

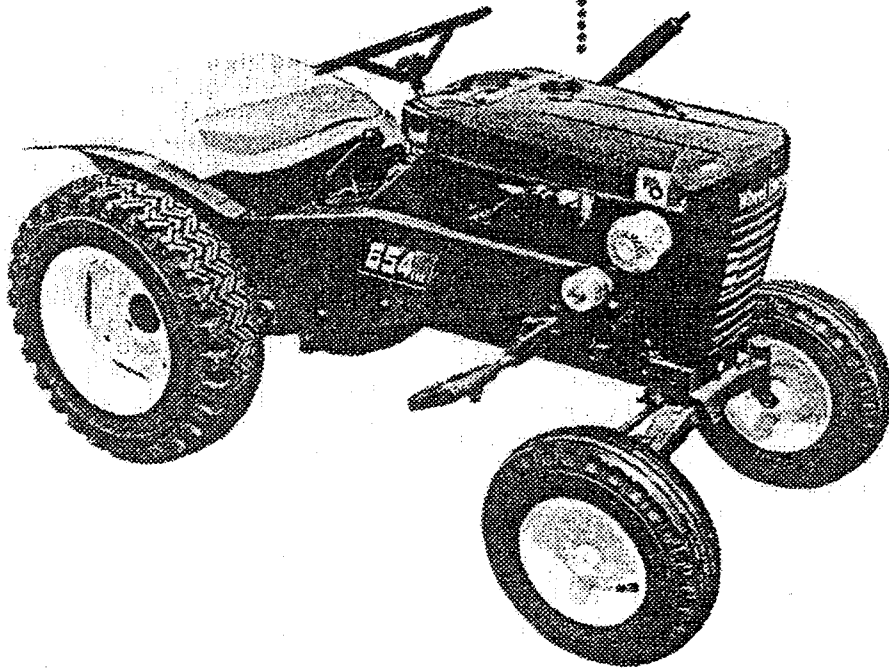
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Wheel Horse

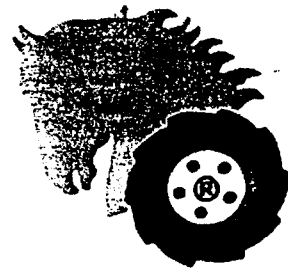
LAWN AND GARDEN TRACTORS

models

604, 654, 704



**OPERATION AND
SERVICE MANUAL
WITH PARTS LIST**



WHEEL-HORSE PRODUCTS, INC.

SOUTH BEND, IND.

THINGS YOU SHOULD KNOW

The transmission is powered on needle bearings and roller bearings. The reduction is 108 to 1, and both final drives are steel forgings. All shafts are turned, ground, hardened, and polished for greater strength and best oil sealing.

Speeds are from 1 mph to 6 mph with 3 speeds forward and 1 reverse.

WARRANTY

We warrant WHEEL HORSE PRODUCTS for ONE YEAR from date of purchase against defective parts and workmanship. We will replace, free of charge, any defective part if returned to the factory PREPAID*. Wheel Horse Products, Inc., reserves the right to make changes or improvements upon its products without imposing any obligations upon itself to install the same upon its products that have been previously manufactured.

The engine and battery carry a separate warranty by the manufacturer. FOR ENGINE OR BATTERY SERVICE, CONTACT YOUR LOCAL ENGINE OR BATTERY SERVICE HEADQUARTERS.

*All warranty claims, work, shipments, must be handled through your authorized Wheel Horse dealer.

NOTE: 90 Day Warranty for Commercial Use.

BEFORE YOU START

There is **NO OIL** in the crankcase of the engine when shipped from the factory. Read Engine Manual and follow all instructions pertaining to type of lubrication specified. The engine is the heart of your tractor and it is very important that you keep it in good condition.

Lubricate all grease fittings with a regular pressure gun lubricant every eight to ten hours of operation. Refer to Figure 1 for the location of grease fittings.

A light machine oil should be used on all moving parts to keep joints from wearing and squeaking.

Remove oil filler plug, located at the left rear side of the transmission, and fill to level of hole with a good grade of S.A.E. 40 Gear Lube (will require about 3 pints).

The transmission should be checked after every 40 hours of use. The transmission should be drained once a year by removing plug on bottom to drain oil. Refill as above paragraph. This is a regular automotive type transmission with sliding gears and should have the same care as your car.

BATTERY

The battery installed in the 654 tractor is a dry charged battery. It is important that you properly prepare this battery to insure good service and long life.

1. Remove vent caps. Remove or destroy any sealing device which may have been used to close or restrict the vent openings.

2. Fill each cell of the battery to the proper level with the battery electrolyte.

NOTE: Temperature of battery and electrolyte at time of filling should be above 60°F. Never fill battery in the vehicle.

3. **BOOST CHARGE:** 15 amps. for 10 minutes or 7 amps. for 30 minutes. Adjust electrolyte level, if necessary, after charge.

4. Install battery with battery posts toward the rear of tractor. Start motor. Check to see if generator is charging properly. After battery has been in service, add only approved water.

DO NOT ADD ACID.

TIRES

The front tires are 4:00 x 8 and should be inflated to 20 pounds of air pressure. The rear tires are 6:00 x 12 and should have 6 to 8 pounds of air pressure. The tires can also be filled with bal-last if desired. Ordinarily this is not necessary as the weight of the operator will add sufficient weight for adequate traction.

STARTING ENGINE

1. Before starting the engine fill gas tank with a good grade of regular gas and open valve on sediment bowl.

2. Place gear shift lever in neutral position.

3. Pull throttle lever $\frac{1}{2}$ way out and turn to the right to lock it in position. Note: The Throttle control has a locking device. Turn the throttle control to the left to unlock, adjust to the desired position and turn to the right to lock.

4. Pull choke lever all the way out to choke engine. If engine is warm and has been running, choking will not be necessary.

5. A. Model 604 and 704 tractors have a recoil starter with an OFF and ON switch. To start push switch to ON position and pull recoil starter.

B. Model 654 tractor has an OFF and ON key, also a starter button. Turn key to ON position and push starter button.

6. When engine starts push choke in to off position and regulate throttle control by turning to the left to unlock and push in or out to desired speed.

7. Depress clutch pedal on left side of tractor before selecting desired gear range.

8. When starting tractor in winter it is desirable to depress clutch so engine does not have to turn transmission.

CLUTCHING

Don't force the gear shift lever if the gears do not immediately mesh. Depress clutch pedal all the way down and let up, then depress again and shift. To avoid sudden starts, release clutch pedal slowly. While in motion do not shift gears without depressing clutch pedal.

The clutch pedal also operates the brakes WHEN DEPRESSED ALL THE WAY DOWN. For this reason, you should depress the clutch-brake pedal ONLY $\frac{3}{4}$ OF THE WAY DOWN WHEN SHIFTING while in motion. This clutch-brake pedal combination makes clutching automatic as you apply the brakes to stop.

PARKING BRAKE

The parking brake is located on the left side of the tractor as shown in Figure 1. To set the parking brake depress the clutch-brake pedal as far as possible and push the parking brake forward. To release the brake depress the clutch-brake pedal and pull the parking brake back.

ATTACHING TOOLS

Complete information on the assembly, attachment, operation and service of the many attaching tools will be provided with each attachment.

All drawn implements attach in seconds. Simply lift the tractor hitch pin, insert the tongue, and replace pin.

All power implements will use the attachment clutch pedal located on the right side of the tractor.

CARE OF TRACTOR

1. Keep tractor greased and oiled regularly. Refer to Figure 1 for the location of grease fittings. Check transmission and engine case oil levels.
2. Keep engine air cleaner clean. This will add to engine life.
3. Keep tires properly inflated. See previous instructions.
4. Keep tractor covered and in a dry place when not in use.
5. Keep grass and dirt out of engine cowling as these will stop the flow of air and decrease engine life.

6. **BRAKE ADJUSTMENT.** The brake band, located on the left side of the transmission, brakes the transmission and in turn stops the wheels.

To adjust first set the parking brake then adjust the nut on the brake rod until it locks the rear wheels. Disengage parking brake, remove cotter

pin from clutch rod at clutch brake pedal and by turning in or out adjust clutch brake pedal to operators desired position.

7. When replacing belts or mounting drive implements make sure all pulleys are in line.

8. On the 654 tractor which has a battery, check liquid after every 40 hours of use. If tractor has been in storage it may be necessary to recharge.

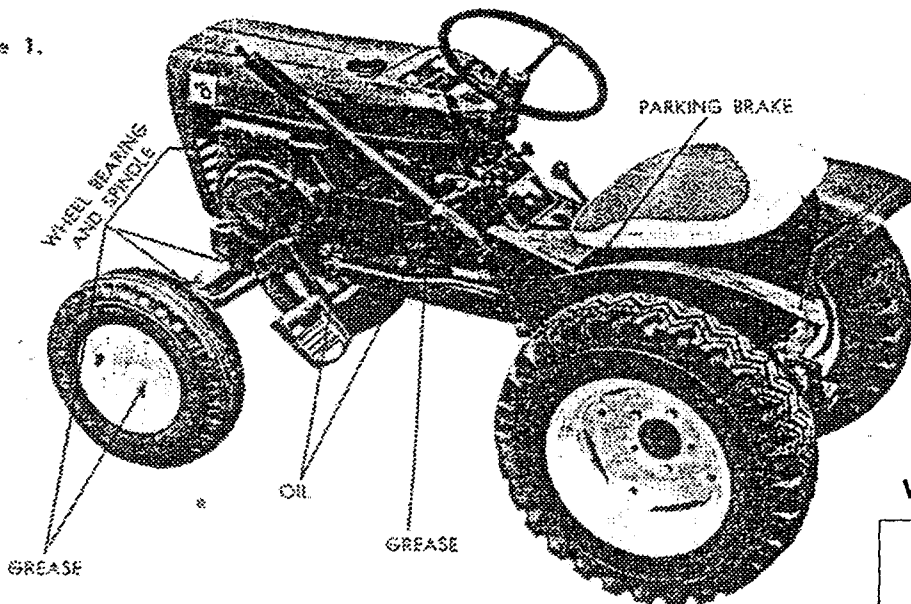
9. Your tractor is only as good as the service you give it. See your Wheel Horse Dealer for a through check-up after each season of use.

10. When replacing belts be sure to purchase them from your Wheel Horse Dealer, as these belts are specifically designed for each application. (NOTE: Make sure all pulleys are in line.)

FOR YOUR SAFETY

- A. Keep all guards on at all times.
- B. Never abuse your tractor by improper handling.
- C. Keep hands and feet from moving parts.
- D. Remove key when not in use.
- E. Be careful on high uneven ground.

Figure 1.

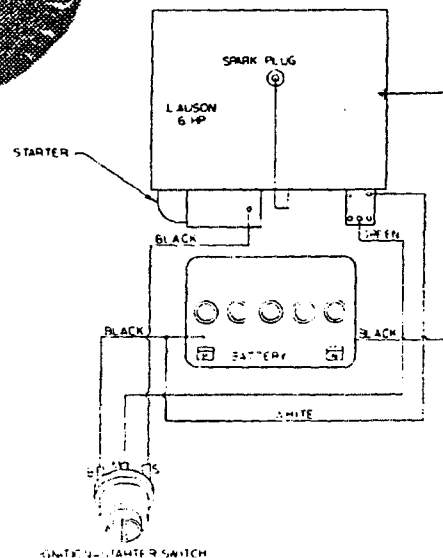


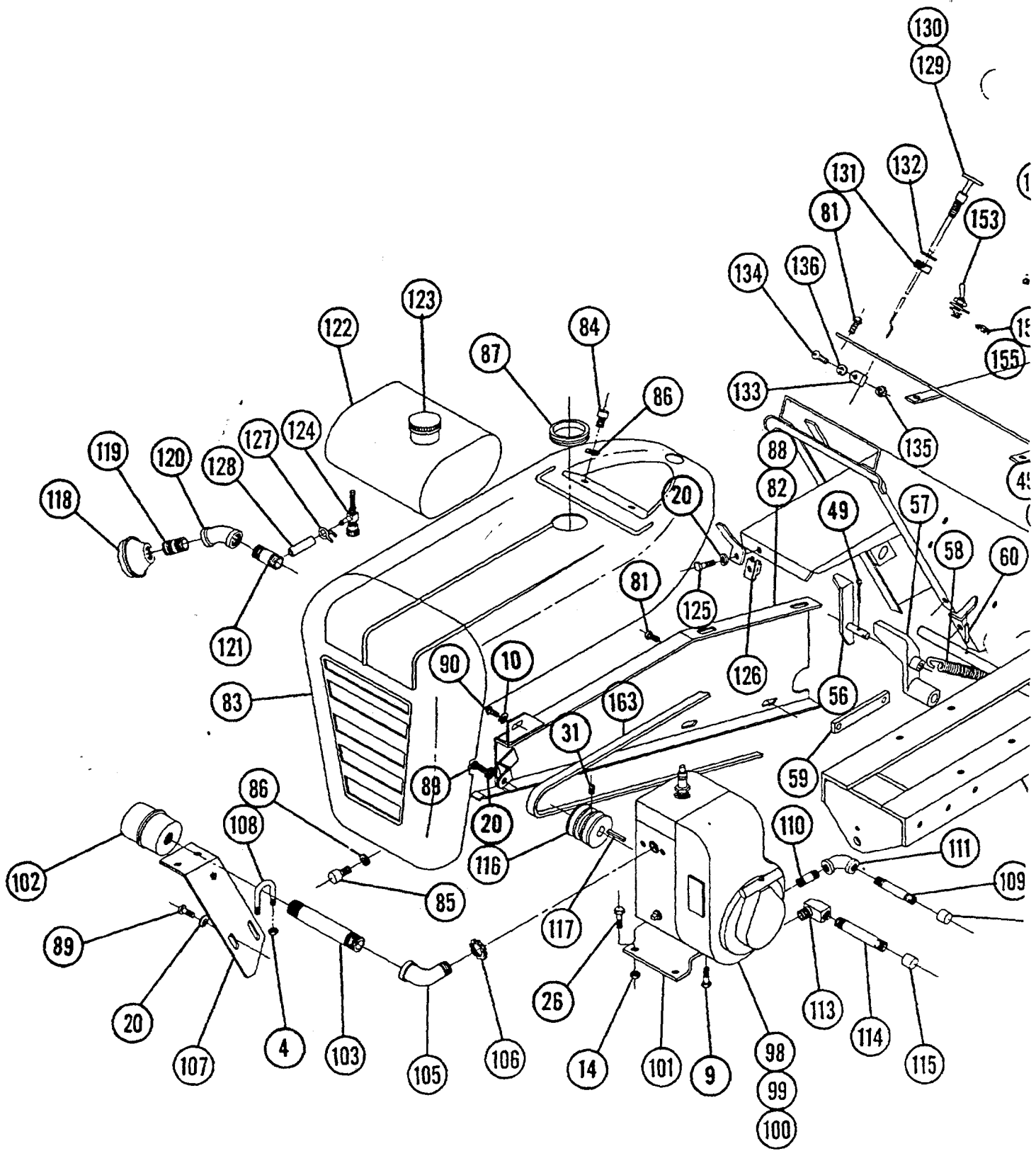
SPECIFICATIONS

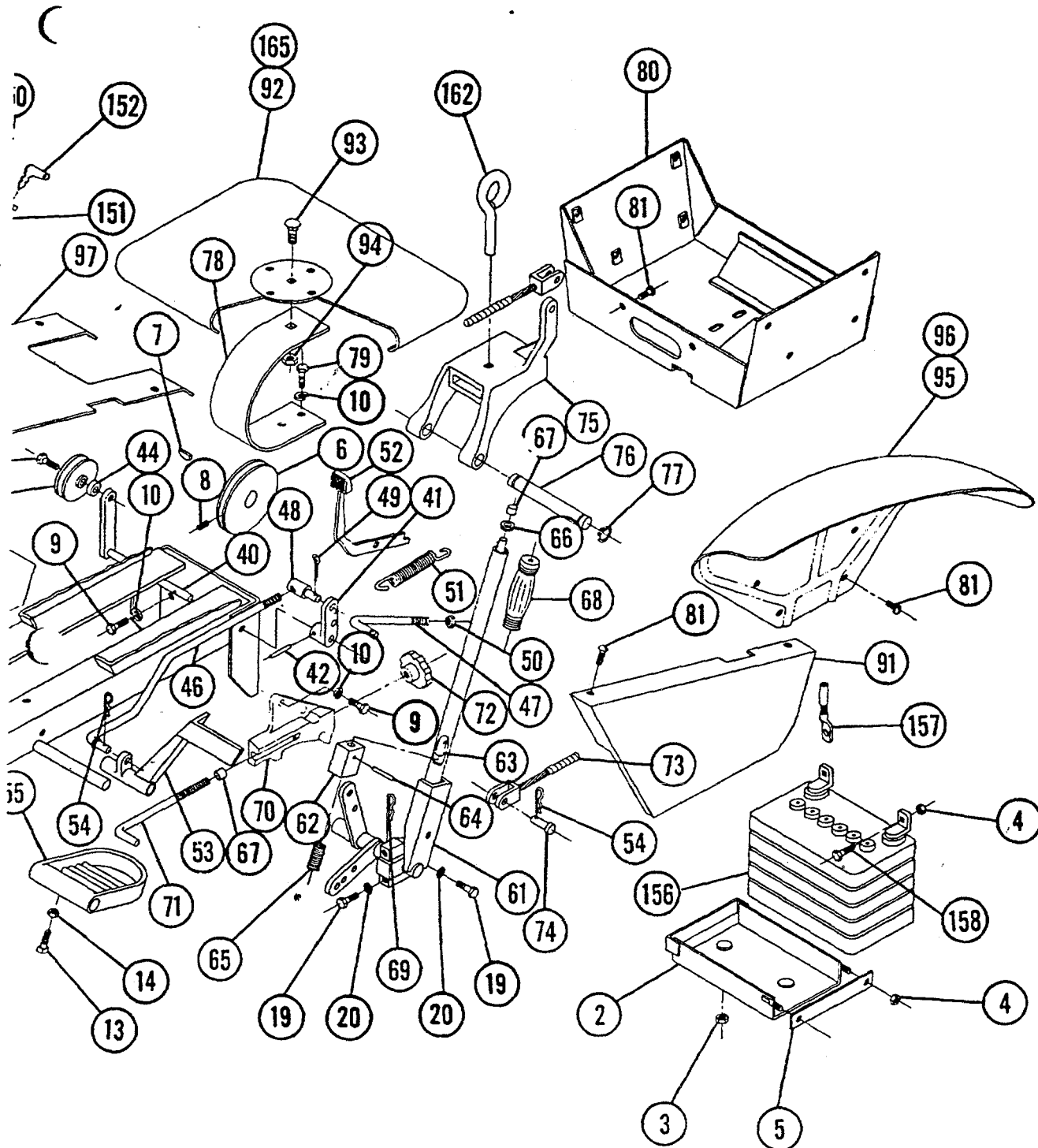
(Specifications subject to change without notice.)

- Length overall 60 inches
- Wheelbase 41½ inches
- Width at rear wheels 30 inches
- Width at front wheels 31¼ inches
- Height 37 inches
- Height to top of hood 32 inches
- Approx. weight:
 - (604) 345 lbs. — (654) 440 lbs. — (704) 395 lbs.
- Crop clearance 7¼ inches
- Frame clearance 13½ inches
- Engine (4-cycle, single cylinder, air cooled) 6 or 7 hp.
- Fuel capacity 4 quarts
- Tires (front) ... 4:00 x 8" pneumatic (16" wheel dia.)
- Tires (rear) Cleat-type or All Purpose tread
 - 6:00 x 12" pneumatic (22" wheel dia.)
- Speeds: 3 forward to 6 mph.; 1 reverse to 2½ mph.
- Turning radius (to outside of outside wheel) 6¼'

Wiring for 654

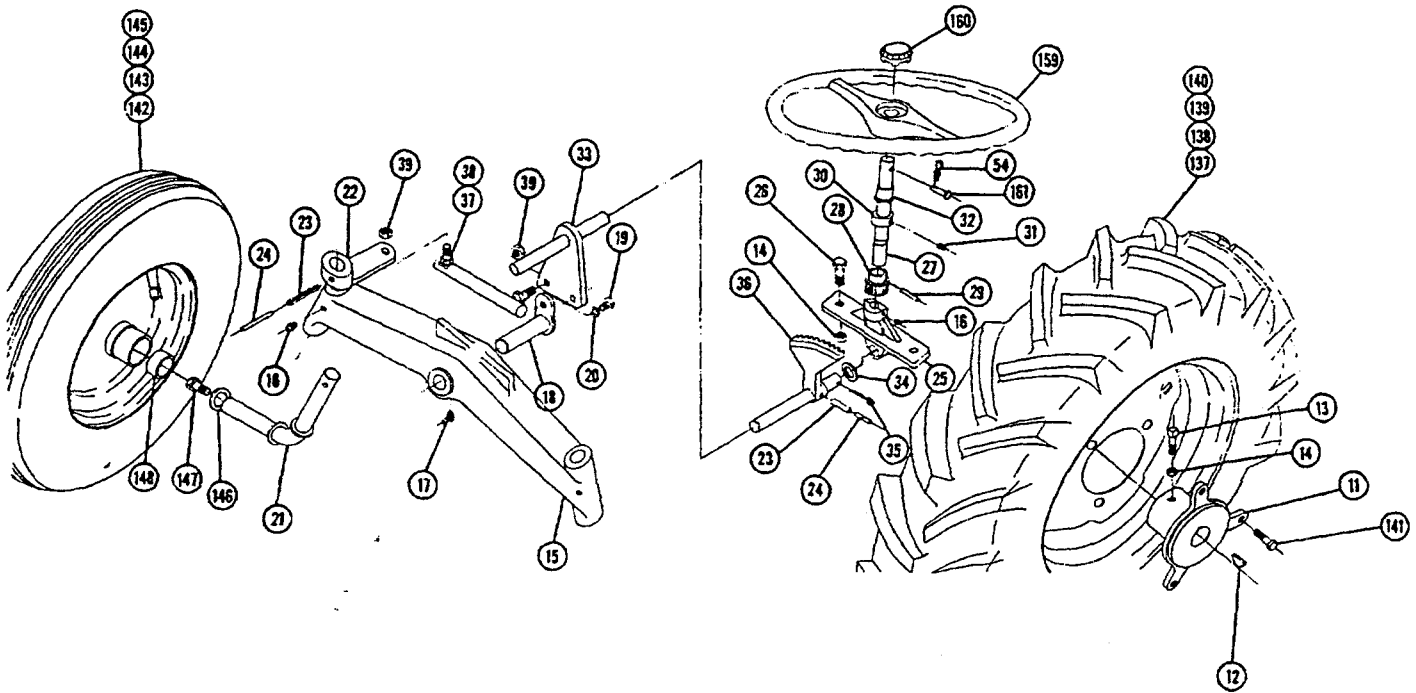






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e Ass'y.



Steering Ass'y. and Rear Wheel Ass'y.

PARTS LIST for MODELS 604, 654 and 704 LAWN and GARDEN TRACTORS

(Except Transmission — see last page for Transmission break down and Parts List.)

When ordering parts always list Part No. and name of part.

Ref. No.	Part No.	Description	No. Req'd.
1	4945	Ass'y. Frame	1
2	4953	Ass'y. Battery Box	1
3	915112-6	Nut — Nylock $\frac{3}{8}$ -18	2
4	915111-6	Nut Nylock $\frac{1}{4}$ -20	6
5	4958	Clamp — Battery	1
6	1611	Pulley	1
7	937014	Key #9 Woodruff	1
8	909849-6	Set Screw $\frac{1}{4}$ -20 x $\frac{3}{8}$ Nylock	1
9	908032-4	Bolt — Hex $\frac{3}{8}$ -16 x $\frac{3}{4}$	10
10	920083-4	Lockwasher $\frac{3}{8}$ Dia.	9
11	3574	Hub — Wheel	2
12	937022	Key #15 Woodruff	2
13	909554-4	Set Screw Sq. Hd. $\frac{3}{8}$ -16 x 1	4
14	915113-6	Nut Nylock $\frac{3}{8}$ -16	10
15	1649	Axle — Front	1
16	1030	Fitting — Grease	5
17	1481	Fitting — Grease 45°	1
18	2294	Ass'y. Pin & Plate	1
19	908015-4	Bolt — Hex $\frac{3}{8}$ -18 x $\frac{1}{2}$	4
20	920082-4	Lockwasher $\frac{3}{8}$ Dia.	8
21	1898	Ass'y. Spindle	2
22	1899	Arm — Steering	2
23	933216	Roll — Pin $\frac{1}{4}$ x $1\frac{1}{8}$	3
24	933174	Roll — Pin $\frac{3}{32}$ x $1\frac{1}{8}$	3
25	4412	Support — Steering	1

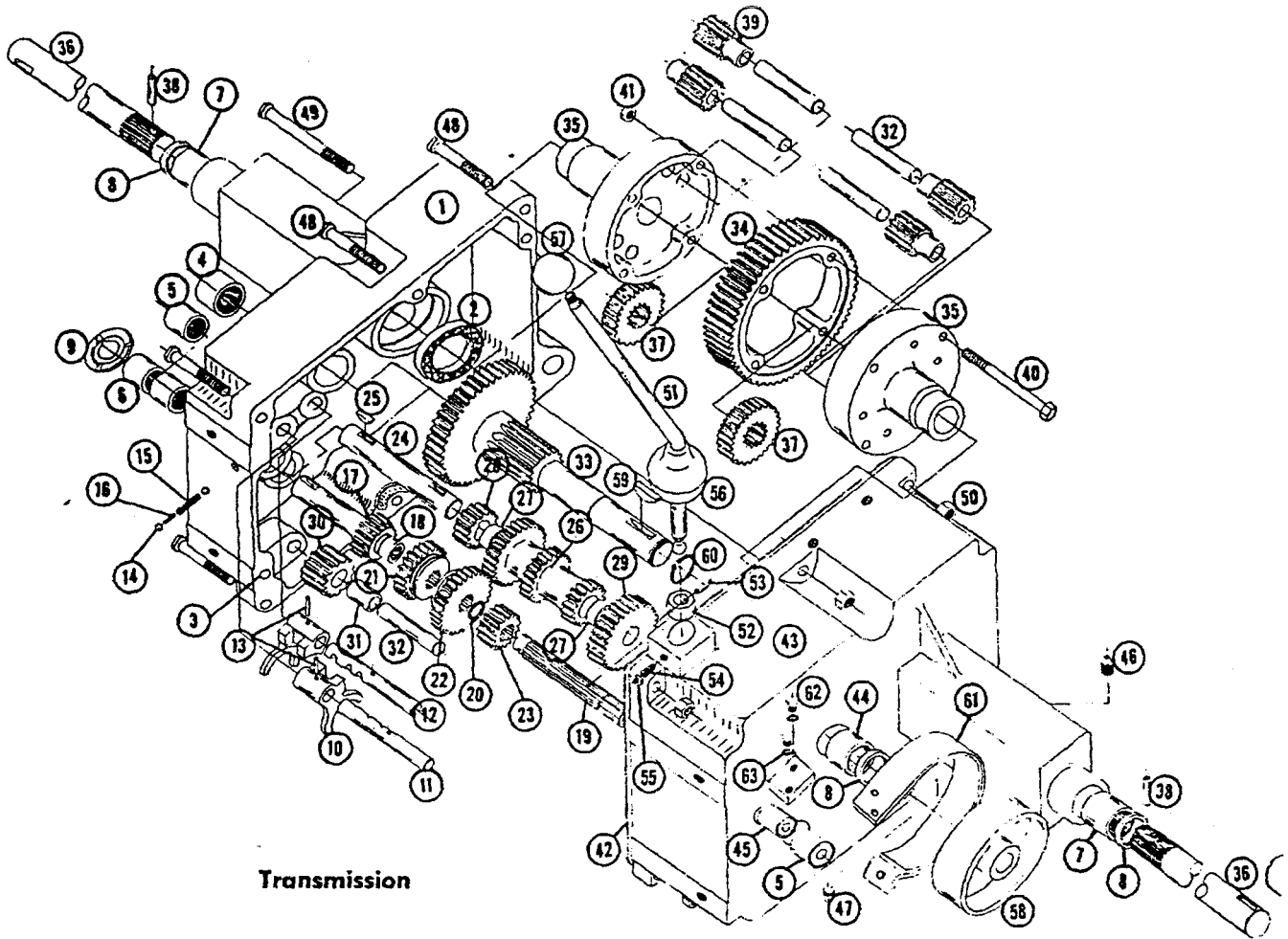
Ref. No.	Part No.	Description	No. Req'd.
26	908035-4	Bolt — Hex $\frac{3}{8}$ -16 x $1\frac{1}{4}$	6
27	4971	Shaft — Steering Upper	1
28	3917	Gear — Steering Pinion	1
29	933215	Roll — Pin $\frac{1}{4}$ x $1\frac{1}{4}$	1
30	1085	Collar	1
31	909848-6	Set Screw $\frac{1}{4}$ -20 x $\frac{1}{4}$ Nylock	2
32	1539	Bushing — Nylon	1
33	4959	Ass'y. Steering Shaft — Lower	1
34	1278	Washer — Shim	2
35	932034-4	Cotter Pin $\frac{3}{8}$ Dia. x 1	1
36	4413	Sector — Steering	1
37	1772	Ass'y. Ball Joint R.H.	1
38	1773	Ass'y. Ball Joint L.H.	1
39	915002-6	Nut — Nylock $\frac{3}{8}$ -24	4
40	3950	Ass'y. Idler Arm & Shaft	1
41	4899	Arm — Clutch Rod Pivot	1
42	933158	Roll Pin $\frac{1}{8}$ x $1\frac{1}{4}$	1
43	1623	Pulley — Idler	1
44	1536	Bushing	1
45	1363	Bolt — Hex $\frac{1}{8}$ -16 x $\frac{1}{8}$ Special	1
46	2593	Rod — Clutch	1
47	3935	Rod — Brake	1
48	5162	Stud — Clutch Rod	1
49	932017-4	Cotter Pin $\frac{1}{8}$ x 1	5
50	915605-4	Nut $\frac{3}{8}$ -16 Elastic Stop	1

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When ordering parts always list Part No. and name of part.

Ref. No.	Part No.	Description	No. Req'd.	Ref. No.	Part No.	Description	No. Req'd.
51	1129	Spring — Clutch	1	111	4216	Elbow — ¼ Pipe x 90° (604-654)	1
52	4417	Ass'y. Lever & Knob — Brake	1	112	4217	Cap ¼ Pipe (604-654)	1
53	2267	Pedal — Clutch	1	113	5222	Elbow — 90° Special (704)	1
54	S-52-3	Hairpin — Cotter	4	114	5223	Nipple ¾ Pipe x 4 — Special (704)	1
55	4421	Footrest	2	115	5224	Cap — ¾ Pipe (704)	1
56	4246	Ass'y. Trip Lever (654-704)	1	116	1621	Pulley — Engine	1
57	4239	Pedal — Attach. Clutch (654-704)	1	117	1349	Key ¼ x ¼ x 1½	1
58	1014	Spring (654-704)	1	118	1744	Muffler (704)	1
59	3933	Link (654-704)	1	119	3947	Nipple 1" Close Pipe (704)	1
60	933188	Roll Pin ¾ x 1 (654-704)	1	120	3939	Elbow 1" x 45° (704)	1
61	2266	Ass'y. Lift Lever	1	121	943366-4	Nipple 1" Pipe x 2" (704)	1
62	4438	Plunger	1	122	2676	Ass'y. Fuel Tank	1
63	4439	Rod	1	123	5186	Cap — Fuel Tank	1
64	933168	Roll Pin ½ x ¾	1	124	4941	Valve — Fuel Shut Off & Filter	1
65	3624	Spring	1	125	908019-4	Bolt — Hex ¾-18 x 1	1
66	3578	Guide — Rod	1	126	4897	Speed Nut ¾-18	1
67	3680	Cap	2	127	950141-4	Clamp ¾ Dia. Corbin (704)	1
68	1000	Grip — Handle	1	128	1796	Fuel Line (704)	1
69	S-52-6	Hairpin — Cotter	1	129	5171	Ass'y. Control — Throttle	1
70	2274	Quadrant	1	130	5170	Ass'y. Control — Choke	1
71	2179	Rod — Height Control	1	131	1364	Nut — Round ¾-18	2
72	2196	Knob — Height Control	1	132	920127-4	Lockwasher ¾ Dia. (Ext. Tooth)	2
73	3931	Ass'y. Cable — Lift	1	133	2879	Clip (704)	2
74	932120-4	Clevis ½ Dia.	2	134	909000-4	Bolt — Rd. Hd. #8-32 x ½ (704)	2
75	3926	Hitch	1	135	915562-4	Nut — Hex #8-32 (704)	2
76	3988	Pin — Hitch Shaft	1	136	920078-4	Lockwasher #8 (704)	2
77	S-50-75	Snap Ring ¾ Shaft	2	137	1667	Ass'y. Wheel Tire & Tube — Rear	2
78	3537	Spring — Seat	1	138	1700	Wheel	2
79	908034-4	Bolt — Hex ¾-16 x 1	2	139	1662	Tire	2
80	4892	Ass'y. Tool Box	1	140	1654	Tube	2
81	1385	Screw — Sems ¼-20 x ½	18	141	1004	Lug — Bolt	6
82	4993	Ass'y. Belt Guard (704)	1	142	1709	Ass'y. Wheel, Tire & Tube — Front	2
83	4975	Ass'y. Hood — Complete	1	143	1712	Wheel — With Two 1521 Bearings	2
84	1345	Thumb — Screw ¼-20 x ¾	2	144	1656	Tire	2
85	1346	Thumb — Screw ¼-20 x ¾	1	145	1657	Tube	2
86	920081-4	Lockwasher ¼ Dia.	3	146	2844	Washer	2
87	2767	Grommet 2½ I.D.	1	147	908033-6	Bolt Nylock ¾-16 x ¾	2
88	4962	Ass'y. Belt Guard (604-654)	1	148	2816	Hubcap	2
89	1432	Screw — Rd. Hd. ¾-24 x ½	3	149	4987	Ass'y. Switch — Ignition (654)	1
90	909082-4	Screw Rd. Hd. ¾-16 x ½	1	150	4882	Nut — Hex ¾-32 — Special (654)	1
91	4419	Shield	1	151	4881	Lockwasher ¾ Dia. — Special (654)	1
92	3973	Seat	1	152	3668	Key — Ignition (654)	1
93	900113-4	Bolt — Carriage ½-13 x 1¼	1	153	3279	Ass'y. Switch (604-704)	1
94	915115-6	Nut — Nylock ½-13	1	154	4856	Plug Button — .500 Hole (654)	1
95	4972	Fender R.H.	1	155	3757	Plug Button — .625 Hole (604-704)	1
96	4973	Fender L.H.	1	156	3653	Battery	1
97	4895	Ass'y. Cover	1	157	4979	Wiring Harness	1
98	4980	Ass'y. Engine — 6 H.P. (604)	1	158	908002-4	Bolt — Hex ¼-20 x 5/8 (654)	2
99	4981	Ass'y. Engine — 6 H.P. (654)	1	159	4983	Steering Wheel	1
100	5150	Ass'y. Engine — 7 H.P. (704)	1	160	2897	Insert	1
101	4416	Base — Engine (604-654)	1	161	932948-4	Pin — Clevis	1
102	1739	Muffler (604-654)	1	162	1813	Tool Pin	1
103	1754	Nipple ¾ Pipe x 5½ (604-654)	1	163	1576	"V" Belt	1
104	4985	Decal — Instrument Panel	1	164	S-56-6	Wrench Allen ½ Hex	1
105	1755	Elbow ¾ Pipe x 90° Street El (604-654)	1	165	3978	Cushion (654-704)	1
106	1756	Nut Lock ¾ Pipe (604-654)	1	166	5147	Decal (704)	1
107	2297	Brace — Exhaust (604-654)	1	167	4969	Decal (654)	1
108	1240	"U" Bolt (604-654)	1	168	4970	Decal (604)	1
109	4943	Nipple — ¼ Pipe x 4 (604-654)	1	169	4410	Decal — Wheel Horse Emblem	2
110	4218	Nipple — ¼ Pipe x 1¼ (604-654)	1	170	4984	Decal — Hood Panel	1



Transmission

TRANSMISSION PARTS LIST

When ordering parts always list Part No. and name of part.

Ref. No.	Part No.	Description	No. Req'd.	Ref. No.	Part No.	Description	No. Req'd.
1	3900	Case - Transmission	1	33	3903	Gear - Brake Shaft	1
2	1533	Bearing - Ball	1	34	3906	Gear - Bull	1
3	3915	Pin - Locating	2	35	3905	Case - Differential	2
4	1532	Bearing - Needle	1	36	3904	Axle - Rear	2
5	1529	Bearing - Needle	2	37	3908	Gear - Axle	2
6	1508	Bearing - Needle	2	38	933217	Pin - Roll $\frac{1}{4}$ x $1\frac{1}{2}$	2
7	1528	Bearing - Needle	2	39	4235	Gear - Differential Pinion	4
8	1232	Seal - Oil	3	40	1329	Cap Screw - Hex $\frac{3}{16}$ - 18 x $3\frac{1}{4}$	4
9	1303	Seal - Oil	1	41	1316	Nut - Hex - Lock $\frac{3}{16}$ - 18	4
10	3503	Fork - Shift	2	42	3912	Gasket	1
11	3515	Rail - Front Shift	1	43	3901	Case Transmission	1
12	3516	Rail - Rear Shift	1	44	1530	Bearing - Needle	1
13	933156	Pin - Roll $\frac{1}{4}$ x 1	2	45	1531	Bearing - Needle	1
14	3517	Ball - Stop	2	46	943460-4	$\frac{1}{4}$ Std. Pipe Plug	1
15	3518	Spring - Stop	1	47	943420-4	$\frac{1}{4}$ Std. Pipe Plug	1
16	3573	Shift Pin - Stop	1	48	908038-4	Bolt - Hex - $\frac{3}{8}$ - 16 x 2	5
17	3522	Gear - Input Drive	1	49	908043-4	Bolt - Hex - $\frac{3}{8}$ - 16 x $3\frac{1}{2}$	1
18	1518	Bearing - Needle	1	50	915113-6	Nut - Nylock $\frac{3}{8}$ - 16	6
19	3907	Shaft - Spline	1	51	4898	Stick - Shift	1
20	S-50-75	Snap Ring Truarc $\frac{3}{4}$ Shaft	1	52	3514	Collar - Shift	1
21	3523	Gear (Hi & Inter.)	1	53	933168	Pin - Roll $\frac{3}{32}$ x $1\frac{1}{8}$	1
22	3524	Gear (Low & Reverse)	1	54	909854-4	Screw - Soc. Hd. - Set $\frac{1}{4}$ - 20 x $\frac{3}{4}$	1
23	3526	Gear - Spline Shaft	1	55	915111-4	Nut - Hex Lock $\frac{1}{4}$ - 20	1
24	3910	Cluster - Shaft	1	56	3577	Boot - Shift Lever	1
25	937014	Key - #9 Woodruff	2	57	1001	Knob - Shift	1
26	3525	Gear - Cluster	1	58	3902	Drum - Brake	1
27	1504	Bushing - Bronze	2	59	937022	Key #15 Woodruff	1
28	3528	Pinion - Cluster Shaft Reduction	1	60	S-50-100	Snap Ring 1" Shaft	1
29	3527	Gear - Cluster Shaft Reduction	1	61	4437	Band - Brake	1
30	4204	Gear - Reverse Idler	1	62	908002-4	Bolt - Hex $\frac{3}{4}$ - 20 x $\frac{3}{4}$	2
31	1516	Bushing - Bronze	1	63	920081-4	Washer - Lock $\frac{1}{4}$	2
32	3909	Pin - Reverse Idler	5				