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 Terra Max using blocks and supports provided.
△ Detach and store Terra Max 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 Terra Max 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 HT1100-20 - HT1100-30 Terra Max is a three section “hybrid” tillage tool. Working width ranges from 20 to 30 feet. The implement is designed to cut and size residue, till soil for faster seedbed warming, break up soil crust on hard dried fields while eliminating compaction layers. The front and rear gangs may be adjusted from 0-8 degree angle, depending on the aggressiveness desired. Various finishing attachments are also available to further smooth, redistribute residue, kill weeds, and break clods.

Models Covered

HT1100-20  20’ (7.5in) spacing
HT1100-25  25’ (7.5in) spacing
HT1100-30  30’ (7.5in) spacing

Document Family

586-831Q-ENG  Assembly Manual
586-831Q  Pre-Delivery Manual (this document)
586-831M  Operator Manual
586-831P  Parts Manual

Tools Required

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

Pre-assembly Checklist

☐ Before assembling, read and understand “Important Safety Information” in front part of this manual.
☐ Have at least two people on hand while assembling.
☐ Make sure area is level and free of obstructions (preferably an open concrete area).
☐ Have all major components
☐ 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.

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

Refer to Figure 3

- Models HT1100-20 - HT1100-30 center frames will be shipped partially pre-assembled. The Terra Max wings will be shipped un-attached and stacked together.

Refer to Figure 4

- The attachment frames (if equipped) will be stacked on pallets and banded together.
- Finishing attachments (if equipped), will be shipped with mounted brackets assembled, reel assemblies assembled and all bolts will be in a box.
- Remove unit from shipping stands (if equipped), after machine is lowered to ground and carefully un-band all components.
- The shipping stands do not need to be returned to Great Plains.

Unloading

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

⚠️ CAUTION

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 Terra Max is a potentially dangerous operation.

1. Reduce risk and complications by first unloading
2. the gangs and finishing attachments
3. the misc. boxes
4. Place these components well out of the maneuvering area needed for unloading the Terra Max.
5. the Terra Max (described in the next section)

Unload Terra Max

6. The center brace bar, front trusses and hitch assembly may be attached to center section on trailer if heavy fork lift is not available to unload machine. See “Assembly” on page 8 to install components needed to pull off side of trailer.
7. A heavy fork lift or two fork lifts are needed to lift the unit stacks off the truck before assembling the rest of the machine. Double-check that all chains and tie-down straps have been released and stowed.
8. Set parking brake on tractor and trailer.
9. Slowly lift the Terra Max off trailer bed using fork lifts.
10. Stop lifting about 12” above the bed.
11. Have the truck driver slowly pull the trailer straight out from under the Terra Max.
12. Making sure to keep level from front to back and side to side, slowly lower the Terra Max.
13. Slowly lower Terra Max until it is resting on the coulter gangs.

**Unpacking Boxes**

- Position boxes in area that you can maneuver components up to machine to assemble.
- Carefully remove banding from boxes.
- Carefully remove banding from brace bars and finishing reels.
- Locate and identify all components before assembling.

**Further Assistance**

Great Plains Manufacturing, Inc. wants you to be satisfied with your new Terra Max. 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 Brace Bar

Refer to Figure 5

- The center brace bar, level bar and hitch need to be installed. The bolt kit needed for assembling the rest of machine will be shipped in a bag. The center will be shipped partially pre-assembled. See “Parts Manual” for part numbers and description of parts.

17. Align holes in plates of the center brace bar (1) with holes on front of center frame (2), secure with \( \frac{3}{4} \times 2 \) hex bolts (3), \( \frac{3}{4} \) lock washers and \( \frac{3}{4} \) nuts.

18. Install the center cylinder mounts (4) to the center frame (2) using \( \frac{3}{4} \times 2 \) hex bolts (3), \( \frac{3}{4} \) lock washers and \( \frac{3}{4} \) nuts. The offset needs to be on the lower side of the mount.


Level Bar

Refer to Figure 6

20. Align bottom holes on h-bracket spring assembly (4) with ears on front of center brace bar, secure with 1 x 3 1/4 usable pins (5), 1.5 x 1.0 x 0.075 machine washers (6) and \( \frac{3}{16} \times 2 \) cotter pin.

- Do not attach the spring bracket to the level bar until after the weight packs are installed if your unit is equipped with that option.

21. Attach level bar (1) with 1 x 9 1/2 pin (2). Align hole in pin and holes in collars on outside of torque tube ears, install \( \frac{3}{8} \times 2 \frac{1}{4} \) Gr. 8 bolts (3) and \( \frac{3}{8} \) nylock lock nuts.

22. Attach front plate of level bar (1) with rear plate of h-bracket spring assembly (4) with \( \frac{3}{4} \times 2 \) Gr. 8 hex bolts (7), \( \frac{3}{4} \) lock washers and \( \frac{3}{4} \) nuts.

23. Bolts may be tightened to specs, See “Torque Values Chart” on page 31 and cotter pins bent.
Valve Brackets & Valves

Refer to Figure 7

The valves and will be connected to the correct hoses and will need to be installed on the center brace bar. The brackets may be in place. If for some reason they are not follow the steps below to install. If the gangs are installed before you place the valves, you will need to take the hoses lose from the valves and route the hoses above the gang bars and underneath the brace bar tubing.

24. Use \( \frac{5}{16} \times 4\frac{1}{2} \) Gr. 5 hex bolt (3), \( \frac{5}{16} \) lock nuts and washers to secure the bypass valve (1) to the by pass valve bracket (2). The bypass valve bracket (2) is attached to the center brace bar using \( \frac{3}{8} \times 1\frac{1}{2} \) hex bolts (4), \( \frac{3}{8} \) lock washers and hex nuts. Be sure to install the level bar before installing this or the mounting bolts for the level bar will have clearance issues.

25. The lock valve (5) is attached to a mounting plate that is welded to the center frame. Use \( \frac{1}{4} \times 1\frac{3}{4} \) Gr. 5 hex bolts (6) to secure to the frame.

26. Depth control valve (7) is secured to the frame using \( \frac{5}{16} \times 2 \) hex bolts (8) and \( \frac{5}{16} \) lock washers.

27. The splitter valve (9), is secure to the mounting plate on the center brace bar using \( \frac{5}{16} \times 2 \) hex bolts (8) and \( \frac{5}{16} \) lock washers.

28. If your unit has the Hydraulic Reel option there will be an additional down pressure valve (10), mount this on the back side of the bulkhead fitting plate, using mount (11), replace the \( \frac{3}{8} \times 1\frac{1}{2} \) Gr. 5 (4) hex bolts, with \( \frac{3}{8} \times 2 \) (4).

Use \( \frac{5}{16} \times 4\frac{1}{2} \) Gr. 5 hex bolt (3), \( \frac{5}{16} \) lock nuts and washers to secure

29. Be sure hoses are routed as shown in, See “Valve Brackets & Hoses” on page 10.

Bolts may be tightened to specs, See “Torque Values Chart” on page 31.
Valve Brackets & Hoses

Refer to Figure 8

The hoses will be shipped hooked up to valves, cylinders, bulkhead fittings, and will be routed on the machine in the proper places. The hoses from the hitch will need to be connected to the bulkhead fittings on the center brace bar. The bypass (1), lock valve (2), splitter valve (3) and depth control valve (4) hoses will be routed underneath or around the weight kits (if your unit is equipped with this option) so that they may be installed or removed without taking hoses or valves lose. The hoses will be secured to the frames using hose holders and P-clips. If any of the hoses are not already secured to the frame route the hoses along the path with the hose holders to the bulkhead brackets and fittings. See “Appendix - Reference Information” on page 31 for proper mounting instructions.

Figure 8
Valve Brackets & Hoses
Center Gang Bars

Refer to center gang bar assembly in “Parts Manual” for correct part numbers of all components. Refer to machine layout drawings in this manual for correct gang assembly placement.

Refer to Figure 9

30. Position gang assemblies (1) in proper locations. Install the gang pivot bolt (2) through tubes of gang bars and tubes on center frame, secure with 1 1/4 flat washers (3) (one on top and one on bottom), 1 1/4 slotted nut (4) (one on top and one on bottom). Tighten bolts snug, torque to 350 to 400ft-lbs. Install the 3/16 x 2 cotter pins (5) through 1 1/4 slotted nuts (4) and bend over to secure.

Be sure turnbuckle assembly (9) is preset at 67 1/4” (center hole to center hole) before installing as shown. See gang angle adjustment in “Operator Manual” before going to field. Attach rear of front turnbuckle to rocker arm before attaching to front gang on right side due to center breaker.

31. Install rocker arm (6) to tube on center frame with 1 1/4 lock nut (7), to secure to frame.

32. Install link (8) with 1 x 3 clevis pin (10), 1.5 x 1.00 x 0.075 machine washer (11) and 3/16 x 2 cotter pin (5).

33. Install link (9), on ear on front of rear gang bars and on to rocker arm (6). Secure with 1 x 3 clevis pin (10), 1.5 x 1.00 x 0.075 machine washer (11) and 3/16 x 2 cotter pin (5).

34. Install the round tubes (14) (two on each gang bar) between bottom front plate (12) (slotted hole toward rear), rear plates (13) and plates on center frame. Install the 3/4 x 6 hex bolts (15), 3/4 lock washers and nuts. Attach other ends of plates (12) and (13) to bottom of center frame with 3/4 x 2 hex bolts (15) and 3/4 lock washers.

35. Install bracket (16) on bottom side of gang bar plate, secure with 5/8 x 3 1/2 hex bolts (17), 5/8 lock washers and nuts.

36. Attach cylinder lug (20) to center frame using 3/4 x 2 hex bolt (21), lock washer and nuts.

37. Now the gang cylinders (18) may be hooked up with the 1 x 3 3/4 clevis pin (19), 1.5 x 1.00 x 0.075 machine washer (11) and 3/16 x 2 cotter pin (5).

38. Hook gang cylinder hoses to gang cylinders, be sure all fittings are tightened to specs, See “Hydraulic Connector ID” on page 32. Now the gang system may be purged of air, See “Purging Hydraulic System” on page 22.

39. Bolts may be tightened to specs, See “Torque Values Chart” on page 31 and all cotter pins may be bent.
Figure 9
Center Gang Bars
TP-69624
Wing Gang Bar

Refer to center gang bar assembly in “Parts Manual” for correct part numbers of all components. Refer to machine layout drawings in this manual for correct gang assembly placement.

Refer to Figure 10

40. Position gang assemblies (1) in proper locations. Install the gang pivot bolt (2) through tubes of gang bars and tubes on center frame, secure with 1\(\frac{1}{4}\) flat washers (3) (one on top and one on bottom), 1\(\frac{1}{4}\) slotted nut (4) (one on top and one on bottom). Tighten bolts snug, torque to 350 to 400ft-lbs. Install the \(\frac{3}{16}\) x 2 cotter pins (5) through 1\(\frac{1}{4}\) slotted nuts (4) and bend over to secure.

Be sure turnbuckle assembly (6) is preset at 96\(\frac{1}{2}\)” before installing as shown below. See gang angle adjustment in “Operator Manual” before going to field.

41. Install turnbuckle assembly (6), adjustable end on ear on front of rear gang bars and fixed end on ear of front gang bars. Secure with 1 x 3 clevis pin (7), 1.5 x 1.00 x 0.075 machine washer (8) and \(\frac{3}{16}\) x 2 cotter pin (5).

42. Install the round tubes (11) (two on each gang bar) between bottom front plate (9) (slotted hole toward rear), rear plates (10) and plates on wing frame. Install the \(\frac{3}{4}\) x 6 hex bolts (12), \(\frac{3}{4}\) lock washers and nuts. Attach other ends of plates (9) and (10) to bottom of wing frame with \(\frac{3}{4}\) x 2 hex bolts (13) and \(\frac{3}{4}\) lock washers.

43. Install bracket (14) on bottom side of gang bar plate, secure with \(\frac{5}{8}\) x 3\(\frac{1}{2}\) hex bolts (15), \(\frac{5}{8}\) lock washers and nuts.

44. Now the gang cylinders (16) may be hooked up with the 1 x 3.38 clevis pin (17), 1.5 x 1.00 x 0.075 machine washer (8) and \(\frac{3}{16}\) x 2 cotter pin (5).

45. Hook gang cylinder hoses to gang cylinders, be sure all fittings are tightened to specs, See “Hydraulic Connector ID” on page 32. Now the gang system may be purged of air, See “Purging Hydraulic System” on page 22.

46. Bolt may be tightened to specs, See “Torque Values Chart” on page 31 and all cotter pins may be bent.
Figure 10
Wing Gang Bars

TP-69627
Hitch Assembly

Refer to Figure 11

47. Bolt the hitch assembly (1) to center frame with the 1 1/4 x 8 Gr. 8 bolts (2), 1 1/4 flat washer (3) (one side of uniball to take up space) and 1 1/4 top lock nuts. Tighten bolts snug, do not torque, as the hitch must pivot freely.

48. Install jack (4) on front outside of hitch to support the front of hitch (1) for the rest of assembly.

49. Remove 1 1/4 x 8 1/2 Gr. 8 special thread bolt (5) from front short level bar tube (6). Align holes in rear of level bar tube (6) and center hole of h-bracket (7). Install the 1 1/4 x 8 1/2 Gr. 8 special thread bolt (5) from the left side and secure with 1 1/4 top lock nut.

50. Bolt the spring hose holder (8) to welded nut on front of hitch with 1/2 x 1 Gr. 5 bolt (9), 1/2 flat washer and 1/2 lock washer.

51. The cylinder (10) will be installed on the hitch (1) using with 1 x 6 hex bolt (11) and 1 top lock nut, the hoses will be hooked into the proper ports. The Rod end of the cylinder will be attached to the H-bracket using 1 x 8 special thread bolt (12) and 1” top lock nut. The hoses will need to be attached to the bulk head fittings on the center brace bar.

Before adhering the decal to the level gauge bracket, be sure to retract the cylinder all the way, position A lines up with the red indicator.
Hose Routing Hitch

Refer to Figure 12

52. The hoses are routed along the hitch (1), the end of the hoses will need to be attached to the valves on the center brace bar.

53. The hydraulic connection end will need to be run through the hose loop and stored on the plate that is attach to the front of the hitch and labeled.

Wing & Brace Bar

Refer to Figure 13

The wings (3) will come partially pre-assembled. Models 20 & 25 will be shipped with wings attached in folded position but will need wing brace bars attached as shown. Un-fold wings before attaching wing brace bars. On model 30, place wing frame assemblies on stand next to the center frame. The hoses and some cylinders will be in place on the wing frames and will need to be attached to the wing brace bars. (Blades have been removed from drawing for simplicity.)

54. Attach wing brace (1) to front of wing frame (3) with $\frac{3}{4} \times 2$ Gr. 5 hex bolts (2), $\frac{3}{4}$ lock washers and $\frac{3}{4}$ nuts.

55. Attach wing frame assemblies (3) to center frame (5) with the wing hinge pins (4), $1\frac{1}{4}$ flat washers (6) (rear side of wing frame hinge tubes) and 1 top lock nuts.

56. Install wing cylinder lug (8) with $\frac{5}{8} \times 3\frac{3}{16} \times 6\frac{1}{2}$ u-bolt (9) to the front of the wing frame, the u-bolts will be on either side of the center frame tube.

57. Do not hook up rod end of fold cylinder (7) until system is purged of air. See “Purging Hydraulic System” on page 20.

58. Bolt may be tightened to specs, See “Torque Values Chart” on page 31.
Gauge Wheel

Refer to Figure 14

59. Install wheel arm mount (1) on wing brace with \(\frac{5}{8}\) x 2 hex bolts (2), secure with \(\frac{5}{8}\) lock washers and nuts.

60. Attach screw jack (3) to wheel arm mount (1) with \(\frac{1}{2}\) x 1\(\frac{1}{4}\) hex bolts (4), \(\frac{1}{2}\) top lock nuts.

61. Slide gauge wheel spindle receiver (5) into wheel arm mount (1), secure with \(\frac{3}{4}\) x 4 hex bolts (6), \(\frac{3}{4}\) lock washers and \(\frac{3}{4}\) nuts. Install the \(\frac{5}{8}\) x 1\(\frac{1}{4}\) hex bolts (7) to the wheel arm mount (1).

62. Align hole in 6-bolt hub/spindle assembly (8) with hole in gauge wheel spindle receiver (5), secure with \(\frac{5}{16}\) x 2\(\frac{13}{16}\) clevis pin (9) and \(\frac{1}{8}\) x 1 cotter pin.

63. Attach wheel/tire assembly (10) to 6-bolt hub/spindle assembly (8) with \(\frac{5}{16}\) lug nuts (11). Tighten all bolts with lock nuts snug, but do not torque. The rest of the bolts may be tightened to specs, See “Torque Values Chart” on page 31.

Hydraulic Wing Lift & Gangs

The hydraulic hoses are fastened to correct center frame cylinders, valves and double block tees. The hoses will be routed along the wing frames and will need to be attached to the bulkhead fitting on the center frame. It is very important to get them hooked up correctly or hydraulic system will not function properly. Be sure hose ends and fittings are clean before assembling hoses. Be sure 196-430D orifice is installed on rod end outside gang cylinder between cylinder port and 811-063C elbow.

64. Attach hoses to cylinders on wings as shown, See “Hydraulic Lift Layout” on page 34, and the Gang Hydraulics Layouts that follow.

Do not over tighten hoses as this could cause damage to valves, See “Hydraulic Connector ID” on page 32.

65. Fasten hoses to wings with bolts and clamps (provided). Attach hose wraps on hoses to prevent hoses from dragging or getting pinched.

66. Also see Hydraulic Layouts in “Appendix Section” for all hose routing.
Attach Hose Clamps and Hose Wraps

Refer to Figure 15

67. When all the hoses are hooked up and tightened properly, put hose clamps on hoses as shown.
68. 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. Hoses may be twisted when the cylinders are placed in the correct location, if so loosen the hydraulic fittings and correct the hoses.

Hydraulic Hose Hookup

69. 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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<thead>
<tr>
<th>Color</th>
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<tr>
<td>Black</td>
<td>Lift (2 hoses)</td>
</tr>
<tr>
<td>Green</td>
<td>Fold (2 hoses)</td>
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<tr>
<td>Red</td>
<td>Gang Adjustment (2 hoses)</td>
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<tr>
<td>Yellow</td>
<td>Hydraulic Reel Att. (2 hoses) (Optional)</td>
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</table>

Refer to Figure 16

Hose Handles

70. 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.
71. 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

Be sure to remove the cylinder retainers from the lift cylinders before purging air from hoses.

Refer to Figure 17

72. Charge the lift system first. Extend the lift cylinders (1) (black handles) until the center section is fully raised. Remove the cylinder transport locks (2) and store on lift straps (3). Raise and lower the lift system several times to purge air from system. Retract and extend the gang system (4) (Red Handles) several times to purge air from system. Watch for leaks and re-tighten fittings if necessary.

73. You may now charge the fold system. Before charging the fold cylinders (5), make sure the rod end of the cylinders (are un-bolted or un-pinned and block is placed under cylinders as shown, so that when the rod is extended, it will clear the wing fold brackets. Extend the fold cylinders (5) (green ends) completely and then close them. Extend and retract the cylinders several times to purge air from the system.

74. Now the rod end of fold cylinders (5) may be hooked up to wing with the 1 x 3/8 usable pin (6), 1.5 x 1.0 x.075 machine washer and 3/16 x 2 cotter pin. Bend cotter pin over to secure.
Depth Stop & Angle Gauge

Refer to Figure 18

- See machine layout drawings in Appendix for proper gang gauge placement for each model. Cycle gang cylinders several times before adjusting the angle gauge rod to 0°.

75. Slide depth stop tube (1) from rear of machine under left wing stop through square hole on depth control bracket on center wing brace. Align rear holes over lever on torque tube, secure with 1/2 x 3 hex bolt (2), 1/2 top lock nut.

76. Fasten depth stop assembly (3) on top of depth stop tube with 1/2 x 2 1/2 hex bolts (4), 1/2 lock washers and nuts.

77. Attach angle gauge bracket assembly (5) to front of center frame with 1/2 x 3 1/32 x 6 u-bolts (6), 1/2 lock washers and 1/2 nuts.

78. Attach gauge link (7) to ear on front of center frame gang bar and gauge bracket assembly (5), secure with 3/8 x 1 1/4 hex bolts (8) and 3/8 top lock nuts.

79. Bolt may be tightened to specs, See “Torque Values Chart” on page 31.
Lights & SMV

Refer to Figure 19

See layout drawings in Appendix for proper light bracket placement. The rear light brackets have mounting plates and the front brackets mount on the front tube of the brace bars. If machine is equipped with a rear attachment the rear light brackets (7) will need to be mounted to the rear tube of the center drag frame. The SMV sign will be shipped in a bag and will need installed on the rear of the machine.

80. Remove u-bolts from light brackets. Install the light brackets (1) and (2) with the $\frac{1}{2} \times 3\frac{1}{32} \times 6$ u-bolts (3), $\frac{1}{2}$ lock washers and $\frac{1}{2}$ nuts. These will be installed on the front brace bar tube next to the outside frame tube plate.

81. Route the wiring along the same path as the hydraulic hoses using p-clips to hold in place. If your machine has an attachment the rear light brackets are attached to the center rear attachment frame.

82. Attach the SMV sign (4) to the rear of the smv bracket (5) with $\frac{1}{4} \times 3\frac{1}{4}$ pan head screws (6), $\frac{1}{4}$ lock washers and $\frac{1}{4}$ nuts.

83. Tighten all bolts to specs, See “Torque Values Chart” on page 31.

Rear Lights

Refer to Figure 20

See layout drawings in Appendix for proper light bracket placement. If machine is not equipped with a rear attachment the rear light brackets will need to be mounted to the rear plate of the center frame with the $3\frac{3}{4} \times 2$ bolts (3).

84. Remove bolts from light brackets. Install the LH (1) and RH (2) light brackets to plates of center drag frame (4) with the $3\frac{3}{4} \times 2$ bolts (3), $3\frac{3}{4}$ lock washers and $3\frac{3}{4}$ nuts.

85. Tighten all bolts to specs, See “Torque Values Chart” on page 31.
Splitter Switch

Refer to Figure 21

The electrical pigtail that attaches to the switch and the splitter valve will be stored in the manual pak.

86. Attach the pigtail (1) to the splitter valve (2) and then to the light harness lead(3).

87. The switch on the pigtail (1) will need installed into the switch bracket (4) that will be mounted on the bulkhead bracket on the front of the brace bar.

88. On the HT1100-30 the pigtail will also attach to the fold assist harness (5) and the fold assist harness will plug into the bypass valve (6).
HT1100-30 Wing Fold Assist

Refer to Figure 22

Wings need to be folded up when installing the proximity sensor (4) to prevent damage to sensor and brackets. Be sure wing safety lock pins are installed.

89. Slide proximity mount bracket (1) over hinge pin (2) in orientation shown, secure with 1 lock nut (3). Tighten 1 lock nut (3) snug but do not torque.

90. Slide proximity sensor (4) through inside, big hole of proximity mount bracket (1) from rear. Be sure there is a nut (5) on back side of bracket and secure with a nut (5) on front side. Route leads of proximity sensor (4) towards center of machine on front tube of center frame as shown.

91. Plug short leads of the fold assist harness (6), one end to the light harness lead w/valve (7) and the other end into the lead from the bypass down pressure valve solenoid (8).

92. Route the rest of fold assist harness (6) as shown back to front tube of center frame and attach plugs to the proximity sensor (4) leads.

93. 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.
Proximity Sensor Adjustment

Refer to Figure 23

Wings need to be folded up when adjusting the proximity sensor (1) to prevent damage to sensor and bracket. Be sure and adjust proximity sensors before unfolding. Be sure wing safety lock pins are installed.

94. Loosen nuts (2) (one on front and one on back side of sensor bracket, adjust the proximity sensor (1) to 1/8” to 1/4”, from front of proximity sensor (3) to rear of wing tube (4) as shown.

95. Re-tighten nuts (2) to secure proximity sensor (1).
Install Decals

Refer to Figure 24

The center brace bar decals will need installed in locations shown. Decals should already be installed on the hitch.
Clean the area on which the decal is to be placed. Peel backing from decal. Press firmly on surface, being careful not to cause air bubbles under decal.

96. Install two, 838-615C amber decals (1) (one each side).
97. Install two 838-611C hand crushing decal (2) on front of brace bar (one each side).
98. Install one, 848-972C bypass valve operating instruction decal (3) on front of truss (left side) (4).
99. Install two, model number decals (5) on front of brace bar (one each side).
Rolling Harrow (optional)

Refer to Figure 25

All rolling harrow brackets (3) and ball joint brackets (6) and (7) should be already installed in proper locations. You will simply need to connect the rolling harrow assemblies (9) with the ball joints to the brackets on the drag frame (1). Each spike tube (8) will have a letter decal on the top of the tube. The letter A starts on the far left side of the unit and proceeds to the right. You may want to check the measurements of the ball joints just to be sure. It is easier to start installation in the middle and work outward.

100. Start by installing the drag frames (1) with $\frac{3}{4}$ x 2 hex bolts (2), $\frac{3}{4}$ lock washers and nuts. Torque bolts to 265 ft-lb. This is easier when the rolling harrows are not attached.

101. Carefully lower machine down or use fork lift or overhead hoist (if available) to raise rolling harrow assemblies (9) to rolling harrow brackets (3). Align ball joint brackets (6) and (7) with rolling harrow brackets (3), secure with 1 x 4 hex bolts (5) and 1 nylon lock nut. Tighten the 1 x 4 hex bolt (5), only until lock nut is against side of bracket, if over tightened damage to the ball joint brackets will occur.

If you should have to remove these brackets, re-attach all the ball joints with $\frac{5}{8}$ x $3\frac{1}{32}$ x $4\frac{1}{2}$ u-bolts (4). It is very important to install the rolling harrow assembly in the proper location, see “Layout Section” of this manual for proper dimensions where it is marked xxx in drawing below. The rolling harrow bracket (3) dimensions are coming off of rear, front tube of drag frame (1) to front of plate of rolling harrow bracket (3). The ball joint bracket (6) is dimensioned off of end of rolling spike tube (8) to side of plate on ball joint bracket (6) (dimensions in layout drawings may come off either end of tube). For complete parts breakdown see “Attachment Section” of Parts Manual.

Re-installation instructions are to place left ball joint brackets (6) in proper location from layout drawing and torque u-bolts to 150 ft-lb. Leave right ball joint bracket (7) loose, as it may need move a little while you bolt up the left rolling harrow bracket (3).
Hydraulic Reel Down Pressure Kit

Refer to Figure 26

102. Install the cylinder mount (1) and mounting bracket (2), using 5/8 x 5 hex bolt (3), lock washer and hex nut in the proper locations on the rear drag frame (4).

103. Mount the double reel arms (5) to the mounting bracket (2) using 5/8 x 4 1/4 special thread Gr. 8 hex bolt (6).

104. Attach the cylinders (7) to the drag arm assembly (5) and the cylinder mount (1) using clevis pin 1 x 3.13 (8) and cotter pin 3/16 x 2 (9).

105. Attach the double reel arms (5) to the double reel pivot bracket (10) using 1 x 7.52 usable pin (11). The double reel frames (12) may need to be attached to the arms (5) using u-bolt 1/2 x 2 x 3 (13). The reels (14) bolt on to the double reel frames (12) using 1 x 4 (15).

106. Attach the double reel bolt on arm (16) to the double reel frame (12) using 5/8 x 2 hex bolt (17), lock washers and nuts.

107. The hydraulics will be run along the hitch and will need to be hooked to the down pressure valve that will be mounted to the center frame on a bracket. Hoses will be run along the center frame and to the double tee block. The top ports of the double tee block will be routed to the rod end of the hydraulic cylinders. For complete hose routing See “Double Hydraulic Reel Layout” on page 52.

108. Hook the hydraulic hoses to the cylinders, rod to rod, and base to base.

109. Purge the hydraulics of air and check for leaks.

Please see layouts for dimensions and placement, and Part Manual for a complete list of parts.
Figure 26
Hydraulic Double Reel
Weight Package Assembly (Optional)

Refer to Figure 27

**CAUTION**

Lower machine until coulters are on ground and pressure is off leveling system.

- Use up to 2 sets of weights (4 weights) may be installed in positions shown.

**NOTICE**

If you have only 1 weight pack set, it be installed in front of the fold cylinder. If you have 2 sets, one must be installed in front of the fold cylinder bracket and one must be installed behind the fold cylinder bracket.

110. Start by removing the \( \frac{3}{4} \times 2 \) Gr. 8 bolts (5) from level bar assembly.

111. Pivot level bar (6) up so there will be clearance to set the 750 pound weight assemblies (8) into place.

112. Pivot level bar spring assembly (7) forward.

113. Carefully lower the 750 pound weight assemblies (8) (4 maximum) onto center frame trusses (9), two on front side of fold cylinders and two on rear side of fold cylinders.

114. Slide rear weights as far forward as possible and install weight box stops (10) on inside of trusses as close to weight as possible (rear weights), secure with \( \frac{1}{2} \times 4\frac{1}{32} \times 8\frac{1}{4} \) u-bolt (11), \( \frac{1}{2} \) lock washers and \( \frac{1}{2} \) nuts.

115. Use a \( \frac{1}{2} \times 4\frac{1}{32} \times 9\frac{1}{4} \) u-bolt (12) to install the front weight stops (13). Be sure to leave enough space for wing rest to attach to brace bar in front of weight packs.

Refer to Figure 28

116. Pivot level bar (2) and the level bar spring assembly (3) until holes in plates are aligned.

117. Re-install \( \frac{3}{4} \times 2 \) Gr. 8 bolts (1), secure with \( \frac{3}{4} \) lock washers and \( \frac{3}{4} \) nuts.

118. Torque \( \frac{3}{4} \times 2 \) Gr. 8 bolts (1) to 375 ft-lbs to be sure bolts do not work loose and cause damage to machine.
Appendix - Reference Information

Torque Values Chart

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

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25199

Torque Values Chart

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<td>650-750 Foot-pounds (175 lbs on 4&quot; cheater).</td>
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Some notes:
- 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

Great Plains | 586-831Q | 10/13/2020
Tire Inflation Chart

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<td>Transport/Center 20 &amp; 25</td>
<td>Titan 380/55R x 16.5G</td>
<td>73 psi (503 kPa)</td>
</tr>
<tr>
<td>Transport/Center 30</td>
<td>BKT 410/50R x 16.5</td>
<td>67 psi (462 kPa)</td>
</tr>
<tr>
<td>Transport/Wings 20 &amp; 25</td>
<td>11L-15SL 12-Ply</td>
<td>52 psi (359 kPa)</td>
</tr>
<tr>
<td>Transport/Wings 30</td>
<td>12.5L x 15” 12-Ply</td>
<td>52 psi (359 kPa)</td>
</tr>
</tbody>
</table>

Hydraulic Connectors and Torque

Refer to Figure 29 (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.
  - Do not use tape sealant, which can clog a filter and/or plug an orifice.

- **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.

- **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.

<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>1/2-18 JIC</td>
<td>24-27</td>
<td>18-20</td>
</tr>
<tr>
<td>-6</td>
<td>1/2-18 ORB w/jam nut</td>
<td>16-22</td>
<td>12-16</td>
</tr>
<tr>
<td>-6</td>
<td>1/2-18 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>
Hydraulic Lift Layout
HT1100-20 & 25 Hydraulic Fold Layout

See Parts Manual for Fittings
HT1100-30 Hydraulic Fold Layout
HT1100-30 Hydraulic Gang Angle Layout
HT1100-20 & 25 Reel Hydraulic Layout
HT1100-20 Machine Layout
HT1100-25 Machine Layout
HT1100-30 Machine Layout
HT1100-30 Machine Layout
HT1100-20 Double Reel/Rolling Harrow Layout
HT1100-20 Double Reel/Rolling Harrow Layout
HT1100-25 Double Reel/Rolling Harrow Layout
HT1100-25 Double Reel/Rolling Harrow Layout

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HT1100-30 Double Reel/Rolling Harrow Layout
HT1100-30 Double Reel/Rolling Harrow Layout
HT1100-20 Single Reel/Rolling Harrow Layout
HT1100-20 Single Reel/Rolling Harrow Layout
HT1100-25 Single Reel/Rolling Harrow Layout
HT1100-25 Single Reel/Rolling Harrow Layout
HT1100-30 Single Reel/Rolling Harrow Layout
HT1100-30 Single Reel/Rolling Harrow Layout