Assembly Manual

5109, 5111, 5113, 5115, 5313, 5315, 5317, 5319, 5321 & 5323 Turbo-Chisel

Great Plains Manufacturing, Inc.
www.greatplainsmfg.com

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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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 Turbo-Chisel using blocks and supports provided.
▲ Detach and store Turbo-Chisel 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 Turbo-Chisel 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 TC5109-5323 Turbo-Chisel is a one or three-section "vertical" tillage tool. Working width ranges from 11 to 29 feet. The implement is designed to cut, size and bury residue. It can work up to 11" deep, will dislodge rootballs and leave the field smooth enough for "one pass" finishing in Spring. For optimum leveling of your machine, it should be equipped with either a Chopper Reel or Buster Bar attachment.

Models Covered

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Document Family

- 566-046E Assembly Manual (this document)
- 566-046Q Pre-Delivery Manual
- 566-046M Operator Manual
- 566-046P 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 machine.
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.

An operator’s and parts manual is also provided with the new machine. Read and understand “Important Safety Information” and “Operating Instructions” in the operator’s manual before assembling the 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.

Note: 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 Turbo-Chisel will be shipped unassembled as shown in a big shipping rack and shipping boxes on pallets. The only parts that will be assembled are the turbo gang assemblies and reel attachment assemblies. The reel attachments (if equipped) will be banded together with the gang assemblies on pallet.

Refer to Figure 3

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

Refer to Figure 4

- Shank parts (mount assembly and shank assembly), small parts and bolts will be shipped in boxes. Rear attachment big parts will be banded to attachment smaller parts box.

Shipping containers 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 level site and prepare to unpack 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.

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

Carefully un-band components.

Now unload individual components one at a time using a fork truck or overhead hoist.

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

Unload Smaller Items First

Unloading the frames is a potentially dangerous operation.

Reduce risk and complication by first unloading
6. the tire wheel assemblies,
7. the smaller items

Place these components well out of the maneuvering area needed for unloading the gang assemblies and frames.

Unpacking Boxes

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

Assembly and Setup Assistance

To order additional copies of pre-delivery instructions or operator.s and parts manuals, write to the following address. Include model numbers in all correspondence.

If you do not understand any part of this manual or have any assembly or setup questions, assistance is available. Contact:

Product Support
Great Plains Mfg. Inc., Service Department
PO Box 5060
Salina, KS 67402-5060

(800)255-9215

gp_web_cs@greatplainsmfg.com
Assembly

5109-5315 Center Transport

Refer to Figure 5

11. Once the center Frame has been uncrated, carefully turn the center frame upside down and set on blocks to assemble torque tube.

12. Carefully raise the torque tube ① with an overhead hoist and secure with 1 1/4 x 7 pins ②, 3/8 x 2 1/4 Gr. 8 hex bolts ③ and 3/8 top lock nut.

13. Install pre-assembled hub assembly ④ into torque tube. Align hole in spindle with hole in torque tube, secure with 1/2 x 4 1/2 hex bolt ⑤ and 1/2 top lock nut.

14. Attach the tire/wheel assembly ⑥ to hub assembly ④ and secure with 5/8 lug nuts ⑦.

15. All bolts may be tightened to specs, See “Torque Values Chart” on page 27.

Note: Fasten the bottom of the torque tube to frame with chain or straps so it does not swing down and hit something while turning center frame over. Carefully use hoist to turn center frame over and set on stands to finish assembling components.

5317-5323 Center Transport

Refer to Figure 6

16. Once the center Frame has been uncrated, carefully turn the center frame upside down and set on blocks to assemble torque tube.

17. Carefully raise the torque tube ① with an overhead hoist, attach to center frame and secure with 1 1/4 x 7 pins ②, 3/8 x 2 1/4 Gr. 8 hex bolts ③ and 3/8 top lock nut.

18. Install the walking axle receiver assemblies ④ into torque tube, secure with 1/2 x 6 Gr. 8 hex bolt ⑤ and 1/2 top lock nut.

19. Install pre-assembled 8-bolt hub assemblies ⑥ into walking axle receiver ④. Align holes in spindle with hole in walking axle receiver, secure with 1/2 x 5 Gr. 8 hex bolt ⑦ and 1/2 top lock nut.

20. Attach the tire/wheel assembly ⑧ to hub assembly ⑥ and secure with 5/8 lug nuts ⑨.

21. All bolts may be tightened to specs, See “Torque Values Chart” on page 27.

Note: Fasten the bottom of the torque tube to frame with chain or straps so it does not swing down and hit something while turning center frame over. Carefully use hoist to turn center frame over and set on stands to finish assembling components.
5317-5323 Wing Transport

Refer to Figure 7

22. Once the wing Frame has been uncrated, carefully turn the wing frame upside down and set on blocks to assemble torque tube.

23. Carefully raise the torque tube ① with an overhead hoist and secure with 1 1/4 x 7 pins ②, 3/8 x 2 1/4 Gr. 8 hex bolts ③ and 3/8 top lock nut.

24. Install pre-assembled 8-bolt hub assemblies ④ into torque tube ①. Align holes in spindle with hole in torque tube, secure with 5/16 x 3 1/2 Gr. 8 hex bolt ⑤ and 5/16 top lock nut.

25. Attach the tire/wheel assembly ⑥ to hub assembly ④ and secure with 5/8 lug nuts ⑦.

26. All bolts may be tightened to specs, See “Torque Values Chart” on page 27.

Note: Fasten the bottom of the torque tube to frame with chain or straps so it does not swing down and hit something while turning center frame over. Carefully use hoist to turn center frame over and set on stands to finish assembling components.

Center Lift & Gang Mount

Refer to Figure 8

27. Attach the cylinder mount bars ① and lift link ② to center frame using 1 x 3 1/2 hex bolts ③, 1 x 4 hex bolts ④ and 1 lock nuts.

28. Now install 4.5 x 10 cylinders ⑤ using 1 x 3 1/8 pins ⑥, 1.5 x 1.0 x .075 machine washers and 3/16 x 2 cotter pins.

29. Install cylinder transport locks ⑦ to lift link ② using the 5/16 wire retainer pin ⑧.


Note: Wing shank mounts ⑪ are only used on a few models, see machine and attachment layout drawings in Appendix for proper placement.

31. Attach outside wing shank mounts ⑫ (if equipped) with 3/4 x 2 1/2 hex bolts ⑬ 3/4 lock washers and 3/4 nuts.

32. Attach center gang mount ⑭ and wing gang mounts ⑮ to front of center frame and wing frame with 3/4 x 2 hex bolts ⑯, 3/4 lock washers and 3/4 nuts.

33. All bolts may be tightened to specs, See “Torque Values Chart” on page 27.
Figure 8
Center Lift & Gang Mount
Trusses

Refer to Figure 9

Note: Do not tighten any bolts until all parts are assembled.

34. Start by bolting the rear of the LH ① and RH ② trusses to center frame using 1 1/4 x 8 1/2 Gr. 8 hex bolts ③, 1 1/4 lock washers and 1 1/4 nuts. Attach middle plates of trusses with 3/4 x 2 1/2 hex bolts ④, 3/4 lock washers, 3/4 nuts, front plates with 3/4 x 2 ⑤ 3/4 lock washers, and 3/4 nuts.

35. Mount the manual pack ⑥ to RH truss ② plate with 1/4 x 3/4 pan screws ⑦, mini end press wheels ⑧, 1/4 lock washers and 1/4 nuts.

36. Models 5317-5323, attach the bypass valve ⑨ to the RH truss ② with 5/16 x 3 hex bolts ⑩, 5/16 lock washers and 5/16 nuts.


38. Models 5317-5323, install the pilot operated check valve ⑬ to rebound valve plate ⑪ with 5/16 x 1 3/4 hex bolts ⑭, 5/16 lock washers, 5/16 nuts.

39. All bolts may be tightened to specs, See “Torque Values Chart” on page 27.
Figure 9  
Trusses
Hitch & Center Lift Assembly

Refer to Figure 10

40. Attach hitch pole 1 to trusses using 1 1/4 x 8 Gr. 8 hex bolts 2, 1 1/4 flat washers 3 (one on each side of uni-ball) and top lock nuts. Washers are needed to ensure a tight fit. Bolts need tightened securely, but do not over-tighten as the hitch needs to pivot.

41. Mount square jack 4 to front mount on hitch 1 with pin provided with jack. Use jack to help support front of hitch for rest of hitch assembly.

42. Attach the four lift mechanism links 6 to the level bar links 6 and torque tube with 1 x 6 Gr. 8 hex bolts 7, and 1 lock nuts. Attach rear of level bar link 6 to center frame ears with 1 x 2 29/64 pins 8, 1.5 x 1.0 x 0.75 machine washers 9 and 3/16 x 2 cotter pins.

43. Attach the rear of the level bars 6 to the top of the level bar links 6 with 1 x 6 Gr. 8 hex bolts 10 and 1 lock nuts.

44. Attach level bar brace 11 between the level bars using 5/8 x 1 1/2 hex bolts 12, 5/8 lock washers and 5/8 nuts.

45. Now the back of the hitch turnbuckle 13, turnbuckle lock 14 and leveling arm 15 may be attached to the front of level bars 6 with 1 1/4 x 9 special thread hex bolt 16 and 1 1/4 lock nut.

46. The bottom of the hitch leveling arm 17 can be attached to the back of the hitch pole 1 using 1 x 7 Gr. 8 hex bolt 18 and 1 lock nut.

47. The front of the hitch turnbuckle 13 may be attached to the hitch pole ears with 1 x 3 5/8 clevis pin 19, 1.5 x 1.0 x 0.75 machine washers and 3/16 x 2 cotter pins. Attach the 3/8 x 4 pin wire snap lock 20 to the turnbuckle lock 13.

48. Attach hose holder 21 to nut on front hitch pole 1 with 1/2 x 1 hex bolt 22, 1/2 flat washer and 1/2 lock washer.

49. Attach counterbalance valve 23 to the plate on front of hitch pole 1 with 5/16 x 3 1/2 hex bolts 24 and 5/16 lock washers.

50. Align holes in safety chain support 26, cat III hitch tongue 27 with holes on left side of hitch pole 1, secure with 1 x 8 Gr. 8 special hex bolts 28, four, 1 SAE flat washers 29, lock washers and 1 nut.

51. Install safety chain 26 on bottom side of hitch 1, secure with 7/8 x 3 hex bolt 30, 7/8 flat washer 31, 7/8 lock washer and 7/8 nut.

52. Attach hitch clevis 32 to cat III hitch tongue 27 with 3/4 x 5 1/2 Gr. 8 hex bolt 33 and 3/4 lock nut.

Note: Do not use hitch clevis 32 if tractor has a hammer strap. Use for transporting with truck.

53. Route safety chain 26 through safety chain support 26.

54. All bolts may be tightened to specs, See “Torque Values Chart” on page 27.
5109-5315 Center Fold

Refer to Figure 11
55. Install center fold bracket ① and rebound valve bracket ② to front center frame plate with 3/4 x 2 1/2 hex bolts ③, 3/4 lock washers and 3/4 nuts.

56. Attach center wing stop ④ (Models 5313 & 5315 only) to truss plates with 5/8 x 1 1/2 hex bolts ⑤, 5/8 lock washers and 5/8 nuts.

57. Attach wing pivot ⑥ plates on side of center frame with 3/4 x 2 1/2 hex bolts ⑦, 3/4 x 3 1/2 hex bolts ⑧ (front wing pivot plates, lower holes only), 3/4 lock washers and 3/4 nuts.

58. Attach 12ga ⑨ 16ga ⑩ shim’s as needed with 3/4 x 2 1/2 hex bolts ⑪, 3/4 lock washers and 3/4 nuts to level wings.

Note: See “Operator’s Manual” general operation and in-field adjustment section for adjustment procedure. Attach extra shim’s to the lower front 3/4 x 3 1/2 hex bolts ⑫, secure with 3/4 lock nuts ⑬.

59. Models 5109-5115 attach rigid smv & light bracket ⑬ to rear truss plates with 5/8 x 1 1/2 hex bolts ⑭, 5/8 lock washers and 5/8 nuts.

60. Attach SMV sign ⑭ to either center wing stop ⑮ or rigid smv & light bracket ⑮ with 1/4 x 3/4 pan head screws ⑯, 1/4 lock washers and 1/4 hex nuts.

61. Models 5313-5315 attach rebound valve ⑰ with 5/16 x 4 hex bolts ⑱, 5/16 lock washers and 5/16 nuts.

62. Tighten all bolts to specs, See “Torque Values Chart” on page 27.

5317-5323 Center Fold

Refer to Figure 12
63. Install front center fold bracket ① and rear center fold bracket ② to center frame plates with 3/4 x 2 1/2 hex bolts ③, 3/4 lock washers and 3/4 nuts.

64. Attach center wing stop ④ to truss plates with 5/8 x 1 1/2 hex bolts ⑤, 5/8 lock washers and 5/8 nuts.

65. Attach wing pivot ⑥ plates on side of center frame with 3/4 x 2 1/2 hex bolts ⑦, 3/4 lock washers and 3/4 nuts.

66. Attach SMV sign ⑧ to center wing stop ⑨ with 1/4 x 3/4 pan head screws ⑩, 1/4 lock washers and 1/4 hex nuts.

67. Tighten all bolts to specs, See “Torque Values Chart” on page 27.
5313-5315 Wings

Refer to Figure 13

68. Carefully align holes in wing frame LH and RH ① with holes on center frame hinges. Secure with 1 1/4 x 8 Gr. 8 hex bolt ② and 1 1/4 top lock nut.

Note: Tighten bolts snug but do not over-tighten as wings need to pivot freely.

69. Attach wing gang mount ③ to front wing frame plates with 3/4 x 2 hex bolts ④, 3/4 lock washers and 3/4 hex nuts.

70. Attach wing cylinder lug ⑤ with 3/4 x 2 hex bolts ④, 3/4 lock washers and 3/4 hex nuts.

Note: Wing shank mounts ⑥ are only used on some models, see machine and attachment layout drawings in Appendix for proper placement.

71. Install wing shank mounts ⑥ to wing frame plate with 3/4 x 2 1/2 hex bolts ⑥, 3/4 lock washers and 3/4 nuts.

72. Attach base end of the 4 x 30 x 2 fold cylinders ⑧ to center fold bracket with 1 x 3 3/8 pins ⑨, 1.5 x 1.0 x.075 machine washer and 3/16 x 2 cotter pin.

Note: Do not attach rod end of the 4 x 30 x 2 fold cylinders ⑧ to wing cylinder lug ⑤ until fold cylinders have been purged of air, See “Purging Hydraulic System” on page 24.

73. Tighten all bolts to specs, See “Torque Values Chart” on page 27.

Figure 13
5313-5315 Wings
5317-5323 Wings

Refer to Figure 14

74. Carefully align holes in wing frame LH and RH with holes on center frame hinges. Secure with 1 1/4 x 8 Gr. 8 hex bolt and 1 1/4 top lock nut.

Note: Tighten bolts snug but do not over-tighten as wings need to pivot freely. When wing frame is attached to center frame, set stands (if available) under outer part of wings to hold wings level for rest of assembly.

75. Attach lower hole of cylinder bar mount to ears of wing frame with 1 x 4 hex bolt, and 1 lock nut.

76. Attach upper hole of cylinder bar mount to one end of wheel arm turnbuckle with 1 x 3 1/2 hex bolt, two 1.5 x 1.0 x.075 machine washers (one in each side of cylinder bar mount), secure with 1 lock nut.

77. Attach other end of wheel arm turnbuckle to wing frame ear with 1 x 3 1/2 hex bolt, two 1.5 x 1.0 x.075 machine washers (one in each side of cylinder bar mount), secure and 1 lock nut.

78. Attach wing cylinder lug and wing cylinder mount with 3/4 x 2 hex bolts, 3/4 lock washers and 3/4 hex nuts.

79. Attach wing gang mount to front wing frame plates with 3/4 x 2 hex bolts, 3/4 lock washers and 3/4 hex nuts.

Note: Wing shank mounts are only used on some models, see machine and attachment layout drawings in Appendix for proper placement.

80. Install wing shank mounts (model 5323 only) to wing frame plate with 3/4 x 2 1/2 hex bolts, 3/4 lock washers and 3/4 nuts.

81. Attach base end of the 4 x 36 x 2 fold cylinders and 4 x 36 x 1.5 fold cylinders to center fold bracket with 1 x 3 3/8 pins, 1.5 x 1.0 x.075 machine washer and 3/16 x 2 cotter pin.

Note: Do not attach rod end of the fold cylinders to wing cylinder lug until fold cylinders have been purged of air, See “Purging Hydraulic System” on page 24.

82. Attach the 4 x 10 x 1.38 wing lift cylinders to cylinder bar mount and ear on torque tube with 1 x 3 3/8 pins, 1.5 x 1.0 x.075 machine washer and 3/16 x 2 cotter pin.

83. Tighten all bolts to specs, See “Torque Values Chart” on page 27.
Figure 14
5317-5323 Wings
569-190S Shank

Note: See machine layouts in Appendix for proper shank placement. The front and rear shank mount assemblies will be shipped pre assembled from factory in two parts in boxes. There will be the mount assembly and the shank assembly.

Refer to Figure 15

84. Install the mount assembly to the rear side of tubes. Install front mount bracket on front of tubes, align holes, secure with 3/4 x 2 1/2 hex bolts, 3/4 lock washers and 3/4 nuts. Slide these two parts over frame tube in proper location.

85. Attach the upper hole of shank assembly with 3/4 x 4 hex bolts, 3/4 lock washers and 3/4 nuts. Attach the lower hole of shank assembly with 5/8 x 4 hex bolts, 3/4 lock nut.

86. Tighten all bolts to specs, See “Torque Values Chart” on page 27.

569-196S Shank

Refer to Figure 16

87. Install the mount assembly to the rear side of tubes. Install front mount bracket on front of tubes, align holes, secure with 3/4 x 2 1/2 hex bolts, 3/4 lock washers and 3/4 nuts. Slide these two parts over frame tube in proper location.

88. Attach the shank assembly with 5/8 x 4 1/2 hex bolt, 5/8 lock washer and 5/8 nut (rear hole), 1/2 x 3 hex bolt, 1/2 lock washer and 1/2 nut (front hole).

89. Tighten all bolts to specs, See “Torque Values Chart” on page 27.
Turbo Gang

Note: See machine layouts in Appendix for proper gang placement. The gang assemblies will come pre-assembled from factory and attached to the gang bar.

Refer to Figure 17
90. Install the gang assembly ① using 1 x 9 1/2 hinge pin ②, secure with 3/8 x 2 1/4 Gr. 8 hex bolts ③, 3/8 top lock nuts.

91. Attach cylinders ④ to ears on gang bars and gang mounts, secure with 1 x 3 1/8 pins ⑤, 1.5 x 1.0 x.075 machine washers and 3/16 x 2 cotter pins.

92. Tighten all bolts to specs, See “Torque Values Chart” on page 27.

Figure 17

Depth Gauge

Refer to Figure 18
93. Install the link mount ⑥ to the center gang bar with 1/2 x 3 1/32 x 7 1/4 u-bolt ⑦, 1/2 lock washers and 1/2 nuts.

94. Install leveling weldment ⑧ to the center gang mount with 1/2 x 5 1/32 x 4 1/2 u-bolts ⑨, 1/2 lock washers and 1/2 nuts.

95. Slide the depth gauge pointer ⑩ over the leveling weldment bolt, secure with 1/2 lock nut.

96. Align one set of holes in the two links ⑪, one on each side of the depth gauge pointer hole ⑫, secure with 1/2 x 1 1/2 bolt ⑬ and 1/2 lock nut.

97. Attach the other end of the links ⑬, one on each side of the hole in the link mount ⑭ with 1/2 x 1 1/2 bolt ⑮ and 1/2 lock nut.

98. Tighten all u-bolts to specs, See “Torque Values Chart” on page 27. Tighten the three lock nuts up snug, but be sure the links will pivot.

99. Clean the surface where TC depth coulter decal ⑯ goes and peel backing off of decal and fasten decal on plate. Firmly press decal to get all air bubbles out.
Valve, Fitting and Hose Assembly

Note: Refer to hydraulic layouts in Appendix for complete hose routings

Refer to Figure 19

Depth Stop

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

101. Slide one end of (with 2 holes) depth stop tube ③ through slotted hole in depth stop valve mounting bracket. Slide other end of depth stop tube ③ over lever on torque tube, secure with 1/2 x 3 hex bolt ④, 1/2 lock washer and 1/2 nut.

102. Bolt depth stop screw assembly ⑤ 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.

103. Tighten all u-bolts to specs, See “Torque Values Chart” on page 27.

Note: Install all hydraulic fittings as shown in steps below. See hydraulic layouts in Appendix for proper hose routing.

Install Rebound Valve and O-Ring Fittings

Refer to Figure 20

104. Thread straight (non-adjustable stud) fittings ⑦ into ports V1, V2 and C2 of rebound valve ⑧.

Note: 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 “Fittings Torque Values” on page 28.

105. Thread elbow (adjustable stud) fitting ⑨ into port C1 of rebound valve ⑩.

a. Follow steps a and b from the foregoing instructions, then proceed with the following steps below.

b. Looking at fitting from end with nut/washer/o-ring assembly, turn nut clockwise as far as possible.

a. Using wrench, turn fitting into port until the washer touches the port spot face. Continue turning fitting until washer touches thread nearest wrench pad.

b. Back off fitting counterclockwise not exceeding one revolution until it is oriented in the correct position.

c. Place wrench on the wrench pad of fitting to keep fittings from turning, See “Fittings Torque Values” on page 28,
Bypass Valve

Refer to Figure 21

106. Attach hoses ① to bypass valve ② (Models 5317-5323 only). Hoses and fittings will have color ties to get hoses hooked up properly.

Note: See TC5317-TC5323 Hydraulic Down Pressure in “Operator’s Manual” for adjusting bypass valve.

Pilot Check Valve

Refer to Figure 22

107. Attach hoses ① to bypass valve ② (Models 5317-5323 only) located on right truss. Hoses and fittings will have color ties to get hoses hooked up properly.

Install Depth Control Valve and O-Ring Fittings

Refer to Figure 23

108. Thread elbow (adjustable stud) fitting ① into left port of depth stop valve ③. Thread straight (non-adjustable stud) fittings ② into front port of depth control valve ①.

109. Tighten as shown in steps 103, 104.
Install Hose Handle and JIC Fittings

Refer to Figure 24

Note: Hose handles are color coded. See “Hydraulic Hose Hookup” on page 23 for proper placement on hoses.

110. Install fittings ① to end of hoses ② running to front of hitch. Attach poppet fittings ③ to fittings ④.

111. Tighten as shown in steps 103, 104.

112. Align the grooves in the front of the hose handles ① with the ribs in the fittings ③ as shown and install the self threading screws ⑤ through holes.

113. Route hoses as shown in layout section in Appendix.

114. 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, See “Torque Values Chart” on page 27. 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.

115. Alternate Assembly Method for JIC.

   a. If torqued method not possible, 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.
Refer to Figure 25

Attach Hose Clamps and Hose wraps
116. When all the hoses are hooked up and tightened properly, put hose clamps on hoses as shown.
117. Install hose wraps on hoses as needed.

Note: 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 Hose Hookup
118. 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.

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<th>Color</th>
<th>Hydraulic Function</th>
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</tr>
<tr>
<td>Green</td>
<td>Fold (2 hoses)</td>
</tr>
<tr>
<td>Red</td>
<td>Gang (2 hoses)</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 26

119. 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.

120. Once all hoses are tightened, hook hoses to tractor.

Purging Hydraulic System

Refer to Figure 27

121. Charge the lift system first. Extend the lift cylinders (black handles) until the center section is fully raised. Remove the cylinder transport locks and install in storage position on lift link. Raise and lower the lift system several times to purge air from system. Watch for leaks and retighten fittings if necessary.

122. The gang lift system (red handles), will need purged. The wing gangs will not start to rise until the center cylinders are fully extended and the master cylinders begin to bypass oil through the rephasing ports, to the wing cylinders. Continue to pump oil to the gang system until the wing gang cylinders are also fully extended. At this point, reverse the flow and raise the gangs, retracting all cylinders. Repeat this procedure several times until all the air is purged out of the system.

123. You may now charge the fold system. Before charging the front and rear fold cylinders, make sure the rod end of the cylinders are un-pinned or un-bolted and block is under cylinder as shown, so that when the rod is extended, it will clear the wing fold brackets. Extend the fold cylinders (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. Remove wood block and install the 1 x 3 3/8 clevis pin (front cylinder). 1.5 x 1.0 x .075 machine washer and 3/16 x 2 cotter pin. Hook up rear cylinder (Models 5317-5323 only) with the 1x 7 Gr. 8 special thread hex bolt, four 1 flat washers (two on each side of rod end cylinder clevis and two on outside fold bracket) and 1 nylock lock nut. Tighten bolt snug but be sure cylinder clevis will still pivot.
Lights

Refer to Figure 28

Note: See machine layout section for proper light bracket placement.

124. Fasten light bracket LH ① to center frame with 1/2 x 4 1/32 x 7 1/4 u-bolts ③, 1/2 lock washers and 1/2 nuts. Repeat same procedure for light bracket RH ②.

125. Route light harness 30’ lead ④ from front of hitch (tractor plug to front), along same route as hydraulic hose (fasten in same clamps and hose wraps as hoses). Plug one end of enhance light module ⑤ to small end of light harness 30’ lead ④. Plug bigger end of wishbone light harness ⑥ into other end of enhance light module ⑤. Route other ends over towards (marked left and right) the light mounting brackets as shown.

126. Mount red lamp lights ⑦ to mounting plates of wing stop or rigid smv and light bracket, with 1/4 x 1 hex bolts ⑧ and 1/4 lock nuts.

127. Mount amber lamp lights ⑨ to top of light brackets ① and ②, with 1/4 x 1 hex bolts ⑧ and 1/4 lock nuts.

128. Tighten all bolts to specs, See “Torque Values Chart” on page 27. 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 ⑩.

Install Rear Hitch (optional)

Note: The rear tow hitch will be shipped with big components banded together and bolts will be in a box. Carefully un-band the components.

Refer to Figure 29

129. Attach rear hitch trusses ① to rear of hitch arms with 3/4 x 2 1/2 hex bolts ②, 3/4 lock washers and 3/4 nuts. Attach middle of rear hitch arms to tubes on center frame with 3/4 x 4 1/32 x 7 1/2 u-bolts ③, 3/4 lock washers and 3/4 nuts.

130. Attach 56” cross arm ④ to bottom side of rear hitch arm plates with 5/8 x 3 1/32 x 4 1/2 u-bolts ⑤, secure with 5/8 lock washers and 5/8 nuts.

Note: Do not tighten any bolts until every thing is installed.

Note: The bolt on sleeve assembly with rigid or flex slide ⑥ may be fastened using 5/8 x 3 1/32 x 4 1/2 u-bolt ⑤, secure with 5/8 lock washers and 5/8 nuts.

Note: Tighten all bolts to specs, See “Torque Values Chart” on page 27.

Note: If machine is equipped with optional rear hitch accessory kit may be installed as shown in “Parts Manual”.

Note: Route hoses and light harness along hitch and frame with hose clamps and hose wraps, provided.

Note: Be sure hoses and light harness is fastened securely so they don’t drag or get pinched.
Completing Setup

131. Be sure all bolts are tightened to specs, See “Torque Values Chart” on page 27

132. The decals may now be installed.

133. See appropriate pages for decals in the “Parts and Operator’s Manual” for decal placement.

134. 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.

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

**NOTICE**

If machine is equipped with a rear attachment, be sure you install the optional rear jack stand, see “Parts Manual (Rear Jack Stand) so machine doesn’t tip backwards when unhooking machine from tractor.

136. Once the options are installed and all of the hydraulic procedures have been completed, you may fold and raise/lower the machine to check for clearance and interferences.

137. 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

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<tr>
<td>M 20 X 2.5</td>
<td>280</td>
<td>205</td>
<td>440</td>
</tr>
<tr>
<td>M 20 X 1.5</td>
<td>310</td>
<td>230</td>
<td>650</td>
</tr>
<tr>
<td>M 24 X 3</td>
<td>480</td>
<td>355</td>
<td>760</td>
</tr>
<tr>
<td>M 24 X 2</td>
<td>525</td>
<td>390</td>
<td>830</td>
</tr>
<tr>
<td>M 30 X 3.5</td>
<td>960</td>
<td>705</td>
<td>1510</td>
</tr>
<tr>
<td>M 30 X 2</td>
<td>1060</td>
<td>785</td>
<td>1680</td>
</tr>
<tr>
<td>M 36 X 3.5</td>
<td>1730</td>
<td>1270</td>
<td>2650</td>
</tr>
<tr>
<td>M 36 X 2</td>
<td>1880</td>
<td>1380</td>
<td>2960</td>
</tr>
<tr>
<td>M 36 X 2</td>
<td>1880</td>
<td>1380</td>
<td>2960</td>
</tr>
</tbody>
</table>

a. in-tpi = nominal thread diameter in inches-threads per inch  
b. N·m = newton-meters  
c. mm x pitch = nominal thread diameter in mm x thread pitch  
d. ft-lb = foot pounds

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

---

Gang Bolt Torque 1 3/4”-5 1288 N·m (850 ft-lb (165 lbs on 5’ cheater)).  
Wheel Bolt Torque Values 1/2”-20 (75-85 ft-lbs) 9/16”-18 (80-90 ft-lbs) 5/8”-18 (85-100 ft-lbs)  
Chopper Hub Spindle Torque 7/8-9 350 ft-lbs
Tire Inflation Chart

<table>
<thead>
<tr>
<th>Wheel</th>
<th>Tire Size</th>
<th>Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>12.5L x 15&quot; F-Ply</td>
<td>620 kPa 90 psi</td>
</tr>
<tr>
<td>Transport/ Wings</td>
<td>12.5L x 15&quot; 12-Ply</td>
<td>379 kPa 55 psi</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 web sites 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>
</tr>
<tr>
<td>Titan</td>
<td><a href="http://www.titan-intl.com">www.titan-intl.com</a></td>
</tr>
<tr>
<td>Galaxy</td>
<td><a href="http://www.atgtire.com">www.atgtire.com</a></td>
</tr>
<tr>
<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 30 (a hypothetical fitting)
Leave any protective caps in place until immediately prior to making a connection.

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

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

3. ORB - O-Ring Boss (SAE J514)
   Note straight threads and elastomer O-Ring.
   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 and jam nut ("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.

<table>
<thead>
<tr>
<th>Dash Size</th>
<th>Fitting</th>
<th>N-m</th>
<th>Ft-Lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4</td>
<td>1/4-18 NPT</td>
<td>1.5-3.0 turns past finger tight</td>
<td></td>
</tr>
<tr>
<td>-5</td>
<td>1/2-20 JIC</td>
<td>19-20</td>
<td>14-15</td>
</tr>
<tr>
<td>-5</td>
<td>1/2-20 ORB w/jam nut</td>
<td>12-16</td>
<td>9-12</td>
</tr>
<tr>
<td>-5</td>
<td>1/2-20 ORB straight</td>
<td>19-26</td>
<td>14-19</td>
</tr>
<tr>
<td>-6</td>
<td>5/16-18 JIC</td>
<td>24-27</td>
<td>18-20</td>
</tr>
<tr>
<td>-6</td>
<td>5/16-18 ORB w/jam nut</td>
<td>16-22</td>
<td>12-16</td>
</tr>
<tr>
<td>-6</td>
<td>5/16-18 ORB straight</td>
<td>24-33</td>
<td>18-24</td>
</tr>
<tr>
<td>-8</td>
<td>3/4 -16 JIC</td>
<td>37-53</td>
<td>27-39</td>
</tr>
<tr>
<td>-8</td>
<td>3/4 -16 ORB w/jam nut</td>
<td>27-41</td>
<td>20-30</td>
</tr>
<tr>
<td>-8</td>
<td>3/4 -16 ORB straight</td>
<td>37-58</td>
<td>27-43</td>
</tr>
</tbody>
</table>
TC5109-TC5315 Hydraulic Lift Layout

See Hydraulic Section for Parts Layout

Black Extend to V1 on Counter Balance Valve

Hose Wrap, Large

C1 to Depth Valve

Hose Wrap, Large

Clamp

Clamp

Depth Stop Valve to Cylinder Base End

Hose Wrap, Large

C2 to Cylinder Rod End

Hose Wrap, Large

Clamp

Clamp

Clamp

Clamp

Clamp

41359
TC5317-TC5323 Hydraulic Lift Layout

See Hydraulic Section for Parts Layout

- Black Extend to V1 on Counter Balance Valve
- Hose Wrap, Large
- Hose Wrap, Large
- C1 to Depth Valve
- Clamps
- C2 to Cylinder Rod End
- Clamp
- Depth Stop Valve to Cylinder Base End
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
TC5313-TC5315 Hydraulic Fold Layout

See Hydraulic Section for Parts Layout

Green Extract to V1 on Rebound Valve

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

C1 to Cylinder Rod End

C2 to Cylinder Base
TC5317-TC5323 Hydraulic Fold Layout

See Hydraulic Section for Parts Layout

Note: Valves Shown Turned 90 degrees for Clarity
TC5109 Hydraulic Gang Layout

See Hydraulic Section for Parts Layout

- Red Retract to Cyl Rod End
- Red Extend to Cyl Base End
- Hose Wrap, Large
- Clamp
- Clamp
- Clamp
- Clamp
- Hose Wrap, Large
- Clamp
- Clamp

41360
TC5111-TC5323 Hydraulic Gang Layout

See Hydraulic Section for Parts Layout

- Hose Wrap, Large
- Red Retract to Cyl Rod End
- Clamp
- Red Extend to Cyl Base End
- Hose Wrap, Large
- Clamp
- Clamp
- Clamp
- Master Cylinder Rod End to Slave Cylinder Base End
- Master Cylinder Rod End to Slave Cylinder Base End
- Hose Wrap, Large
TC5109 Machine Layout

Note: Center Coulter with Center of Machine.

7 Blade Gang
567-016K LH

5 Blade Gang
567-013K RH

7 Blade Gang
567-017K

5 1/4

8 1/4

5 1/4

5

11 3/4

30 TYP

5 1/2

5

30 TYP

20 1/2

569-196S

569-281S
TC5111 Machine Layout

Note: Center Couter with Center of Machine.

8 Blade Gang
567–018K LH

7 Blade Gang
567–017K RH

8 Blade Gang
567–019K

4 7/8

3 1/4

4 7/8

5 1/2

5 1/2

30 TYP

30 TYP

5 1/2

5 1/2

569–196S

569–281S

20 1/2

04/12/2012
TC5113 Machine Layout

6 Blade Gang 567-014K LH
7 Blade Gang 567-016K LH
8 Blade Gang 567-019K RH
6 Blade Gang 567-015K

Note: Center Coufer with Center of Machine.
TC5115 Machine Layout

Note: Center Coulter with Center of Machine.
TC5313 Machine Layout

Note: Center Coulter with Center of Machine.
TC5315 Machine Layout

Note: Center Coulter with Center of Machine.
TC5321 Machine Layout
TC5323 Machine Layout

Diagram showing the layout of a machine with various labeled parts and dimensions.
Twisted Shovel Layout (9 13 17 21 Shank)

Model TC5315 Shown.
Same on 5111, 5319, 5323 Models.

Shows Direction of Twisted Shovels.

Note: Center Coulter with Center of Machine.
Twisted Shovel Layout 11 15 19 23 Shank

Model TC5315 Shown.
Same on 5111, 5319, 5323 Models.

Shows Direction of Twisted Shovels

Note: Center Coulter with Center of Machine.

8 Blade Gang 567-019K LH
7 Blade Gang 567-016K LH
8 Blade Gang 567-019K RH
8 Blade Gang 567-019K
TC5109 Chopper Reel Layout
TC5111 Chopper Reel Layout

---

41851

---

569-207L

84” TUBE

569-150K

11 3/4

566-046E

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50" TUBE

84" TUBE

6 3/8

30

36 3/4

2 1/4

10 1/4 Typ

50" TUBE

74 3/8

97 3/8

74 3/8

97 3/8
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TC5319 Chopper Reel Layout
TC5321 Chopper Reel Layout
TC5323 Chopper Reel Layout
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569-166K

75” BAR
569-171K LH

13 1/2
52

75” BAR
569-172K RH

13 1/2
52
TC5111 Buster Bar Layout

569–166K

569–180K LH

86

17 1/4

72 1/4

569–166K

86” BAR 569–181K RH

17 1/4

72 1/4
TC5113 Buster Bar Layout
TC5313 Buster Bar Layout
TC5315 Buster Bar Layout

NOTE: 566-098H has been rotated 180 degrees to allow for proper mounting.

NOTE: 566-098H has been rotated 180 degrees to allow for proper mounting.
TC5317 Buster Bar Layout

75" BAR 569-171K LH
53" BAR 569-167K LH 16 1/4
53" BAR 569-168K RH 16 1/4
75" BAR 569-172K RH

NOTE: 566-098K has been rotated 180 degrees to allow for proper mounting.

52
78 1/2
109
57
76
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