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Parts and Service Manual **TIREPUMPER**

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MANUAL PART NUMBER 99900388

Iowa Mold Tooling Co., Inc. is an Oshkosh Truck Corporation company.

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REVISIONS LIST

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TO ORDER PARTS:

1. Give the model number.
2. Give the serial number.
3. Give the part number, description and quantity needed.

NOTE:

IMT will not be responsible for parts ordered without the serial number.

SECTION 1. OPERATION

1-1. PRINCIPLE OF OPERATION

The TIREPUMPER is a two-chambered pump driven by compressed air against a diaphragm. Each chamber is divided by a diaphragm. One side of the diaphragm is the liquid being pumped. As compressed air moves one diaphragm outward, the diaphragm in the other chamber is drawn inward by a reciprocating rod which connects the two diaphragms. As the diaphragm moves outward, it causes pressure on the liquid side of the diaphragm which evacuates that chamber. Simultaneously, the other diaphragm is creating a vacuum on the liquid side of the diaphragm which draws liquid into the other chamber. At the end of the stroke, the rod and diaphragms change direction and the chamber that just filled is evacuated. As one chamber fills, the other chamber evacuates and then the rod reverses direction. The two fluid chambers are manifolded together with a suction and discharge check valve for each chamber to maintain flow in one direction.

Alternate pressurizing and exhausting of the diaphragm air chamber is performed by an air distribution valve. When the spool is at one end of the valve body, inlet air pressure is connected to one diaphragm chamber and the other diaphragm air chamber is connected to the exhaust. When the spool moves to the opposite end of the valve body, the chamber porting is reversed.

1-2. OPERATION

A. The Tirepumper does not come standard with a built-in lubrication reservoir. An in-line lubricator should be installed in the compressed air line and filled with Air Lube AF anti-freeze lubricant for year around operation. No alterations should be made to the pump.

B. Make sure air line to pump is free from dirt or other foreign matter. Blow out air line before attaching to pump.

C. Turn on air supply to pump.

CAUTION

MAKE SURE AIR SUPPLY PRESSURE TO PUMP DOES NOT EXCEED 125 PSIG.

The Tirepumper is supplied with a preset pressure regulator. Do not attempt to alter regulator knob or breakage will occur.

Pumping volume is controlled by a color flow valve which is supplied.

D. Pumping volume (gpm) can be set by counting the number of strokes per minute. The Tirepumper pumps approximately 1/10 gallon per stroke. A stroke is 1/2 cycle or one air exhaust.

When pump is used for moving thick materials check stroke rate to determine that pump is not operating at a faster rate than material is capable of flowing, or cavitation will occur. If pump is operating at a speed too fast for available flow, reduce the volume of air to the pump until stroke rate approximates discharge volume (30-60 cycles per minute).

If opening the color flow valve increases cycling rate without increasing the flow rate, the pump is being starved of liquid due to suction limitations. Further opening of the air inlet valve will waste compressed air. Set the inlet valve for the lowest cycling rate that meets your particular needs.

1-3. MIXING SOLUTION

Prepare by pouring the calcium chloride mixture into the water (never the water into the calcium chloride, as considerable heat is generated in this mixing process). The solution should be allowed to cool to atmospheric temperature before pumping in the tire.

1-4. CONNECTING THE VALVE STEM

The following connections should be made when the pump is not running and with control handle in the check position. To connect liquid fill core ejector to 2-piece style rear tractor valves (see Figure A-1):

1. Unscrew union (item 1) from core ejector body (item 2) and screw on valve stem finger tight.
2. Screw core ejector body on union (item 1) making certain rubber gasket (item 3) is in place, with handle (item 4) of core ejector pulled out.
3. Push handle (item 4) of core ejector in until it makes contact with the core housing of the valve, then hold the core ejector in left hand, strike the handle (item 4) with the right hand to force the core housing in ejector chuck (item 6).
4. Turn handle (item 4) to the left to unscrew the core housing, pushing inward lightly so you can feel the threads disengage when completely unscrewed.
5. Pull handle (item 4) out as far as it will go to retract core housing into ejector body. The handle will pull out easier if rotated while pulling, as packing nut (item 7) should be tight enough to prevent air or liquid leaks.

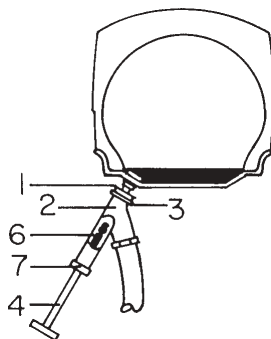


FIGURE A-1.

To connect liquid fill core ejector to 1-piece style front tractor valves (see Figure A-2):

1. Screw adapter (item A) and gasket to union (item 1).
2. Insert large end of core remover (item B) securely into chuck of core housing ejector (item 6).
3. Screw adapter and union assembly on valve stem finger tight.
4. Screw ejector union and adapter assembly to core ejector body making sure gasket is in place. The rest of the operation is the same as with the above 2-piece valve as described above.

1-5. REMOVING SOLUTION FROM TUBE-TYPE OR TUBELESS TIRE

Jack up tractor until tire is slightly deflected and valve is at the bottom. Connect core housing ejector and union to valve stem as previously described. Unscrew and retract core housing into ejector body with control handle at check position.

Turn control handle to evacuate position and start pump. Run until tire is completely evacuated. Turn control handle to check position, stop pump and disconnect core ejector after replacing core housing in valve stem.

In case of a tubeless tire, unseat beads and demount front bead from rim and pump remaining solution from tire.

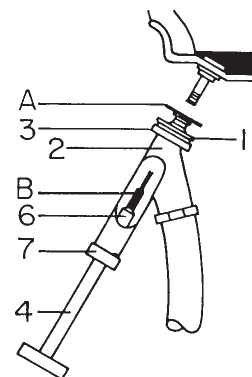


FIGURE A-2.

1-6. FILLING TUBE-TYPE OR TUBELESS TIRES WITH SOLUTION

To fill a tire 75% with water or solution:

1. Inflate tire to 35 psi after beads have been fully seated in mounting procedure.
2. Jack up the wheel, if done on a tractor, and turn to bring valve to top position.
3. Lower jack until tire is slightly deflected.
4. With pump not running and control handle at check position, connect ejector and remove core housing as described above.
5. After connection is made, bleed pressure down to about 5 lbs. (to keep the beads seated on the rim) by moving control handle to evacuate position.
6. Start pump and move control handle to fill position. Start hydroinflating tire. Check pressure in tire every few minutes with pump gauge by placing pump in the check position. If pressure exceeds 20 psi move handle to evacuate until pressure is bled back to not less than 5 psi. After pressure is lowered, continue pumping. Repeat above steps as often as necessary to fill until water or solution weight added to the assembly is equal to that shown in the Liquid Weighting Tables.

7. Replace core housing in valve stem by pushing handle in until contact is made and turn to right until core housing is screwed tight in valve stem.

8. Withdraw handle, turn handle to evacuate, and pump all liquid from hose.

9. Shut off pump, then unscrew ejector body (item 2) and union (item 1) from valve.

10. Set final working pressure after tire has been mounted on tractor with weight on tire and valve at bottom, using an air-water gauge according to tire manufacturer's specifications.

WARNING

NEVER INFLATE BEYOND 35 LBS. PRESSURE. IF BEADS HAVE NOT SEATED BY THE TIME PRESSURE REACHES 35 PSI, DEFLATE THE ASSEMBLY, REPOSITION THE TIRE ON THE RIM, RE-LUBRICATE AND RE-INFLATE. AFTER SEATING BEADS, ADJUST INFLATION TO RECOMMENDED PRESSURE. ALLOWING AIR PRESSURE TO BUILD WITHIN THE ASSEMBLY IN AN ATTEMPT TO SEAT THE BEADS IS A DANGEROUS PRACTICE. IN SEATING BEADS, INFLATION BEYOND 35 POUNDS PRESSURE MAY BREAK THE BEAD (OR EVEN THE RIM) WITH EXPLOSIVE FORCE SUFFICIENT TO CAUSE SERIOUS PHYSICAL INJURY OR DEATH. INSPECT BOTH SIDES OF THE TIRE TO BE SURE BEADS ARE EVENLY SEATED. IF NOT, COMPLETELY DEFLATE TIRE, UNSEAT BEADS AND REPEAT ENTIRE MOUNTING PROCEDURE.

1-7. LIQUID WEIGHTING OF TRACTOR TIRES

The following tables provide data on the filling of front and rear tractor tires with calcium chloride solution, based on valve level or approximately 75% fill.

These tables are based on the use of Type 1 - 77% commercial calcium chloride flake. If Type 2 - 94% calcium chloride flake is used, reduce the pounds/kilograms CaCl₂ weights in these tables by 25%.

Where freezing temperatures never occur, plain water can be used, but the weight added will be 20% less than calcium chloride solution. Plain water freezes solid at 32°F/0°C.

Where anti-freeze protection is needed, the 3-1/2 lb/420g calcium chloride solution is slush free to -12°F/-24°C and will freeze solid at -52°F/-47°C. The 5 lb/600g calcium chloride solution is slush free to -52°F/-47°C and will freeze solid at -62°F/-52°C.

Table A-1. LIQUID WEIGHTING - FRONT TRACTOR TIRES

TIRE SIZE	WATER		3-1/2 lbs/420g CaCl ₂			5 lbs/600g CaCl ₂		
		WEIGHT	WATER	CaCl ₂	TOTAL WT	WATER	CaCl ₂	TOTAL WT
	GAL/LITER	LBS/KG	GAL/LITER	LBS/KG	LBS/KG	GAL/LITER	LBS/KG	LBS/KG
4.00-12	2/8	177/7	1.7/7	6/2.7	20/9.1	1.6/6	8/3.6	21/9.5
4.00-15	2.5/10	219/5	2/8	7/3.2	24/11	2/8	10/4.5	27/12
5.00-15	4/15	33/15	3/12	10/4.5	35/16	3/12	15/6.8	40/18
5.50-16	5/19	42/19	4/15	14/6.4	47/21	4/15	20/9.1	53/24
6.00-14	6/23	50/23	5/19	18/8.2	60/27	5/19	25/11	67/30
6.00-16	6/23	50/23	5/19	18/8.2	60/27	5/19	25/11	67/30
6.50-16	7/27	58/26	6/23	21/9.5	71/32	5.5/21	28/13	74/34
7.50-10	6/23	50/23	5/19	18/8.2	60/27	4.8/18	24/11	64/29
7.5L-15	8.5/33	71/32	7/27	24/11	82/37	7/27	35/16	93/42
7.50-16	10/38	83/38	8.5/33	30/14	101/46	8/28	40/18	107/49
7.50/18	11/42	92/42	9.5/37	33/15	112/51	9/35	45/20	120/54
7.50-20	12/46	100/45	10/38	35/16	118/54	9.5/37	48/22	127/58
9.00-10	9/35	75/34	7.5/29	26/12	89/40	7.2/28	36/16	96/44
9.5L-15	11/42	92/42	9.5/37	33/15	112/51	9/35	45/20	120/54
9.50-15	18/69	150/68	16/62	56/25	189/86	15/58	75/34	200/91
9.50-20	18/69	150/68	16/62	56/25	189/86	15/58	72/33	200/91
9.50-24	20/77	167/77	17/65	60/27	202/92	16/62	80/36	213/97
10.00-16	18/69	150/68	16/62	56/25	189/86	15/58	69/31	184/84
11L-15	14/54	117/53	12/46	42/19	142/64	11/42	53/24	147/67
11L-16	15/58	123/56	13/50	46/21	155/70	12/46	60/27	160/73
11.00-15	24/92	200/91	20/77	70/32	237/108	19/73	95/43	253/115
11.00-16	25/96	208/94	22/85	77/35	260/118	20/77	93/42	267/121
14L-16.1	28/108	233/106	24/92	84/38	284/129	23/88	110/50	307/139
16.5L-16.1	41/158	342/155	35/135	122/55	414/188	33/127	167/76	440/220

Table A-2. LIQUID WEIGHTING - REAR TRACTOR TIRES

TIRE SIZE	WATER		3-1/2 lbs/420g CaCl ₂			5 lbs/600g CaCl ₂		
		WEIGHT	WATER	CaCl ₂	TOTAL WT	WATER	CaCl ₂	TOTAL WT
	GAL/LITER	LBS/KG	GAL/LITER	LBS/KG	LBS/KG	GAL/LITER	LBS/KG	LBS/KG
7.2-16	7/26	58/26	6/23	21/9.5	71/32	5/19	25/11	67/30
8.3-16	9/34	75/34	8/30	28/13	95/43	8/27	40/18	107/49
9.5-16	12/45	100/45	10/38	35/16	118/54	10/38	50/23	133/60
11.2-16	18/68	150/68	15/57	53/24	178/81	14/53	70/32	187/85
12.4-16	21/79	175/79	18/68	63/29	213/97	17/64	85/39	227/103
13.6-16.1	31/117	258/117	26/98	91/41	308/140	25/95	125/57	333/151
18.4-16.1	49/185	409/186	42/159	147/67	497/225	39/148	195/88	520/236
8.3-24	13/49	108/49	11/42	39/18	131/59	10/38	50/23	133/60
9.5-24	17/64	142/64	15/57	53/24	178/81	14/53	70/32	187/85
11.2-24	24/91	200/91	20/76	70/32	237/108	19/72	95/43	253/115
12.4-24	30/114	250/113	26/98	91/41	308/140	25/95	125/57	333/151
13.6-24	38/144	317/144	32/121	112/51	379/172	30/114	150/68	400/181
14.9-24	47/178	392/178	40/151	140/64	474/215	38/144	190/86	507/230
16.9-24	61/231	509/231	52/197	182/83	616/279	49/185	245/111	654/297
17.5L-24	55/208	459/208	47/178	165/75	557/253	45/170	225/102	600/272
19.5L-24	69/265	575/265	60/231	210/95	710/322	56/215	280/127	747/339
21L-24	87/335	725/335	74/285	259/118	876/398	70/269	350/159	934/424
14.9-26	48/182	400/181	41/155	144/65	486/220	39/148	195/88	520/236
16.9-26	65/246	542/246	56/212	196/89	663/301	52/197	260/118	694/315
18.4-26	79/299	659/299	68/257	238/108	805/365	64/242	320/145	854/387
23.1-26	128/485	1068/485	109/413	328/173	1291/586	103/390	515/234	1374/623
24L-26	128/484	1068/484	106/484	110/416	385/175	1302/591	104/394	520/236
28L-26	157/594	1309/594	134/507	469/213	1587/720	127/481	635/288	1694/769
11.2-28	27/102	225/102	24/91	84/38	284/129	22/83	110/50	293/178
12.4-28	35/132	292/132	30/114	105/48	355/161	28/106	140/64	374/170
13.6-28	43/163	359/163	37/140	130/59	439/199	35/132	175/79	467/212
14.9-28	53/201	442/201	46/174	161/73	545/247	43/163	215/98	574/260
16.9-28	69/261	575/261	59/223	207/94	699/317	56/212	280/127	747/339
18.4-28	84/318	701/318	72/273	252/114	852/387	68/257	340/154	907/412
21L-28	97/367	809/367	83/314	291/132	982/445	79/299	395/179	1054/478
14.9-30	57/216	475/216	48/182	168/76	568/258	46/174	230/104	614/279
16.9-30	73/276	609/276	63/238	221/100	746/338	59/223	292/132	787/357
18.4-30	89/337	742/337	77/291	270/123	912/414	72/273	360/163	960/436
23.1-30	143/541	1193/541	123/466	431/196	1457/661	116/439	580/263	1547/702
24.5-32	170/644	1418/643	146/553	511/232	1729/784	138/522	690/313	1841/835
30.5L-32	217/821	1809/821	186/704	651/295	2202/999	176/666	880/399	2347/1065
35.5L-32	313/1204	2609/1204	268/1031	938/426	3172/1440	254/977	1270/577	3388/1538
14.9-34	63/238	525/238	54/204	189/86	639/290	51/193	255/116	680/308
16.9-34	82/310	684/310	70/265	245/111	829/376	66/250	330/150	880/399
18.4-34	100/379	834/378	85/322	298/135	1007/457	81/307	405/184	1081/1490
20.8-34	128/485	1068/485	109/413	328/173	1291/1586	103/390	515/234	1374/623
23.1-34	159/602	1326/602	136/515	476/216	1610/730	128/485	640/290	1708/775
13.9-36	51/193	425/193	44/167	154/70	521/236	42/159	210/95	560/254
13.6-38	57/216	475/216	49/185	172/78	581/264	46/174	230/104	614/279
15.5-38	66/250	550/250	56/212	196/89	663/301	53/201	265/120	707/321
16.9-38	90/341	751/341	77/291	270/123	912/414	73/276	365/166	974/442
18.4-38	110/416	971/416	94/356	329/149	1113/505	89/337	445/202	1187/539
20.8-38	140/530	1168/530	120/454	420/191	1421/645	114/432	570/259	1521/690
18.4-42	115/442	959/435	98/377	343/156	1160/527	93/358	465/211	1240/563
20.8-42	148/569	1234/560	127/488	444/202	1503/682	120/462	600/272	1600/726
14.9-46	80/303	667/303	68/257	238/108	805/365	65/246	325/147	867/393
18.4-46	129/488	1075/488	111/420	389/176	1314/596	105/397	525/238	1400/635
20.8-46	150/568	1251/568	128/384	448/203	1515/687	121/458	605/274	1614/732
10-16.5	12/46	97/44	10/38	35/16	119/54	10/38	50/23	134/61
12-16.5	15/58	126/57	13/50	46/21	154/70	13/50	65/30	78/35
14-17.5	22/85	185/84	19/73	67/30	227/103	19/73	95/43	114/52
15-19.5	29/112	240/109	25/96	87/39	294/133	25/96	125/57	150/68

SECTION 2. INSTALLATION AND REPAIR

WARNING

POSSIBLE EXPLOSION HAZARD CAN RESULT IF 1,1,1,-TRICHLOROETHANE, METHYLENE CHLORIDE OR OTHER HALOGENATED HYDROCARBON SOLVENTS ARE USED IN PRESSURIZED FLUID SYSTEMS HAVING ALUMINUM OR GALVANIZED WETTED PARTS. DEATH, SERIOUS BODILY INJURY OR PROPERTY DAMAGE COULD RESULT. CONSULT WITH THE FACTORY IF YOU HAVE QUESTIONS CONCERNING THE USE OF HALOGENATED HYDROCARBON SOLVENTS.

2-1. INSTALLATION PROCEDURE

Position the pump as close as possible to the source of the liquid to be pumped. Avoid long or undersized suction lines and use as few fittings as necessary. At the time of installation, inspect all external fasteners for tightness. Tighten loose fittings to prevent leakage.

The pump can be submerged if the materials of construction are compatible with the liquid and the exhaust is piped above the liquid level. Piping for the exhaust must not be smaller than 1". Reduced pipe size can restrict the exhausted air and reduce pump performance.

If the unit is to be totally submerged, the air exhaust must be piped above liquid level to prevent the liquid and foreign material from entering the air distribution mechanism.

2-2. AIR SUPPLY

Do not connect the unit to an air supply in excess of 125 PSI (8.61 bar). Install a shutoff valve in the air line to permit removal of the pump for servicing. When connecting an air supply of rigid piping, mount a section of flexible line to the pump to eliminate strain on the piping. The use of an in-line air filter is recommended. Support the weight of the air line and filter to prevent excessive weight on the pump's air valve. Failure to comply may result in damage to the pump.

2-3. FREEZING OR ICING OF EXHAUST

Icing of the air exhaust can occur under certain conditions. When pump performance suffers because of icing, be certain to use the proper lubricant as shown in the Troubleshooting section. Icing is more likely to occur at high discharge pressures.

2-4. MAINTENANCE

CAUTION

BEFORE MAINTENANCE OR REPAIR, SHUT OFF THE COMPRESSED AIR, BLEED THE PRESSURE AND DISCONNECT THE AIR LINE FROM THE PUMP. THE PUMP DISCHARGE LINE MAY BE PRESSURIZED AND MUST BE BLED. WHEN THE PUMP IS USED FOR TOXIC OR CAUSTIC FLUIDS, IT SHOULD BE FLUSHED CLEAN PRIOR TO DISASSEMBLY.

When the pump is used for materials that tend to settle out or change state from a liquid to a solid, care must be taken after each use or during idle time to remove them and flush the pump as required to prevent damage.

In freezing temperatures, the pump must be completely drained unless the liquid is resistant to freezing. After disconnecting the discharge and inlet hoses, tilt the pump to drain the fluid.

2-5. CHECK VALVE SERVICING

The need for servicing is usually indicated by poor priming, unstable cycling, poor performance or the pump is cycling, but not pumping.

Remove the manifold. Inspect the balls and seats for wear or damage. If pump is to prime properly, valves must be air tight.

2-6. PUMP SERVICING

Refer to the "Disassembly/Reassembly Instructions" (manual part number 99900503) for any repair procedures specific to the pump (IMT part number 70731387).

CAUTION

WEAR SAFETY GLASSES WHENEVER REPAIRS ARE BEING PERFORMED. FAILURE TO DO SO CAN RESULT IN SERIOUS INJURY.

2-7. TROUBLESHOOTING

This information is to be used as a guide to help you determine a plan of action when experiencing one or more of the following conditions. This guide should be used in conjunction with appropriate manuals which accompany the Tirepumper. The following conditions of operation are covered in this guide:

1. Fast Cycles/Low Volume
2. No Cycles
3. Leaking
4. Noise
5. Parts Breakage
6. Slow Cycles
7. Erratic Cycles

These are all common conditions that may be experienced over the life of your pump. Each condition is broken down into potential causes. The causes are listed, and recommendations to correct these causes are given.

Definitions for specific terms used within this guide are listed below:

AIR VALVE - Brass or stainless steel housing attached to the pump center block by four bolts.

PISTON - Aluminum cylinder housing within the air valve. Controls flow of air within the pump.

CAVITATION - Pump is discharging less fluid than its rated capacity due to a reduction or lack of fluid supply to the pump inlet. In effect, the pump's liquid chamber is not filled prior to discharge.

STATIC DISCHARGE HEAD - The vertical distance, in feet, from the pump center line to the point of free delivery of the liquid.

INLET PRESSURES - Includes the relative weight and velocity of the fluid measured in pounds of pressure at the inlet of the pump.

SPECIFIC GRAVITY - Ratio of any liquid's weight to that of water at 62°F. Water at 62°F is said to have a specific gravity of 1.0.

STATIC SUCTION LIFT - The vertical distance, in feet, from the liquid supply level to the pump center line, the pump being above supply level.

VAPOR PRESSURE - All liquids exert pressure due to formation of vapor at its free surface. In any pumping system the pressure at any point should never be reduced below the vapor pressure of the liquid or vapor will form causing partial or complete stoppage of liquid flow into the pump.

VISCOSITY - That property which offers resistance to flow due to the existence of internal friction within the fluid.

WATER HAMMER - The internal effects on the pump of forces placed on it by high inlet pressures or static head pressures.

2-8. RECOMMENDED LUBRICANTS

The use of Air Lube AF anti-freeze lubricant is recommended (IMT Part # 89086160-QT, 89086161-GAL). The following 5 WT, grade 15 lubricants may be used if performance does not suffer:

EXXON - Unis N Grade 15

MOBIL - DTE 11M

PENZOIL - Penzbell AWX Arctic Wt Hyd Oil

SHELL - Tellus T 15 Oil

TEXACO - Code 1693 Rando Oil HD 2-15 HVI

TROUBLESHOOTING

POTENTIAL CAUSES

FAST CYCLES/LOW VOLUME

VALVE BALL/SEAT

- A. Valve ball/seat not sealing due to damage from sharp objects
- B. Valve ball/seat not sealing due to damage from chemicals/temperature
- C. Valve ball sticking due to swelling caused by chemicals/temperature
- D. Valve ball held open by object too large to pass

HOUSING

- A. Fingers eroded or corroded causing valve ball to stick
- B. Valve seat worn - ball drops below seat into elbow/chamber

SUCTION CONDITIONS

- A. Cavitation caused by plugged suction line or inlet housing
- B. Cavitation caused by valve on suction line closed or partially closed
- C. Air leaks in suction line at threaded connections, hose, flange, etc.

RECOMMENDATIONS

Replace - add suction strainer
 Replace with compatible elastomer
 Replace with compatible elastomer
 Clean - add suction strainer

Replace with compatible material
 Replace with compatible material

Clean
 Open valve
 Check for and fix leaks

POTENTIAL CAUSES**NO CYCLES****DIAPHRAGM**

- A. Normal mechanical fatigue
- B. Premature mechanical failure from extended cavitation
- C. Premature mechanical failure from high suction head or water hammer
- D. Mechanical failure from chemical absorption
- E. Mechanical failure from high or low temperature
- F. Leak at diaphragm and piston plate
- G. Mechanical failure due to abrasion
- H. Diaphragm cut or torn by sharp object passing thru water chamber
- I. Diaphragm cut or torn by sharp edges on worn or corroded piston plate

AIR PRESSURE LOW, FLUID PRESSURE HIGH

- A. Discharge valve closed or partially closed
- B. Discharge piping or pump housing plugged with product
- C. Static discharge head, specific gravity and/or viscosity is too great
- D. Air supply pressure too low or turned off

SHAFT / O-RINGS

- A. O-rings worn flat from normal friction between shaft and o-rings
- B. Premature o-ring wear - softened or hardened by synthetic lubricants
- C. O-rings worn flat and shaft scarred by abrasive particles from air supply
- D. O-rings worn flat and shaft scarred by chemicals from diaphragm failure or fumes
- E. Shaft grooves and relief filled with oil sludge or pipe dope
- F. Center block ports to shaft bushing plugged
- G. Piston wedged against water chamber by object
- H. Center block o-rings installed in wrong slot in bushing

AIR VALVE

- A. Piston scarred by abrasives from air supply or diaphragm failure
- B. Piston corroded by chemicals from diaphragm failure or fumes
- C. Brass body deformed by blows from hammer, etc.
- D. End cap with pin rotated so that air valve and body ports are misaligned
- E. End cap with pin corroded and leaking air / end cap o-ring leaking air
- F. Piston stuck due to lack of lubrication
- G. Piston unable to move due to condition of air - particles, oil, water
- H. Piston coating worn until surface rough or aluminum exposed
- I. Air valve gasket blown or improperly installed

CONDITION OF AIR

- A. Piston movement inhibited by presence of too much oil/water
- B. Piston movement inhibited by a lubricant with too high viscosity
- C. Particles, pipe dope or tape plugging air valve piston, screen, etc.
- D. Ice forming inside the air valve or plugging the muffler

VALVE BALL / SEAT

- A. Valve ball softened by chemicals and stuck in seat or in chamber

LEAKS**VALVE SEAT**

- A. Valve seat softened and leaking due to chemical absorption

HOUSING

- A. Sealing surfaces of water chamber/manifold to seat pitted or corroded
- B. Sealing surfaces of water chamber to diaphragm bead pitted or corroded
- C. Hole in water chamber made by outer piston and hard object in chamber
- D. Hole in water chamber or manifolds due to corrosion or erosion
- E. Water/air chambers broken at clamp band mating surfaces

CLAMP BAND

- A. Clamp band weakened by repeated use or overtightening
- B. Clamp band weakened by lack of cleaning or lubrication
- C. Clamp band binding or galling due to dirt or corrosion on band housing

IMPROPER ASSEMBLY

- A. Valve seat installed upside down with O-ring facing up
- B. Valve seat and chamber/manifold ports out of alignment
- C. Water chambers aligned so seat faces not in plane

NOISE**VALVE BALL**

- A. Valve ball rattling inside pump housing

HOUSING

- A. Loud air exhaust noise

RECOMMENDATIONS

Replace diaphragm
 Correct suction conditions
 Elevate pump; surge suppressor
 Select alternative elastomer
 Select alternative elastomer
 Tighten (clean air side)
 Select alternative elastomer
 Utilize suction strainer
 Replace

Open valve
 Clean
 Increase air pressure (max. 125 psi)
 Increase air

Replace
 Replace o-rings - use recommended lubricant
 Use air filter / replace parts
 Replace
 Clean
 Clean
 Suction strainer
 Install in correct grooves

Air filter
 Replace
 Replace
 Replace
 Replace
 Increase amount of lubrication
 Air filter (moisture trap; coalescing filter)
 Replace air valve
 Replace

Decrease lubrication; add moisture trap
 Replace with recommended lubricant
 Clean
 Coalescing filter; ethylene glycol

Replace with compatible elastomer

Replace with compatible elastomer

Replace with compatible material
 Replace with compatible material
 Replace - add suction strainer
 Replace with compatible material
 Replace - add surge suppressor

Replace
 Replace
 Replace hardware - lubricate hardware

Install the o-ring facing down toward chamber
 Realign
 Realign

Create a suction lift for positive seating action
 Create a head on discharge for positive seating

Use muffler to reduce noise below OSHA stds.

POTENTIAL CAUSES**PARTS BREAKAGE****IMPROPER ASSEMBLY**

- A. Screws and cone nuts substituted with std fasteners on air chambers
- B. Fasteners on air chambers overtightened creating stress on cast parts

SLOW CYCLES**AIR PRESSURE LOW, FLUID PRESSURE HIGH**

- A. Discharge valve closed or partially closed
- B. Discharge piping or pump housing plugged with product
- C. Static discharge head, specific gravity and/or viscosity too great
- D. Air supply pressure too low or turned off
- E. Orifice in air line fittings restricting air flow
- F. Air regulator too small for air flow required
- G. Air line too small or too long for air flow and pressure required

SHAFT / O-RINGS

- A. O-rings worn flat from normal friction
- B. Premature O-ring wear - softened or hardened by synthetic oils
- C. O-rings worn flat & shaft scarred by abrasives or diaphragm failure
- D. O-rings worn flat & shaft scarred by chemicals
- E. Shaft grooves and relief filled with oil sludge or pipe dope

AIR VALVE

- A. Piston scarred by abrasives from air supply or diaphragm failure
- B. Piston corroded by chemicals from diaphragm failure or fumes
- C. Brass body deformed by blows from hammer or other object
- D. End cap with pin rotated - piston and valve body ports misaligned
- E. End cap with pin corroded and leaking air/end cap o-ring leaking air
- F. Piston stuck due to lack of lubrication
- G. Coating on piston worn down to bare aluminum
- H. Center block ports partially plugged
- I. Piston unable to move due to condition of air - particles, oil, water

CONDITION OF AIR

- A. Piston movement inhibited by the presence of too much oil or water
- B. Piston movement inhibited by lubricant with too high viscosity
- C. Particles, pipe dope or teflon tape plugging air valve, screen, etc
- D. Ice forming inside the air valve or plugging the muffler

VALVE BALL / SEAT

- A. Discharge being restricted by swollen valve ball

ERRATIC CYCLES**DIAPHRAGM**

- A. Mechanical failure from flexing
- B. Mechanical failure from chemical absorption
- C. Mechanical failure from high or low temperature
- D. Leak at diaphragm and piston plate
- E. Diaphragm cut or torn by sharp object passing through water chamber
- F. Diaphragm cut or torn by sharp edges on worn or corroded piston plate

SHAFT / O-RINGS

- A. O-rings worn flat from normal friction between shaft and o-rings
- B. Premature o-ring wear - softened or hardened by synthetic lubricants
- C. O-rings worn flat and shaft scarred by abrasives from air supply
- D. O-rings worn flat and shaft scarred by chemicals from diaphragm failure
- E. Shaft grooves and relief filled with oil sludge or pipe dope

AIR VALVE

- A. Piston scarred by abrasives from air supply or diaphragm failure
- B. Piston corroded by chemicals from diaphragm failure or exposure to fumes
- C. Brass body deformed by blows from hammer or other object
- D. End cap with pin rotated so that air valve and body ports are misaligned
- E. End cap with pin corroded and leaking air / end cap o-ring leaking air
- F. Piston stuck due to lack of lubrication
- G. Coating on piston worn to bare aluminum
- H. Piston unable to move due to air condition - particles, oil, water

CONDITION OF AIR

- A. Piston movement inhibited by presence of too much oil or water
- B. Particle, pipe dope or teflon tape plugging air valve piston, screen, etc.
- C. Ice forming inside air valve or plugging muffler

VALVE BALL / SEAT

- A. Valve ball/seat not sealing due to damage from sharp objects
- B. Valve ball/seat not sealing due to damage from chemicals or temperature
- C. Valve ball sticking due to swelling caused by chemical or temperature
- D. Valve ball held open by object too large to pass

HOUSING

- A. Fingers eroded or corroded causing valve ball to stick
- B. Valve seat worn until valve ball drops below seat into elbow or chamber

SUCTION CONDITIONS

- A. Cavitation caused by plugged suction line or inlet housing
- B. Cavitation caused by valve on suction line closed or partially closed
- C. Air leaks in suction at threaded connections, hose, flange, etc.

RECOMMENDATIONS

Reassemble with correct hardware
Check torque during assembly

Open valve
Clean
Increase air pressure (max 125 psi)
Increase air pressure
Replace
Replace
Replace

Replace
Replace o-rings - use recommended lubricant
Replace - use air filter
Replace
Clean

Replace: add air filter
Replace
Replace
Realign
Replace
Increase lubrication
Replace air valve
Clean
Add air filter: coalescing filter

Decrease lubrication: add moisture trap
Replace with recommended lubricant
Clean
Add coalescing filter: ethylene glycol

Replace with compatible elastomer

Replace
Replace with compatible elastomer
Replace with compatible elastomer
Tighten / clean
Suction strainer
Replace

Replace
Replace o-rings: use recommended lubricant
Air filter / replace parts
Replace
Clean

Air filter: replace
Replace
Replace
Replace with anti-rotation air valve
Replace
Increase lubrication
Replace air valve
Air filter: coalescing filter

Decrease lubrication: coalescing filter
Clean
Coalescing filter: ethylene glycol

Replace (possibly add suction strainer)
Replace with compatible elastomer
Replace with compatible elastomer
Clean - add suction strainer

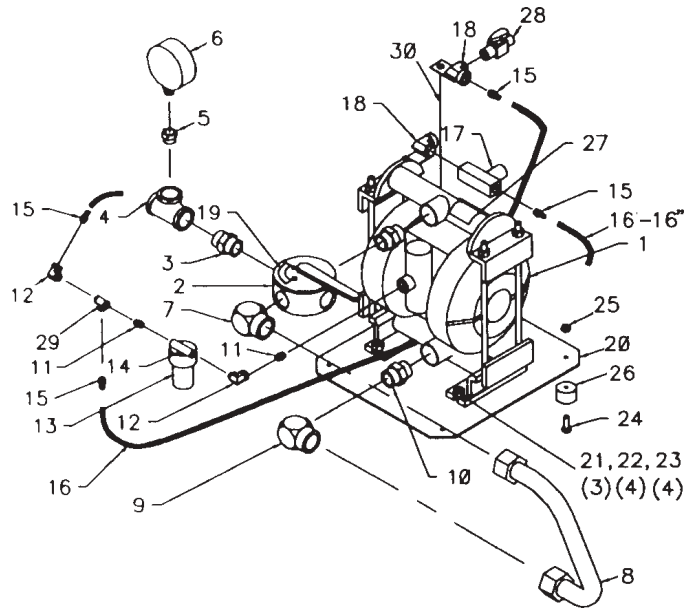
Replace with compatible elastomer
Replace

Clean
Open valve
Check and fix leaks

SECTION 3. PARTS

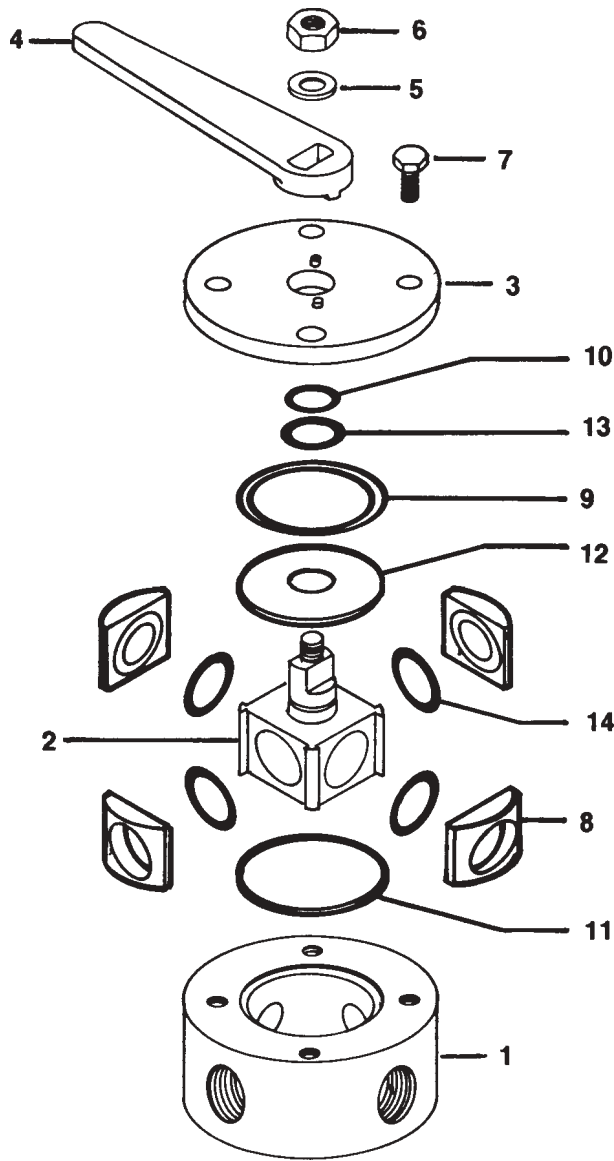
3-1. GENERAL

This section is provided as an aid in the identification, repair and ordering of parts. See the "Disassembly/ Reassembly Instructions" manual for component parts specific to the pump (IMT part number 70731387).



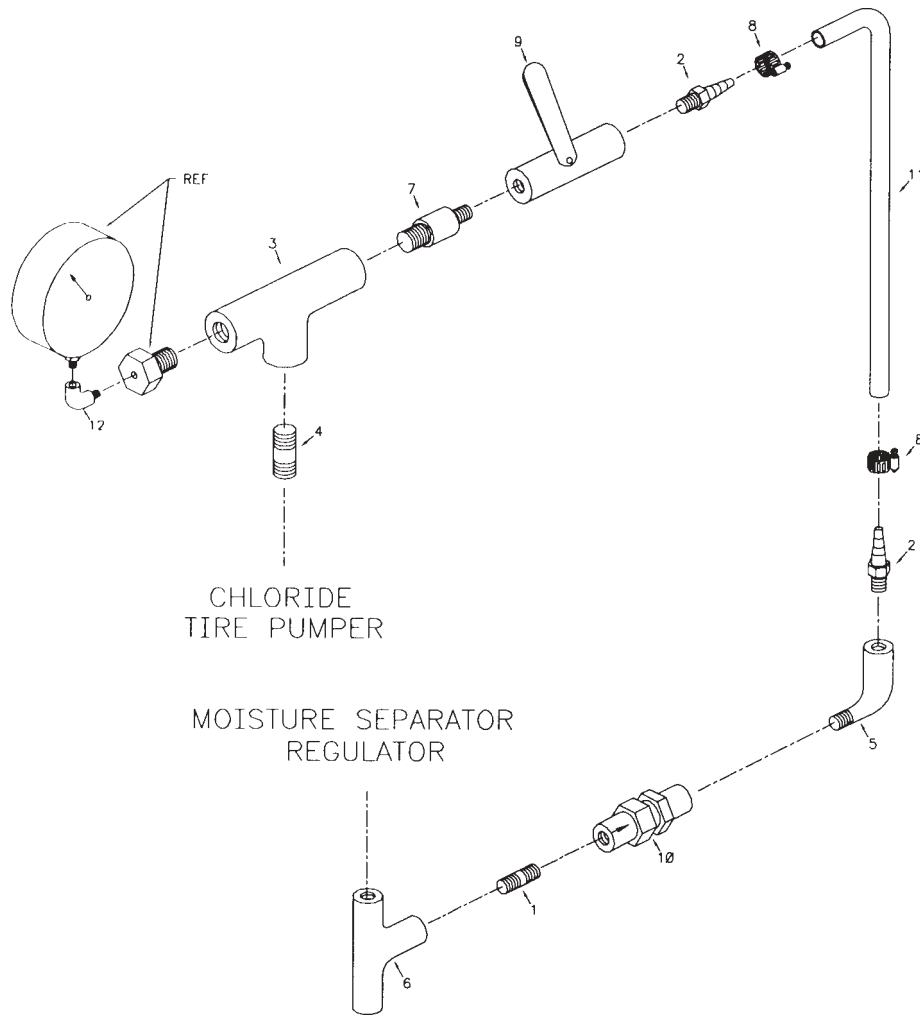
ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION	QTY
1.	70731387	PUMP	1	16.	89392146	HOSE 1/4 PUSH LOCK	34"
2.	70732360	VALVE ASM - 4 WAY	1	17.	73054034	COLOR-FLOW VALVE	1
3.	72053558	ADAPTER 3/4MPT 3/4MPT	1	18.	52709397	MTG BRACKET - AIR CTRL	2
4.	72053555	TEE 3/4NPT	1	19.	70393263	DECAL	1
5.	72531831	RED. BUSHING 3/4 3/4NPT	1	20.	60113887	MOUNTING PLATE	1
6.	70048011	VACUUM GAUGE	1	21.	72060025	CAP SCR 5/16-18X1 HHGR5	3
7.	72531429	ELBOW 3/4MPT 1-5/16MJIC 90°	1	22.	72062109	NUT 5/16-18 LOCK	4
8.	70143793	TUBE ASM	1	23.	72063002	WASHER 5/16 WRT	4
9.	72531430	ELBOW 1"MPT 1-5/16MJIC 90°	1	24.	72060636	MACH SCR #10-24X3/4 RDHD	4
10.	72053473	COUPLING 1"NPT STL	1	25.	72062106	NUT #10-24 LOCK	4
11.	72053013	PIPE NIPPLE 1/4NPT X CLOSE	2	26.	76039990	RUBBER BUMPER	4
12.	72531131	STREET ELBOW 1/4NPT 90°	2	27.	70392497	DECAL-LUBRICATE PUMP	1
13.	70048059	AIR REGULATOR	1	28.	73054108	VALVE-SHUTOFF	1
14.	72053240	PIPE PLUG 1/8NPT HOL HEX	1	29.	72053610	TEE 1/4NPT STL	1
15.	72532552	HOSE FITTING 1/4 1/4 TYPE O	4	30.	72060026	CAP SCR 5/16-18X1-1/4 HHGR5	1

FIGURE C-1. TIREPUMPER ASSEMBLY (51709670)



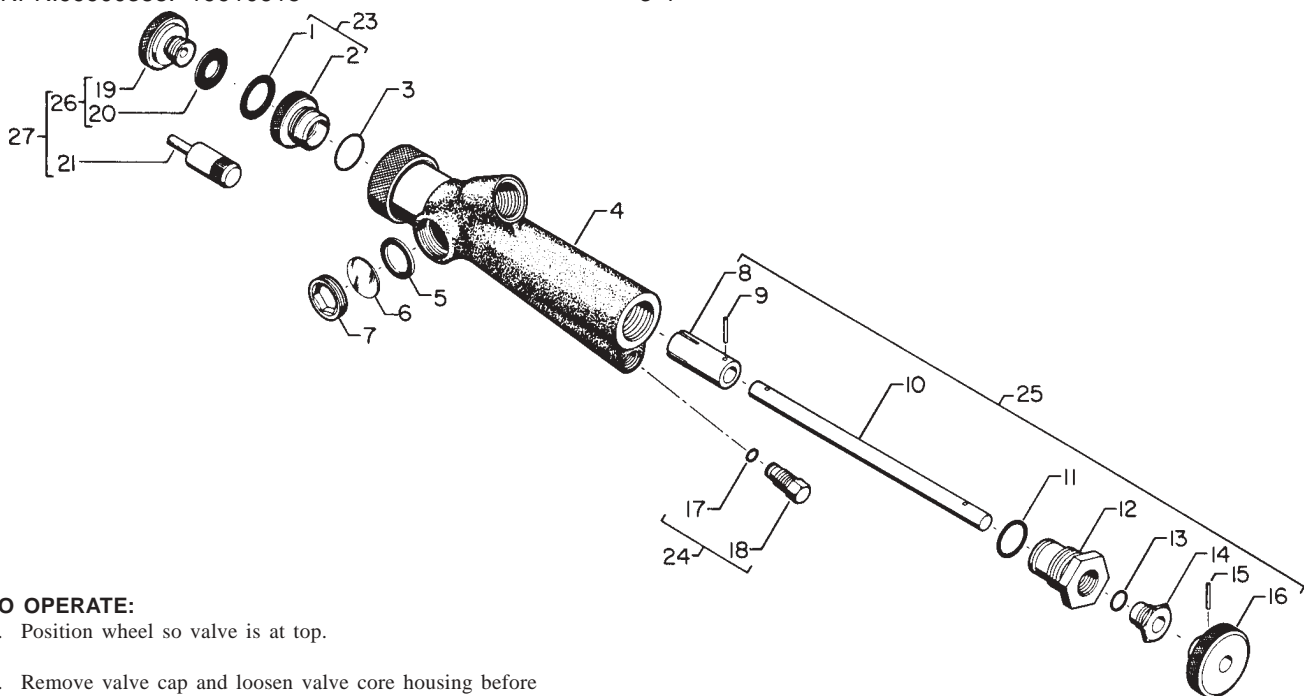
ITEM	PART NO.	DESCRIPTION	QTY
1.	70143877	BODY	1
2.	77041434	ROTOR 3/4 BRASS	1
3.	70143878	CAP	1
4.	70143879	HANDLE	1
5.	72063001	WASHER 1/4 WRT	1
6.	72062000	CAP SCR 1/4-20X1/2 HH GR5	1
7.	72060001	CAP SCR 1/4-20X5/8 HH GR5	4
8.	76393362	SEAL-PORTED (PART OF 15)	4REF
9.	76393365	O-RING (PART OF 15)	1REF
10.	76393364	O-RING (PART OF 15)	1REF
11.	70143881	WASHER-BTM(PART OF 15)	1REF
12.	70143880	WASHER-TOP(PART OF 15)	1REF
13.	76393366	O-RING (PART OF 15)	1REF
14.	76393363	O-RING (PART OF 15)	4REF
15.	51393264	REPAIR KIT (INCL:8-14)	1

FIGURE C-2. 4-WAY VALVE ASSEMBLY (70732360)



ITEM	PART NO.	DESCRIPTION	QTY
1.	72053725	ADAPTER 1/2MPT X 1/2MPT	1
2.	72053457	BARB NIPPLE 1/2MPTX1/2BARB	2
3.	72053555	TEE 3/5NPT	1
4.	72053558	ADAPTER 3/4MPT X 3/4MPT	1
5.	72053591	ST ELBOW 1/2NPT BRS 90°	1
6.	72531961	TEE 1/2NPT BRS	1
7.	72053726	ADAPTER 3/4MPT 1/2MPT HEX	1
8.	72066004	HOSE CLAMP SAE#12	2
9.	73054192	BALL VALVE 1/2NPT	1
10.	73054676	IN-LINE CHECK VALVE 1/2FPT	1
11.	89039176	AIR HOSE 1/2 RED 250PSI	24"
12.	72053523	ST ELBOW 1/4NPT BRS 90°	1

FIGURE C-3. OPTION - AIR INFLATION KIT (51709763)



TO OPERATE:

1. Position wheel so valve is at top.
2. Remove valve cap and loosen valve core housing before attaching inflator to valve.

NOTE

To service standard bore valves, assemble nose adapter to inflator. This adapter has a rubber gasket for sealing against rim nut.

Do not use nose adapter when servicing super large bore valves TR F900, TR F910, TR F910B and TR F916.

Connect inflator to valve mouth and rotate knurled swivel nut to engage threads. Tighten nut until valve hits stop in inflator. Tighten by hand only!

3. Engage knurls on core housing with collet by pushing knob forward and tapping lightly with hand.
4. Turn knob counterclockwise to remove core housing from valve.
5. Retract knob assembly completely to rear of inflator to disengage core housing.
6. Start liquid filling. When tire appears to be fully inflated, rotate the valve handle to the CHECK position to bleed trapped air from the tire. Continue filling in this manner until the tire is properly filled.
7. Shut off pump. Insert core housing into valve stem by pushing knob assembly forward and turning clockwise until the core is fully engaged.
8. Disengage collet from core housing by pulling knob assembly firmly toward the rear of the inflator.
9. Unscrew the inflator from the valve stem.
10. Tighten the valve core securely.
11. Check the tire pressure and top-off as necessary. Use standard air gauge and chuck.

ITEM	PART NO.	DESCRIPTION	QTY
1.	76392292	RUBBER WASHER 13/16	1
2.	70024285	ADAPTER-TRACTOR & LG BORE	1
3.	7Q072016	O-RING (PART OF 4)	1
4.	70024286	INFLATOR SUB-ASM(INCL:3,5-7)	1
5.	76392293	RUBBER WSHR 3/4(PART OF 4)	1
6.	76392294	LENS (PART OF 4)	1
7.	70024287	SOCKET NUT (PART OF 4)	1
8.	70142699	COLLET (PART OF 25)	1
9.	72066618	LOCK PIN (PART OF 25)	1
10.	70142700	ROD (PART OF 25)	1
11.	7Q072014	O-RING (PART OF 25)	1
12.	70024288	HOUSING CAP (PART OF 25)	1
13.	7Q072011	O-RING (PART OF 25)	1
14.	70024289	O-RING RETAINER(PART OF 25)	1
15.	72066618	LOCK PIN (PART OF 25)	1
16.	70024290	KNOB (PART OF 25)	1
17.	7Q072006	O-RING	1
18.	70024291	PLUG	1
19.	70024323	ADAPTER-STD TIRE VALVE	1
20.	76392421	RUBBER WASHER 3/4	1
21.	70142864	CORE EXTRACTOR	1
22.	51392295	REPAIR KIT (INCL:1,3,9,13,15,17,20)	REF
23.	70024307	ADPTER W/WASHER(INCL:1&2)	REF
24.	70024321	PLUG W/O O-RING(INCL:17&18)	REF
25.	70731625	KIT (INCL:8-16)	REF
26.	70024322	ADAPTER W/WASHER (INCL:19 & 20)	REF
27.	70731694	EXTRACTOR KIT(INCL:19,20,21)	REF

FIGURE C-4. OPTION - CALCIUM CHLORIDE TIRE INFLATOR (70731567)

TRPR:99900388: 20000707

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