Pre-Delivery 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

TC5109 11-Foot 1-section
TC5111 14-Foot 1-section
TC5113 16-Foot 1-section
TC5115 19-Foot 1-section
TC5313 16-Foot 3-section
TC5315 19-Foot 3-section
TC5317 21-Foot 3-section
TC5319 24-Foot 3-section
TC5321 26-Foot 3-section
TC5323 29-Foot 3-section

Document Family

566-046E Assembly Manual
566-046Q Pre-Delivery Manual (this document)
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

The Turbo-Chisel will be shipped pre-assembled as shown.

Refer to Figure 3
- The Turbo-Chisel will be shipped with shipping stands that will not need to be returned to Great Plains.
- Wings will be connected to center frame and folded in transport positions.
- Gangs will be pre-assembled and banded together on pallets.
- Shank mount assemblies will be attached to frames in proper locations.
- Pre-assembled light brackets will be banded to center frame.

Refer to Figure 4
- Shank assemblies will be shipped in a box on a pallet.
- Finishing attachments (if equipped), will be pre-assembled and banded to pallet.
Unloading

Be sure the truck is on level ground, preferably concrete.

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

Unload Smaller Items First
Unloading the Turbo-Chisel is a potentially dangerous operation.
Reduce risk and complications by first unloading
1. the gangs and finishing attachments
2. the misc. boxes
3. the Turbo-Chisel
   (described in the next section)

Unload Turbo-Chisel
4. Place these components well out of the maneuvering area needed for unloading the Turbo-Chisel.
5. Double-check that all chains and tie-down straps have been released and stowed.
6. Set parking brake on trailer tractor.
7. Slowly lift the Turbo-Chisel off trailer bed using two fork lifts.
8. Stop lifting about 12" above the bed.
9. Have the truck driver slowly pull the trailer straight out from under the Turbo-Chisel.
10. Making sure to keep level from front to back and side to side, slowly lower the Turbo-Chisel.
11. Lower the Turbo-Chisel down until the shipping stands are about 12" off ground.
12. Remove shipping stands.
13. Remove tongue jack from field positions and put in storage position with foot of jack towards ground.
14. Slowly lower Turbo-Chisel until it resting on the center transport tires and front tongue jack.

Unpacking Boxes
Note: Position boxes in area that you can maneuver components up to machine to assembly.
15. Carefully remove banding from boxes.
16. Carefully remove banding from gangs and finishing reels.
17. 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

Gangs

Refer to Figure 5

Note: Folding models will be shipped with wings attached in transport position, but shown in field position or no wings for clarity. The large bolts will be shipped either in frame or part assemblies in proper locations. The smaller bolts will be shipped in a box. See “Parts Manual for part numbers and description of parts. The gangs will come pre-assembled on gang tube. Refer to machine layout in Appendix for proper gang placement.

18. Start by attaching the center gang bar assembly ①, with a fork lift or overhead hoist with 3/4 x 2 hex bolts ②, 3/4 lock washers and 3/4 nuts.

19. Carefully move the gang assemblies ③ into the machine so the c-flexes are just under the gang bar mount assembly ① as shown. Install a mounting plate ④ above and below gang tube. Secure with a 3/4 x 6 hex bolt ④ (rear hole of plate) and 3/4 lock nut. Now align holes of gang bracket plate ⑦ on bottom side of c-flex, secure with 5/8 x 7 hex bolts ⑧, 5/8 lock washers and 5/8 nuts.

20. Bolts may be tightened to specs, See “Torque Values Chart” on page 17.

21. Repeat same procedure for the wings after the hitch and hydraulics have been installed so the wings may be unfolded.

Truss, Depth Stop Tube & Wing Stop Assembly

Refer to Figure 6

22. Attach rear of RH hitch truss ① and LH hitch truss ② with 1 1/4 x 8 1/2 Gr. 8 special thread bolt ③, 1 1/4 lock washer and 1 1/4 nut. Secure middle plate with 3/4 x 2 1/2 hex bolts ④, 3/4 lock washers and 3/4 nuts. Secure front plate with 3/4 x 2 hex bolts ⑤, 3/4 lock washers and 3/4 nuts.

23. Slide front of depth stop assembly ⑥ through square hole of bracket welded on left side of LH truss. Align rear holes of depth stop assembly ⑥ on torque tube lever, secure with 1/2 x 3 hex bolt ⑦, 1/2 lock washer and 1/2 nut.

24. Attach center wing stop ⑥ (Folding Models) or rigid smv & light bracket ⑥ (Rigid Models) to top plates of trusses with 5/8 x 1 1/2 hex bolts ⑩, 5/8 lock washers and 5/8 nuts.

25. Mount the manual pack ⑪ to RH truss ① plate with 1/4 x 3/4 pan head screws ⑫, mini end press wheels ⑬, 1/4 lock washers and 1/4 nuts.

26. Bolt may be tightened to specs, See “Torque Values Chart” on page 17.
Hitch & Level Bar Assembly

Refer to Figure 7

Note: The hitch assembly ① will also come pre-assembled from the factory with tongue jack ⑥ mounted on top rear of hitch.

27. Remove the 1 1/4 x 8 Gr. 8 hex bolts ③ from front of trusses. On folding models slide the level bar assembly ④ under fold cylinders (as this will be attached to the rear of hitch as shown) as you move hitch assembly towards the trusses.

28. Attach hitch assembly ① to front of trusses with 1 1/4 x 8 Gr. 8 hex bolts ③, 1 1/4 flat washers ② and 1 1/4 lock nuts. Be sure to insert the two 1 1/4 flat washers ② (one on each side of hitch uni-ball) to ensure tight fit. Bolts need to be tightened securely, but do not torque as the hitch needs to pivot.

29. Remove the tongue jack ⑥ from storage location and install it on the jack stub at the front of the hitch frame.

30. Now remove the two 1 x 6 Gr. 8 hex bolts ⑤ from the rear of the level bar assembly ④. Install the ear of the level bar assembly ④ to the level bar links ⑤ with the 1 x 6 Gr. 8 hex bolts ⑤ and 1 hex lock nuts.

31. Attach the front of the level bar assembly ④ with 1 x 3 5/8 pin clevis ⑦, 1.50 x 1.0 machine washer ⑧ and 3/16 x 2 cotter pin shipped in hitch location.

Note: Tongue jack ⑥ may be adjusted up or down to get holes to align up to install pin.

32. Tighten all bolts securely but do not torque as the level bar assembly needs to pivot.

Note: See hydraulic layout section in Appendix for complete hose layout and follow the following steps to connect hoses.
Hydraulic Hose Assembly

Note: Once the hitch and trusses are installed, the hydraulics may be hooked up. All models will be shipped with hoses attached to hitch. The hoses will be capped off and will need to be hooked up to fittings. The hose ends and fittings will be marked with color ties and will need to be hooked up with matching colors. Be sure to get the hoses hooked correctly or hydraulics will not work correctly. Refer to hydraulics in parts manual for hydraulic layouts.

Install Rebound Valve and O-Ring Fittings

Refer to Figure 8

33. Inspect all components for damage or contamination during shipping.

34. Lubricate o-ring and threads on fitting.

35. Thread straight (non-adjustable stud) fittings 3 into ports V1 and V2 of rebound valve 1, finger tight

Note: Do not over tighten as this could cause damage to valves. Tighten as shown, See "Hydraulic Connectors and Torque" on page 18 or proper torque value.

36. Follow steps 34 and 35, then proceed to steps below.

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

38. Using wrench, Thread 45 degree elbow (adjustable stud) fittings 2 into port C1 and C2 of rebound valve 1, until the washer touches the port spot face. Continue turning fitting until washer touches thread nearest wrench pad.

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

40. Place wrench on the wrench pad of fitting to prevent fitting from turning.

Note: Do not over tighten as this could cause damage to valves. Tighten as shown, See "Hydraulic Connectors and Torque" on page 18 or proper torque value.

Bypass Valve

Refer to Figure 9

41. 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.
Install Depth Control Valve and O-Ring Fittings

Refer to Figure 10
42. Follow same procedure (steps 34-41) for installing fittings into depth control valve.
43. Thread elbow (adjustable stud) fitting into side port of depth stop valve. Thread straight (non-adjustable stud) fittings into front port of depth control valve.
Note: Do not over tighten as this could cause damage to valves. Tighten as shown, See “Hydraulic Connectors and Torque” on page 18 or proper torque value.
44. Route hoses as shown in layout section in Appendix.
45. 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.
46. Alternate Assembly Method for JIC.
   a. If torqued method not possible, then proceed to steps b-e.
   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 11

Attach Hose Clamps and Hose Wraps
47. When all the hoses are hooked up and tightened properly, put hose clamps on hoses as shown.
48. 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

49. Great Plains hydraulic hoses are color coded to help you hook up 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>Gang (2 hoses)</td>
</tr>
</tbody>
</table>

Refer to Figure 12

Hose Handles

50. 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.

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

**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.
Purging Hydraulic System

Refer to Figure 13

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

53. The gang lift system ➌ (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.

54. You may now charge the fold system. Before charging the front ➋ and rear ➋ 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 ➋ and ➋ (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 ➋). 1.5 x 1.0 x.075 machine washer and 3/16 x 2 cotter pin. Hook up rear cylinder ➋ (Models 5317-5323 only) with the 1x 7 Gr. 8 special thread hex bolt ➋, four 1 flat washers ➋ (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.

569-190S Shank

Note: The 569-190S shank mount assemblies will be shipped pre assembled in proper location.

Refer to Figure 14

55. Attach the shank assemblies ➊ to shank mounts ➋ with 3/4 x 4 hex bolts ➋, (top hole) 3/4 lock washers and 3/4 nuts. Install 5/8 x 4 hex bolt ➋, 5/8 lock washer and 5/8 nut in bottom hole.

56. Tighten all bolts to specs, See “Torque Values Chart” on page 17.
569-196S Shank

Note: The 569-196S shank mount assemblies will be shipped in a wooden box. See machine layouts in Appendix for proper shank placement.

Refer to Figure 15

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

58. Tighten all bolts to specs, See “Torque Values Chart” on page 17.

Depth Gauge

Refer to Figure 16

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

60. Install leveling weldment ③ to the center gang mount with 1/2 x 5 1/32 x 4 1/2 u-bolts ④, 1/2 lock washers and 1/2 nuts.

61. Slide the depth gauge pointer ⑤ over the leveling weldment bolt, secure with 1/2 lock nut.

62. Align one set of holes in the two links ⑥, one on each side of the depth gauge pointer hole ⑦, secure with 1/2 x 1 1/2 bolt ⑧ and 1/2 lock nut.

63. Attach the other end of the links ⑨, one on each side of the hole in the link mount ① with 1/2 x 1 1/2 bolt ⑩ and 1/2 lock nut.

64. Tighten all u-bolts to specs, See “Torque Values Chart” on page 17. Tighten the three lock nuts up snug, but be sure the links will pivot.

65. Clean the surface where TC depth coulter decal ⑪ goes and peel backing off of decal and fasten decal on plate. Firmly press decal to get all air bubbles out.
5113-5115 Wings

Refer to Figure 17
67. Tighten all u-bolts to specs, See “Torque Values Chart” on page 17.
Note: Folding models will be shipped with wings attached.

Light Brackets

Note: Model 5109 light brackets will be installed in the proper location but turned towards inside of machine. See machine layout in Appendix for proper location.

Refer to Figure 18
68. Remove 1/2 x 4 1/32 x 7 1/4 u-bolts ② from light bracket assembly ①. Rotate light bracket assembly ① 180 degrees. Re-install 1/2 x 4 1/32 x 7 1/4 u-bolts ②, secure with 1/2 lock washers and 1/2 nuts.
69. Tighten all u-bolts to specs, See “Torque Values Chart” on page 17.
70. Attach light plug ③ to light wiring harness ④ that is pre-assembled to frame.
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 19

71. 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.

72. 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.

73. Tighten all bolts to specs, See “Torque Values Chart” on page 17

Completing Setup

74. If the Turbo-Chisel is equipped with an optional finishing attachment, refer to “Parts Manual” for parts breakdown and layout section of Appendix for proper placement.

**NOTICE**

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

75. Once the options are installed, fold the Turbo-Chisel to check for clearance and interferences. Slowly fold Turbo-Chisel while watching that hoses and wiring harnesses do not become pinched or kinked, watching for interferences.

Note: Double check that all bolts are tightened to specs, See “Torque Values Chart” on page 17. Consult the “Operator’s Manual”, for the first time field adjustments before going to the field.
# Appendix - Reference Information

## Torque Values Chart

<table>
<thead>
<tr>
<th>Bolt Size</th>
<th>Grade 2</th>
<th>Grade 5</th>
<th>Grade 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>in-tpi</td>
<td>N-m</td>
<td>ft-lb</td>
<td>N-m</td>
</tr>
<tr>
<td>1/2&quot;-20</td>
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<td>6</td>
<td>13</td>
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<td>5/16&quot;-18</td>
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<td>24</td>
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<td>17</td>
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<td>26</td>
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<td>97</td>
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<td>955</td>
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<td>355</td>
<td>1080</td>
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<td>1 1/4&quot;-12</td>
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<td>1990</td>
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<td>745</td>
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<td>1 1/2&quot;-6</td>
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<td>870</td>
<td>2640</td>
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<td>1 1/2&quot;-12</td>
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<td>980</td>
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<th>Grade 8</th>
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<td>in-tpi</td>
<td>N-m</td>
<td>ft-lb</td>
<td>N-m</td>
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<td>5.8</td>
<td>3</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>8.8</td>
<td>7</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>10.9</td>
<td>17</td>
<td>12</td>
<td>26</td>
</tr>
<tr>
<td>M 5 X 0.8</td>
<td>18</td>
<td>13</td>
<td>28</td>
</tr>
<tr>
<td>M 6 X 1</td>
<td>33</td>
<td>24</td>
<td>52</td>
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<tr>
<td>M 8 X 1.25</td>
<td>39</td>
<td>29</td>
<td>61</td>
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<td>M 8 X 1</td>
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<td>91</td>
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<tr>
<td>M 10 X 1.5</td>
<td>60</td>
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<td>95</td>
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<tr>
<td>M 10 X 0.75</td>
<td>92</td>
<td>68</td>
<td>145</td>
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<tr>
<td>M 12 X 1.75</td>
<td>99</td>
<td>73</td>
<td>155</td>
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<tr>
<td>M 12 X 1.5</td>
<td>145</td>
<td>105</td>
<td>225</td>
</tr>
<tr>
<td>M 14 X 2</td>
<td>155</td>
<td>115</td>
<td>240</td>
</tr>
<tr>
<td>M 14 X 1.5</td>
<td>195</td>
<td>145</td>
<td>310</td>
</tr>
<tr>
<td>M 16 X 2</td>
<td>220</td>
<td>165</td>
<td>350</td>
</tr>
<tr>
<td>M 18 X 2.5</td>
<td>280</td>
<td>205</td>
<td>440</td>
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<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>1350</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>
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</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>
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<tbody>
<tr>
<td>Transport</td>
<td>12.5L x 15”  F-Ply</td>
<td>620 kPa 90 psi</td>
</tr>
<tr>
<td>Transport/ Wings</td>
<td>12.5L x 15” 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>
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<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>
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</table>

Hydraulic Connectors and Torque

Refer to Figure 20 (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 4 and the 37° cone 5 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 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 6 and jam nut 8 (“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>
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</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>3/16-18 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>
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<tr>
<td>-8</td>
<td>3/4 -16 ORB straight</td>
<td>37-58</td>
<td>27-43</td>
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</table>
TC5109-TC5315 Hydraulic Lift Layout

See Hydraulic Section for Parts Layout

Black Extend to V1 on Counter Balance Valve

Hose Wrap, Large

Black Retract to V2 on Counter Balance Valve

C1 to Depth Valve

Hose Wrap, Large

Clamp

Hose Wrap, Large

C2 to Cylinder Rod End

Depth Stop Valve to Cylinder Base End

Clamp

Hose Wrap, Large

Hose Wrap, Large

Clamp

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

Black Retract to V2 on Counter Balance Valve

C1 to Depth Valve

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

C2 to Cylinder Rod End

Depth Stop Valve to Cylinder Base End

Clamp

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

Hose Wrap, Large

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

Green Extend to Port IN Bypass Valve

Green Retract to Port T Bypass Valve

Hose Wrap, Large

Clamp

Hose Wrap, Large

Clamp

Pilot Line to Port In to Extend

Front Cylinder Base End to Port 1 Tee Check Valve

Front Cylinder Rod End to Port Reg Bypass Valve

Cylinder Rod End to Port 1

Cylinder Base End to Pilot Line, Port 3

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

See Hydraulic Section for Parts Layout

- Hose Wrap, Large
- Red Retract to Cyl Rod End
- Red Extend to Cyl Base End
- Clamp
- Hose Wrap, Large
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
- Clamp
- Hose Wrap, Large
- Hose Wrap, Large
- Clamp
TC5111-TC5323 Hydraulic Gang Layout

See Hydraulic Section for Parts Layout
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

11 3/4

30 TYP

5 1/2

11 3/4

30 TYP

20 1/2

569-1965

569-2815
TC5111 Machine Layout

Note: Center Counter with Center of Machine.

8 Blade Gang 567-018K LH

7 Blade Gang 567-017K RH

8 Blade Gang 567-019K

4 7/8

3/4

4 7/8

5 1/2

5 1/2

5 1/2

5 1/2

30 TYP

5 1/2

5

5

5

30 TYP

20 1/2

569-196S

569-281S
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 Counter with Center of Machine.
TC5115 Machine Layout
TC5313 Machine Layout

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

8 Blade Gang 567-019K LH
7 Blade Gang 567-018K LH
8 Blade Gang 567-019K RH
8 Blade Gang 567-019K

Note: Center Coulter with Center of Machine.
TC5319 Machine Layout
TC5321 Machine Layout
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.

8 Blade Gang 567–018K LH
7 Blade Gang 567–016K LH
8 Blade Gang 567–019K RH
8 Blade Gang 567–019K
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
TC5113 Chopper Reel Layout
TC5115 Chopper Reel Layout
TC5313 Chopper Reel Layout
TC5315 Chopper Reel Layout

41855
TC5317 Chopper Reel Layout
TC5319 Chopper Reel Layout
TC5321 Chopper Reel Layout
TC5323 Chopper Reel Layout
TC5109 Buster Bar Layout

569-166K

13 1/2

52

569-171K LH

75” BAR

569-172K RH

75” BAR

41300
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

41302

---

75” BAR 569-171K LH
64” BAR 569-173K
13 3/4
41 1/4
79 3/4

569-166K

75” BAR 569-172K RH

569-173K

13 3/4
41 1/4
TC5115 Buster Bar Layout

NOTE: 566-088H has been rotated 180 degrees to allow for proper mounting.

NOTE: 566-088H has been rotated 180 degrees to allow for proper mounting.
TC5313 Buster Bar Layout

41304

42” BAR
569-169K RH

53” BAR
569-167K

569-166K

53” BAR
569-168K

569-166K

42” BAR
569-170K RH

16 1/4

52

78 1/4

97 1/4

16 1/4

52

78 1/4

97 1/4
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
TC5319 Buster Bar Layout

41307
TC5321 Buster Bar Layout
TC5323 Buster Bar Layout
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<td>566-046E, manual</td>
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</tr>
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<td>566-046P, manual</td>
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566-046Q, manual