Read the operator’s manual entirely. When you see this symbol, the subsequent instructions and warnings are serious - follow without exception. Your life and the lives of others depend on it!

Illustrations may show optional equipment not supplied with standard unit.
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2019-03-21
Important Safety Information

Look for Safety Symbol
The SAFETY ALERT SYMBOL indicates there is a potential hazard to personal safety involved and extra safety precaution must be taken. When you see this symbol, be alert and carefully read the message that follows it. In addition to design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

Be Aware of Signal Words
Signal words designate a degree or level of hazard seriousness.

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Use Adequate Lifting Means
The frame sections and gangs of this machine are extremely heavy. If using multiple lifters, make sure each is rated for at least its share of the load.

Prepare for Emergencies

▲ Be prepared if a fire starts
▲ Keep a first aid kit and fire extinguisher handy.
▲ Keep emergency numbers for doctor, ambulance, hospital and fire department near phone.
Be Familiar with Safety Decals

▲ Read and understand the “Safety Decals” section of the Operators Manual.
▲ Read all instructions noted on the decals.
▲ Keep decals clean. Replace damaged, faded and illegible decals.

Wear Protective Equipment

▲ Wear protective clothing and equipment.
▲ Wear clothing and equipment appropriate for the job. Avoid loose-fitting clothing.
▲ Because prolonged exposure to loud noise can cause hearing impairment or hearing loss, wear suitable hearing protection such as earmuffs or earplugs.
▲ Because operating equipment safely requires your full attention, avoid wearing entertainment headphones while operating machinery.

Avoid High Pressure Fluids

Escaping fluid under pressure can penetrate the skin, causing serious injury.

▲ Avoid the hazard by relieving pressure before disconnecting hydraulic lines.
▲ Use a piece of paper or cardboard, NOT BODY PARTS, to check for suspected leaks.
▲ Wear protective gloves and safety glasses or goggles when working with hydraulic systems.
▲ If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury.

Use Safety Lights and Devices

Slow-moving tractors and towed implements can create a hazard when driven on public roads. They are difficult to see, especially at night.

▲ Use flashing warning lights and turn signals whenever driving on public roads.

Use lights and devices provided with implement

Keep Riders Off Machinery

Riders obstruct the operator’s view. Riders could be struck by foreign objects or thrown from the machine.

▲ Never allow children to operate equipment.
▲ Keep all bystanders away from machine during operation.

Shutdown and Storage

▲ Lower implement, put tractor in park, turn off engine, and remove the key.
▲ Secure FCA4500 using blocks and supports provided.
▲ Detach and store FCA4500 in an area where children normally do not play.
Tire Safety

Tire changing can be dangerous and should be performed by trained personnel using correct tools and equipment.

- When inflating tires, use a clip-on chuck and extension hose long enough for you to stand to one side—not in front of or over tire assembly. Use a safety cage if available.
- When removing and installing wheels, use wheel-handling equipment adequate for weight involved.

Safety At All Times

Thoroughly read and understand the instructions in this manual before operation. Read all instructions noted on the safety decals.

- Be familiar with all machine functions.
- Operate machinery from the driver’s seat only.
- Do not leave machine unattended with tractor engine running.
- Do not stand between the tractor and machine during hitching.
- Keep hands, feet and clothing away from power-driven parts.
- Wear snug-fitting clothing to avoid entanglement with moving parts.
- Watch out for wires, trees, etc., when folding and raising machine. Make sure all persons are clear of working area.
Introduction

The FCA4500 Field Cultivator Air Drill has been designed with care and built by skilled workers using quality materials. Proper setup, maintenance, and safe operating practices will help the customer get years of satisfactory use from the machine.

Description of Unit

The FCA4500 Field Cultivator Air Drill, is a five-section seedbed preparation and planting tool all in one. Working width is 45 feet. The implement is designed for secondary field operations to smooth, level, eliminate weeds incorporate chemicals, apply fertilizer and drill seed.

Models Covered

FCA4500-7275  45-Foot 5-section 7.5” spacing

Document Family

560-594Q-ENG  Assembly Manual (this document)
560-594Q  Pre-Delivery Manual
560-594M  Operator Manual
560-594P  Parts Manual

Tools Required

• Basic Hand Tools
• Torque Wrench
• Fork Truck, Overhead Hoist or Loader

Pre-assembly Checklist

1. Before assembling, read and understand "Important Safety Information" in front part of this manual.
2. Have at least two people on hand while assembling.
3. Make sure area is level and free of obstructions (preferably an open concrete area).
4. Have all major components
5. Have all fasteners and pins shipped with FCA4500 Field Cultivator Air Drill.
Using This Manual
This manual was written to help you assemble and prepare the new machine for the customer. The manual includes instructions for assembly and setup. Read this manual and follow the recommendations for safe, efficient and proper assembly and setup.

A parts manual is also provided with the new machine. Refer to the parts manual for proper part’s identification. As a reference, keep the operator’s and part’s manual on hand while assembling.

The information in this manual is current at printing. Some parts may change to assure top performance.

Definitions
The following terms are used throughout this manual.

**NOTICE**
A crucial point of information related to the preceding topic. Read and follow the directions to remain safe, avoid serious damage to equipment and ensure desired field results.

 Useful information related to the preceding topic.

Right-hand and left-hand as used in this manual are determined by facing the direction the machine will travel while in use unless otherwise stated. An orientation rose in some line art illustrations shows the directions of: Up, Back, Left, Down, Front, Right
Shipping Inventory

The machine will be shipped partially assembled, as shown, in several big shipping racks and shipping boxes. The K-Flex mounts should be installed in the correct locations on the frames. The openers and the reel baskets will be assembled but will need to be install in the correct location on the machine. Locate the reel arms, opener arm mounts, opener arms and mounting hardware before installing. See “FCA4500-7275 Opener Layout” on page 40 & 35 for proper placement.

Refer to Figure 3

- All frame sections, hitch and torque tubes will be shipped in shipping container.
Refer to Figure 4

- Shank parts, small parts and bolts will be shipped in boxes or secured and sitting on the bottom of the shipping racks. Openers will be attached to their respective attachment bars and will need installed with mounts onto the rear or the frame sections. Shipping stands, and racks do not need to be returned to Great Plains.

Unloading

Once everything is unloaded from “storage pod” you may proceed with taking parts out of shipping containers. Carefully move everything to a level site and prepare to un-pack items.

Unpacking Components

Be sure you have read and understood the Important Safety Information, starting on page 1 of this manual, before you start unpacking components.

Unload Smaller Items First

Unloading the frames is a potentially dangerous operation.

Reduce risk and complication by first unloading

6. the tires, gauge wheel assemblies,
7. boxes, crates
8. the smaller items

Place these components well out of the maneuvering area needed for unloading the shipping racks.

Centering components:

Be sure and center fork truck or chains (overhead hoist) on components so they won’t slide and cause injury.

Unload individual components one at a time using a fork truck or overhead hoist. Place frame sections on level ground using shipping stands or assembly stands if available.

Move each component out of the way so you have plenty of room to remove the next one.

9. Carefully unload the shipping racks that contain the frames and cart components out of shipping container

Unpacking Boxes

10. Carefully remove banding and lids from boxes.
11. Locate and identify all components and hardware before assembling.

Further Assistance

Great Plains Manufacturing, Inc. wants you to be satisfied with your new Turbo Chisel Narrow. If for any reason you do not understand any part of this manual or are otherwise dissatisfied with the product please contact:

Great Plains Service Department
1525 E. North St.
PO Box 5060
Salina, KS 67402-5060

Or go to www.greatplainsag.com and follow the contact information at the bottom of your screen for our service department.
Assembly

Center Frame Assembly

Refer to Figure 5

12. Once the center frame has been uncrated and placed on assembly stands, the brace bar and trusses may be installed.

13. Carefully move center brace bar 12 to front of center frame 1, with overhead hoist or fork lift, secure with \( \frac{3}{4} \times 2 \) hex bolts 3, \( \frac{3}{4} \) lock washers and \( \frac{3}{4} \) nuts.

14. Attach center frame trusses 4 with \( \frac{3}{4} \times 2 \) hex bolts 5 (front plates), \( \frac{3}{4} \) lock washers and \( \frac{3}{4} \) nuts, rear plates with \( \frac{5}{8} \times 1 \frac{1}{2} \) hex bolts 6, \( \frac{5}{8} \) lock washers and \( \frac{5}{8} \) nuts.

15. Attach light brackets, LH 7 and RH 8 with \( \frac{1}{2} \times 4 \frac{1}{32} \times 4 \) u-bolts 9, \( \frac{1}{2} \) lock washers and \( \frac{1}{2} \) nuts.

See machine layout section in “Appendix” for proper light bracket placement.

16. Attach light mounting brackets 10 to rear of center frame truss with \( \frac{1}{2} \times 1 \frac{1}{2} \) hex bolt 11, \( \frac{1}{2} \) lock washers and \( \frac{1}{2} \) nuts.

17. Mount smv post 12 with \( \frac{1}{2} \times 4 \frac{1}{32} \times 4 \) u-bolt 13, \( \frac{1}{2} \) lock washers and \( \frac{1}{2} \) nuts as close to center of tube as possible. Attach smv sign 14 to rear of smv post with \( \frac{1}{4} \times \frac{3}{4} \) pan head screws 15, \( \frac{1}{4} \) lock washers and nuts.

18. All bolts may be tightened to specs, See “Torque Values Chart” on page 30. Plastic end caps may need to be attached to any and all open 4 x 3 tubes.
Torque Tube & Level Bar

Refer to Figure 6

19. Carefully raise the torque tube (1) with an overhead hoist and secure with 1 1/4 x 6 pins (2), 3/8 x 2 1/4 Gr. 8 hex bolt (3) and 3/8 top lock nut.

20. Attach rear of RH level bar (4) to the torque tube with the 1 x 6 Gr. 8 special hex bolt (6) and 1 top lock nut. Repeat with LH level bar (5).

21. Mount the level bar cross tube (7) to the level bar side plates with 1/2 x 1 1/2 hex bolts (8), secure with 1/2 lock washers and 1/2 nuts.

22. Now attach the rear of the level bar link (9) the front side of the level bar assembly (4) and (5), secure with 1 1/4 threaded bar pin (10), 1 1/4 flat washers (18), 1/4 slotted nuts and 3/16 x 1 1/2 roll pins.

23. Align holes in leveling links (11) with outer tubes of level bars and other end with welded ears on center brace bar. Secure with 1 x 7 Gr. 8 special thread bolts (13) and 1 top lock nuts. Align holes in front leveling links (12) with front of level bar link (9) and other end with welded ears on center brace bar. Secure with 1 x 7 Gr. 8 special thread bolts (13) and 1 top lock nuts.

24. Align top holes in rear leveling links (12) with rod end of 3.50 x 8 x 1.25 cylinders (14) and rear of level bar link (9) secure with 1 x 11 1/2 lift pin (16), 1.5 x 1.00 x.075 machine washers and 3/16 x 2 cotter pins. Fasten other end to welded ears on center brace bar with 1 x 9 Gr. 8 hex bolt (18) and 1 top lock nut.

25. Attach base end of 3.50 x 8 x 1.25 cylinders (16) to plates on front of center frame with 1 x 3 1/8 pin (19), 1.5 x 1.0 x.075 machine washer and 3/16 x 2 cotter pin.

26. Install cylinder transport lock pin (17) through aligned holes of front hole of level bar link (6) and welded ear of center brace bar. Tighten all bolts with lock nuts down snug but make sure everything will still pivot on bolts. Rest of bolts may be tightened to specs, See "Torque Values Chart" on page 30.
Center Fold

Refer to Figure 7

27. Attach inside plates of center wing stop ①, to center frame trusses using 5/8 x 1 1/2 bolts ②, 5/8 lock washers and nuts.

28. Attach outside plates of center wing stop ③, to outside tubes of center frame with 5/8 x 3 1/32 x 6 1/2 u-bolts ④, 5/8 lock washers and nuts.

29. Mount front ④ and rear ⑤ fold brackets to center frame plates with 5/8 x 1 1/2 bolts ②, 5/8 lock washers and nuts.

30. Insert the 1/2 x 4 1/2 pin w/keepers ⑥ into round tubes on wing stop ①.

31. All bolts may be tightened to specs, See “Torque Values Chart” on page 30.

Connect Hitch

Refer to Figure 8

32. Attach hitch ① to center brace bar using 1 1/4 x 7 Gr. 8 hex bolts ②, 1 1/4 flat washers ③ (one on outside of hitch, both sides) and 1 top lock nut.

33. Mount square jack ⑥ to front mount on hitch ① with pin provided with jack.

• Use jack to help support front of hitch for rest of hitch assembly.

34. Align holes in hitch base ⑤ with holes in front of hitch ①.

35. Align holes in safety chain support ⑧ with holes on left side of hitch ①, secure with 1 x 8 Gr. 8 special hex bolts ⑦, 1 lock washers and 1 nuts.

36. Install safety chain ⑧ on bottom side of hitch ①, secure with 7/8 x 3 hex bolt ⑩, 7/8 flat washer ⑨, 7/8 lock washer and 7/8 nut.

37. Route safety chain ⑧ through safety chain support ⑥.

38. Mount spring hose loop ⑪ to top side of hitch ①, with 1/2 x 1 bolt ⑫, 1/2 lock washer and 1/2 flat washer.

39. Mount the manual pack ⑬ to hitch ① with 1/4 x 3/4 pan screws ⑭, rubber spacers ⑮, 1/4 lock washers and 1/4 nuts.

40. All bolts may be tightened to specs, See “Torque Values Chart” on page 30.
Install Inside Wings

Refer to Figure 9

☐ Be sure and install the 1 x 6 1/4 hinge pins ☐ as shown with roll pin in slot on front side of hinge. Wing fold brackets should already be installed on the inside wing frames.

41. Carefully align holes in wing frame LH ☑ with holes in center frame. Secure with 1 1/4 x 6 1/4 hinge pins ☒, 3/8 x 2 1/2 roll pins, 1 flat washer and 1 top lock nut.

42. Attach wing brace ☐ to the front of the wing frame LH ☑ with 3/4 x 2 hex bolts ☑, 3/4 lock washers and 3/4 hex nuts.

43. Align holes in wheel arm LH ☑ with plates on wing frame LH ☑, secure with 1 1/4 x 6 hinge pins ☒, 3/8 x 2 1/4 hex bolts and 3/8 top lock nuts.

44. Fasten LH wing truss ☒ to wing with 5/8 x 1 1/2 hex bolts ☒, 5/8 lock washers and 5/8 hex nuts.

45. Align hole in rear of LH wing pull ☒ to LH wheel arm ☑, with 1 x 3 1/8 clevis pin ☒, 1.5 x 1.0 x.075 machine washer and 3/16 x 2 cotter pin.

46. Align bottom holes of leveling links ☒ with ear on wing brace ☑, secure with 1 x 9 Gr. 8 bolt ☒ and 1 top lock nut.

47. Align top holes in leveling links ☒, rod end of 4.25 x 8 x 1.50 lift cylinder ☒ and front of LH wing pull ☒, secure with 1 x 7 Gr. 8 special thread bolt ☒ 1 top lock nut.

48. Attach base end of 3.25 x 8 x 1.25 lift cylinder ☒ to ear of wing brace ☑ with 1 x 3 1/8 pin ☒, 1.5 x 1.0 x.075 machine washer and 3/16 x 2 cotter pin.

49. Repeat same procedure for right wing.

50. Tighten all bolts to specs, See “Torque Values Chart” on page 30.
Install Outside Wings

Refer to Figure 10

The outside wing hinges with the 180° fold rocker should already be installed on the wing frames.

51. Attach outside wing brace ① to front side of wing frame ②, with 3/4 x 2 hex bolts ③, 3/4 lock washers, 3/4 hex nuts.
52. Carefully align holes in wing hinges ④, with holes in fold brackets, secure with 11/4 x 7 Gr. 8 hex bolt ⑤ and 11/4 x 8 Gr. 8 ⑥, and 11/4 top lock nut.
53. Attach holes in wheel arm ⑦, to wing frame ②, secure with 11/4 x 6 pin ⑧, 3/8 x 21/4 Gr. 8 hex bolts and 3/8 top lock nut.
54. Attach base end of 4 x 8 x 1.37 lift cylinder ⑨ to the outside wing brace ① with 1 x 33/8 pin ⑩, 1.5 x 1.0 x.075 machine washer and 3/16 x 2 cotter pin. Align rod end of cylinder with holes in the wing pull bar ⑪ & 2 leveling links ⑫ secure with 1 x 7 Gr. 8 hex bolt ⑬, 1 top lock nut.
55. Attach wing pull bar ⑫ to turn buckle ⑭ using 1 x 33/8 pin ⑮, 1.5 x 1.0 x.075 machine washer and 3/16 x 2 cotter pin.
56. Attach base end of 4 x 14 x 1.25 fold cylinders ⑯ to wing fold bracket ⑰ with 1 x 31/8 pin ⑱, 1.5 x 1.0 x.075 machine washer and 3/16 x 2 cotter pin.
57. Do not attach rod end of fold cylinders until fold system has been purged, See “Purging Hydraulic System” on page 26.
58. Attach T bracket ⑱ to wing frame with 1/2 x 31/32 x 5 u-bolts ⑲, 1/2 lock washers and 1/2 nuts. See layout section in “Appendix” for proper placement of T bracket ⑳. Repeat for other wing.

Tighten all bolts to specs, See “Torque Values Chart” on page 30.

Figure 10
5-Section Outside Wing
Transport

Center Transport

Refer to Figure 11

See transport section of “Parts Manual” for proper parts breakdown for center walking beam assemblies (left hand and right hand). See notes on drawing for proper hole placement of walking beam spindle and front tube on walking beam. See “Tire Inflation Chart” on page 31, for proper tire sizes for tire/wheel assembly ⑤.

59. Install the walking beam assembly ① into the torque tube with 5/16 x 4 Gr. 8 hex bolt ② and 5/16 top lock nut.

60. Align hole in spindle/hub assembly ③ to hole in walking beam assembly ① secure with 1/2 x 4 1/2 hex bolt ④ and top lock nut.

61. Mount tire/wheel assembly ⑤ to spindle/hub assembly ③ with 5/8 lug nuts ⑥.

Left hand is shown. Repeat same procedure for right side.

62. Tighten all bolts to specs, See “Torque Values Chart” on page 30.

Inside Wing Transport

Refer to Figure 12

See transport section of “Parts Manual” for proper parts breakdown for inside wing walking beam assemblies. See notes on drawing for proper hole placement on walking beam spindle and front tube of walking beam. See “Tire Inflation Chart” on page 31, for proper tire sizes for tire/wheel assembly ⑥.

63. Install the walking beam assembly ① into the wing torque tube with 5/16 x 4 Gr. 8 hex bolt ② and 5/16 top lock nut.

64. Align hole in spindle/hub assembly (13.5” spindle) ③ and spindle hub assembly (17” spindle) ④ to hole in walking beam assembly ① secure with 5/16 x 2 13/16 pin clevis ⑤ and cotter pin.

65. Mount tire/wheel assembly ⑥ to spindle/hub assembly ③ and ④ with 9/16 lug nuts ⑦.

Left hand is shown. Repeat same procedure for right side.

66. Tighten all bolts to specs, See “Torque Values Chart” on page 30.
Outside Wing Transport

Refer to Figure 13

**WARNING**

On outside wings the torque tubes will be the opposite of the inside wings on the same side. Example: On the left outside wing you will install a right hand wing torque tube.

See transport section of “Parts Manual” for proper parts breakdown for wing walking beam assemblies. See notes on drawing for proper hole placement on walking beam spindle and front tube of walking beam. See “Tire Inflation Chart” on page 31, for proper tire sizes for tire/wheel assembly.

67. Install the walking beam assembly ① into the wing torque tube with 5/16 x 4 Gr 8. hex bolt ② and 5/16 top lock nut.

68. Align hole in 13.5" spindle/hub assembly ③ to hole in walking beam assembly ① secure with 5/16 x 2 13/16 pin clevis ⑤ and cotter pin. Repeat with 17" spindle/hub assembly ⑥.

69. Mount tire/wheel assembly ⑦ to spindle/hub assembly ③ and ⑤ with 5/16 lug nuts ⑧.

Left hand side is shown. Repeat same procedure for right side.

70. Tighten all bolts to specs, See “Torque Values Chart” on page 30.
Install Gauge Wheel (Caster Style)

Refer to Figure 14

Gauge Wheel Arms will be shipped assembled but will to be installed on the machine. Wheels will need to be mounted on the hubs. Be sure and install the 1 x 5\(\frac{1}{2}\) pin \(\circ\) as shown with roll pin in slot on outside of pivot mount \(\circ\). See “Tire Inflation Chart” on page 31, for proper tire sizes for tire/wheel assembly \(\circ\).

71. Start by installing the LH or RH caster wheel arm \(\circ\) and top caster wheel arm \(\circ\) to the brackets on frames with 1 x 5\(\frac{1}{2}\) gauge wheel pin \(\circ\), \(\frac{7}{8}\) flat washers and \(\frac{7}{8}\) lock nuts.

72. Fasten back side of turnbuckle assembly \(\circ\) to LH or RH wing pull bar (level bar on center section), front side to lever to caster wheel arm with 1 x 3\(\frac{1}{16}\) clevis pins \(\circ\) and 3\(\frac{1}{16}\) x 2 cotter pins.

73. Attach the pivot mount assembly \(\circ\) to caster wheel arms \(\circ\) and \(\circ\), secure with 1 x 5\(\frac{1}{2}\) gauge wheel pins \(\circ\), 3\(\frac{1}{8}\) x 2 roll pins, \(\frac{7}{8}\) flat washers and \(\frac{7}{8}\) lock nuts.

74. Slide 6-bolt hub assembly \(\circ\) into pivot mount assembly \(\circ\), align holes, secure with 5\(\frac{1}{16}\) x 3 hex bolt \(\circ\) and 5\(\frac{1}{16}\) lock nut.

75. Attach the wheel/tire assembly \(\circ\) to 6-bolt hub assembly and secure with 5\(\frac{1}{16}\) lug nuts \(\circ\).

76. Tighten bolts to specs, See “Torque Values Chart” on page 30.

77. See layout section in “Appendix” for proper adjustment of gauge wheel assembly.

**NOTICE**

Outside wing gauge wheels will need to be installed oriented with the tire to the inside.

78. Install just like the other gauge wheels.
Install K-Flex

See layout section in “Appendix” for proper shank placement.

Refer to Figure 15

79. Slide k-flex shank mount ① through slot in k-flex clamp ②. Slide these two parts over frame tube in proper location.

80. Align top hole in k-flex clip ③ with top hole in k-flex clamp ②, secure with 1/2 x 1 1/2 hex bolt ④, 1/2 lock washer and nut. Install 1/2 x 5 hex bolts ⑤, 1/2 lock washers and nuts.

81. Slide shank ⑥ through slotted hole in k-flex shank mount (1), secure with 5/8 x 2 hex bolt ⑦ and 5/8 top lock nut. Attach sweep ⑧ with 1/16 x 1 3/4 plow bolts ⑨, one, 1/16 flat washer ⑩ (top slotted hole) and 1/16 nylock nuts.

82. Tighten all bolts to specs, See “Torque Values Chart” on page 30.

Install Magnum Shank

See layout section in “Operator’s Manual” for proper shank placement.

Refer to Figure 16

83. Loosen 1/2 x 1 1/2 hex bolt ④ clear up to get 5/8 x 2 hex bolt ⑤ installed.

84. Position pre-assembled shank mount assembly ① over front of frame tube in proper location. Secure with 5/8 x 4 1/32 x 4 3/4 u-bolt ② and 5/8 top lock nut.

85. Be sure the 3/4 nylock jam nut ③ is loose enough for shank cradle to pivot.

86. Slide shank ⑤ into shank cradle until holes are aligned, secure with 5/8 x 2 hex bolt ⑥ and 5/8 top lock nut.

87. Align sweep ⑦ with holes on shank ⑤, secure with 1/16 x 1 3/4 plow bolts ⑨, one, 1/16 flat washer ⑩ (top slotted hole) and 1/16 nylock nuts.

88. Re-tighten 1/2 x 1 1/2 hex bolt ④ until threads bottom out.

IMPORTANT(!) Be sure and tighten 3/4 nylock jam nut ③ until threads bottom out to insure that hole doesn’t wear excessively.

89. Tighten rest of bolts to specs, See “Torque Values Chart” on page 30.
Hydraulics

Hydraulic hoses may be shipped partially assembled (attached to fittings and some cylinders). These assemblies will need to be mounted on the machine and attached to the correct cylinders. See “Hydraulic Layouts” starting on page 28.

Hydraulic Depth Stop

Refer to Figure 20

90. Align holes in depth control valve ① to top of depth stop valve mounting bracket ② using 5/16 x 2 hex bolts ② and 5/16 lock washers.

91. Slide one end of depth stop tube ③ (with 2 holes) through slotted hole in depth stop valve mounting bracket. Slide other end of depth stop tube ③ over peg on LH level bar, secure with 1/2 flat washer ④ and 1/8 x 1 cotter pin ④.

92. Bolt depth stop screw assembly ④ to front of depth stop tube ③ with 1/2 x 2 1/2 hex bolts ⑥, 1/2 lock washers and 1/2 nuts.

93. Tighten bolts to specs. See “Torque Values Chart” on page 30 and bend cotter pin.

Install all hydraulic fittings as shown in steps on following pages. Refer to layout section in “Appendix” for complete hydraulic layouts.

Depth Control Valve

Refer to Figure 18

94. Thread elbow (adjustable stud) fitting ② into rear port of depth stop valve ①. Thread straight (non-adjustable stud) fittings ③ into right port of depth control valve ①.

Tighten ORB fittings, See “Rebound Valve and O-Ring Fittings” on page 18
Rebound Valve and O-Ring Fittings

Refer to Figure 19

95. Thread straight (non-adjustable stud) fittings \( \equiv \) into ports V1, V2 and C2 of rebound valve \( 1 \).

\- Tighten as shown below. Do not over tighten as this could cause damage to valves.
  a. Inspect all components for damage or contamination during shipping.
  b. Lubricate o-ring and threads on fitting.
  c. Turn fitting into port until finger tight, See “Hydraulic Connectors and Torque” on page 31 or proper torque value.

96. Thread elbow (adjustable stud) fitting \( \equiv \) into port C1 of rebound valve \( 1 \).
  a. Follow steps a and b from the foregoing instructions, then proceed with the following steps below.
  b. Looking from fitting from end with nut/washer/o-ring assembly, turn nut clockwise as far as possible.
  c. Using wrench, turn fitting into port until the washer touches the port spot face. Continue turning fitting until washer touches thread nearest wrench pad.
  d. Back off fitting counterclockwise not exceeding one revolution until it is oriented in the correct position.
  e. Place wrench on the wrench pad of fitting to prevent fitting from turning, and See “Hydraulic Connectors and Torque” on page 31 for proper torque value.
Hydraulic Fold Valves

Refer to Figure 20

The Hydraulic Fittings for the fold system will be partially assembled. Will need to be mounted and the hoses routed along the machine.

97. The Hydraulic Fold fittings will need to be attached to the front fold bracket along with a second double hydraulic tee block (1) using $\frac{5}{16} \times 5\frac{1}{2}$, $\frac{5}{16}$ lock washer and $\frac{5}{16}$ hex nuts. Route the attached hoses (6) towards the back of the machine and attach to another double hydraulic tee block (1) that needs to be mounted on the rear fold bracket using $\frac{5}{16} \times 3\frac{1}{2}$, $\frac{5}{16}$ lock washer and $\frac{5}{16}$ hex nuts.

98. These hoses will T-off and will need to be connected with the T-fitting (5) that comes out of the front Tee Block (1) and the T-fitting (6) that comes out of the solenoid valve (7). These 2 valves control the hydraulics for the seed towers.

99. Attach fold hoses to the rear double hydraulic tee block (1) and then to the fold cylinders. Do not attach the cylinders to the wing fold brackets until after you purge the hydraulic system.

100. Tighten bolts to specs, See “Torque Values Chart” on page 30 and bend cotter pin.
Install Fold System Double Tee Blocks

Refer to Figure 21

These hoses may be shipped partially assembled.

101. Thread elbow (adjustable stud) fitting ② into rear and front ports of double tee blocks ①. Thread straight (non-adjustable stud) fittings ③ into left and right ports of double tee block ①.

102. Fasten MJIC tee’s ④ between hoses as shown. See “Opener Hydraulics” on page 21 for proper installation.

Tighten ORB fittings, See “Rebound Valve and O-Ring Fittings” on page 18.

Install Hose Handles

Refer to Figure 22

Hose handles are color coded. See “Hydraulic Hose Hookup” on page 25 for proper placement on hoses.

103. Install fittings ② to end of hoses ① running to front of hitch. Attach poppet fittings ③ to fittings ②.

104. Tighten ORB fittings, See “Rebound Valve and O-Ring Fittings” on page 18.

105. Align the grooves in the front of the hose handles ④ to the back two ribs of fittings ② as shown and install the self threading screws ⑤ through holes.

106. Route hoses as shown in layout section in “Appendix”.

Figure 21
5-Section Double Tee Block

Figure 22
Hose Handle Assembly
Opener Hydraulics

Refer to Figure 20

The opener valve bracket, valves and hoses will be partially assembled. The bracket will need to be mounted on the front of the center frame section and the hoses routed along the machine.

107. Mount the valve bracket using 1 x 4 1/2 plate, and 3/8 x 5 1/2 hex bolts, 3/8 flat washers, 3/8 lock washers and 3/8 hex nuts.

108. Route single hose that is connected to the counter balance valve to the rear of the machine and connect to the bottom port on the bottom Double Tee Block (see drawing insert). This hose connects to the rod end of the opener cylinders. This hose will have T-fittings for each cylinder.

109. Hoses A, B & C attach to the base end of the opener cylinders. Match the lettered hoses to the ports on the rear tee blocks. Ports A connect to the center cylinders. Ports B connect to the inside wing cylinders. Ports C connect to the outside wing cylinders.

110. Tighten bolts to specs, See “Torque Values Chart” on page 30 and bend cotter pin.

111. See “FCA4500-7275 Opener Layout” on page 40 for proper routing.
Install JIC Fittings  
Refer to Figure 24

112. Install JIC female hose 1 to male fitting.

113. When the JIC hoses are routed, follow the following procedure for hooking up and tightening.
   a. Inspect for possible contamination or damage from shipping or handling. Sealing surface should be smooth. Annular tool marks of (100uin) concentric with thread permissible.
   b. Lubricate the threads and the entire surface of the cone with hydraulic fluid or a light lubricant.
   c. Align mating components for hand connection and turn flare nut until sealing surfaces make full contact.
   d. Torque nut to the values shown in "Torque Value Chart" page 23. If a wrench pad is provided next to nut, place a second wrench on pad to prevent flare from rotating while being torqued.
   e. When torquing nut onto a straight flared fitting, it may be necessary to also place a wrench on the flared fitting wrench pad to prevent it from turning during assembly.

114. Alternate Assembly Method for JIC.
   a. If torqued method not possible, follow steps a-c (step 166), then proceed to the steps below.
   b. Lightly wrench tighten the nut until there is firm resistance.
   c. Place a wrench on wrench pad next to nut as near the 6 o’clock position as possible.
   d. Place second wrench on nut as near the 3 o’clock position as possible.
   e. Turn nut clockwise to no less than the 4 o’clock position and no more than the 6 o’clock position. Required rotation generally decreases as size increases.
Attach Hose Clamps and Hose wraps

Refer to Figure 25

115. When all the hoses are hooked up and tightened properly, put hose clamps on hoses as shown.

116. Install hose wraps on hoses as needed.

Be sure and get hoses and light wiring harness fastened properly so they do not drag. Check to be sure there is enough slack in hinge area when folding machine the first time.

Hydraulic Handle Hook Up

The towers on the Field Cultivator will not retract during folding if the tractor does not have a live power pin in the 7 pin harness.

⚠️ CAUTION

If towers on wings do not retract during folding, crack any hydraulic hose fitting behind the check valve to relieve pressure on the towers. If this warning is ignored damage to the implement is certain.
ADC2350 Hydraulic Connections

**WARNING**

Only trained personnel should work on system hydraulics!

Escaping fluid under pressure can have sufficient pressure to penetrate the skin, causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic lines. Use a piece of paper or cardboard, **NOT BODY PARTS**, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. If an accident occurs, seek immediate medical attention from a physician familiar with this type of injury.

The standard air drill has one hydraulic circuit (with a low pressure relief valve return line). The standard circuit powers lift, fold and weight-transfer functions, controlled by a valve block on the right front of the air drill.

**Raise/Fold Hose**

This hose is connected to valve block port “V3” on the implement. Connect it to port “C” on the cart.

**Lower/Unfold Hose**

This hose is connected to valve block port “V4” on the implement. Connect it to port “D” on the cart.

**Relief Valve Return**

This hose is connected to valve block port “DUMP” on the implement. Connect it to port “G” on the cart.

Check hose routing to ensure adequate slack for link arm movement, and clearance from pinching or abrading cart/air drill components.

**NOTICE**

**Equipment Damage Risk:**

If the tractor to be used has a load-sensing or constant-flow hydraulic system, the drill must be equipped with an optional bypass valve to avoid tractor damage. See Options section of Operator manual for ordering.

**Equipment Damage Risk:**

DO **NOT** connect the Sump return line to a tractor power-beyond-port.
Hydraulic Hose Hookup

117. Great Plains hydraulic hoses are color coded to help you hookup hoses to your tractor outlets. Hoses that go to the same remote valve are marked with the same color.

<table>
<thead>
<tr>
<th>Color</th>
<th>Hydraulic Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>Lift (2 hoses)</td>
</tr>
<tr>
<td>Green</td>
<td>Fold (2 hoses)</td>
</tr>
<tr>
<td>Red</td>
<td>Openers</td>
</tr>
</tbody>
</table>

**WARNING**

High Pressure Fluid Hazard:
Relieve pressure before disconnecting hydraulic lines. Use paper or cardboard, NOT BODY PARTS, to check for leaks. Wear protective gloves and safety glasses or goggles when working with hydraulic systems. Escaping fluid under pressure can have sufficient pressure to penetrate the skin causing serious injury. If an accident occurs, seek immediate medical assistance from a physician familiar with this type of injury. Only trained personnel should work on system hydraulics.

Hose Handles

Refer to Figure 27

118. To distinguish hoses on the same hydraulic circuit, refer to hose handles. The hose under an extended-cylinder symbol feeds a cylinder base end. The hose under a retracted-cylinder symbol feeds a cylinder rod end.

119. Once all hoses are tightened, hook hoses to tractor...
Purging Hydraulic System

Refer to Figure 28

120. Charge the lift system first. Extend the lift cylinders ① (black handles) until the center section is fully raised. Remove the 1 x 4 1/2 cylinder transport lock pin ②. The wings will not start to raise until the center cylinders are fully extended and the master cylinders begin to bypass oil through the rephasing ports, to the wing cylinders. Watch for leaks and re-tighten fittings if necessary. Continue to pump oil to the lift system until the wing cylinders are also fully extended. At this point, reverse the flow and lower the unit to the ground, retracting all cylinders. Raise and lower the unit several times to purge air from the system.

121. You may now charge the fold system. Before charging the fold cylinders ③, make sure the rod end of the cylinders are un pinned and block is under cylinders as shown on rear cylinders, so that when the rod is extended, it will clear the wing fold brackets. Extend the fold cylinders ③ (green ends) completely and then close them. Extend and retract the cylinders several times to purge air from the system. Now the cylinders may be extended far enough to be connected to the wing fold brackets.

122. Remove wood block and install 1 x 7 Gr. 8 special thread bolt ④, 1 flat washers and 1 top lock nut to rod end of inside wing cylinders and slot in fold bracket.

Tighten 1 x 7 Gr. 8 special thread bolt ④ down to where there is 1/16” to 1/8” gap. Be sure bolt will still turn freely.

123. Remove wood blocks and install 1 x 7 hinge pins ⑤, 1 flat washers, 1 3/4 rollers and 3/8 x 2 roll pins to base end of outer wing cylinders and rocker.

124. Cycle the opener hydraulics before attaching to the opener brackets.
Openers Seed Tube Set Up

Refer to Figure 28

After the Field Cultivator Assembly is completed and the Hydraulic Systems have been purged of air you will need to route and cut the seed tubes that are attached to the openers.

125. Park the Field Cultivator with the openers 1 hanging off the side of a road or terrace.

126. Extend the openers 2 all the way down, and make sure the towers 3 have been raise all the way up. This allows the hose length to be cut as long as needed to ensure that while the implement is in use it will have full range of motion. Towers will raise themselves when the machine is unfolded.

127. Attach the seed tube 4 to one of the ports on the tower 5.

128. Route the tube to the appropriate opener 1, be sure to run through the hose guide 3, cut the tube and attach to the opener seed tube 5. Tubes must be long enough for full range of motion (flexing down). If the tubes are too long they will plug or get pinched during folding. See "Seed Tube Routing Layout" on page 48 for tube routes.

129. After tubes are connected to the openers travel 20ft or more with the down pressure on the openers engaged, increase or decrease the pressure to get all the openers to run level across the whole machine.

CAUTION

If seed towers on the wings do not retract during folding crack a hydraulic hose behind the check valve to release pressure on the towers. If this warning is ignored damage to the implement is certain.

![Figure 29 Opener Seed Tubes](image)

<table>
<thead>
<tr>
<th>Length</th>
<th>Quantity</th>
<th>Placement</th>
</tr>
</thead>
<tbody>
<tr>
<td>47-53in</td>
<td>6</td>
<td>Cart to Hitch Manifold</td>
</tr>
<tr>
<td>135-141in</td>
<td>4</td>
<td>Rear of Hitch Manifold to Inside Wing Tube</td>
</tr>
<tr>
<td>178-184in</td>
<td>2</td>
<td>Rear of Hitch Manifold to Rear Towers Center</td>
</tr>
<tr>
<td>92-98in</td>
<td>2</td>
<td>Short Tube weldment to Inside Wing Rear Tower</td>
</tr>
<tr>
<td>128-134in</td>
<td>2</td>
<td>Long Tube Weldment to Outside Wing Rear Tower</td>
</tr>
</tbody>
</table>
Light Assembly

Refer to Figure 30

130. Route light harness lead with valve led plug ① from front of hitch (tractor plug to front), along same route as hydraulic hoses (fasten in same clamps and hose wraps as hoses). Plug one end of enhance light module ② to small end of light harness lead ①. Plug bigger end of wishbone light harness ③ into other end of enhance light module ②. Route other ends over towards (marked left and right) the light mounting brackets as shown. The led plug on the harness lead plugs into the fold assist harness ⑦.

131. Mount red lamp lights ④ to top of light mounting brackets, with $\frac{1}{4} \times 1$ hex bolts ⑤ and $\frac{1}{4}$ lock nuts.

132. Mount amber lamp lights ⑥ to top of light brackets with $\frac{1}{4} \times 1$ hex bolts ⑤ and $\frac{1}{4}$ lock nuts.

133. Tighten all bolts to specs. Be sure and get all wiring harnesses fastened up securely with hose wraps or clamps (if routed close to hydraulic hoses) or use cable ties.
Install Openers

Refer to Figure 31

The openers will be shipped assembled and attached to the respective attachment bars & will need to be installed with mounts on to the rear of the frame sections. See parts manual for the correct opener arm brackets.

134. Install the opener tubes to the cultivator frame sections using opener arm brackets. To mount opener arm bracket use \( \frac{5}{8} \times 4 \times 4\) u-bolt, \( \frac{5}{8} \) lock washers and \( \frac{5}{8} \) hex nuts, and either opener arm mount or these mounts do not have a hydraulic cylinder.

135. Use opener arm brackets with \( \frac{3}{4} \times 2\) Gr5 hex bolt, \( \frac{3}{4} \) lock washers and \( \frac{3}{4} \) hex nuts, and opener arm mount, this mount does have a hydraulic cylinder and it should already be in place.

136. For outside wing openers use opener arm mount for the right side and opener arm mount for the left side. Use the corresponding opener arm bracket for mounting to the wings. Refer to the Parts Manual for parts drawing and list break down.

137. Use \( \frac{3}{4} \times 3\) u-bolt, \( \frac{3}{4} \) lock washer and \( \frac{3}{4} \) hex nuts, to mount all the opener tubes to opener mount arms. Use 1 x 7 Gr.8 special thread hex bolt to attach all the mounting arms to the mounting brackets.

138. The hose holder bars will need to be installed. Use \( \frac{3}{4} \times 3\frac{1}{2} \times 4 \) u-bolt, \( \frac{3}{4} \) lock washer and \( \frac{3}{4} \) hex nuts, to secure to the attachment bars. The fertilizer hose retainers simply snap on to the hose holder bar to keep the seed tubes in place. You may place these anywhere along the bar to keep the hoses from getting tangled.

Refer to the Operator Manual that came with your seed cart for seed rate information, and for instructions on how to set up the cart.

Blockage monitor has been connected in numerical order from left to right, starting on the outside left wing and moving to the right across the machine.

Completing Setup

139. If the decals are not already in place they can now be installed.

140. See appropriate pages for decals in the “Parts Manual” for decal placement.

141. To install new decals:
   a. Clean the area on which the decal is to be placed.
   b. Peel backing from decal. Press firmly on surface, being careful not to cause air bubbles under decal.
   c. Slowly peel away top protective covering being careful not to pull decal from implement.

142. If machine has an optional finishing attachment, refer to the “Parts Manual” for parts break down and attachment layout drawings of this manual.

143. Be sure to consult the operating instructions, “Operator’s Manual”, for the first time field adjustments before going to the field.
# Appendix

## Torque Values Chart

<table>
<thead>
<tr>
<th>Bolt Size</th>
<th>Bolt Head Identification</th>
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<tr>
<td>7⁄16-13</td>
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<td>6000</td>
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<tr>
<td>1-1</td>
<td>7000</td>
</tr>
</tbody>
</table>

Torque tolerance + 0%, -15% of torquing values. Unless otherwise specified use torque values listed above.

---

**Wheel Bolt Torque Values**

- **1/2”-20 (75-85ft-lbs)**
- **9/16”-18 (80-90ft-lbs)**
- **5/8”-18 (85-100ft-lbs)**
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Appendix 31

Tire Inflation Chart

<table>
<thead>
<tr>
<th>Wheel</th>
<th>Tire Size</th>
<th>Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center Transport</td>
<td>340/60R16.5</td>
<td>73 psi (503 kPa)</td>
</tr>
<tr>
<td>Wing Transport</td>
<td>9.5L x 15 8Ply</td>
<td>44 psi (303 kPa)</td>
</tr>
<tr>
<td>Gauge Wheels</td>
<td>11L x 15SL 12Ply</td>
<td>52 psi (359 kPa)</td>
</tr>
</tbody>
</table>

Tire Warranty Information

All tires are warranted by the original manufacturer of the tire. Tire warranty information is found in the brochures included with your Operator’s and Parts Manuals or online at the manufacturer’s websites listed below. For assistance or information, contact your nearest Authorized Farm Tire Retailer.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Web site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firestone</td>
<td><a href="http://www.firestoneag.com">www.firestoneag.com</a></td>
</tr>
<tr>
<td>Gleason</td>
<td><a href="http://www.gleasonwheel.com">www.gleasonwheel.com</a></td>
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<tr>
<td>Titan</td>
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<td>BKT</td>
<td><a href="http://www.bkt-tire.com">www.bkt-tire.com</a></td>
</tr>
</tbody>
</table>

Hydraulic Connectors and Torque

Refer to Figure 32 (a hypothetical fitting)

Leave any protective caps in place until immediately prior to making a connection.

NPT - National Pipe Thread
Note tapered threads, no cone/flare, and no O-ring.
① Apply liquid pipe sealant for hydraulic applications.
Do not use tape sealant, which can clog a filter and/or plug an orifice.

JIC - Joint Industry Conference (SAE J514)
② Note straight threads ④ and the 37° cone ⑤ on “M” fittings (or 37° flare on “F” fittings).
Use no sealants (tape or liquid) on JIC fittings.

ORB - O-Ring Boss (SAE J514)
Note straight threads ⑤ and elastomer O-Ring ⑦.
Prior to installation, to prevent abrasion during tightening, lubricate O-Ring with clean hydraulic fluid.
Use no sealants (tape or liquid) on ORB fittings.

ORB fittings that need orientation, such as the ell depicted, also have a washer ⑧ and jam nut ⑨ (“adjustable thread port stud”). Back jam nut away from washer. Thread fitting into receptacle until O-Ring contacts seat. Unscrew fitting to desired orientation. Tighten jam nut to torque specification.

Dash | Fitting | N-m | Ft-Lbs
--- | ------- | ---- | --------
-4  | 1/4-18 NPT | 1.5-3.0 turns past finger tight |
-5  | 1/2-20 JIC | 19-20 | 14-15 |
-5  | 1/2-20 ORB w/jam nut | 12-16 | 9-12 |
-5  | 1/2-20 ORB straight | 19-26 | 14-19 |
-6  | 9/16-18 JIC | 24-27 | 18-20 |
-6  | 9/16-18 ORB w/jam nut | 16-22 | 12-16 |
-6  | 9/16-18 ORB straight | 24-33 | 18-24 |
-8  | 3/4-16 JIC | 37-53 | 27-39 |
-8  | 3/4-16 ORB w/jam nut | 27-41 | 20-30 |
-8  | 3/4-16 ORB straight | 37-58 | 27-43 |

Figure 32
Hydraulic Connector ID
Hydraulic Lift Layout

- Black Extend to V1 on Rebound Valve
- Black Retract to V2 on Rebound Valve
- Clamps
- Depth Stop Valve
  - C1 to Depth Stop Valve
- Rod End, Inner Wing Cylinder to Base End, Outer Wing Cylinder
- Rod End, Center Frame Cylinder to Base End, Inner Wing Cylinder
- Bottom Holes Tee Rod End Outer
- Top Holes Tee Block to Base End Cylinders
Hydraulic Lift Layout
Hydraulic Fold Layout

Green Extend to Tee Block, Bottom Hole.

Green Retract to Tee Block, Top Hole.

Top Holes Tee Block to Rod End Cylinders.

Bottom Holes Tee Block to Base End Cylinders.

Tee to Tee Block, Top Holes.

Tee to Tee Block, Bottom Holes.
Hydraulic Fold Layout

Diagram showing the hydraulic fold layout with labeled components such as "Rope Wrap" and "Clamp."
FCA4500-7275 Tower Hydraulic & Bracket Layout

Adapter 811-3240 installs on bottom of solenoid to cross 811-1470 to hoses that route out to wings and hook to towers.

Elbow 811-2180 installs in rear of check valve. See 811-0790 attaches to elbow and then to hoses. Hoses route to wings and hook to towers.

Solenoid

Hydraulic Valve Assembly

Check Valve

Attached to Cylinder Base End

Attach to Base

Attachment Handle

Dimension to Wing Fold Bracket

Bolt on Stub for Tower Mounting
FCA4500-7275 Tower Hydraulic & Bracket Layout
FCA4500 Opener Hydraulic Layout
FCA4500-7275 Opener Layout
FCA4500-7275 Opener Layout
FCA4500-7275 Machine Layout
Fertilizer Tower Layout

Mount Fertilizer Tower tubes 3” lower for clearance
Fertilizer Tower Layout

Mount Fertilizer Tower tubes 3” lower for clearance
Fertilizer Tube Routing Layout
Fertilizer Tube Routing Layout
Seed Tube Routing Layout
Seed Tube Routing Layout

Reels Removed from Drawing just for clarification.
Match number on Tower to number on opener for hose length.
Seed tubes must go thru the tube guides before attaching to the Openers.
See Pg 12 for procedure to find hose lengths.
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