

PART 2. FRONT AXLE ASSEMBLIES MF 50 AND 65 TRACTORS

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SERVICING MF 50 & 65 MULTI-PURPOSE, STANDARD, HI-ARCH, AND UTILITY FRONT AXLE ASSEMBLIES

Similarities between front axle assemblies of the Multi-Purpose, Standard, Hi-Arch and Utility description permit servicing procedures of these assemblies to be combined and discussed as one.

Single wheel front axle assemblies and twin wheel front axle assemblies each deserve separate discussions of servicing procedures. The procedures concerning axles of this type will include servicing the front pedestal and support assemblies.

Consult the Parts Book for information regarding the inter-change features of parts.

REMOVING FRONT AXLE AS A UNIT

Front axle assemblies of this description are removed as a unit when complete disassembly is not necessary.

Support the tractor with front wheel slightly touching the ground, refer to Fig. 1, and remove:

1. Lower grill panel.
2. Lower steering arm, No. 3, from pedestal shaft.
3. Thrust plate, No. 20, and shims from end of front pivot pin.
4. Front pivot support.

5. Front axle assembly by rolling the unit forward and out from tractor (a floor jack supporting the front axle center member facilitates easy handling when following this procedure). See Fig. 5.

Install the assembly as a unit by reversing the procedures for removing.

REMOVING FRONT AXLE TO DISASSEMBLE

When front axles of this description are to be completely disassembled, remove the assemblies as follows:

1. Slightly loosen the wheel lug nuts.
2. Support tractor with front wheels clearing the ground.
3. Remove:
 - a. Front wheels.
 - b. Lower grill panel.
 - c. Grease fittings.
 - d. Tie rods ends, Nos. 1 and 9, from spindle steering arms, Nos. 10 and 27. Fig. 1.
 - e. Tie rods end No. 6, from main steering arm, No. 3.
 - f. Main steering arm from pedestal shaft.
 - g. Both R.H. and L.H. axle extension assemblies, Nos. 15 and 25, Fig. 1, (if so equipped).
 - h. Pivot thrust plate, No. 20, and shims, No. 21.

NOTE: Save the shims.

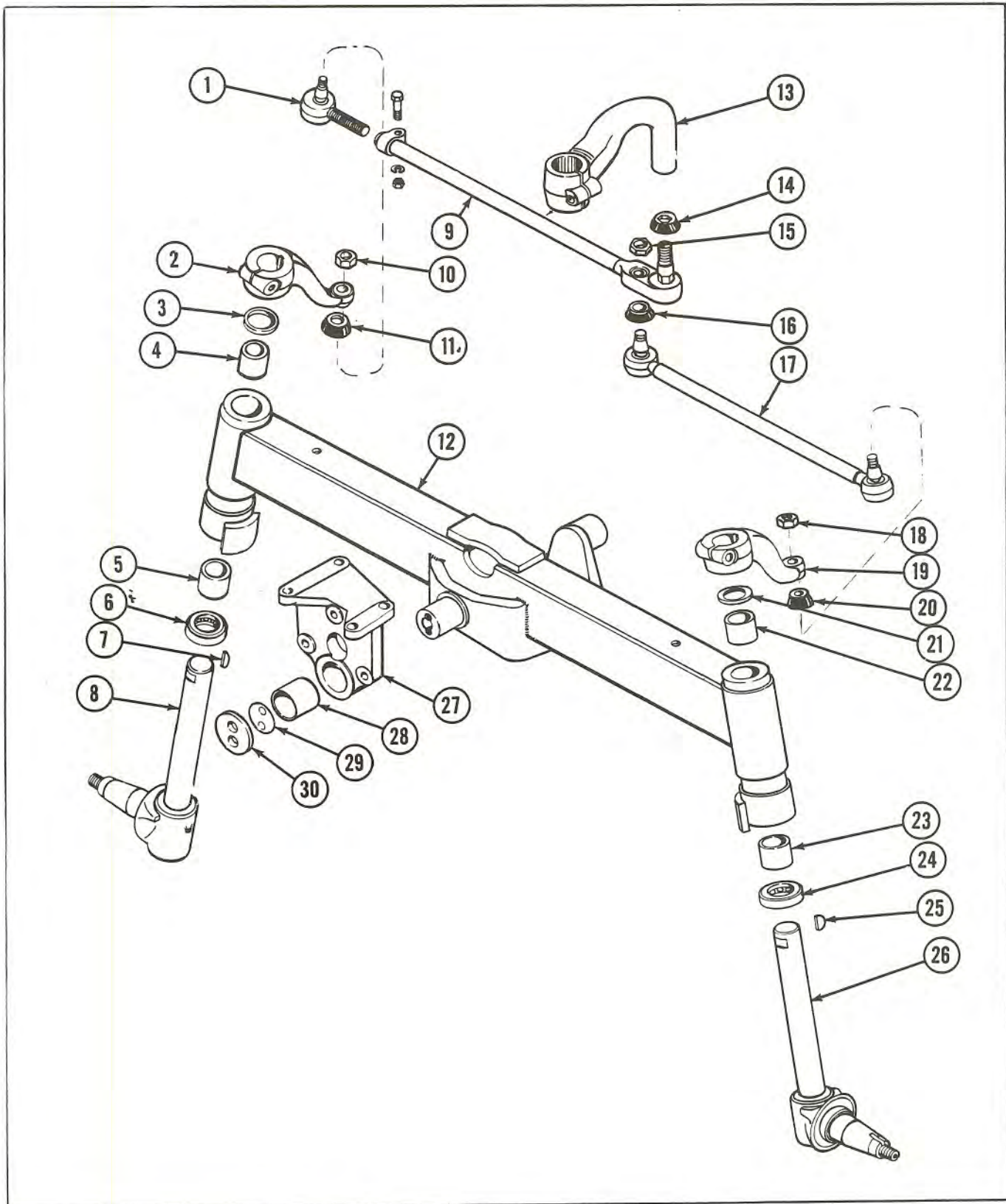


Fig. 3 — MF 65 Utility Front Axle Assembly Nomenclature.

- 1. Tie Rod End
- 2. Spindle Steering Arm
- 3. Felt Dust Seal
- 4. Spindle Bushing
- 5. Spindle Bushing
- 6. Thrust Bearing

- 7. Woodruff Key
- 8. Spindle Assembly
- 9. Tie Rod Assembly
- 10. Nut
- 11. Dust Seal
- 12. Front Axle Assembly

- 13. Main Steering Arm
- 14. Dust Seal
- 15. Nut
- 16. Dust Seal
- 17. Tie Rod Assembly
- 18. Nut

- 19. Spindle Steering Arm
- 20. Dust Seal
- 21. Felt Dust Seal
- 22. Spindle Bushing
- 23. Spindle Bushing
- 24. Thrust Bearing

- 25. Woodruff Key
- 26. Spindle Assembly
- 27. Pivot Support Assembly
- 28. Pivot Bushing
- 29. Shim Pack
- 30. Thrust Plate

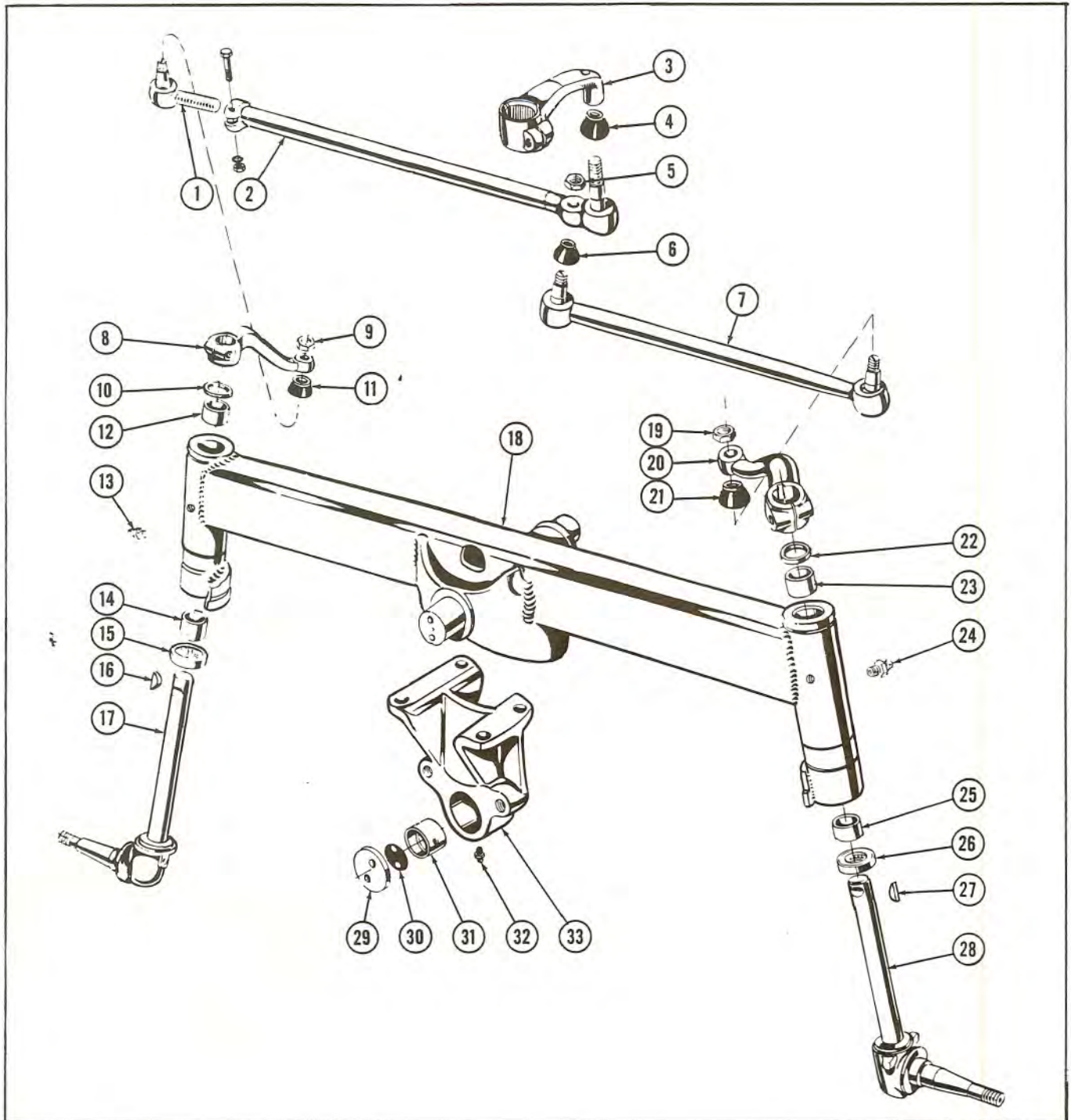


Fig. 4 - MF 50 Multi-Purpose Front Axle Assembly Nomenclature

- | | | | |
|-------------------------|----------------------|--------------------------|---------------------------|
| 1. Tie Rod End | 10. Dust Seal | 19. Nut | 28. Spindle Assembly |
| 2. Tie Rod Assembly | 11. Dust Seal | 20. Spindle Steering Arm | 29. Thrust Plate |
| 3. Main Steering Arm | 12. Spindle Bushing | 21. Dust Seal | 30. Shim Pack |
| 4. Dust Seal | 13. Grease Fitting | 22. Dust Seal | 31. Pivot Bushing |
| 5. Nut | 14. Spindle Bushing | 23. Spindle Bushing | 32. Grease Fitting |
| 6. Dust Seal | 15. Thrust Bearing | 24. Grease Fitting | 33. Axle Support Assembly |
| 7. Tie Rod Assembly | 16. Woodruff Key | 25. Spindle Bushing | |
| 8. Spindle Steering Arm | 17. Spindle Assembly | 26. Thrust Bearing | |
| 9. Nut | 18. Front Axle | 27. Woodruff Key | |

entering through grease fitting hole, to drill a spot in the bore 1/64" deep. When installing the bushing, line up the grease holes and insert a long punch to stake bushing into drill spot.

Replacement pivot bushings are pre-sized and do not require reaming when installed carefully with the proper tool.

Spindle bushings are renewable but require sizing after installation.

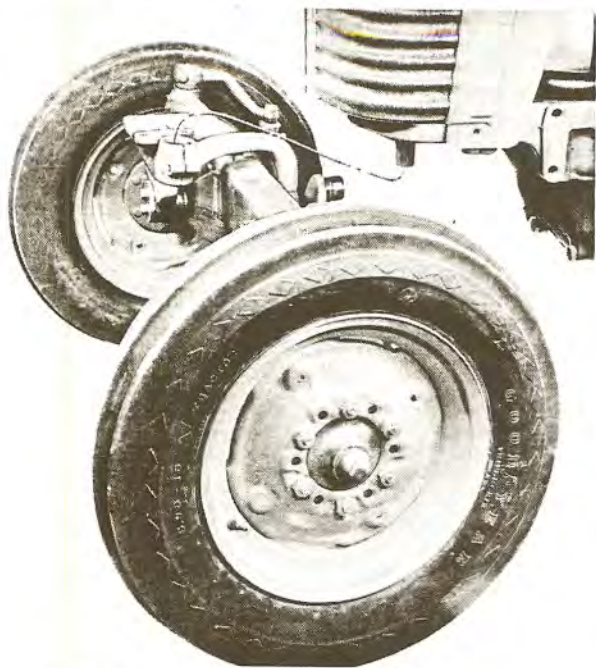


Fig. 5 — Removing Wide Front Axle Assembly

Tie rod ends are not adjustable for wear. Recommended toe-in adjustment is 0-1/4 inch.

End-play adjustment is 0.002-0.008 inch between support housing front face and front pivot bracket rear face.

ASSEMBLING THE AXLE

1. Install: (Refer to Fig. 1).
 - a. Bearing, No. 17, to spindle, No. 19.
 - b. Spindle bushings, Nos. 14 & 16, and ream to size.
 - c. Spindle through axle spindle tube, No. 15.
 - d. Dust seal, No. 13.
 - e. Woodruff key, No. 18, to spindle.
 - f. Spindle steering arm, No. 10, to spindle.
 - g. Tighten spindle, bolt arm clamp.
 - h. Repeat procedure for spindle assembly on other side.

INSTALLING THE AXLE

1. Install: (Refer to Fig. 1).
 - a. Rear pivot bushing, making certain grease holes are in alignment.
 - b. Axle main center-member, No. 24, by carefully inserting the rear pivot pin of center-member into support casting pivot pin bore.

c. Steering arm, No. 3, onto pedestal shaft and tighten clamp.

d. Front pivot bushing, No. 22, in front pivot bracket, No. 23.

e. Front pivot bracket to front pivot pin and attach to support casting.

f. Tie rods, No. 6, to main steering arm, No. 3.

g. Axle extensions, Nos. 15 and 25, to main center-member.

h. Tie rods Nos. 1 and 9, to spindle steering arms Nos. 10 and 27.

i. Shims, No. 21, (which are available in 0.002, 0.005 and 0.010 inch thickness) to the end of front pivot pin and secure with thrust plate, No. 20.

NOTE: End-play should be 0.002-0.008 inch between pivot bracket and center-member.

- j. Wheels.
- k. Lower grill panel.
- l. Grease fittings.
2. Lubricate all grease fittings.
3. Adjust toe-in 0-1/4 inch.



Fig. 6 — Adjusting Toe-In

ADJUSTING THE TOE-IN

To adjust the toe-in of all wide front axle models, loosen the right tie rod set screw at the outer end and the clamp bolt at the inner end. Turn the tube assembly, No. 2, Fig. 1, in (or out) to obtain the desired toe-in. See Fig. 6.

The toe-in is measured between the center tire ribs (at hub height) at both front and rear. Proper toe-in is obtained when the distance across the front is 0 to 1/4 inch less than the distance across the back. See Fig. 7.

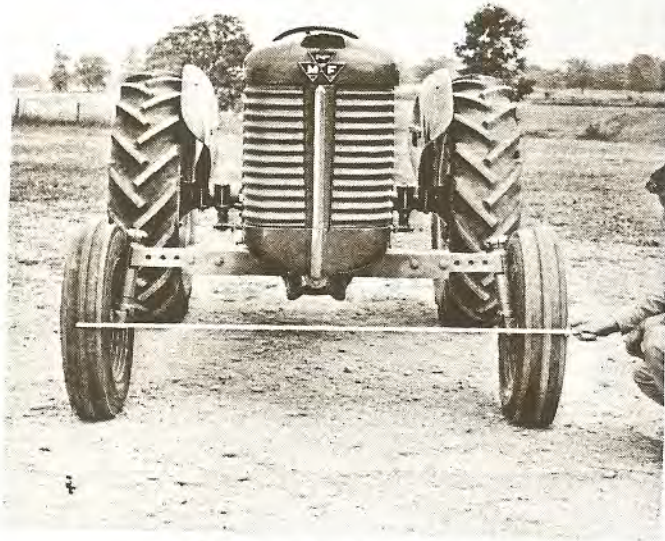


Fig. 7 — Measuring Toe-In

SERVICING THE ROW CROP SINGLE WHEEL FRONT AXLE REMOVING

To remove the single wheel fork axle assembly, proceed according to the following instructions, and refer to Fig. 8.

1. Support the tractor so that front wheel barely touches the ground, and then remove:
 - a. Lower grill panel.
 - b. Sheet metal dust cap, No 1.
 - c. Thrust plate, No. 2, by removing the cap screws.
 - d. Shims, No. 3.
 - e. Steering arm, No. 24, by working through opening in support casting, and loosening clamp bolt retaining the arm to wheel fork.
2. Carefully raise front end of tractor, while at the same time, withdrawing the wheel fork from below. See Fig. 9.

NOTE: Do not permit wheel fork shaft to become cocked out of line while removing.

3. Your purpose may or may not require removal of wheel; if it should be required, then do so as the first step of removal, refer to Group IV, Section B, Part 4 for instructions on removing wheel.

4. Remove the front axle support, No. 6, by removing the six cap screws.

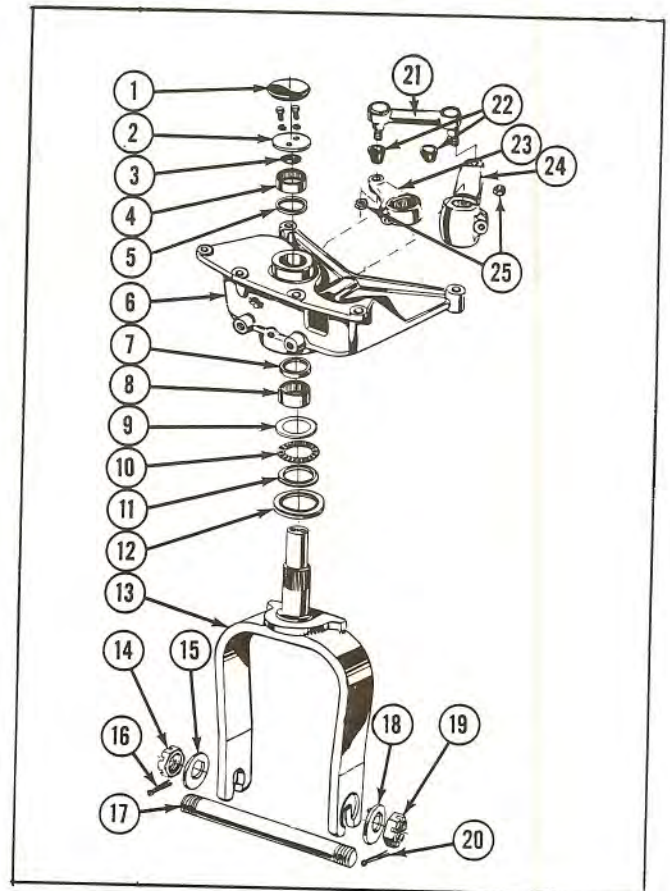


Fig. 8 — Single Front Wheel Axle Nomenclature

- | | |
|---------------------------|-----------------------|
| 1. Dust Cap | 13. Yoke Assembly |
| 2. Thrust Plate | 14. Castellated Nut |
| 3. Shim Pack | 15. Eccentric Washer |
| 4. Needle Bearing | 16. Cotter Pin |
| 5. Oil Seal | 17. Front Axle Shaft |
| 6. Front Support Assembly | 18. Eccentric Washer |
| 7. Oil Seal | 19. Castellated Nut |
| 8. Needle Bearing | 20. Cotter Pin |
| 9. Upper Bearing Race | 21. Arm Link Assembly |
| 10. Thrust Bearing | 22. Dust Seals |
| 11. Lower Bearing Race | 23. Spindle Arm |
| 12. Oil Seal | 24. Main Steering Arm |

DISASSEMBLING

Remove: (Refer to Fig. 8).

1. The upper needle bearing, No. 4, from support casting No. 6.
2. Oil seal, No. 5, from support casting.
3. Oil seal, No. 7, from support casting.

4. Lower needle bearing, No. 8, from fork shaft, No. 13.
5. Bearing race, No. 9, from fork shaft.
6. Needle thrust bearing, No. 10, from fork shaft.
7. Bearing race, No. 11, from fork shaft.
8. Oil Seal, No. 12.

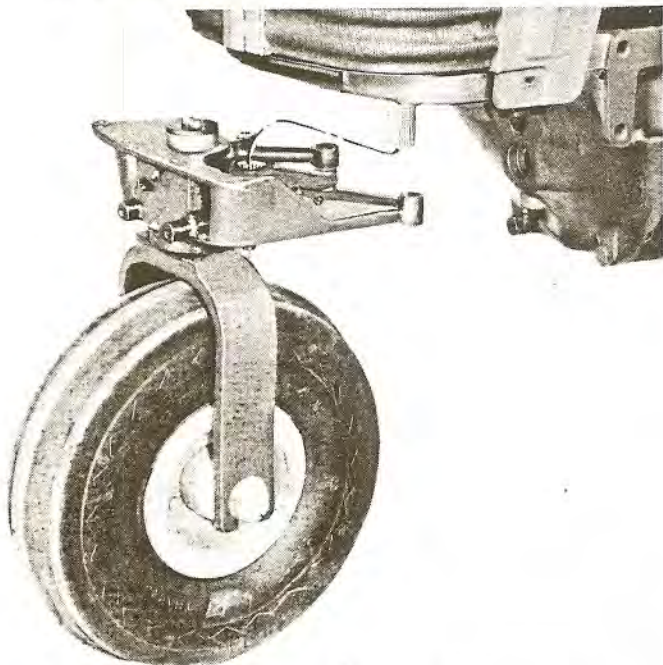


Fig. 9 - Removing Single Front Wheel Axle Assembly

INSPECTING

Clean all parts thoroughly; examine needle bearings and the needle thrust bearing. Replace new parts and oil seals if necessary.

ASSEMBLING AND INSTALLING

1. To assemble and install the wheel fork, simply reverse the steps of the disassembly procedure. A blind spline on the wheel fork and the steering arm will facilitate correct alignment of the two parts.

2. Adjust the up and down end-play of the wheel fork to 0.002-0.008 inch measuring clearance between lower face of support casting and upper face of wheel fork. Shims provide for this adjustment.

3. Adjust the front wheel (which has a taper roller bearing) to have a slight rotational drag.

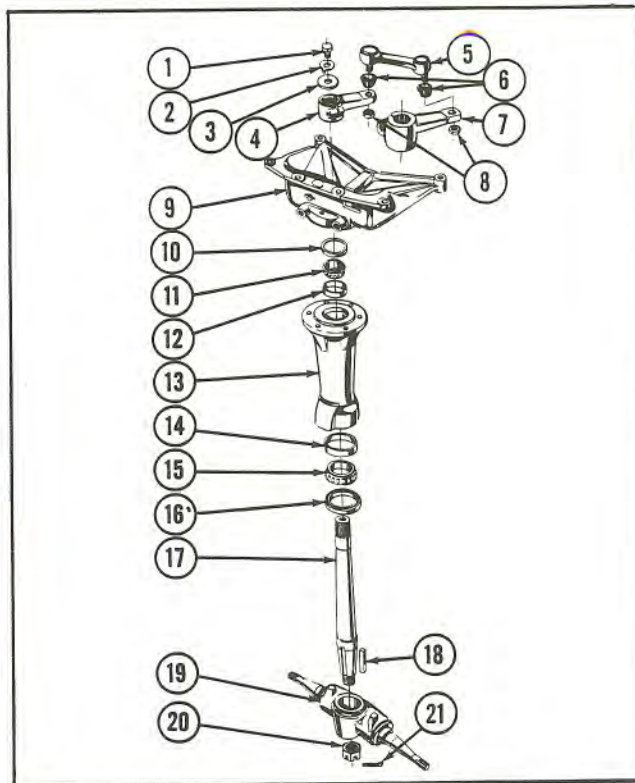


Fig. 10 - Twin Front Wheel Axle Nomenclature

- | | |
|---------------------------|----------------------------|
| 1. Cap Screw | 12. Upper Bearing Cup |
| 2. Lip Washer | 13. Pedestal Housing |
| 3. Flat Washer | 14. Lower Bearing Cup |
| 4. Spindle Arm | 15. Lower Bearing Cone |
| 5. Arm Link Assembly | 16. Oil Seal |
| 6. Dust Seals | 17. Spindle Shaft |
| 7. Steering Arm | 18. Shaft Key |
| 8. Nut | 19. Front Spindle Assembly |
| 9. Front Support Assembly | 20. Castellated Nut |
| 10. Oil Seal | 21. Cotter Pin |
| 11. Upper Bearing Cone | |

4. Lubricate the assembly thoroughly.

NOTE: Always press or drive a needle bearing from the lettered side of bearing.

SERVICING ROW CROP TWIN WHEEL FRONT AXLES
REMOVING

To remove the twin wheel axle, proceed as follows:

1. Support the tractor with front wheels touching the ground (complete disassembly is more easily accomplished when wheels are removed).

2. Remove: (Refer to Fig. 10).

a. Lower grill panel.

b. Cap screw, No. 1, after unlocking lip washer, No. 2.

- c. Flat washer, No. 3.
 - d. Steering arm, No. 7, working through support casting.
3. Carefully raise tractor, and at the same time, withdraw from below, the spindle shaft, No. 17, axle, No. 19, and wheels as an assembly. (See Fig. 11).
4. Remove:
- a. Lower pedestal assembly, No. 13, from support casting, No. 9.
 - b. Front axle support, No. 9.

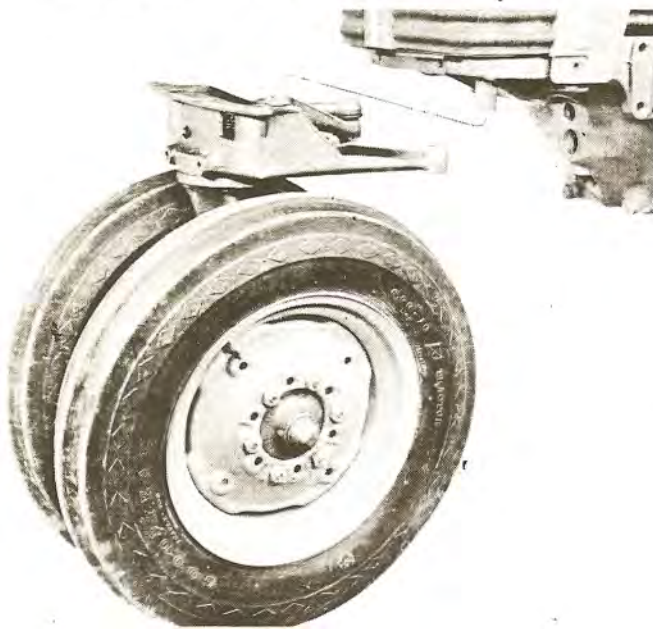


Fig. 11 — Removing Twin Front Wheel Axle Assembly

DISASSEMBLING

Remove: (Refer to Fig. 10)

- 1. Oil seals, Nos. 10 and 16, from pedestal, No. 13.

- 2. Upper and lower bearing cones, Nos. 11 and 15, from pedestal.
- 3. Upper and lower bearing cups, Nos. 12 and 14, from pedestal.
- 4. Cotter pin and castellated nut, No. 20, from spindle shaft, No. 17.
- 5. Axle, No. 19 and key, No. 18, from spindle shaft.

INSPECTION

Clean all parts thoroughly and examine for wear. Replace new parts and oil seals if necessary.

ASSEMBLING AND INSTALLING

- 1. Reverse the disassembly procedures and tighten cap screw No. 1, Fig. 10 until all end-play is removed from spindle, leaving a slight drag on the bearings.
- 2. Blind splines on the lower spindle shaft in the steering arm provide for a correct installation.

See Group IV, Section B, Part 4 for wheel and hub information.

NOTE: When assembling, install new oil seals, and lightly grease the sealing surfaces. Rotate the shaft as it passes through seals.

- 3. Lubricate the assembly thoroughly.

PART 5—POWER STEERING PUMPS—MF 35, 50 AND 65 TRACTORS

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DESCRIPTION

The power steering pump is constant running, gear type and is driven by the camshaft gear train. The pump delivers a volume of oil to the system with a regulated pressure of 1100 to 1200 psi, except on the MF 65 Diesel with the direct injection engine, tractor Serial No. 685 996 and up, which has a regulated pressure of 1500 psi. A relief valve is located in the pump to maintain this pressure.

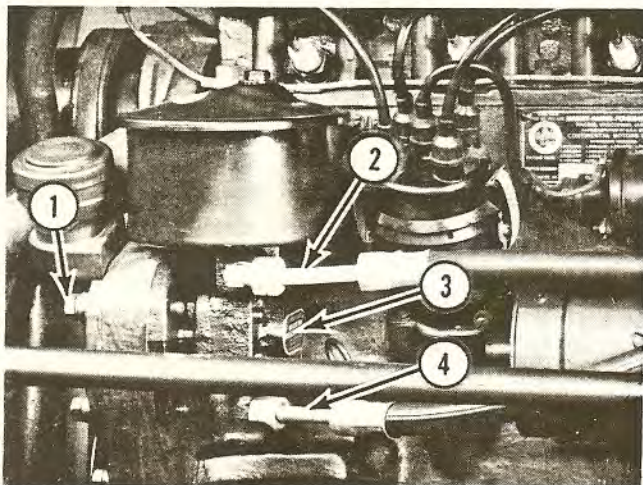


Fig. 1 - Barnes Power Steering Pump

1. Mounting Bolt 2. Return Line 3. Name Plate 4. Pressure Line

SERVICING PUMP (Gas Tractors)

The power steering pumps listed in this section are used on MF and TO 35, 40 and 50 Tractors, also MF 65 Tractors. The early model 35, 40, 50 and 65 Gas Tractors use the Barnes pump, which can be identified by a tag on the housing; see Fig. 1. This pump can be replaced for service by a Cessna pump which is also used on late model gas tractors. See Fig. 2 for identification of this pump.

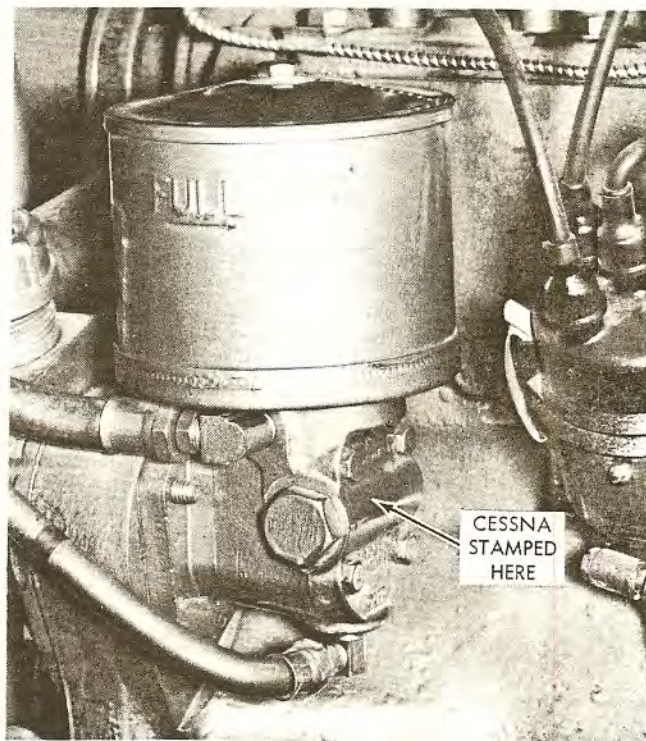


Fig. 2 - Cessna Power Steering Pump

NOTE: The pump drive gear used on the 35, 40 and 50 gasoline model tractors is different from that used on the 65 gasoline tractors.

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