

REPAIR CATALOG

R-2131

WHITE MOBI LIFT

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Supplement "A" to Repair Catalog R2131

This supplement is to be used in conjunction with Repair Catalog R2131 on the MSA 20, 20 II, 25 and 25 II Fork Lift Trucks. This supplement covers changes, corrections and additions to be added to the Repair Catalog.

Page 9	Change 35P3381 gasket (ref. #76) to 35P1381 (Corr.)	
Page 10	Change 10R1119 Spark Plug (ref. #106) to 10R1191.	
Page 19	Change 35P1450 Prestolite No. to IEB-2042SS1.	
Page 24	Add conversion kit to change 35A7708 pump (Autopulse) to 35A8639 pump (Bendix).	
35R75	Kit - conversion, with attaching parts	1
Page 26	Change D1173 coupling (ref. #15) to 35P517.	
Page 32	Change description on 50A2883 ring (ref. #22) to Ring - back-up, "O" ring.	
	Change 35A4141 countershaft (ref. #30) to 35A9882 (35A4141).	
Page 36	Change 35A1205 valve (ref. #10) to 35A1250.	
Page 38	Change 35A6300 shaft (ref. #3) to 35A9884 (35A6300). Change 35A6301 shaft (ref. #4) to 35A9883 (35A6301).	
Page 44	Change 35A6907 clamp (ref. #53) to 35A6107 (Corr.).	
Page 48	Change 35A8595 rod (ref. #18) to 35A8592 and length to 4-3/16".	
Page 52	Change 36A8526 support (ref. #7) to 36A9853 (36A8526).	
Page 56	Add note to 50A4746 nipple (ref. #29). Used on lift trucks with 90° boss opening in transmission case.	
29 36A9797	Pipe Assembly - transmission case, 1-1/2" O.D. x 90° Used when transmission case is replaced with flush opening in case.	1
Page 60	Change 35P1286 cover (ref. #18) to 10P3074 (35P1286).	
Page 64	Change 36A9442 bracket (ref. #32) to 36A8888 (36A9442). Change 10A5914 spring (ref. #34) to 10A25890	

Page 66 Add repair kit for tilt cylinder
 35R113 *Repair Kit - cylinder (Includes ref #5, 6, 7, 12, 13, 14, 15 and 18.)

Page 74 Add lift chain to Triplex Tri-Free Lift with BL534 chain.

Chain for Lift - 5/8" Pitch BL534 - 3x4 lacing.

<u>M.F.H.</u>	<u>O.A.H.L.</u>	<u>Chain Length</u>	<u>M.F.H.</u>	<u>O.A.H.L.</u>	<u>Chain Length</u>
133"	70"	156-7/8"	161"	76"	181-7/8"
137"	70"	156-7/8"	165"	76"	181-7/8"
141"	70"	156-7/8"	169"	76"	181-7/8"
145"	70"	156-7/8"	169"	82"	193-1/8"
149"	70"	163-1/8"	173"	82"	199-3/8"
151"	70"	163-1/8"	177"	82"	199-3/8"
149"	76"	175-5/8"	181"	82"	199-3/8"
153"	76"	175-5/8"	185"	82"	205-5/8"
157"	76"	175-5/8"			

Page 76 Change 75P2048 Repair Kit to 35R70.

Page 92 Change GM147887 clevis (ref. #38) to GM174887 (Corr.).

Page 93 Add note; Parts used on MSA Lift Trucks to No. 28100235 Inc.
 Add the following parts for Auxiliary Valves on MSA Lift Trucks Serial No. 28100236 and after.

40	35A3120	Sleeve - power adapter, 7/16"-14 x 1-3/8"	1	1
41	35A3117	Gasket - sleeve	1	1
42		50A1666 Quad Ring - sleeve	1	1
45		50A4425 Elbow - inlet, 7/8"-14 JIC x 90°	2	2
46	10A16285	"O" Ring, elbow	2	2
47		50A4453 Nipple - close, auxiliary valve, 3/4"	1	-
48		50A4579 Coupling - pipe, 3/4"	1	1
49		50A4825 Connector - hose, 3/4" x 1-1/16" JIC	2	2
50	35A8096	Hose and Tube - return, auxiliary valve to tank, 29-11/16" long	1	1
51	35A8097	Hose and Tube - pressure line, control valve to auxiliary valve	1	1
	35A8112	Angle - clip support	1	1
	35A8113	Clip - tubes	1	1
		50A3653 Bolt - hex., 5/16"-18 x 1/2"	2	2
		50A3658 Bolt - hex., 5/16"-18 x 1-1/2"	1	1
		50A3730 Nut - hex., 5/16"-18	1	1

MSA SERIES LIFT TRUCKS

FOREWORD

This catalog contains a complete list of parts for the MSA 20, 20 II, 25, and 25 II Series Lift Trucks. To assist in determining the part numbers and description, the parts in this catalog are grouped according to their location on the Lift Truck. Reference numbers only are shown in each illustration. These numbers correspond to those in the reference number column in the list of parts which precedes each "exploded view".

TYPICAL PARTS ARE SHOWN, AND MAY NOT ALWAYS BE IDENTICAL WITH CURRENT PARTS. REFER TO THE TEXT.

To further assist in locating repair parts, the part numbers are arranged in numerical sequence and indexed on pages 96 thru 102 inclusive.

Component parts of assemblies are listed following the assembly itself and are identified as being part of the assembly by this notation following the description:

Consists of the following.....parts:

or

Includes the following.....parts:

Part numbers only make up an assembly. Hardware items are not to be included.

Parts such as standard bolts, nuts, screws, washers, etc., are indented and listed under the respective individual parts with which they are used. The quantity for many of the items listed is shown as A.R. (as required). The correct amount of shims should be determined in order to get the proper clearance.

"Right or Left" is determined by facing the mast from the Lift Truck driver's platform.

When in need of repair parts always order the parts from your Mobilift Dealer nearest you. All parts orders should plainly specify your name, post office address and whether shipment is to go by parcel post, express or freight.

Before returning repair parts it is necessary to secure written permission from the company authorizing the return of such parts. In the returning of repair parts be sure the package is tagged with your name and address. Prepay transportation charges.

Claims of shortage or breakage should be made to the transportation company on receipt of goods.

It is the policy of White Industrial Division, White Motor Corporation, to improve its products whenever it is possible and practical to do so. We reserve the right to make changes or add improvements in the design or construction at any time without incurring the obligation to install such changes on products previously delivered.



SAFETY FIRST

Most accidents are caused by the failure of some individual to observe simple and fundamental safe rules or precaution. For this reason accidents can be prevented by recognizing the cause of the accidents and doing something about it before the accident occurs.

Regardless of the care used in the design and construction of equipment, there are many points that cannot be completely safeguarded without interfering with accessibility and efficient operation.

A careful operator is the best insurance against an accident.

THE COMPLETE OBSERVANCE OF ONE SIMPLE RULE WOULD PREVENT MANY THOUSAND SERIOUS INJURIES EACH YEAR.

THAT RULE IS:
"NEVER ATTEMPT TO CLEAN, OIL, OR ADJUST
A MACHINE WHILE IT IS IN MOTION"

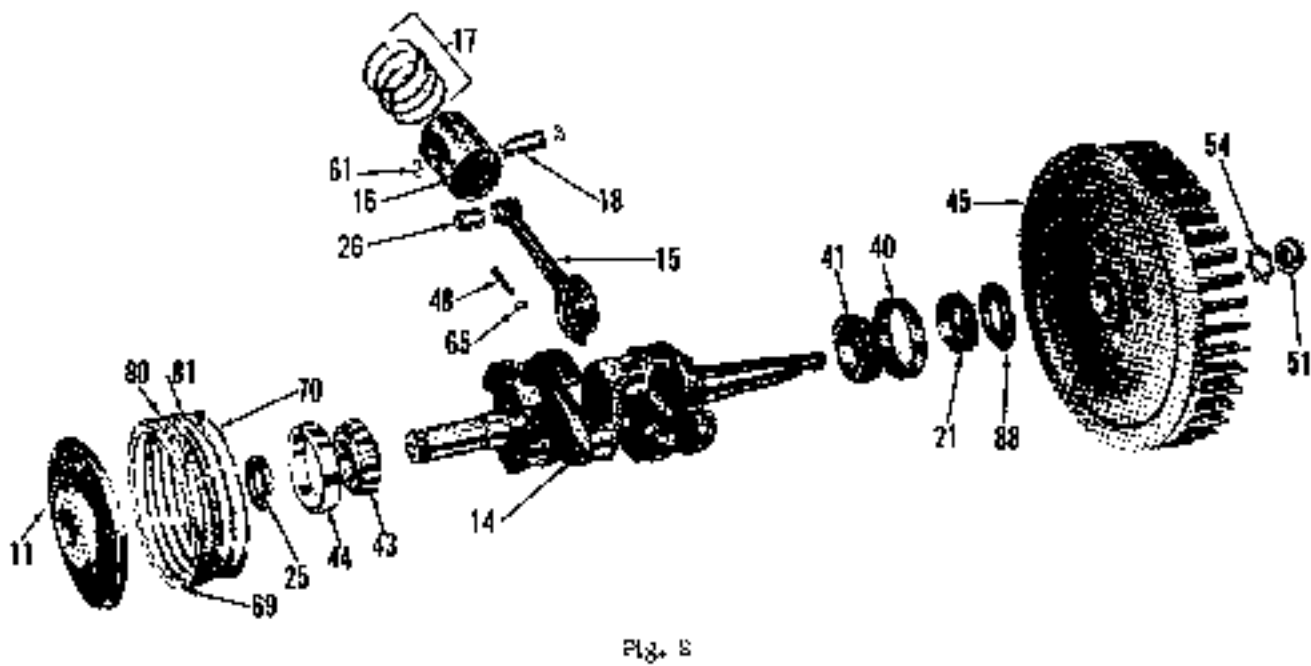
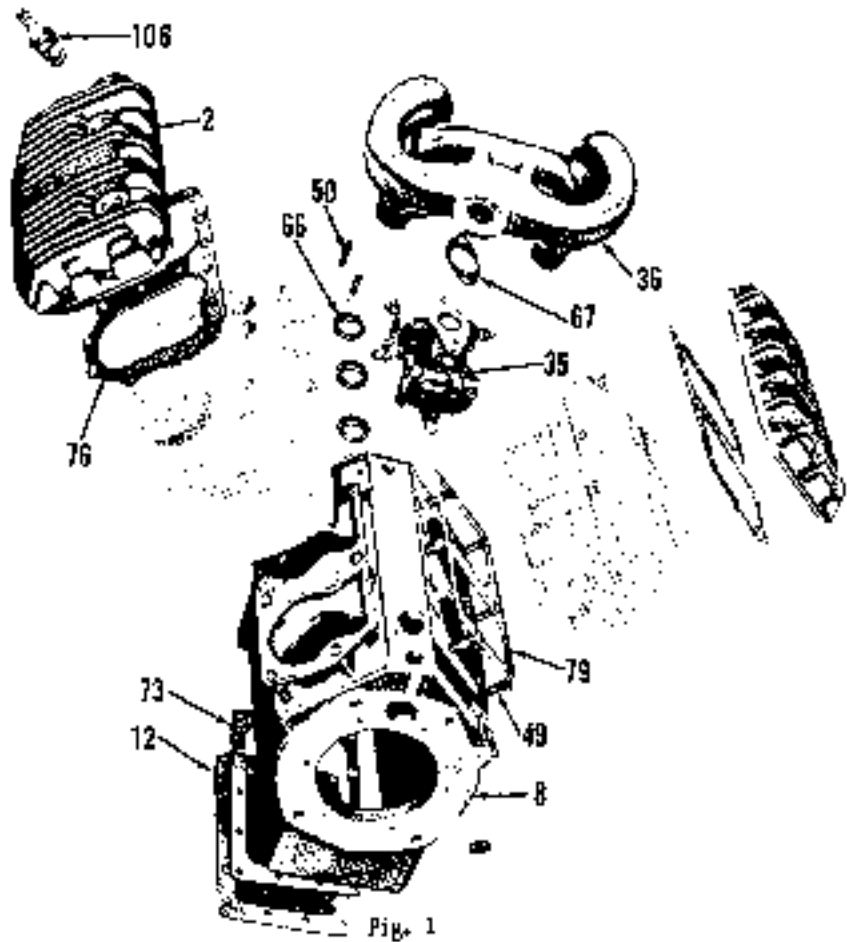
Signed: NATIONAL SAFETY COUNCIL

MSA SERIES LIFT TRUCKS

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MSA SERIES LIFT TRUCKS



MSA SERIES LIFT TRUCKS

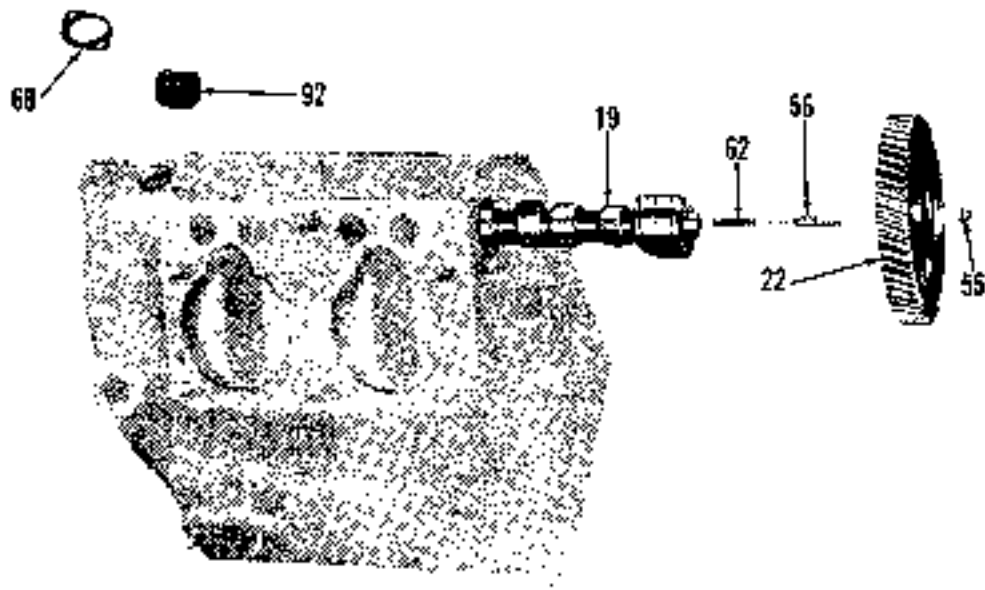


Fig. 3

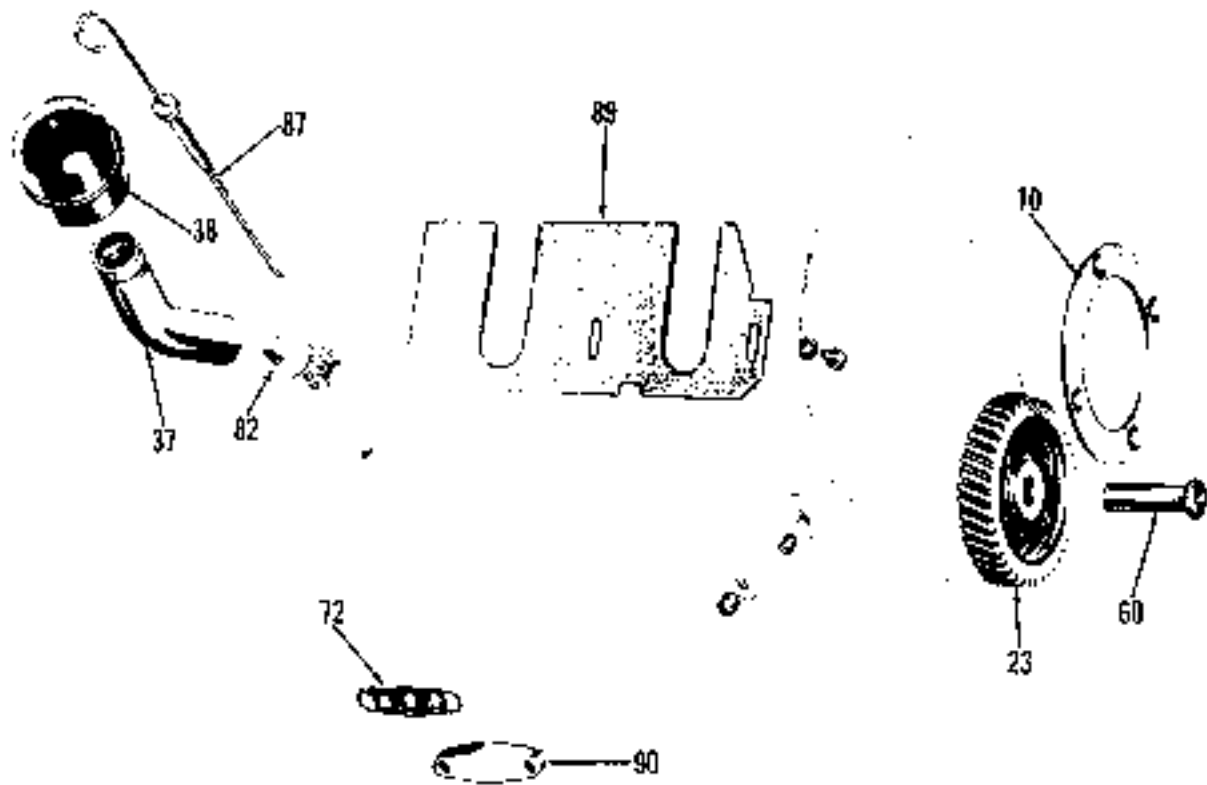


Fig. 4

This diagram shows an exploded view of a mechanical assembly. The central component is a large, cylindrical part with a flange and internal features, labeled 1. Surrounding it are various smaller components, each labeled with a number: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, and 27. The components are arranged in a way that shows their relative positions and how they fit together. Some components are shown in cross-section to reveal internal details. The diagram is a technical drawing used for assembly instructions.

Fig. 5

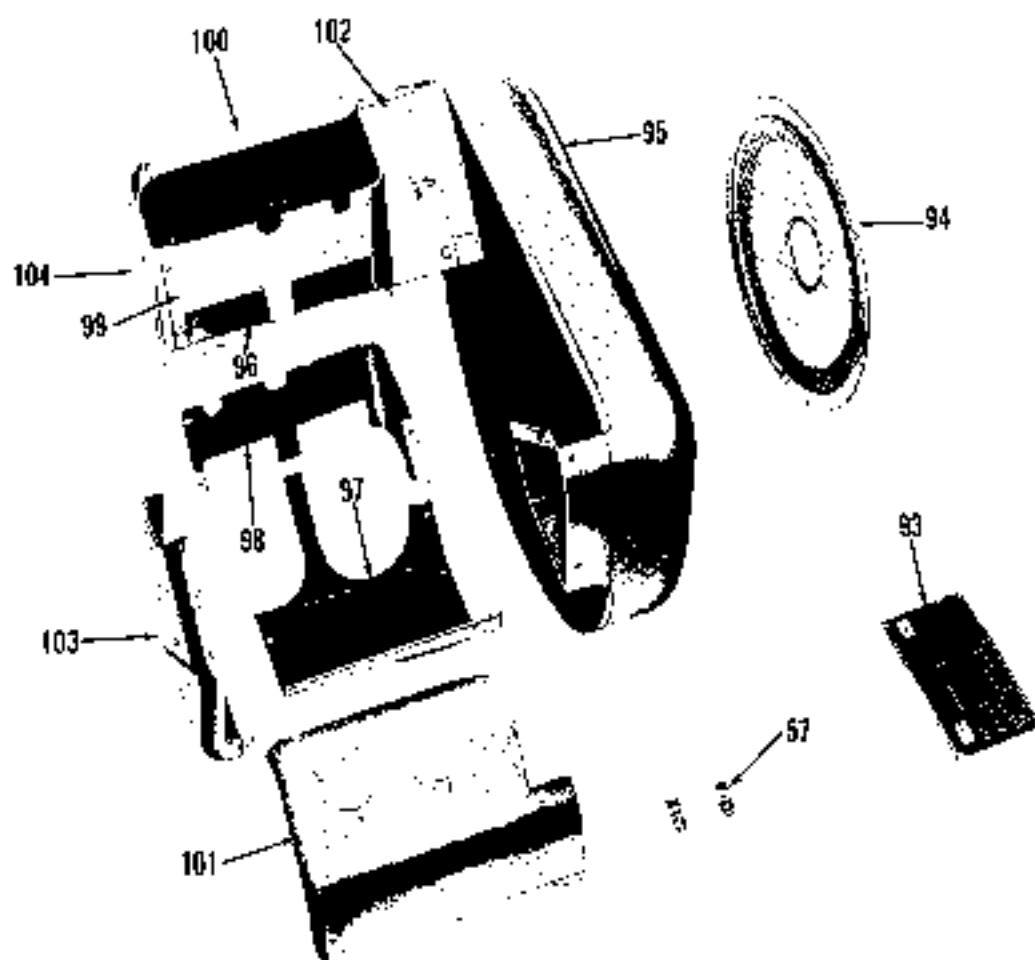


Fig. 6

MSA SERIES LIFT TRUCKS

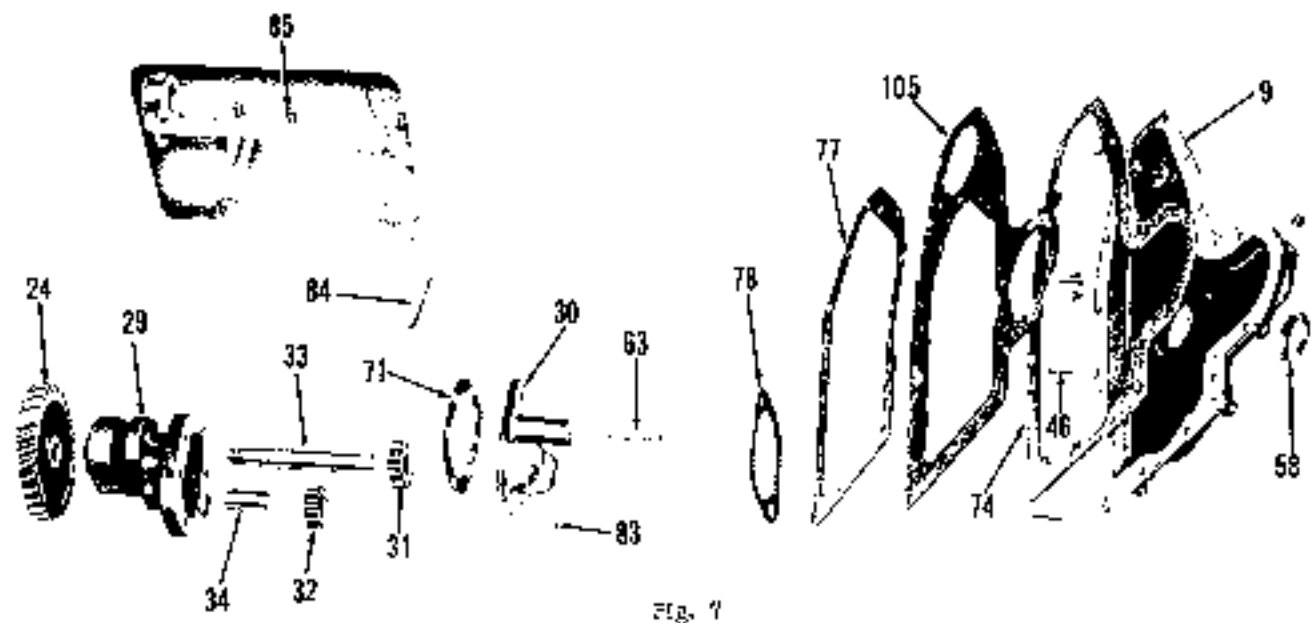
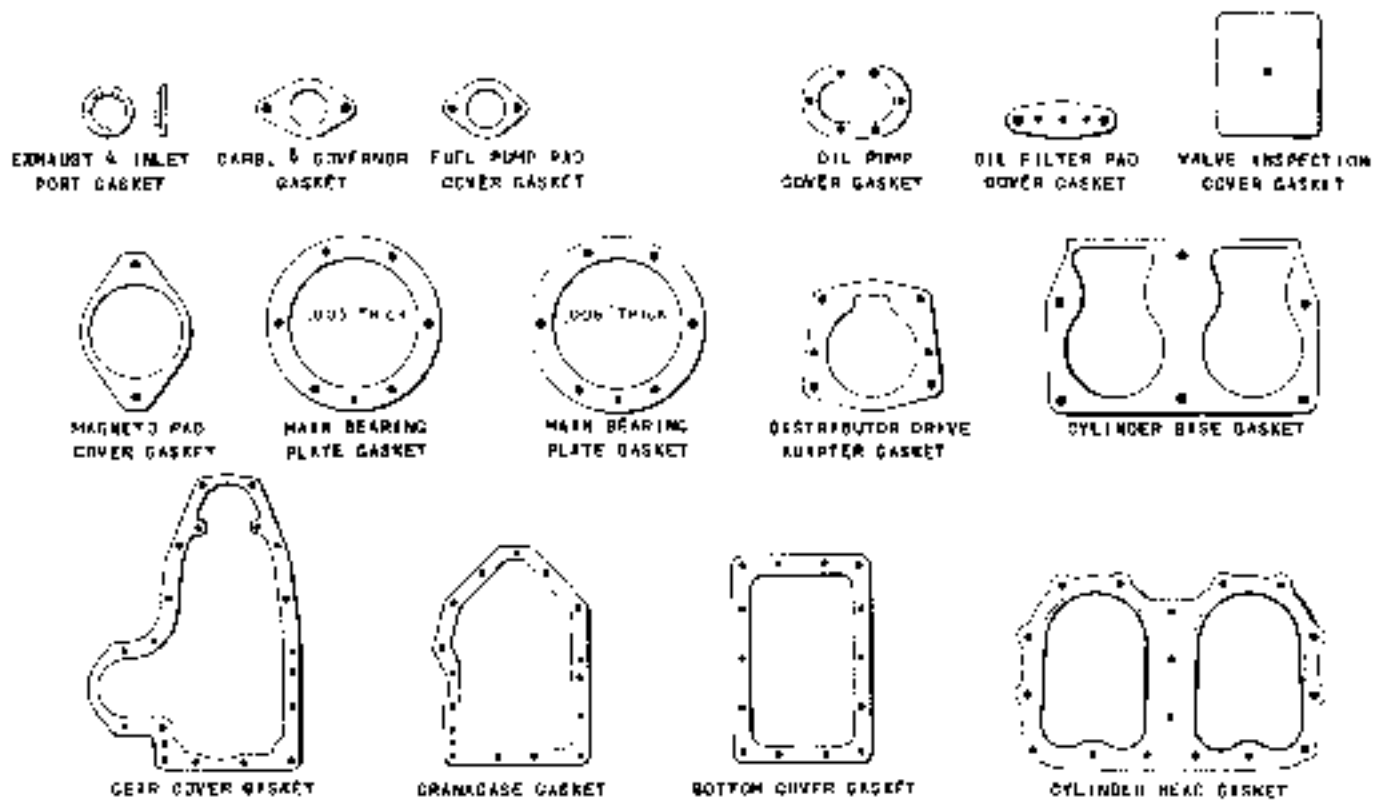


Fig. 7



GASKET SET

Fig. 5

MSA SERIES LIFT TRUCKS

		Fig. No.		DESCRIPTION		No. Pcs.
Fig. No.	Ref. No.	Wisconsin Motor		ENGINE		
6	1	35P131P	AA-98-S7	Block - cylinder assembly	1	
1	2	85P182D	AB10CB	Head - cylinder	2	
5	3	15P541	AD41	Guide - valve stem	8	
3	4	9604H	AE70B	Valve - inlet	4	
		15P309	AE75D	Valve - exhaust, rocker	4	
5	5	9308R	AF49A	Spring - valve, inlet	4	
		35P1321	AF54	Spring - valve, exhaust	4	
5	6	9307R	AG26	Seat - valve spring, inlet	4	
		35P1322	AG31	Rotator - valve and spring seat, exhaust	4	
6	7	9308R	AH9	Lock - valve spring seat	8 pr.	
1	8	35P1323	BA-45C-S1	+Crankcase - assembly	1	
1	8	35P2030	BA-46C-89-S1	++Crankcase - assembly	1	
7	9	35P1324	BD-100C-2-S1	Cover - gear, assembly	1	
4	10	35P1325	BE209	Plate - bearing retainer	1	
2	11	35P1326	BG210-C19-S2	Plate - main bearing	1	
1	12	35P1327	GH141A	Plate - crankcase bottom cover	1	
		35P1328	BH152	Cover - magnetic pad	1	
2	14	35P1329	CA71A-102-S1	Crankshaft	1	
2	15	35P1330	DA48-S1	Rod - connecting, assembly	4	
2	16	35P1331	DD-190A-1	Piston - standard	4	
		35P1332	DD190A-1-85	Piston - .005 oversize	4	
		35P1333	DD190A-1-S10	Piston - .010 oversize	4	
		35P1334	DD190A-1-S20	Piston - .020 oversize	4	
2	17	35P1335	DR31A	Ring Set - piston, standard	1	
		35P1336	DR31A-85	Ring Set - piston, .005 oversize	1	
		35P1337	DR31A-S10	Ring Set - piston, .010 oversize	1	
		35P1338	DR31A-S20	Ring Set - piston, .020 oversize	1	
2	18	9321R	DE65	Pin - piston, standard	4	
		35P1339	DE65-003	Pin - piston, .005 oversize	4	
8	19	35P1340	EA113	Camshaft	1	
5	20	15P110	FE1	Follower - valve	8	
2	21	R024R	GA36A	Gear - crankshaft	1	
3	22	35P1341	GB45A	Gear - camshaft	1	
4	23	R0341	GC27B-1	Gear - idler	1	
7	24	35P1342	GD34C	Gear - oil pump	1	
2	25	35P1343	PH200B	Seal - oil	1	
2	26	35P2020	HG197A	Bushing - piston pin (9330R)	4	
5	27	9325R	HG201	Insert - valve seat, inlet	4	
		15P313	HG201D	Insert - valve seat, exhaust	4	
7	28	35P2007	K95L	++Oil Pump - assembly (933502X)	1	
1	29	35P2091	KA61C-81	Body - oil pump (15P314)	1	
7	30	35P1345	KB4852	Cover - oil pump	1	
7	31	35P1346	KC56-1	+Gear - oil pump drive	1	
7	32	9339R	KC56-2	+Gear - oil pump driven	1	
7	31-32	35P2008	KC56A	Gear - oil pump, drive and driven	2	
7	33	15P137	KD121-S1	Shaft - drive, oil pump	1	
7	34	35P1347	KD122	+Shaft - snub, oil pump	1	
7	34	35P2009	KD122A	++Shaft - snub, oil pump	1	
1	35	35P1348	L63-S1	Carburetor - Zenith 1209, use 85P1977	1	
1	36	35P1377	LZ63-14-S1	Carburetor - Zenith 13105 (35P1348)	1	
1	36	35P1349	LD138C	Manifold - inlet and exhaust	1	
4	37	35P1350	LP303P	+Tube - oil filler	1	
4	37	35P1351	LP303AM	++Tube - oil filler	1	
4	38	35P1351	LO63	Cap - oil filler and vent	1	
2	40	TY2022	ME68-1	Cap - main bearing	1	
2	41	30154	ME71-1	Gene - main bearing	1	
2	42	35P1353	ME114	Bearing - main, take-off end	1	
2	43	35P1354	ME114-1	Gene - main bearing, take-off end	1	
2	44	35P1355	ME114-2	Cap - main bearing, take-off end	1	

M5A SERIES LIFT TRUCKS

		Part No.	DESCRIPTION		No. Pcs.
Fig. No.	Ref. No.		Wisconsin Motor	ENGINE (Cont'd)	
2	45	35P2006	NC140G-3-S1	Flywheel - engine, with ring gear (85P1854).....	1
		15P553	GH144	Gear - flywheel ring	1
2	46	35P1355	PA291	Pin - dowel, gear cover	2
5	47	15P322	PA189A	Screw - adjusting, valve tappet	3
5	48	35P135E	PA149-S1	Bolt - connecting rod	8
1	49	38C6H	PC33T	Stud - cylinder block to crankcase	12
1	50	35P1367	PC40C	Stud - manifold to cylinder block	4
2	51	35P1353	PD123	Nut - flywheel mounting	1
2	52	GM147510	PD121	+Paint - for connecting rod bolt	1
		35P2031	PD146	+Nut - lock, 5/16"-24 (replaces hex nut and palnut)....	1
7	53	GM272071	PD185	Nut - for oil pump gear	1
2	54	35P1360	PE65	Lockwasher - for flywheel nut	1
3	55	35P1361	PF52	Butter - camshaft thrust plunger	1
3	56	35P1362	PF107	Plunger - thrust, for camshaft	1
		35P1363	PF120-1	Plug - in gear cover	1
6	57	35P1364	PG314	Clip - holding, spark plug cables	2
		35P2019	PG1183	Bracket - oil filler tube clamp	1
		35P2020	PG1174	Clamp - oil filler tube	1
		35P2021	PG1175	Clamp - tube, oil sump	1
		50A3648	-----	Belt - hex., 1/4"-20 x 1".....	1
7	58	50A2408	PH299	Seal - oil, crankshaft flywheel end	1
7	59	35P1366	PH438	Lockscrew - oil pump	1
4	60	35P1367	PJ105	Stud - idler gear	1
2	61	35P1368	PK32	Ring - retainer, piston pin	8
3	62	35P1369	PM106	Spring - camshaft thrust plunger	1
7	63	35P1370	PM111	Spring - oil pump relief valve	1
8	64	35P1371	Q12J	*Gasket Set - (Figure 9) overhaul	1
		35P1372	Q28	*NOTE: Includes parts with a single asterisk (*).	
				**Gasket Set - valve grinding	1
				NOTE: Includes parts with double asterisk ().	
2	65	35P1373	QA114	Shim - connecting rod, .002 thick	8
1	66	9387R	Q975	*Gasket - manifold to block	6
1	67	35P1374	QC71A	*Gasket - for carburetor and governor	4
3	68	35P1375	QD67	*Gasket - fuel pump pad cover	1
2	69	35P1376	QD327C	*Gasket - bearing plate, .006 thick	2
2	70	35P1377	QD527D	*Gasket - bearing plate, .008 thick	1
7	71	35P1378	QD335	Gasket - oil pump cover	1
4	72	35P1379	QD595A	*Gasket - oil filter pad cover	1
1	73	9396R	QDE10A	*Gasket - crankcase bottom cover	1
7	74	35P1380	QDE11	*Gasket - gear cover	1
5	75	9396R	QDE12A	*Gasket - valve inspection cover plate	4
1	76	35P1381	QDE18C	*Gasket - cylinder head	2
7	77	35P1382	QDE14	*Gasket - gear cover spacer	1
7	78	35P1383	QDE16	*Gasket - magnet pad cover	1
1	79	9404R	QU617	*Gasket - for cylinder base	2
2	80	35P1384	QF33D	Shim - main bearing plate, .006 thick	2
2	81	35P1385	QF93C	Shim - main bearing plate, .018 thick	2
4	82	35P138E	RG91	Screen - oil filler	1
7	83	9409R2	RD112	Screen - oil pump	1
7	84	35P1387	RF1126	Pipe - oil filter outlet	1
7	85	35P1388	RP1143	Nozzle - oil spray	4
		35P2032	RF1472A	Guide - oil sump	1
1	86	35P1389	PF97	Plug - oil sump hole	1
4	87	35P1390	RJ159M	+Oil Sump	1
4	88	35P1391	RJ159N	+Oil Sump	1
2	89	35P1392	RK170	Oil Sling	1
4			RK185	Plate - splash	2

M5A SERIES LIFT TRUCKS

		Part No.		DESCRIPTION		No. Pcs.
Fig. No.		Ref. No.	Wisconsin Motor	ENGINE (Cont'd)		
4	90	35P1393	SA38C	Cover - pad, oil filter	1	
5	91	35P1394	SA38	Plate - cover, valve inspection	4	
3	92	35P1395	SA69	Cover - for fuel pump pad	1	
5	93	35P1396	SD248	Plate - engine inspection	1	
6	94	35P1397	SE20G	+Screw - flywheel thread	1	
6	94	35P2014	SE204-C-1-51	+Screw - assembly, rotating	1	
				Includes the following 3 parts:		
		35P5012	PI426	++Governor - screw	1	
		35P2013	PI442	++Washer - screw retaining	5	
		35P2015	KA104	++Screw - bolt thread, 1/4"-20 x 3/4"-5	5	
6	95	35P1398	SE74VA	+Screw - flywheel	1	
8	96	35P2010	SE74-VA-22	+Screw - flywheel	1	
9	96	35P5011	SE753	Screw - lower cylinder, R.H. side (35P1399)	1	
				+NOTE: Used on Wisconsin Engines to No. 3510395 Inc.		
				+NOTE: Used on Wisconsin Engines to No. 3510395 and after.		
9	97	35P1400	SE752	Screw - lower cylinder, L.H. side	1	
8	98	35P1401	SE77C	Deflector - cylinder head, L.H. side	1	
8	99	35P1402	SE77D	Deflector - cylinder head, R.H. side	1	
6	100	35P1403	SE79C	Screw - cylinder head, R.H. side	1	
6	101	35P1404	SE79C	Screw - cylinder head, L.H. side	1	
6	102	35P1405	SE80	Cover - side, for flywheel screw	1	
6	103	35P1406	SE82C	Cover - rear screw, L.H. side	1	
6	104	35P1407	SE83C	Cover - rear screw, R.H. side	1	
		35P1408	T109	Governor - assembly, (Hoof No. 3-110)	1	
		35P2049	-----	Governor - assembly, (Hoof No. 3-110A), (35P1408) ..	1	
7	105	94513	WE182A	Spacer - gear on	1	
1	106	10P1119	YD6-SE	Spark Plug - gasoline (AC-C8G)	4	

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
MUFFLER			
1	35A8781	Muffler	1
2	35A8545	Pipe - exhaust (35A7312)	1
		50A1746 - Clamp, exhaust pipe to muffler	1
3		50A2391 - Nipple, tee, 1-1/4" x 2-1/8"	1
4	35A8540	Extension - muffler	1
5		50A763 - Clamp, muffler extension, 2"	1
6	35A8780	Clamp - muffler to support	1
		GM180681 - Bolt, hex., 5/16"-18 x 1-1/4"	2
		GM123916 - Nut, hex., 5/16"-18	2
		GM123394 - Washer, plain, 13/32" I.D., 13/16" O.D.	1
7	35A8729	Support - muffler clamp	1
8	35A8073	*Baffle - muffler	1
9	35A8077	*Clamp - baffle	1
10	1541721	*Spacer - clamp	2
		*50A3656 - Bolt, hex., 5/16"-18 x 1"	2
		*50A3780 - Nut, hex., 5/16"-18	2
		*NOTE: Used on MSA Lift Trucks to No. 25100255 Inc.	

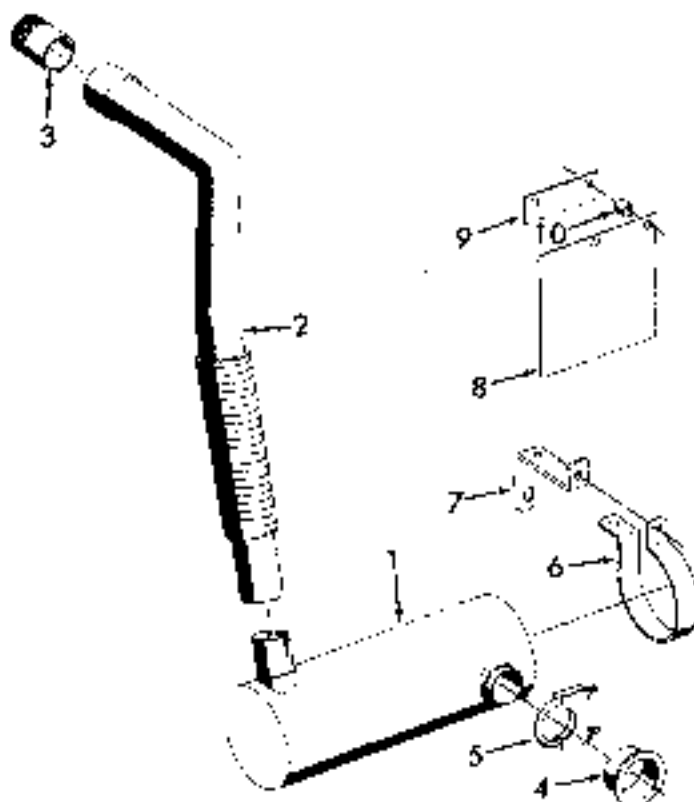


Fig. 9

M5A SERIES LIFT TRUCKS

Kit No	Part No.	DESCRIPTION	No. Per
	Zenith	CARBURETOR	
	12088	Carburetor - complete, use 35P1377	1
	13165	Carburetor - complete (35P1345)	1
1	35P1411	* Gasket - flange	1
2	35P1412	Screw - throttle plate	2
3	35P1413	Plate - throttle	1
4	CE7117	Spring - idle needle	1
5	35P1414	* Needle - idle adjusting	1
7	1CP177	Pin - 1/8", fuel inlet	1
8	35P1415	* Seal - throttle shaft	2
9	35P1416	* Retainer - shaft seal	2
12	35P1417	Screw - throttle stop	1
18	9b-88x	Shaft - throttle, and stop lever, used on Zenith	1
		(Carb. 12088)	
13	35P2816	Shaft - throttle and stop lever, used on Zenith	1
		(Carb. 13165)	
14	3563R	* Jet - idle	1
15	KE7C44	* Axle - float	1
16	35P1418	Assembly - float and linkage	1
17	35P2317	* Washer - fibre, fuel valve seat	1
18	U366R	* Valve and Seat - foot	1
19	35P1420	* Gasket - bowl to body	1
20	35P1421	Bowl - fuel	1
21	35P1422	Plug - main jet passage	1
22	RE7054	* Washer - fibre, passage plug	1
23	35P1423	Jet - main	1
24	RE7055	* Washer - fibre, main jet	1
25	35P1424	Screw - bowl to body	4
26	1CP177	Plug - bowl drain	1
27	35P1425	* Retainer - choke shaft packing	1
28	35P1426	Bracket - choke	1
30	35P1427	Screw - choke bracket	2
31	35P1428	Shaft - choke	1
32	35P1429	Screw - choke lever swivel	1
33	35P1430	Spring - choke lever return	1
34	35P1431	Screw - bracket clip	1
35	35P1432	Clip - bracket tube	1
36	GM218552	Nut - clamping screw	1
37	CE7184	* Washer - choke shaft packing	1
39	35P1434	Plate - choke	1
40	35P1435	Screw - choke plate	2
41	35P1436	* Plug - choke shaft hole	1
42	35P1437	* Washer - fibre, discharge jet	1
43	35P1438	Jet - discharge	1
44	35P1439	Jet - well vent	1
45	35P1440	Venturi	1
46	35P1441	Tube - idle filler, used on Zenith Carb. 12088	1
47	35P1442	Gushing - throttle shaft	2
48	1CP189	Lever - choke	1
49	GM456315	Nut - choke shaft	1
50	GM100488	Lockwasher - choke shaft nut	1
51	35P1443	Kit - gasket (** parts in gasket set)	1
	35P1446	Kit - repair parts (* parts in repair kit)	1

MSA SERIES LIFT TRUCKS

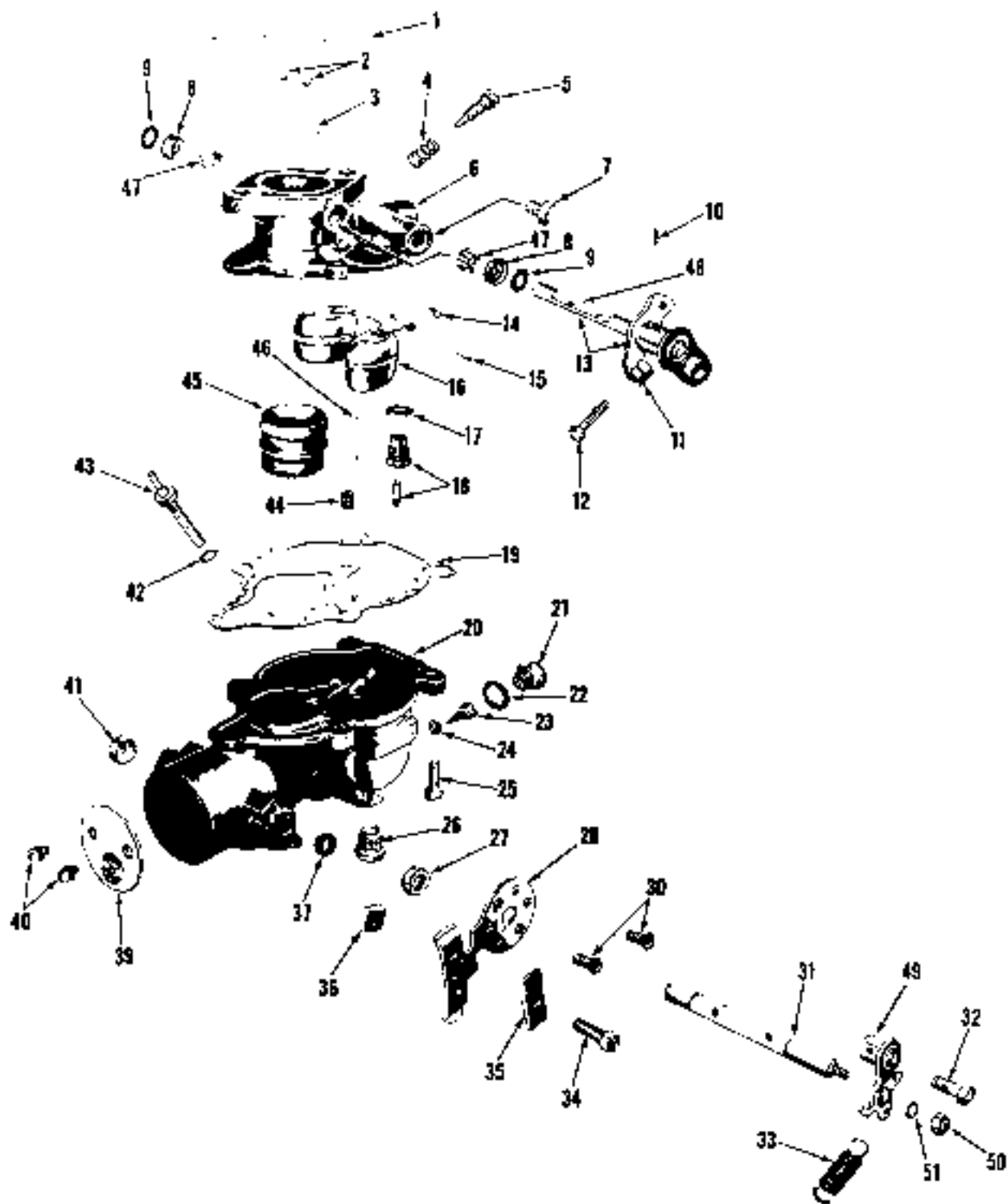


Fig. 10

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
		WISCONSIN	
		ENGINE OIL FILTER	
1	35A7331	RV400	1
2	35F1411	RV-40	1
3	35F1431	QD-683	1
4	35A7342	-----	1
4	35A8721	-----	1
5	35A7502	-----	2
6	35A7353	-----	2
7	35A4793	-----	1
7	35A8723	-----	1
8	35A7707	-----	1
8	35A8748	-----	1

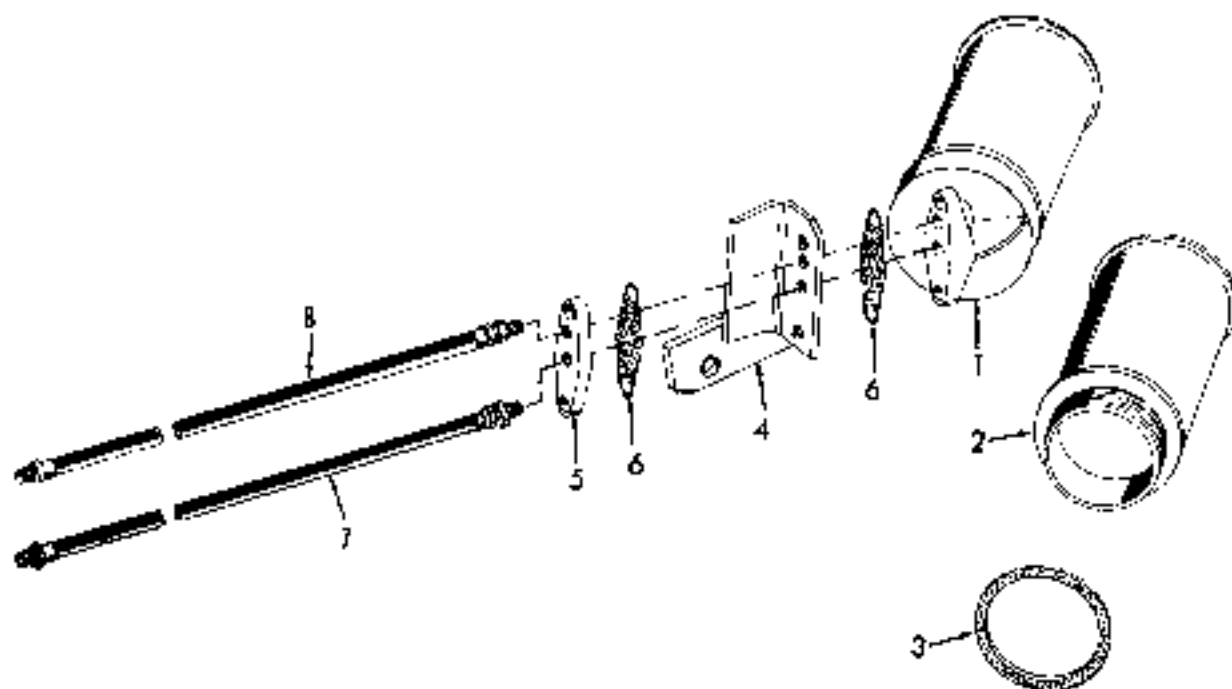


Fig. 11

MSA SERIES LIFT TRUCKS

Ref. No	Part No	DESCRIPTION	No. Pcs
		AIR CLEANER	
		Group 1	
		Used on MSA 23 and 25 Lift Trucks to No. 28100437 (inc.	
1	19A1E004	Air Cleaner - assembly (Frank Corporation PA 70-1PL).....	1
		Includes the following 3 parts:	
2	10P1372	Base - assembly.....	1
3	10P1373	Filter - air cleaner.....	1
4	10P1374	Cover - filter.....	1
		GM120240 - Nut, wing, No. 10-32 N.F.	1
5	33A72E6	Bracket - air cleaner.....	1
		GM100122 - Bolt, hex., 3/8"-16 x 1".....	2
		GM120377 - Nut, hex., 3/8"-16.....	2
6	33A72E5	Hose - air cleaner to carburetor.....	1
		GM105479 - Clamp, hose, carburetor, 1-7/8".....	1
		GM105481 - Clamp, hose, air cleaner end, 2-1/8".....	1
7	33A72d7	Clamp - air cleaner tube.....	1
8	33A7375	Baffle - assembly.....	1

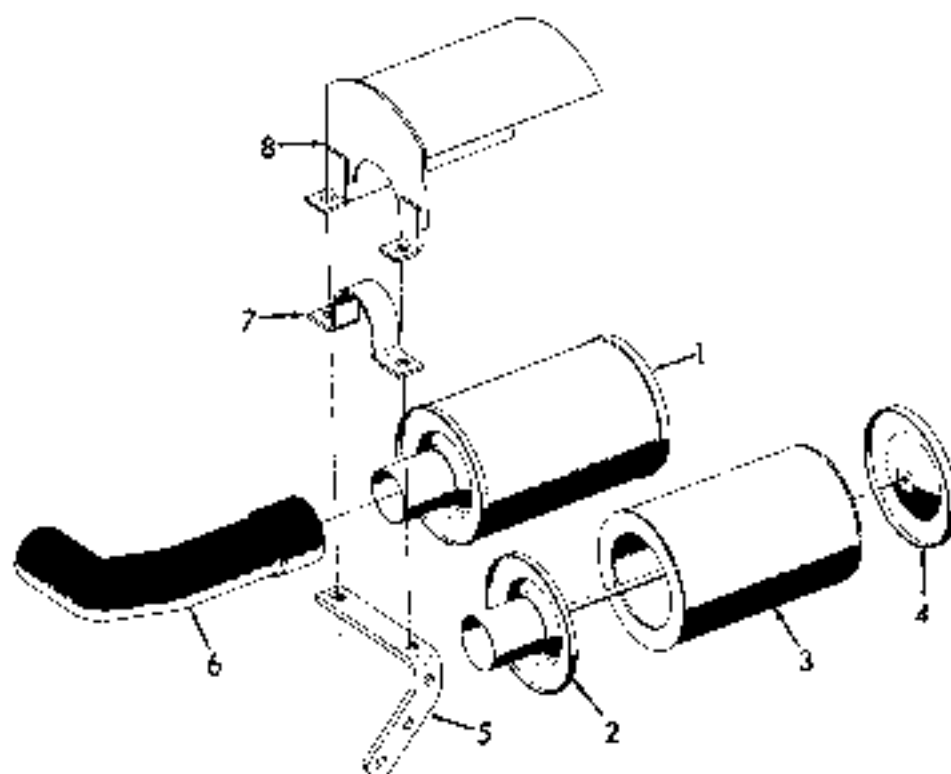


Fig. 12

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	Qty. Per
		AIR CLEANER	
		Group II	
		Used on M5A 20 II and 25 II Lift Trucks No. 28106-438 and after.	
1	36A8738	Air Cleaner - assembly, with mounting bracket	1
		50A4197 - Washer, plain, 9/16" I.D., 1-3/8" O.D.	2
		Includes the following 2 parts:	
2	13P1873	Filter - air cleaner	1
3	13P1874	Cover - filter	1
4		GM120246 - Nut, wing, No. 10-32 N.F.	1
5	35A7265	Hose - air cleaner to carburetor	1
		GM108479 - Clamp, hose, carburetor end, 1-7/8"	1
		GM195481 - Clamp, hose, air cleaner end, 2-1/8"	1
6	35A3723	Cover - air cleaner	1
7	35A6717	Retainer - air filter	1
8	2914587	Snap Ring - retainer	1
	35A6743	Insulation - air cleaner back, 1/2" thick x 9-3/4" long	1
	35A6741	Insulation - air cleaner, 1/2" thick, 7-1/4" wide x 14-1/2" long	1
	35A6742	Insulation - battery shroud, 1/2" thick x 18" square	1
9	35A6752	Duct - intake, battery end	1
	35A6749	Insulation - duct, 1/2" thick x 5" x 8-1/2"	1

MSA SERIES LIFT TRUCKS

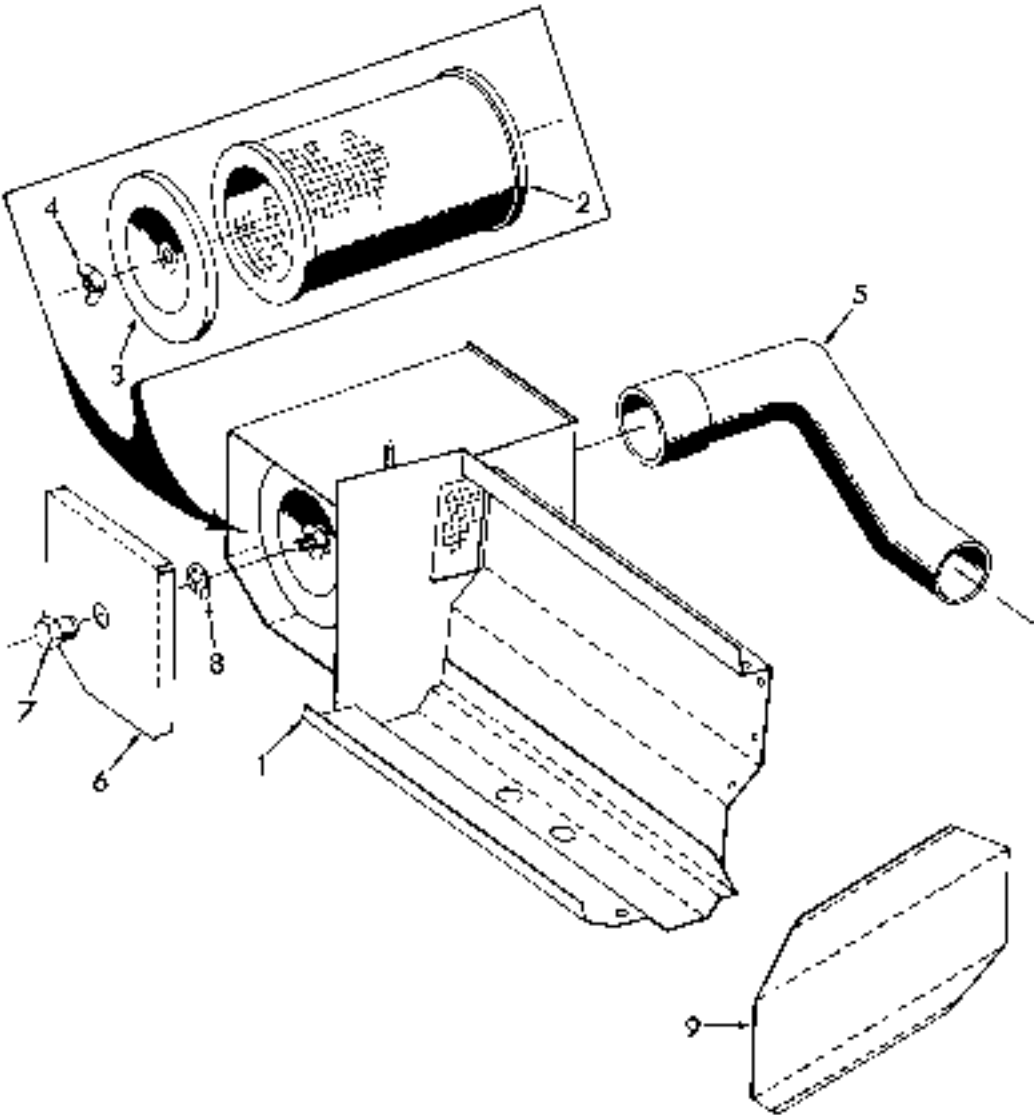


Fig. 13

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.	
		GENERATOR, REGULATOR, BATTERY AND ELECTRICAL SYSTEM		
		Group 1		
		Used on MSA 20-25 Lift Trucks to No. 28180435 Incl.		
1	10A21399	*Generator - with pulley, (Delco-Remy No. 1103426) (10A17645)	1	
		*NOTE: Order Service parts for generator direct from Delco-Remy Division or United Motor Service.		
		GM158077 - Bolt, hex., 3/16"-16 x 3/4"	1	
		GM153361 - Bolt, hex., 5/16"-16 x 1-1/4"	2	
2	10A17847	Pulley - generator, 2-13/16" O.D.	1	
		GM124566 - Key, Woodruff, No. 5, 1/8" x 5/8"	1	
	10A17846	Fan - generator	1	
3	25A7263	Belt - generator drive, 49" O.C.	1	
4	25A7270	Pulley - generator drive, 4-7/10" dia.	1	
		25A158 - Nut, hex., (Nylon), 1/2"-12	1	
		GM163866 - Key, Woodruff, No. 1/8" x 5/4"	1	
5	25A7260	Bracket - generator	1	
6	25A7267	Support - bracket	1	
		GM158120 - Bolt, hex., 3/8"-16 x 1-1/2"	4	
7	25A7265	Arm - generator adjusting	1	
8	25A3137	Regulator	1	
		GM1180320 - Bolt, hex., 1/4"-20 x 3/4"	3	
	10P2325	Battery - 12 volt, type 25M, 46A, 36 month	1	
	10P2334	Battery - 12 volt, type 25M, 46A, 48 month	1	
	10P2365	Electrolyte - 5 gallon	-	
	10P2393	Hose - electrolyte dispenser, for gal. container	-	
9	25A7213	Box - battery	1	
10	25A7217	Strap - battery hold down	1	
		25A2742 - Nut, hex. jam, 5/8"-16	2	
11	25A7219	Hold-Down - battery	1	
		GM158032 - Nut, wing, 5/8"-11	2	
12	25A7279	Baffle - battery	1	
		25A2755 - Screw, socket head, 3/8"-16 x 1-1/4"	2	
13	25A3583	Cable - battery ground	1	
14	25A3532	Cable - battery to starter	1	
	25A4771	Harness - wiring, upper	1	
	25A4773	Harness - wiring, lower	1	
	25A7507	Harness - wiring, generator to regulator	1	
		25A4602 - Clip, battery cables and harness	4	
	10A9146	Wire - ignition switch to fuel pump	1	
	RT663	Clip - harness	1	
		25A4667 - Clip, battery cables	4	
15	25A7702	Horn	1	
	25A7701	N Nut - hex., Gripco, 1/4"-20	1	
16	25A408	Relay - horn (25A316 later.)	1	
	25A7764	Wire - relay to horn	1	
17	25A3325	Button - horn	1	
	25A7176	Wire - button to harness	1	
	25A7175	Wire - button to ground	1	
18		25A3261 - Bushing, generator, horn wire	1	
19	25A7763	Bracket - horn	1	
	Machine No.	Accessories No.		
20	25P1489	IF433	Coil - distributor	1
21	25P1479	YPER	Coil - ignition (Procedure No. 200687)	1
	10P227	PC236	Stud - starter bracket	2
	15P042	25A13A	Bracket - starter support	1
	25P1471	25G13A	Arm - actance	1
22	25P1475	PG36E-3	Clamp - holding coil	1
23	25P1473	TA16-3	Starter - 12 volt (Frestolite No. MBK-1100)	1
24	25P1474	FD298	Connector - terminal, for ground strap	1

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION		No. Pcs.
		GENERATOR, REGULATOR, BATTERY AND ELECTRICAL SYSTEM Group I		
	Moline No.	Wiscorpn No.		
25	85P1470	YC-77-S1	Solenoid - starting switch	1
	35P1478	YL-350-7	Wire - assembly, solenoid to starter	1
26	85P1477	YD20	Cap - terminal, for ignition wires	2
27	35P1475	YD25A	Cap - terminal, coil wire	1
28	85P1479	YF10-A-S1	Distributor - (Auto Lite No. LAD3004-27)	1
			Includes the following 4 parts:	
	85P1481	-----	Point - set, distributor (Prestolite No. IGS-23241)	1
	35P1450	-----	Condenser - distributor (Prestolite No. IGS-2042S11) (35P1452)	1
	35P1761	-----	Rotor - distributor (Prestolite No. IG16573)	1
	35P2009	-----	Cap - distributor (Prestolite No. IG1224D)	1
	35P1480	YL352-S	Wire - ignition coil to distributor	1
	35P1463	YL280M	Cable Set - distributor ignition	1
29	35P1481	PI109	Grommet - cable	1
	35P1482	YL838-10	Cable - to ignition coil	1
30	35P1433	GD10.-1	Gear - distributor drive	1
31	35P1434	GF63	Pinion - distributor drive	1
32	35P1435	TA123-2	Shaft - distributor drive	1
33	35P1436	TB117B-S1	Adapter - distributor drive	1
34	35P1437	ISG182	Bushings - distributor drive shaft	2
35	35P1438	QD615A	Gasket - for distributor adapter	1
36	35P1439	TB112	Housing - distributor drive	1
	-----	2E14	Oil - distributor drive	1
	GM187294	RF170A	Coupling - oiler to pipe, 1/8"	1
	50A4463	RF904	Pipe - oiler, 1/8" pipe x 4"	1
	-----	RF990	Elbow - pipe to drive housing, 1/8" -90°	1
	85P2016	X3-106	Bolt - str. brace, No. 10-32 x 1"	2
	GM103022	PD-110	Nut - hex., No. 10-32	1

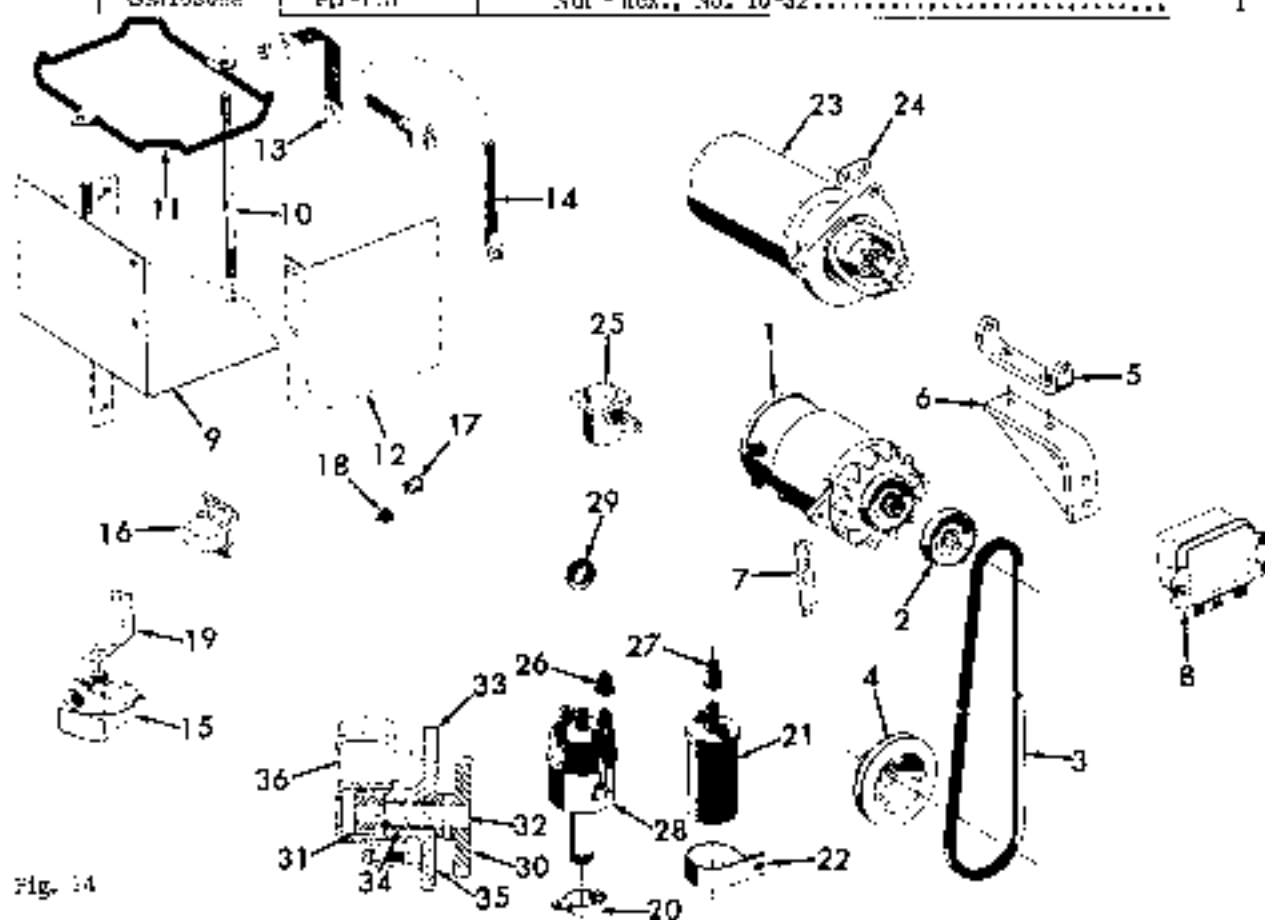


Fig. 14

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
		GENERATOR, REGULATOR, BATTERY AND ELECTRICAL SYSTEM	
		Group B	
		Used on MSA 20 II and 25 II Lift Trucks No. 22100438 and after.	
1	10A21393	Generator - less fan and pulley (Delco-Remy No. 119042E)	1
2	-----	Nut - hex., (Delco-Remy No. 191524)	1
3	-----	Washer - lock, (Delco-Remy No. 1341576)	1
		NOTE: Order service parts for generator and starting motor direct from Delco-Remy Division or United Motor Service.	
		GM180077 - Bolt, hex., 5/16"-18 x 3/4"	1
		GM180081 - Bolt, hex., 5/16"-18 x 1-1/4"	2
		GM120378 - Nut, hex., 5/16"-18	2
		GM120383 - Washer, plain, 11/32" I.D., 11/16" O.D.	1
		30A4256 - Washer, internal external lock, 5/16"	1
		30A4257 - Washer, internal external lock, 3/8"	1
4	10A17647	Pulley - generator, 2-13/16" O.D.	1
5		GM124545 - Key, Woodruff, No. 5, 1/2" x 5/8"	1
6	10A17648	Fan - generator	1
7	10A21401	Baffle - generator pulley	2
8	35A7263	Bolt - generator drive, 49" O.C.	1
9	35A7270	Pulley - generator drive, on engine, 4-7/16" dia.	1
		30A156 - Nut, hex., (Nylok, 1/2"-18)	1
		30A2025 - Washer, plain, 17/32" I.D., 27/32" O.D.	1
		GM138646 - Key, Woodruff, No. 7, 1/8" x 3/4"	1
10	35A7286	Bracket - generator	1
11	35A7267	Support - generator bracket	1
		GM130126 - Bolt, hex., 3/8"-16 x 1-1/2"	4
		GM120377 - Nut, hex., 3/8"-16	2
12	35A7285	Arm - generator adjusting	1
		GM130124 - Bolt, hex., 3/8"-16 x 1-1/4"	1
		GM120377 - Nut, hex., 3/8"-16	1
		30A4219 - Washer, plain, 13/32" I.D., 13/16" O.D.	2
13	35A5137	Regulator - (Delco-Remy 119003)	1
		30A4253 - Washer, internal external lock, 7/4"	2
		30A3616 - Bolt, hex., 1/4"-20 x 3/4"	3
14	10P2342	Battery - dry, 12 volt, 35A, GTX 58, 24 month	1
14	10P2342	Battery - dry, 12 volt, 35A, SS 53, 36 month	1
	10P2368	Electrolyte - 5 gallon	-
	10P2369	Hose - electrolyte dispenser, for 5 gallon container	-
15	35A3722	Hold-down - battery	1
16		30A3762 - Nut, wing, Zinc, 1/4"-20	2
		30A4201 - Washer, plain, Zinc, 9/32" I.D., 5/8" O.D.	2
17	35A3718	Hook - battery hold-down	1
18	35A3305	Cable - battery ground	1
19	35A3302	Cable - battery to starter	1
20	35A3756	Boot - battery, positive terminal	1
21	35A4771	Harness - wiring, upper	1
22	35A4773	Harness - wiring, lower, with 2-20 amp. and 1-15 amp. fuses	1
23	15P912	Strap - rubber	1
24	35A7667	Harness - wiring, generator to regulator	1
25		30A4682 - Clip, battery cable and harness	4
26		30A4687 - Clip, battery cable	3
27	35A7762	Horn	1
28	35A7761	Nut - hex., Gripco, 7/8"-20	1
29	35A403	Relay - horn (35A216 Inter.)	1
30	35A7764	Wire - relay to horn wire, 14 Ga. x 8" long	1
31	35A6395	Button - horn	1
32	35A7179	Wire - horn button to relay wire, 14 Ga. x 21" long	1
33	35A7178	Wire - horn button to ground, 14 Ga. x 19" long	1
34	10A20839	Buzzing - horn, horn wire (30A3361)	1
35	35A7738	Bracket - horn	1

MSA SERIES LIFT TRUCKS

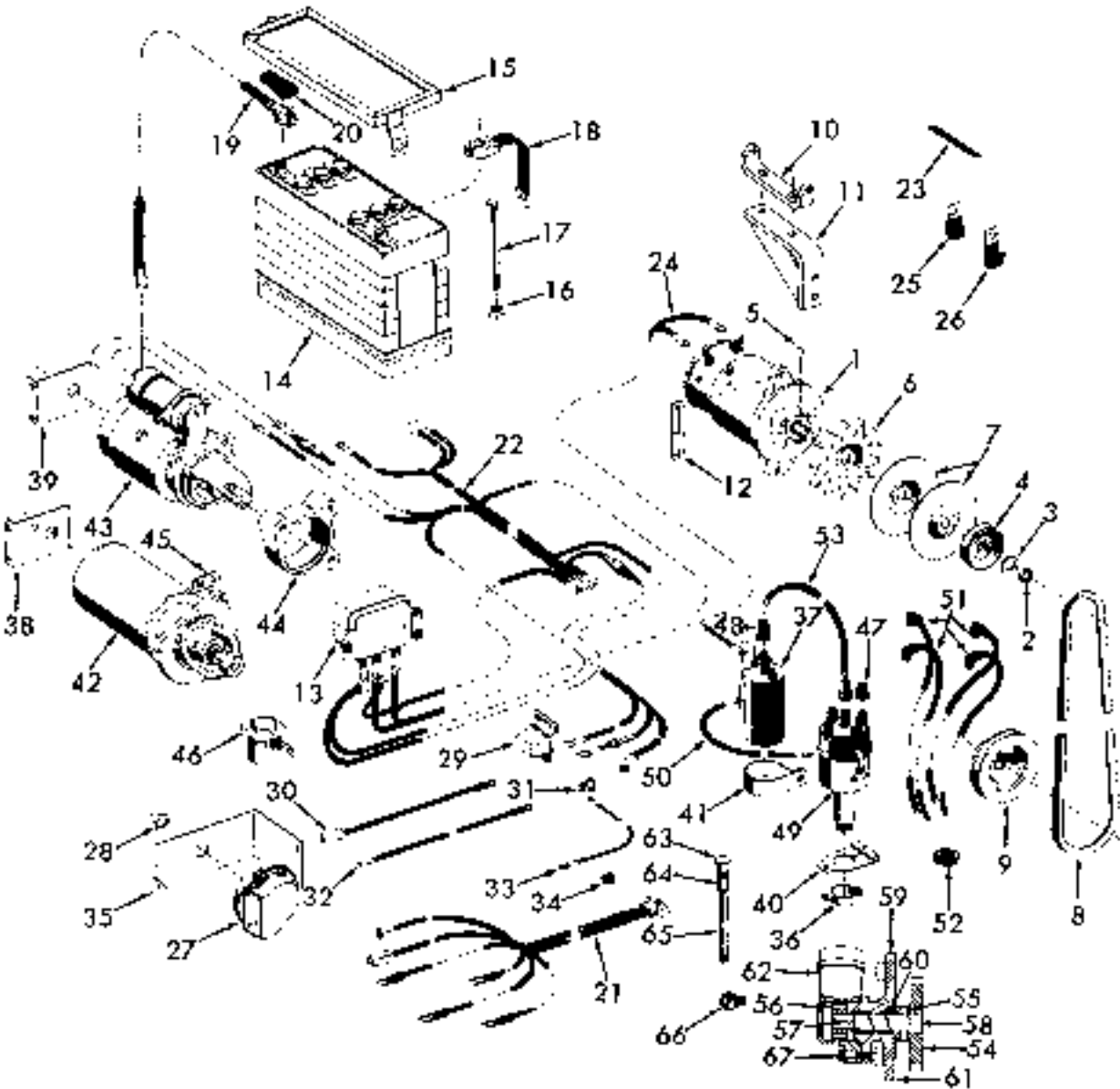


Fig. 16

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION		No. Pcs.
GENERATOR, REGULATOR, BATTERY AND ELECTRICAL SYSTEM (Cont'd)				
Group II				
Used on MSA 20 II and 25 II Lift Trucks No. 28100436 and after.				
	Moline No.	Wisconsin No.		
36	35P1489	HP439	Collar - distributor	1
37	35P1470	YF86	Coil - ignition (Prestolite No. 200667)	1
	15P326	PC396	Stud - starter bracket, 5/16" x 24	2
38	15P549	PG514A	Bracket - starter support, for 35P1470 starter	1
39	35P1883	PG514C	Bracket - starter support, for 35A8847 and 35A8870 starters	1
40	35P1471	PG543A	Arm - advance	1
41	35P1472	PG556-3	Crimp - coil	1
42	35P1473	YA18-3	Starter - 12 volt (Prestolite No. MB34100)	1
NOTE: See Mobilift Service Bulletin No. B-16 for replacement starter.				
43	35A8847	-----	Starter - with solenoid, 12 volt, special, slotted, ...	1
44	35A8870	-----	Starter - with solenoid, 12 volt, (Delco-Remy No. 1107990)	1
	-----	-----	35A5122 - Bolt, hex., 3/8" x 2-1/2"	2
	35P2033	PC-542	Stud - starter mounting, 3/8"-16 x 3/8"-24 x 2-10/16" long	2
45	35P1884	PG328	Spacer - starting motor, for 35A8847 and 35A8870 starters	1
46	35P1474	YD-296	Connector - terminal, for ground strap	1
46	35P1475	YC-77-51	Solenoid - starting motor, used with 35P1473 starter ..	1
	35P1476	Y1-15R-7	Wire - assembly, solenoid to starter, for 35P1473 starter	1
47	35P1477	YD-20	Cap - terminal, for ignition wires	5
48	35P1478	YD-20A	Cap - terminal, coil	1
49	35P1479	YF10-A-51	Distributor (Prestolite No. AD6064-2F)	1
Includes the following 4 parts:				
	35P1451	-----	Point Set - distributor (Prestolite No. ICS 2224D)	1
	35P1450	-----	Condenser - distributor (Prestolite No. ICS2D42-5S1) ..	1
	35P1761	-----	Rotor - distributor (Prestolite JG-1657R)	1
	35P2003	-----	Cap - distributor (Prestolite No. 1G1324D)	1
50	35P1480	Y1352-8	Wire - ignition coil to distributor, 14 Ga. x 6" long ..	1
51	35P1453	Y1285M	Cable Set - distributor ignition	1
52	35P1481	F13192	Grommet - cables	1
53	35P1482	Y1309-15	Cable - coil to distributor, 15" long	1
54	35P1483	GD101-1	Gear - distributor drive	1
55	-----	PA313	Pin - groove, drive gear, 5/32" x 1" long	1
56	35P1484	GF86	Pinion - drive shaft	1
57	-----	PA64	Pin - pinion, distributor drive, 1/9" x 3/4" long	1
58	35P1485	TA120-3	Shaft - distributor drive	1
59	35P1486	TB1178-51	Adapter - distributor drive	1
60	35P1487	NG132	Gushing - distributor drive shaft	2
61	35P1488	QD415A	Gasket - for distributor adapter	1
62	35P1489	TB119	Housing - distributor drive	1
63	-----	RE14	Oilier - distributor drive	1
64	GM167094	RF170A	Coupler - oilier to pipe, 1/8"	1
65	30A4465	RF204	Pipe - oilier, 1/8" pipe x 4"	1
66	-----	RF398	Elbow - pipe to drive housing, 1/8" x 90°	1
67	35P2019	XB-106	Bolt - center bore, No. 10-32 x 1"	3
	GM103682	PD-115	Nut - hex., No. 10-32	3

MSA SERIES LIFT TRUCKS

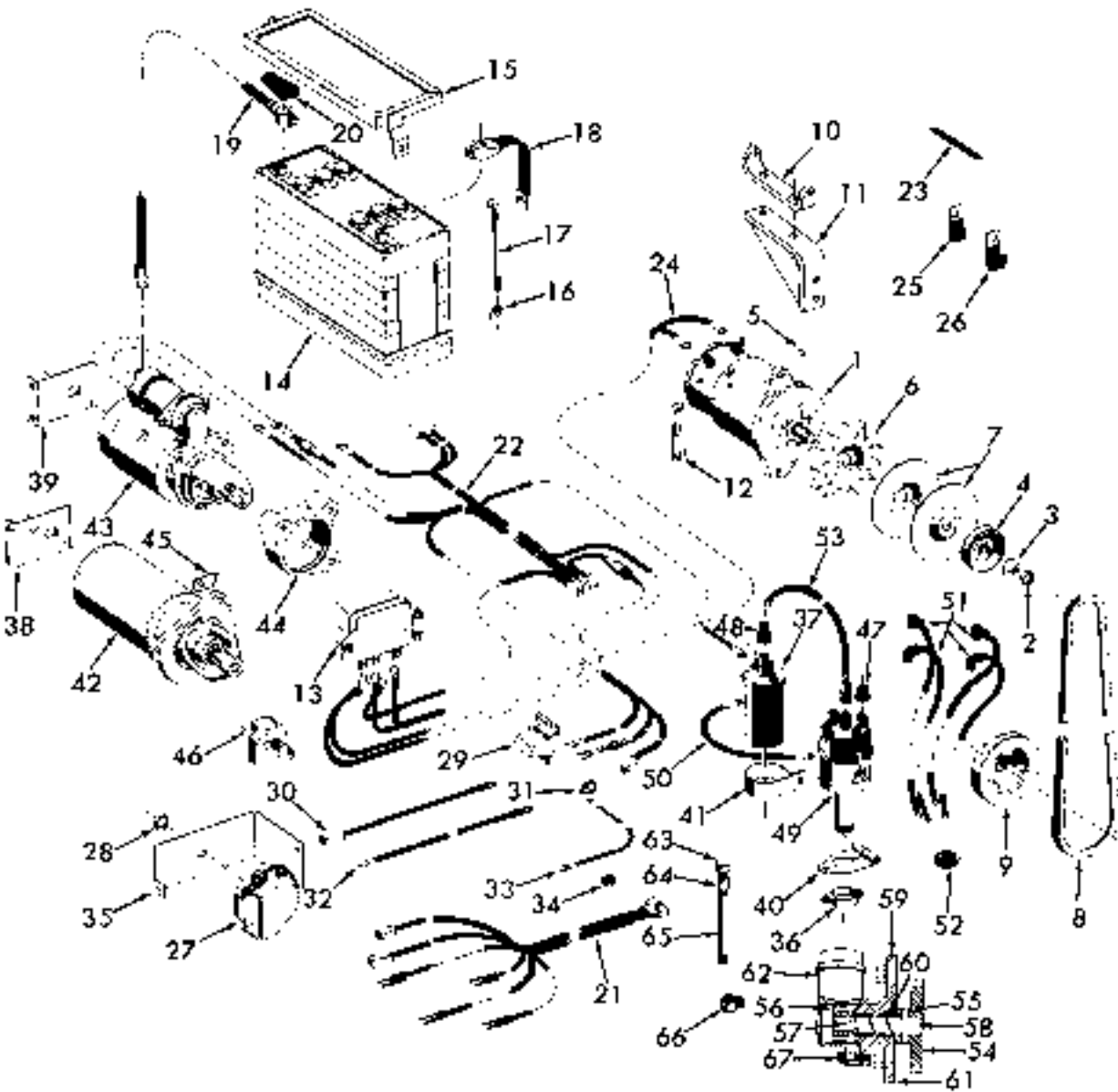


Fig. 15

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
FUEL TANK AND FUEL PUMP			
1	35A9146	Tank - fuel (35A9819)	1
2		30A2481 - Elbow, tank, 1/8" x 90°	1
3		30A2617 - Shut-off, fuel tank	1
		GM117243 - Plug, pipe, 1/8" drain	1
		30A9364 - Bolt, hex., 5/8"-16 x 3/4"	10
		30A1800 - Nut, hex., 3/8"-16	10
		Includes the following part:	
	35A7308	Insulation - tank, used with 35A9819 tank	1
4	35A9167	Gauge - fuel tank	1
5	35A178	Cap - filler, fire proof	1
		Includes the following 9 parts:	
6	35P55	Cap - filler	1
7	35P468	Pin - filler cap	1
8	35P56	Arm - filler cap	1
9	35P467	Pin - arm to cap	1
10	35P57	Spring - arm	1
11	35P58	Catch - arm	1
12	35P468	Pin - arm catch	1
13	35P59	Flange - screw	1
14	35P60	Screw - assembly	1
15	35A6359	Cap - handle, fuel tank	1
		GM190126 - Bolt, hex., 5/8"-16 x 1-1/2"	2-1
		30A154 - Nut, hex., (Nylon) 3/8"-16	2-1
		30A3085 - Washer, plain, 18/92" I.D., 1" O.D.	2-1
		30A1920 - Bolt, hex., 3/8"-16 x 2-1/2"	2
	10A17423	Spacer - handle, 3/8" heavy pipe x 1" long	2
16	30A1541	Washer - Belleville	8-4
17	35A4158	Hose - fuel, pump to carburetor	1
18	35A179	Hose - fuel, tank to pump	1
19		30A2481 - Elbow, carburetor, 1/8"-90°	1
		30A4687 - Plug, fuel line	1
20		GM9402836 - Elbow, 90°, 1/8" to 7/16"-20	1
21	35A7708	* Pump - fuel, electric (Autopulse Reg. 20-2)	1
		Includes the following 6 parts:	
		GM190018 - Bolt, hex., 1/4"-20 x 3/8"	2
22		GM105404 - Nipple, pipe, close, 1/8"	1
23		30A2490 - Elbow, filter to pump, 1/8" x 45°	1
24	35P1263	* Housing - assembly	1
	35P1264	* Coil - assembly, with bellows and armature	1
25	35P1265	* Body - pump	1
	35P1266	* Plug - body	1
26	35P1267	* Gasket - pump, between body and housing	1
		* NOTE: Used on MSA 23-28 Lift Trucks to No. 29100515 Inc.	
	35A8639	** Pump - fuel (Bendix No. 477160)	1
		Includes the following 13 parts:	
		30A5517 - Terminal, single collector	1
	35P1366	** Cover - pump	1
	35P1367	** Gasket - cover	1
	35P1368	** Magnet - pump	1
	35P1369	** Filter - pump	1
	35P1390	** Retainer - cup and plunger	1
	35P1391	** Washer - cup gasket	1
	35P1392	** Gasket - spring cup	1
	35P1393	** Cup and Valve - pump	1
	35P1394	** Spring - plunger return	1
	35P1395	** Plunger - pump	1
	35A8672	** Adapter - fuel pump	1
		** 30A3848 - Bolt, hex., 1/4"-20 x 3/4"	2
		** 30A870 - Bolt, rd. hd., 1/4"-20 x 3/4"	2
		** 30A1396 - Nut, hex., 1/4"-20	4

MSA SERIES LIFT TRUCKS

Ref. No	Part No.	DESCRIPTION	No. Pcs.
		FUEL TANK AND FUEL PUMP (Con't)	
	33A3307	** Wire - fuel pump to ignition switch, fused, 14 Ga. x 6" long	1
27	33A7712	**NOTE: Used on MSA 20 II and 20 II Lift Trucks No. 28100316 and after. Strainer - fuel filter	1
		Includes the following 6 parts:	
28	33F1281	Cover - filter	1
29	30P1282	Bowl - metal	1
30	33P1283	Ball - assembly	1
31	10P2364	Strainer - element	1
32	10P2365	Gasket - bowl	1
33	10P2366	Gasket - element sealing	1

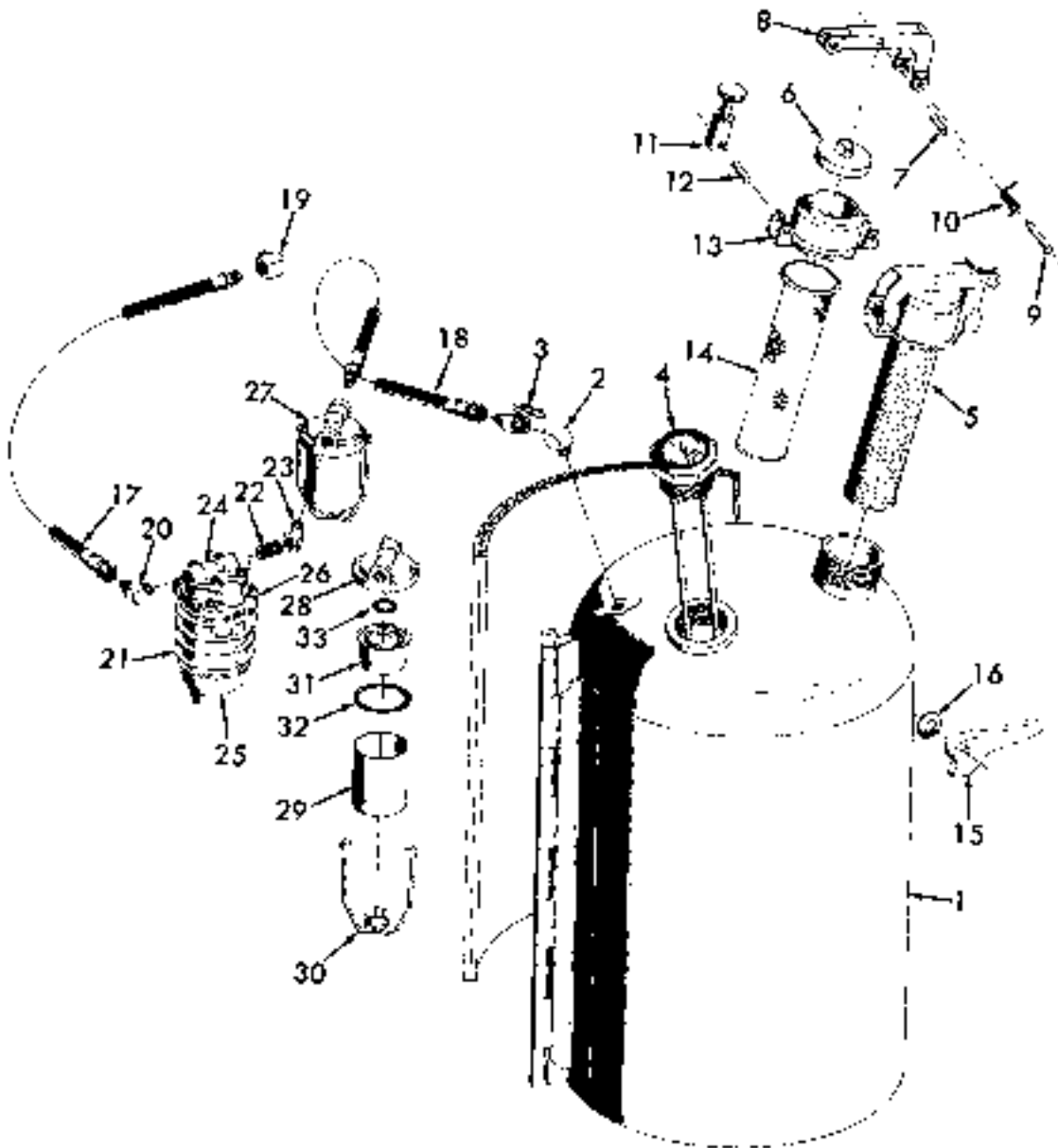


Fig. 16

M54 SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
		LP GAS EQUIPMENT	
	35A5033	*Tank - LP-Gas, 20 lb.	1
	80A5085	*Support - tank	1
	35A4861	*Hinge - support	2
	35A5948	*Pin - hinge	2
	35P1774	*Clamp - tank (35A4861 Inter.)	1
		*GM193182 - Bolt, hex., 3/8"-16 x 1"	1
		*GM177923 - Nut, corner, 1/2" x 3/4"	2
		*Note: Used on LP-Gas equipped trucks with 20 lb. tank.	
	D213E	**Tank - LP-Gas, 88-1/2 lb.	1
	35A3296	**Door - tank service	1
	35A3297	**Guide - hood, 1" x 1-1/4"	2
	35A3298	**Brace - hood, angle, 1-1/4" x 29-1/4"	2
	35A3299	**Guide - hood support, 1" offset, 2" x 2-1/4"	4
	35A3300	**Support - side member, 3/8" x 3" x 7-7/8"	2
	35P308	**Strap - tank, L.H.	1
	35P51E	**Strap - tank, R.H.	1
		**50A3884 - Bolt, hex., 3/8"-16 x 1-1/4"	4
		**50A388E - Bolt, hex., 3/8"-16 x 1"	6
		**50A1900 - Nut, hex., 3/8"-16	12
		**NOTE: Used on LP-Gas equipped trucks with 33-1/2 lb. tank.	
1	35P1296	Vaporizer - assembly	1
	35P1095	Repair Kit - vaporizer (includes diaphragm, seat, seals and washers)	1
	35P1298	Bracket - vaporizer	1
		GM193180 - Bolt, hex., 3/8"-16 x 3/4"	1
2	35P1084	Solenoid - 22 volt	1
3	35P1085	Regulator - Zenith Model C	1
		Includes the following 2 parts:	
	35P1372	Valve - block and spring assembly	1
	35P1373	Screw - adjusting, fuel pressure	1
	35P1096	Repair Kit - regulator (includes diaphragm, gaskets and seals)	1
		-GM115036 - Nipple, pipe, close, 1/4" N.P.T.	1
		++50A4481 - Nipple, 1/4" x 2-1/2"	1
		50A378 - Elbow, street, 1/4" N.P.T.	1
		GM119247 - Nipple, pipe, 1/4" N.P.T. x 4"	1
		GM144813 - Adapter, tube, 1/4" N.P.T. x 3/8"	1
4	35P2297	Elbow - adapter, with adjusting screw	1
5	35P1299	Carburetor	1
	35P1087	Gasket - carburetor	1
6	35P509	Elbow - carburetor	1
		50A2476 - Elbow, street, 3/8"-90°	1
7	35P514	Bulldozed - Filter	1
		Includes the following 2 parts:	
		GM144355 - Elbow, adapter, 1/4" N.P.T. x 3/8"	3
	35P1005	Element - filter	1
	35P1638	Spring - filter	2
8	35P1598	Hose - filter to tank, 14" long (35P1303)	1
9	35P1301	Hose - filter to solenoid, 22" long	1
10	35P1589	Hose - carburetor to regulator, 22" long (35P1302)	1
	85A8789	Grommet - fuel line, 3/4" I.D. x 1-1/8" O.D. x 2-1/2" long	1
11	35P1393	Wire - regulator to vacuum switch, 6" long	1
12	35P1775	Wire - pressure switch to ignition switch, fused, 16" long (35P1304)	1
13	35P1395	Switch - vacuum	1
		+GM137967 - Nipple, pipe, 1/8" N.P.T. x 9"	1
		++50A4483 - Nipple, pipe, 1/8" N.P.T. x 3"	1
		50A2481 - Elbow, street, 1/8" N.P.T. x 90°	1
		++50A4485 - Nipple, pipe, 1/8" N.P.T. x 4"	1
14	35P119	Coupling - hose to tank, female	1
15	D2173	Coupling - hose to tank, male	1
		Includes the following 2 parts:	
	30A1701	"O" Ring - coupling	1
	35P176H	Gasket - coupling	1

MSA SERIES LIFT TRUCKS

Ref. No	Part No.	DESCRIPTION	No. Pcs.
LP GAS EQUIPMENT (Cont'd)			
16	35P530	Dash - plug, instrument panel	1
	35P1306	Clamp - hose	1
		GM181393 - Bolt, hex., 7/16"-20 x 3/4"	1
		*GM160122 - Bolt, hex., 3/8"-10 x 1"	2
		*GM102835 - Nut, hex., 3/8"-16	2
	35P515	Relief Valve	1
	35P1307	*Coupling - relief valve	1
	35P1306	*Coupling - relief valve	1
	35P1309	*Adapter - relief valve	1
		*GM119093 - Elbow, adapter, 3/8" N.P.T. x 45°	1
		*GM121207 - Nipple, pipe, close, 3/8" N.P.T.	2
		*50A2476 - Elbow, street, 3/8" N.P.T. x 90°	1
	35P1311	*Hose - relief valve	1
	35P1310	*Clamp - hose	1
		*NOTE: Used on LP-Gas equipped trucks with 30 lb. tank.	
17	35A 7733	Manifold - engine, LP-Gas	1
	35R61	Spark Plug - LP-Gas, 18 MM AC-ME8 or Champion D9J	4
	35P1490	Swirling - carburetor to air cleaner hose, 1" x 1-5/8" I.D. x 1-5/8" O.D. ..	1
		*NOTE: Used on MSA 20 and 25 Lift Trucks to No. 28100437 inc. **NOTE: Used on MSA 20 II and 25 II Lift Trucks No. 28100438 and after.	

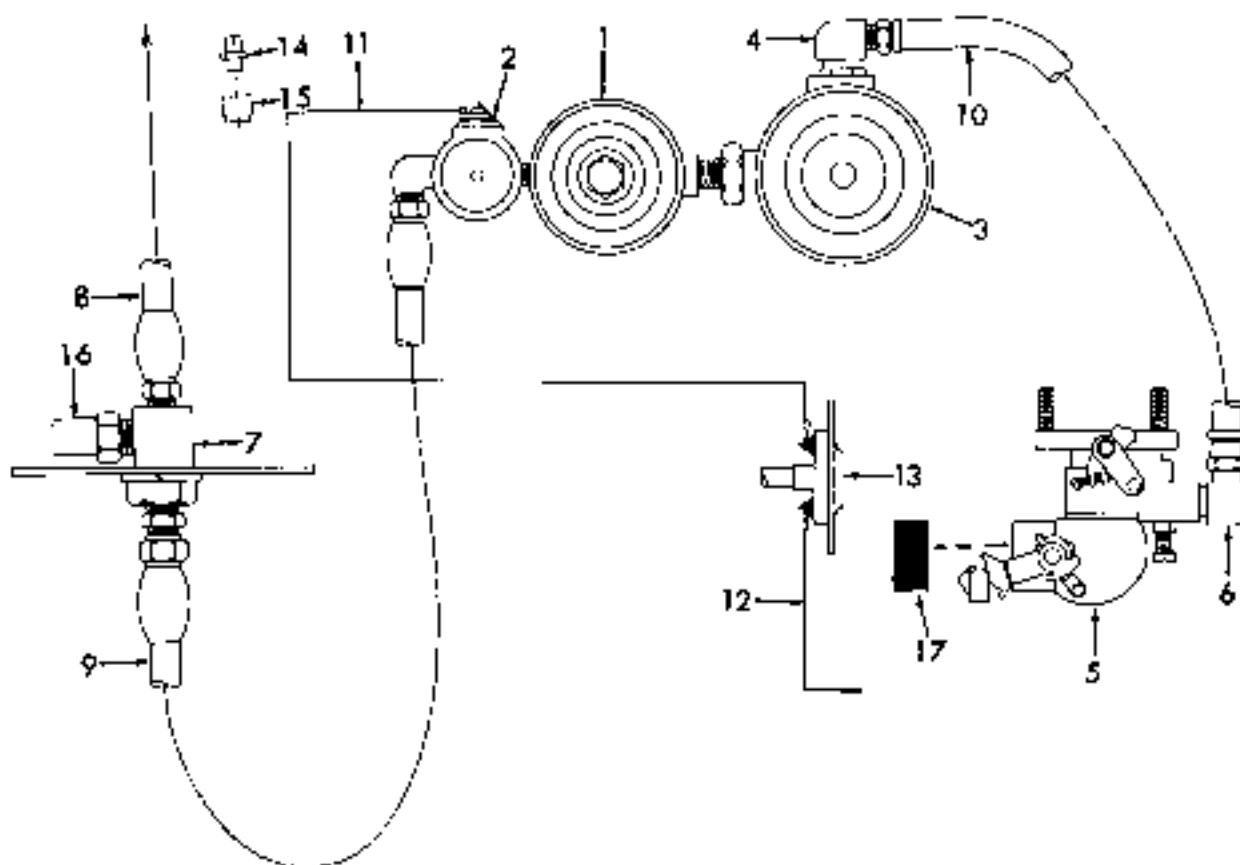


Fig. 17

MSA SERIES LIFT TRUCKS

Kit No.	Part No.	DESCRIPTION	No. Pcs.
ADAPTER HOUSING AND DAMPENER DRIVE			
1	35A7261	Housing - adapter	1
		GM141240 - Pin, dowel, housing, 3/8" x 3/4"	2
2	35A7260	Stud - housing, 7/16"-14 x 1-11/16"	4
		GM271561 - Nut, hex., 7/16"-14	4
		30A1925 - Bolt, hex., 3/8"-16 x 2-1/2"	7
		GM180124 - Bolt, hex., 3/8"-16 x 1-1/4"	3
		GM180132 - Bolt, hex., 3/8"-16 x 2-1/4"	2
3	35A7263	Hub - dampener mount	1
		GM124555 - Key, Woodruff, No. 13	1
4	35A7467	Gasket - hub	1
5	35A7445	Washer - stat, lock, 1-17/32" I.D.	1
6	35A7428	Nut - hex., 1/2"-12 UNF	1
7	35A7733	Dampener - drive, 8-7/8" O.D.	1
		GM190077 - Bolt, hex., 5/16"-18 x 3/4"	6
8	35A7378	* Baffle - engine	1
		* NOTE: Used on MSA 20 and 25 Lift Trucks to No. 26100437 Inc.	
	35A9747	** Cover - engine, mounts over spark plugs, 3" x 9"	1
		** NOTE: Used on MSA 20 and 25 Lift Trucks No. 28100482 and after.	
		GM120583 - Screw, rd. hd., 1/4"-20 x 5/8"	3
ENGINE MOUNTING BOLTS AND BRACKET			
9	35A7186	Plate - engine adjusting	1
		GM180124 - Bolt, hex., 3/8"-16 x 1-1/4"	2
		50A3489 - Washer, plain, 13/32" I.D., 1-1/8" O.D.	2
10	35A7669	Mounting - engine	1
		50A2641 - Bolt, hex., (Nylok) 1/2"-13 x 2"	1
		50A3438 - Washer, plain, 17/32" I.D., 1-1/2" O.D.	1
11	35A7680	Shim - engine mounting	A, B,

MSA SERIES LIFT TRUCKS

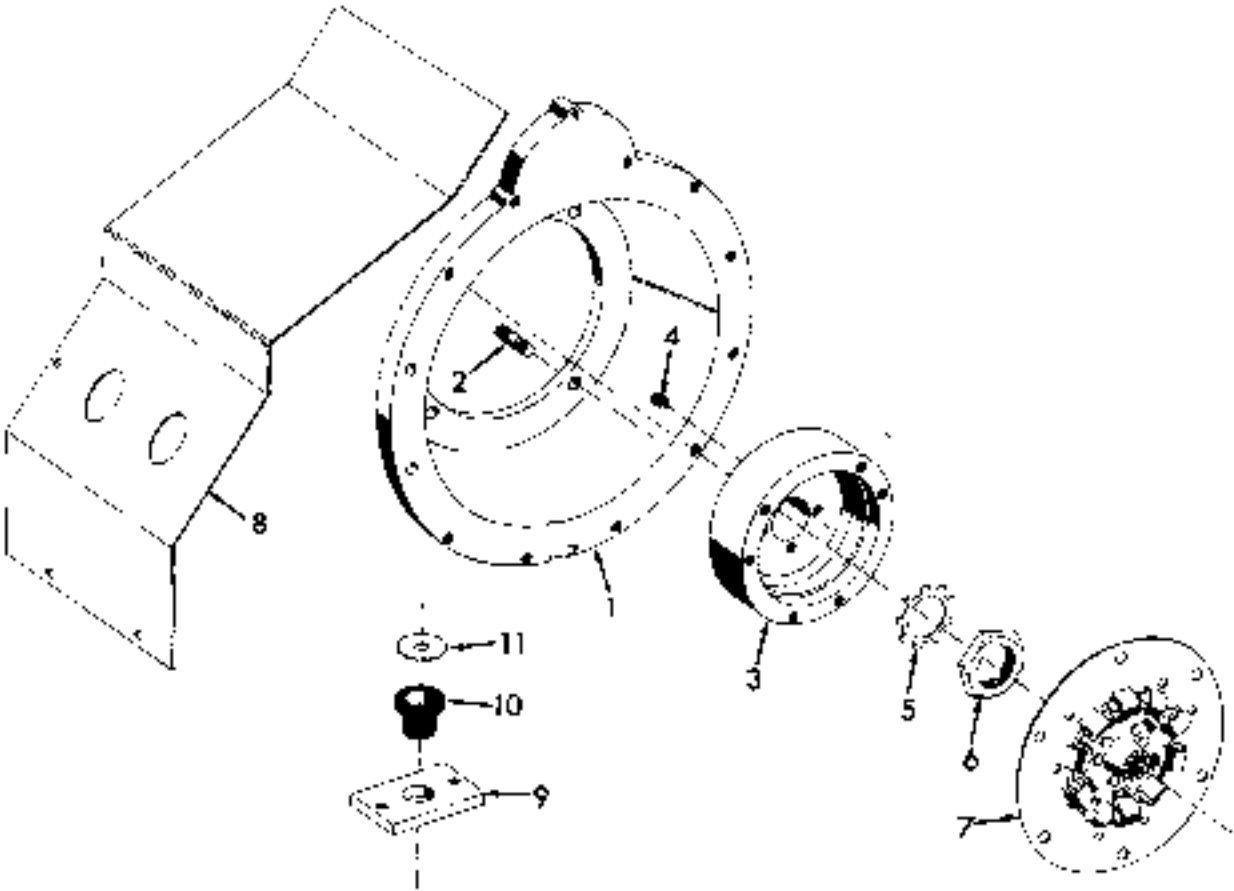


Fig. 18

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs
TRANSMISSION CASE			
1	35A7227	Case - transmission	1
		GM444855 - Plug, drain, 1/8"-27	1
		GM180149 - Bolt, hex., 7/16"-14 x 1-1/2"	5
		GM180161 - Bolt, hex., 7/16"-14 x 1-3/4"	6
		GM180165 - Bolt, hex., 7/16"-14 x 2-1/4"	2
		GM271501 - Nut, hex., 7/16"-14	2
		GM188592 - Bolt, hex., 7/16"-14 x 4-1/4"	2
2	JT7205	Stud - adapter to case	2
3	35A4136	Adapter - transmission case	1
4	35A4463	*Gasket - adapter	1
5	35A4136	Cover - transmission case	1
		GM145849 - Ball, cover, 9/32" dia.	1
		GM180184 - Bolt, hex., 3/8"-16 x 1-1/4"	15
		GM180128 - Bolt, hex., 3/8"-16 x 1-3/4"	3
6	35A4462	*Gasket - transmission case cover	1
7	10A9792	Pin - dowel, cover to case	4
8	35A4412	Cap - bearing	1
		GM180122 - Bolt, hex., 3/8"-16 x 1"	5
9	35A4456	*Shim - bearing cap, .002", red	A.R.
10	35A4424	*Shim - bearing cap, .003", green	A.R.
11	35A4425	*Shim - bearing cap, .005", blue	A.R.
12	35A4430	*Shim - bearing cap, .020", yellow	A.R.
	35R36	*Kit - gaskets, transmission and differential overhaul	-
		NOTE: Kit includes parts identified with a single asterisk ().	
13	35A2112	Plug - pipe, drain (Magnetic)	1
	85P1755	Oil - transmission, Donax T-4, 1 gallon	-
	35P1756	Oil - transmission, Donax T-4, 5 gallon	-

MSA SERIES LIFT TRUCKS

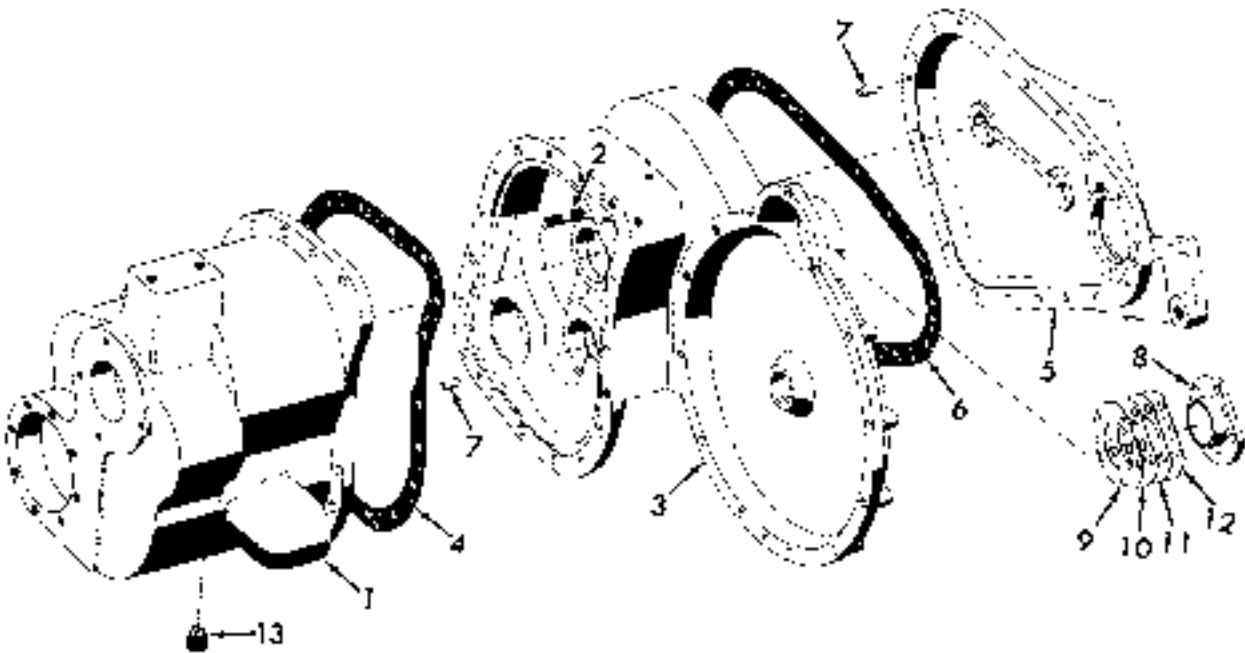


Fig. 19

MSA SERIES LIGHT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
TRANSMISSION			
	35A34	Housing - assembly	1
		Consists of the following 11 parts:	
1	35A7710	Housing	1
2	35A6783	Piston	2
3	35A7708	Plate - friction	2
4	35A8268	Plate - backing, same as 35A334 with 16 micro finish	2
		Caution: MSA light trucks must use only plates with 16 micro finish.	
5	35A335	Ring - backup	2
6	10A15839	Ring - piston	2
7	35A339	Ring - retainer, backup ring	2
8	35A355	Ring - oil seal	2
9	35A381	Spring - piston	2
10	35A332	Retainer - spring	2
11	35A340	Ring - snap, spring retainer	2
12	35A3822	Shaft - input, with steel balls and bridge	1
		CM140641 - Ball, steel, 5/16"	2
13	10A7936	"O" Ring - input shaft, 1-1/2" I.D. x 1-3/4" O.D. (50A765)	3
14	80A7183	Screw - set, socket head, 1/2"-13 x 8/8"	1
15	35A341	Ring - oil seal, *In 35A88 kit	4
	80A36	*Kit - gasket, transmission and differential overhaul	1
		NOTE: Kit includes parts identified with a single asterisk ().	
16	80A4128	Carrier - forward	1
17	35A4131	Carrier - reverse	1
18	10A8712	Rollers - carrier, short	108
19	80A7963	Rollers - carrier, long	108
20	35A7665	Spacer - rollers, short, for 35A4128 carrier	1
21	80A7964	Spacer - rollers, long, for 35A4131 carrier	1
22		35A2885 - Ring, backup, quad, ring	1
23	80A3823	Washer - carrier thrust, outer	2
24	35A7668	Washer - carrier thrust, inner	2
25	10A7930	Cone - bearing, input shaft	1
26	10A7931	Cup - bearing, input shaft	1
27	10A4762	Cone - bearing, input shaft, valve end	1
28	10A7571	Cup - bearing, input shaft, valve end	1
29	35A3821	Gear - clutch, input shaft	1
30	35A4141	Countershaft	1
31	35A3810	Gear - forward, on countershaft, 58 teeth	1
32	80A4143	Gear - output, on countershaft	1
33	10A4702	Ring - retainer, countershaft gears (50A1689)	3
34	35A4142	Gear - reverse, on countershaft	1
35	15A8627	Cone - bearing, countershaft	1
36	10A863	Cup - bearing, countershaft	1
37	10A6752	Cone - bearing, countershaft, valve end	1
38	10A7571	Cup - bearing, countershaft, valve end	1
39	80A4133	Carrier - differential, with gear	1
40	35A4422	Cone - bearing carrier	1
	10A7637	Cup - bearing, for 35A4422 cone, Ref. No. 40	1
41	35A6785	Flange - differential carrier	1
		10A1440 - Screw, counterbore, 3/4" x 10 x 1"	8
42	80A4161	Cone - bearing, carrier flange	1
43	10A7233	Cup - bearing, carrier flange	1
44	35A4380	Gear - bevel	2
45	35A7346	Washer - thrust, gear, .0312	A, R
46	35A7347	Washer - thrust, gear, .0332	A, R
45	35A7348	Washer - thrust, gear, .0362	A, R
45	35A8252	Washer - thrust, gear, .039	A, R
45	35A8710	Washer - thrust, gear, .045	A, R

MSA SERIES LIFT TRUCKS

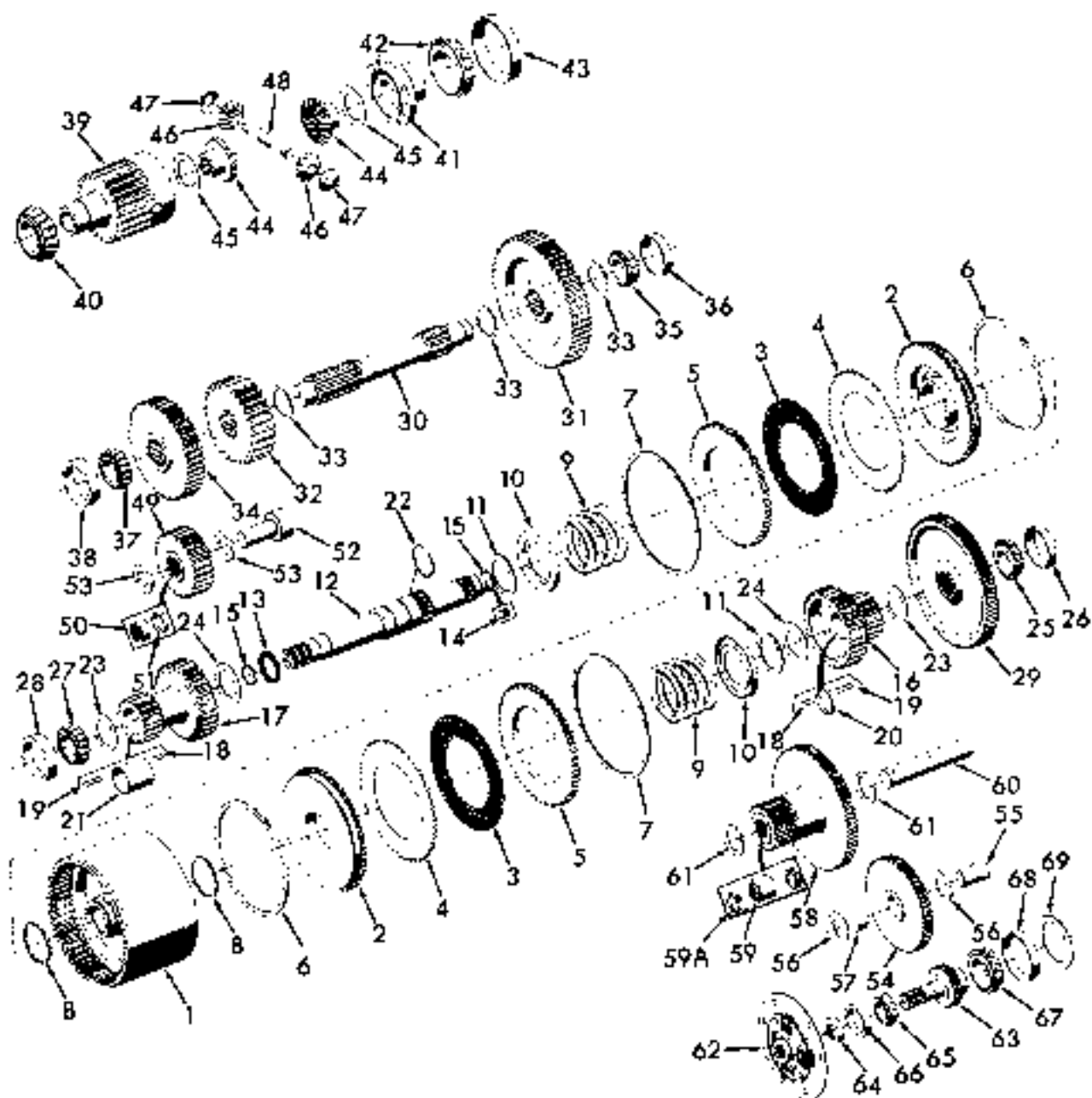


Fig. 20

M3A SERIES LIFT TRUCKS

Ref. No	Part No	DESCRIPTION	No. Pos
TRANSMISSION (Gear'd)			
46	35A4337	Pinion - bevel gear	2
47	35A4334	Washer - pinion thrust	2
48	35A4335	Shaft - pinion	1
	55A2846 - Pin, roll, 3/16" x 1-3/4"		1
49	35A4140	Gear - reverse idler, with needle bearing and spacers	1
	55A2845 - Pin, roll, 3/16" x 3/4"		1
50	35A353	Bearing - needle, idler gear	2
51	35A3777	Spacer - needle bearing	1
52	35A4139	Shaft - reverse, idler gear, with roll pin	1
	55A2845 - Pin, roll, 3/16" x 3/4"		1
	55A378 - Ring, retainer, idler shaft		1
53	35A4144	Washer - thrust, reverse gear	2
54	35A3614	Gear - idler	1
55	35A3615	Shaft - idler gear, with roll pin	1
	55A2832 - Pin, roll, 3/16" x 1"		1
56	35A3617	Washer - thrust, idler gear	2
57	35A4140	Bearing - needle, idler shaft	2
58	35A3618	Gear - compound, idler, with needle bearings and retaining rings	1
59	35A3772	Bearing - needle, idler gear	2
60A		55A4792 - Retaining ring, needle bearing	4
60	35A3612	Shaft - idler gear, with roll pin	1
	55A2832 - Pin, roll, 3/16" x 1"		1
61	35A4148	Washer - thrust, idler gear	2
62	35A7735	Damper - assembly, on flywheel, 9-7/8" O.D.	1
	GM130077 - Bolt, hex., 5/16"-18 x 3/4"		6
63	35A3609	Gear - input, in damper	1
64	35A4175	*Seal - oil, damper assembly	1
	35R36	*Kit - gasket, transmission and differential overhaul	1
65	35A3607	Gear - bearing, input gear, damper end	1
66	10A14902	Cup - bearing, input gear, damper end	1
67	15A12648	Gear - bearing, input gear, pump end	1
68	15A12647	Cup - bearing, input gear, pump end	1
69	35A4145	Spacer - input gear	1
NOTE: Kit includes parts identified with a single asterisk ().			

MSA SERIES LIFT TRUCKS

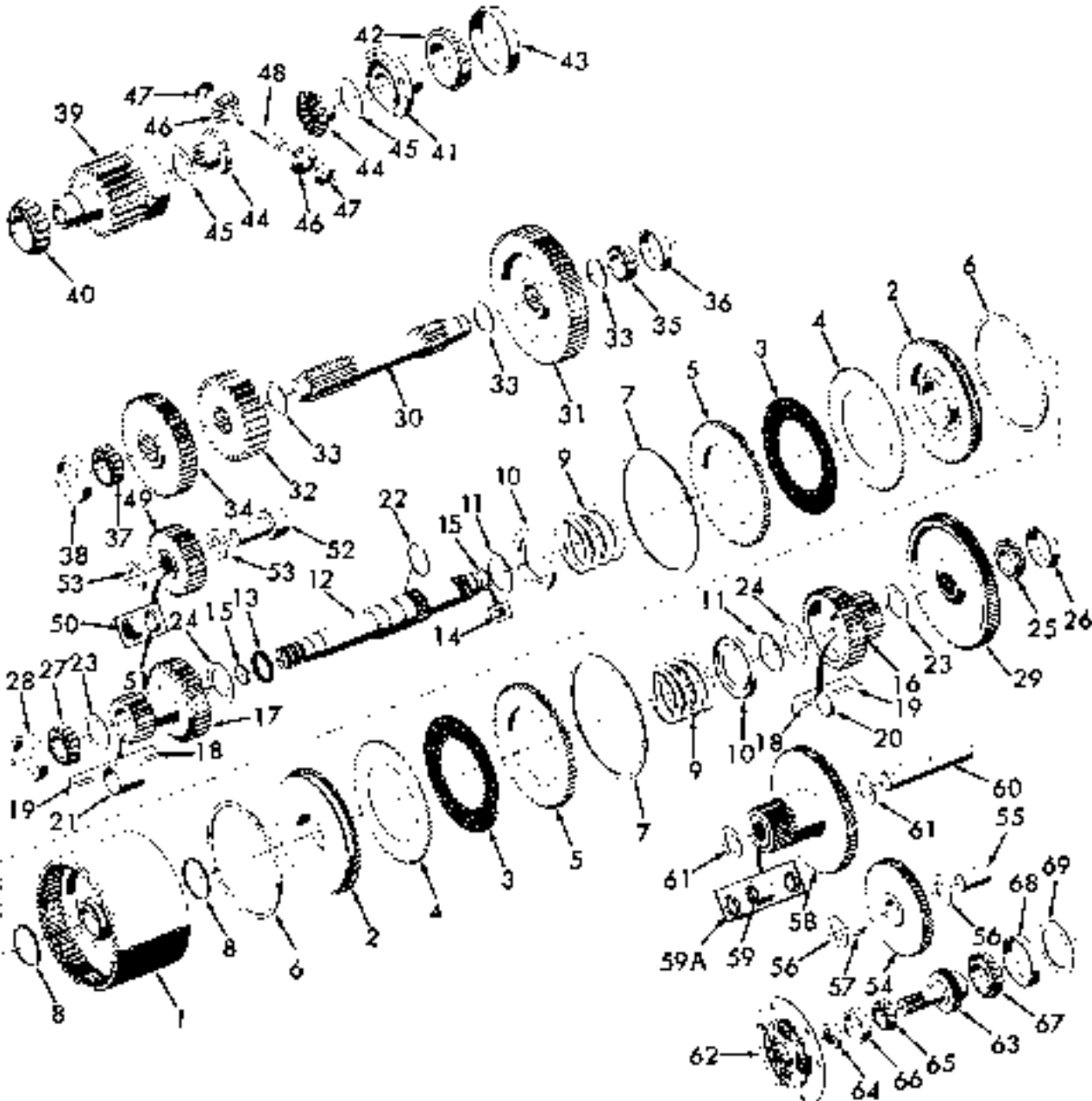


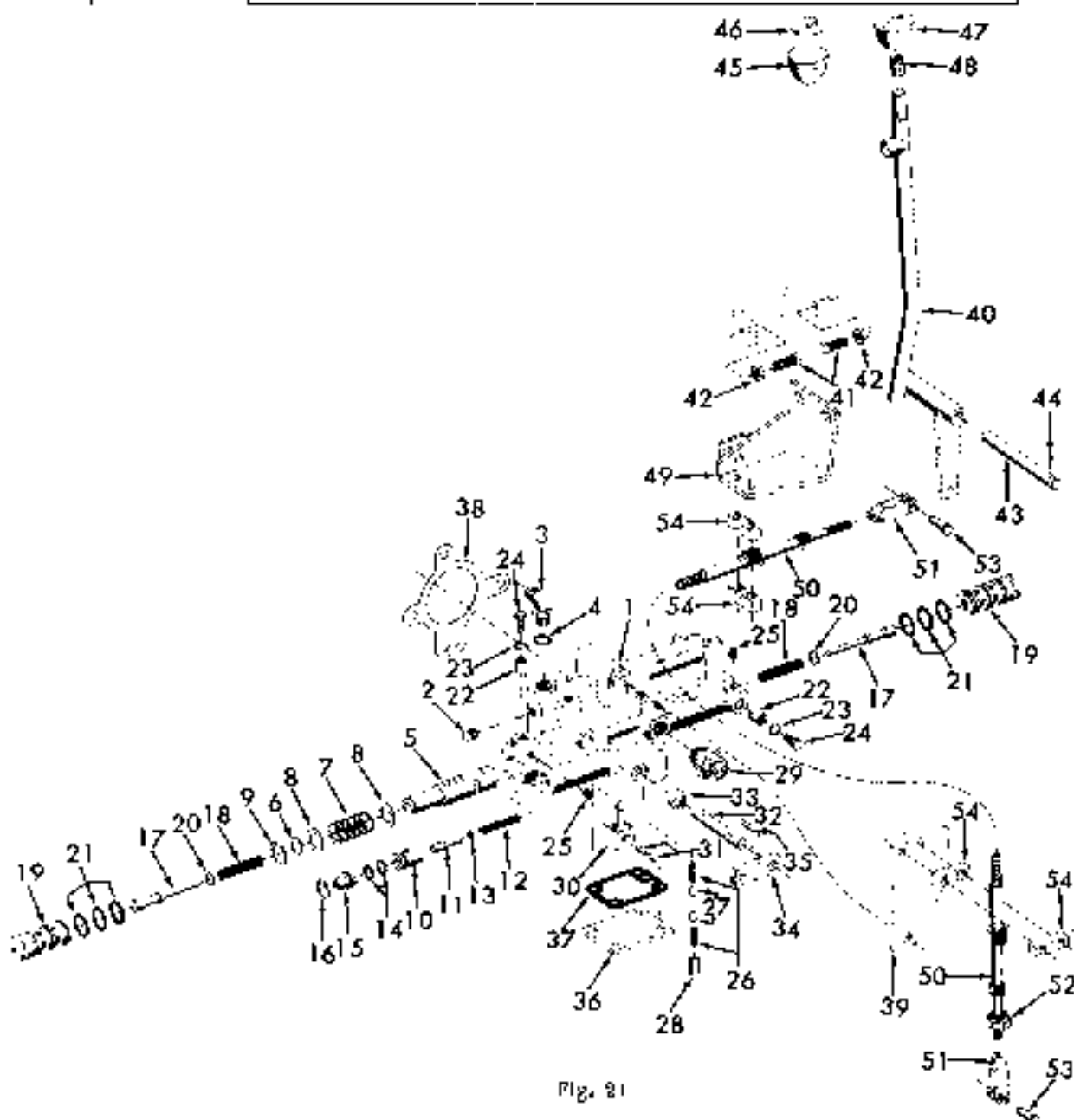
Fig. 20

M3A SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
TRANSMISSION CONTROL VALVE AND CONTROLS			
1	35A1467	Valve - assembly, complete Includes the following 23 parts:	1
		50A1926 - Bolt, hex., 3/8"-16 x 3-1/4"	2
		50A1928 - Bolt, hex., 3/8"-16 x 3-3/4"	2
2		GM4448 - Plug, pipe, 1/2"-27	3
3		50A1423 - Elbow, valve, 3/16"-16 x 90°	1
4	10A1640c	"O" Ring - elbow to valve body	1
5	35A5171	Spool - valve, 4-7/16" long (35A7137)	1
		//NOTE: When replacing 35A7137 spool with 35A5171, use 35A8170 lever.	
6		50A2241 - Ring, snap, spool (Spicolex RST6)	1
7	35A7743	Spring - spool	1
8	35A7129	Washer - spool	2
9		50A2241 - Ring, snap, washer retainer	1
10	35A1200	Valve - relief, 3/4" O.D. x 1-1/8" long	1
11	35A1249	Piston - relief valve	1
12	35A7147	Spring - relief valve	1
13	35A5107	Shim - relief valve, 3/8" O.D. x 1/32" thick	2
14	10A8329	Seal - "O" ring, valve and block, 3/4" O.D.	2
15	35A5177	Block - valve	1
16	10A6330	Ring - snap, block retaining	1
17	35A7128	Spool - inching	2
18	35A7744	Spring - inching spool	2
19	35A7127	Spool - control	2
20		50A2246 - Ring, snap, spool	2
21	10A8308	Seal - "O" ring, spool	6
22	35A7188	Eccentric - hydraulic valve adjusting	2
23		30A192 - Ring, snap, eccentric	2
24		GM180020 - Bolt, hex., 1/4"-20 x 3/4"	2
25		30A2740 - Set Screw, (Nylo's), 5/16"-16	2
26	35A9341	Spring - Jerk, 3/32" dia. x 27/32" long (35A7745)	2
27		GM143643 - Ball, steel, 3/5" dia.	2
28	35A7107	Pin - detent, valve detent	1
29	35A7687	Switch - manual start, in body	1
30	35A8170	Lever - control arm (35A7127)	1
31		50A1678 - Pin, roll, 3/16" dia. x 7/16"	2
32	35A4940	Shaft - control arm, 1/2" x 3-3/8"	1
33	35A4946	Seal - shaft, control arm	1
34	35A9367	//Lever - control arm (35A7127)	1
		//NOTE: When replacing 35A7127 lever with 35A9367, use 35A9342 plate.	
35		50A2543 - Pin, roll, 3/16" dia. x 3/4"	1
36	35A7181	Cover - valve body	1
		GM160019 - Bolt, hex., 1/4"-20 x 5/8"	4
37	35A7182	Gasket - cover	1
38	35A7170	+Shim - body to transmission case, .002, red	A.R.
39	35A7171	+Shim - body to transmission case, .003, green	A.R.
40	35A7172	+Shim - body to transmission case, .004, blue	A.R.
41	35A7173	+Shim - body to transmission case, .005, yellow	A.R.
42	35R36	+Kit - gasket, transmission and differential overhaul	-
		+NOTE: Parts with cross (-) included in 35R36.	
43	35A9342	##Plate - mounting, control valve cable clamp (35A7150 - 35A8743)	1
		##NOTE: When replacing 35A7150 plate with 35A9342, use 35A9367 lever.	
44	35A8110	Lever - transmission control (35A6131)	1
45		GM134363 - Set Screw, cup point, lever adjusting, 3/8"-16 x 1"	2
46		GM124829 - Nut, hex, jam, 3/8"-16	2
47	35A6135	Shaft - lever, 1/2" x 1-1/4"	1
48		50A2525 - Pin, roll, 3/16" x 1"	1
49	35A4119	Knob - lever, for 35A6131 lever	1
50	35A4190	Insert - knob, transmission control, for 35A4119 knob	1
51	35A4612	Knob - lever, solid, for 35A8815 lever	1
52		35A4587 - Insert, knob, for 35A6312 knob	1

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
TRANSMISSION CONTROL VALVE AND CONTROLS (Cont'd)			
49	35A6102	Bracket - transmission control lever	1
		GM180122 - Bolt, hex., 3/8"-16 x 1"	2
		GM180079 - Bolt, hex., 5/16"-18 x 1"	1
		GM120378 - Nut, hex., 5/16"-18	1
		GM120393 - Washer, plain, 11/32" I.D., 11/16" O.D.	2
50	35A6434	*Cable - transmission control, 59" long	1
50	35A3726	**Cable - transmission control, 69" long	1
		*NOTE: Used on MSA 20 and 25 Lift Trucks to No. 28100437 inc.	
		**NOTE: Used on MSA 20 II and 25 II Lift Trucks no. 28100429 and after.	
51		GM174897 - Clevis, cable, short, 5/16"-24	2
52		GM124829 - Nut, hex., jam, 3/16"-24	2
53		GM120690 - Pin, clevis, 5/16"	2
		GM103873 - Pin, cotter, 5/32" x 3/4"	2
54	35A6416	Clamp - cable	4
		GM180065 - Bolt, hex., 5/16"-18 x 1-3/4"	4



MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
DRIVE AXLE, WHEELS AND TIRES			
1	35A 6298	Housing - axle, left hand	1
2	35A 6299	Housing - axle, right hand	1
		GM150145 - Bolt, hex., 7/16"-14 x 1-3/8".....	16
3	35A 6300	Shaft - axle, left hand	1
4	35A 6301	Shaft - axle, right hand	1
		SEA2746 - Screw, flat head, 3/8"-10 x 1".....	4
5	35A 6302	Housing - bearing	2
6	35A 4423	Stud - bearing housing	12
		SEA1694 - Nut, wheel, 1/2"-20	12
7	10A 5521	*"O" Ring - left hand axle housing	1
8	EC13	*"O" Ring - right hand axle housing	1
9	35A 6400	*Seal - oil, axle housing	2
10	10A 7807	Cup - bearing, left hand axle housing, inner	1
11	35A 5844	Bearing - ball, axle housing, outer	2
12	1EA16066	Ring - retainer, ball bearing, on axle housing, 2-3/8" dia.	2
13		SEA1758 - Ring, retaining, in bearing housing	2
14	35A 6304	*Ring - sealing, wheel to housing	2
15	35A 4443	*Shim - left hand axle housing, .002	A.R.
16	35A 4448	*Shim - left hand axle housing, .003	A.R.
17	35A 4447	*Shim - left hand axle housing, .005	A.R.
18	35A 4448	*Shim - left hand axle housing, .020	A.R.
	36R86	*Kit - gasket, transmission and differential overhaul	1
		NOTE: Kit includes parts identified with a single asterisk ().	
19	25A 6327	Wheel - less tire, MSA 20 and 25	2
20	SEA 4393	Tire - cushion, 16-1/4" x 6" x 11-1/4".....	2
21	35A 6335	Wheel - less tire, MSA 30 and 35	2
22	SEA 4394	Tire - cushion, 16-1/4" x 7" x 11-1/4".....	2

M5A SERIES LIFT TRUCKS

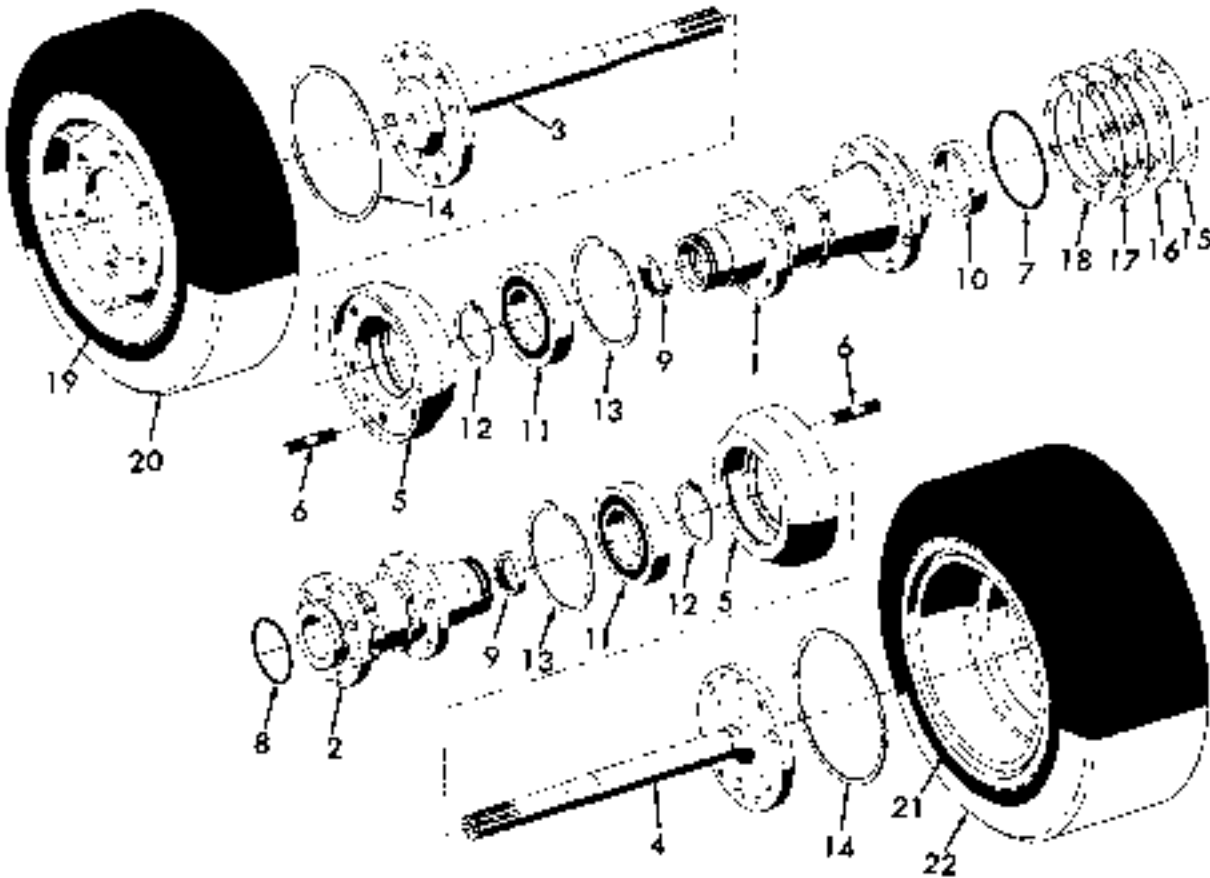


Fig. 22

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
		BRAKES AND BRAKE LINKAGE	
1	35A4406	Brake - left hand	1
	35A4407	Brake - right hand	1
		Each includes the following 18 parts:	
	35A1441 - Bolt, 12 pt., 3/8"-16 x 1-1/4"		1
	35A1155 - Screw, cap, flat head, 3/8"-16 x 1-3/4"		6
	GM120977 - Nut, hex., 3/8"-16		22
	35A1442 - Bolt, 12 pt., 3/8"-16 x 1-1/2"		6
2	35A7851	Washer - flat, (Special) cut, 7/16" I.D., 1" O.D.	10
	35A2808 - Washer, flat, 7/16" I.D., 1" O.D.		2
3	35F1892	Plate - backing, left hand (35F1882)	1
4	35F1898	Plate - backing, right hand (35F1209)	1
4	35F1270	Shoe - assembly, with lining	4
		Includes the following 2 parts:	
5	35F1271	Kit - lining, with rivets (enough for 1 truck)	2
6	35F127	Rivet - lining	48
7	35F1272	Lever - actuating	2
8	35F1273	Eccentric - shoe adjusting	4
9		GM120269 - Nut, hex., 3/8"-24	4
10	35P1274	Anchor - pin	4
11	35P1273	Plate - anchor pin	2
12	35P1274	Cap - anchor pin	4
13		GM138026 - Nut, hex., 1/2"-20	4
14	35P1277	Stem - returning lever, L.H.	1
14	35P1278	Stem - actuating lever, R.H.	1
15	35P1279	Spring - shoe return	2
16	35A3807	Pedal - brake, with bushings	1
17	35A7808	Bearing - brake pedal	2
18	35A7810	Shaft - pivot, brake pedal	1
		GM139077 - Bolt, hex., 5/16"-18 x 3/4"	1
19	35A2743	Spacer - shaft to pedal	1
20	35A4397	Spring - tension, brake pedal	2
21	35A7230	Eye Bolt - spring, 1/2"	2
		GM120288 - Nut, hex., jam, 1/2"-13	4
22	35A7799	Shaft - spring mounting	1
		GM121222 - Pin, cotter, 3/32" x 3/4"	3
23	35A284	Shaft - brake release	1
24		GM144243 - Clevis, adjusting, 3/8"-24	1-2
25		GM128073 - Pin, clevis, 3/8"	1
		GM124926 - Nut, hex., jam, 3/4"-24	4
26	35A4331	Exhauster - brake	1
27	35A7872	Pivot - sleeve, long	1
28	35A7871	Pivot - sleeve, short	1
		Each includes the following 2 parts:	
29	35A7659	Bearing - pivot	4
30	35A7670	Seal - pivot	4
31	35A7668	Shaft - sleeve pivot	1
32	35A4327	Clamp - pivot shaft to frame	8
33	35A4320	Red - brake, right hand	1
34	35A4319	Red - brake, left hand	1
		GM120398 - Washer, plate, 11/32" I.D., 1 1/16" O.D.	2
		GM137141 - Pin, cotter, 1/16" x 5/8"	2
35		GM142720 - Ball joint	2
		GM124320 - Nut, hex., jam, 5/16"-24	4
36	35A6649	Plate - brake pivot, left hand	1
37	35A6650	Plate - brake pivot, right hand	1
38	35A4300	Linking - brake plate	2
39	35A4323	Plate - mounting (35A4344)	1
		35A651 - Plug, snap, (Pro-Arc 5100-52) for 35A4323 plate	4-2
40	35H4667	Ring - snap, (Pro-Arc 5133-52) for 35A4323 plate	2
41	35A3732	Cable - brake	1

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
BRAKES AND BRAKE LINKAGE (Cont'd)			
42	35A6543	Clevis - brake cable (GM144243)	2
43		GM103496 - Pin, clevis, 3/8"	2
		GM141405 - Pin, cotter, 7/64" x 8/4"	2
44	35A6644	Stud - reducer bushing, used with 35A6543 clevis, 5/8"-18 to 3/8"-24	2
45		GM103494 - Pin, clevis, 1/4"	2
		GM103562 - Pin, cotter, 1/16" x 3/4"	2
		GM131004 - Bolt, hex., 5/16"-24 x 1-1/8"	6
46	35A7611	Bell - crank, control rod	1
		Includes the following parts:	
47	35A7606	Bearing - bell crank	2
48	35A7609	Shaft - bell crank	1
49	35A6397	Pin - lock, shaft	1
50		50A1627 - Ring, snap, shaft	1
51	35A7301	Rod - bell crank to pedal	1
52		GM138079 - Pin, rod clevis	1
		GM121222 - Pin, cotter, 3/32" x 3/4"	1

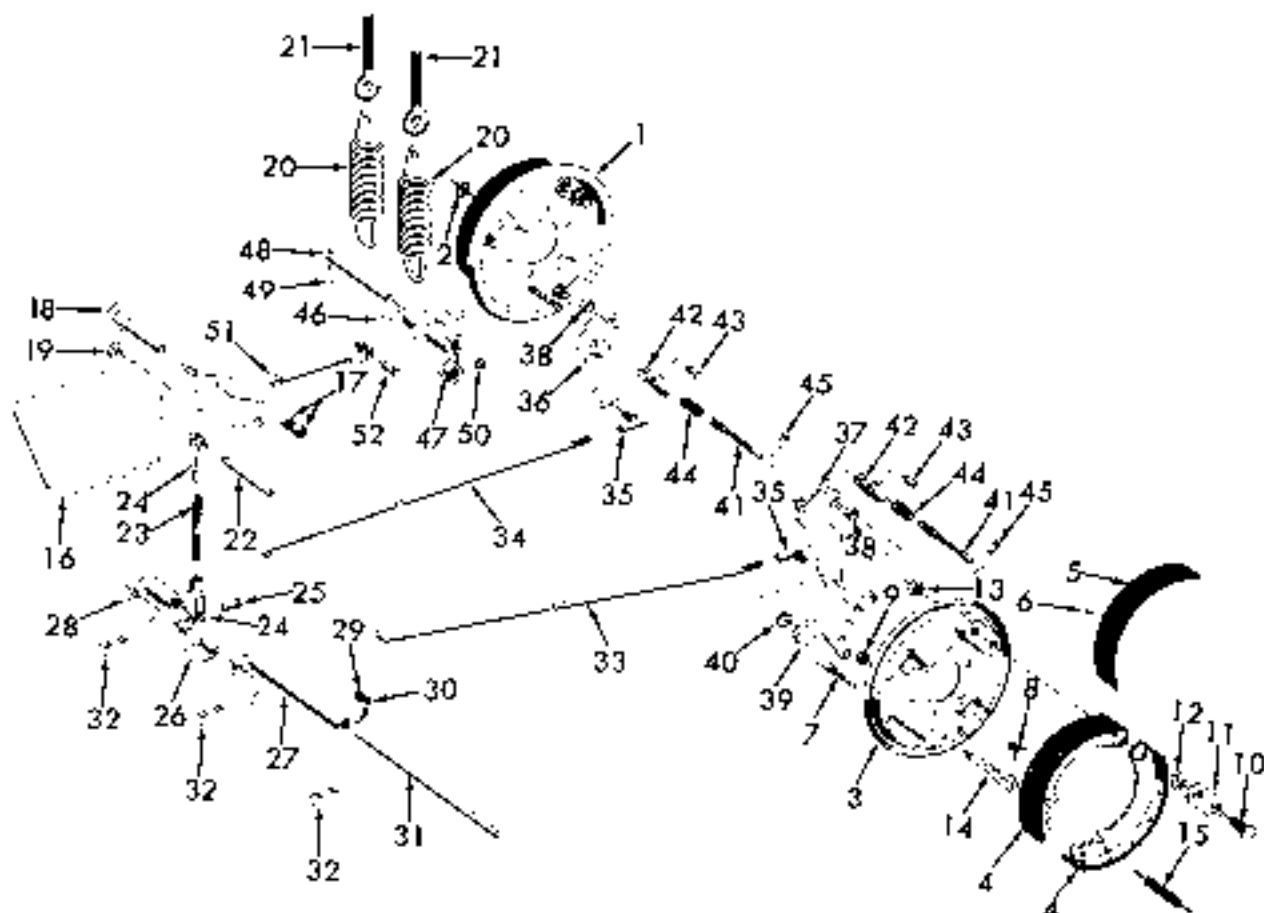


Fig. 23

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
STEERING GEAR			
1	35A3590	Housing - steering gear	1
2	35A6254	Shaft - steering	1
3	35A9594	Cover - steering housing	1
4		GM444726 - Plug, pipe, 1/2"	2
5	10A19477	Seal - oil, steering shaft (10A19329)	1
6	35A3535	Gear - bevel, steering shaft	1
7		GM102847 - Nut, lock gear, 1/2"-20	1
		GM103375 - Pin, cutter, 3/32" x 1-1/4"	1
8	7A498	Key - lock, bevel gear to shaft	1
9	10A7330	Cone - bearing, bevel gear	2
10	10A7591	Cup - bearing, bevel gear	2
11	35A5120	Shim - bevel gear bearings, .005 thick	A.R.
12	35A5119	Shim - bevel gear bearings, .010 thick	A.R.
13		50A994 - Ring, snap, bevel gear bearing (Tru-Arc N5000-237)	2
14		50A990 - Nut, adjusting, bevel gear bearing	1
15		50A991 - Washer, lock, adjusting nut	1
16	35A7749	Gear - worm, right hand steering	1
16	35A7751	Gear - worm, left hand steering	1
17	35A3504	Shaft - worm gear, 4-13/16" long	1
18	PA2131	Key - lock, worm gear to shaft	1
19	10A14963	Cone - bearing, worm gear shaft	2
20	10A14962	Cup - bearing, worm gear shaft	2
21	10A17157	Ring - snap, worm gear bearing (Tru-Arc N5000-200)	1
22	35A4102	Shim - worm gear bearing, .003 thick	A.R.
23	35A4104	Shim - worm gear bearing, .010 thick	A.R.
24	35A8582	Plug - expansion, worm gear opening, 2-1/16" dia.	1
25	35A3596	Seal - oil, worm gear shaft	1
26	35A3581	Cover - worm gear shaft	1
27		50A838 - Bolt, hex., Nylock, 1/4"-20 x 3/4"	5
28	35A5121	Shim - cover, .002 thick	A.R.
29	35A5122	Shim - cover, .003 thick	A.R.
30	M539	"O" Ring - cover, 2-35/64" I.D., 3-9/64" O.D.	1
31	35A7748	Worm - steering, right hand steering	1
31	35A7750	Worm - steering, left hand steering	1
32		50A985 - Nut, lock, steering worm	1
33		50A986 - Washer, lock nut	1
34	35A3503	Bearing - needle, steering worm	1
35	10A735	Bearing - ball, steering worm	1
36	30A1567	Ring - snap, ball bearing, inner (Tru-Arc N5000-236)	1
37		50A982 - Ring, snap, ball bearing, outer	1
38	35A4103	Shim - ball bearing, inner, .005 thick	A.R.
39	35A4101	Shim - ball bearing, inner, .010 thick	A.R.
40	35A3502	Shim - ball bearing, outer, .005 thick	A.R.
41	35A3583	Cover - steering worm	1
42	35A1781	Wheel - hand, steering	1
43		GM103597 - Key, Woodruff, No. 11, 3/16" x 7/8"	1
44		50A159 - Nut, hex., (Nylock), 1/2"-20	1
		GM103375 - Pin, cutter, 3/32" x 1-1/4"	1
45		GM142099 - Plug, button, hand wheel, 1-1/4"	1
46	35A8613	Shaft - spinner knob (35A4783)	1
		GM120394 - Washer, plain, 18/32" I.D.	1
		50A155 - Nut, hex., (Nylock), 3/8"-24	1
		50A154 - Nut, hex., (Nylock), 3/8"-16	1
47	35A4794	Shafting - spinner shaft	1
48	35A4119	Knob - spinner, hand wheel, for 35A4793 shaft	1
49	35A4792	Insert - spinner knob, 13/16" O.D.	1
50	35A3295	Knob - spinner, hand wheel, for 35A8613 shaft	1
51		50A4837 - Insert, knob, for 35A8613 knob	1
52	35A6256	"U" Bolt - steering gear mounting	1
		GM120369 - Nut, hex., 3/8"-24	2

MSA SERIES LIFT TRUCKS

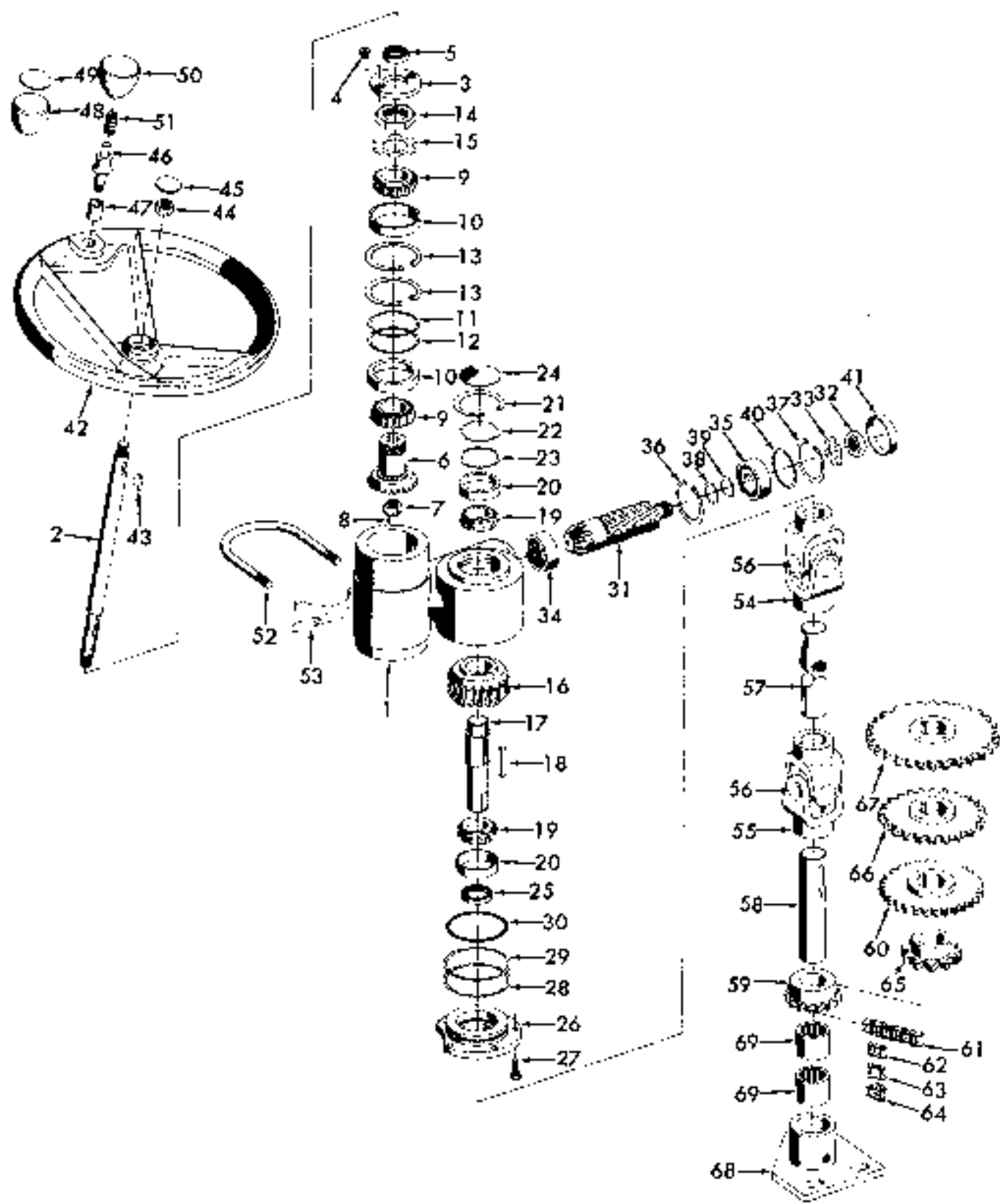


Fig. 24

MSA SERIES LIFT TRUCKS

Kit No.	Part No.	DESCRIPTION	No. Pcs.
STEERING GEAR (Cont'd)			
53	35A6907	Clamp - steering gear housing	1
54	35A7295	U-joint - steering shaft, upper	1
55	35A7296	U-joint - steering shaft, lower	2
		Each includes the following part:	
		GM113782 - Key, Woodruff, No. 15	1
		GM108626 - Key, Woodruff, No. 21	2
		30A4197 - Set Screw, hex. socket, 3/8"-16 x 3/4"	4
		30A5742 - Nut, hex. jam, 3/8"-16	4
56	10P715	Kit - center cross	2
57	35A7297	Shaft - steering, between joints	1
58	35A7298	Shaft - steering sprocket	1
		GM117807 - Key, Woodruff, No. 27	1
		30A2614 - Washer, plain, 1-17/64" I.D., 1-11/16" O.D.	2
		30A2412 - Washer, plain, 1-17/64" I.D., 2" O.D.	1
59	35A3089	*Sprocket - shaft, steering, 18 teeth	1
60	35A7604	*Sprocket - pivot yoke shaft, 30 teeth	1
61	-----	*Chain - steering gear to sprocket, 65 lks., for MSA 20 and 25 use 15P922 ..	1
61	-----	*Chain - steering gear to sprocket, 109 lks., for MSA 30 and 35 use 15P923 ..	1
	15P923	*Chain - 10 feet of 1/2" pitch roller chain (approx. 229 links)	-
62	15P924	*Link - roller	-
63	15P925	*Link - connecting	-
64	15P926	*Link - offset	-
		*NOTE: Used on MSA Series Lift Trucks to No. 28100238 Inc.	
65	35A8068	**Sprocket - shaft, steering, 13 teeth	1
66	35A8069	**Sprocket - pivot yoke shaft, 24 teeth	1
67	-----	**Chain - 5/8 P., steering gear to sprocket, 68 links, use 15P927	1
		**NOTE: Used on MSA Series Lift Trucks No. 28100237 thru 28100815 Inc.	
68	35A8068	*Sprocket - shaft, steering, 13 teeth	1
67	35A8041	*Sprocket - pivot yoke shaft, 31 teeth	1
61	-----	*Chain - 5/8 P., steering gear to sprocket, 71 links, use 15P927	1
		*NOTE: Used on MSA Series Lift Trucks No. 28100816 and after.	
	15P927	Chain - 10 feet of 5/8" pitch roller chain (Approx. 192 links)	-
62	15P928	Link - roller	-
63	30050	Link - connecting	-
64	15P929	Link - offset	-
65	35A7299	Cage - shaft, steering sprocket	1
		GM180175 - Bolt, hex., 1/2"-13 x 1-1/4"	5
		GM120390 - Washer, plain, 17/32" I.D., 1-1/16" O.D.	3
		GM104365 - Fitting, grease, 1/8"-90°	1
69	35A1847	Bearing - cage, needle	2

MSA SERIES LIFT TRUCKS

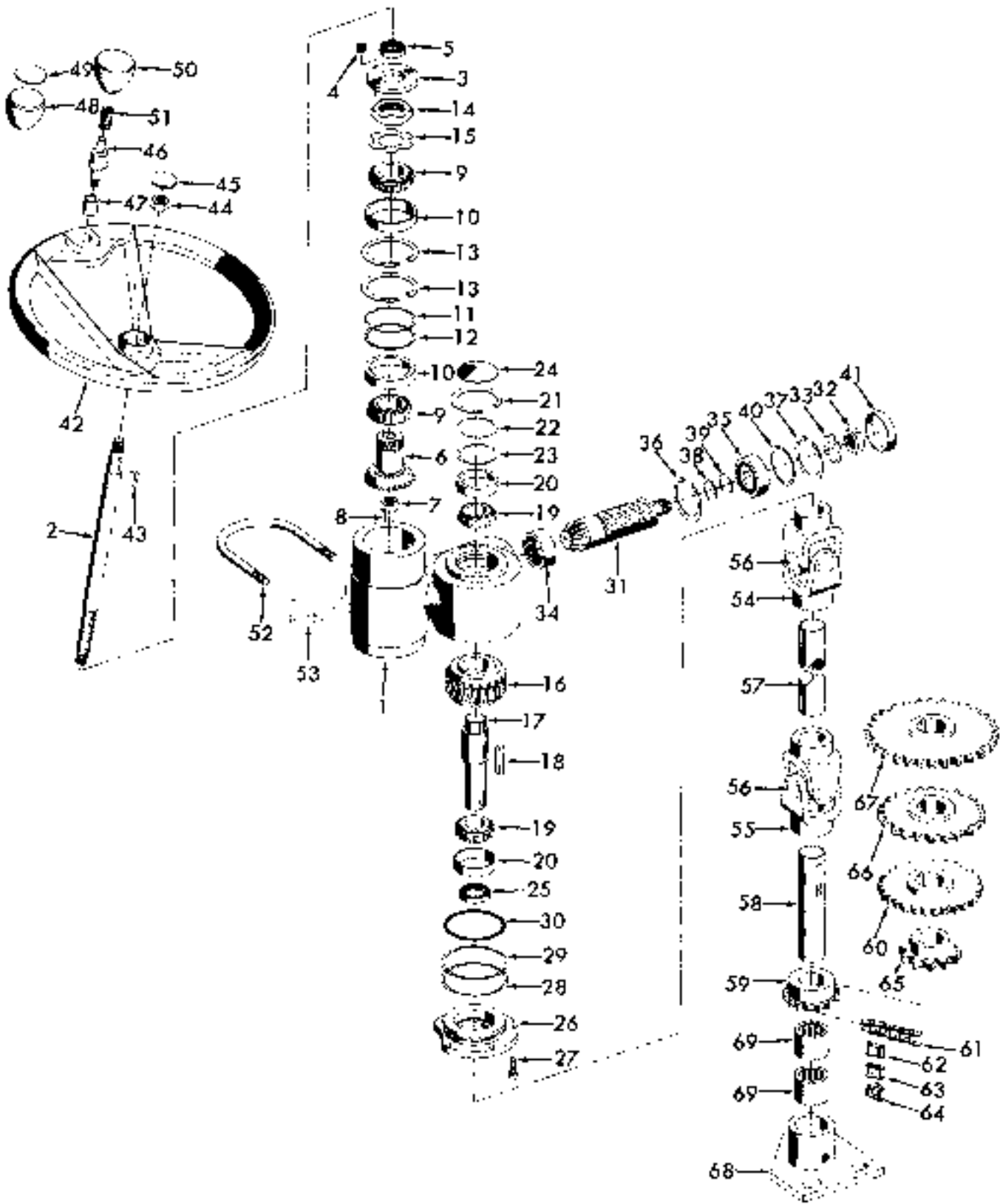


Fig. 26

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs
STEERING AXLE AND WHEELS			
1	35A3602	Yoke - pivot, steering wheels	1
2	35A4109	Seal - oil, pivot yoke, lower	1
3	35A3603	Seal - oil, pivot yoke, upper	1
4	10A7007	Cup - bearing, pivot yoke, lower	1
5	10A2406	Cone - bearing, pivot yoke, lower	1
6	10A7052	Cup - bearing, pivot yoke, upper	1
7	10A7051	Cone - bearing, pivot yoke, upper	1
8		35A567 - Ring, snap, upper bearing	1
9	35A3614	*Sprocket - pivot yoke shaft	1
		*NOTE: Used on MSA Series Lift Trucks to No. 28100235 Inc.	
10	35A4060	**Sprocket - pivot, yoke shaft, 24 teeth	1
		**NOTE: Used on MSA Series Lift Trucks No. 28100237 thru 29100615 Inc.	
11	35A8641	+Sprocket - pivot yoke shaft, 31 teeth	1
		-NOTE: Used on MSA Series Lift Trucks No. 28100616 and after.	
12	F444	Key - shaft to sprocket	2
13	35A4123	Plate - retainer, sprocket to shaft	1
14		35A649 - Screw, plate retainer, 3/8"-18 x 3/4"	2
15	35A4110	Shim - retainer plate, .005 thick	A, B,
15	35A4111	Shim - retainer plate, .010 thick	A, B,
15	35A7826	Shim - retainer plate, .042 thick	A, B,
16	35A4124	Shaft - axle, steering wheels	1
17	35A7824	Nut - axle shaft, slotted, 1-1/8"-12	2
		GM102867 - Pin, cotter, 1/16" x 2"	2
		GM271290 - Filling, grease, 1/4"-2E, 89 th	2
18	F398	Bearing - ball, axle shaft	4
19	X391	Slinger - oil, axle shaft, center	2-5-4
20	X398	Slinger - oil, axle shaft, center, used on early models with 2 spacers	1
21	35A4122	Spacer - pivot yoke, MSA 20-25 only, 1" or 2-1/4" long	2-1
22	T171	Pin - steering axle to pivot yoke	1
23	35A4108	Wheel - steering, with cushion tire, for MSA 20-25	2
24	35A4107	Tire - cushion, 4 x 4 x 8-1/2, for MSA 20-25	2
25	36A4120	Wheel - steering, with cushion tire, for MSA 30-35	2
26	R393	Tire - cushion, 5 x 5 x 8, for MSA 30-35	2

MSA SERIES LIFT TRUCKS

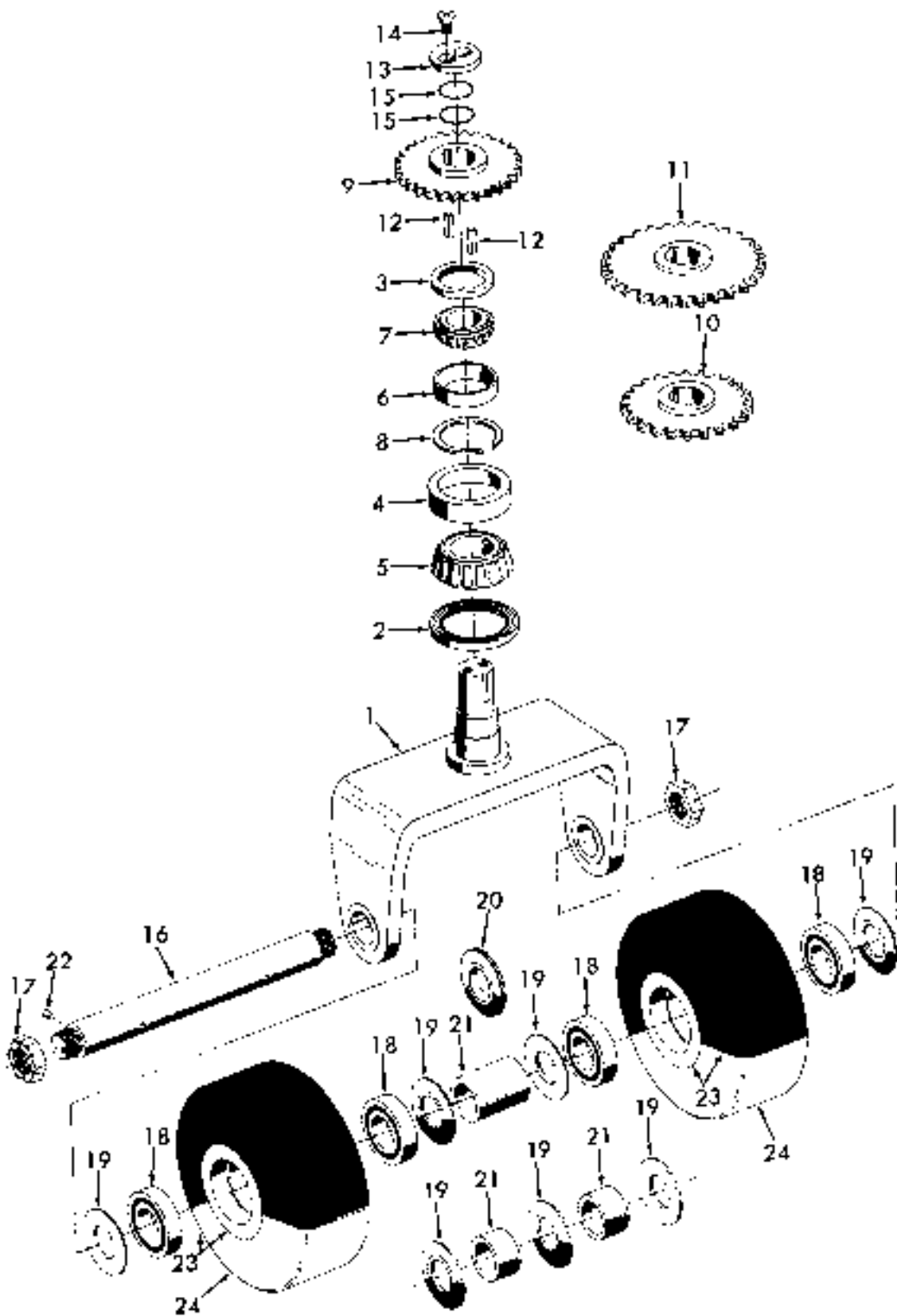


Fig. 25

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	Qty.
THROTTLE CONTROLS			
1	85A8819	Pedal - accelerator (85A8283)	1
2	50A8138	** Pad - pedal (no response), 4" x 7"	1
2	85A9134	** Pad - heel, on counterweight, 7" x 7-3/8"	1
4	55A8260	Hinge - accelerator pedal	1
		GM172450 - Bolt, self locking, 5/16" - 18 x 5/8"	2
5	55A8261	Pin - hinge to pedal	1
6	55A8262	Pin - pedal	1
		GM126398 - Washer, plain, 11/32"	1
		GM103021 - Pin, cutter, 1/16" x 1/2"	1
7	85A7094	* Cable - accelerator pedal, 40" long	1
7	55A8620	** Cable - accelerator pedal, 38" long	1
8		GM126814 - Nut, hex., No. 10-32	2
9		GM186956 - Clevis, 10-32	1
10	55A7109	Spring - tension, accelerator cable	1
11	55A7395	Clip - spring anchor	1
12	55A7626	* Bell - crank, throttle control	1
14	55A8593	** Bell - crank, throttle control	1
15	55A7355	Bracket - bell crank	1
		50A3659 - Bolt, hex., 5/16" - 18 x 1-7/8"	1
		50A3616 - Bolt, hex., 1/4" - 20 x 1/2"	5
		50A1898 - Nut, hex., 1/4" - 20	2
		50A1777 - Nut, lock, to bell crank, 1/4" - 20	1
		50A8821 - Washer, plain, 17/64" L.O., 5/8" O.D.	2
16	10A10799	Spacer - bell crank	1
		50A3655 - Pin, clevis, 3/16"	1
17	55A7675	* Rod - throttle control, 1/8" x 6"	1
		GM181598 - Pin, cutter, 3/64" x 3/8"	1
		*NOTE: Used on MSA 20-20 II-25 and 25 II Lift Trucks to No. 28100618 Inc.	
18	55A3595	** Rod - throttle control, 3/16" x 4-18/16" long	1
		** 50A3619 - Pin, cutter, 1/16" x 1/2"	1
19		** 50A4816 - Ball, joint, #10-32, rod to carburetor arm	1
20		** 50A5901 - Nut, hex., #10-32	1
		**NOTE: Used on MSA 20 II and 25 II Lift Trucks No. 28100618 and alter.	
21	55A7871	Bracket - cable mounting	1

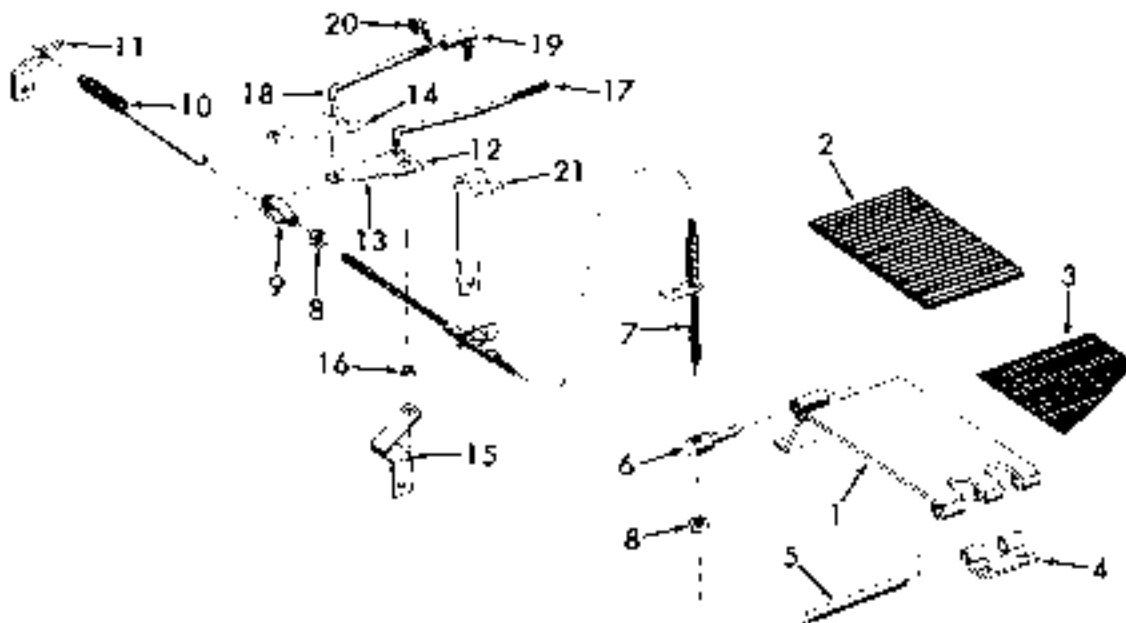


Fig. 26

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	Qty.
INSTRUMENT PANEL AND INSTRUMENTS Group I Used on MSA 20 and 25 Lift Trucks to No. 26100235 inc.			
1	35A 6275	Panel - instrument	1
		50A3846 - Bolt, hex., 1/4"-20 x 3/4"	4
		50A1895 - Nut, hex., 1/4"-20	4
		GM142073 - Burster, plug, 13/32"	2
2	35A 4277	Hour Meter	1
		GM100737 - Screw, round head, No. E-22 x 3/8"	6
3	10A3438	Dampener - vibration, hour meter	1
4	35A4113	Switch - ignition and starter	1
5	35A4114	Plate - instruction, ignition and starter switch	1
6	35A4115	Indicator - generator	1
7	35A7609	Switch - pressure, hour meter	1
	35A4779	Wire - hour meter to ignition switch	1
8	10A4922	Choke Control	1
		GM138542 - Washer, int. lock	1
		GM124925 - Nut, hex. jam, 3/8"-24	1
		50A3812 - Clamp, choke cable	1
9	35A 6123	Plate - cover, auxiliary valve opening	1
		GM139020 - Bolt, hex., 1/4"-20 x 3/4"	4
		GM123375 - Nut, hex., 1/4"-20	4

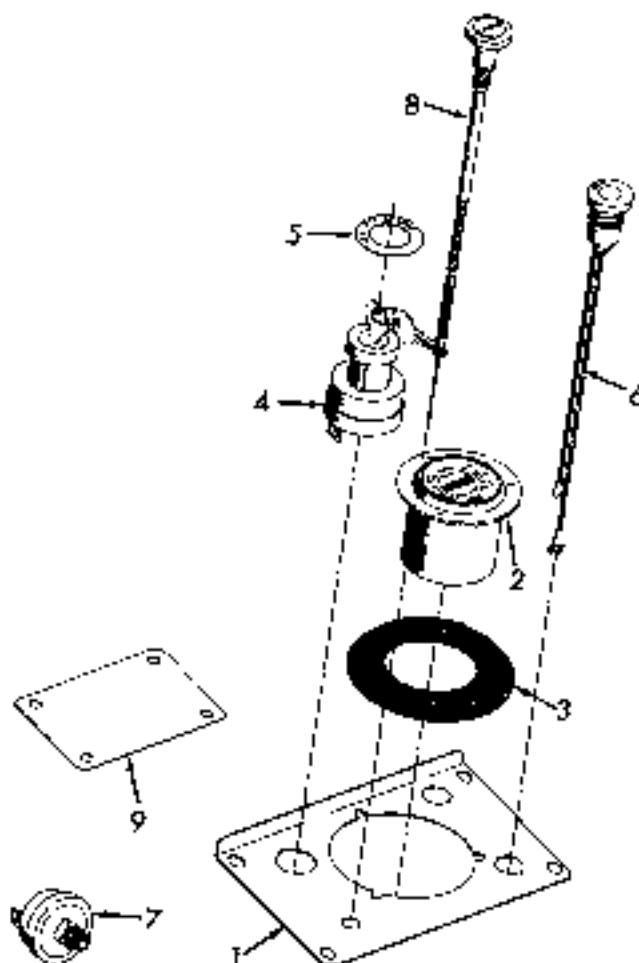
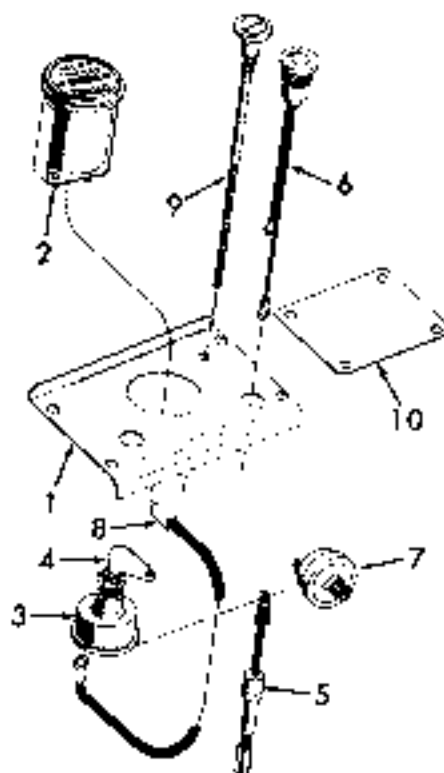


Fig. 27

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
INSTRUMENT PANEL AND INSTRUMENTS			
Group II			
Used on MSA 20 and 25 Lift Trucks No. 29100296 and after.			
1	35A8030	Panel - instrument	1
		50A8646 - Bolt, hex., 1/4"-20 x 3/4"	4
		50A1638 - Nut, hex., 1/4"-20	4
2	35A8580	Hour Meter	1
3	85A8640	Switch - ignition and starter	1
		Includes the following parts:	
4	35P1559	Key - switch	2
5	95A9607	Wire - fused, fuel pump to ignition switch, 14 Ga. x 6" long	1
6	35A4115	Indicator - generator	1
7	35A7608	Switch - pressure, hour meter	1
8	35A4770	Wire - hourmeter to ignition switch	1
9	15A4322	Choke Control	1
		GM133542 - Washer, internal lock	1
		GM124926 - Nut, hex., jam, 3/8"-24	1
		50A2812 - Clamp, choke cable	1
10	35A6123	Plate - cover, auxiliary valve opening	1
		GM190026 - Bolt, hex., 1/4"-20 x 3/4"	4
		GM120375 - Nut, hex., 1/4"-20	4


Fig. 2b

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
FRAME AND COUNTERWEIGHT			
1	35A6104	Frame - main	1
2	35A8289	Plug - magnetic, 3/4"-14, recessed sq. hd. (35A3254)	1
3	35A7334	Bolt - frame to drive train, 5/8"-11 x 1-1/2"	4
4	35A8926	Bolt - frame to drive train, R.H., upper, 5/8"-11 x 1-7/8"	4
5	35A7115	Bracket - on top of hydraulic tank	1
6	35A7117	Support - bracket to drive train	1
		GM271540 - Bolt, hex., 5/8"-11 x 1-1/4"	4
		GM271547 - Bolt, hex., 5/8"-11 x 1-1/2"	4
		GM131018 - Washer, plain, 21/32" I.D., 1-5/16" O.D.	12
		GM124589 - Nut, hex., 5/8"-11	4
7	35A8326	Support - drive train, left hand axle (35A7225)	1
8	20H4507	Snap Ring - support (Tru-Axle 5138-E2)	1
9	35A7245	Tie - frame, right hand	1
10	35A7243	Tie Bar - frame, left hand side	1
		GM180177 - Bolt, hex., 1/2"-13 x 1-1/2"	4
11	35A7920	Eye - lifting, power train	1
		35A8632 - Bolt, hex., 1/2"-13 x 1-3/4"	2
12	35A8322	*Breather - with dip stick	1
13	35A8069	**Dipstick - hydraulic tank less breather	1
	35A7140	*Insulation - on hydraulic oil tank, 1" x 6" x 6"	1
		*NOTE: Used on MSA Trucks to No. 28100011 Inc.	
		**NOTE: Used on MSA Trucks No. 28100012 and after.	
14	-----	Counterweight - MSA 20-25 (Order from Mobilift Sales Dept.)	1
		GM271750 - Bolt, hex., 5/8"-18 x 2-1/2"	4
		GM131018 - Washer, plain, 21/32" I.D., 1-5/16" O.D.	4
15	35A6198	Strut - counterweight, 3/4" x 4-1/4"	4
		GM131017 - Washer, plain, 21/32" I.D., 1-1/2" O.D.	4
		GM420099 - Nut, hex., 3/4"-16	4
16	35A8308	+Cover - chain	1
17	35A5040	++Cover - chain	1
		+NOTE: Used on MSA 20, 20 II, 25 and 25 II to No. 28100015 Inc.	
		++NOTE: Used on MSA 20 II and 25 II No. 28100016 and after.	
18	35A4404	Counterweight - auxiliary, for MSA 25	2
		GM280175 - Bolt, hex., 1/2"-13 x 1-2/4"	4
		GM120396 - Washer, plain, 17/32" I.D., 1-1/16" O.D.	4
		GM100462 - Fitting, grease, 1/8" x 90°	2
19	35A9128	Shield - engine throat and frame	1

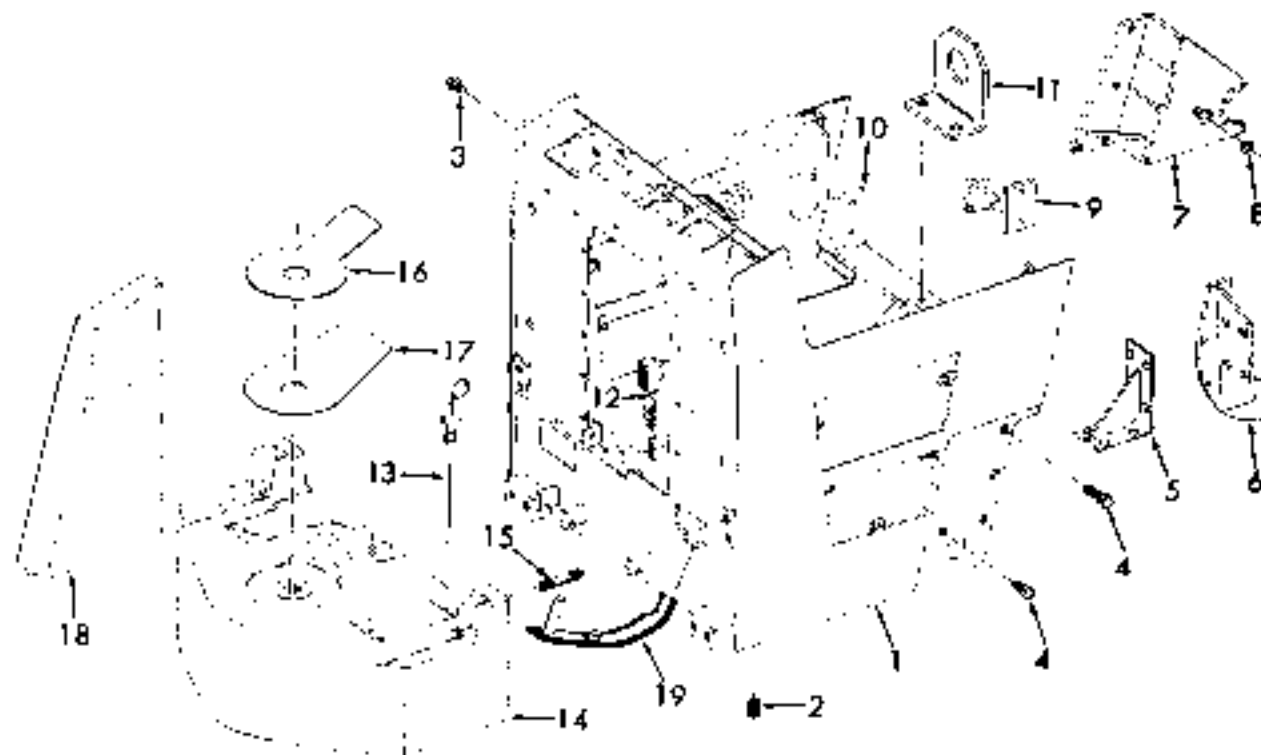


Fig. 28

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	Qty. Per
HOOD AND OVERHEAD GUARD			
1	35A6411	Hood	1
		GM150577 - Bolt, hex., 5/16"-18 x 3/4"	4
2	35A3736	Bar - angle, hood bumper, 31-1/2" long (35A642e)	1
		GM150122 - Bolt, hex., 3/8"-16 x 1"	2
3	10A13467	Groutnut - bumper bar	4
4	35A1567	Catch - hood	1
		GM150018 - Bolt, hex., 1/4"-20 x 1/2"	1
5	35A7374	Grille	2
6	35A9181	Cover - lower left hand (35A725a)	1
7	35A6874	Cover - lower right hand	1
		GM120533 - Screw, round head, 1/4"-20 x 5/8"	10
		50A4870 - Fastener, screw	10
8	35A7673	*Baffle - engine, left hand side	1
		*GM150077 - Bolt, hex., 5/16"-18 x 3/4"	2
		*GM120333 - Washer, flat, 11/32" I.D., 11/16" O.D.	2
9	35A7746	*Insulation - hood, 3/4" x 24" x 30"	1
10	35A3744	**Insulation - hood, 1" x 7-1/2" x 31"	1
11		**50A5082 - Insulation, hood, front, 1" x 10-1/2" x 31"	1
12		**50A5090 - Insulation, hood, center, 1" x 4" x 31"	1
		**50A5159 - Insulation, hood, hinge end, 1" x 5" x 30"	1
13	35A6787	**Baffle - fuel tank, R.H. side	1
14	35A8731	**Baffle - fuel tank, front	1
		**50A3650 - Bolt, hex., 5/16"-18 x 3/4"	2
15	35A6733	**Baffle - engine, side	1
16	35A6734	**Baffle - engine, front	1
		**50A3996 - Screw, slotted machine, #10-24 x 5/8"	18
		**50A3771 - Nut, tinnermans, #10-24	13
		**50A4682 - Screw, hex., self tapping, #10-24 x 3/8"	2
		**50A4242 - Washer, internal lock, #10	2
17		**50A3774 - Plug, baffle, 5/8", (for gasoline trucks)	2
18		**50A3090 - Plug, baffle, 1-1/4" (for gasoline trucks)	1
19	35A9112	**Baffle - upper, 2-3/8" x 14-1/4"	1
20	35A9167	**Baffle - center	1
21	35A9114	**Baffle - lower	1
		**50A8090 - Screw, slotted machine, #10-24 x 3/8"	4
		**50A3771 - Nut, tinnermans, #10-24	4
		**50A8060 - Bolt, hex., 3/8"-10 x 1"	1
22	35A9121	**Insulation - baffle, upper, 1/2" x 13-1/2" x 14-8/16"	1
23		**50A5157 - Insulation, baffle, center	1
24	35A9122	**Insulation - baffle, lower, U-shaped, 1/2" x 13" x 15-1/8"	1
25	35A9140	**Insulation - baffle, vertical, 1/2" x 8-1/4" x 25-3/8"	1
		*NOTE: Used on MSA 20 and 25 Lift Trucks to No. 28100437 Inc.	
		*NOTE: Used on MSA 20 II and 25 II Lift Trucks No. 28100438 and after.	
26	35A6709	Link - hood latch, lower, on units less overhead guard	2
27	35A8173	Link - hood latch, lower, on units with overhead guard	2
28	D694	Shaft - link to control bracket and hood, 3/8" x 1-5/8"	2
29	35A6069	Spacer - between links, on shaft	1
30	35A6718	Shaft - links, 5/16" x 2-7/16"	2
		GM103878 - Pin, cotter, 3/32" x 3/4"	8
31	35A6070	Hook - spring, on shaft	1
32	35A6072	Spring - tension, on lower shaft	1
33	M140	Spacer - link	1
34	35A6714	Link - hood latch, upper, on units less overhead guard	2
35	35A6172	Link - hood latch, upper, on units with overhead guard	2
		GM103340 - Washer, plate, 11/32" I.D., 11/16" O.D.	4
36	10A8657	Spacer - link, upper	1
37	-----	Guard - overhead (35A48E2), order from Mobilift Sales Dept.	1
		50A8604 - Bolt, hex., 3/8"-16 x 3/4"	2
		50A2778 - Bolt, hex., 1/2"-13 x 2"	6

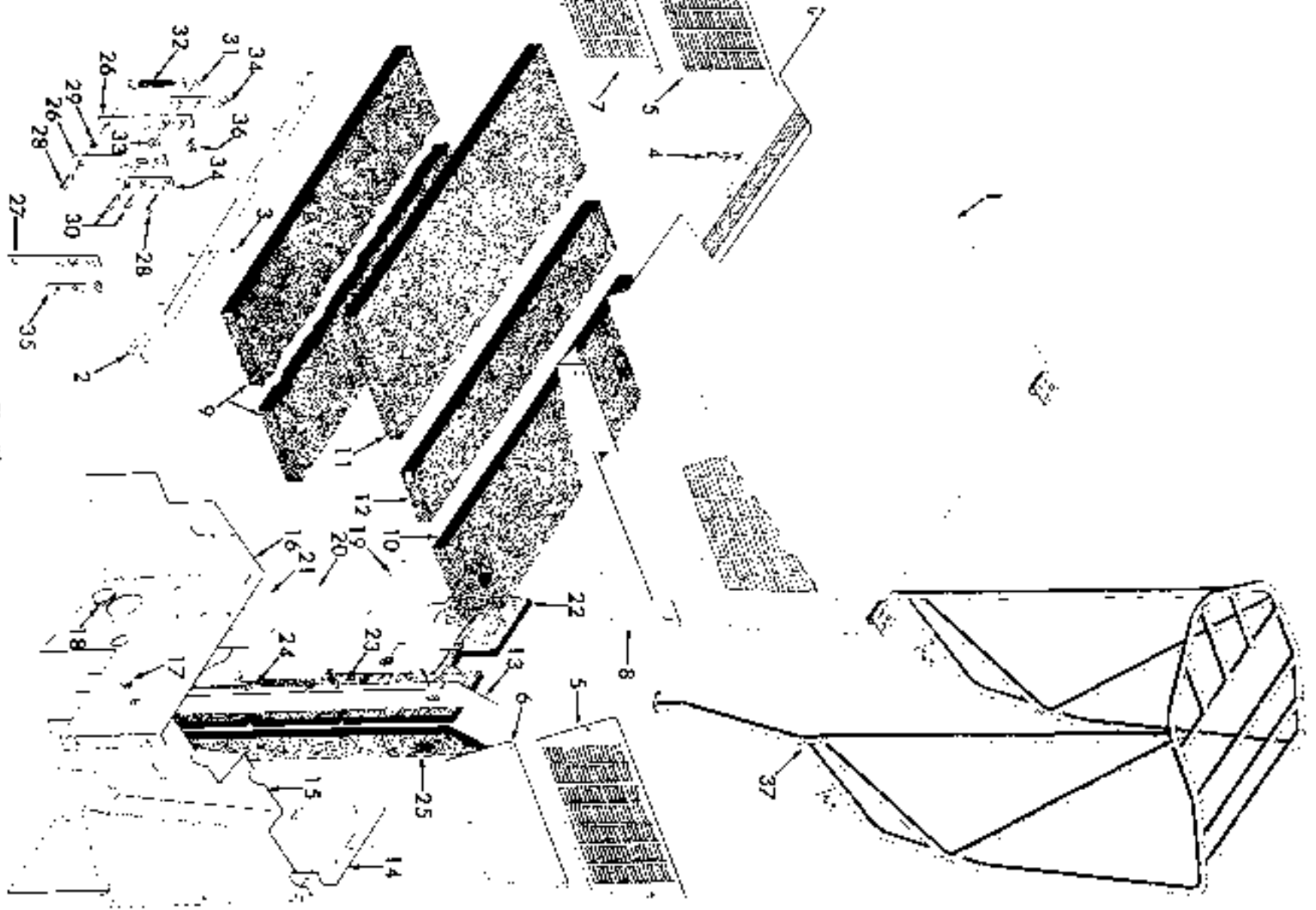


Fig. 30

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
OIL LINES AND FILTER			
Group 1			
Used on MSA 20, 20M, 25, and 25 II Lift Trucks to No. 28100815 Inc.			
1	35A7765	*Filter - assembly	1
		Includes the following 4 parts:	
		*GM180124 - Bolt, hex., 3/8"-16 x 1-1/4"	2
		*GM120377 - Nut, hex., 3/8"-16	2
2	10F1869	*Cover - top, casting	1
		*GM181411 - Bolt, hex., 7/16"-20 N.F. x 3"	1
		*GM116104 - Washer, copper, 29/64" I.D., 1/16" thick	1
3	10F1852	*Gasket - cover, 3-9/16" O.D.	1
4	85F1812	*Element - filter	1
5	10F1865	*Shell - assembly	1
5A		*GM105087 - Elbow, filter, 1" x 90°, street elbow	3
6	35A8046	*Hose - spacer, 1" I.D., 1-1/4" O.D. x 1-1/4" long	1
7	35A8045	*Nipple - pipe, filter hose, 1" x 2'	3
8	35A8047	*Hose - filter to tank, 1-1/4" I.D. x 17-1/2"	1
9	35A8048	*Hose - filter to pump, 1-1/4" I.D. x 8"	1
		*NOTE: Used on Lift Trucks to No. 28100011.	
10	35A8015	**Filter - assembly, 5-1/8" O.D. x 4-13/16" long	1
11	35A8018	**Valve - filter	1
12	35A8083	**Gasket - filter	1
13	35A8026	**Cover - hydraulic filter	1
		**50A8666 - Bolt, hex., 5/16"-18 x 1"	6
		**50A4221 - Washer, plain, 5/16"	6
14		**50A1749 - Seal-o-seal, cover, 5/16"	6
15		**GMP402568 - Elbow, cover, 1" pipe to 1-5/16" JIC-90°	1
16	35A7921	**Tube - filter	1
17	35A8062	**Hose - tank to pump, 1" I.D. x 8"	1
18	35A8041	**Tube - hose to pump	1
19	35A8051	**Breather - reservoir, on tube	1
20		**GM144112 - Elbow, tank breather port, 1/4"-90°	1
21	35A8054	**Nipple - tee, 1/4" pipe x 2" long	1
22	35A8087	**Hose - vent, to breather, 1/2" I.D. x 21" long	1
		**50A4306 - Clamp, hose, 3/4"	2
		**NOTE: Used on Lift Trucks No. 28100012 and after.	
23	35A8049	Clamp - hose, worm type	4-2
24		GM9410976 - Elbow, valve inlet, 7/8"-14 x 90°	1
25		GM9411106 - Connector, pump outlet, 7/8"-14 x 45°	1
26	10A10265	"O" Ring - elbow and connector	2
27	35A7727	Hose - with tube assembly, pump to valve	1
28	35A4855	Hose - hydraulic tank to transmission	1
29		50A4746 - Nipple, tee-in, transmission case, 1-1/2" x 2-1/2"	1
		GM105432 - Clamp, hose, 2-1/4"	2
31	10A15005	Nipple - valve outlet, 2-1/2" long	1
32	35A3119	Elbow - valve, 3/4" x 90°	1
		GM444637 - Plug, pipe, hex. head, 3/4"-14 N.P.T.	1
33	35A7037	Nipple - tee, hose to elbow, 1" I.D. x 5-1/2"	1
34	35A6484	Hose - valve outlet to tank	1
		GM105475 - Clamp, hose, 1-3/8"	2
35	35A5118	Hose - valve to lift cylinder	1
36		50A4422 - Elbow, valve to hose, 7/8"-14 x 45°	1
37		GM9410294 - Connector, lift cylinder, straight, 7/8"-14	1
38	10A10285	"O" Ring - elbow and connector	2
39		GM9410976 - Elbow, pump, flow divider and valve transmission	2
40	10A16403	"O" Ring - elbow, pump flow divider to transmission valve	2
		50A4306 - Clamp, hose, lift cylinder	1
41	10A5814	Spring - clamp	1
42	35A7680	Anchor - spring, on transmission case	1
		50A749 - Strap, hose	1
43	35A7124	Hose - pump to transmission valve	1
44	35A4342	Hose - vent	1

MSA SERIES LIFT TRUCKS

Ref. No	Part No	DESCRIPTION	Qty
OIL LINES AND FILTER (Cont'd)			
35		GM9409389 - Tee, vent line to transmission, 1/8".....	1
46		GM144117 - Elbow, vent line, 1/8" x 45° street	1
47	35A7073	Nipple - tee to elbow, 1/8" I.D. x 1-1/2".....	3
49	50A4340	Hose - vent, 3/8" I.D. x 21-1/2"	1
		GM145819 - Clamp, hose, 3/8".....	4
49	25A5031	Restrictor - reducer, valve tilt port, lower, 3/4" x 9/16" x 15 x 1-1/16".....	1
50	50A0632	Bushing - reducer, in valve tilt port, upper, 3/4" x 10 to 9/16" x 15 x 1-1/16".....	1
		50A2776 - Clip, tilt hose, R.H. side	1
		50A3337 - Clip, tilt hose, L.H. side	1
		50A2776 - Clip, lift cylinder hose, R.H. side.....	1
51	10A12012	"O" Ring - bushing.....	2
52		GM9410976 - Elbow, valve, 9/16" x 15 x 90°.....	6
53	10A16405	"O" Ring - elbows, 9/16" x 15 x 90°.....	6
54	30A7367	Hose - valve to tee, back tilt, 14" long	1
56	35A7553	Hose - valve to tee, forward tilt, 1E" long	1
56		GM94102030 - Elbow, hose to tee, 9/16" x 15 x 90°.....	2
57		50A2881 - Tee, oil lines, 9/16" x 15	2
58	50A7084	Hose - tilt cylinder, rear left hand, 38" long	1
58	35A7555	Hose - tilt cylinder, front left hand, and rear and front for right hand, 45".....	2

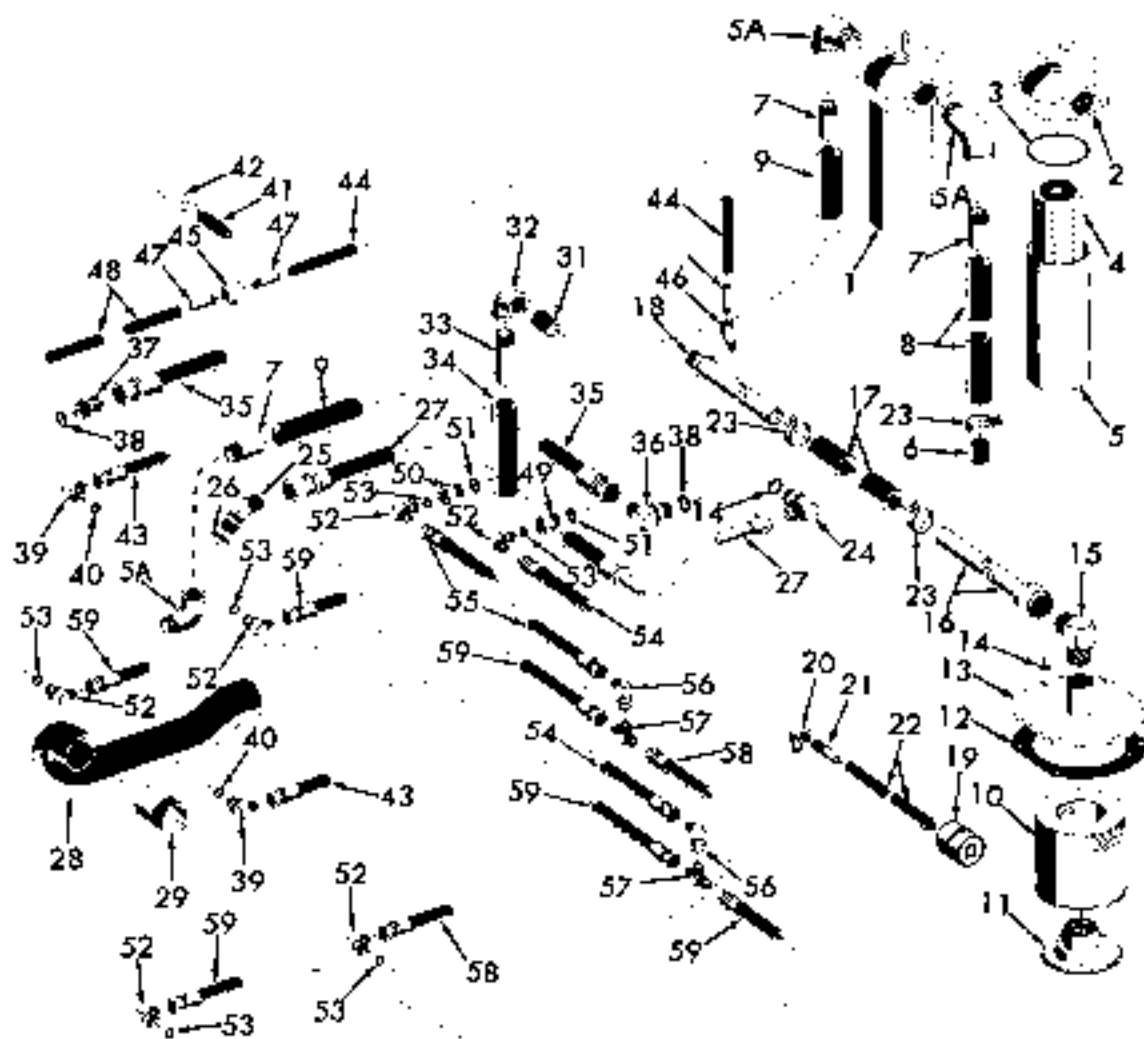


Fig. 3:

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
OIL LINES AND FILTER			
Group II			
Used on MSA 20 II and 25 II No. 28100618 and after.			
1	35A8018	Filter - assembly, 5-1/8" O.D. x 4-13/16" Long	1
2	35A8019	Valve - filter	1
3	35A8033	Gasket - filter	1
4	35A8018	Cover - hydraulic filter	1
		50A3657 - Bolt, hex., 5/16"-18 x 1-1/4"	6
		50A4221 - Washer, plain, 3/8" I.D., 7/8" O.D.	6
		50A4749 - Star-o-seal, cover bolts, 5/16" I.D.	6
		50A4830 - Elbow, cover, 1-1/4" pipe to 1-5/8"-12 JIC-90°	1
7	35A8021	Tube - filter, curved, 1-1/4" O.D. x 20-1/4" long	1
8	35A8014	Hose - tube to pump, 1-1/4" I.D. x 4" long	1
9	35A8049	Clamp - hose, worm type	2
10	35A8051	Breather - reservoir, on tube	1
11		50A4759 - Clip, hose to frame	1
12		GM144112 - Elbow, tank breather port, 1/4"-90°	1
13	35A8054	Nipple - tee, 1/4" pipe x 2" long	1
14	35A8037	Hose - vent to breather, 1/2" I.D. x 21" long	1
15		50A4356 - Clamp, hose, 3/4"	2
16		GM9410978 - Elbow, valve inlet, 7/8"-14, 90°	1
17		GM9411106 - Elbow, pump outlet, 7/8"-14, 45°	1
18	10A10235	"O" Ring - elbow and connector	2
19	35A7737	Hose - with tube assembly, pump to valve	1
20	35A4065	Hose - hydraulic tank to transmission	1
21		50A4746 - Nipple, tee, transmission case, 1-1/2" x 2-1/2"	1
22		GM105482 - Clamp, hose, 2-1/4"	2
23		50A4505 - Nipple, valve outlet, 3/4" x 2"	1
24	35A8119	Elbow - valve, 3/4" x 90°	1
25		GM444837 - Plug, pipe, hex. head, 3/4"-14	1
26	35A7087	Nipple - tee, hose to elbow, 3/4" pipe x 3" long	1
27	35A8454	Hose - valve outlet to tank	1
28		GM105475 - Clamp, hose, 1-3/8"	2
29	35A8118	Hose - valve to lift cylinder	1
30		50A4422 - Elbow, valve to hose, 7/8"-14, 45°	1
31		GM9410204 - Connector, lift cylinder, straight, 7/8"-14	1
32	10A10235	"O" Ring - elbow and connector	2
33		GM9410976 - Elbow, pump, flow divider and transmission valve	2
34	10A16405	"O" Ring - elbow	2
35	35A7124	Hose - pump to transmission valve	1
36	35A4342	Hose - vent, 2/2" I.D. x 26-1/2"	1
37		GM9409939 - Tee, vent line to transmission, 1/2"	1
38		GM144117 - Elbow, vent line, 1/2"-45° street	1
39		50A2394 - Nipple, tee and elbow, 1/8" I.D. x 1-1/2"	3
40	35A4340	Hose - vent, 3/8" I.D. x 21-1/2" long	1
41		GM145619 - Clamp, hose, 5/8"	4
42	35A5001	Restrictor - reducer, valve tiltport, lower, 3/4"-18 to 3/16"-18 x 1-1/16"	1
43	35A5002	Bushing - reducer, in valve tilt port, upper, 3/4"-18 to 3/16"-18 x 2-1/16"	1
44	10A12012	"O" Ring - restrictor and bushing	2
45		50A4539 - Tee, valve, 3/16"-18	2
46	10A16405	"O" Ring - tee and elbows	6
47		35A4223 - Elbow, tilt cylinder ports, 9/16"-18 J.I.C.	4
48	35A8200	Hose - with tube assembly, tilt cylinder, R.H. rear port to control valve	1
49	35A8202	Hose - with tube assembly, tilt cylinder, R.H. front port to control valve	1
50	35A5135	Tube - tilt cylinder, L.H., tee to tube and hose, rear port	1
51	35A8204	Hose - with tube assembly, tilt cylinder, L.H., rear port to tube	1
52	35A5138	Tube - tilt cylinder, L.H., tee to tube and hose, front port	1
53	35A8205	Hose - with tube assembly, tilt cylinder, L.H., front port to tube	1
54		50A4637 - Clip, hoses	2
		50A3655 - Bolt, hex., 5/16"-18 x 2/4"	2
		50A3730 - Nut, hex., 5/16"-18	1

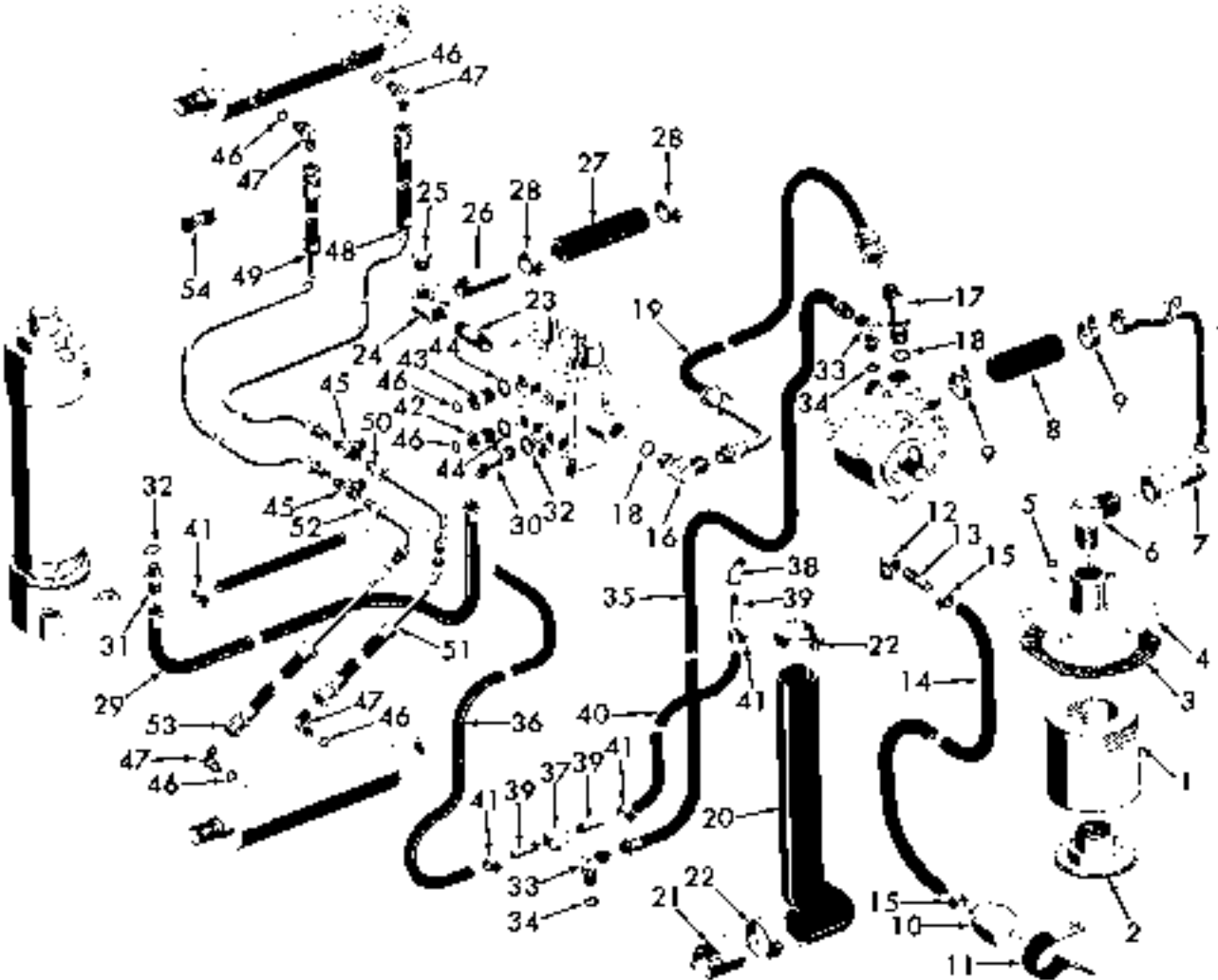


Fig. 32

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
HYDRAULIC PUMP			
Group 1			
Used on MSA 20, 20 II, 25, and 25 II Lift Trucks to No. 23100615 Inc.			
1	35A30E0	Pump - hydraulic, with flow control valve, 16.7 G.P.M., (Webster No. 2YDS2-RA) Includes the following 24 parts:	1
		50A1629 - Bolt, hex., 3/8"-16 x 4"	2
2	35P1253	Shaft - drive, with gear	1
3	35P1252	Gear - idler, with idler shaft	1
4	35P1255	Body - pump, assembly	1
		Includes the following part:	
5	35P207	Bearing - needle, drive and idler shafts	2
6	35P1267	Retainer - with oil seal	1
		Includes the following parts:	
7	35P1206	Seal - Oil	1
8	10P1966	Screw - pan head, thread cutting, #10-24 x 3/8"	4
9	10P2327	Seal - "O" ring, retainer, 3/32" x 1-3/4" x 1-5/16"	1
10	35P1290	Plate - gear	1
11	10P2025	Pin - dowel, 3/8" x 1-11/32"	2
		50A3081 - Bolt, hex., 3/16"-18 x 2-1/4"	6
12	10P2015	Plate - wear, body end	1
13	10P2014	Plate - wear, cover end	1
14	10P2018	Seal - wear plate, cover, rubber	2
15	35P254	Seal - wear plate, inner, rubber	2
16	35P251	Ring - back-up, wear plate seal, ivory	2
17	10P2021	Seal - "O" ring, 3/8" I.D.	2
18	35P1256	Cover - pump, outer	1
		Includes the following parts:	
19	35P297	Bearing - needle, drive and idler shafts	2
20	35P1202	Body - flow divider	1
		50A3053 - Bolt, hex., 5/16"-18 x 1-1/2"	3
21	35P1291	"O" Ring - body, flow divider to pump cover	2
22	10P1591	Piston - flow divider	1
23	10P1592	Spring - flow control piston, 27 coil, 2-1/4" long	1
24	10P1593	Plug - flow control piston, 3/4"-18 N.F.	1
25	35P1294	"O" Ring - plug, 3/4"	1
26	35P290	Valve - relief	1
27	35P1293	Spring - relief valve, 1" long	1
28	35P292	Flag - relief valve spring	1
29	35P293	Shim - relief valve	A.R.
30	35A4430	Shim - pump to cover, green, .003	A.R.
30	35A4434	Shim - pump to cover, blue, .005	A.R.
30	35A4440	Shim - pump to cover, yellow, .020	A.R.
30	35A5224	Shim - pump, metal, .003	A.R.
30	35A5223	Shim - pump, metal, .005	A.R.
30	35A5225	Shim - pump, metal, .010	A.R.
30	35A5222	Shim - pump, metal, .020	A.R.
31	35A4145	Spacer - pump to cover, 3/32" x 2-17/32" I.D. x 2-7/32" O.D.	1

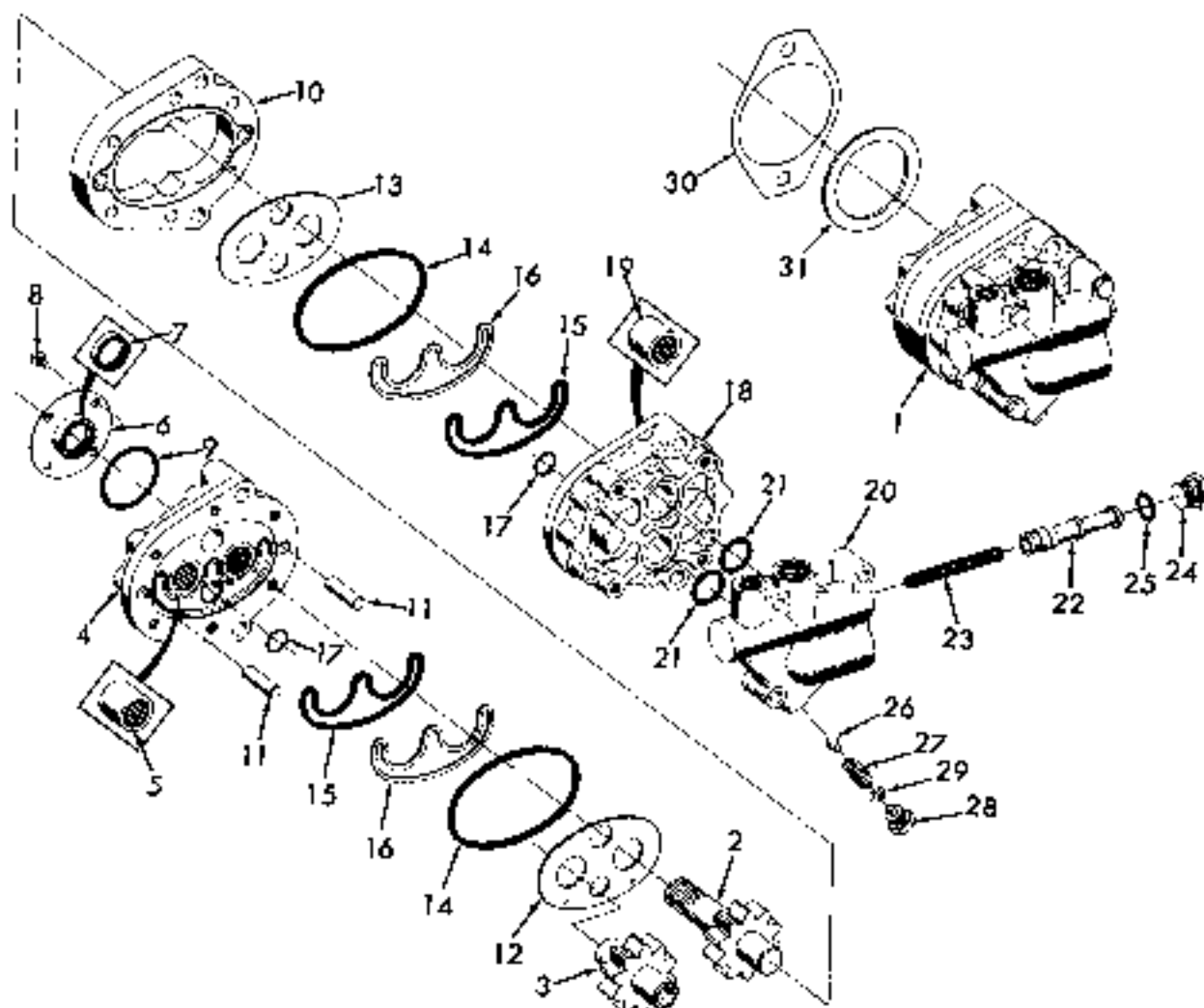


Fig. 88

Ref. No.	Part No.	DESCRIPTION	No. Pos.
HYDRAULIC PUMP			
Group II			
Used on M5A 20 II and 22 II Lift Trucks No. 29100616 and after.			
1	*****	Pump - hydraulic (Webster No. 2YLD54-05), for replacement order 10A24659 pump; and 10A24286 flow divider.....	1
		Consists of Ref. No. 2 through 86;	
2	10A24659	Pump - hydraulic	1
		Includes Ref. No. 3 through 29;	
		30A1929 - Bolt, hex., 3/8" -16 x 4'	2
3	35P2058	Body - assembly, front	1
4	10P3074	Cover - assembly, rear	1
		Each includes the following parts:	
5	35P207	Bearing - needle, drive and idler shafts	4
6	35P2059	Shaft - drive, with drive gear	1
7	35P1287	Retainer - with oil seal	1
		Includes the following part:	
8	35P1295	* Seal - oil	1
9	10P1968	Screw - pan head, rhd. cutting, No. 10-24 x 3/8"	4
10	10P2027	* Seal - "O" ring, retainer, 1-3/4" I.D. x 1-15/16" O.D.	1
11	35P2060	Gear - idler	1
12	35P2061	Plate - gear, .8011 thick	1
13	35P2062	Pin - dowel, gear plate, 3/8" x 1-7/16"	2
		30A3872 - Bolt, hex., 3/8" -16 x 2-3/4"	6
14	10P2019	Plate - wear, pump body	1
15	10P2014	Plate - wear, pump cover	1
16	10P3077	* Seal - wear plate, outer, rubber	2
17	35P284	* Seal - wear plate, inner, rubber	2
18	10P3067	* Ring - back-up, wear plate seal	2
19	10P2021	* Seal - "O" ring, 5/8" I.D., 3/4" O.D. (35P287)	2
20	35P2061	* Seal - "O" ring, manifold to pump	2
21	10A24286	Flow Divider - assembly	1
		Includes Ref. No. 22 through 29;	
22	35P2098	Piston	1
23	10P1592	Spring - piston, 27 coils	1
24	10P1596	Plug - piston and spring, 3/4" -16 N.F.	1
25	35P1294	Seal - "O" ring, plug, 7/8" O.D.	1
26	35P2094	Valve	1
27	35P2065	Spring - valve	1
28	35P298	Shim - valve spring	A.R.
29	35P292	Plug - valve, 1/2" -20 N.F.	1
30	35P2090	Bolt - hex. socket, 5/16" -18 x 1-3/4"	4
	35R69	* Kit - seals	1
		NOTE: These parts identified with an asterisk () are included in seal kit.	
31	35A4439	Shim - pump to cover, green, .003	A.R.
31	35A4488	Shim - pump to cover, blue, .005	A.R.
31	35A4440	Shim - pump to cover, yellow, .026	A.R.
31	35A4224	Shim - pump, metal, .003	A.R.
31	35A3223	Shim - pump, metal, .006	A.R.
31	35A3205	Shim - pump, metal, .010	A.R.
31	35A3222	Shim - pump, metal, .020	A.R.
32	35A4145	Spacer - pump to cover, 3/32" x 2-17/32" I.D., 3-7/32" O.D.	1

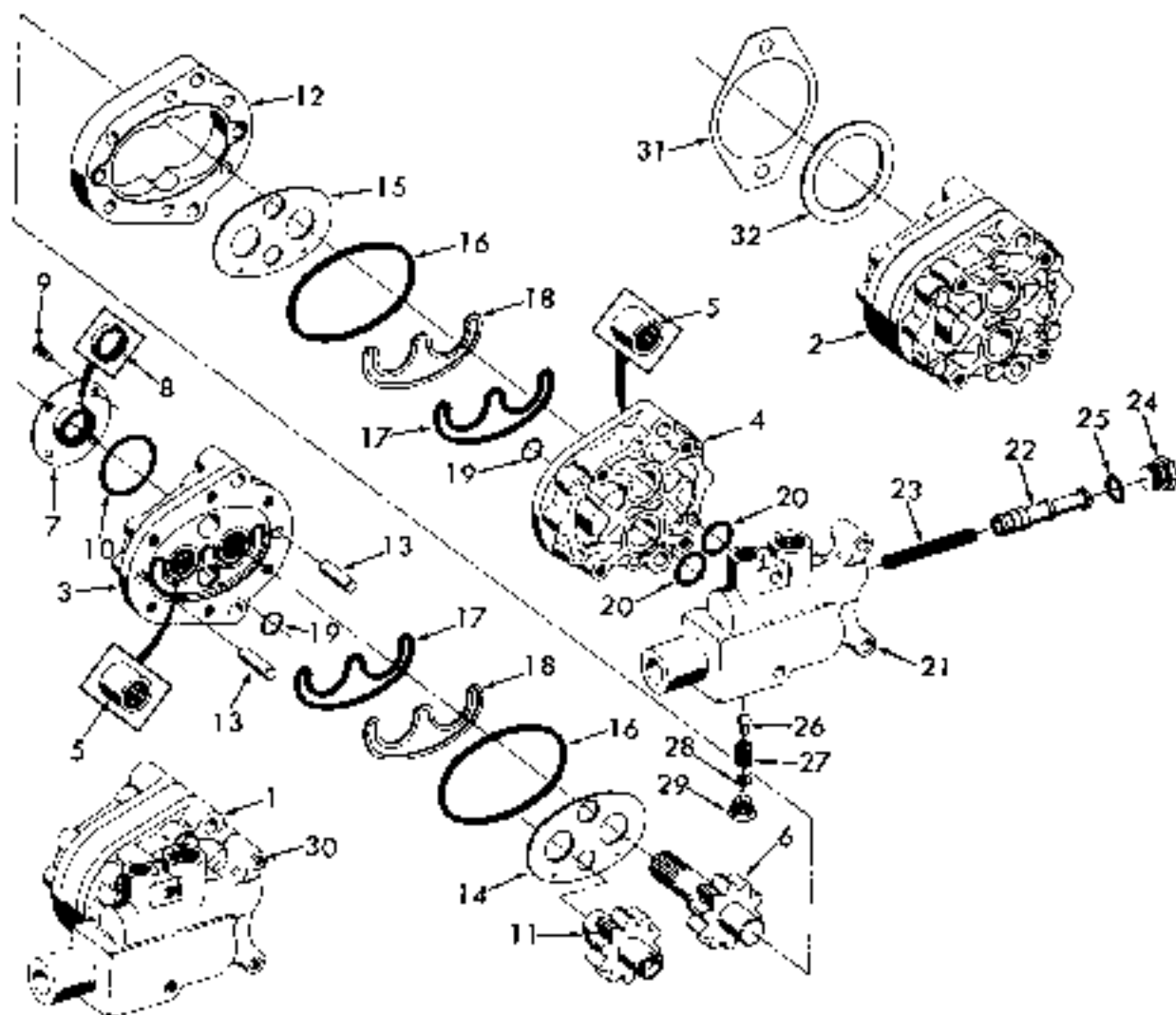


Fig. 34

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
MAST CONTROL LEVERS AND VALVE			
1	36A5903	Valve - mast control, assembly, MSA 20-25	1
2	36A5904	Valve - mast control, assembly, MSA 30-35	1
		Each includes the following 28 parts:	
		50A1825 - Bolt, hex., 5/8"-18 x 2-1/2"	3
		GM120377 - Nut, hex., 3/8"-16	8
3	15P660	Seal - spool	4
3	15P656	Spring - spool centering	2
4	10P1652	Washer - stop, centering spring	2
5	15P654	Collar - stop, centering spring	2
6	15P652	Bolt - stop collar	2
7	10P1650	Washer - lock, stop collar bolt	2
8	15P655	Disc - stop collar	2
9	15P657	Ring - stop, stop disc	2
10	15P653	Bonnet - rubber, spool opening	2
11	83P215	Plug - ball check	1
12	10A4528	"O" Ring - ball check plug	1
13	83P218	Plunger - check and relief valve	2
	20P4777	Spring - plunger, check valve	1
14	83P216	Seat - relief valve	1
15	10A12012	"O" Ring - relief valve seat	1
16	35P227	Spring - relief	1
17	35P222	Guide - relief spring	1
18	35P213	Ball - relief guide	1
19	10A16483	Washer - spacer, relief spring	1
20	10A16480	Shim - relief spring	1
21	10A16457	Gasket - relief spring cap	1
22	35P220	Cap - relief spring	1
23	35P1248	Plug - port, 7/8"-14 UNF.	2
24	35P225	"O" Ring - port plug	1
25	35P1034	Plug - conversion	1
26	15P747	Gasket - conversion plug	1
27	36A3430	+Lever - control, lift and tilt (36A6032)	1
28	36A4119	Knob - control lever, for 36A6032 threaded lever	1
29	36A4189	Label - lever, lift and tilt, for 36A4119 knob	1
30	36A3511	+Knob - control lever, solid, for 36A3430 lever	1
31		+50A4887 - Insert, knob	1
32	36A3422	+Bracket - lever mounting (36A6124)	1
		GM130082 - Bolt, hex., 1/4"-20 x 1"	6
		GM120375 - Nut, hex., 1/4"-20	6
33	36A7780	Spring - lever, used with 36A6032 lever	1
34	13A6314	Spring - lever	1
35	36A6039	Stop Washer - lever, used with 36A7780 spring	1
36	16A24261	+Bracket - spring, L-shaped, 4" long	1
		+50A3657 - Bolt, hex., 5/8"-18 x 1-1/4"	1
		+50A1900 - Nut, hex., 3/8"-16	1
	35R37	+Kit - control lever	1
		(NOTE: 35R37 Kit includes parts identified with a cross(+), used to convert 36A6032 lever to new style lever 36A3430.)	
37	36A6026	Pivot - lever	1
38	36A6684	Bolt - pivot bar	1
		50A1043 - Nut, hex., (Ema), 5/16"-24	1
39	36A6159	Bell Crank - control lever, right hand	1
40	36A6149	Bell Crank - control lever, left hand	1
41	36A6096	Shaft - bell crank	1
42	36A6099	Lock Pin - shaft, used on 36A6096 shaft with only 1 groove for snap ring	1
43		50A1827 - Snap ring, shaft	1-2
44	36A6153	Link - connecting, valve to bell crank	2
		GM124829 - Nut, hex. jam, 3/8"-12	2
45	13A12513	Swivel - N. hd., 1/4" x 1-1/2"	2
		GM120393 - Washer, plain, 11/32" I.D., 11/16" O.D.	2

M5A SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs
MAST CONTROL LEVERS AND VALVE (Cont'd)			
48	GM300373	Pin, cotter, 3/32" x 3/4".....	2
	GM174867	Clevis, short, 3/16" x 24.....	2
	GM124820	Nut, hex. jam, 5/16" x 24.....	2
17	GM120690	Pin, clevis, 5/16" x 33/32".....	2
	GM193373	Pin, cotter, 3/32" x 3/4".....	1

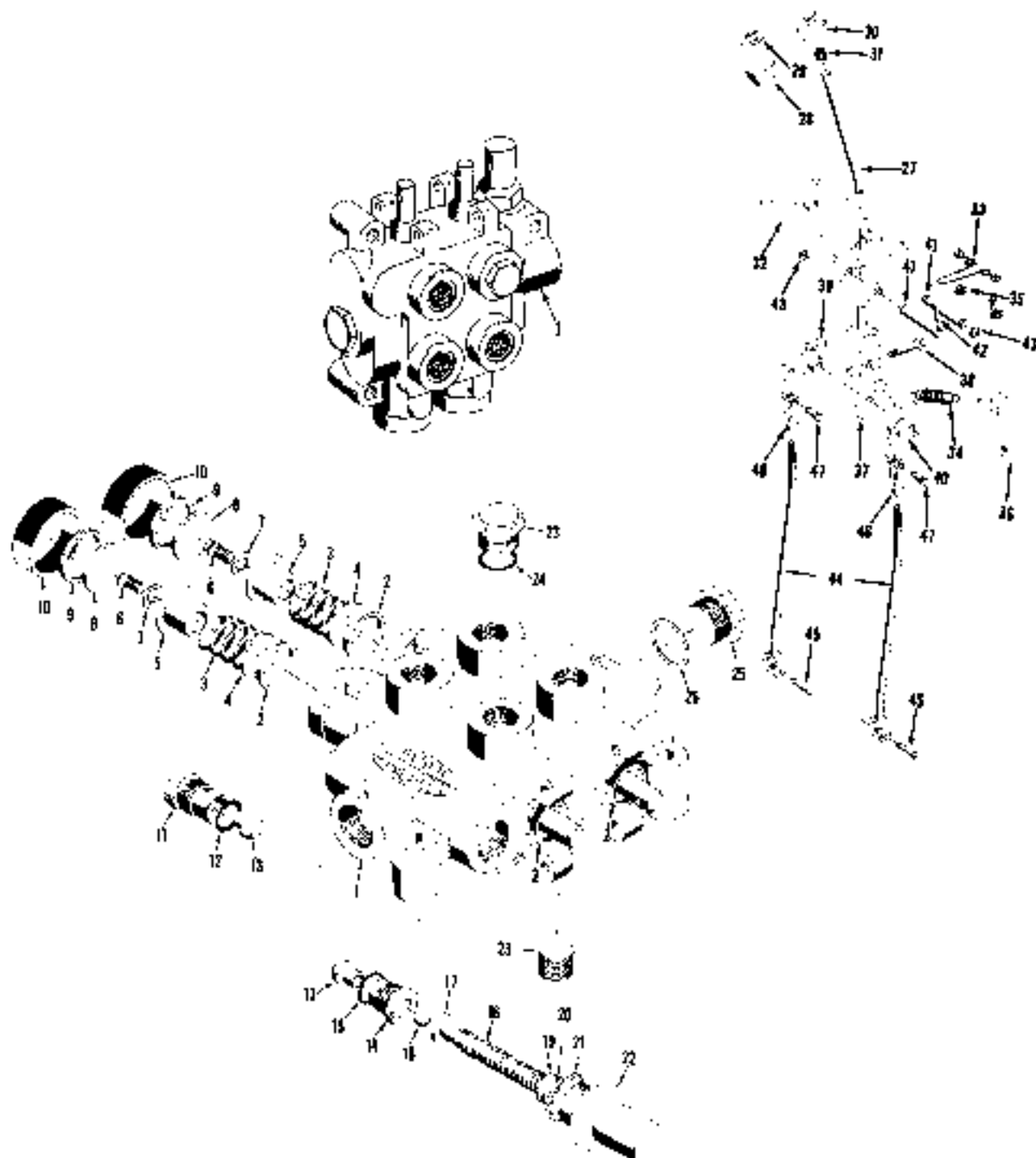


Fig. 35

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
		TILT CYLINDER	
1	36A7284	Cylinder - assembly, 6" F, 11" B	2
		Includes the following 20 parts:	
2	35P2249	Shell - assembly	2
3	35P1250	Piston - half	2
4	35P1251	Piston - half	2
5	35P2272	Seal - "O" ring, piston to rod	2
6	35P1252	Rider - nylon, piston	4
7	35P1253	Packing - assembly	2
8	35P1254	Rod - piston, 13-5/8" long	2
9	35P1255	Nut - piston rod	2
10	35P1256	Retainer - piston rod seals	2
11	35P1257	Bushing - piston rod retainer	2
12	10A7956	Seal - "O" ring, retainer to bushing	2
13	35P1258	Packing - assembly, retainer bushing	2
14	10A4729	Seal - "O" ring, retainer to outer shell	2
15	35P221	Ring - back-up, outer retainer seal	2
16	35P1259	Washer - threaded, with nylon peller	2
17	35P235	Peller - nylon	2
18	35P1260	Ring - wiper, piston rod	2
19	35B7235	End - piston rod, with bushing	2
20	15A13163	Bushing - piston rod end	2
		GM181648 - Bolt, hex. head, 3/8"-24 x 1-1/2"	2
		GM120368 - Nut, hex., 3/8"-24	2
21	35A7236	Bearing - cylinder, head end	1
22	35A5301	Pin - cylinder, rod end, front, 1-1/4" x 3-1/4"	2
23	35A8388	Pin - cylinder, head end, rear, 1" x 2-5/16" (35A7256)	2
		35A2352 - Pin, roll, 1/4" x 8"	2
		35A4082 - Pin, roll, 1/4" x 1-3/8"	4

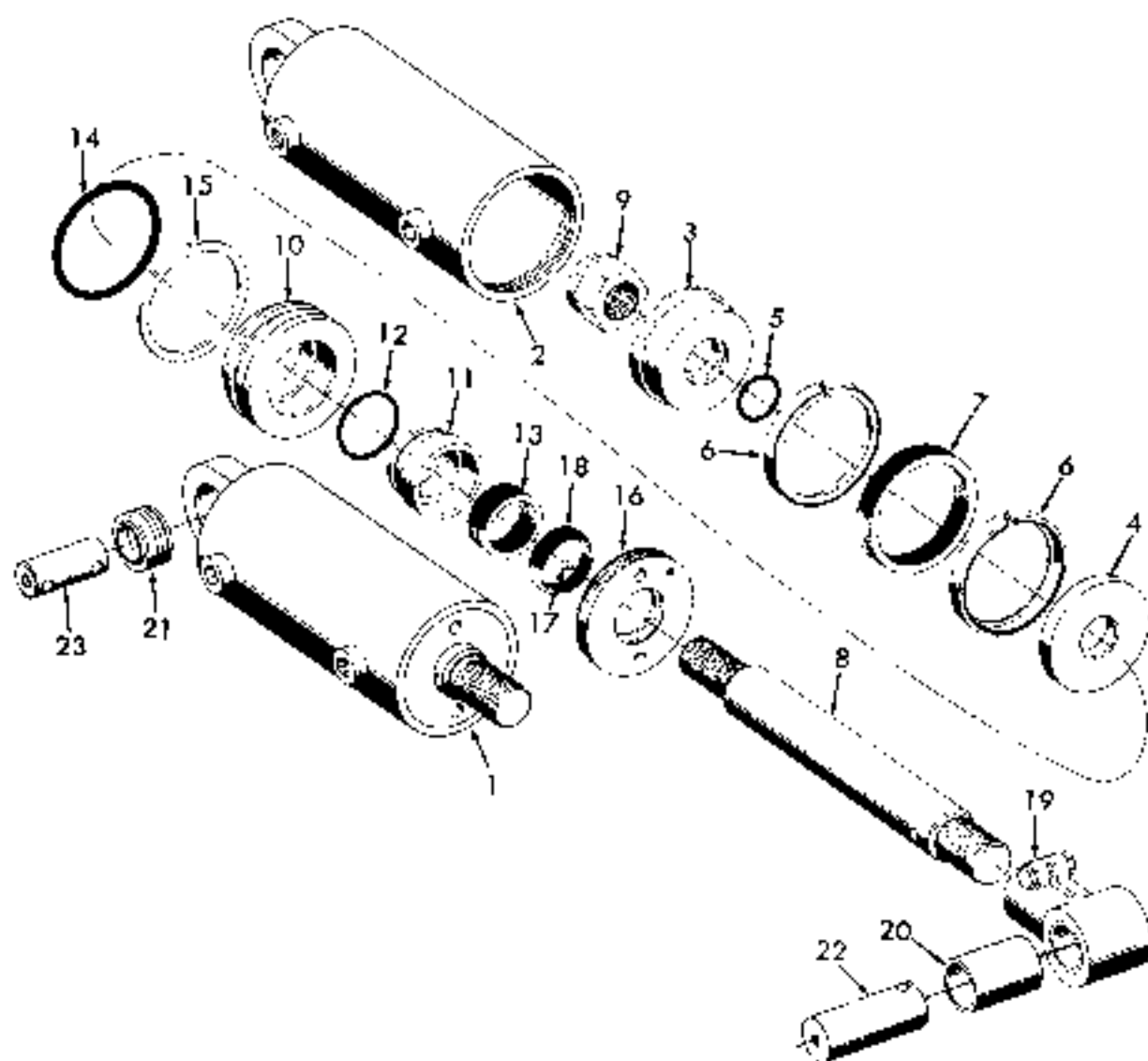


Fig. 38

M5A SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
DUPLEX MAST			
1	-----	Rail - outer, assembly, see chart on page 72 Includes the following part:	1
		GM19173d - Fitting, grease, 1/8" straight	4
2	35A6790	Screw - bearing cap, 1/2"-13 x 2-1/2"	4
3	35A4046	Bushing - bearing cap	2
4	-----	Rail - inner assembly, see chart on page 72 Includes the following part:	1
4A	35A3686	Pin - bearing, inner rail	6
5	35A3692	Shoe - mast	6
		50A1676 - Screw, hex. socket, 3/8"-16 x 5/8"	12
6	35A3693	Shim - mast shoe	A, 2
7	35A3601	Roller - mast	10
8	35A3667	Bearing - mast roller	10
9		50A1677 - Ring, snap, mast bearing	10
10	30A1681	Ring - snap, mast bearing	10
11	-----	Carriage - assembly, Order from Mobilift Sales Dept. Includes the following part:	1
11A	35A3686	Pin - bearing, carriage	4
12	35A622	Bearing - thrust, carriage	4
13	35A5459	Pin - thrust bearing	4
		50A4135 - Set screw, socket head, cup point, 3/8"-16 x 1/2"	2
14	-----	Rack - load safety, Order from Mobilift Sales Dept. 50A232 - Bolt, hex., 5/8"-11 x 1-1/2" GM124347 - Nut, hex., 5/8"-11	1 6 6
	55A6791	Bracket - mounting, load rack to carriage	2
15	-----	Chain - 4 x 6 lacing, No. BL54E, see chart on page 72	2
16	-----	Chain - 3 x 4 lacing, No. BL534, see chart on page 72	1
18	35A3702	Anchor - chain, 2-1/2" long, for BL54E chain	2
18	85A5510	Anchor - chain, 2-1/2" long, for BL534 chain	2
21	35A4082	Pin - chain anchor, 16/64" x 1-5/16"	4
20	35A8702	Anchor - chain, 4-1/4" long, for BL54E chain	2
20	35A5509	Anchor - chain, 4-1/4" long, for BL534 chain	2
19	85A8700	Pin - chain anchor, 5/8" x 1-3/4" long 50A1976 - Ring, retainer, anchor pin 50A1765 - Ring, retainer, chain pin	2 2 6
22	-----	Rod - chain anchor, see chart on page 72 GM124944 - Nut, hex., jam, 3/8"-18	2 6
	35A4333	Nut - spherical, 3/8"-18	2
23	-----	Cylinder - lift, see chart on page 72 GM180126 - Bolt, hex., 3/8"-16 x 1-1/2" GM124829 - Nut, hex. jam, 3/8"-18	1 1 1
24	36A3712	Head - piston GM102592 - Set screw, cup point, 5/16"-19 x 1/2"	1 1
25	35A3604	Guide - piston head GM180173 - Bolt, hex., 1/2"-18 x 1-1/4"	2 4
26	35A4007	Block - stop, outer rail GM180174 - Bolt, hex., 1/2"-18 x 1-1/8"	2 4
27	35A6987	Sheave - chain, 3" dia.	4
28	35A6988	Sheave - chain, 4-5/8" dia.	2
29	35A0396	Bearing - sheave	6
30	35A4079	Pin - sheave bearing, 2-3/8" long 50A2867 - Pin, roll, 5/32" x 5/8"	2 2
31	-----	Fork - lifting, see chart on page 72	2
32	35A603	Pin - fork stop, 2-1/16" long	2
33	35A669	Lever - stop pin	2
34	35A607	Spring - stop pin 50A2882 - Pin, roll, 3/16" x 1"	2 2
	35A4097	Washer - fork lock, 1/16" x 21/32" I.D., 7/8" O.D.	2
35	36A3707	Latch - fork, includes bushing	1
36	10A13028	Bushing - latch, 3/3" I.D., 3/8" long	1

M5A SERIES LIFT TRUCKS

Kit No.	Part No.	DESCRIPTION	No. Per
DUPLEX MAST (Cont'd)			
37	35A4084	Pin - latch, 5/8" x 1-7/8"	1
		50A2884 - Pin, roll, 8/16" x 1-1/2"	1
38	35A3686	Cap - latch dog	1
39	85A8697	Plunger - latch dog	1
40	35A368E	Spring - latch dog	1
41	85A7949	Tube - vent, curved, 1/4" and 3/8" O.D.	1
42		Hose - vent tube, see chart on page 72	1
		50A3678 - Clamp, hose, 7/16"	2
43	35A7307	Elbow - vent hose, 90°, 1/4"-18" N.P.T.	1
44	85A7670	Strap - vent hose	2
		GM133073 - Screw, rd. hd., 1/4"-20 x 2-1/2"	2
45	85A1464	Spacer - vent hose	2

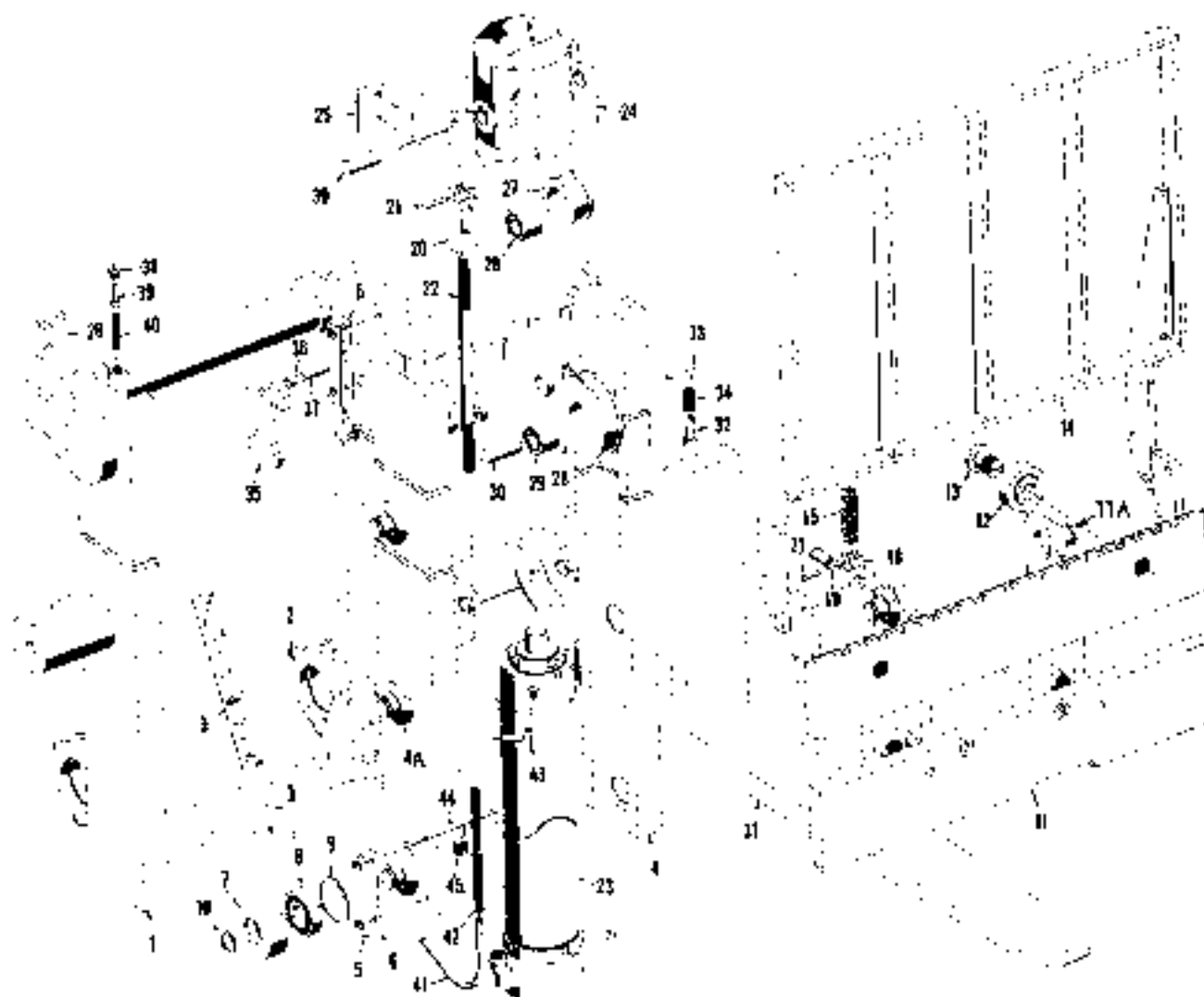


Fig. 37

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Per
DUPLIX LIFT CYLINDER			
1	35A7887	Cylinder - lift, complete, 34-7/8" long	1
1	35A7895	Cylinder - lift, complete, 39-7/8" long	1
1	35A7900	Cylinder - lift, complete, 43-3/8" long	1
		Each includes the following 40 parts:	
2	35P1136	Shell - for 34-7/8" cylinder, for cylinders with 1/2" lock nut (Ref. 30)...	1
2	35P1455	Shell - for 34-7/8" cylinder, for cylinders with 3/4" lock nut (Ref. 30)...	1
2	35P1187	Shell - for 39-7/8" cylinder, for cylinders with 1/2" lock nut (Ref. 30)...	1
2	35P1456	Shell - for 39-7/8" cylinder, for cylinders with 3/4" lock nut (Ref. 30)...	1
2	35P1198	Shell - for 43-3/8" cylinder, for cylinders with 1/2" lock nut (Ref. 30)...	1
2	35P1457	Shell - for 43-3/8" cylinder, for cylinders with 3/4" lock nut (Ref. 30)...	1
3	35P693	Screw - button head, cylinder shell	1
4	35P632	* Seal - button head screw	2
5	35P1199	Tube - intermediate, for 34-7/8" cylinder	1
5	35P1200	Tube - intermediate, for 39-7/8" cylinder	2
5	35P1201	Tube - intermediate, for 43-3/8" cylinder	1
6	35P1202	Plunger - for 35-1/2" cylinder	2
6	35P1505	Plunger - for 40-1/2" cylinder	1
8	35P1204	Plunger - for 44" cylinder	1
7	35P183	* Ring - wiper, intermediate tube (35P1205 Inter.)	1
6	35P132	* Spring - garter, wiper ring	2
9	35P1207	Retainer - wiper ring	2
10	10A7346	* "O" Ring - retainer, 3-3/4" I.D., 4" O.D.	2
11	35P1208	Bushing - intermediate tube	1
12	35P1209	* "O" Ring - intermediate tube bushing, 2-3/8" I.D., 3-5/8" O.D.	1
13	35P1210	* Ring - back-up, "O" ring	1
14	35P1211	* Packing - tube bushing	1
15	35P1212	* Ring - wiper, plunger	1
16	35P1206	* Spring - garter, wiper ring	1
17	35P1213	Retainer - plunger wiper ring	1
13	35P174	* "O" Ring - wiper retainer, 2-1/2" I.D., 2-3/4" O.D.	1
19	35P1214	Piston	1
20	35P1215	* Packing - piston	1
21	10A7958	* "O" Ring - piston, inner, 1-1/2" I.D., 1-3/4" O.D.	1
22	35P1216	* Ring - back-up, "O" ring	1
23	35P1217	Ring - snap, piston retainer	1
24	35P1218	Bearing - intermediate tube	1
25	35P1219	Ring - bearing retainer	1
26	35P1220	Ring - snap, bearing	1
27	35P1262	Head - cylinder, for cylinders with 1/2" lock nut, ref. 30	2
27	35P1458	Head - cylinder, for cylinders with 3/4" lock nut, ref. 30	1
28	35P1222	* "O" Ring - cylinder head, 3-7/8" I.D., 4-1/8" O.D.	2
29	35P1450	* Ring - back-up, head "O" ring (35P1222)	1
29A	35P1400	* Ring - cylinder head, nylon, upper, for cylinders with 3/4" lock nut (Ref. 30)	2
	35R73	* Repair Kit - lift cylinder (35R69)	*
		*NOTE: Repair Kit consists of the above items identified by an asterisk.	
30	35P1224	Nut - lock, cylinder head, for cylinders with 1/2" lock nut (Ref. 30)...	1
30	35P1461	Nut - lock, cylinder head, for cylinders with 3/4" lock nut (Ref. 30)...	1
31	35A4209	Spacer - intermediate tube, 1/4" x 3-2/8" O.D., for 34-7/8" and 39-7/8" cylinders	1
31	35A3453	Spacer - intermediate tube, 1" x 3-8/8" O.D. for 34-7/8" cylinder	1
32	35A4100	Spacer - plunger, 1/4" x 2-3/8" O.D., for 34-7/8" and 39-7/8" cylinder	1
33	35A4095	Spacer - plunger, 1" x 2-3/8" O.D., for 34-7/8" cylinder	1
38	35A7912	Spring - oil restrictor	1
34	35A7793	Washer - perforated, oil restrictor	1
35	35A7792	Spacer - oil restrictor	1
36	35A7793	Har - sleeve	1
37	35P1221	Rod - end, cylinder top, 2-1/8" long	1
	35P1227	Lock Washer - rod	2

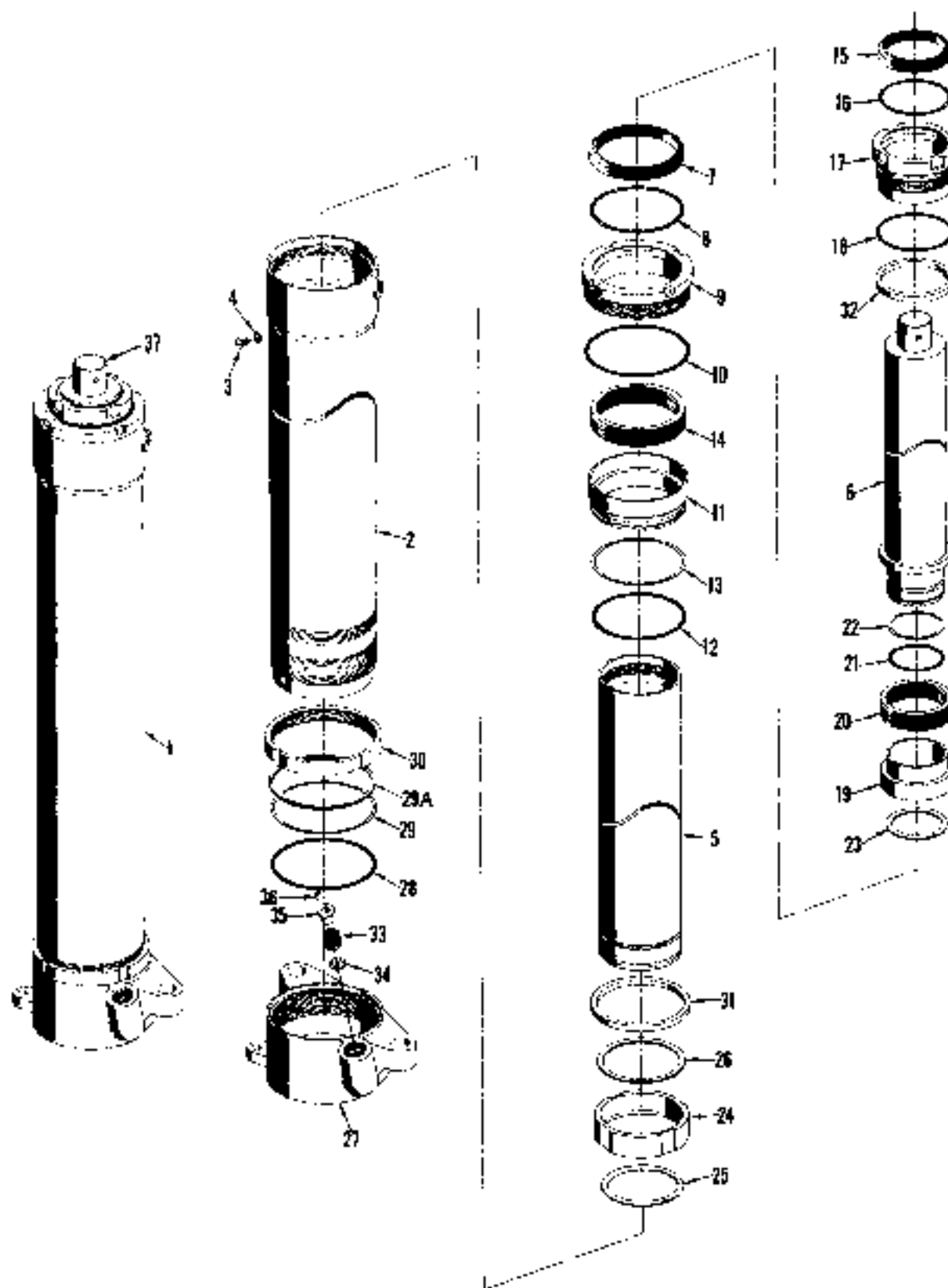


Fig. 28

MSA SERIES LIFT TRUCKS

VARIABLE PARTS CHART FOR DUPLEX MAST

Outer Rail	Inner Rail	Cylinder Assy.	Chain Assy. - BL546	Chain Assy. - BL534	Chain Anchor Rod	Vert. Hose	Mast M.F.H. O.A.H.L.	
35A4210 - 60-1/2"	35A4240 - 60-1/2"	35A7882 - 32-3/8"	35A4315 - 201 lks.	35A8519 - 201 lks.	35A4321 - 12"	35A7328 - 18"	91"	68-1/2"
35A4211 - 62"	35A4241 - 62"	35A7883 - 32-3/8"	35A4315 - 201 lks.	35A8519 - 201 lks.	35A4322 - 15"	35A7329 - 19"	94"	65"
35A4212 - 68-1/2"	35A4242 - 67-1/2"	35A7884 - 32-3/8"	35A4315 - 201 lks.	35A8519 - 201 lks.	35A4324 - 15"	35A7328 - 18"	97"	66-1/2"
35A4213 - 65"	35A4243 - 65"	35A7885 - 32-3/8"	35A4315 - 201 lks.	35A8519 - 201 lks.	35A4326 - 21"	35A7328 - 19"	100"	68"
35A4214 - 66-1/2"	35A4244 - 66-1/2"	35A7886 - 34-7/8"	35A4315 - 201 lks.	35A8519 - 201 lks.	35A4325 - 24"	35A7329 - 21-1/2"	102"	69-1/2"
35A4215 - 68"	35A4245 - 69"	35A7887 - 34-7/8"	35A4316 - 225 lks.	35A8520 - 225 lks.	35A4321 - 12"	35A7329 - 21-1/2"	106"	71"
35A4216 - 69-1/2"	35A4246 - 69-1/2"	35A7888 - 34-7/8"	35A4316 - 225 lks.	35A8520 - 225 lks.	35A4322 - 15"	35A7329 - 21-1/2"	109"	72-1/2"
35A4217 - 71"	35A4247 - 71"	35A7889 - 37-3/8"	35A4316 - 225 lks.	35A8520 - 225 lks.	35A4324 - 15"	35A7330 - 24"	112"	74"
35A4218 - 72-1/2"	35A4248 - 72-1/2"	35A7890 - 37-3/8"	35A4316 - 225 lks.	35A8520 - 225 lks.	35A4326 - 21"	35A7330 - 24"	113"	75-1/2"
35A4219 - 74"	35A4249 - 74"	35A7891 - 37-3/8"	35A4316 - 225 lks.	35A8520 - 225 lks.	35A4328 - 24"	35A7330 - 24"	116"	77"
35A4220 - 75-1/2"	35A4250 - 75-1/2"	35A7892 - 37-3/8"	35A4317 - 249 lks.	35A8521 - 249 lks.	35A4321 - 12"	35A7330 - 24"	121"	78-1/2"
35A4221 - 77"	35A4251 - 77"	35A7893 - 39-7/8"	35A4317 - 249 lks.	35A8521 - 249 lks.	35A4322 - 15"	35A7331 - 26-1/2"	124"	80"
35A4222 - 78-1/2"	35A4252 - 75-1/2"	35A7894 - 39-7/8"	35A4317 - 249 lks.	35A8521 - 249 lks.	35A4324 - 15"	35A7331 - 26-1/2"	127"	81-1/2"
35A4223 - 80"	35A4253 - 80"	35A7895 - 39-7/8"	35A4317 - 249 lks.	35A8521 - 249 lks.	35A4326 - 21"	35A7331 - 26-1/2"	130"	83"
35A4224 - 81-1/2"	35A4254 - 81-1/2"	35A7896 - 48-3/8"	35A4317 - 249 lks.	35A8521 - 249 lks.	35A4328 - 24"	35A7332 - 30"	133"	84-1/2"
35A4225 - 83"	35A4255 - 83"	35A7897 - 43-3/8"	35A4318 - 273 lks.	35A8522 - 273 lks.	35A4321 - 12"	35A7332 - 30"	136"	86"
35A4226 - 84-1/2"	35A4256 - 84-1/2"	35A7898 - 48-3/8"	35A4318 - 273 lks.	35A8522 - 273 lks.	35A4322 - 15"	35A7332 - 30"	139"	87-1/2"
35A4227 - 86"	35A4257 - 86"	35A7899 - 43-3/8"	35A4318 - 273 lks.	35A8522 - 273 lks.	35A4324 - 15"	35A7332 - 30"	142"	89"
35A4228 - 87-1/2"	35A4258 - 87-1/2"	35A7900 - 48-3/8"	35A4318 - 273 lks.	35A8522 - 273 lks.	35A4326 - 21"	35A7332 - 30"	145"	90-1/2"
35A4229 - 89-1/2"	35A4259 - 89-1/2"	35A7901 - 48-3/8"	35A4318 - 273 lks.	35A8522 - 273 lks.	35A4328 - 25"	35A7333 - 33"	148"	92-1/2"
35A4230 - 91"	35A4260 - 91"	35A7902 - 46-3/8"	35A4318 - 273 lks.	35A8522 - 273 lks.	35A4328 - 25"	35A7333 - 33"	151"	94"
35A4231 - 92-1/2"	35A4261 - 92-1/2"	35A7903 - 48-3/8"	35A4318 - 273 lks.	35A8522 - 273 lks.	35A4331 - 31"	35A7333 - 33"	154"	95-1/2"
35A4232 - 94"	35A4262 - 94"	35A7904 - 46-3/8"	35A4318 - 273 lks.	35A8522 - 273 lks.	35A4332 - 35"	35A7333 - 33"	157"	97"
35A4233 - 95-1/2"	35A4263 - 95-1/2"	35A7905 - 49-3/8"	35A4319 - 313 lks.	35A8523 - 313 lks.	35A4331 - 12"	35A7334 - 36"	160"	98-1/2"
35A4234 - 97-1/2"	35A4264 - 97-1/2"	35A7906 - 49-3/8"	35A4319 - 313 lks.	35A8523 - 313 lks.	35A4329 - 10"	35A7334 - 36"	163"	100-1/2"
35A4235 - 99"	35A4265 - 99"	35A7907 - 49-3/8"	35A4319 - 313 lks.	35A8523 - 313 lks.	35A4323 - 19"	35A7334 - 36"	166"	102"
35A4236 - 100-1/2"	35A4266 - 100-1/2"	35A7908 - 49-3/8"	35A4320 - 329 lks.	35A8524 - 329 lks.	35A4321 - 12"	35A7334 - 36"	169"	103-1/2"
35A4237 - 105"	35A4267 - 102"	35A7909 - 52-3/8"	35A4320 - 329 lks.	35A8524 - 329 lks.	35A4322 - 15"	35A7335 - 37-1/2"	172"	105"
35A4238 - 105-1/2"	35A4268 - 103-1/2"	35A7910 - 52-3/8"	35A4320 - 329 lks.	35A8524 - 329 lks.	35A4324 - 15"	35A7335 - 37-1/2"	175"	106-1/2"
35A4239 - 105-1/2"	35A4269 - 105-1/2"	35A7911 - 52-3/8"	35A4320 - 329 lks.	35A8524 - 329 lks.	35A4327 - 22"	35A7335 - 37-1/2"	178"	108-1/2"

NOTE: For breakdown of lift cylinder see page 70.

NOTE: Order replacement parts on Forks, Extension Forks, Carriages and Safety Racks from Mobilift Sales Department.

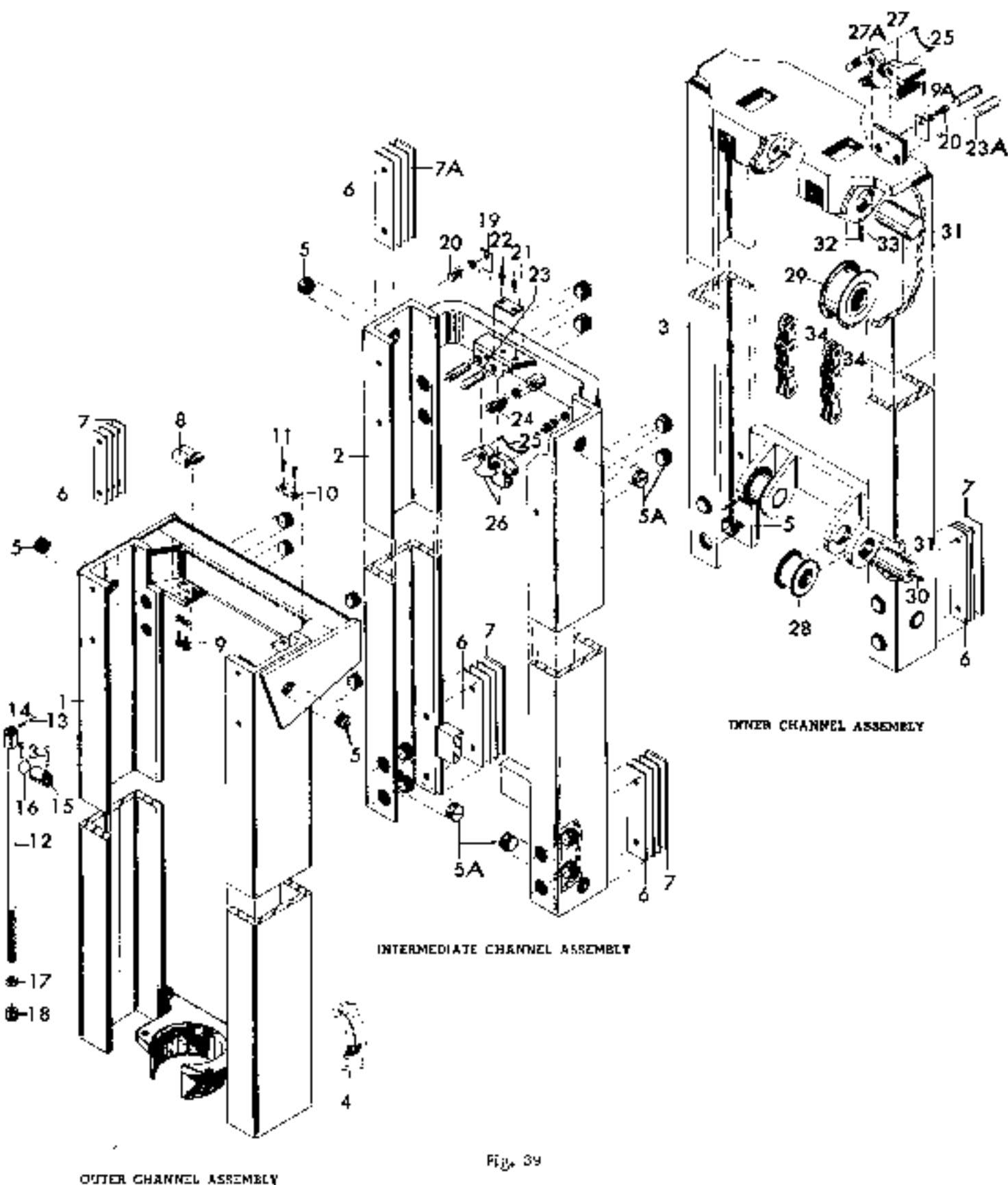
Ref. No.	Part No.	DESCRIPTION	Qty. Pcs.
DECALS AND EMBLEMS			
	35A8315	Decal - Mobilift, on mast (35A6089), 2-1/2" x 15".....	2
	35A8716	Decal - plain, on side, 1-1/2" x 30-1/2".....	2
	35A8717	Decal - plain, right hand side.....	1
	35A8718	Decal - plain, left hand side.....	1
	35A4969	Emblem - Mobilift, 1-7/16" x 3-29/32".....	2
		GM181014 - Washer, plain, 5/32" L.D., 3/8" O.D.	8
		GM254236 - Nut, square, No. 8-32.....	8
	35A8614	Decal - Mobilift, on side of hood, 2-1/4" x 13-1/2".....	2
	35A8661	Decal - warning, ramp descending, 1-3/16" x 3".....	1
	35A8662	Decal - capacity, 2000 lb. at 15" L.C., 1-2/8" x 4".....	1
	35A8663	Decal - capacity, 2500 lb. at 15" L.C., 1-3/8" x 4".....	1
	35A8822	Decal - Mobilmatic Edw.....	1
	35A8831	Decal - High Free Lift.....	2
	15A8169	Decal - LP-Gas fuel specifications, 2" x 3-1/4".....	1
PAINT			
	15P1014	Paint - 16 oz., pressurized, prairie gold.....	-
	15P1015	Paint - quart, prairie gold.....	-
	15P1018	Paint - gallon, prairie gold.....	-
TRANSMISSION OIL			
	35P1755	Oil - transmission, 1 gallon.....	-
	35P1756	Oil - transmission, 5 gallons.....	-

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
UPRIGHT FOR TRIPLEX TRI-FREE LIFT (Cascade Viewmast) Group I - for MSA 20 and 25			
1	-----	*Channel - outer assembly	1
2	-----	*Channel - center assembly	1
3	-----	*Channel - inner assembly	1
		*NOTE: Order above parts by M.F.H. and O.A.H.L.	
4	35P2054	Cap - bearing, outer tail pivot	2
		90A1205 - Screw, bearing cap, 5/8"-11 x 2-1/2"	4
5	85P188F	Plug - channel, outer and inner	12
5A	35P2022	Plug - channel, center	12
6	35P1889	Shim - bearing	A, R,
7	35P1840	Bearing - channels, outer and inner	4
7A	35P2025	Bearing - channels, center	4
	-----	Bolt - hex., 9/8"-24 x 1/2"	16
8	35P1841	Tripp	1
9	-----	Bolt - hex., 3/8"-24 x 1"	2
10	35P1800	Pad	1
11	-----	Bolt - hex., 1/4"-28 x 3/8"	2
12	25P2022	Rod - lift	2
13	35P1845	Pin - rod and anchor	4
14	35P1844	Retainer - pin	2
15	35P2029	Anchor - chain, outer channel	2
17		GM114482 - Nut, hex. jam, 9/8"-13	2
18		50A1011 - Nut, hex., (Nylock) 5/8"-16	2
19	50F1849	Keeper - pins, center channel	1
19A	35P2036	Keeper - pins, inner channel	1
20	-----	Bolt - hex., 3/8"-24 x 1/2"	2
21	35P1850	Pad - center channel	1
22	-----	Bolt - hex., 1/4"-28 x 3/8"	2
23	35P1850	Pin - latch, center channel	2
23A	35P2035	Pin - latch, inner channel	1
24	-----	Bolt - hex., socket, 1/2"-18 x 3/4"	1
25	35P1851	Spring - latch, center channel	2
25A	35P2037	Spring - latch, inner channel	1
26	35P1862	Latch - lift, center channel	2
27	35P2008	Latch - lift, inner channel, L.H.	1
27A	35P2009	Latch - lift, inner channel, R.H.	1
28	35P2026	Sheave - chain, lower	2
29	35P2026	Sheave - chain, upper	2
30	-----	Pitting - grease, straight, 1/4"-28	4
31	35P2027	Shaft - sheaves	4
32	-----	Screw - hex. socket, jam, 1/4"-20	4
33	-----	Set Screw - hex. socket, 5/16"-24 x 5/8"	4
34	-----	Chain - lift, see chart below, 3/4" pitch BL634	2

CHAIN FOR LIFT - 3/4" Pitch BL634

M.F.H.	O.A.H.L.	Chain Length	M.F.H.	O.A.H.L.	Chain Length
132"	73"	156-7/8"	161"	78"	163-1/8"
137"	73"	158-7/8"	166"	78"	163-1/8"
141"	70"	156-7/8"	169"	78"	163-1/8"
145"	70"	158-7/8"	169"	82"	199-3/8"
148"	70"	156-7/8"	173"	82"	199-3/8"
151"	70"	158-7/8"	177"	82"	199-3/8"
149"	76"	163-1/8"	181"	82"	199-3/8"
158"	76"	163-1/8"	185"	82"	199-3/8"
157"	76"	163-1/8"			



MSA SERIES LIFT TRUCKS

Rel. No.	Part No.	DESCRIPTION	No. Pcs.
		1 W/PIEX TRI-FREE LIFT CYLINDER (Cascade Viewmast)	
		Group II	
		4" Diameter, for MSA 20 and 26	
1	-----	*Cylinder - assembly, complete	1
		*NOTE: Order above part by M, F, H, and O, A, H, L.	
		Each includes the following 37 parts:	
2	35P1457	Shell - cylinder, outer, for 70" O.A.H.L. mast	1
2	35P2041	Shell - cylinder, outer, for 76" O.A.H.L. mast	1
2	35P2042	Shell - cylinder, outer, for 82" O.A.H.L. mast	1
3	35P338	Screw - button head, cylinder shell	1
4	35P332	**Seal - button head screw	1
5	35P1201	Tube - cylinder, intermediate, for 70" O.A.H.L. mast	1
5	35P2043	Tube - cylinder, intermediate, for 76" O.A.H.L. mast	1
5	35P2044	Tube - cylinder, intermediate, for 82" O.A.H.L. mast	1
6	35P2045	Plunger - cylinder, inner, for 70" O.A.H.L. mast	1
6	35P2046	Plunger - cylinder, inner, for 76" O.A.H.L. mast	1
6	35P2047	Plunger - cylinder, inner, for 82" O.A.H.L. mast	1
7	35P183	*Ring - wiper, intermediate tube	1
8	35P182	**Spring - garter, wiper ring	1
9	35P1207	Retainer - wiper ring	1
10	10A7846	**"O" Ring - retainer	1
11	35P1206	Bushing - intermediate tube	1
12	35P1209	**"O" Ring - intermediate tube bushing	1
13	35P1210	**Ring - back-up, "O" ring	1
14	35P2215	**Packing - cone bushing	1
15	35P1212	**Ring - wiper, plunger	1
16	35P1208	**Spring - garter, wiper ring	1
17	35P2213	Retainer - plunger wiper ring	1
18	35P174	**"O" Ring - wiper retainer	1
19	35P1214	Piston	1
20	35P1211	**Packing - piston	1
21	10A7956	**"O" Ring - piston, inner	1
22	35P1216	**Ring - back-up, "O" ring	1
23	35P1217	Ring - snap, piston retainer	1
24	35P1218	Bearing - intermediate tube	1
25	35P1213	Ring - bearing retainer	1
26	35P1220	Ring - snap, bearing	1
27	35P2040	Head - cylinder	1
28	35P1222	**"O" Ring - cylinder head, lower	1
29	35P1459	**Ring - back-up, head "O" ring	1
30	35P1460	**Ring - cylinder head, upper	1
31	35P2048	Repair Kit - for cylinder	1
		NOTE: Repair Kit consists of the above items identified by a double asterisk ().	
32	35P1461	Nut - lock, cylinder head	1
33	35P1836	Body - restrictor	1
34	10A16236	"O" Ring - body	1
35	35A4932	Spring - oil restrictor	1
36	35P1337	Washer - perforated, oil restrictor	1
37	35P148	Spacer - oil restrictor	1

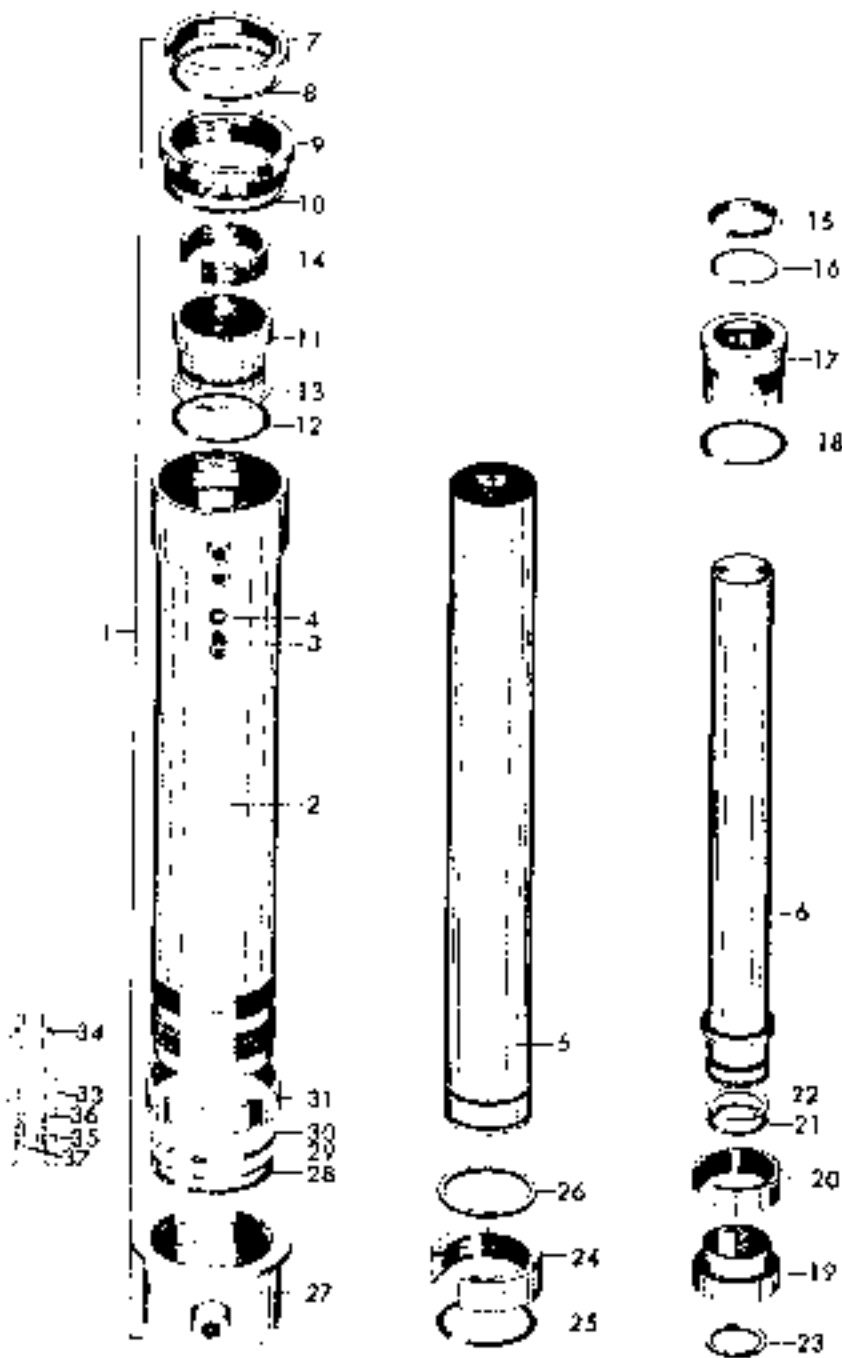


Fig. 40

MSA SERIES LIFT TRUCKS

Ref. No	Part No.	DESCRIPTION	No. Pcs.
CROSS HEAD FOR UPRIGHT (Cascade Viewmast) Group III - for MSA 20 and 25			
1	35P2049	Cross Head - upright	1
2	-----	Bolt - socket head, 1/4"-20 x 1-1/4"	2
3	35P1230	Pad - head	1
4	-----	Bolt - flat head, hex. socket, 1/4"-20 x 1/2"	2
5	35P2020	Sheave - cross head	2
6	35P2027	Shaft - sheave	2
7	-----	Socket Jam Screw - 1/4"-20	2
8	-----	Set Screw - cup point, hex. socket, 1/4"-20 x 3/8"	2
9	-----	Fitting - grease, straight, 1/4"-26	2
10	35P2052	Shoe - head	2
11	-----	Bolt - hex. socket, 1/2"-13 x 3/4"	2
12	-----	Bolt - hex. anchor, 5/8"-11 x 3"	2
13	35P2053	Shim - shoe	A.R.

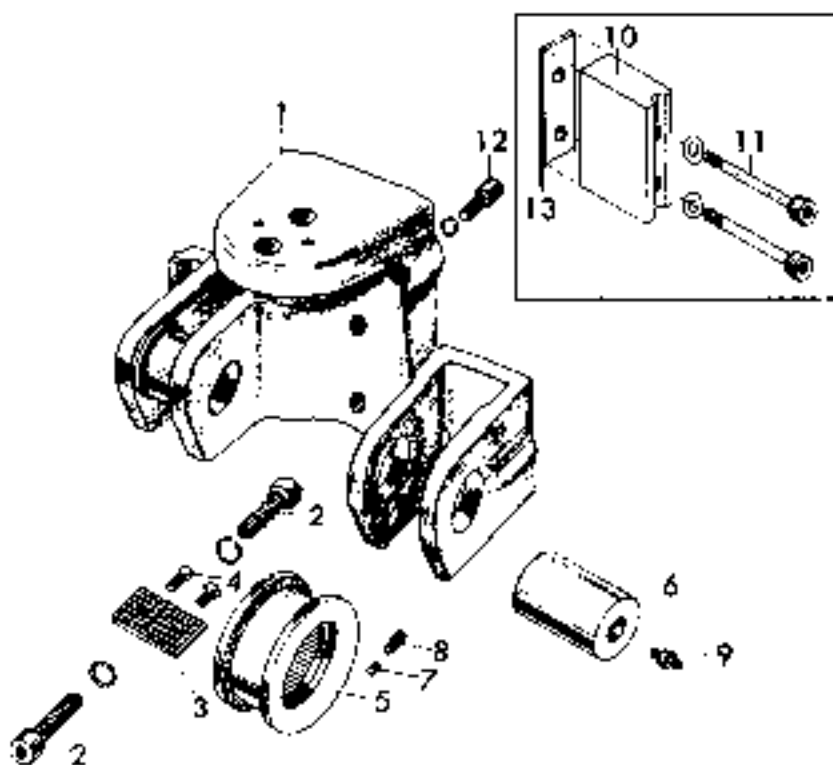


Fig. 41

ADAPTING PARTS FOR TRIPLEX T&F-FREE LIFT (Cascade Viewmast)		
Group IV - for MSA 20 and 25		
35A4046	Bushing - axle	2
	50A4028 - Fitting, grease, 1/8" straight	2
35A7349	Tube - vent, L-shaped, 1/4" O.D. x 3/8" O.D. tubing	1
35A7383	Hose - vent, 1/4" I.D. x 35" long	1
35A7307	Elbow - vent hose, 90°, 1/4"-18 N.P.T.	1
	50A3573 - Clamp, hose, 7/16"	2

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
		CARRIAGE FOR TRIPLEX T31-FREE LIFT (Cascade Viewmast) Group V - for MSA 20 and 25	
1	-----	Carriage - assembly, order from Mobilift Sales Department..... Includes the following parts:	1
2	35P2054	Wear pad - carriage	2
3	-----	Bolt - hex. socket, flat head, 1/4"-20 x 1/2"	4
4	35P2055	Shim - wear pad	A.R.
5	35P1865	Roller - assembly, carriage guides	4
6	-----	Bolt - hex. socket, 1/2"-13 x 1-1/2"	4
7	35P1866	Nut - bolt, roller support, 1/2"-13	4
8	-----	Screw - adjusting, roller assembly, half dog, nylock, 5/8"-11 x 1"	4
9	35P1868	Roller - carriage	4
10	35P1867	Sleeve - roller	4
11	35P1854	Washer - roller, inner	4
12	-----	Pinning - grease, straight, 1/4"-28	5
13	35P1869	Plug - roller, outer	4
14	35P1864	Screw - hex. socket, 5/16"-13 x 1"	2
15	35P2056	Bar - yoke	1
16	35P2057	Yoke - carriage	1
	-----	Bolt - hex., 3/8"-24 x 2"	2

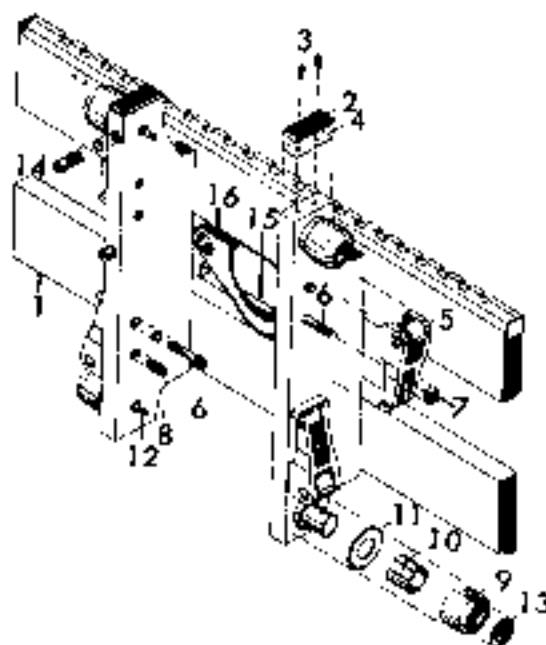


Fig. 42

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
		TRIPLEX MAST - TRIFREE LIFT (Knickerbocker) - 2500#	
		Group 1	
1	-----	*Rail - outer assembly	1
		50A11E9 - Bolt, 12 pt., 1/2" x 2-1/2"	4
		GM120384 - Washer, lock, 1/2"	4
2	-----	*Rail - inner assembly	1
3	-----	*Rail - center assembly	1
4	35P1612	Pad - wear	36
5	35P1648	*Cylinder - assembly, see page 3 for breakdown	1
6	35P1649	Roller - chain	4
7	35P1650	Race - inner	4
8	35P1651	Bearing - roller	4
9	35P1652	Washer - thrust, inner	4
10	35P1653	Washer - thrust, outer	4
11	-----	Fitting - grease, 1/4" drive (Alemite 1668)	4
12	35P1654	Ring - bearing retainer, outer	4
13	35P1655	Chain - lift, 5/8" pitch (No. 8L384)	4
14	35P1656	Pin - chain connecting	4
15	35P1657	Anchor - chain	4
16	35P1658	Plate - chain anchor	2
17		50A3697 - Bolt, hex., 5/8" x 2-1/2"	4
18		50A1912 - Nut, hex., 5/8" x 11	4
19	35P1659	Elbow - cylinder to hose, 90°	1
20	35P1660	Connector - hose to elbow	1
21	35P1661	*Hose - cylinder	1
22	35P1662	Fitting - hose to elbow	1
23	35P1193	Clamp - fitting	1
24	35P1663	Elbow - hose	1
25	35P1665	Spacer - cylinder pilot to inner cylinder	1
26	35P1664	Screw - spacer	1
27	35P1667	Anchor - chain, lower	4
28	35P1668	Pin - chain connecting	4
29	35P1668	Roll Peg - carriage	4
30	35P667	Washer - thrust, bearing, inner and outer	6
31	35P1621	Bearing - roller	4
32	35P1620	Spacer - bearing	4
33	35P1622	Turn - roller	4
34	35P1623	Ring - retaining, roller	4
35	35P1768	Fitting - grease, 1/4" drive x 45° (Alemite 1669)	4
36		GM215554 - Bolt, hex., 3/8" x 2-1/4"	4
37	35P1134	Screw - shaft support, for fitting, 5/8" x 2-1/4"	4
38	-----	Fitting - grease, (Alemite 1728-17)	4
39	35P1146	Shaft - roller	5
40	35P1145	Support - shaft	4
41	35P1147	Roller - shaft	4
		*NOTE: Order parts for lift by serial number of mast plus MPH and OAH.	
42	35A4046	Bushing - axle	2
		GM4445E3 - Plug, pipe, hydraulic tank	1
43	35A5301	Pin - tilt	2
		50A2852 - Pin, roll, 1/4" x 2-1/2"	2
		GM191753 - Fitting, grease, 1/4" straight	3
44	35A7015	Carriage - 32"	-
44	35A7046	Carriage - 34"	-
44	35A7047	Carriage - 36"	-
44	35A7048	Carriage - 38"	-
44	35A7049	Carriage - 40"	-
44	35A7050	Carriage - 42"	-
44	35A7051	Carriage - 44"	-
44	35A7052	Carriage - 46"	-
44	35A7053	Carriage - 48"	-

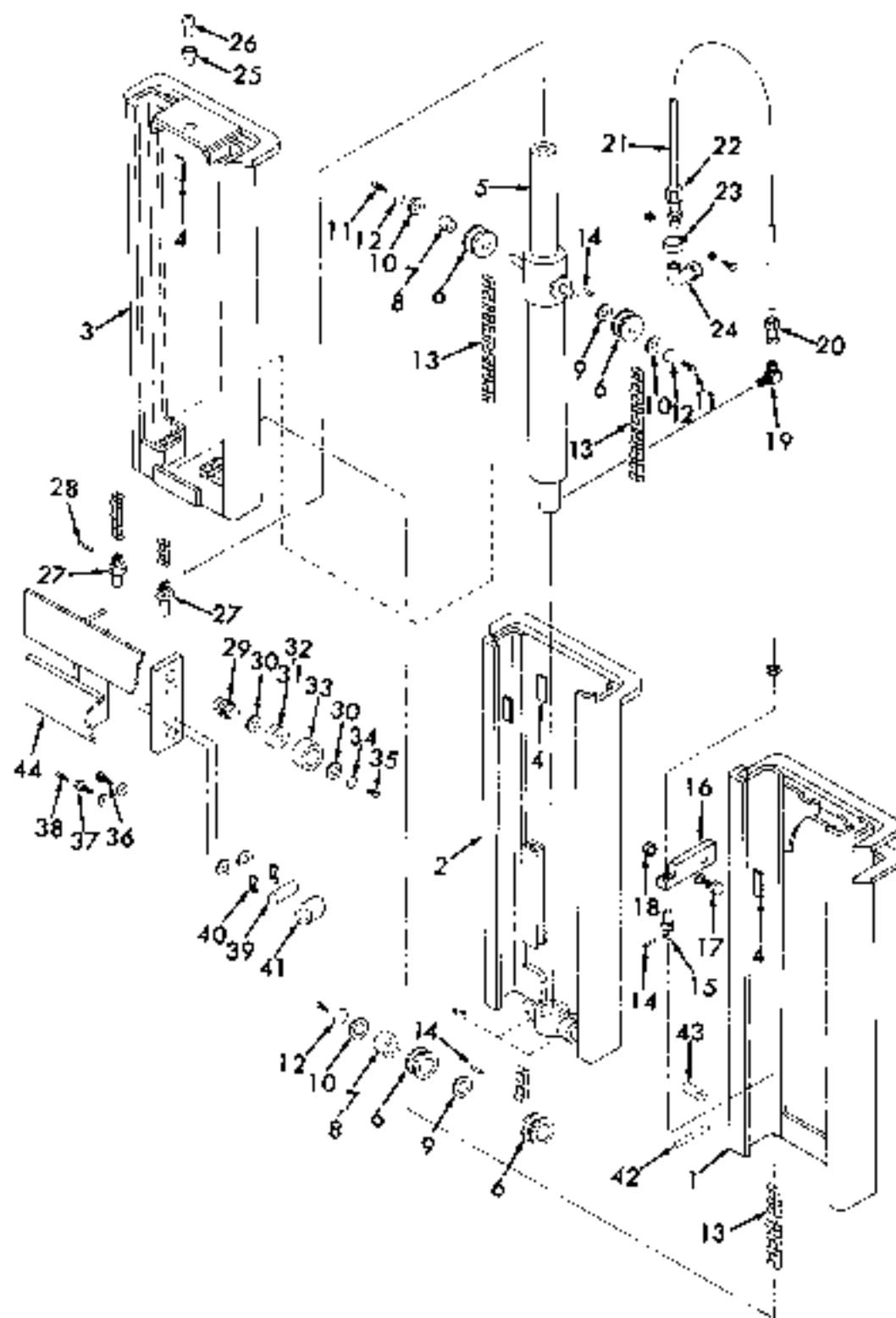


Fig. 43

MSA SERIES LIFT TRUCKS

Ref. No	Part No	DESCRIPTION	No. Pcs
LIFT CYLINDER - TRIFREE LIFT (Knickerbocker) - 2500# Group II			
1	35F1646	*Cylinder - lift, assembly Includes the following 27 parts:	1
2	35F1711	*Tube - cylinder, outer	1
3	35F1712	*Tube - interstage	1
4	35F1713	*Tube - plunger, inner	1
5	35F1726	Packing Set - outer cylinder, lower section, 4-1/2" O.D.	1
6	35F1727	Nut - packing, lower section	1
7	35F1729	Set Screw - packing nut	1
8	35F1728	Ring - wiper, packing nut	1
9	35F1720	Spacer - packing	1
10	35F1724	Ring - wear, outer cylinder	2
11	35F1731	Ring - stop, outer cylinder, bottom section	1
12	35F1732	Ring - snap, stop ring, inner	1
13	35F1733	Ring - snap, stop ring, outer	1
14	35F1717	Packing Set - outer cylinder, top section, 4" O.D.	1
15	35F1714	Nut - packing, top section, outer	1
16	35F1716	Ring - wiper, upper packing nut	1
17	35F1718	"O" Ring - upper packing nut, 5-1/4" O.D.	1
18	35F1730	Packing Set - plunger to interstage, 3" O.D.	1
19	35F1734	Gland - plunger packing	1
20	35F1736	"O" Ring - plunger gland, 3-1/4" O.D.	1
21	35F1735	Ring - wiper, plunger gland	1
22	35F1729	Ring - wear, plunger to interstage, upper	1
23	35F1715	Cap - interstage, upper	1
24	35F1719	"O" Ring - interstage cap, 4-1/8" O.D.	1
25	35F1720	Washer - backup, interstage cap	1
26	35F1721	Screw - vent, interstage cap	1
27	35F1722	Washer - seal, vent screw	1
	35F1737	Pipe Plug - outer cylinder	1
		*NOTE: Order parts for cylinder giving serial number of mast plus MFI and OAH.	
28	35A8043	Body - restrictor	1
29	35A7913	Spring - oil restrictor	1
30	35A7796	Disc - oil restrictor	1
31	35A7792	Sleeve - oil restrictor	1
32	35A7793	Bar - oil restrictor	1
33		50A4425 - Elbow, connecting, 90°	1
34		50A4428 - Connector, restrictor	1
35	10A16285	"O" Ring - fittings	2

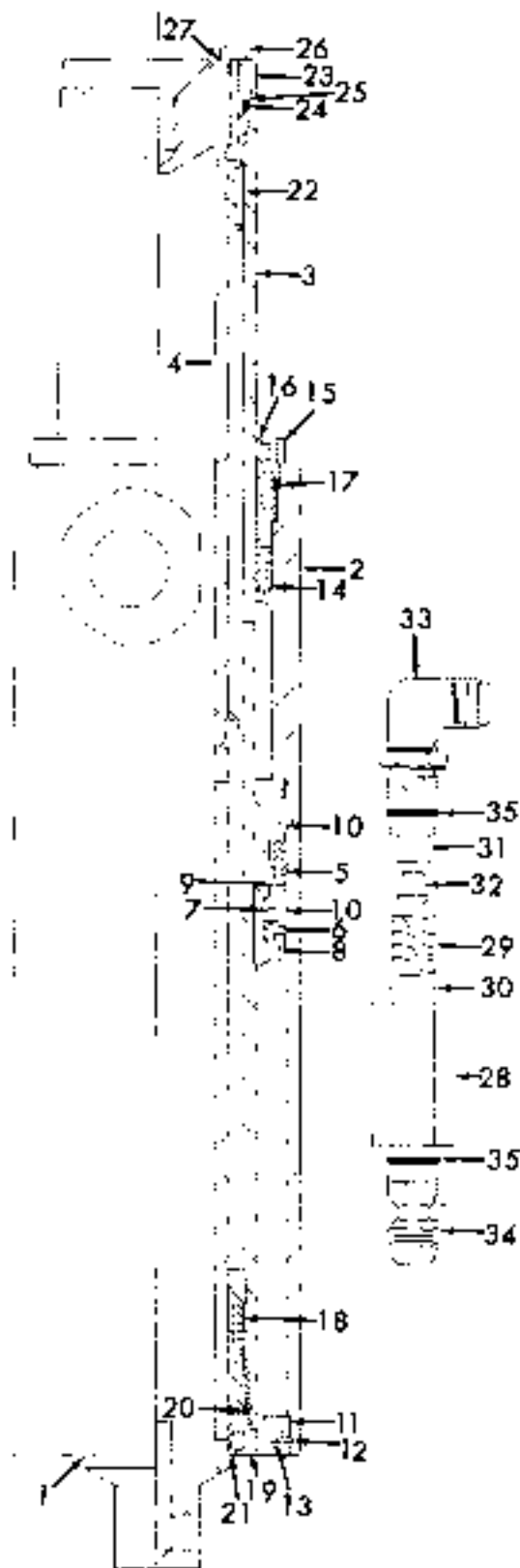


Fig. 44

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
		TRIPLEX MAST - MULTI LIFT (Knickerbocker) - 2500# Group III	
1	-----	Rail - outer assembly	1
		SEA1188 - Bolt, 12 pt., 1/2"-19 x 2-1/2"	4
		GM120384 - Washer, lock, 1/2"	4
2	-----	Rail - center assembly	1
3	-----	Rail - inner assembly	1
4	35P1E12	Pad - wear	36
5	35P1G14	*Cylinder - assembly, see page 86 for breakdown	1
6	35P653	Screw - cylinder	1
7	35P1G17	Spacer - cylinder mounting	1
8	35P1E13	Lock - roller shaft	4
10	35P1G16	Shalt - chain roller, inner	4
11	35P176F	Fitting - grease, 1/4" drive x 45° (Alemite 1828)	4
12	35P667	Washer - bearing	2
13	35P669	Bearing - 3" chain roller	4
14	35P654	Roller - chain, 3" dia.	4
15	35P661	Anchor - chain, turnbuckle and carriage	4
16	35P1824	*Chain - lift, 5/8" pitch No. 81534	4
17	35P1G18	Anchor - chain	4
18		GM219753 - Nut, hex., jam, 3/4"-16	4
19	35P666	Turnbuckle - anchor rod	2
20	35P1815	*Rod - lift	2
		*NOTE: Order pins for lift by serial number of mast plus MCH and OAHL.	
21		GM219753 - Nut, hex., jam, 3/4"-16	2
22	35P1823	Ring - bearing retaining	4
23	35P1G21	Bearing - roller	4
24	35P1G23	Tire - roller	4
25	35P667	Washer - bearing	8
26	35P1823	Race - bearing, inner	4
27	35P1146	Shaft - roller	4
28	35P1145	Support - shaft	3
29	35P1134	Screw - shaft support	4
30	-----	Fitting - grease (Alemite No. 17288)	1
31		GM215524 - Bolt, hex., 3/8"-24 x 1-3/4"	4
32		50A4239 - Washer, shock proof, 5/8"	8
33		50A4205 - Washer, plain, 5/8"	8
34	35P1147	Roller - shaft	4
35	50A4046	Pushing - axle	2
36	50A3301	Pin - tilt	2
		50A3862 - Pin, roll, 1/4" x 2-1/2"	2
		GM191755 - Fitting, grease, 1/8" straight	3
		GM443362 - Plug, pipe, for hydraulic tank, 1/8"-27	1

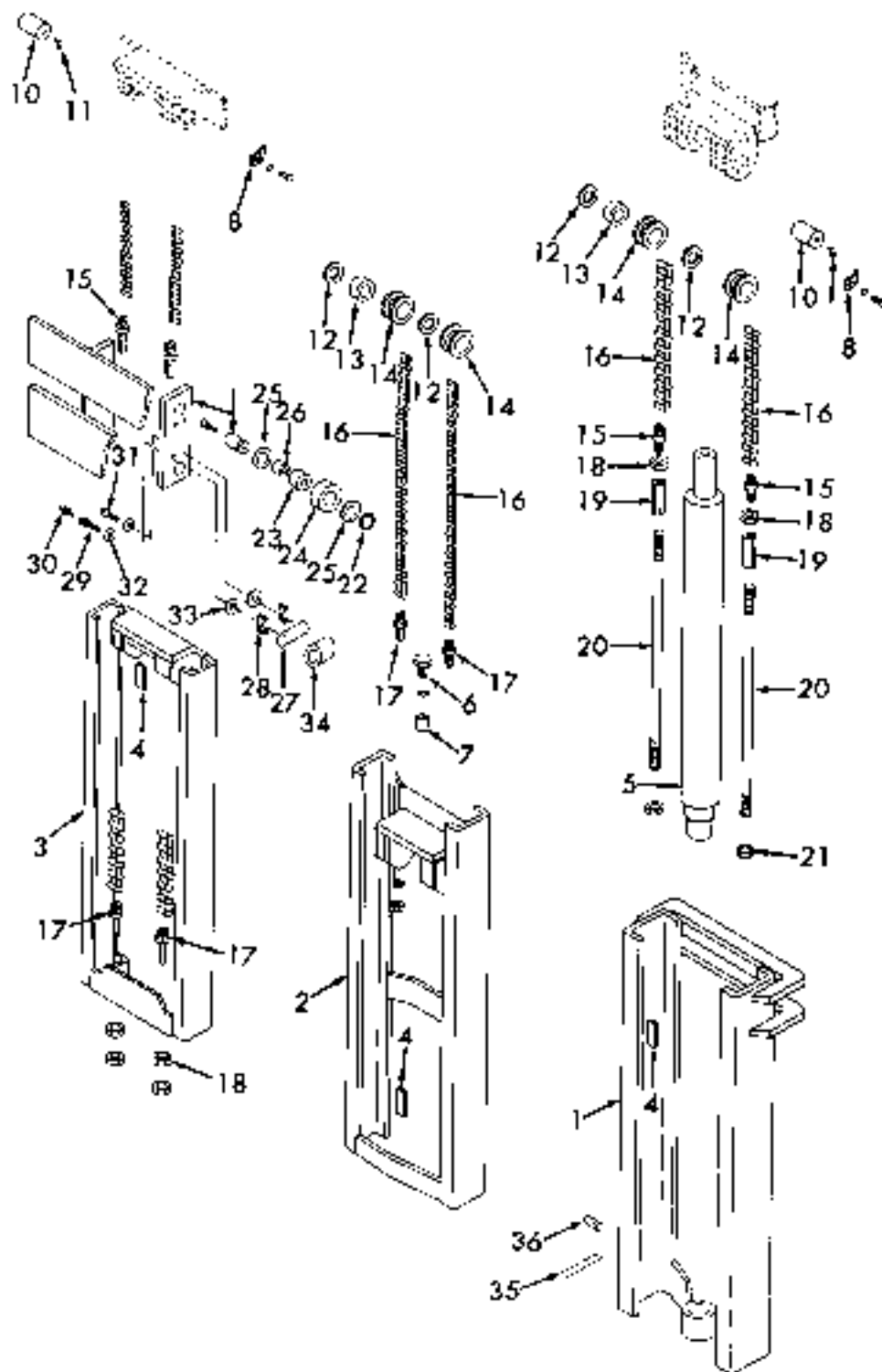


Fig. 45

MSA SERIES LIFT TRUCKS

Ref. No	Part No	DESCRIPTION	No. Pcs
		LIFT CYLINDER - MULTI LIFT (Knickerbocker) - 2500# Group IV	
1	85P1614	*Cylinder - lift, assembly, 3-3/4" O.D., Includes the following 13 parts:	1
2	85P1635	*Cylinder - with base, assembly	1
3	85P1626	*Rod - piston	2
		*NOTE: Order parts by serial number of mast plus MFH and OAH,	
4	85P1684	Snap Ring - piston	1
5	85P1633	**O" Ring - piston, 1" I.D., 1-1/4" O.D.	1
6	85P1631	Piston - cylinder	1
7	85P1632	**Ring - wiper, piston, 3-1/4" O.D.	1
8	85P1627	Head - cylinder	1
9	85P1630	Bushing - head	1
10	85P1636	Ring - retaining, bushing	1
11	85P1629	Ring - retaining, cylinder head	1
12	85P1628	Cap - cylinder head	1
13	85P1634	**O" Ring - cap, 1-7/16" I.D., 1"	1
14	85P1637	**Wiper - cap	1
	85P1638	**Packing Kit - cylinder (includes parts identified with double asterisk),	1
15	85A7907	Fitting - vent	1
16		50A3572 - Clamp, hose, 7/16"	2
17	85A7849	Tube - vent	1
18	85A7834	Hose - vent, for 62" OAH and 125" MFH, 1/4" I.D. x 36"	1
18	85A7850	Hose - vent, for 50" OAH and 135" MFH, 1/4" I.D. x 39"	1
18	85A7851	Hose - vent, for 35" OAH and 144" MFH, 1/4" I.D. x 42"	1
18	85A7852	Hose - vent, for 73" OAH and 153" MFH, 1/4" I.D. x 45"	1
18	85A7853	Hose - vent, for 74" OAH and 162" MFH, 1/4" I.D. x 48"	1
18	85A7854	Hose - vent, for 77" OAH and 171" MFH, 1/4" I.D. x 51"	1
18	85A7855	Hose - vent, for 80" OAH and 180" MFH, 1/4" I.D. x 54"	1
18	85A7856	Hose - vent, for 85" OAH and 189" MFH, 1/4" I.D. x 57"	1
18	85A7857	Hose - vent, for 86" OAH and 198" MFH, 1/4" I.D. x 60"	1
18	85A7859	Hose - vent, for 89" OAH and 207" MFH, 1/4" I.D. x 63"	1
19	85A7970	Strap - vent hose	1
		GM133855 - Screw, rd. hd., 1/4"-20 x 1-1/2"	1
		GM123375 - Nut, hex., 1/4"-20	1
20	85A1464	Spacer - strap	1
21	85A8099	Body - oil restrictor	1
22	85A7913	Spring - oil restrictor	1
23	85A7795	Disc - oil restrictor	1
24	85A7782	Sleeve - oil restrictor	1
25	85A7793	Hat - oil restrictor	1
26		85A4425 - Elbow, 90°	1
27		85A4428 - Connector, body	1
28	10A15255	*O" Ring - fittings	2

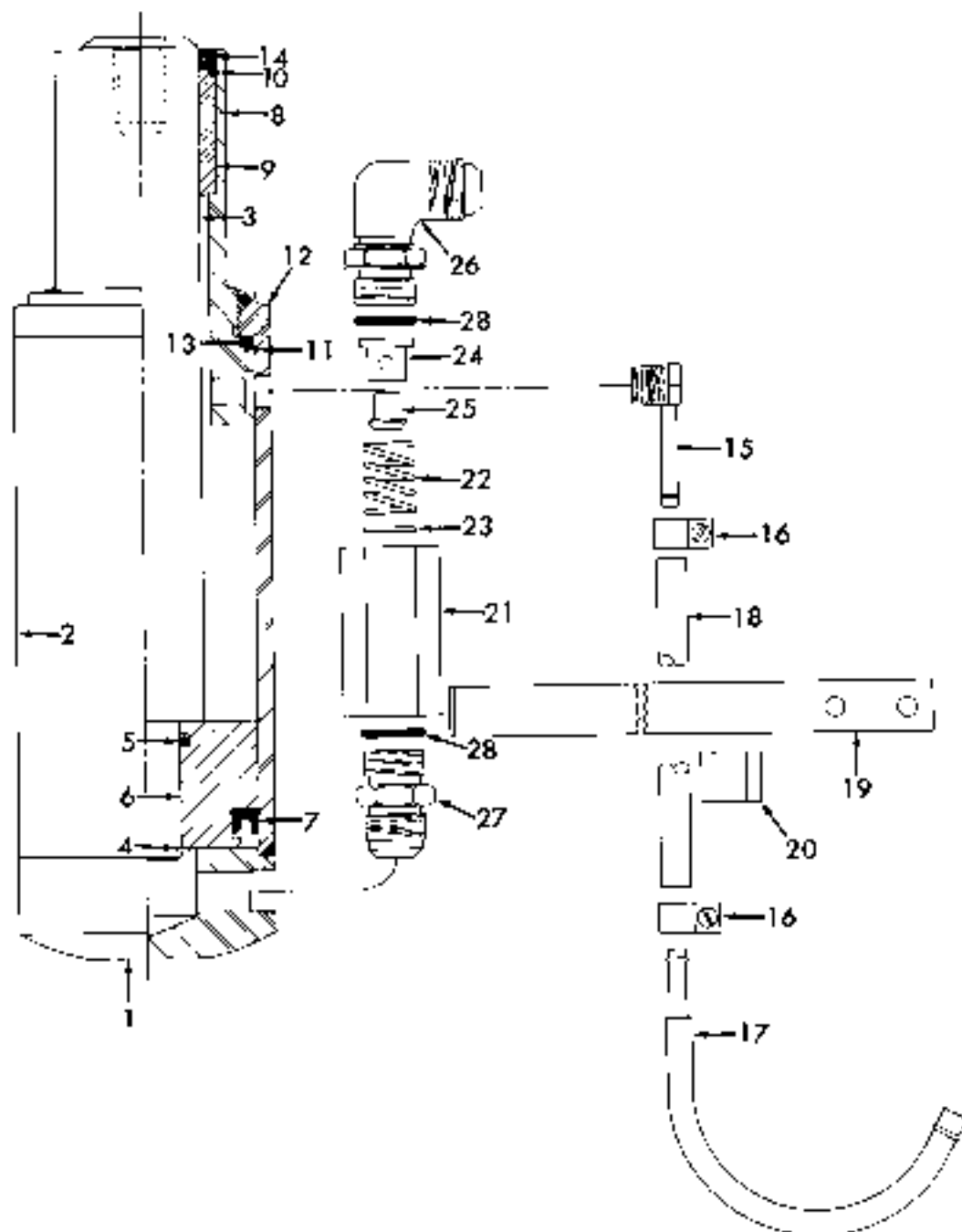


Fig. 48

Ref. No.	Part No.	DESCRIPTION	No. Pcs.	
SHEAVE TAKE-UP - FOR HOSES			Single	Double
1	36A0083	Function Block - hoses	1	2
2	36A0080	Support - assembly, R.H.	-	1
3	36A0081	Support - assembly, L.H.	1	1
4	36A0093	Bracket - support, R.H.	-	1
5	36A0082	Bracket - support, L.H.	1	1
6	10A11140	Snap Ring - support pin	1	2
7	35A0038	Block - guide rod	1	2
8	35B0090	Block - sheave take-up	1	2
		Includes the following part:		
9	35A0085	Pin - sheave, 1" x 3-1/2"	1	2
10	10A11140	Snap Ring - pin	1	2
11	-----	Hose - junction block to elbow, see chart on bottom of page	2	4
12	-----	Hose - elbow to auxiliary valve, see chart on bottom of page	2	4
	35P1640	Hose - 1' of 3/8" I.D., single braid hose	-	-
13		30A2620 - Fitting, hose ends	3	16
14		30A4850 - Elbow, hoses, upper ends, 90°	2	4
15		30A4428 - Elbow, hoses, to valve, 90°	2	4
16	10A16403	"O" Ring - elbow	2	4
17	35A0094	Clamp - hose, mounts to support	1	2
		30A3850 - Bolt, hex., 1/4"-20 x 1-1/2"	1	2
		30A1638 - Nut, hex., 1/4"-20	2	4
18	35A0049	Clamp - hose, mounts to front air cylinder hose	1	2
19	35A0304	Band - hoses, 3/4" I.D. x 1" long	30	60
20	-----	Rod - guide, see chart on bottom of page	-	-
		30A3747 - Nut, hex. jam, 3/4"-10	4	8
21	35B0069	Sheave - block and support, 4-13/16" dia.	2	4
		Includes the following part:		
22	35A0091	Bushing - sheave, 1" I.D. x 2" long	2	4

MPH	OAH1	Guide Rod	Length	Hose Junction Block to Elbow	Hose Elbow to Aux. Valve
106"	71"	30A4837	43-3/4"	75"	72-1/2"
108"	72-1/2"	30A4838	45-1/4"	80-1/2"	74"
112"	74"	30A4840	46-3/4"	82"	75-1/2"
115"	75-1/2"	30A4842	48-1/4"	84-1/2"	77"
118"	77"	30A4844	49-3/4"	85"	78-1/2"
121"	78-1/2"	30A4846	51-1/4"	86-1/2"	80"
124"	80"	30A4848	52-3/4"	88"	81-1/2"
127"	81-1/2"	30A4852	54-1/4"	89-1/2"	83"
130"	83"	30A4839	46"	91"	84-1/2"
133"	84-1/2"	30A4840	46-3/4"	92-1/2"	86"
136"	86"	30A4841	47-1/2"	94"	87-1/2"
139"	87-1/2"	30A4842	48-1/4"	95-1/2"	89"
142"	89"	30A4843	49"	97"	90-1/2"
145"	90-1/2"	30A4844	49-3/4"	98-1/2"	92"
148"	92-1/2"	30A4845	51"	100-1/2"	93-1/2"
151"	94"	30A4847	51-3/4"	102"	95"
154"	95-1/2"	30A4848	52-1/2"	103-1/2"	96-1/2"
157"	97"	30A4850	53-1/4"	105"	98"
160"	98-1/2"	30A4851	54"	106-1/2"	99-1/2"
163"	100-1/2"	30A4853	55-1/4"	108-1/2"	101"
166"	102"	30A4854	56"	110"	102-1/2"
169"	103-1/2"	30A4855	56-3/4"	111-1/2"	104"
172"	105"	30A4856	57-1/2"	113"	105-1/2"
175"	106-1/2"	30A4857	58-1/4"	114-1/2"	107"
178"	108-1/2"	30A4858	60-1/4"	116-1/2"	108-1/2"

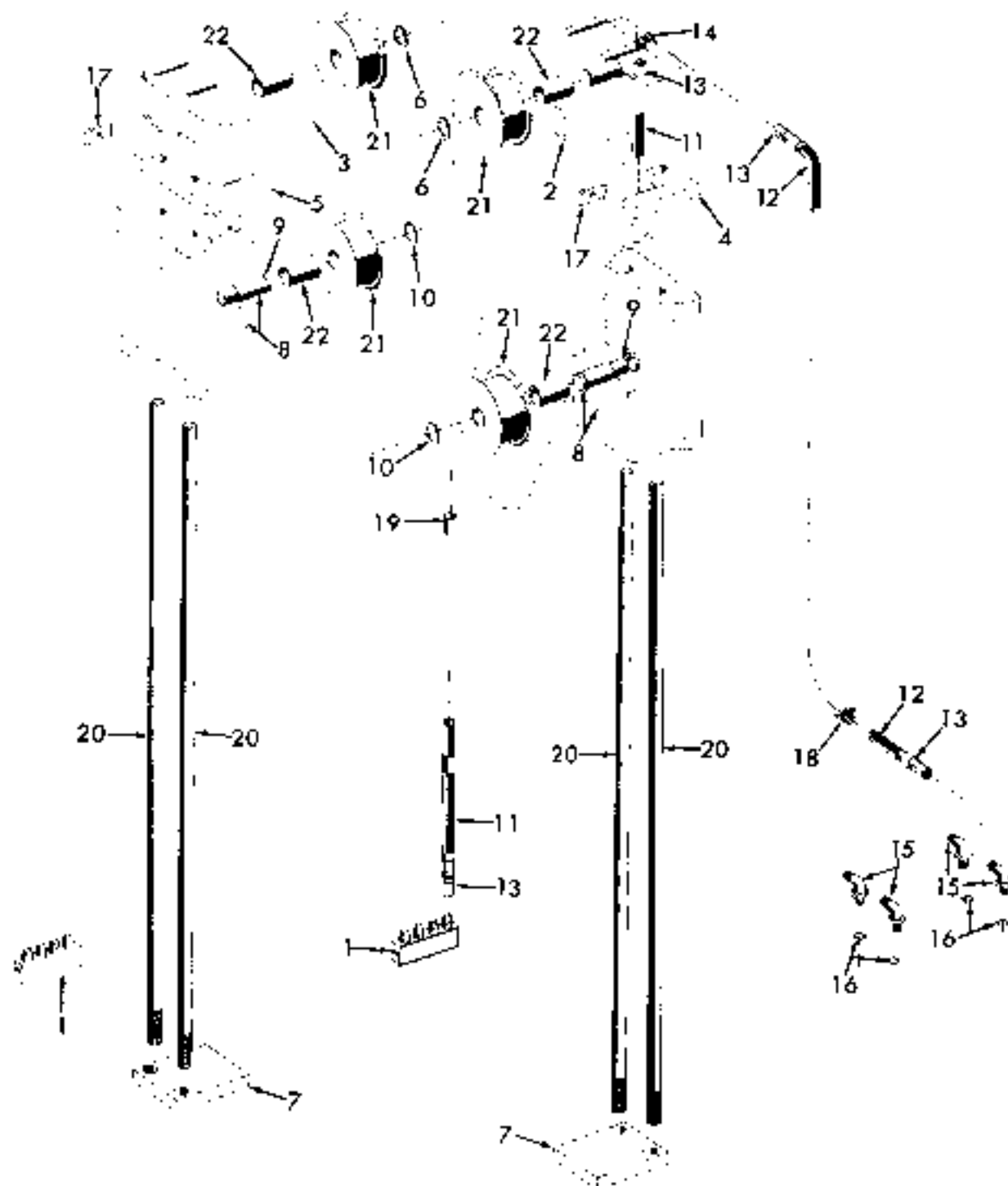


Fig. 47

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.	
		HOSE REELS	Narrow Reel	Wide Reel
1	35A1449	Reel - hose, left hand, 91" thru 207" (Duplex Mast)	1	-
1	35A0889	Reel - hose, left hand, 91" thru 207" (Triplex Mast)	-	1
1	35A3244	Reel - hose, right hand, 91" thru 207" (Duplex Mast)	1	-
1	35A0884	Reel - hose, right hand, 91" thru 207" (Triplex Mast)	-	1
		Each includes the following 21 parts:		
		50A3679 - Bolt, hex., Zinc, 1/2"-13 x 1"	2	2
2	35P1175	Shaft - assembly, reel	1	-
2	35P1176	Shaft - assembly, reel	-	1
3	35P1172	Nipple - shaft, 2"	1	1
4	35P1172	Elbow - nipple, female	1	1
5	35P1174	Elbow - shaft, male end	1	1
6	35P1182	Hub - reel	1	-
6	35P1183	Hub - reel	-	1
7	10A7956	"O" Ring - shaft	3	3
8	35P1031	Ring - back-up, "O" ring	4	4
9	35P1184	Snap Ring - hub	1	1
10	35P1037	Elbow - hub, 45°	2	2
11	35P1155	Elbow - hub, 90°	2	2
12	35P1182	Bar - reel	1	-
12	35P1177	Bar - reel	-	1
13	35P1177	Flange - reel, inner	1	1
14	35P1178	Divider - reel, center ring	1	1
15	35P1181	Flange - reel, outer	1	1
		50A1680 - Nut, hex., 1/4"-20	4	4
		50A1922 - Bolt, hex., 5/16"-18 x 8-1/4"	6	-
		GM187953 - Bolt, hex., 5/16"-18 x 4-1/2"	-	6
		50A3730 - Nut, hex., 5/16"-18	6	6
16	35P1179	Spacer - flanges, 1-5/16" long	11	-
16	35P1180	Spacer - flanges, 1-15/16" long	-	11
17	35P1185	Spring - assembly, with cover, R.H.	1	1
17	35P1186	Spring - assembly, with cover, L.H.	1	1
18	35A1452	Block - junction, hydraulic hoses	1	1
		Includes the following 12 parts:		
		50A3869 - Bolt, hex., 3/8"-16 x 1-1/2"	1	1
		50A4206 - Washer, plain, Zinc, 3/8"	1	1
19	35P1180	Body - block	1	1
20	35P1191	Plunger - body	1	1
21	35P1182	Plug - body	2	2
		GM145645 - Ball, steel, 7/16"	2	2
22	35P1183	Spring - ball	2	2
23	35P1184	Spacer - spring and ball	2	2
24	35P1060	Shaft - block	1	1
25	35P1189	"O" Ring - shaft	3	3
26	35P1188	Ring - back-up, "O" ring	2	2
27	35P1187	Snap Ring - shaft	2	2
28	35P1195	Connector - hose to shaft	2	2
29	10A5319	"O" Ring - connector, 3/8" I.D.	2	2
30	10A5035	"O" Ring - plug body, 12/32" I.D.	2	2
		GM0410076 - Connector, tubes to valve	2	2
	35P1060	Hose - reels, 1-foot of hose, 3/8" I.D., order length as needed for lift	2	2
		50A2620 - Fitting, hose ends	8	8
	10A18405	"O" Ring - fittings to valve	2	2
		50A2417 - Clip, upright, 3/4" wide	2	2
		50A2668 - Bolt, hex., 3/8"-18 x 1"	2	2

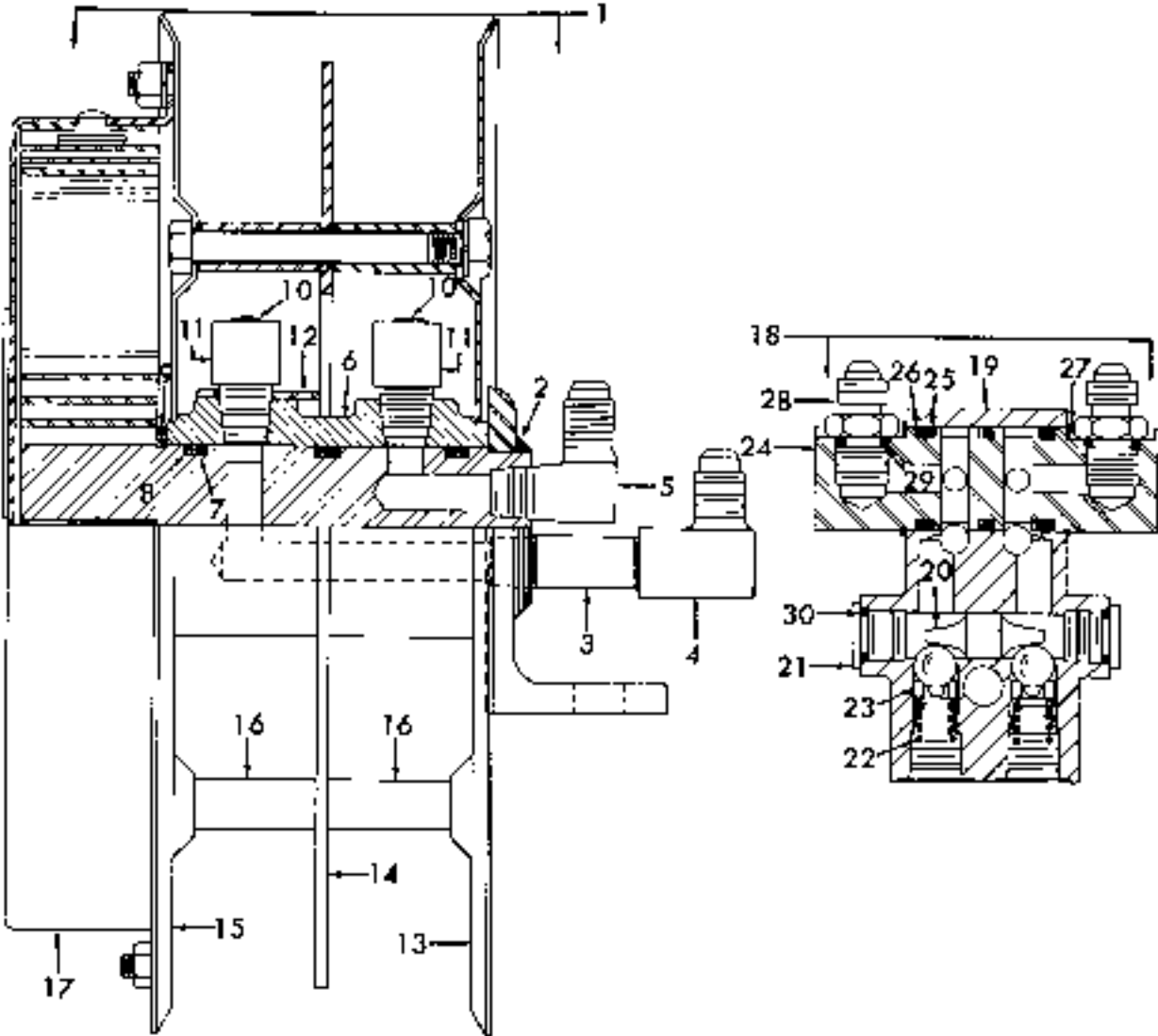


Fig. 18

M5A SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.	
			SINGLE	DOUBLE
		AUXILIARY VALVES		
1	35A6487	Valve - control, complete	1	-
1	35A6498	Valve - control, complete	-	1
		Each includes the following 22 parts:		
		GM180134 - Bolt, hex., 3/8"-16 x 4-1/4"	3	2
		GM120977 - Nut, hex., 3/8"-16	2	3
		GM120998 - Washer, plain, 7/16" I.D., 1" O.D.	2	2
2	15P660	Seal - spool	2	4
3	15P658	Spring - spool centering	1	2
4	15P1932	Washer - stop, centering spring	1	2
5	15P654	Collar - stop, centering spring	1	2
6	15P652	Bolt - stop collar	1	2
7	15P1930	Washer - lock, stop collar bolt	1	2
8	15P655	Disc - stop collar	1	2
9	15P637	Ring - snap, stop disc	1	2
10	15P633	Bonnet - rubber, spool opening	1	2
11	35P215	Plug - ball check	1	1
12	15A6329	"O" Ring - ball check plug	1	1
13	35P219	Plunger - check and relief valve	2	2
	25P4777	Spring - plunger, check valve	1	1
14	35P216	Seat - relief valve	1	1
15	15A12018	"O" Ring - relief valve seat	1	1
16	35P227	Spring - relief	1	1
17	35P222	Guide - relief spring	1	2
18	35P213	Ball - relief guide	1	-
19	15A18489	Washer - spacer, relief spring	1	1
20	15A18490	Slide - relief spring	1	1
21	15A18487	Gasket - relief spring cap	1	1
22	35P220	Cap - relief spring	1	1
23	35P1008	Plug - pipe	1	-
24	35A6154	Bracket - mounting, auxiliary valve	1	1
		GM180122 - Bolt, hex., 3/8"-16 x 1"	2	2
25	35A6163	Brace - bracket	2	2
		GM180124 - Bolt, hex., 3/8"-16 x 1-1/4"	4	4
		GM120977 - Nut, hex., 3/8"-16	6	6
		GM120994 - Washer, plain, 13/32" I.D., 18/16" O.D.	4	4
26	35A6185	Bracket - lever mounting	1	-
28	35A6390	Bracket - lever mounting	-	-
		GM180322 - Bolt, hex., 1/4"-20 x 1"	4	4
		GM120375 - Nut, hex., 1/4"-20	4	4
27	35A7780	Spring - bracket	-	2
28	35A6309	Stop Washer - bolt	-	4
29	35A6617	Lever - control, nut threaded (35A6156)	1	-
30	35A6615	Lever - control, nut threaded (35A6092)	-	1
31	35A4119	Knob - lever, for 35A6156 and 35A6092 levers	1	-
31	35A6354	Label - knob, for 35A4119 knob	1	1
	35A6295	Knob - lever, solid, for 35A6617 and 35A6092 levers	1	2
		35A4887 - Insert - knob	1	2
32	35A6095	Bar - pivot	-	1
32A		35A2817 - Pin, roll, 3/8" x 2"	-	1
33	35A6094	Red Crank - lever	-	2
34	35A6096	Shaft - lever	1	1
35	35A6097	Lock Pin - shaft	1	1
		35A1927 - Snap Ring, shaft	1	1
36	35A6184	Link - assembly, control lever to valve	1	2
37	15A12319	Rivet - link, drilled, 1/4" x 1-1/2"	1	2
		GM120333 - Washer, plain, 11/32" I.D., 11/16" O.D.	1	2
38		GM147387 - Clevis, short, 5/16"-24	1	2
		GM194920 - Nut, hex. jam, 5/16"-24	1	2
39		GM123630 - Pin, clevis, 5/16"	1	2
		GM103373 - Pin, cotter, 3/32" x 3/4"	2	4
		GM124820 - Nut, hex. jam, 3/8"-16	-	1

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Per	
AUXILIARY VALVES (Cont'd)			Single	Double
40	85A8120	Sleeve - power adapter, 7/16"-14 x 1-3/8"	1	1
41	85A8117	Gasket - sleeve	1	1
42		50A1868 - Quad Ring, sleeve	1	1
43	15A15005	Nipple - valves, 3/4" x 2-1/2"	1	1
44	85A9119	Elbow - valve outlet, 3/4"	1	1
45		GM9413978 - Elbow, Inlet, 7/8"-14 IIC x 90°	2	2
46	10A18263	"O" Ring - elbow	2	2
47	35A7090	Nipple - outlet, auxiliary valve, 3/4" x 3-1/2"	1	-
47	10A18300	Nipple - outlet, auxiliary valve, 3/4" x 1-1/4"	-	1
48	35A7388	Elbow - valve, 3/4" x 45°	1	1
49	15A12216	Nipple - rod, 3/4" x 2"	2	2
50	35A7384	Hose - return, auxiliary valve to tank, 1" I.D. x 29"	1	1
		GM111614 - Clamp, hose, 1-1/2"	2	2
51	35A6738	Hose - control valve to auxiliary valve, 1/2" I.D. x 48"	1	1

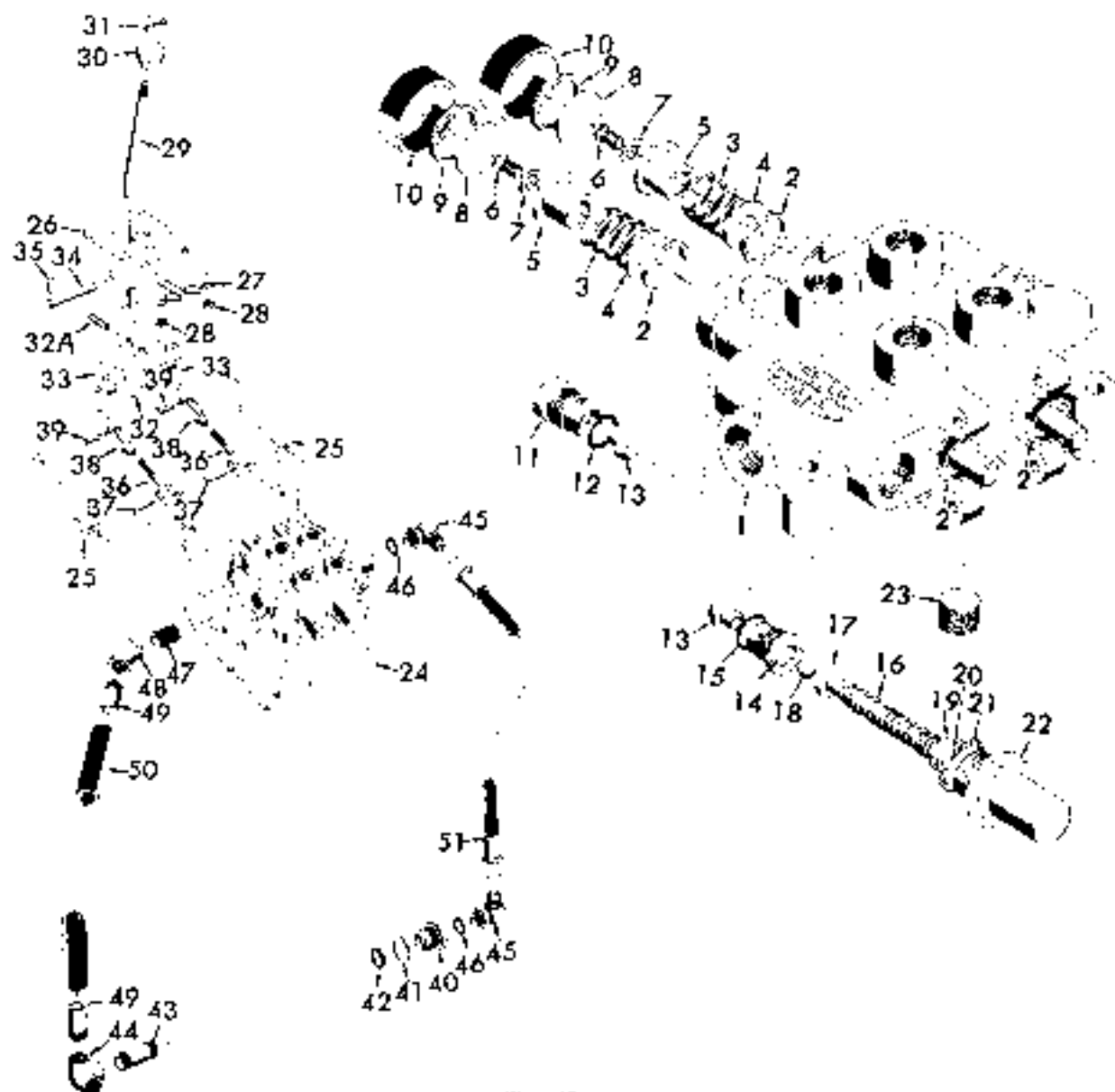


Fig. 48

MSA SERIES LIFT TRUCKS

Ref. No.	Part No.	DESCRIPTION	No. Pcs.
		DIAL LEVER CONTROL - LIFT AND TILT	
1	36A8279	Plate - lever mounting	1
2	36A8280	Lever - lift, R.H.	1
3	36A8281	Lever - tilt, L.H.	1
4	36A8293	Knob - lift lever	1
5	36A8294	Knob - tilt lever	1
6		30A4587 - Insert, knob	2
7	36A8275	Shaft - levers	2
8		30A1827 - Snap Ring, shaft	4
9	36A8282	Link - connecting, lift rod	1
10	36A8283	Link - connecting, tilt rod	1
11	15A12313	Rivet - connecting link, clevis, 1/4" x 1-1/2"	2
		GM120892 - Washer, plain, 1-1/32" I.D., 1-1/16" O.D.	2
		GM103373 - Pin, cotter, 3/32" x 3/4"	2
12		GM174897 - Clevis, shrn, 5/16"-24	2
		GM124920 - Nut, hex, jam, 5/16"-24	2
13		GM120690 - Pin, clevis, 5/16" x 3/8"	2
		GM100273 - Pin, cotter, 3/32" x 5/4"	2
14	36A8274	Bracket - detent, lifting lever	1
		30A3656 - Bolt, hex., 5/16"-14 x 1"	2
		30A3730 - Nut, hex., 5/16"-14	2
		30A4221 - Washer, plain, 3/8" I.D., 7/8" O.D.	2
15	36A8264	Spring - detent	1
16		30A5032 - Ball, detent spring, 11/32" Dia.	1
17		30A4790 - Screw, hex, socket, lock type, 3/8"-16 x 1/2"	1
18		30A3742 - Nut, hex, jam, 3/8"-16	1

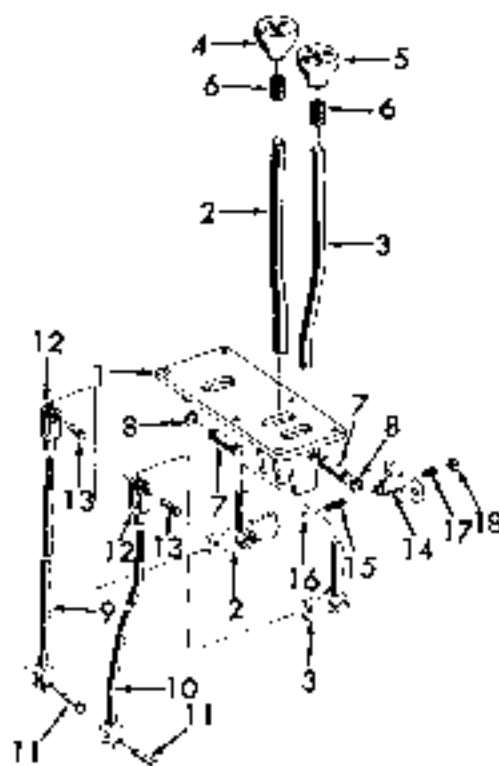


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