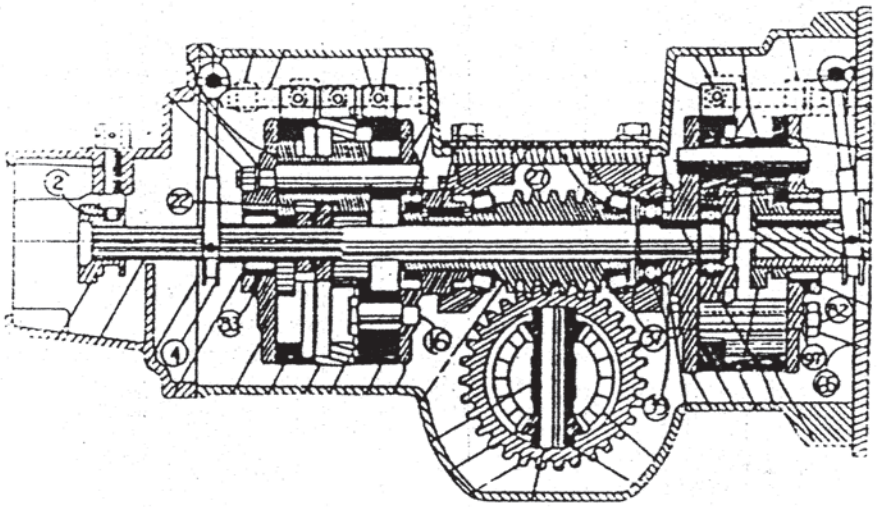
MOUNTAINEER



TRANSMISSION SERVICE MANUAL

MODEL: 88
120

UNITED FARM TOOLS, INC.
Lawn & Garden Division
4540 W. Washington Street
Charleston, WV 25313

Phone: 304-744-5865
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83/84

FRONT TRANSMISSION

:DRIVE WHEELS

REMOVAL FROM TRACTOR CHASSIS

1. Remove hinged front hood (Item #125). Hood is fastened to advance casting (Item #80) by two sockets.
2. Disconnect and remove battery.
3. Drain transmission oil. Drain plug is provided through bottom/forward hole of right axle housing. When using a hoist or platform, oil may be drained quickly through open front nose of advance casting by tilting the chassis forward.
4. Remove TOOL shift and GEAR shift engagement rods. TOOL shift rod is attached to the attachment shift lever (Item #84) at top right of advance casting. GEAR shift rod is attached to shift lever (Item #127) at left forward side of tractor chassis casing (Item #78). After removing hand knobs, slip both rods forward through dash and free from tractor.
5. With TOOL shift rod removed, slowly rotate attachment shift lever (Item #84) forward, driving clutch dog (Item #3) ahead on drive shaft until attachment wear block falls free. Position hand through front opening and below clutch dog to catch wear block as it falls free. Remove clutch dog by sliding it off end of splined drive shaft.
6. Remove the (7) hex head bolts and lockwashers from the advance casting (Item #80) and remove the advance casting and gasket from the front of chassis casting (Item #78(.
7. Release spring tension on front three bands (Reverse, Hi and Lo), by backing off each of the three adjusting screws (Item #12). Caution that clutch springs (Item #11) remain in their operating position between the tabs of the clutch bands.
8. Remove front shift yoke (Item #6). Free the shift yoke from the shaft (Item #7) by driving each of three 3/16" split pins out--catching each with your fingers to prevent dropping into transmission gearing. With a rubber mallet, slowly drive the shift lever/shaft assembly from the shift yoke, taking care not damage the shaft oil seal. Shift yoke is now free and can be easily lifted from shifting nut--again taking caution not toddrop either of the (2) wear blocks (Item #5) into transmission.
9. Remove (8) hex head bolts and lockwashers from top bearing plate (Item #26) and remove bearing plate, spacer and fiber gasket from chassis.
10. Pull entire front planetary transmission assembly (including bearing block and worm gear) through three loosened bands and out of tractor chassis casting. HINT: Bearing block (Item #31) must stay in up or mounted position to slip through chassis casting.

REASSEMBLY INTO TRACTOR CHASSIS

Simply reverse the order of the 10 steps to the front transmission the chassis---starting with Step 10 and ending with Step 1. The following suggestions may be helpful.

a. Step 10 - Placing the tractor in a vertical position with front end up makes guiding the transmission assembly through the bands and chassis walls much easier. Rotate front pin plate (Item #24) of transmission to "screw" steel worm into mesh with bronze gear. Bearing block (Item #31) must be in up or normal mounting position or transmission assembly will not slide freely through chassis.

b. Step 9 - Make sure that the machined mounting edge of both bearing blocks (Item #31 and 36), the spacer block and the top bearing plate are clean and free of any dirt or grit. Machined surface of top bearing plate (Item #26) must reassemble down against spacer block. Bolt tightening sequence follows:
   (1) With spacer, gasket, and top plate in place, start and finger tighten (4) 1/2-13 x 1¼ hardened hex bolts and lockwashers in four outside holes of top plate--bolting top plate loosely to chassis casting.
   (2) Start (2) 1/2-13 x 1½" hardened hex bolts and lockwashers through top plate into front bearing block.
   (3) Start (2) 1/2-13 x 1½" hardened hex bolts and lockwashers through top plate into rear bearing block.
   (4) Torque (4) outside bolts (top plate to chassis) to 60 ft-lbs.
   (5) Torque (4) inside bolts (top plate to bearing blocks) to 60 ft-lbs. If possible, rotate worm gear whil tightening bolts to eliminate binding and ensure correct tapered bearing adjustments.

Additionally, before bolting transmission in place, check that all three bands are in line with the corresponding planet gear of the transmission--and further that bands are positioned between locating set screws on both front (Item #24) and rear drive plates (Item #13).

c. Step 8 - Use only new 3/16 x 1" hardened split roll pins. Discard old used roll pins. Inspect wear blocks for abnormal wear before reinserting.

d. Step 7 - Retighten each adjusting screw to originial approximate position of locknut. If for some reason, locknut has been moved, retighten each band until when engaged by rotating cam shaft, the band fits snugly around planet gear and disengaged, the spring compression releases band and fully extends speed pin (Item #9) out against low point of cam lobe. FINAL ADJUSTMENT OF BANDS can be made only with tractor running, following previously outlined procedures for setting band tension.

e. Step 5 - Inspect wear block before reassembling.

f. Step 4
   (1) TOOL shift rod - If adjusted properly, when rod is locked behind dash in the engaged position, the face of the drive dog (Item #3) will rest 1 25/32 from the face of the advance casting. Adjustments may be made by loosening the locknut on the shift rod, turning the rod clockwise or CCW into the threaded sleeve (Item #128) as required, and then locking in place with the locknut.
   (2) GEAR shift rod - If adjusted properly, rod will lock behind dask (away from operator) when shiftnut (Item #4) is flush against front pin plate (Item #24). This is clearly visible through front opening in advance casting. Only when shift nut is against front pin plate will full engagement between the shift gear (Item #22) and the three orbit gears (Item #21) occur. Adjustments to the GEAR shift rod are made in the same manner as adjustments to the TOOL shift rod.

   Proper adjustment of both rods is essential to minimize excessive block wear, and to ensure full gear mesh.

DISASSEMBLY OF FRONT TRANSMISSION

1. Remove (3) 7/16" hex nuts and lockwashers from gear drive pins, and separate front pin plate (Item #24) from transmission.
2. Remove shift nut (Item #4) from shift gear (Item #22) by rotating clockwise (left hand threads) and slide shift gear out of pin plate. CAUTION: Do not attempt to press shiftnut from shift gear.
3. Back off retaining set screw located in hub of pin plate. Press out roller bearing (Item #25) from pin plate.
4. Remove 57T planet gear (Item #23) from gear assembly.
5. Remove 51T planet gear (Item #17) from gear assembly.
6. Remove (3) orbit gears (Item #21) from gear pins.
7. Rotate (3) reverse orbit gear pins (Item #16) clockwise (LH thread) to remove (3) reverse orbit gears (Item #15).
8. Remove 54T planet gear (Item #14) from gear assembly.
9. Remove (3) spacers (Item #19) from gear pins.
10. Back nut (Item #30) off worm gear (Item #34).
11. Press rear pin plate (Item #13) off worm.
12. Press bearing cup (Item #32) from bearing block (Item #31).
13. Drive (2) bearing cones (Item #33) from worm gear.

DISASSEMBLY OF FRONT TRANSMISSION IS COMPLETED

ASSEMBLY OF FRONT TRANSMISSION (Complete)

1. All worm gears and bearing blocks are checked, preloaded, and matched as sets at the factory. Replacement of worm gear (Item #34) or either bearing block (Items #31 &36) makes it necessary to recheck loading of Timken tapered bearins across the worm gear.
   a. Insert internal snap ring (Item #37) into rear bearing block (Item #36). If rear transmission is already assembled, remove from chassis and ready for bench preloading of bearings.
   b. Press bearing cups (Item #32) into both front and rear bearing blocks.
   c. Press bearing cones (Item #33) onto ground diameter of worm gear.
   d. With two ½-13 Hex Head bolts, mount the front bearing block to the ground side of top bearing plate (Item #26).
   e. Mount worm gear and bearing cones between two bearing blocks, and tighten down second bearing block with (2) ½-13 bolts to bearing support plate.
   f. Check end play with indicator. If required, shim between bearing cone and worm gear shoulder to obtain from .003" preload to .003" end play.
2. Once correct bearing adjustment is achieved, assembly of the front transmission follows the reverse procedure for disassembly--beginning with Step 13 and ending with Step 1. Several additional specifications should be noted.
   a. Step 11 - DO NOT ATTEMPT TO PRESS REAR PIN PLATE (Item #13) ONTO WORM GEAR. Instead, heat the pin plate in an oven at 500°F for 30 minutes. Then remove pin plate from oven, and drop over ground diameter of worm gear. Generally, you have only about 5 seconds before the pin plate will shrink and not fall over the worm gear. Don't forget to install key (Item #35). Prior to dropping the plate over the worm gear.
   b. Step 7 - Time reverse orbit gears by synchronizing all timing marks to centerline of the transmission.
   c. Step 6 - Time (3) compound orbit gears by synchronizing all timing marks to centerline of the transmission. Press two bushings (Item #19) into each compound orbit gear (Item #21). Eine ream or hone bushings. Bushings should be .002 -.003" larger than drive pins.

REAR TRANSMISSION - CLUTCH

REMOVAL FROM TRACTOR CHASSIS

1. Remove hinged front hood (Item #125). Hood is fastened to advance casting (Item #80) by two socket screws.
2. Disconnect and remove battery.
3. Drain transmission oil. Drain plug is provided through bottom/forward hole of right axle housing. When using a hoist or platform, oil may be drained quickly through open front nose of advance casting.
4. Remove TOOL shift and GEAR shift engagement rods.
5. Remove clutch dog (Item #3) and wear block (Item #2) through front opening of advance casting.
6. Disconnect FWD/REV control rod (Item #103) from universal joint (Item #85) by removing hex bolt and lock nut.
7. Disconnect CLUTCH control rod (Item #91) from connecting joint (Item #101) by driving through 3/16" split roll pin.
8. Remove (2) hex head bolts and lockwashers and remove PTO bracket (Item #126) from rear hood.
9. Remove (8) hex head bolts and lockwashers and remove engine mounting plate (Item 64---including engine and handle bar assembly) and gasket from rear of tractor chassis (Item #78). This is facilitated by placing the tractor in a vertical position with the engine end up, and then lifting vertically straight up so as not to bind engine crank/spline in the rear shifting gear (Item #45).
10. Release spring tension on clutch band by backing off adjusting screw. Caution that spring remains in its normal position between tabs of band.
11. Rotate clutch cam to disengaged or off position.
12. Remove the rear shift yoke (Item #6). Free the shift yoke from shaft (Item #51) by driving each of three 3/16" split roll pins out---catching each with your fingers to prevent dropping into transmission gearing. With a rubber mallet, slowly drive the PTO shift rod/shaft assembly from the shift yoke, taking care not to damage the shaft oil seal. Shift yoke is now free and can be easily lifted from shifting nut---again taking caution not to drop either of the (2) wear blocks (Item #5) into transmission.
13. Remove (8) hex head bolts and lock washers from top bearing plate (Item #26) and remove bearing plate, spacer and fiber gasket from chassis.
14. Pull entire rear planetary transmission assembly (including rear bearing block and splined drive shaft) out rear of chassis casting. Hint: Bearing block (Item #36) must stay in up or normal mounted position to slip through chassis casting.

REASSEMBLY INTO TRACTOR CHASSIS

Simply reverse the order of the 14 steps to remove the rear transmission from the chassis---starting with Step 14 and ending with Step 1. The following suggestions may be helpful.

a. Step 14-Work with tractor in a vertical position. Rotate splined shaft to align with splined front shift gear (Item #22). Do not try to jam or force splined shaft through front transmission.
b. Step 13-Follow same bolt tightening procedure used to reassemble front transmission.
c. Step 12-Use only new 3/16 x 1" hardened split roll pins. Inspect wear blocks for excessive wear. Shifting of rear sliding gear (Item #45) must be free and easy with no binding from the yoke or wear blocks.

d. Step 10-Retighten adjusting screw to original approximate position of lock nut. If for some reason, lock nut has been moved, retighten band until when fully engaged by clutch cam shaft, the band fits snugly around planet gear and when disengaged, the spring compression releases band and fully extends speed pin out against low point of cam lobe. MAKE SURE the band is centered flat on the planet gear, resting between the two guide set screws.

e. Step 9-Center engine spline in sliding gear (Item #45), and torque bolts to 30 ft-lbs. When aligning bolts, a ¼" spacer between engine mounting plate and gasket (Item #65) is helpful to get several of the bolts surrounding the ignition points started.

f. Step 8-Use slot provided in PTO mounting bracket to get full gear engagement in both high and low ranges. Correctly adjusted, the same slight pressure of the PTO shift rod against the PTO shift bracket notch would be felt in both the forward and back positions.

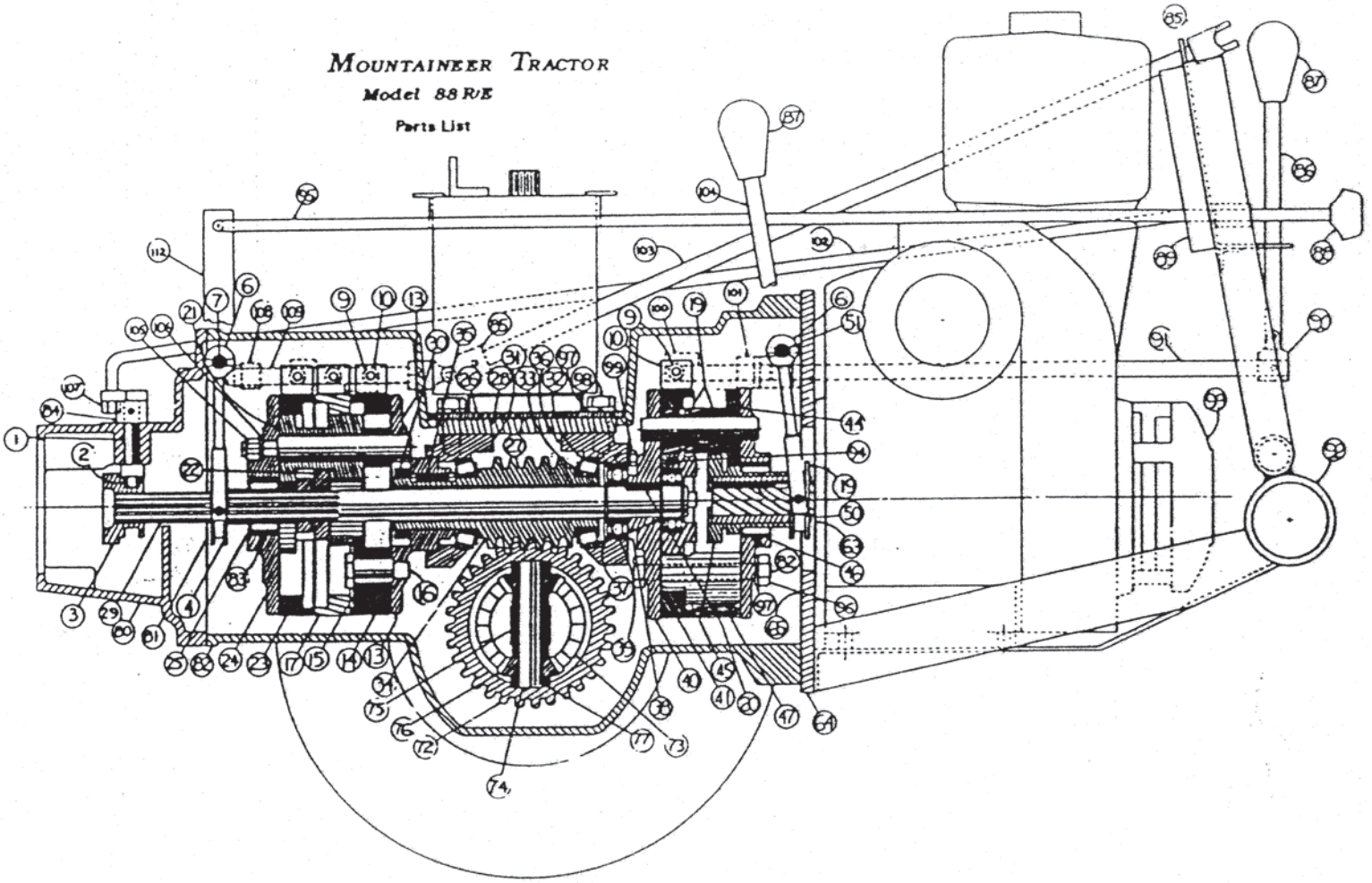
DISASSEMBLY OF REAR TRANSMISSION

1. Remove hex nut and lockwasher from each of three 1/2 x 4" Hex bolts (Item #82) and separate rear pin plate (Item #47) from front pin plate. The sliding gear (Item #45) will come with the rear pin plate. Remove shift nut (Item #49) from gear---watch out for left hand threads. Rotate shift nut clockwise to loosen. Remove sliding gear from pin plate. Back off set screw in hub of pin plate--press roller bearing (Item #46) from pin plate.
2. Remove planet gear (Item #41).
3. Remove (3) orbit gears (Item #44).
4. Remove first external snap ring (Item #39) from end of splined drive shaft (Item #29). Use gear puller to pull sun gear (Item #43) from drive shaft. Remove three countersunk set screws (Item #94) and press ball bearing (Item #42) from sun gear. Sun Gear (Item #43) is completely disassembled.
5. Remove second external snap ring from drive shaft. Press drive shaft through front pin plate (Item #40).
6. Remove third external snap ring. Press bearing block (Item #36) from drive shaft. Drive shaft (Item #29) is now free from assembly and could be replaced.
7. Remove (3) hex bolts and lockwashers and ball bearing (Item #38) can be pressed free from bearing block.
8. Remove internal snap ring (Item #37), and press bearing cup (Item #32) from bearing block. Bearing block (Item #36) is now completely disassembled.

DISASSEMBLY OF REAR TRANSMISSION IS COMPLETED.

MOUNTAINEER

Lawn & Garden Equip.



Mfg. by

UNITED FARM TOOLS
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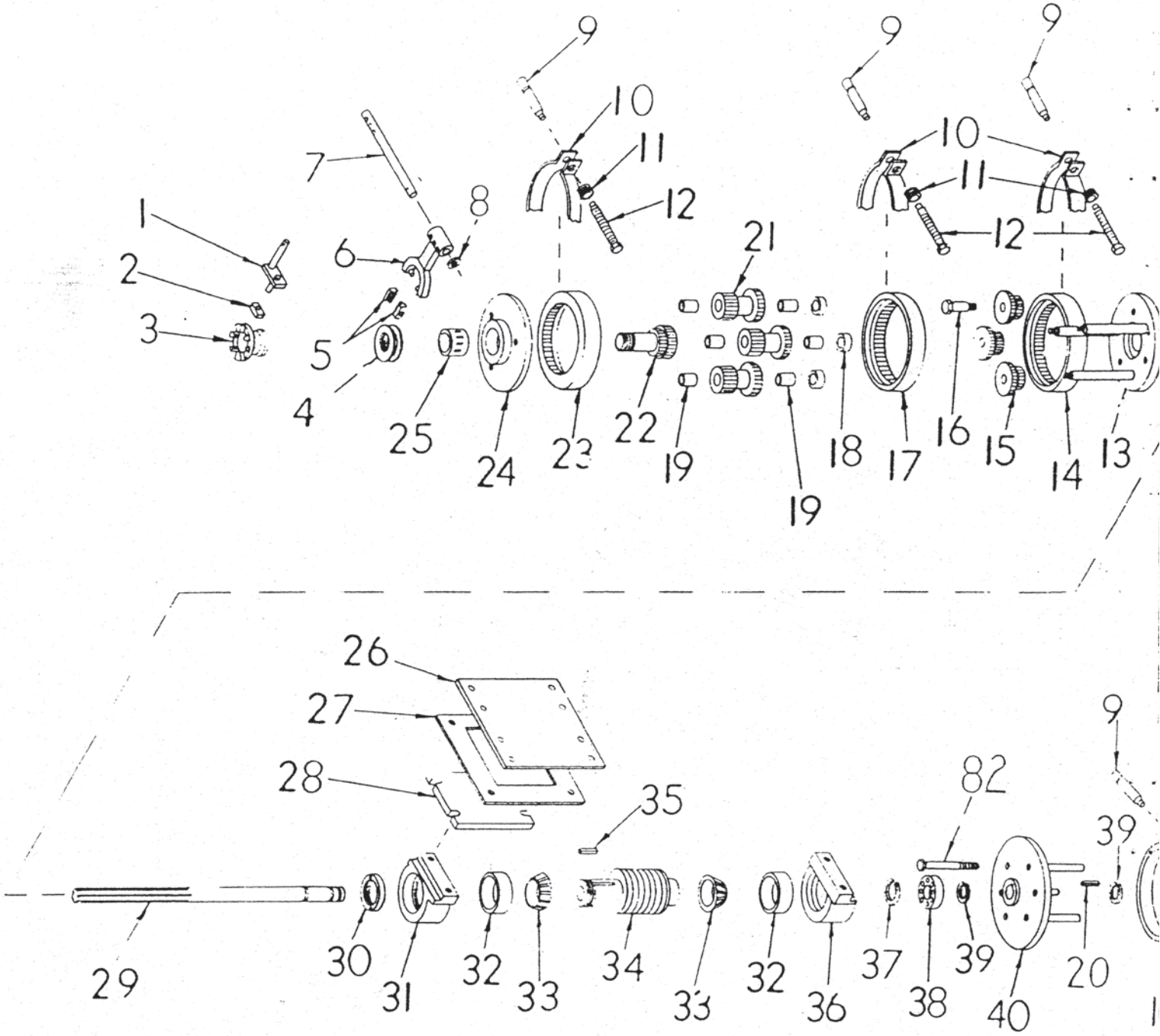
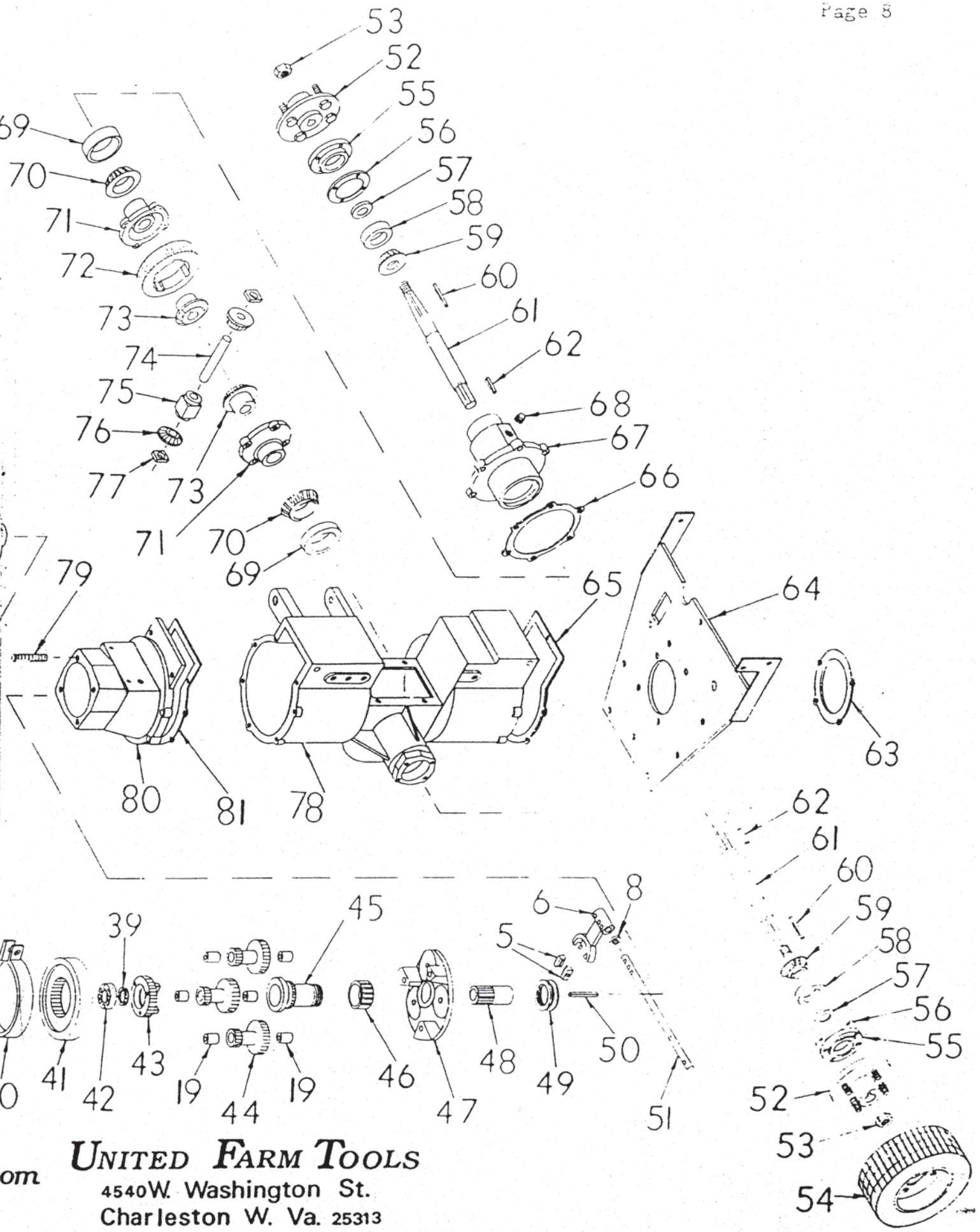
MOUNTAINEER TRACTOR

MODEL 88R/E

Assembly Drawing (Drive Train)





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UNITED FARM TOOLS
4540W. Washington St.
Charleston W. Va. 25313

MOUNTAINEER Model 88R/E Parts List

REF	QTY	PART	DESCRIPTION
1	1	683	Weldment, Tool Shift
2	1	685	Wear Block, Attachment
3	1	687	Clutch Dog
4	1	625	Shift Nut
5	4	679	Wear Block
6	2	680	Shift Yoke
7	1	681	Shaft, Front Shift Yoke
8	2	812	Oil Seal, Shift Shaft
9	4	669	Speed Pin
10	4	667	Clutch Band
11	4	670	Clutch Spring
12	4	668	Adjusting Screw, Clutch
13	1	616	Rear Drive Plate - Front Transmission
14	1	611	Gear, 54T Reverse
15	3	623	Reverse Orbit Gear
16	3	620	Orbit Gear Pin
17	1	610	Gear, 51T Low
18	3	619	Spacer
19	12	810	Bronze Oil Groove Bushing
20	1	851	Key
21	3	622	Compound Gear
22	1	624	Shifting Sun Gear
23	1	612	Gear, 57T High
24	1	617	Front Drive Plate - Front Transmission
25	1		Bearing
26	1	661	Bearing Block Support Plate
27	1	816	Gasket, Support Plate
28	1	662AB	Riser Blocks
29	1	604	Splined Drive Shaft
30	1	603	Worm Gear Nut
31	1	606	Bearing Support Housing - Front
32	2	805	Bearing, Cup
33	2	804	Bearing, Cone
34	1	602	Worm Gear
35	1	852	Key - Worm
36	1	607	Bearing Support Housing - Rear
37	1	855	Retaining Ring - Bearing Housing
38	1	808	Ball Bearing - Shaft
39	3	858	Retaining Ring - Drive Shaft
40	1	626	Front Drive Plate - Rear Transmission
41	1	613	Gear, 57T Modified
42	1	809	Ball Bearing - Fixed Sun Gear
43	1	632	Gear, Fixed Sun
44	3	629	Compound Gear
45	1		
46	1	807	Bearing
47	1	627	Rear Drive Plate - Rear Transmission
48	1	633	Engine Spline Sleeve
49	1	631	Shift Nut
50	1	853	Key - Drive Shaft
51	1	682	Shaft, Rear Shift Yoke
52	2	659	Hub, Wheel
53	2		Locknut - 3/4 - 16
54	2		Wheel Assembly
55	2	651	Axle Bearing Retainer
56	2	813	Gasket
57	2	811	Oil Seal, Axle
58	2	800	Bearing, Cone
59	2	801	Bearing, Cup
60	2	854	Key - Wheel
61	2	648	Axle Shaft
62	2	852	Key - Axle
63	1	817	Gasket - Engine
64	1	663	Engine Mounting Plate
65	1	818	Gasket - Chassis
66	2	814	Gasket - Axle Housing
67	1	645	Axle Housing Casting
68	1		Oil Filler Plug 3/4 NPT
69	2	803	Bearing, Cup
70	2	802	Bearing, Cone
71	2	638	Differential Housing
72	1	637	Gear, Bronze Alloy
73	2	636	Gear, 18T Bevel
74	1	639	Shaft, Differential
75	1	642	Block, Differential
76	2	635	Pinion - 12T Bevel
77	2	640	Square Drive Key
78	1	601	Chassis Casting
79	2	858	Quick Mount Stud
80	1	692	Front Casting
81	1	815	Gasket, Front Casting
82	3		Bolt 1/2 - 13 x 4
83	2		Locking Set Screw 1/4 - 20
84	1	711	Weldment, Tool Shift Lever
85	2		U - Joint Assembly
	[2]	729	U - Joint End
	[1]	728	U - Joint Center
	[1]	857	Connecting Pin
86	1	718	Rod, Clutch
87	3	700	Control Knob
88	2	699	Control Knob
89	1	738	Dash
90	2	730	Rod Connecting Joint
91	1	717	Rod, Clutch Connector
92	1	735	Weldment, Frame
93	1		Engine
94	3		C'Sunk Setscrew 1/4 - 28
95	1		Control Rod, Gear HI/LO
96	3		Hex Nut 1/2 - 13
97	11		Lock Washer 1/2
98	4		Hex Cap Screw 1/2 - 13 x 1 1/2
99	3		Hex Cap Screw 1/4 - 20 x 1/2
100	1	715	Cam Shaft, Clutch
101	1	716	Clutch Rod Connector
102	1		Control Rod - Attachment
103	1	721	Control Rod - Fwd/Rev
104	1	719	Control Rod - PTO
105	3		Hex Nut 7/16 - 20
106	3		Lockwasher 7/16
107	2		Locknut 3/8 - 16
108	1	713	Cam Shaft Bushing
109	1	720	Cam Shaft, FWD/REV
			Parts Not Illustrated
	1	701	Control Assy, Throttle
	2	702	Hand Grip
	1	704	Muffler
	1	709	Bracket, PTO Shift
	1	710	Support, PTO Shift Rod
	1		Control Lever, FWD/REV
	1	723	Support, FWD/REV Control
	1		Weldment, Handle Bar
	1	737	Rear Hood
	1		Weldment, Front Hood
	4	819	O-Ring, Speed Pin
	3	860	Extension Spring

ASSEMBLY OF REAR TRANSMISSION (Complete)

1. Insert internal snap ring (Item #37) in bearing block (Item #36).
2. Press bearing cup (Item #32) into bearing block against snap ring.
3. Press roller bearing (Item #38) into opposite side of bearing block. Use (3) 1/4 x 1/2" lg. hex head cap screws and lockwashers as bearing retainers.
4. Insert external snap ring (Item #39) in groove nearest center of drive shaft (Item #29).
5. Press bearing block assembly on drive shaft down to snap ring.
6. Insert (3) 1/2 x 4 Hex Head bolts into front pin plate (Item #40).
7. CRITICAL: Press drive shaft and 1/4 x 1/4 x 1 key through bore of front pin plate (Item #40), until pin plate is solid against ball bearing. Maximum TIR on face of pin plate after pressing should not exceed .006 - .010".
8. Insert second external snap ring on drive shaft.
9. Press ball bearing (Item #42) into sun gear (Item #43). Use (3) Countersunk set screw as retainers.
10. Press sun gear on drive shaft with lugs away from bearing block. Use external snap ring on drive shaft as bearing retainer.
11. Press two bushings (Item #19) into each orbit gear (Item #44). IMPORTANT: Drill 5/32" dia. oil holes through bushings using two holes already drilled through gear teeth as guides. Line ream or hone bushings. Bushings should be .002-.003" larger than ground drive pins.
12. Apply light film of #90 Gear Lube or grease to each gear pin before placing orbit gear on pin. Set timing mark on each gear uniformaly to the outside.
13. Press roller bearing (Item #46) into rear pin plate (Item #47). Secure in place with self-licking set screw threaded into pin plate hub. Do not over-tighten set screw against outer cage of bearing.
14. Push shift gear (Item #45) through roller bearing pressed into pin plate.
15. Tighten shift nut (Item #49) counterclockwise onto shift gear. (LH thd.)
16. Locate 57T planet gear (Item #41) on recess machined into three legs of rear pin plate.
17. Assemble front and rear pin plate assemblies. Rotate shift gear as both shift gear and planet gear go into mesh with three orbit gears. Tap rear pin plate to drive the three drive pins through plate. Secure with lockwashers and nuts. Torque three bolts to 60 ft-lbs. Stake nuts to bolts to minimize possible backing off of nut.

ASSEMBLY OF REAR TRANSMISSION IS COMPLETE.

TRANSMISSION BANDS

SERVICING-BAND ADJUSTMENTS

1. Band Adjusting Screws-A total of (4) band adjusting screws (Item #12) are all located on the left top portion of main tractor chassis casting (Item #78). To adjust an adjusting screw, first loosen the lock nut. Then turn the adjusting screw clockwise to tighten, counter-clockwise to loosen band tension. After making adjustment, retighten lock nut. AVOID overtightening. Normal adjustments would be 1/2-3/4 turns, then check performance before further adjusting.
2. CLUTCH Band Adjustment-If clutch slippage occurs, loss of power to the main drive shaft will result. While this is generally most noticeable by lack of power delivered to the attachment, there should also be an appreciable drop in power available for the drive wheels. NOTE, if the attachment lacks in power, but there is normal power available at the drive wheels, dismount the attachment and check for proper setting of the attachment overlaced slip clutch-as tractor clutch slippage is not occuring.

   If clutch slippage is occuring---or as standard procedure in replacing a worn band (Item #10) or reassembly of rear planetary transmission in tractor---the adjusting screw should be tightened such that when the clutch control lever is rotated counterclockwise through the slot in the dash---approximately 1" from the leftmost engaged position, the control rod will meet sufficient resistance to spring back into a disengaged position.
3. FWD & REV Drive Band Adjustment-First ensure that main clutch is not slipping. Then, if there is a lack of power in any or all of the three speed modes---or in the case of reassembly of front planetary transmission into tractor or replacement of a worn band---adjustments are required of the three forward adjusting screws (Item #12). With a mowing attachment mounted and engaged, position the tractor on concrete against a solid wall---lock the FWD/REV control rod in the desired speed range---and slowly tighten the matching adjusting screw until wheels begin to break traction. CAUTION: Do not overtighten as it will make it difficult to engage the FWD/REV cam lobes over center.

CLUTCH BAND REPLACEMENT

1. Refer to procedure for "Removal of Rear Transmission from Chassis." Follow Step 1 - Step 11.
2. Step 12-Back clutch band adjusting screw (Item #12) out far enough that clutch band can be rotated clockwise and freed from both speed pin (Item #9) and adjusting screw.
3. Step 13-Remove clutch band from chassis by straddling open portion of band aroung shift yoke (Item #6).
4. Installing new band is done by reversing Step 13- Step 1. It is important that compression spring (Item #11) be properly seated between band tabs, securely on both the speed pin and adjusting screw tapered end.
5. Set correct CLUTCH band tension by procedures outlined in preceeding section, "Servicing-Band Adjustments", paragraph #2.

FWD & REV BAND REPLACEMENT

1. Refer to procedure for "Removal of Front Transmission from Chassis." Follow Step 1 - Step 6.
2. Step 7-Release spring compression on front three bands (HI,LO,REV) by backing off each of the three adjusting screws (Item #12). Back adjusting screws off far enough that with FWD/REV cam lobes in neutral position, each band can be rotated clockwise, freed from both the speed pin and adjusting screw, and removed from around the planet gear. Caution that compression springs remain between tabs as bands are removed, and are not dropped in gearing.
3. Step 8-One at a time, slip each band down over planet gears, straddle shift yoke between tabs, and remove from chassis.
4. Installing new bands is done by reversing Step 8 - Step 1. First slide reverse band into position, and then tighten adjusting screw ensuring that spring is between tabs and seated over both speed pin and adjusting screw. Next, middle or LO speed band. And last, the front or HI speed band. When all three bands are in place, make sure they are seated flatly against the correct planet gear (edges not overlapping), and between two set/locating screws on the outside diameter of both the front and rear pin plates.
5. Set correct speed band tension by procedures outlined in preceeding section, "Servicing-Band Adjustments," paragraph #3.

AXLE/DIFFERENTIAL ASSEMBLY

REPLACING AXLE OIL SEALS

1. Prop up or hoist tractor until the wheels are off the ground.
2. Drain transmission oil.
3. With 3/4" deep well socket, remove (4) stud nuts, and lift wheel and tire assembly from wheel hub.
4. Remove 3/4-16 Locknut (Item #53) from end of axle shaft.
5. Use gear puller to remove wheel hub (Item #52) from tappered axle (Item 60).
6. Remove (4) 5/16 x 1 hex head bolts and lockwashers from bearing cap (Item #55) and remove cap and gasket from either the axle housing (Item #67 on right side) or main chassis on left side.
7. Press worn or damaged seal out of bearing cap. Discard old seal.
8. Press new seal in bearing cap. Press only on outside lip of seal---pressing on center web of seal will cause deformation and caving in of seal. HINT: Coating outer edge of seal with non-hardening gasket sealant before pressing in bearing cap helps to prevent leakage between the seal and bore.
9. Use a piece of thin, flexible plastic to protect the seal as you slide it back over axle shaft and remount bearing cap and gasket with (4) bolts and lockwashers.
10. With 3/16" x 1 1/2" key (Item #60) in place, drive with a soft hammer the wheel hub back on the tapered axle shaft.
11. Lock wheel hub in place with lock nut (Item #53).
12. Use (4) stud nuts to remount tire wheel to wheel hub.
13. Add 6 Quarts of Transmission Oil.
14. Lower Tractor wheels to ground.

REPLACING AXLE OIL SEAL IS COMPLETED.

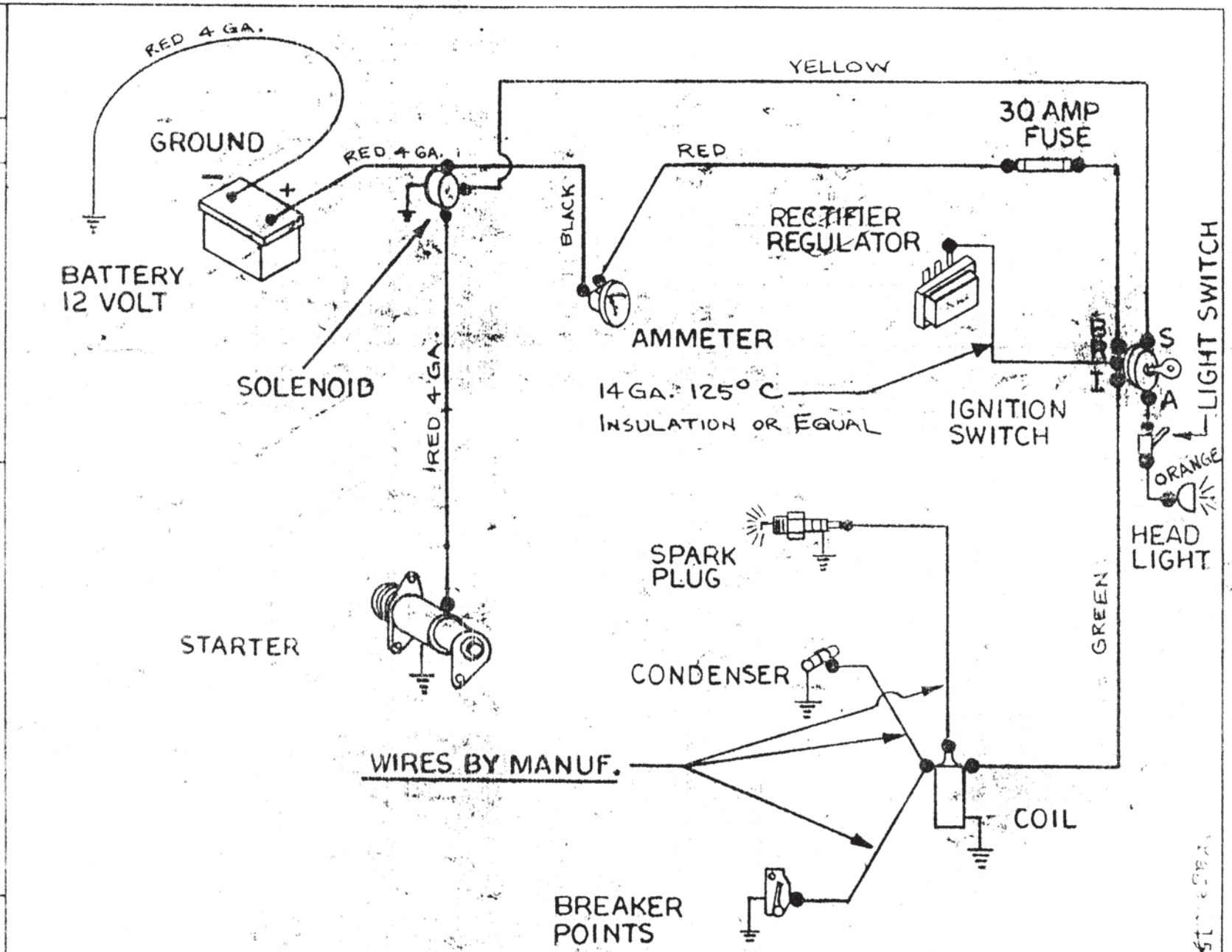
DISASSEMBLY OF AXLE/DIFFERENTIAL ASSEMBLY

1. Prop up or hoist tractor until the wheels are off the ground.
2. Drain transmission oil.
3. With 3/4" deep well socket, remove (4) stud nuts and lift wheel and tire assembly from wheel hub. Remove wheels from both sides.
4. Remove 3/4-16 Locknut (Item #53) from end of axle shaft. Both sides.
5. Use gear puller to pull wheel hub (Item #52) from tapered axle shaft (Item #60). Both sides.
6. Remove (4) 5/16 x 1 hex head bolts and lockwashers and remove bearing cap (Item #55) and gasket from axle housing (Item #67).
7. Remove (4) 5/16 x 1 hex head bolts and lockwashers and remove left bearing cap and gasket from main chassis casting (Item #78).
8. Slide both right and left axles (Item #61) from engagement with differential housing (Item #71). Bearing cone (Item #59) and bearing cup (Item #58) will come out of housing bore when axle is removed. Shims used to adjust bearings should be noted and saved for reassembly.
9. Remove (6) hex head bolts and lockwashers and remove axle housing (Item #67) and gaskets (Item #66) from chassis casting.
   Note shims and save for reassembly.
10. Differential assembly can be removed through axle housing opening in chassis casting.
11. Complete disassembly of differential is straight forward with aid of exploded assembly drawing.

REASSEMBLY OF AXLE/DIFFERENTIAL ASSEMBLY INTO CHASSIS

1. Assemble differential, and press (2) bearing cones (Item #70) on machined diameter of differential housing (Item #71).
2. If required, press bearing cup (Item #69) in machined recessed bore of chassis casting.
3. If required, press bearing cup (Item #69)in machined recessed bore of axle housing.
4. Position assembled differential between bearing cup in chassis and bearing cup in axle housing. Shim (Item #66) between axle housing and chassis casting to adjust Timken tapered bearings. When correctly adjusted, 0 - .004" end play of differential assembly should be detected. Bolt axle housing to chassis with (6) hex head bolts and lockwashers.
5. Press bearing cone (Item #60) down against machined shoulder of axle. Repeat for both axles.
6. With key (Item #62) in axle keyway, slide axle into keyed gear bore (Item 73) of differential assembly. Repeat for both sides.
7. Tap bearing cone (Item #58) into bearing bore and snug against bearing cone (Item #59). Repeat for both sides.
8. Left side only-use (4) 5/16 x 1 hex head bolts and lockwashers to bolt bearing cap (Item #55 and one shim (Item #56) to chassis casting.
9. Right side-use (4) 5/16 x 1 hex head bolts and lockwashers to bolt bearing cap and required number of shims to chassis casting. Shim such that measureable end play of axle shaft is 0-.003".
10. With 3/16" x 1-1/2" key (Item #60) in place, drive with a soft hammer the wheel hub back on the tappered axle. Repeat for both sides.
11. Lock wheel hub in place with lock nut (Item #53). Repeat both sides.
12. Use (4) stud nuts to remount tire wheel to wheel hub. Repeat both sides.
13. Add 6 Quarts of Transmission Oil.
14. Lower tractor wheels to ground.

ASSEMBLY OF AXLE/DIFFERENTIAL INTO CHASSIS IS COMPLETED.



REVISIONS	MATERIAL KOHLER K181S	TITLE MODEL 88E WIRING DIAGRAM	NO. REQD.
DRAWN ELD CHKD. APPVD. TDR	UNITED FARM TOOLS, INC. SOUTH CHARLESTON, W. VA. 25309	FRACTIONAL ± 1/32 DECIMAL ± .010 LIMITS ON DIMENSIONS UNLESS OTHERWISE SPECIFIED	DRAWING NO. 9005 MODEL 88E

"" APPENDAGE ""

NOTE - SINCE BAND RETAINING PINS HAVE BEEN ADDED TO THE PIN PLATES, IT IS NOW NECESSARY TO REMOVE THE 3 BANDS WITH THE FRONT TRANSMISSION. TO DO THIS, REMOVE THE 3 ADJUSTING SCREWS (ITEM # 12) AND DISENGAGE THE BANDS FROM THE 3 SPEED PINS (ITEM # 9)

ALSO THE FRONT TRANSMISSION WILL BE EASIER TO REMOVE IF THE WHEELS ARE BLOCKED OFF THE GROUND AND THE TRANSMISSION IS SCREWED OFF THE WORM GEAR BY ROTATING THE WHEELS.