated 19 November 1979. REASON: To revise torque specification for 475B Steering Cylinder).

**SUBJECT: Improved Boom, Bucket and Steer Cylinder Rod Seal  
Model 35C, 45C, 55B, 55C, 75B, 125B, 175B, 275B, 475B, 380-IIIA**

A new U-cup rod seal can be used in place of the poly-pac rod seal now in use on boom bucket and steer cylinders with part numbers and serial numbers shown on the list below.

The U-cup rod seal makes an improved seal over other packings previously used.

The U-cup rod seal can be used only when the cylinder is completely disassembled.

When complete disassembly of the cylinder is not necessary, the poly-pac seal may still be used.

**NOTE:** The U-cup rod seal can only be used on cylinders with ductile iron cylinder caps.

Order the necessary U-cup seal kit or the poly-pac seal from the parts list below.

MODEL	BOOM CYLINDER P/N	U-CUP SEAL KIT	POLY-PAC SEAL	EFFECTIVE SERIAL NUMBER
35C	LH - 2521774, RH - 2521773	2519972	NONE*	472A101CB, 458A101CB
45C	LH - 2521767, RH - 2521768	2519987	NONE*	473A101CB, 459A101CB
55C	LH - 2523872, RH - 2523873	2525949	NONE*	480A101CB, 481A101CB
55B	LH - 2514111, RH - 2514122	2525949	2517363	433B700CAC, 416C857CAC
75B	LH - 2518076, RH - 2518075	2525949	2517363	443C101CAC, 447C101CAC
125B	LH - 2517389, RH - 2517390	2525956	2517364	439B174C, 439C151FSC, 441B192C, 441C101FSC
175B	2518119	2526039	2517364	427C246C, 427C115FSC 438C259C, 438C159FSC
275B	2504218	2525953	2517365	425C487C, 425C218FSC
475B	2514095	2525954	2517366	420B122C, 421J281C

\*No poly-pac seals are available for these cylinders at this time.

<u>MODEL</u>	<u>BUCKET CYLINDER P/N</u>	<u>U-CUP SEAL KIT</u>	<u>POLY-PAC SEAL</u>	<u>EFFECTIVE SERIAL NUMBER</u>
35C	LH – 2521043, RH – 2521041	2519971	NONE*	472A101CB, 458A101CB
45C	LH – 2521044, RH – 2521042	2519971	NONE*	473A101CB, 459A101CB
55C	LH – 2526668, RH – 2526667	2520205	NONE*	480A101CB, 481A101CB
55B	2514258	2520205	2517362	433B706CAC, 416C965CAC
75B	2520412	2525949	2517363	443D101CAC, 443D101FSC, 447D101CAC, 447D101FSC
125B	2517395	2525951	2517363	439B174C, 439B151FSC, 441B192C, 441C101FSC
175B	2518125	2525956	2517364	427C246C, 427C115FSC, 438C259C, 438C159FSC
275B	2516176	2526039	2517364	425D101C, 425D101FSC
475B	2514104	2525952	2517366	420B122C, 421J281C

<u>MODEL</u>	<u>STEER CYLINDER P/N</u>	<u>U-CUP SEAL KIT</u>	<u>POLY-PAC SEAL</u>	<u>EFFECTIVE SERIAL NUMBER</u>
35C	2518513	2519973	NONE*	472A101CB, 458A101CB
45C	2518513	2519973	NONE*	473A101CB, 459A101CB
55C	2526859	2519973	NONE*	480A101CB, 481A101CB
55B	2518802	2521999	NONE*	416D101CAC, 433C101CAC
75B	2518802	2521999	NONE*	443D101CB, 443D101CAC, 447D101CB, 447D101CAC
125B	2518871	2521999	NONE*	439B371CB, 439B200CAC, 439B126FSC, 441B393CB, 441B265CAC, 441B101FSC
175B	2518117	2525950	2517362	427C246C, 427C109FSC, 438C259C, 438C156FSC.
275B	2516160	2525955	2517363	425D101C, 479A101C, 482A101C
475B	2514101	2526058	2517364	420B122C, 421J283C
380-IIIA				
Lift Cyl.	2522115	2525956	2517364	
Tilt Cyl.	2522120	2525956	2517364	
Pitch Cyl.	2522411	2525955	2517363	418F101K, 434C101K,
Steer Cyl.	2522598	2528180	2517365	484B101K

\*No poly-pac seals are available for these cylinders at this time.

See the following installation instructions for either the U-cup rod seal or the poly-pac seal installation on the boom, bucket or steer cylinders for machines shown on the previous list.

*NOTE: It is recommended procedure to rework both boom, bucket or steer cylinders at the same time.*

## INSTALLATION OF THE U-CUP ROD SEAL (See Figures 1, 2, 3 and 4)

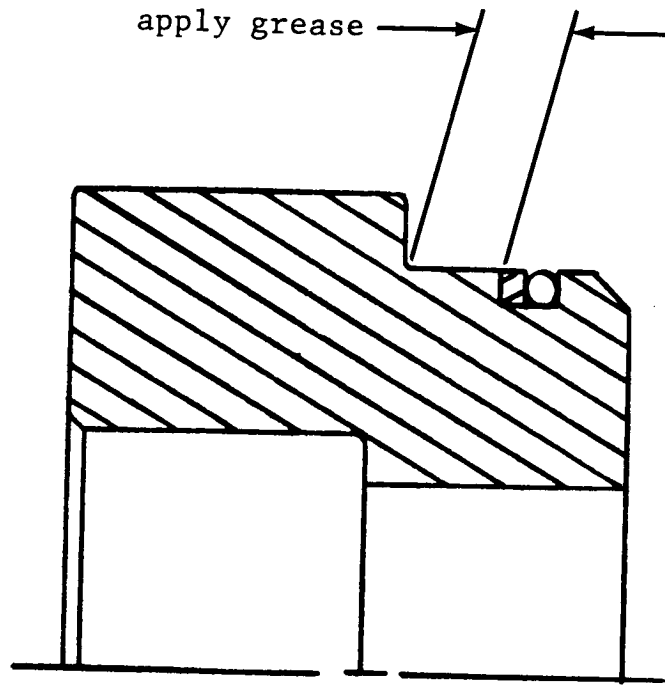
1. Remove the piston rod assembly from the cylinder.
2. Remove the piston rod nut or lock bolt, piston, cylinder cap, packing sleeve, spacers, flange and wiper seal from the piston rod.
3. Clean all parts thoroughly. Check the piston rod for surface damage. Remove any surface damage with a crocus cloth or fine hone.
4. Push the wiper seal (Item 8) into the new flange (Item 11, if used) with the lip of the seal facing outward.
5. Install the retaining ring (Item 9) on the piston rod.
6. Lubricate the wiper seal (if used) and the piston rod with clean hydraulic oil. Install the flange (Item 11) with the wiper seal (Item 8) on the piston rod. On some steering cylinders, install the snap ring that retains the cylinder cap. (The flange is not used on these cylinders. See Figure 4).
7. Install a new back-up ring (Item 6) in the groove in the cylinder cap.
8. Install a new o-ring (Item 5) in the groove in the cylinder cap. The o-ring must be on the fluid side of the back-up ring.
9. Apply hydraulic fluid to the inside of the cap. Install the new rod packing in the cylinder cap. The end of the packing with the groove must be toward the inside of the cylinder. Install the back-up ring in the cap.
10. Apply hydraulic fluid to the inside of the rod packing and back-up ring in the cylinder cap. Install the cylinder cap (Item 13) on the rod.
11. Align the holes in the retaining ring and flange (if used) with the holes in the cylinder cap.
12. On cylinders where a flange is used: Install the retainer bolts through the retaining ring, and flange into the cylinder cap, Tighten the bolts to the specified torque. See the Torque Chart
13. Install a new o-ring (Item 14) in the piston and install the piston on the cylinder rod. Install the piston rod nut (Item 2). On some cylinders, install the lockbolt and washer in the piston. Tighten the nut or lockbolt to the specified torque. See the Torque Chart.

*NOTE: On some cylinders the piston must be turned onto the cylinder rod to the correct dimension. See Figure 7 for the correct dimensions.*

14. Install the locking device (Item 1) through the piston rod nut. This device can be a cotter pin, a set screw, or a bolt and nut, depending upon the cylinder. The torque of the piston rod nut can vary plus or minus 10% to align the holes in the piston rod and nut for the locking device. If the locking device is a bolt and nut, use the ball end of a ball peen hammer to cause distortion to the threads of the lock bolt after you tighten the nut.
15. Install new wear rings (Item 3) and inner and outer seal rings (Items 4 and 15) on the piston if required.
16. Apply a Lithium base, multi-purpose grease to the pilot area of the cylinder cap as shown in Figure 1.
17. Apply hydraulic fluid to the wear rings on the piston and the packing. Install a piston ring compressor on the piston.

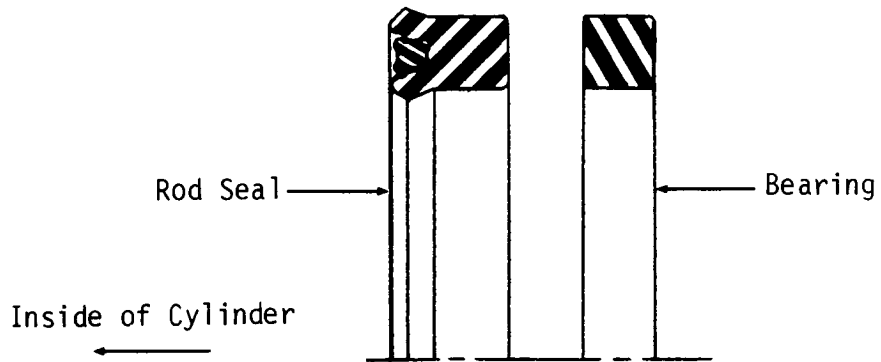


18. Carefully install the piston rod assembly in the cylinder. If the cylinder has a port, use a piece of shim stock to cover the port. Make sure that you do not damage the wear rings or sealing rings on the piston.
19. On cylinders with a flange and cylinder cap: Install the cylinder cap bolts and tighten to the specified torque. See the Torque Chart.
20. On cylinders with a snap ring holding the cylinder cap: Push the cylinder cap into the cylinder. *NOTE: The cylinder cap must be pushed far enough into the cylinder to permit the installation of the snap ring and still permit the installation of the cylinder cap bolts.*
21. Slide the cylinder rod wiper onto the cylinder cap.
22. Install the snap ring that retains the cylinder cap.
23. Slide the plate that retains the cylinder cap onto the cylinder. Install the cylinder cap bolts.
24. Tighten the cylinder cap bolts to the specified torque. See the Torque Chart.



TS-15267

Figure 1

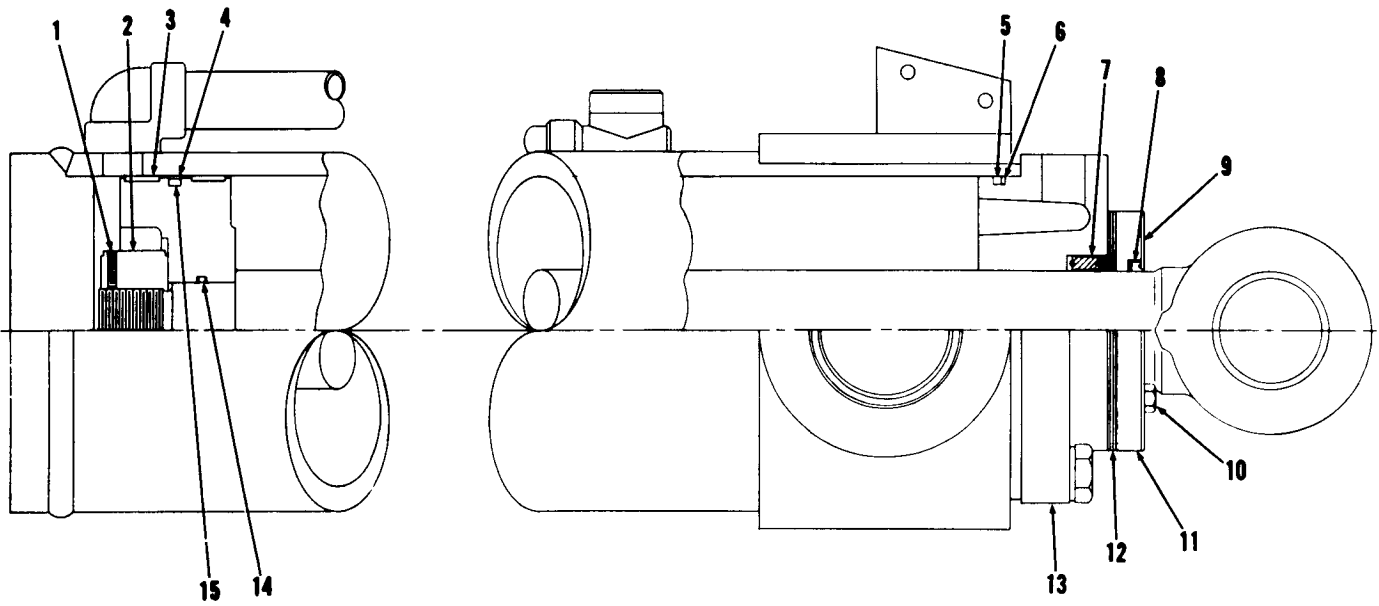


TS-15622

Figure 2

U-cup Seal

-5-



**Figure 3**  
Cylinder with U-cup Seal

TS-15660



**Figure 4**  
Cylinder with snap ring installed

TS-31535

INSTALLATION OF THE POLY-PAC SEAL (See Figures 5 and 6)

1. Remove the flange mounting bolts (Item 4).
2. Move the wiper retainer and the flange away from the cylinder cap. Check the wiper seal (Item 2) and replace if necessary.
3. Remove the rod packing back-up ring from the cylinder cap. Discard the back-up ring. Remove the rod packing (Item 1) from the cylinder cap. Discard the rod packing. *NOTE: Do not damage the cylinder rod or the inside of the cap. Clean the opening for the rod packing in the cylinder cap.*
4. Apply hydraulic fluid to the inside of the cylinder cap (Item 6). Apply hydraulic fluid to the rod packing (Item 1). Install the rubber ring in the cylinder cap with the flat side down. (See Figure 5).
5. Apply hydraulic fluid to the fiber ring (See Figure 5). Install the fiber ring in the cylinder cap with the groove side down. Make sure the cut in the fiber ring is 180° from the cut in the rubber ring.
6. Apply hydraulic fluid to the teflon ring. (See Figure 5). Install the teflon ring in the cylinder cap. Make sure the cut in the teflon ring is 180° from the cut in the fiber ring.
7. Move the flange (Item 5) and the wiper retainer (Item 3) against the cylinder cap (Item 6). Align the bolt holes in the cylinder cap.
8. Install the flange mounting bolts (Item 4). Tighten the bolts to the specified torque. See the Torque Chart.

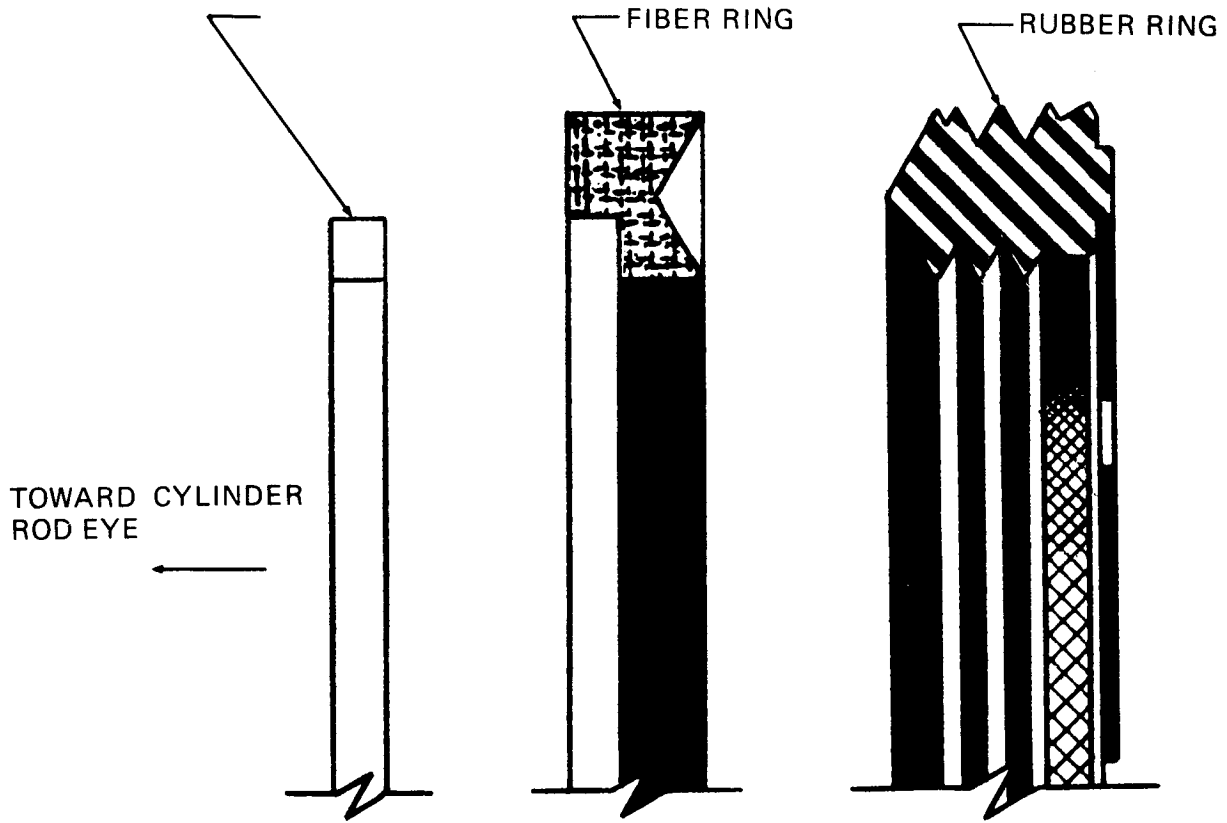


Figure 5  
Poly-pac Seal

TS-30724

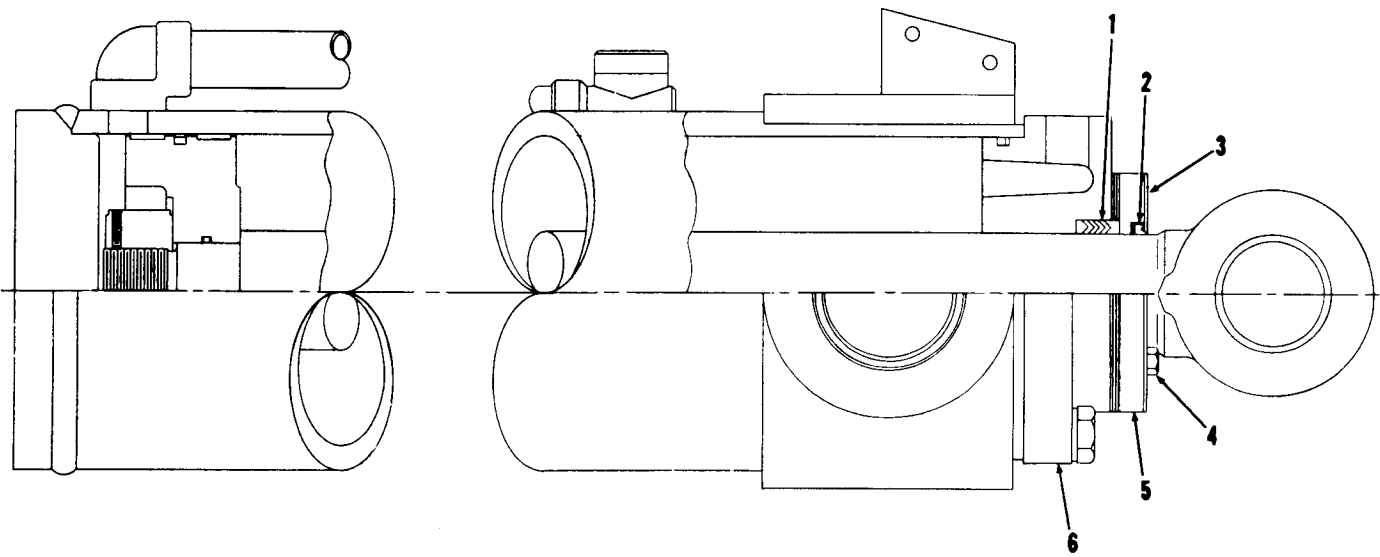
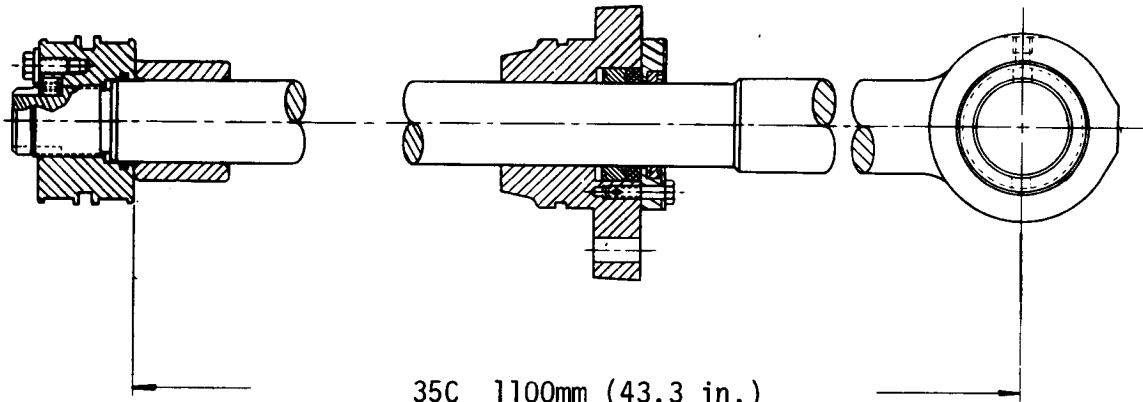


Figure 6  
Cylinder with poly-pac Seal

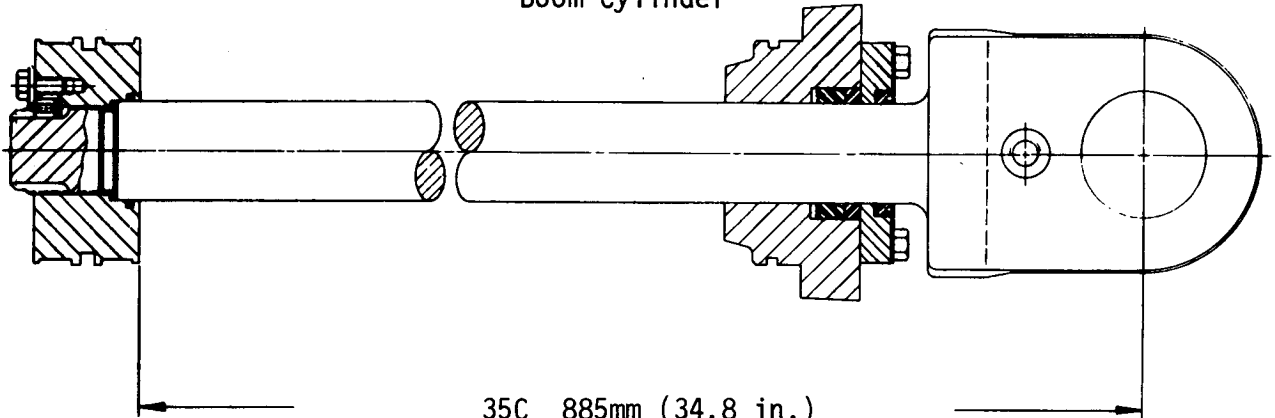
TS-14474

Bucket Cylinder



- 35C 1100mm (43.3 in.)
- 45C 1246mm (49.0 in.)
- 55C 1339mm (52.7 in.)

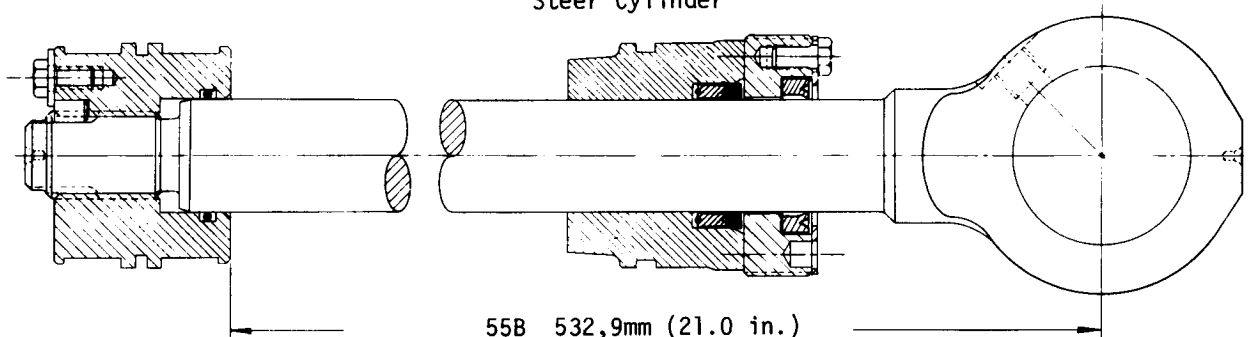
Boom Cylinder



- 35C 885mm (34.8 in.)
- 45C 905mm (35.6 in.)
- 55C 905mm (35.6 in.)

TS-15383

Steer Cylinder



- 55B 532,9mm (21.0 in.)
- 55C 495mm (19.5 in.)
- 75B 532,9mm (21.0 in.)

TS-15659

Figure 7

1 None used  
 2 Lockbolt & Washer  
 \* Revised Bolt Torque Specification

TORQUE CHART LBF-FT

MODEL	FLANGE BOLTS			PISTON ROD NUT			CYLINDER CAP BOLTS		
	LIFT	PITCH	STEER TILT	LIFT	PITCH	STEER TILT	LIFT	PITCH	STEER TILT
380-III A	90-100	34-40	90-100	1500	1500	1500	175-190	175-190	175-190
475B	42	42	100*	2000	2000	1000	1500	1530	153
275B	42	42	17	1000	1000	750	545	505	90-100
175B	42	42	17	1000	1000	750	300	505	90-100
125B	42	17	1	1000	1000	750	168	320	18-20
75B	17	17	1	750	400	20 <sup>2</sup>	90	210	4
55B	17	7	1	750	400	20 <sup>2</sup>	90	210	4
55C	40	10	1	20 <sup>2</sup>	20 <sup>2</sup>	175	175	175	2
45C	40	10	1	20 <sup>2</sup>	20 <sup>2</sup>	175	175	175	2
35C	40	10	1	20 <sup>2</sup>	20 <sup>2</sup>	175	175	175	2
	BOOM BUCKET STEER			BOOM BUCKET STEER			BOOM BUCKET STEER		

**TORQUE CHART N-m**

MODEL	FLANGE BOLTS			PISTON ROD NUT				CYLINDER CAP BOLTS		
	BOOM	BUCKET	STEER	BOOM	BUCKET	STEER	BOOM	BUCKET	STEER	
35C	54,2	13,6	1	27,1 <sup>1</sup>	27,1 <sup>2</sup>	237,2	237,2	237,2	2,7	
45C	54,2	13,6	1	27,1 <sup>1</sup>	27,1 <sup>2</sup>	237,2	237,2	237,2	2,7	
55C	54,2	13,6	1	27,1 <sup>1</sup>	27,1 <sup>2</sup>	237,2	237,2	237,2	2,7	
55B	23	9,5	1	1017	542	27,1 <sup>2</sup>	122	285	5,4	
75B	23	23	1	1017	542	27,1 <sup>2</sup>	122	285	5,4	
125B	57	23	1	1356	1356	1017	228	434	24,4-27,1	
175B	57	57	23	1356	1356	1017	407	685	122-135,6	
275B	57	57	23	1356	1356	1017	739	685	122-135,6	
475B	57	57	135,6	2712	2712	1356	2033,7	2074,7	207,4	

MODEL	LIFT	PITCH	STEER	TILT	LIFT	PITCH	STEER	TILT	LIFT	PITCH	STEER	TILT
380III A	122,0-135,6	47,5-54,2	122,0-135,6	122,0-135,6	2033,7	2033,7	1355,8	2033,7	237,2-257,6	237,2-257,6	644,0-711,8	237,2-257,6

**TORQUE CHART KGF-m**

MODEL	FLANGE BOLTS			PISTON ROD NUT				CYLINDER CAP BOLTS		
	BOOM	BUCKET	STEER	BOOM	BUCKET	STEER	BOOM	BUCKET	STEER	
35C	5,5	1,4	1	2,8 <sup>2</sup>	2,8 <sup>2</sup>	24,2	24,2	24,2	0,3	
45C	5,5	1,4	1	2,8 <sup>2</sup>	2,8 <sup>2</sup>	24,2	24,2	24,2	0,3	
55C	5,5	1,4	1	2,8 <sup>2</sup>	2,8 <sup>2</sup>	24,2	24,2	24,2	0,3	
55B	2,3	1,0	1	103,7	55,3	2,8 <sup>2</sup>	12,4	29,0	0,6	
75B	2,3	2,3	1	103,7	55,3	2,8 <sup>2</sup>	12,4	29,0	0,6	
125B	5,8	2,3	1	138,3	138,3	103,7	23,2	44,2	2,5-2,8	
175B	5,8	5,8	2,3	138,3	138,3	103,7	41,5	69,9	12,4-13,8	
275B	5,8	5,8	2,3	138,3	138,3	103,7	75,3	69,9	12,4-13,8	
475B	5,8	5,8	13,8	276,6	276,6	138,3	207,0	211,1	21,1	

MODEL	LIFT	PITCH	STEER	TILT	LIFT	PITCH	STEER	TILT	LIFT	PITCH	STEER	TILT
380III A	12,4-13,8	4,8-5,5	12,4-13,8	12,4-13,8	207,4	207,4	138,3	207,4	24,2-26,3	24,2-26,3	65,7-72,6	24,2-26,3

<sup>1</sup>None Used  
<sup>2</sup>Lockbolt & Washer



August 1984

(This bulletin replaces Michigan SG-925 dated May 1982.  
REASON: New seal kit part numbers to eliminate ordering additional parts.)

SUBJECT: Improved Cylinder Rod Seals  
All Models

## SERVICE GRAM

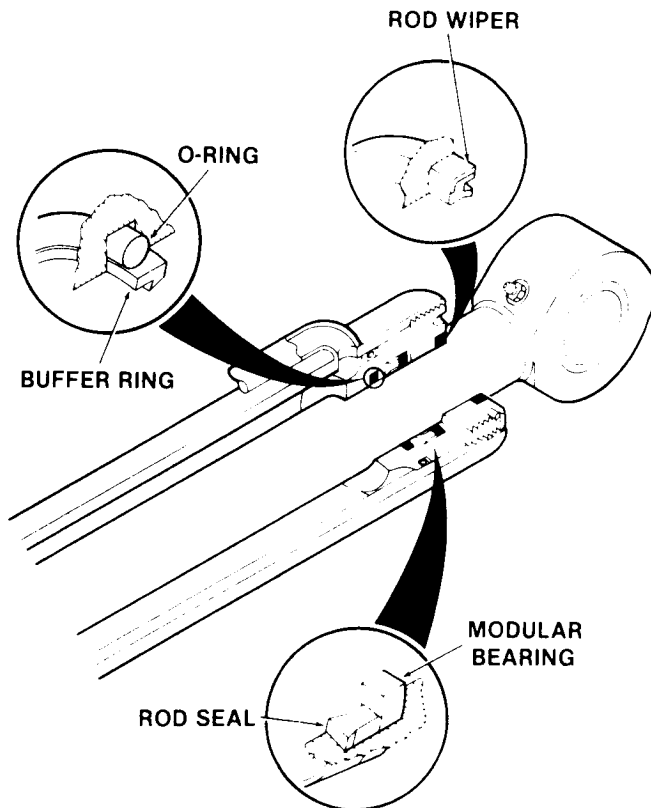
CLARK SG-925A  
Group Ref. No. 1100-  
1200

Changes have been made to improve the cylinder rod seal life. This has been done by the addition of a BUFFER RING to the cap. The buffer ring is used as an additional seal. This will keep high pressure oil away from the rod seal and keep the oil temperature lower at the rod seal.

Cylinder rod WEAR RINGS have been added to most cylinder caps. The wear ring is used as a rod bearing and will reduce repair costs by providing a replaceable part. The wear ring prevents contact between the piston rod and cylinder cap surfaces and will reduce the possibility of rod damage during transit.

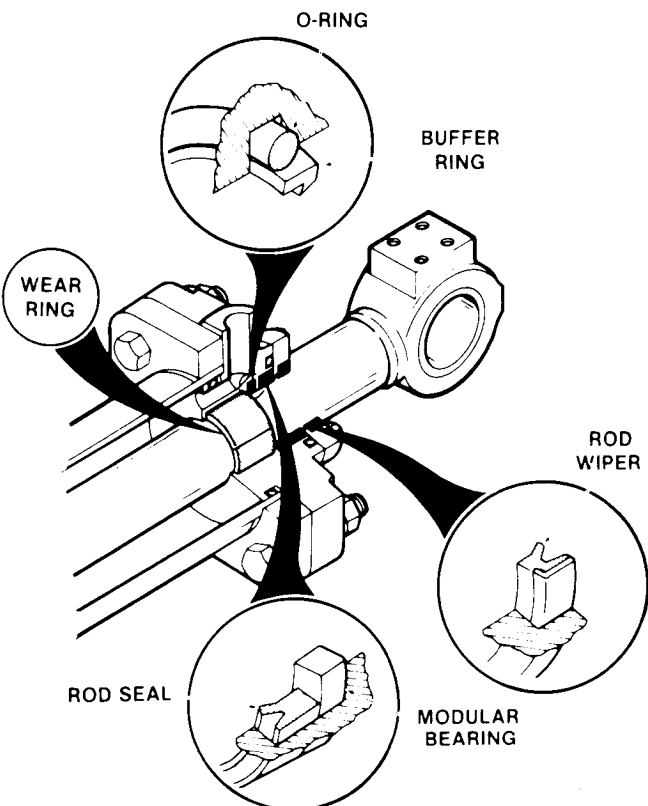
The buffer ring and wear ring are located in grooves machined in the cylinder cap bore.

These improvements should be added to all cylinders whenever rod seals need replacing.



**Figure 2**  
For caps fastened by a snap ring or a flange with threads.

TS 21424



**Figure 3**  
For caps fastened by bolts.

TS 21423

(11K1)

Most existing cylinder caps can be reworked to add the buffer ring and wear ring. The Cylinder Cap Rework Chart (A and Fig 1) is arranged by machine model, cylinder application and cylinder assembly part number. **To use this chart you must know the part number of the cylinder assembly or the cap being reworked.**

The cylinder cap and rod **must be inspected** for wear before rework. If the cap has a larger bore than the maximum cap bore or the rod diameter is smaller than the minimum rod diameter (see chart B for dimensions) the cap cannot be reworked and the rod should not be reused.

If only a buffer ring is being added to the cap, the rod bearing surface (area E, Figure 1) must be free of burrs and there should be no loose material in any scratches. Only small scratches are allowed as long as the bore diameter is not larger than the maximum cap bore (See Chart B). The rod seal counter bore area should be clean and free of rust, scratches and pitting. This surface has a recommended finish of 32 microinches (.8 micrometers) or better. After rework the buffer ring and wear ring grooves must have a finish of 63 microinches (1.6 micrometers) or better.

The piston rod must also be inspected for damage as well as for having a smaller diameter than the minimum rod diameter (See Chart B - Cylinder Cap and Rod Wear Limits).

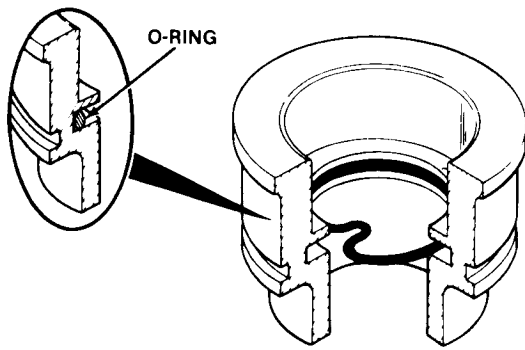
There are a limited number of reworked bucket and boom cylinder caps available at Central Parts. It is **recommended** that one set of reworked cylinder caps be ordered to start a customer rework and exchange program. New part numbers for the reworked caps and cylinder assemblies will be found in Chart C.

**NOTE:** *Be sure to record the new cap and cylinder assembly number in the machine record after rework.*

To order the parts from Chart C the part number of the cylinder must be known.

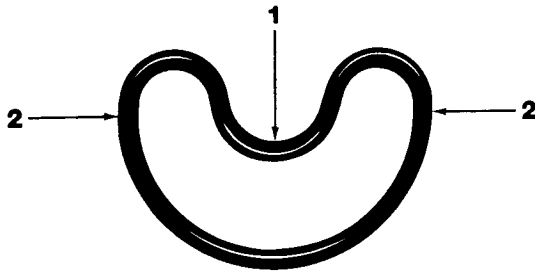
#### INSTALLATION:

1. Remove the cap from the piston rod.
2. Remove and discard the rod seal, modular bearing and wiper.
3. See Chart A and Fig. 1 for machining specifications.
4. For assembly of caps that are fastened in the cylinder by a flange or snap ring follow steps A-G. For caps that are fastened to the cylinder with bolts follow steps H - P.



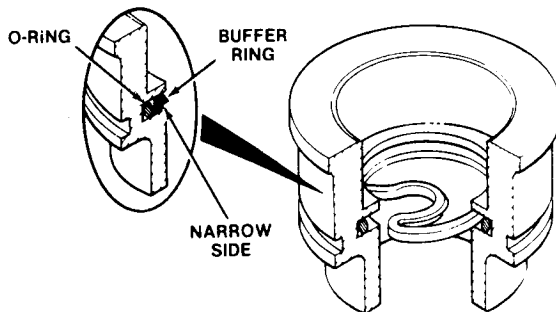
TS-21374

A. Apply hydraulic fluid to the o-ring. Install the o-ring in the groove.



TS-21398

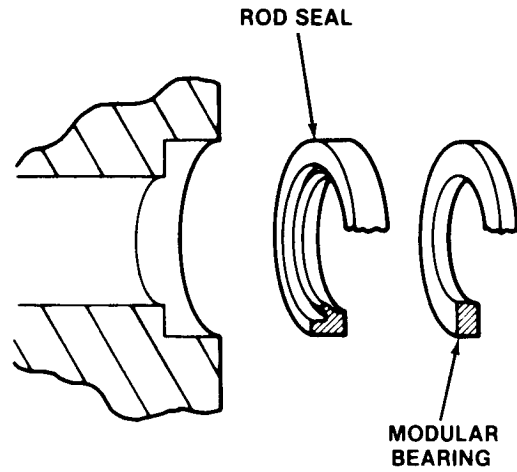
B. Apply hydraulic fluid to the buffer ring. Push the top (1) of the ring down while holding the sides (2). Push the sides together until the ring will slide into the bore.



TS 21373

C. Install the buffer ring.

**NOTE:** Be sure the ring is installed correctly, with the narrow side toward the inside of the cylinder. Carefully smooth the ring fully into the groove.

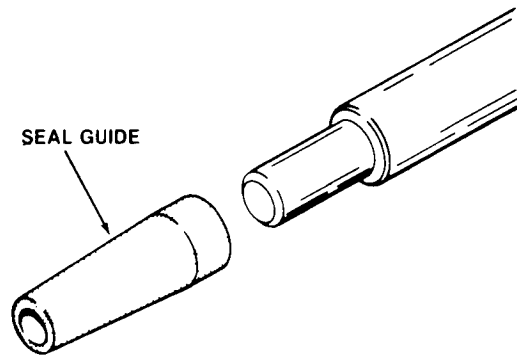


TS-21238

D. Apply hydraulic fluid to the rod seal and install with the lip toward the pressure.

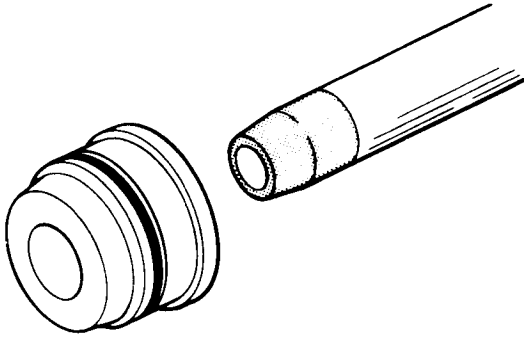
Apply hydraulic fluid to the modular bearing and install it.

Apply grease to the o-ring and back-up ring that fit on the outside of the cap. Install the back-up ring. Install the o-ring.



TS 21467

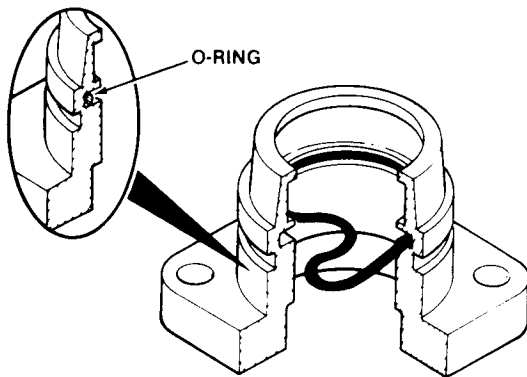
E. Apply grease to the inside of the seal guide and install it on the end of the rod. Apply hydraulic fluid to the outside of the guide.



TS-21124

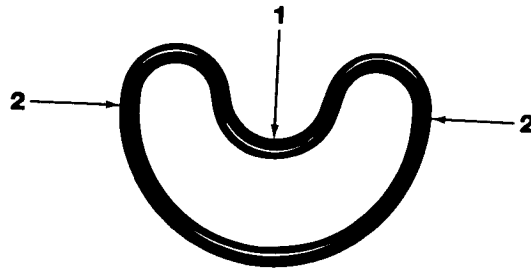
F. Install the retainer ring if used. Apply hydraulic fluid to the inside of the flange and install it on the rod, with the wiper toward the rod eye. Install the snap ring, if used. Apply hydraulic fluid to the inside of the cap and install it on the rod. **NOTE:** Be sure not to damage the rod seal or buffer ring.

G. Remove the seal guide and install the piston. Install the assembly into the cylinder. See Figure 2 for the completely assembled reworked cylinder assembly. See Shop Manual No. 3275 for complete cylinder disassembly and assembly information.



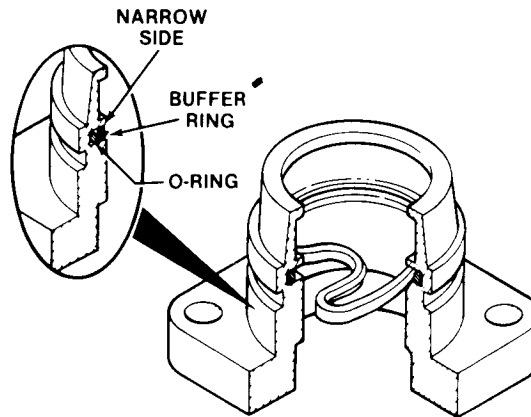
TS-21372

H. Apply hydraulic fluid to the o-ring. Install the o-ring in the groove.



TS-21398

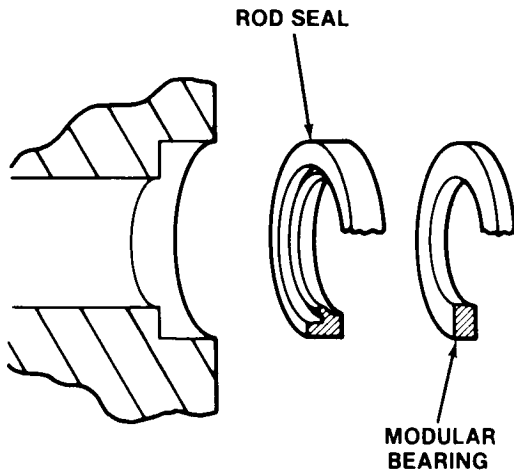
I. Apply hydraulic fluid to the buffer ring. Push the top (1) of the ring down while holding the sides (2). Push the sides (2) together until the ring wall slide into the bore.



TS-21371

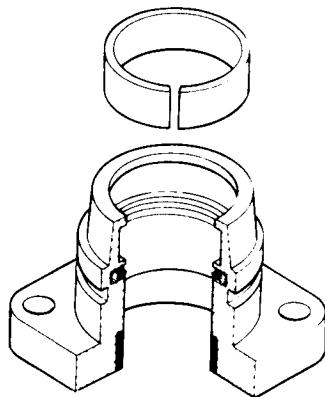
J. Install the buffer ring.

**NOTE:** Be sure the ring is installed correctly, with the narrow side toward the inside of the cylinder. Carefully smooth the ring fully into the groove.



TS-21238

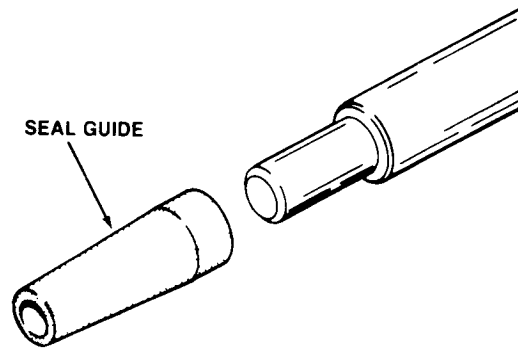
K. Apply hydraulic fluid to the rod seal and install **with the lip toward the pressure**. Apply hydraulic fluid to the modular bearing and install it. Apply hydraulic fluid to the new rod wiper. Install the wiper in the flange. Install the flange and retainer.



TS 21370

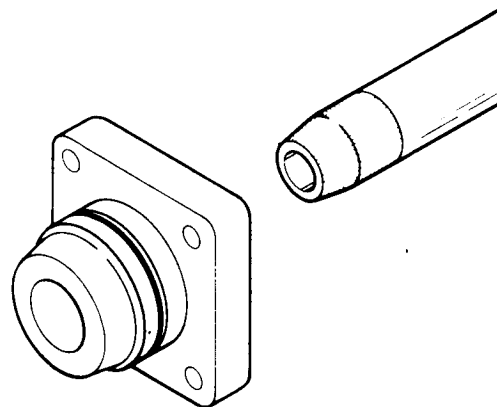
L. To install the wear ring in the groove, the ring must be compressed. To compress the ring, put one of the split ends of the ring inside of the other and push the ring together. A clamp may be used if needed.

M. Apply grease to the o-ring and backup ring that fit on the outside of the cap. Install the backup ring. Install the o-ring.



TS-21467

N. Apply grease to the inside of the seal guide and install it on the end of the rod. Apply hydraulic fluid to the outside of the guide.



TS-21125

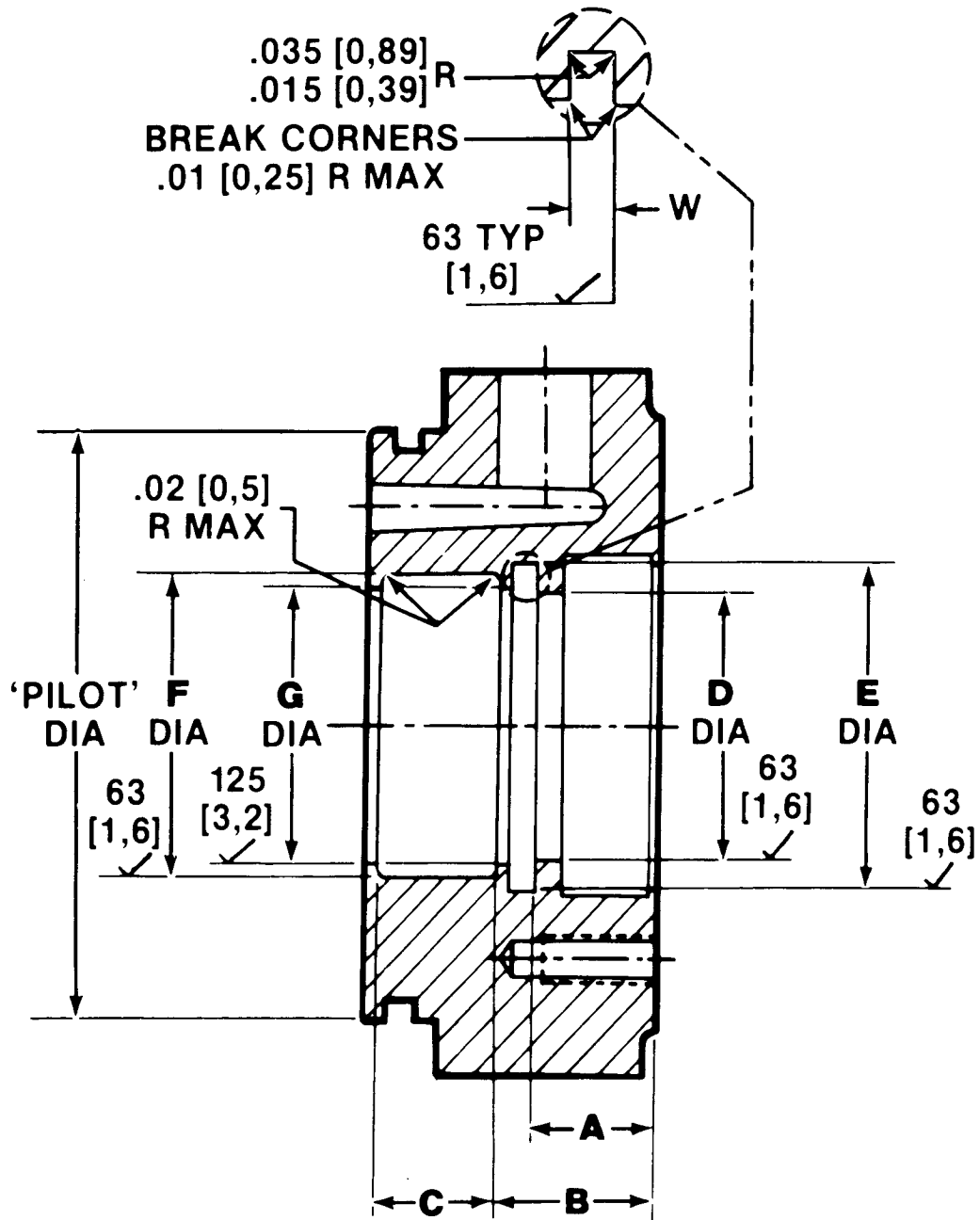
O. Apply hydraulic fluid to the inside of the cap and install it on the rod.

**NOTE:** *Be sure not to damage the rod seal or buffer ring.*

P. Remove the seal guide and install the piston. Install the assembly into the cylinder. See Figure 3 for the completely assembled reworked cylinder assembly.

See Shop Manual 3275 for complete cylinder disassembly and assembly information.

# CYLINDER CAP REWORK



**NOTE:**  
 DIAMETERS D, E, F & G  
 MUST BE CONCENTRIC  
 WITH 'PILOT' DIA  
 WITHIN  $.004 [0,1]$  FIM

**BREAK CORNERS**  
 $.02 [0,5] R \text{ MAX}$

TS-21422

Figure 1

CYLINDER CAP REWORK CHART

CYLINDER ORIGINAL CYLINDER ASSEMBLY	CYLINDER CAP		REWORKING DIMENSIONS									
	ORIGINAL CAP	CAP NUMBER AFTER REWORK	A INCHES	B INCHES	C INCHES	D INCHES	E INCHES	F INCHES	G INCHES	W INCHES		
2504218	2504217	964591	1.320-1.330	1.750-1.760	1.760-1.775	3.516-3.520	4.116-4.121	3.882-3.887	3.570-3.580	.247-.257		
2514095	2514105	964570	1.275-1.285	1.705-1.715	2.260-2.275	4.516-4.520	5.330-5.336	4.882-4.887	4.570-4.580	.320-.330		
2514101	2514100	964572*	1.315-1.325	1.695-1.705	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.820-2.830	.247-.257		
2514104	2514103	964571	1.315-1.325	1.770-1.780	3.885-3.900	4.516-4.520	5.330-5.336	4.882-4.887	4.570-4.580	.320-.330		
2514111	2514110	964582	1.200-1.220	1.550-1.570	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2514122	2514110	964582	1.200-1.220	1.550-1.570	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2514258	2514259	964670	1.220-1.240	---	---	---	2.424-2.428	---	---	.166-.176		
2516160	2516161	962701*	1.170-1.180	1.447-1.457	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2516176	2516173	964595	1.320-1.340	---	---	---	3.366-3.371	---	---	.247-.257		
2517389	2517386	2550691	1.320-1.340	1.700-1.720	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.820-2.830	.247-.257		
2517390	2517386	2550691	1.320-1.340	1.700-1.720	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.820-2.830	.247-.257		
2517395	2517392	964597	1.200-1.220	1.620-1.630	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2518075	2517601	2550685	1.200-1.220	1.510-1.530	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2518076	2517601	2550685	1.200-1.220	1.510-1.530	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2518117	2518118	964664*	1.220-1.240	---	---	---	2.424-2.428	---	---	.166-.176		
2518119	2518120	964574	1.320-1.340	1.750-1.760	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.820-2.830	.247-.257		
2518125	2516029	964576	1.320-1.340	---	---	---	3.366-3.371	---	---	.247-.257		
2518802	2518821	964666*	1.220-1.240	---	---	---	2.174-2.178	---	---	.166-.176		
2518871	2518821	964666*	1.220-1.240	---	---	---	2.174-2.178	---	---	.166-.176		
2520412	2523387	964659	1.200-1.220	1.510-1.530	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2522115	2517386	2550691	1.320-1.340	1.700-1.720	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.820-2.830	.247-.257		
2522120	2517386	2550691	1.320-1.340	1.700-1.720	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.820-2.830	.247-.257		
2522411	2516161	962701	1.170-1.180	1.447-1.457	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2522598	2522594	964594*	1.320-1.340	1.720-1.740	1.510-1.525	3.516-3.520	4.116-4.121	3.882-3.887	3.570-3.580	.247-.257		
2522607	2522606	962699	1.320-1.340	1.700-1.720	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.820-2.830	.247-.257		
2522880	2516161	962701	1.170-1.180	1.447-1.457	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2522932	2516161	962701*	1.170-1.180	1.447-1.457	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2523004	2512001	964587	1.220-1.240	---	---	---	2.424-2.428	---	---	.166-.176		
2524053	2524046	Do Not Rework	---	---	---	---	---	---	---	---		
2524276	2524275	2550687	1.320-1.340	1.700-1.720	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.82-2.83	.247-.257		
2524467	2524466	2550690	1.410-1.420	1.780-1.800	1.260-1.275	3.016-3.020	3.616-3.621	3.382-3.387	3.07-3.08	.247-.257		
2525298	2525292	2541244	1.320-1.340	---	---	---	3.366-3.371	---	---	.247-.257		
2525743	2525742	2541851*	1.220-1.240	---	---	---	2.174-2.178	---	---	.166-.176		
2525863	2525876	2550689	1.360-1.370	1.795-1.805	1.760-1.775	4.016-4.020	4.830-4.836	4.382-4.387	4.07-4.08	.320-.330		
2527513	2517601	2550685	1.200-1.220	1.510-1.530	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		

\* REWORKED CAPS FROM CPD NOT AVAILABLE AT THIS TIME

CYLINDER CAP REWORK CHART

CYLINDER ORIGINAL CYLINDER ASSEMBLY	CYLINDER CAP		REMACHINING DIMENSIONS										W MM
	ORIGINAL CAP	CAP NUMBER AFTER REWORK	A MM	B MM	C MM	D MM	E MM	F MM	G MM	F MM		W MM	
2504218	2504217	964591	33,528-33,782	44,450-44,704	44,704-45,085	89,306-89,408	104,546-104,673	98,603-98,730	90,678-90,932	98,603-98,730		6,274-6,528	
2514095	2514105	964570	32,385-32,639	43,307-43,561	57,404-57,785	114,706-114,808	135,382-135,534	124,003-124,130	116,078-116,332	124,003-124,130		8,128-8,382	
2514101	2514100	964572*	33,401-33,655	43,053-43,307	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	79,553-79,680		6,274-6,528	
2514104	2514103	964571	33,401-33,655	44,958-45,212	98,679-99,060	114,706-114,808	135,382-135,534	124,003-124,130	116,078-116,332	124,003-124,130		8,128-8,382	
2514111	2514110	964582	30,480-30,988	39,370-39,878	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	66,853-66,980		4,216-4,470	
2514122	2514110	964582	30,480-30,988	39,370-39,878	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	66,853-66,980		4,216-4,470	
2514258	2514259	964670	30,988-31,496	---	---	---	61,570-61,671	---	---	---		4,216-4,470	
2516160	2516161	962701*	29,718-29,972	36,754-37,008	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	66,853-66,980		6,274-6,528	
2516176	2516173	964595	33,528-34,036	---	---	---	85,496-85,623	---	---	---		6,274-6,528	
2517389	2517386	2550691	33,528-34,036	43,180-43,688	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	79,553-79,680		6,274-6,528	
2517390	2517386	2550691	33,528-34,036	43,180-43,688	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	79,553-79,680		6,274-6,528	
2517395	2517392	964597	30,480-30,988	41,148-41,402	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	66,853-66,980		4,216-4,470	
2518075	2517601	2550685	30,480-30,988	38,354-38,862	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	66,853-66,980		4,216-4,470	
2518076	2517601	2550685	30,480-30,988	38,354-38,862	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	66,853-66,980		4,216-4,470	
2518117	2518118	964664*	30,988-31,496	---	---	---	61,570-61,671	---	---	---		4,216-4,470	
2518119	2518120	964574	33,528-34,036	44,450-44,704	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	79,553-79,680		6,274-6,528	
2518125	2516029	964576	33,528-34,036	---	---	---	85,496-85,623	---	---	---		6,274-6,528	
2518802	2518821	964666*	30,988-31,496	---	---	---	55,220-55,321	---	---	---		4,216-4,470	
2518871	2518821	964666*	30,988-31,496	---	---	---	55,220-55,321	---	---	---		4,216-4,470	
2520412	2523387	964659	30,480-30,988	38,354-38,862	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	66,853-66,980		4,216-4,470	
2522115	2517386	2550691	33,528-34,036	43,180-43,688	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	79,553-79,680		6,274-6,528	
2522120	2517386	2550691	33,528-34,036	43,180-43,688	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	79,553-79,680		6,274-6,528	
2522411	2516161	962701	29,718-29,972	36,754-37,008	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	66,853-66,980		4,216-4,470	
2522598	2522594	964594*	33,528-34,036	43,688-44,196	38,354-38,735	89,306-89,408	104,546-104,673	98,603-98,730	90,678-90,932	98,603-98,730		6,274-6,528	
2522607	2522606	962699	33,528-34,036	43,180-43,688	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	79,553-79,680		6,274-6,528	
2522880	2516161	962701	29,718-29,972	36,754-37,008	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	66,853-66,980		4,216-4,470	
2522932	2516161	962701*	29,718-29,972	36,754-37,008	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	66,853-66,980		4,216-4,470	
2523004	2512001	964587	30,988-31,496	---	---	---	61,570-61,671	---	---	---		4,216-4,470	
2524053	2524046	Do Not Rework	---	---	---	---	---	---	---	---		---	
2524276	2524275	2550687	33,528-34,036	43,180-43,688	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	79,553-79,680		6,274-6,528	
2524467	2524466	2550690	35,814-36,068	45,212-45,720	32,004-32,385	76,606-76,708	91,846-91,973	85,903-86,030	77,978-78,232	85,903-86,030		6,274-6,528	
2525298	2525292	2541244	33,528-34,036	---	---	---	85,496-85,623	---	---	---		6,274-6,528	
2525743	2525742	2541851*	30,988-31,496	---	---	---	55,220-55,321	---	---	---		4,216-4,470	
2525863	2525876	2550689	34,544-34,798	45,593-45,847	44,704-45,085	102,006-102,108	122,682-122,834	111,303-111,430	103,378-103,632	111,303-111,430		8,128-8,382	
2527513	2517601	2550685	30,480-30,988	38,354-38,862	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	66,853-66,980		4,216-4,470	

\*REWORKED CAPS FROM CPD NOT AVAILABLE AT THIS TIME

CHART A



CYLINDER CAP REWORK CHART

CYLINDER ORIGINAL CYLINDER ASSEMBLY	CYLINDER CAP		REMANCHING DIMENSIONS									
	ORIGINAL CAP	CAP NUMBER AFTER REWORK	A INCHES	B INCHES	C INCHES	D INCHES	E INCHES	F INCHES	G INCHES	W INCHES		
2527549	2517601	2550685	1.200-1.220	1.510-1.530	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2527900	2527899	2550686*	1.315-1.325	1.695-1.705	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.82-2.83	.247-.257		
2528161	2528163	2550688	1.670-1.680	2.090-2.100	2.395-2.400	5.016-5.020	5.830-5.836	5.382-5.387	5.070-5.080	.320-.330		
2528419	2528422	964585*	1.220-1.240	---	---	---	2.424-2.428	---	---	.166-.176		
2528565	2528562	2550685	1.200-1.220	1.510-1.530	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2528566	2528562	2550685	1.200-1.220	1.510-1.530	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2528567	2528561	964574	1.320-1.340	1.750-1.760	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.820-2.830	.247-.257		
2528568	2528563	2550691	1.320-1.340	1.700-1.720	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.820-2.830	.247-.257		
2528569	2528564	964591	1.320-1.330	1.750-1.760	1.760-1.775	3.516-3.520	4.116-4.121	3.882-3.887	3.570-3.580	.247-.257		
2528570	2528563	2550691	1.320-1.340	1.700-1.720	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.820-2.830	.247-.257		
2528603	2528605	964582	1.200-1.220	1.550-1.570	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2528604	2528605	964582	1.200-1.220	1.550-1.570	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2528848	2528849	2541516*	1.200-1.240	---	---	---	2.674-2.678	---	---	.166-.176		
2528982	2540381	2550691	1.320-1.340	1.700-1.720	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.820-2.830	.247-.257		
2528983	2540381	2550691	1.320-1.340	1.700-1.720	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.820-2.830	.247-.257		
2529205	2525742	2541851*	1.220-1.240	---	---	---	2.174-2.178	---	---	.166-.176		
2529399	2529397	964673	1.315-1.325	1.730-1.740	1.895-1.900	2.766-2.770	3.366-3.371	3.132-3.137	2.82-2.83	.247-.257		
2529566	2528849	2541516*	1.200-1.240	---	---	---	2.674-2.678	---	---	.166-.176		
2529648	2532212	2541244	1.320-1.340	---	---	---	3.366-3.371	---	---	.247-.257		
2532204	2532205	964659	1.200-1.220	1.510-1.530	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2532213	2532212	2541244	1.320-1.340	---	---	---	3.366-3.371	---	---	.247-.257		
2532353	2532352	964664*	1.220-1.240	---	---	---	2.424-2.428	---	---	.166-.176		
2532427	2532425	964666*	1.220-1.240	---	---	---	2.174-2.178	---	---	.166-.176		
2532534	2532533	964595	1.320-1.340	---	---	---	3.366-3.371	---	---	.247-.257		
2532606	2532605	962701*	1.170-1.180	1.447-1.457	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2532655	2532656	964670	1.220-1.240	---	---	---	2.424-2.428	---	---	.166-.176		
2532705	2532425	964666*	1.220-1.240	---	---	---	2.174-2.178	---	---	.166-.176		
2536734	2528562	2550685	1.200-1.220	1.510-1.530	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2536739	2528562	2550685	1.200-1.220	1.510-1.530	.635-.650	2.266-2.270	2.674-2.678	2.632-2.637	2.320-2.330	.166-.176		
2536980	2536981	2550686*	1.315-1.325	1.695-1.705	1.260-1.275	2.766-2.770	3.366-3.371	3.132-3.137	2.82-2.83	.247-.257		

\* REWORKED CAPS FROM CPD NOT AVAILABLE AT THIS TIME

CHART A

CYLINDER CAP REWORK CHART

CYLINDER ORIGINAL CYLINDER ASSEMBLY	CYLINDER CAP		REMANCHING DIMENSIONS									
	ORIGINAL CAP	CAP NUMBER AFTER REWORK	A	B	C	D	E	F	G	W		
			MM	MM	MM	MM	MM	MM	MM	MM	MM	MM
2527549	2517601	2550685	30,480-30,988	38,354-38,862	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	4,216-4,470		
2527900	2527899	2550686*	33,401-33,655	43,053-43,307	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	6,274-6,528		
2528161	2528163	2550688	42,418-42,672	53,086-53,340	60,579-60,960	127,406-127,508	148,082-148,234	136,703-136,830	128,778-129,032	8,128-8,382		
2528419	2528422	964585*	30,988-31,496	---	---	---	61,570-61,671	---	---	4,216-4,470		
2528565	2528562	2550685	30,480-30,988	38,354-38,862	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	4,216-4,470		
2528566	2528562	2550685	30,480-30,988	38,354-38,862	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	4,216-4,470		
2528567	2528561	964574	33,528-34,036	44,450-44,704	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	6,274-6,528		
2528568	2528563	2550691	33,528-34,036	43,180-43,688	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	6,274-6,528		
2528569	2528564	964591	33,528-33,782	44,450-44,704	44,704-45,085	89,306-89,408	104,546-104,673	98,603-98,730	90,678-90,932	6,274-6,528		
2528570	2528563	2550691	33,528-34,036	43,180-43,688	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	6,274-6,528		
2528603	2528605	964582	30,480-30,988	39,370-39,878	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	4,216-4,470		
2528604	2528605	964582	30,480-30,988	39,370-39,878	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	4,216-4,470		
2528848	2528849	2541516*	30,480-31,496	---	---	---	67,919-68,021	---	---	4,216-4,470		
2528982	2540381	2550691	33,528-34,036	43,180-43,688	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	6,274-6,528		
2528983	2540381	2550691	33,528-34,036	43,180-43,688	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	6,274-6,528		
2529205	2525742	2541851*	30,988-31,496	---	---	---	55,220-55,231	---	---	4,216-4,470		
2529399	2529397	964673	33,401-33,655	43,942-44,196	47,879-48,260	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	6,274-6,528		
2529566	2528849	2541516*	30,480-31,496	---	---	---	67,919-68,021	---	---	4,216-4,470		
2529648	2532212	2541244	33,528-34,036	---	---	---	85,496-85,623	---	---	6,274-6,528		
2532204	2532205	964659	30,480-30,988	38,354-38,862	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	4,216-4,470		
2532213	2532212	2541244	33,528-34,036	---	---	---	85,496-85,623	---	---	6,274-6,528		
2532353	2532352	964664*	30,988-31,496	---	---	---	61,570-61,671	---	---	4,216-4,470		
2532427	2532425	964666*	30,988-31,496	---	---	---	55,220-55,321	---	---	4,216-4,470		
2532534	2532533	964595	33,528-34,036	---	---	---	85,496-85,623	---	---	6,274-6,528		
2532606	2532605	962701*	29,718-29,972	36,754-37,008	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	4,216-4,470		
2532655	2532656	964670	30,988-31,496	---	---	---	61,570-61,671	---	---	4,216-4,470		
2532705	2532425	964666*	30,988-31,496	---	---	---	55,220-55,321	---	---	4,216-4,470		
2536734	2528562	2550685	30,480-30,988	38,354-38,862	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	4,216-4,470		
2536739	2528562	2550685	30,480-30,988	38,354-38,862	16,129-16,510	57,556-57,658	67,919-68,021	66,853-66,980	58,928-59,182	4,216-4,470		
2536980	2536981	2550686*	33,401-33,655	43,053-43,307	32,004-32,385	70,256-70,358	85,496-85,623	79,553-79,680	71,628-71,882	6,274-6,528		

\*REWORKED CAPS FROM CPD NOT AVAILABLE AT THIS TIME

CHART A

CYLINDER ROD AND CAP WEAR LIMITS

ORIGINAL CYLINDER ASSEMBLY	MINIMUM ROD DIAMETER		MAXIMUM CAP BORE
	IN	MM	
2527549	2.25	57,15	2.259 57,379
2527900	2.75	69,85	2.759 70,079
2528161	5.00	127,00	5.009 127,229
2528419	2.25	57,15	2.259 57,379
2528565	2.25	57,15	2.259 57,379
2528566	2.25	57,15	2.259 57,379
2528567	2.75	69,85	2.759 70,079
2528568	2.75	69,85	2.759 70,079
2528569	3.50	88,90	3.509 89,129
2528570	2.75	69,85	2.759 70,079
2528603	2.25	57,15	2.259 57,379
2528604	2.25	57,15	2.259 57,379
2528848	2.25	57,15	2.259 57,379
2528982	2.75	69,85	2.759 70,079
2528983	2.75	69,85	2.759 70,079
2529205	1.75	44,45	1.759 44,679
2529399	2.75	69,85	2.759 70,079
2529566	2.25	57,15	2.259 57,379
2529648	2.75	69,85	2.759 70,079
2532204	2.25	57,15	2.259 57,379
2532213	2.75	69,85	2.759 70,079
2532353	2.00	50,80	2.009 51,029
2532427	1.75	44,45	1.759 44,679
2532534	2.75	69,85	2.759 70,079
2532606	2.25	57,15	2.259 57,379
2532655	2.00	50,80	2.009 51,029
2532705	1.75	44,45	1.759 44,679
2536734	2.25	57,15	2.259 57,379
2536739	2.25	57,15	2.259 57,379
2536980	2.75	69,85	2.759 70,079

ORIGINAL CYLINDER ASSEMBLY	MINIMUM ROD DIAMETER		MAXIMUM CAP BORE
	IN	MM	
2504218	3.50	88,90	3.509 89,129
2514095	4.50	114,30	4.509 114,529
2514101	2.75	69,85	2.759 70,079
2514104	4.50	114,30	4.509 114,529
2514111	2.25	57,15	2.259 57,379
2514122	2.25	57,15	2.259 57,379
2514258	2.00	50,80	2.009 51,029
2516160	2.25	57,15	2.259 57,379
2516176	2.75	69,85	2.759 70,079
2517389	2.75	69,85	2.759 70,079
2517390	2.75	69,85	2.759 70,079
2517395	2.25	57,15	2.259 57,379
2518075	2.25	57,15	2.259 57,379
2518076	2.25	57,15	2.259 57,379
2518117	2.00	50,80	2.009 51,029
2518119	2.75	69,85	2.759 70,079
2518125	2.75	69,85	2.759 70,079
2518802	1.75	44,45	1.759 44,679
2518871	1.75	44,45	1.759 44,679
2520412	2.25	57,15	2.259 57,379
2522115	2.75	69,85	2.759 70,079
2522120	2.75	69,85	2.759 70,079
2522411	2.25	57,15	2.259 57,379
2522598	3.50	88,90	3.509 89,129
2522607	2.75	69,85	2.759 70,079
2522880	2.25	57,15	2.259 57,379
2522932	2.25	57,15	2.259 57,379
2523004	2.00	50,80	2.009 51,029
2524053	4.50	114,30	4.509 114,529
2524276	2.75	69,85	2.759 70,079
2524467	3.00	76,20	3.009 76,429
2525298	2.75	69,85	2.759 70,079
2525743	1.75	44,45	1.759 44,679
2525863	4.00	101,60	4.009 101,829
2527513	2.25	57,15	2.259 57,379

CYLINDER CAP REWORK PARTS LIST

APPLICATION	ORIGINAL CYLINDER ASSEMBLY	CYLINDER ASSY. NO. AFTER REWORK	ORIGINAL CAP	CAP NUMBER AFTER REWORK	SEAL KIT
55B Boom	2514111	964661	2514110	964582	2542577
55B Boom	2514122	964660	2514110	964582	2542577
55B Boom	2528603	964660	2528605	964582	2542577
55B Boom	2528604	964661	2528605	964582	2542577
55B Bucket	2514258	964669	2514259	964670	2551403
55B Bucket	2532655	964669	2532656	964670	2551403
55B Steering	2518802	964667	2518821	964666	2542570
55B Steering	2532705	964667	2532425	964666	2542570
75B Boom	2518075	962702	2517601	2550685	2542577
75B Boom	2518076	962703	2517601	2550685	2542577
75B Boom	2527513	964783	2517601	2550685	2542577
75B Boom	2527549	964784	2517601	2550685	2542577
75B Boom	2528565	964783	2528562	2550685	2542577
75B Boom	2528566	964784	2528562	2550685	2542577
75B Bucket	2520412	964581	2523387	964659	2542577
75B Bucket	2532204	964581	2532205	964659	2542577
75B Steering	2518802	964667	2518821	964666	2542570
75B Steering	2532705	964667	2532425	964666	2542570
75C Boom	2528565	964783	2528562	2550685	2542577
75C Boom	2528566	964784	2528562	2550685	2542577
75C Boom	2536734	964784	2528562	2550685	2542577
75C Boom	2536739	964783	2528562	2550685	2542577
75C Bucket	2529648	964791	2532212	2541244	2542569
75C Steering	2529205	964792	2525742	2541851	2542570
125B Boom	2517390	964597	2517386	2550691	2542568
125B Boom	2528568	964597	2528563	2550691	2542568
125B Boom	2517389	964598	2517386	2550691	2542568
125B Boom	2528570	964598	2528563	2550691	2542568
125B Bucket	2517395	964578	2517392	964579	2542576
125B Steering	2518871	964671	2518821	964666	2542576
125B Steering	2532427	964671	2532425	964666	2542570
125C Boom	2528983	964793	2540381	2550691	2542568
125C Boom	2528982	964794	2540381	2550691	2542568
125C Bucket	2525298	964795	2525292	2541244	2542569
125C Bucket	2532213	964796	2532212	2541244	2542569
125C Steering	2525743	964797	2525742	2541851	2542570
175B Boom	2518119	964596	2518120	964574	2551397
175B Boom	2528567	964596	2528561	964574	2551397
175B Bucket	2518125	964575	2516029	964576	2542568
175B (L4) Bucket	2524276	964798	2524275	2550697	2542568

CYLINDER CAP REWORK PARTS LIST (Continued)

APPLICATION	ORIGINAL CYLINDER ASSEMBLY	CYLINDER ASSY. NO. AFTER REWORK	ORIGINAL CAP	CAP NUMBER AFTER REWORK	SEAL KIT
175B Steering	2518117	964586	2518118	964664	2551398
175B Steering	2532353	964586	2532352	964664	2551398
175C Boom	2524467	964799	2524466	2550690	2542571
175C Bucket	2524276	964798	2524275	2550687	2542568
175C Steering	2528848	964801	2528849	2541516	2542576
275B Boom	2504218	964590	2504217	964591	2551396
275B Boom	2528569	964590	2528564	964591	2551396
275B Bucket	2516176	964573	2516173	964595	2551397
275B Bucket	2532534	964573	2532533	964595	2551397
275B Steering	2516160	962700	2532605	962701	2551399
275B Steering	2532606	962700	2532605	962701	2551399
275C Boom	2525863	964802	2525876	2550689	2542574
275C Bucket	2529399	964803	2529397	964673	2551397
275C Steering	964804	964804	2528849	2541516	2542576
475B Boom	2514095	964569	2514105	964570	2551400
475B Bucket	2514104	964589	2514103	964571	2542572
475B Steering	2514101	964592	2514100	964572	2551397
475C Boom	2528161	964805	2528163	2550688	2542573
475C Bucket	2524053	964806	Use New	2540119	2542572
475C Steering	2527900	964807	2527899	2550686	2542568
475C Steering	2536980	964807	2536981	2550686	2542568
280 IIIA, Lift	2522607	962698	2522606	962699	2542568
280 IIIA, Pitch	2523004	964665	2512001	964587	2551398
280 IIIA, Steering	2522932	964665	2516161	964585	2551399
280 IIIA, Tilt	2522880	964662	2516161	962701	2551399
280B Lift	2522607	962698	2522606	962699	2542568
280B Pitch	2523004	964665	2512001	964587	2551398
280B Steering	2528419	964663	2528422	964585	2551399
280B Tilt	2522880	964662	2516161	962701	2551399
380 IIIA, Lift	2522115	962697	2517386	2550691	2542568
380 IIIA, Pitch	2522411	964583	2516161	962701	2551399
380 IIIA, Steering	2522598	964593	2522594	964594	2551402
380 IIIA, Tilt	2522120	964577	2517386	2550691	2542568
380B Lift	2522115	962697	2517386	2550691	2542568
380B Pitch	2522411	964583	2516161	962701	2551399
380B Steering	2522598	964593	2522594	964594	2551402
380B Tilt	2522120	964577	2517386	2550691	2542568

August 1982

MICHIGAN SG - 950  
Group Ref. No. 1100  
1200

**SUBJECT: Cylinder Polypac Rod Seals for Temporary Cylinder Repair  
All Models of Wheel Loaders and Dozers**

Split polypac rod seals are now available for use to give a quick way of repairing cylinder seal leakage without having to disassemble the cylinder.

This will help to keep machine downtime to a minimum.

*NOTE: The polypac seal is recommended to be used as a temporary repair only. The service life may not be as long as the ring type seal. Replace the polypac seal with the correct ring type seal as soon as possible.*

To install the seal, order the parts from the list below and see Shop Manual No. 3275 and Supplement No. 3283 for complete installation instructions and information.

Seal Part Number:	to be used on	Cylinders with a Rod Diameter of:
2533853		3 in. (76,2 mm)
2533854		4 in. (101,6 mm)
2533855		5 in. (127,0 mm)
2533856		5.5 in. (139,7 mm)