



Flat Fold Marker Single Section YP Planters

Used with:

- YP425A, YP425A3P
- YP625A, YP625A3P, YP625PD/TD
- YP825A, YP825A3P
- YP925TD



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!

General Information

These instructions explain how to install field markers on a compatible planter.

These instructions apply to an installation of:

Kit	Kit Description
113-836A	4-30 3P PLTR FLAT FOLD MKR
113-837A	4-30 PT PLTR FLAT FOLD MKR
113-838A	6-30 PT PLTR FLAT FOLD MKR
113-839A	6-38-40 8-30 PT PLTR FOLD MKR
113-854A	4-38-40 PT PLTR FLAT FOLD MKR
113-855A	4-38-40 3P PLTR FLAT FOLD MKR
113-857A	4-36 PT PLTR FLAT FOLD MKR
113-858A	4-36 3P PLTR FLAT FOLD MKR
113-859A	6-36 3P PLTR FLAT FOLD MKR
113-860A	6-36 PT PLTR FLAT FOLD MKR
113-861A	6-110 3P PLTR FLAT FOLD MKR
113-862A	6-110 PT PLTR FLAT FOLD MKR
113-863A	9-65 3P PLTR FLAT FOLD MKR

One kit includes two markers (left and right), an automatic sequence valve, all hydraulic hoses and fittings, and all necessary mounting hardware.

One kit updates one planter.

Related Documents

Have the Operator Manual at hand for planter movements.

401-651M	YP425/625/825A3P Operator Manual
401-652M	YP425/625/825A Operator Manual
401-754M	YP625PD Operator Manual
401-755M	YP625TD/925TD Operator Manual

Have the current Parts Manual at hand for parts identification.

401-651P	YP425/625/825A3P Parts Manual
401-652P	YP425/625/825A Parts Manual
401-754P	YP625PD Parts Manual
401-755P	YP625TD/925TD Parts Manual

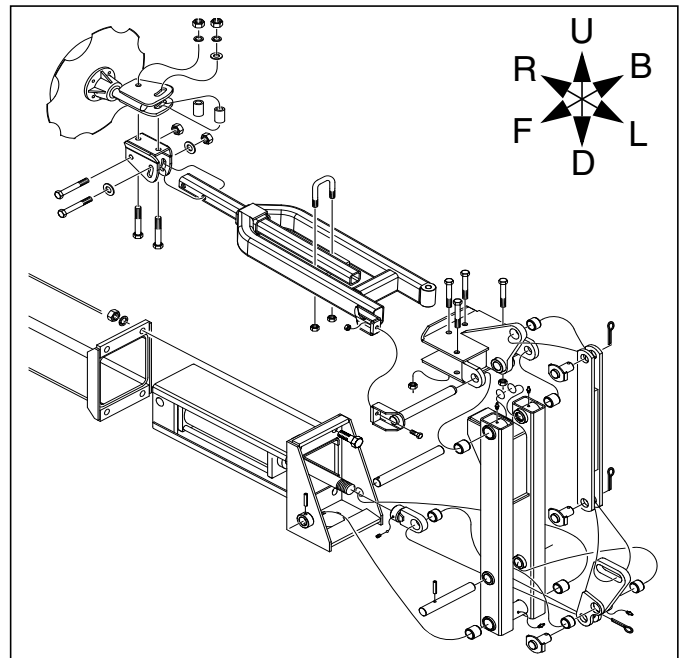
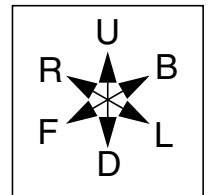


Figure 1
Flat Fold Marker Kit

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Notations and Conventions

“Left” and “Right” are facing in the direction of machine travel. An orientation rose in the line art illustrations shows the directions of Left, Right, Front, Back, Up, Down.



Call-Outs

- ① to ⑨ and ① to ⑨ Single-character callouts identify components in the currently referenced Figure or Figures. These callouts may be reused for different items from page to page.
- ⑪ to ⑫ Two-digit callouts in the range 11 to 22 reference affected existing parts.
- ③① to ③① Two-digit callouts in the range 31 to 91 reference new parts.

Before You Start

Parts and Tools Required

- You need a suitable tractor for positioning the planter, and having sufficient hydraulic circuits, with adequate capacity to operate the markers (installing markers increases the required circuits by one).
- You need a hoist with 136 kg (300 pound) capacity.
- Have safety goggles and gloves for inspecting hydraulic connections and handling sharp marker discs.
- Other than the hoist, only basic hand tools are required.
- 5 liters (1.2 gallons) of hydraulic fluid is needed to charge the marker system.
- General purpose grease lubricant and grease gun.
- Liquid PTFE pipe sealant, if the kit includes QD couplers. See page 20 for more information.

Compatibility

Refer to Figure 2 (consult planter Operator manual for serial number plate location)

1. Check the model number of the planter against the table at right to ensure you have the correct kit.

Sequence

If installing the markers as part of export pre-delivery, perform the installation at the point called for in the pre-delivery manual:

401-754Q YP625/925 Export Pre-Delivery Manual

Comprehension

2. Review these instructions. Make sure the installers understand where each part or assembly is installed, and what tools are required for the task.

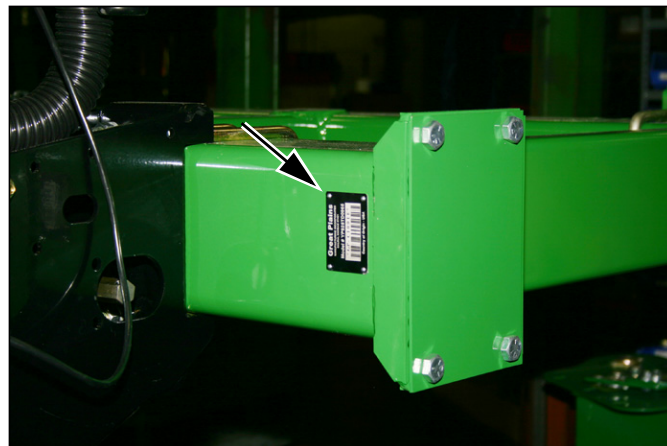


Figure 2
YP925 Serial Number Plate

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Kit	Compatible Planters
113-836A	YP425A3P, spacings up to 30 in. (76 cm)
113-837A	YP425A, spacings up to 30 in. (76 cm)
113-838A	YP625A3P, spacings up to 30 in. (76 cm)
113-839A	YP625A, spacings 38 in. or 40 in., YP825A, spacings up to 30 in. (76 cm)
113-854A	YP425A, spacings 38 in. or 40 in
113-855A	YP425A3P, spacings 38 in. or 40 in
113-857A	YP425A, spacing 36 in.
113-858A	YP425A3P, spacing 36 in.
113-859A	YP625A3P, spacing 36 in.
113-860A	YP625A, spacing 36 in.
113-861A	YP625TD, spacing 110 cm
113-862A	YP625PD, spacing 110 cm
113-863A	YP925TD, spacing 65 cm

Pre-Assembly Preparation

Work Location

3. Move the planter to a location with:
 - access to tractor or hydraulic power;
 - adequate illumination; and,
 - clear surface beneath for recovery of any falling or dropped parts - if the surface is not clear, have a tarp or drop cloth available.
4. Raise planter. Install lift cylinder locks and/or parking stands, as provided. Lower planter onto locks. This minimizes planter movement during exercising of markers on a planter with a shared lift/ marker circuit.
5. Set all hydraulic remote circuits to Float (to ensure that pressure is relieved). Shut off tractor or hydraulic source.

WARNING

High Pressure Fluid Hazard:

Ensure lift circuit pressure is zero at step 5. Wear gloves and safety eyewear when working on hydraulics. Some planter configurations require disconnecting hydraulic fittings in the lift circuit. Dangerous releases of hydraulic fluid may occur if pressure remains in the circuit. This could lead to serious personal injury. If hydraulic fluid penetrates the skin, seek immediate medical attention from a physician familiar with this type of injury.

Install Sequence Valve Mount

Attach Valve to Mount

If the sequence valve (71) is already attached to the mount (48), continue at “Identify Mount Style”.

Refer to Figure 3 and Figure 4

6. Select one:

(71) 810-197C VALVE, SEQUENCE SHOEMAKER

Examine the valve body to establish which faces are front, rear and bottom.

The front (supply/return) face has two FORB ports adapted to $\frac{9}{16}$ MJIC. They are stamped “1” and “2”.

The rear (cylinder) face has four MORB ports adapted to $\frac{9}{16}$ MJIC. They are stamped “C1”, “C2”, “R1” and “R2”. The “C” ports connect to cylinder rod (retract) ends. The “R” ports connect to cylinder base (extend) ends.

The bottom face has two $\frac{3}{8}$ -16 threaded holes for mounting (not shown).

7. Select one:

(48) 411-642D MOUNT, SEQUENCE VALVE
and two sets:

(53) 802-017C HHCS 3/8-16X1 GR5

(63) 804-013C WASHER LOCK SPRING 3/8 PLT

Orient the valve (71) on the top break (3) of the mount (48), with the valve rear (4-port) face toward the mount side break. Secure the valve to the mount with two bolts (53) and lock washers (63).

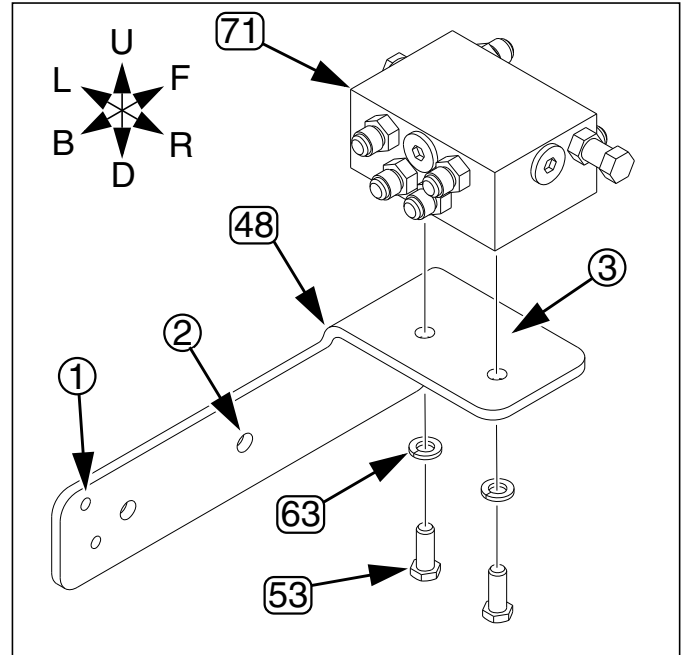


Figure 3
Sequence Valve Mount

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Note: Leave protective plastic caps on ports until instructed to remove them at later steps.

Note: See table on page 11 for sequence valve port assignments.

Identify Mount Style

There are two styles of sequence valve mount:

- North American Models YP425/625/825 use a ground drive mount, based on bundle:

113-841S SEQUENCE VALVE MOUNT ASSY

This style mounts to the ground drive weldment using existing planter fasteners and the smaller 7 mm holes (1) in the side of the mount (48).

- Export Models YP625PD/TD and YP925 use a fan mast mount based on bundle:

113-867S SEQUENCE VALVE MOUNT ASY FAN

This style mounts to the existing fan post using a new U-bolt (69, not shown) through the large 11 mm holes (2) in the side of the mount (48).

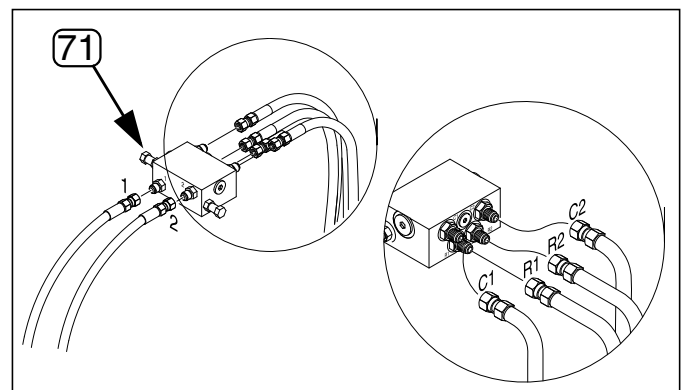


Figure 4
Sequence Valve Front and Rear

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Install Mounted Valve

Ground Drive Mount

For a mast mount, continue at step 11.

The sequence valve mount uses the existing fasteners for the ground drive speed sensor.

Refer to Figure 5

8. Remove and save two sets existing:
 - (15) 803-006C NUT HEX 1/4-20 PLT
 - (17) 804-006C WASHER LOCK SPRING 1/4 PLT
 If possible leave the following existing parts in place, to ease re-assembly:
 - (18) 804-007C WASHER FLAT 1/4 SAE PLT
 - (14) 802-224C HHCS 1/4-20X1 1/4 GR5
9. Align the smaller 7 mm mounting holes of the sequence valve mount (48) with the speed sensor mounting holes in the ground drive weldment. Loosely secure with saved lock washers (17) and nuts (15).
10. Adjust the speed sensor (5) for a 1.6 mm gap between its top face and the toothed wheel (6). See Operator manual for further details regarding this adjustment. Tighten nuts (15).

Continue at “Install Hydraulics” on page 6.

Mast Mount

For a ground drive mount, begin at step 8 above.

Refer to Figure 6

11. Select one new:
 - (69) 806-132C U-BOLT 3/8-16 X 3 1/32 X 2 3/4
 and two sets new:
 - (63) 804-013C WASHER LOCK SPRING 3/8 PLT
 - (59) 803-014C NUT HEX 3/8-16 PLT
12. Loosely secure the mount (48) near the base of the mast (7).

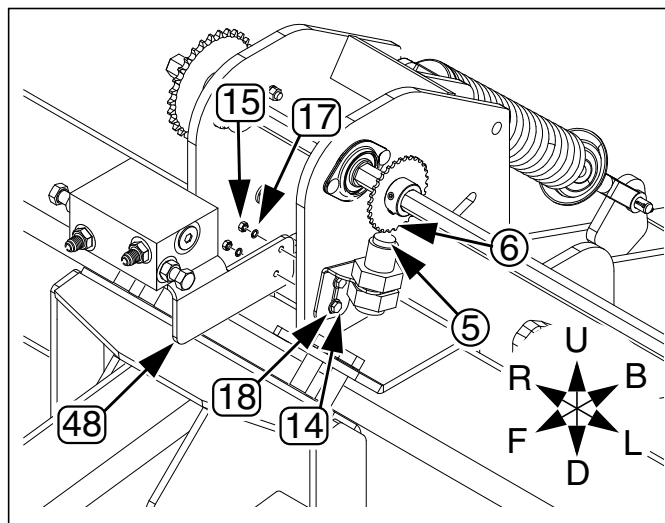


Figure 5
Ground Drive-Mounted Valve

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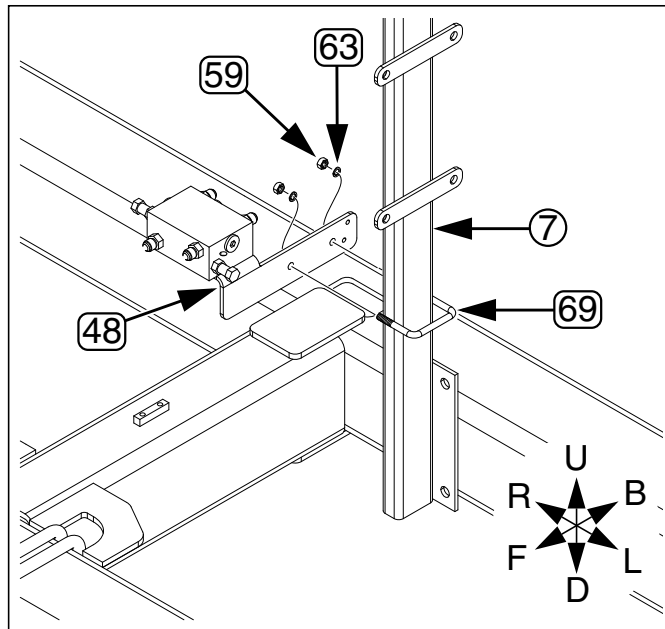


Figure 6
Mast-Mounted Valve

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Install Hydraulics

Identify Hoses

There are two or three sets of hoses in the system. There are either three pairs, or one pair and one set of four. See table below for hose part numbers by kit.

See “**Hydraulic Connector Identification**” on page 20 for descriptions of hydraulic connections, as well as fitting torque recommendation, and sealant information.

Note: Do not remove plastic caps or plugs on hoses or fittings until just before making connections.

Kit	Kit Description Planter Models	Hose Part Numbers, Length and Connectors		
		Supply (S)	Base End (R1, R2)	Rod End (C1, C2)
113-836A	4-30 3P PLTR FLAT FOLD MKR YP425A3P, spacings up to 30 in. (76 cm)	(78) 811-395C 183cm FJIC-MNPT Dedicated	(88) 841-397C 292cm FJIC-FJIC	(88) 841-397C 292cm FJIC-FJIC
113-837A	4-30 PT PLTR FLAT FOLD MKR YP425A, spacings up to 30 in. (76 cm)	(77) 811-287C 76cm FJIC-FJIC Shared, 2-Cylinder	(86) 841-171C 181cm FJIC-FJIC	(87) 841-374C 216cm FJIC-FJIC
113-838A	6-30 PT PLTR FLAT FOLD MKR YP625A3P, spacings up to 30 in. (76 cm)	(77) 811-287C 76cm FJIC-FJIC Shared, 4-Cylinder	(89) 841-469C 259cm FJIC-FJIC	(88) 841-397C 292cm FJIC-FJIC
113-839A	6-38-40 8-30 PT PLTR FOLD MKR YP625A, spacings 38 in. or 40 in., YP825A, spacings up to 30 in. (76 cm)	(77) 811-287C 76cm FJIC-FJIC Shared, 4-Cylinder	(85) 841-125C 325cm FJIC-FJIC	(84) 841-124C 358cm FJIC-FJIC
113-854A	4-38-40 PT PLTR FLAT FOLD MKR YP425A, spacings 38 in. or 40 in	(77) 811-287C 76cm FJIC-FJIC Shared, 2-Cylinder	(89) 841-469C 259cm FJIC-FJIC	(88) 841-397C 292cm FJIC-FJIC
113-855A	4-38-40 3P PLTR FLAT FOLD MKR YP425A3P, spacings 38 in. or 40 in	(78) 811-395C 183cm FJIC-MNPT Dedicated	(91) 841-477C 356cm FJIC-FJIC	(91) 841-477C 356cm FJIC-FJIC
113-857A	4-36 PT PLTR FLAT FOLD MKR YP425A, spacing 36 in.	(77) 811-287C 76cm FJIC-FJIC Shared, 2-Cylinder	(89) 841-469C 259cm FJIC-FJIC	(88) 841-397C 292cm FJIC-FJIC
113-858A	4-36 3P PLTR FLAT FOLD MKR YP425A3P, spacing 36 in.	(78) 811-395C 183cm FJIC-MNPT Dedicated	(91) 841-477C 356cm FJIC-FJIC	(91) 841-477C 356cm FJIC-FJIC
113-859A	6-36 3P PLTR FLAT FOLD MKR YP625A3P, spacing 36 in.	(78) 811-395C 183cm FJIC-MNPT Dedicated	(81) 811-637C 422cm FJIC-FJIC	(81) 811-637C 422cm FJIC-FJIC
113-860A	6-36 PT PLTR FLAT FOLD MKR YP625A, spacing 36 in.	(77) 811-287C 76cm FJIC-FJIC Shared, 4-Cylinder	(85) 841-125C 325cm FJIC-FJIC	(84) 841-124C 358cm FJIC-FJIC
113-861A	6-110 3P PLTR FLAT FOLD MKR YP625TD, spacing 110 cm	(78) 811-395C 183cm FJIC-MNPT Dedicated	(81) 811-637C 422cm FJIC-FJIC	(81) 811-637C 422cm FJIC-FJIC
113-862A	6-110 PT PLTR FLAT FOLD MKR YP625PD, spacing 110 cm	(79) 811-436C 396cm FJIC-MNPT Dedicated	(81) 811-637C 422cm FJIC-FJIC	(81) 811-637C 422cm FJIC-FJIC
113-863A	9-65 3P PLTR FLAT FOLD MKR YP925TD, spacing 65 cm	(78) 811-395C 183cm FJIC-MNPT Dedicated	(84) 841-124C 358cm FJIC-FJIC	(84) 841-124C 358cm FJIC-FJIC

Prepare Supply Hoses

Hose Part Numbers

This table has a complete list of hose callouts, part numbers and descriptions. Your kit contains at most three different part numbers.

Call-out	Part Number	Description
(77)	811-287C	HH3/8R2 030 3/4FJIC 9/16FJIC
(78)	811-395C	HH1/4R1 072 9/16FJIC 1/2MNPT
(79)	811-436C	HH1/4R1 156 9/16FJIC 1/2MNPT
(80)	811-494C	HH1/4R1 190 9/16FJIC
(81)	811-637C	HH1/4R2 166 9/16FJIC
(84)	841-124C	HH 1/4 R2 141 9/16FJIC
(85)	841-125C	HH 1/4 R2 128 9/16FJIC
(86)	841-171C	HH1/4R2 075 9/16FJIC
(87)	841-374C	HH1/4R2 085 9/16FJIC
(88)	841-397C	HH1/4R2 115 9/16FJIC
(89)	841-469C	HH1/4R2 102 9/16FJIC
(91)	841-477C	HH1/4R2 140 9/16FJIC

Dedicated Supply Circuit Hose

If the supply hoses rely on a shared circuit, continue at “Two-Cylinder Shared Supply Circuit” on page 8 or “Four-Cylinder Shared Supply Circuit” on page 9.

13. Select the two supply hoses (S). See the table on page 6 for the correct part number for the planter.

Refer to Figure 7

14. Select two new:
 (82) 811-856C CP 1/2FNPT MALE QD
 and a quantity of PTFE^a pipe thread sealant.
15. Apply sealant to the MNPT threads of the hose fittings. Attach the couplers (82) to the MNPT ends of the supply hoses (S).
16. Select two new:
 (51) 800-300C CABLE TIE 2 DIA MIN - ORG
 Not shown in figure. Secure one tie to the QD end of each hose. Wrap it around the hose body at the crimp. Pull snug. Cut off excess tie.
17. Select one set new:
 (49) 502-067D HYD HOSE CLAMP LABEL
 (50) 502-068D HYD HOSE CLAMP BRACKET
 (52) 802-009C RHSNB 5/16-18X1 1/4 GR5
 (62) 803-199C NUT HEX FLANGE 5/16-18 PLT

Assemble the clamp near the QD end of the hoses. The orientation of the arrows does not matter, and the label side does not need to be up.

Note: Supply hoses are FJIC-to-FJIC where the markers are on the lift circuit (North America pull-type planters only). One FJIC end is connected into the existing lift circuit.

In a shared 2-cylinder circuit (Model YP425 pull-type only), the marker kit includes tees, which replace existing elbows.

In a shared 4-cylinder circuit, the marker kit includes a cross, which replaces existing tees.

Note: Supply hoses are FJIC-to-MNPT where the markers are on a dedicated hydraulic circuit. The MNPT end of the hose is connected to a QD coupler.

Note: A hose clamp and label (see step 17) are provided in all kits. Their use on hoses shorter than 80 cm is optional, and is not documented in this manual.

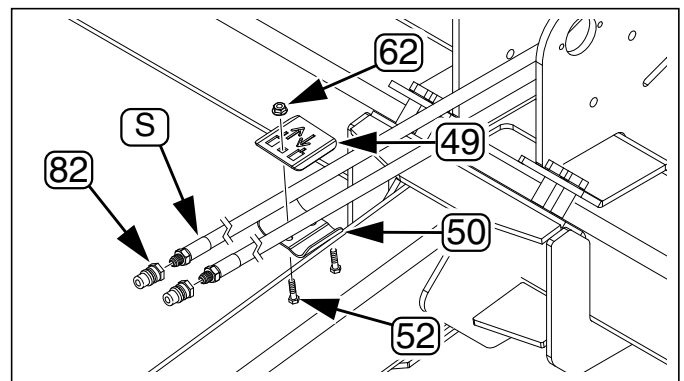


Figure 7
QD Couplers, Clamp

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a. See page 20 for pipe sealant information and NPT torque values.

Pull-Type Tongue Hose

For 2-point, 3-point and North American pull-type, continue at **"Install Cylinder Hoses"** on page 10.

Refer to Figure 8

18. Select two new:
 - ⑤0 502-068D HYD HOSE CLAMP BRACKET
19. Where existing hoses are clamped to the tongue, remove and save four sets:
 - ⑬ 802-159C HHCS 5/16-18X1 GR5
 - ⑲ 804-009C WASHER LOCK SPRING 5/16 PLT
20. Add the new clamps ⑤0 to each clamp stack. Loosely secure with the saved bolts and washers.
21. Route the new supply hoses under the new tap clamps. Forward of the first clamp ① leave the same length of free hose as exists for the fan and any lift hoses.
22. Secure the clamps. If the bolts ⑬ are too short, replace them with locally provisioned $\frac{5}{16}$ -16 fasteners, or use cable ties instead of clamps.

Continue at **"Install Cylinder Hoses"** on page 10.

Two-Cylinder Shared Supply Circuit

If the supply hoses are on a dedicated circuit, use the instructions at **"Dedicated Supply Circuit Hose"** on page 7. If the kit includes a cross (not a tee ⑦3), continue at **"Four-Cylinder Shared Supply Circuit"** on page 9.

23. Select the two supply hoses ⑤. See the table on page 6 for the correct part number for the planter.

Replace Existing Elbow

Refer to Figure 9

24. Select two sets new:
 - ⑦3 811-078C TE 3/4MJIC
 Remove any protective caps from the center port and one end port.
25. Locate the existing elbows ②2. Perform the next step separately for lift and lower hoses, to reduce the risk of reversing the circuit at re-connection.
26. Remove one:
 - ②2 811-725C EL 90 3/4MJIC
 Replace it with a tee ⑦3. The removed elbow is not re-used.
27. Select two new:
 - ⑦5 811-150C EL 3/4FJIC 3/4MJIC
 Remove any protective plug from the FJIC end of the elbow ⑦5. Remove any protective cap remaining on the tee ⑦3. Connect the elbow ⑦5 to the tee, with the MJIC end oriented up.

Install Supply Hoses

28. Remove any protective plug from one end of each supply hose. Remove any protective cap from the MJIC ends of elbows ⑦5. Connect one hose to each elbow.

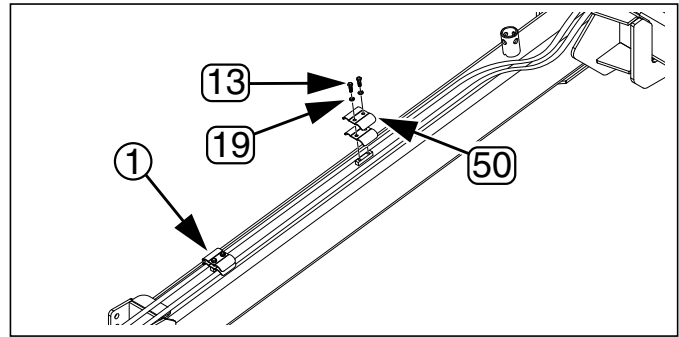


Figure 8
Tongue Hose Routing

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⚠ WARNING

High Pressure Fluid Hazard:

Ensure lift circuit pressure is zero. Wear gloves and safety eyewear when working on hydraulics. Dangerous releases of hydraulic fluid may occur if pressure remains in the circuit. This could lead to serious personal injury. If hydraulic fluid penetrates the skin, seek immediate medical attention from a physician familiar with this type of injury.

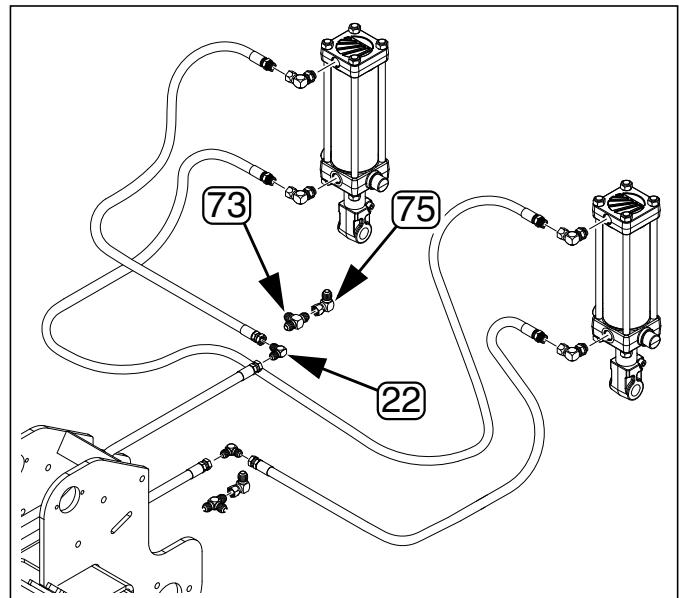


Figure 9
2-Cylinder Shared Circuit

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Continue at **"Install Cylinder Hoses"** on page 10.

Four-Cylinder Shared Supply Circuit

If the supply hoses are a dedicated marker circuit, use the instructions at “**Dedicated Supply Circuit Hose**” on page 7. If the kit included a tee, rather than a cross (74), use the instructions at “**Two-Cylinder Shared Supply Circuit**” on page 8.

29. Select the two supply hoses (S). See the table on page 6 for the correct part number for the planter.

WARNING

High Pressure Fluid Hazard:

Ensure lift circuit pressure is zero. Wear gloves and safety eyewear when working on hydraulics. Dangerous releases of hydraulic fluid may occur if pressure remains in the circuit. This could lead to serious personal injury. If hydraulic fluid penetrates the skin, seek immediate medical attention from a physician familiar with this type of injury.

Refer to Figure 10

30. Select two sets new:
(74) 811-147C CR 3/4MJIC
Remove any protective caps from any three ports.
31. Locate the existing tees (21) at the rear ends of the hoses to the hitch. Perform the next step separately for lift and lower hoses, to reduce the risk of reversing the circuit at re-connection.
32. Remove one:
(21) 811-078C TE 3/4MJIC
Replace it with a cross (74). The removed tee is not re-used.
33. Select two new:
(75) 811-150C EL 3/4FJIC 3/4MJIC
Remove any protective plug from the FJIC end of the elbow (75). Remove any protective cap remaining on the cross (74). Connect the elbow (75) to the cross, with the MJIC end oriented up.

Install Supply Hoses

34. Remove any protective plug from one end of each supply hose. Remove any protective cap from the MJIC ends of elbows (75). Connect one hose to each elbow.

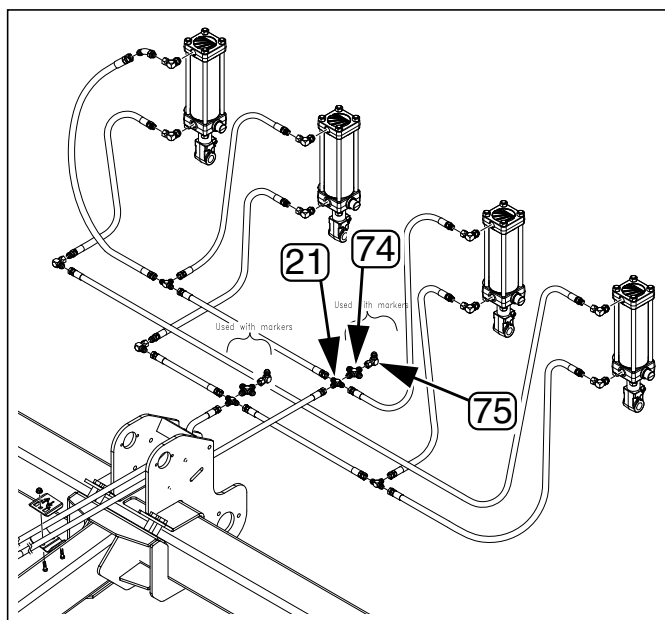


Figure 10
4-Cylinder Shared Circuit

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Install Cylinder Hoses

Mark Cylinder Hoses

Mark Base End Hoses

35. Select the two base end (extend) hoses **R1**, **R2**. See the table on page 6 for the correct part number for the planter.
36. Mark one hose "R1" at each connector. This mark does not need to be permanent. Masking tape suffices. Mark the other base end hose "R2".

Mark Rod End Hoses

37. Select the two rod end (retract) hoses **C1**, **C2**. See the table on page 6 for the correct part number for the planter.
38. Mark one hose "C1" at each connector. Mark the other rod end hose "C2".

Remove Frame Caps

Refer to Figure 11 (which depicts a lock nut; the actual fastener set may include a plain nut and washer)

39. At each frame cap **11**, remove and save four sets of $\frac{5}{8}$ -11 nuts **3**, any washers, and bolts **4** (part numbers vary by planter model).

The fasteners are re-installed at step 71 on page 14.

The frame cap **11** is not re-used.

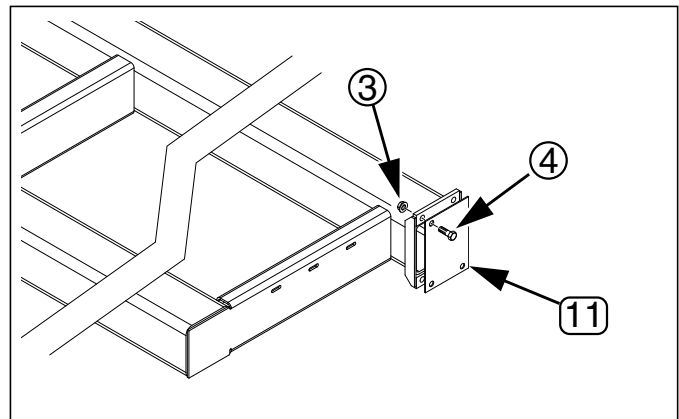


Figure 11
Remove Frame Cap

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Route Cylinder Hoses

Refer to Figure 12 (depicting a notional frame with top entrance hole)

Cylinder hoses run inside the main or rear tool bar. They enter the tool bar at machine center, via an entrance hole **5** that may be on top of the tube, or on the front face of the tube.

40. Route hoses **C1** and **R1** from the tool bar center hole to the left end of the tube.
41. Route hoses **C2** and **R2** from the tool bar center hole to the right end of the tube.

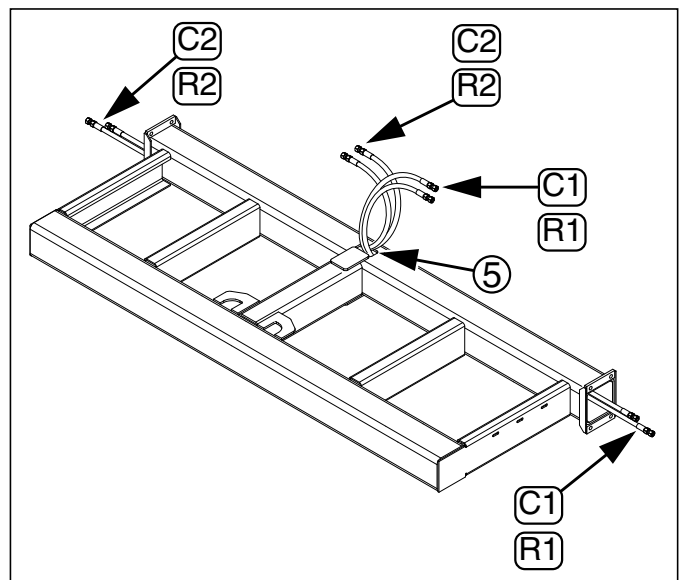


Figure 12
Route Cylinder Hoses

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Connect Sequence Valve

Sequence Valve Port Assignments

Port Stamp	Function
1	Supply ^a
2	Supply ^a
C1	Left Cylinder Rod End
C2	Right Cylinder Rod End
R1	Left Cylinder Base End
R2	Right Cylinder Base End

^a Either port 1 or port 2 may be connected to the Extend or Retract side of a tractor remote, as long as the other port is connected to the Retract or Extend port of that same remote.

Connect Supply Hoses at Valve

42. Remove any caps from the two supply ports (stamped "1" and "2" on the valve body). Remove any plugs from one FJIC end of each supply hose (S). Connect the FJIC hose ends to MJIC valve ports 1 and 2. Do not use pipe sealant. See page 20 for torque specification.

Connect Cylinder Hoses at Valve

43. Remove any caps from the four rear ports (stamped "C1" through "R2" on the valve body). Remove any plugs from one FJIC end of each marked cylinder hose. Connect the FJIC hose ends marked C1 through R2 to MJIC valve ports stamped C1 through R2. Do not use pipe sealant.

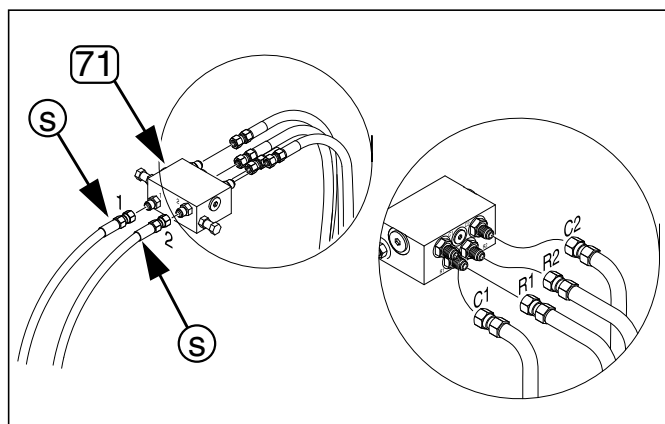


Figure 13
Connect Valve Hoses

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Note: The port stampings "C" and "R" are arbitrary. In particular, "R" does not mean rod or retract.

Connect Cylinders

Prepare Cylinder Ports

Refer to Figure 14

The cylinders have three ports:

- The cylinder face with a single base end port is to be the **bottom** face.
- The cylinder face with both base and rod end ports is to be the **side** face. Only the rod end port is used. This port may face forward or back when installed.

NOTICE

Machine Damage Risk:

The cylinders must be connected using the designated two (of three) ports, and must be installed with the base end port down, and the rod end (side) port facing to planter front or rear. Any other configuration will result in fitting damage during marker use.

44. Select two new:

70 810-196C CYL 2.5X10X1.12 ROD (TIE)

These cylinders may be pre-installed in the mount weldments. If so, remove the cylinders from the mounts. Disconnect the rod end tang (not shown at right) from the inner arm lug, if connected. Save all pins, spacers and fasteners.

Note: If the cylinders already have elbows installed, do not perform step 45 through step 49, but use those steps to verify that the cylinders are setup correctly for this installation. It may be necessary to adjust elbows, or swap an elbow with a plug.

45. Remove any threaded plug or dust plug from the (side) rod end ports **7**.
46. Remove any threaded plug or dust plug from the (bottom) base end ports **8**.
47. Inspect the plugs at the unused (side) base end port **9**. If either of these ports is plugged with a dust plug (non-threaded), replace it with a threaded plug removed from one of the other ports. Any remaining plugs are not re-used.

Install Cylinder Fittings

Refer to Figure 15

48. Select four new:

72 811-065C EL 9/16MJIC 9/16MORB

49. Remove any protective caps from the MORB ends of the elbows. Install elbows at all open ports (**7**, **8**) on both cylinders. Point MJIC end toward cylinder base before tightening jam nut. See page 20 for ORB fitting installation information. Do not use pipe sealant.

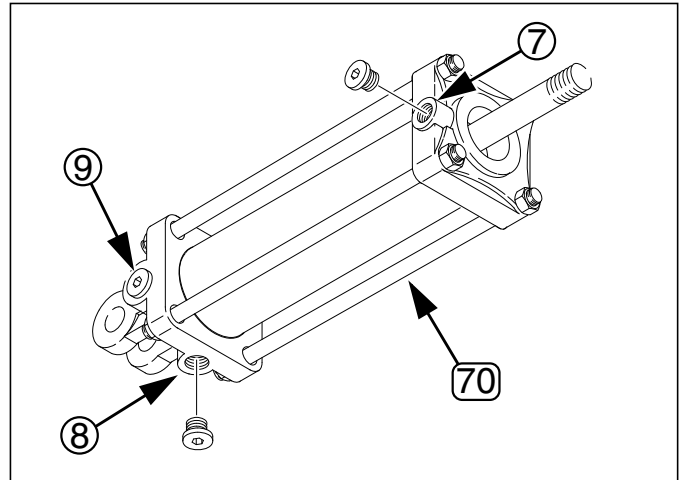


Figure 14
Cylinder Ports

31992

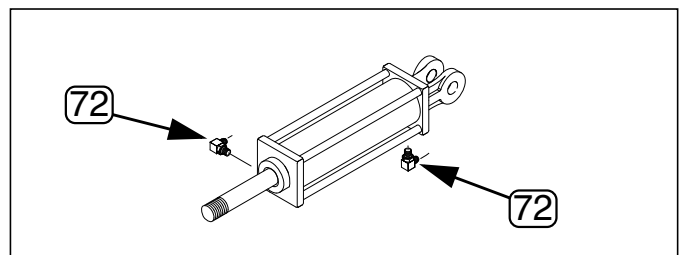


Figure 15
Cylinder Fittings

31800

Connect Hoses to Cylinders

Note: It will be helpful to have a supporting surface (platform, table or bench) to support the cylinder for the next few steps.

Refer to Figure 16 (depicting planter right side)

50. Position each cylinder near the end of the tool bar. Remove any protective plugs in hose ends. Remove protective caps on elbow MJICs.
51. Connect hose **R1** to the left cylinder base end elbow.
52. Connect hose **C1** to the left cylinder rod end elbow.
53. Connect hose **R2** to the right cylinder base end elbow.
54. Connect hose **C2** to the right cylinder rod end elbow.

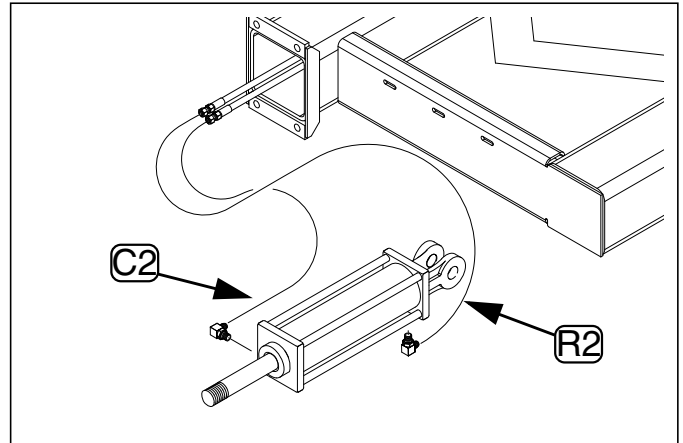


Figure 16
Cylinder Hoses

31800

Cycle Marker Hydraulics

55. Connect the marker (or marker/lift) circuit to a hydraulic source, such as tractor remotes.
56. Set the control lever for the remote circuit to Neutral or Float.
57. Start the tractor or hydraulic pump.
58. Slowly move the circuit lever in the Retract direction (if the planter is lowered, or on lock channels, it should remain lowered). Hold the circuit at Retract until one marker cylinder rod is fully retracted and the other extended, then hold for several more seconds. Check for leaks.
59. Slowly reverse the circuit lever, to Extend. If marker and lift share a circuit, the planter will raise off lock channels. Hold the circuit at Retract until one marker cylinder rod is fully extended and the other retracted, then hold for several more seconds. Check for leaks.
60. To minimize planter movement with a shared marker/lift circuit, install lift cylinder locks while the planter is raised.
61. Repeat step 58 and step 59 approximately ten times, to ensure that all air has been displaced from the systems.

During the final iteration of step 59, briefly move the lever to Retract, then to Extend. Slowly operate the lever to retract both marker rods.

62. Set the remote circuit to Float. Shut off hydraulic source. Leave supply hoses connected at source.

⚠ WARNING

High Pressure Fluid Hazard:

Wear gloves and safety eyewear. Use cardboard to check for leaks. Dangerous releases of hydraulic fluid may occur at leaks or loose connections. This could lead to serious personal injury. If hydraulic fluid penetrates the skin, seek immediate medical attention from a physician familiar with this type of injury.

⚠ CAUTION

Crushing Hazard:

Verify that step 4 on page 3 was completed (raise and lock up planter). Keep all persons away from planter during marker circuit testing. If the marker circuit is shared with the lift circuit, planter raise and lower occurs during marker cylinder cycles. Anyone near the planter could be pinched or crushed by unexpected moving parts.

Install Cylinders

Depending on shipment destination and shipping method, marker arms may be sub-assemblies, or largely pre-assembled. Skip steps as instructed.

Refer to Figure 17

63. Select one new:

33 113-435H PLANTER MARKER MOUNT WMNT

This may be part of a larger assembly. If so, unfold the arm to provide clearance for the cylinder rod.

64. Orient the mount **33** so that the cylinder pivot pin hole **1** is up.

65. Check that the base end elbow of the cylinder **70** is down. Slide the cylinder, from the rod end, into the mount **33**.

66. Select one new:

32 113-435D CYLINDER LUG PIN

Note that one end of this pin has a hole.

67. Select two new:

35 113-437D CYLINDER SPACER W/ HOLE

68. Insert the no-hole end of the lug pin **32** through the side wall of the mount **33**.

Add a spacer **35**.

Align the cylinder **70** base lugs with the pin **32**.

Push the pin through the base lugs.

Add another spacer **35**.

Push the pin through the other mount side wall.

69. Select one new:

67 805-180C PIN ROLL 1/4 X 1 1/2 LG PLT

70. Adjust the first spacer and the lug pin to align their holes. Secure the spacer to the lug pin with the roll pin **67**.

71. Select four sets of $\frac{5}{8}$ -11 bolts **2**, nuts **3**, and any washers **4**, saved at step 39 on page 10.

72. Slide the mount into the frame tube. Secure with saved $\frac{5}{8}$ -11 fasteners.

73. Repeat step 63 through step 72 for the other cylinder mount.

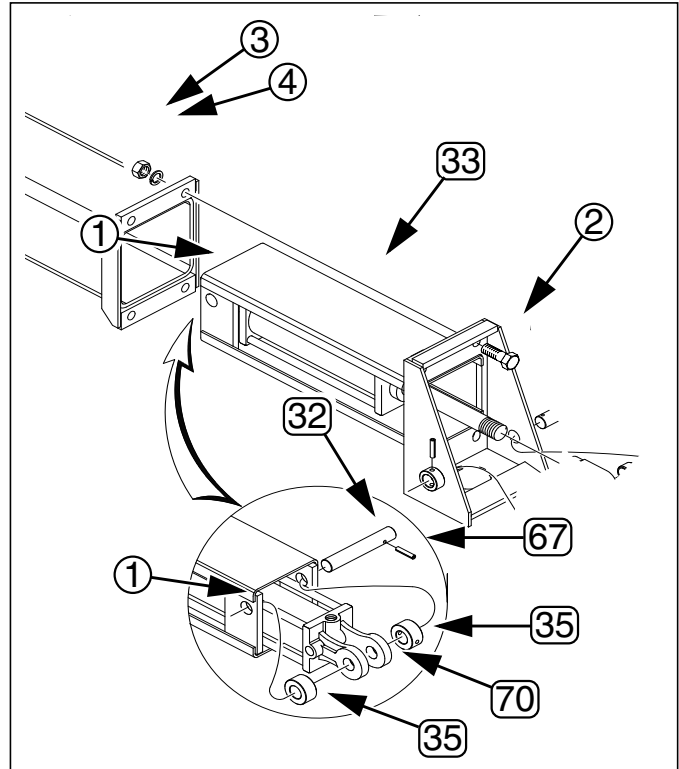


Figure 17
Cylinder Mount

29872

Install Arm Mechanisms

Install First Stage Arms

If the first stage arms are already installed, continue at “Connect Cylinder Rods”.

Refer to Figure 18

74. Select one new:
 - ③④ 113-437H 1ST STAGE ARM WELDMENT or 113-517H 1ST STAGE ARM WMNT
 Note that the arm weldment has a stop weldment ⑥ on one end, and protruding to one side.
75. Select one new:
 - ③⑥ 113-439D 1ST STAGE MOUNTING PIN
 Note that the pin has a hole in one end. When inserted, this end must be on the same side of the mount weldment ③③ as the pivot bushing ⑦ with the hole.
76. Orient the arm stage ③④ with the second stage stop ⑥ such that it will be facing toward planter center with the arm folded (as shown), and facing up with the arm unfolded.
77. Align the inner pivot tube ⑧ of the arm stage with the arm pivot ⑦ on the mount. Insert the pivot pin ③⑥.
78. Select one new:
 - ⑥⑦ 805-180C PIN ROLL 1/4 X 1 1/2 LG PLT
79. Adjust the pivot pin ③⑥ position and rotation to align its hole with the mount bushing hole ⑦. Secure the pivot pin with the roll pin ⑥⑦.
80. Repeat step 74 through step 79 for the other arm.

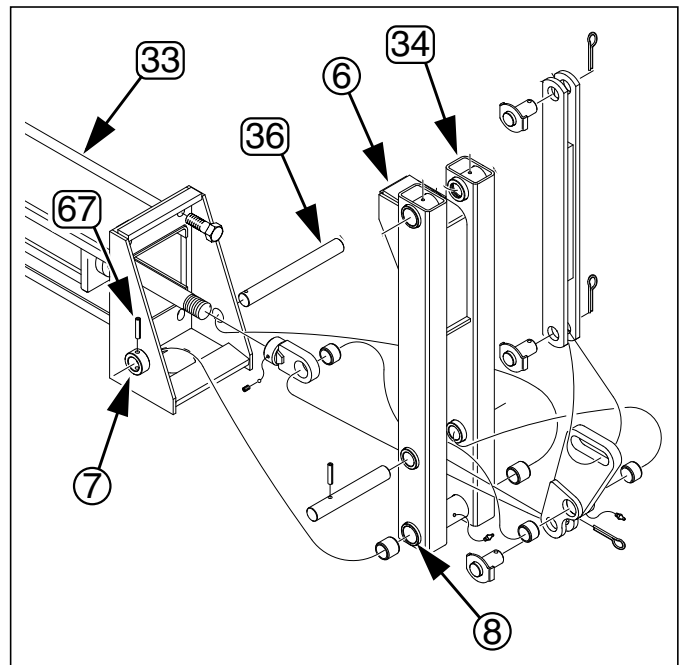


Figure 18
Marker First Stage Arm

29872

Connect Cylinder Rods

Refer to Figure 19

81. At each first stage arm pivot link ④①, remove and save one set:
 - ⑥⑥ 805-060C PIN COTTER 7/32 X 2
 - ④② 113-448H CYL. PIVOT PIN WMNT
- Note: It may be necessary to activate the hydraulic circuit and slightly extend the cylinder rod in order to obtain tang to pivot link clevis ④① alignment. Observe all cautions on page 13.
82. Align the tang ⑨ on the rod end with the clevis end of the link ④①. Secure with pin weldment ④② and cotter pin ⑥⑥. Repeat for other arm.
 83. Unfold both marker arms. Set circuit lever to Extend until one arm is unfolded. Briefly reverse the lever to Retract until either arm begins moving, then quickly reverse it to Extend to extend the other arm.

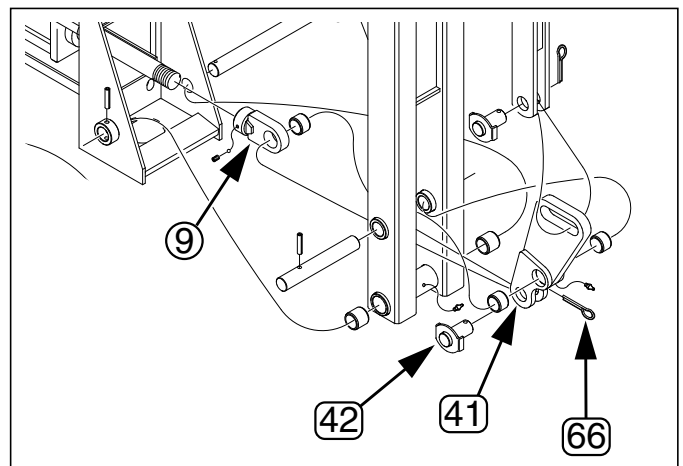


Figure 19
Cylinder Rod Connection

29872

Install Transfer Link

Refer to Figure 20

If the lower/inside end of the transfer link (40) is already pinned to the first stage arm pivot link (41), continue at "Install Second Stage".

84. Select one new:
 (40) 113-446H TRANSFER LINK WMNT
 and one set new:
 (66) 805-060C PIN COTTER 7/32 X 2
 (42) 113-448H CYL. PIVOT PIN WMNT
 The pin (66) may be shipped in the link. Remove a set at one end.
85. Connect one end of the transfer link (40) to the first stage arm pivot link (41) using a pin weldment (42) and cotter pin (66).
86. Repeat step 84 and step 85 for the other arm.

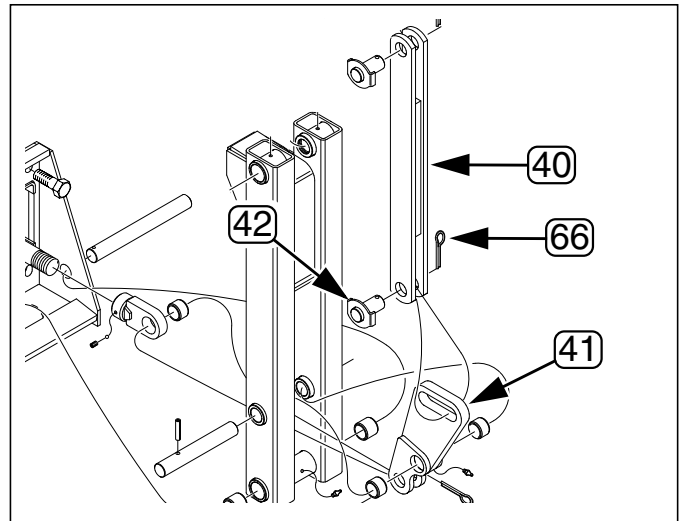


Figure 20
Transfer Link

29872

Install Second Stage

Install Second Stage Mount

Refer to Figure 21

If the second stage mount (38) is already installed, continue at "Install Second Stage Arms" on page 17.

87. Select two new:
 (83) 816-166C O-RING 1 ID X 1 1/4 OD X 1/8
 These may already be installed.
88. If the O-rings (83) are not installed, apply general purpose grease to them, then insert them in the inner grooves of the first stage arm outer pivots.
89. Select one each new:
 (38) 113-440H 2ND STAGE MOUNT WMNT
 (39) 113-442H 2ND STAGE MOUNT PIN
 Apply some grease to the mount pin (39).
90. Align the pivot holes of the second stage mount weldment (38) with the outer pivot holes of the first stage arm (34). Orient the mount's link lug (1) to point out/down (it faces away from the stage stop (6)). From planter *front*, carefully insert the mount pin (39). Pin (39) is secured at step 97.
91. Select one set new:
 (66) 805-060C PIN COTTER 7/32 X 2
 (42) 113-448H CYL. PIVOT PIN WMNT
 The pin (66) may be shipped in the link. Remove a set at the free end.
92. Align the free end of the link (40) with the mount lug (1). Secure with pivot pin (42) and cotter pin (66).
93. Repeat step 87 through step 92 for the other arm.

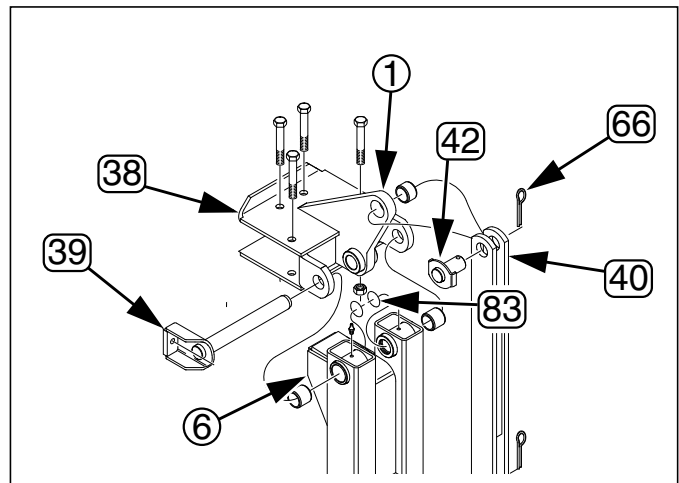


Figure 21
Second Stage Mount

29872

Install Second Stage Arms

If the second stage arms are already installed, continue at **"Fertilizer Shim"**.

Refer to Figure 22

94. Select one new of:

- (43) 113-449H 6 ROW 2ND STAGE ARM WMNT
- 113-450H 8 ROW 2ND STAGE ARM WMNT
- 113-835H 4 ROW 2ND STAGE ARM WMNT

Note that the arm stage has a pivot (2) and a shear tab weldment (3).

95. Select four sets new:

- (55) 802-042C HHCS 1/2-13X3 3/4 GR5
- (60) 803-019C NUT LOCK 1/2-13 PLT

These fasteners may be loosely installed in the second stage mount weldment (38). If so, remove and save them.

96. Slide the arm stage (43) into the second stage mount weldment (38). Orient the arm (43) with the pivot (2) to planter rear, and the shear tab (3) to planter front. Secure it with one bolt (55) and lock nut (60) through the rear mount weldment hole nearest the weldment pivot.

97. Select one set new (shear bolt):

- (57) 802-295C HHCS 5/16-18X1 1/2 GR2
- (58) 803-011C NUT LOCK 5/16-18 PLT

These fasteners may already be loosely installed in the mount pin (39), or in the arm shear tab (3). If so, remove and save them.

98. Rotate the mount pin (39) into face-to-face alignment with the shear tab (3). Secure with shear bolt (57) and lock nut (58).

99. If the planter has a fertilizer system, you can also select one new:

- (44) 113-551D MARKER SHIM

and install it now instead of at step 105. See **"Fertilizer Shim"** for installation details.

100. Install three more bolts (55) and lock nuts (60) through the remaining mount weldment holes. Tighten to snug, and not to Grade 5 torque spec. The arm must be free to swing if the shear bolt (57) fails in the field.

101. Repeat step 94 through step 100 for the other arm.

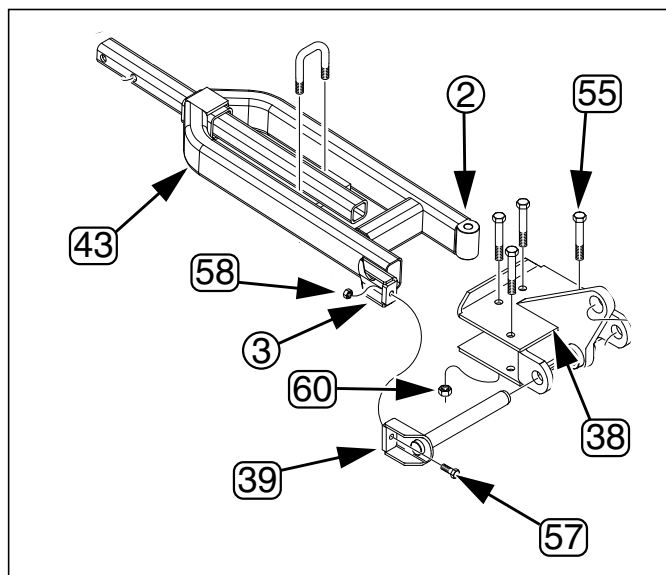


Figure 22
Second Stage Arm

29872

Fertilizer Shim

If the planter does not have a fertilizer system, continue at “**Install Marker Tubes**”.

Without a shim (44) installed, the marker discs are at some risk of striking fertilizer tanks or hoppers when folded.

Refer to Figure 23

102. Inspect the top side (unfolded, bottom side if folded as shown) of each second stage mount weldment (38). If a shim (44) is already installed on both, continue at “**Install Discs**” on page 19.

103. Select two new:

(44) 113-551D MARKER SHIM

104. Remove and save the nuts (60) on the two mount weldment bolts (55) nearest the link lug.

105. Install shim (44) so that the tabs end (with holes) are flush against the mount weldment (38), and the raised edge is toward the (disc) end of the arm.

106. Repeat step 102 through step 105 for the other arm.

When the arm is folded, the raised section of the shim rests on the stage stop (6). This holds the arm up an extra 7° when folded.

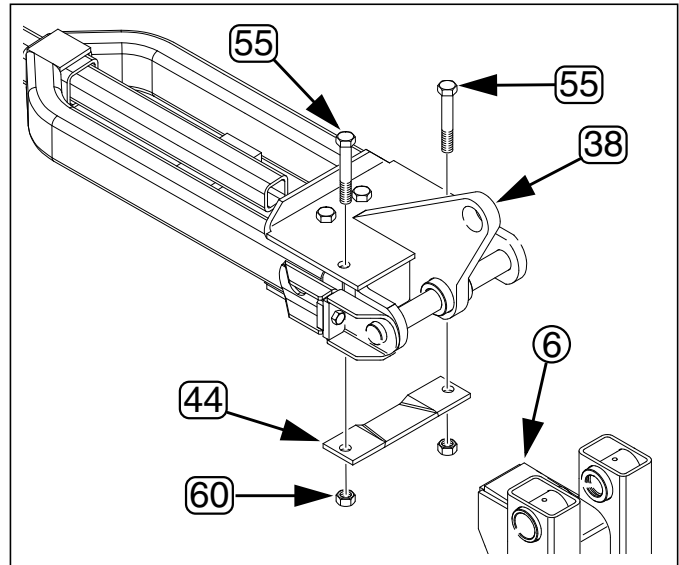


Figure 23
Fertilizer Shim

31998

Install Marker Tubes

Refer to Figure 24

If the marker tubes (37) are already installed, continue at “**Install Discs**” on page 19.

107. Select one new of:

(37) 113-440D MARKER TUBE 36 LG

113-500D MARKER TUBE 42 IN LONG

113-848D MARKER TUBE 20 LG

113-855D MARKER TUBE 26 LG

108. Slide the end of the tube (37) that has no holes into the rectangular hole (4) at the outer end of the second stage arm (43). Orient the tube so that the tube's bolt holes are facing to planter front and rear.

109. Select one new:

(68) 806-103C U-BOLT 1/2-13 1 17/32 X 2 3/4
and two new:

(60) 803-019C NUT LOCK 1/2-13 PLT

These fasteners may be pre-installed in the arm weldment.

110. Secure the tube to the arm at the mount plate. The final position of the tube is set when marker extension is set (page 20).

111. Repeat step 107 through step 110 for the other arm.

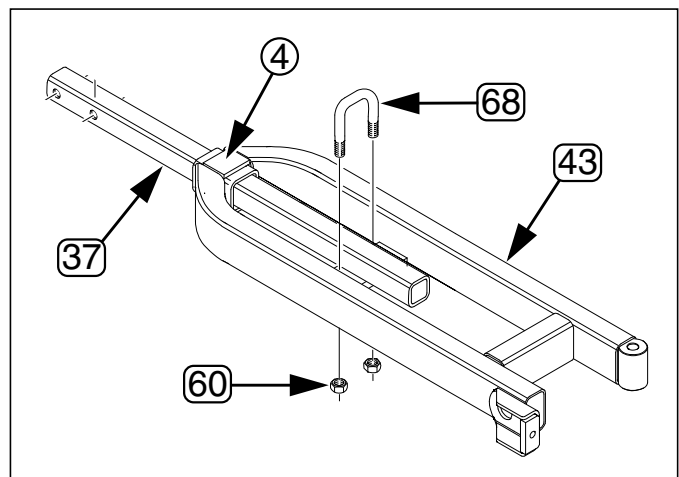


Figure 24
Marker Tube

31999

Install Discs

Refer to Figure 25 (which depicts the left arm, folded)

If the discs are already installed, continue at “Set Initial Extension”.

If the markers are being installed as part of export pre-delivery, you may wish to defer disc installation until all above-frame components are installed. This minimizes sharp object hazards during work on top of the frame.

Start with the left side of the planter. The 113-563S disc assemblies (45) use identical parts, but are normally pre-assembled in mirror-image for left and right use.

112. Select one new:

(45) 113-563S MARKER DISC & HUB ASSEMBLY

Choose the assembly (45) that matches the image in Figure 25 for the left arm, or matches the image in Figure 26 for the right arm.

113. Select two new:

(64) 804-017C WASHER FLAT 1/2 USS PLT
and four sets new:

(54) 802-039C HHCS 1/2-13X3 GR5

(60) 803-019C NUT LOCK 1/2-13 PLT

114. If the arm is folded, orient the disc assembly (45) on top of the arm tube (37).

If the arm is unfolded, orient the assembly on the bottom of the arm tube.

115. Attach the arm to the tube with a bolt (54) and lock nut (60) at the outer holes. Tighten only to snug. The weldment must pivot for field adjustment.

116. Place a washer (64) on the other bolt (54). Insert it through the assembly adjustment slot, then the arm tube. Add another washer (64) and add a lock nut (60). Set the adjustment angle to centered in the curved slot. Tighten nut. Final disc angle adjustments are made based on field conditions.

Refer to Figure 26 (which depicts the right arm, folded)

117. Repeat step 112 through step 116 for the right arm.

CAUTION

Sharp Object Hazard:

Wear gloves when working with or near the marker disc. The edges are sharp. Lift the assembly at the hub or adjustment mount. The disc rotates freely, and it is easy to lose a grip. A falling disc could inflict serious injury.

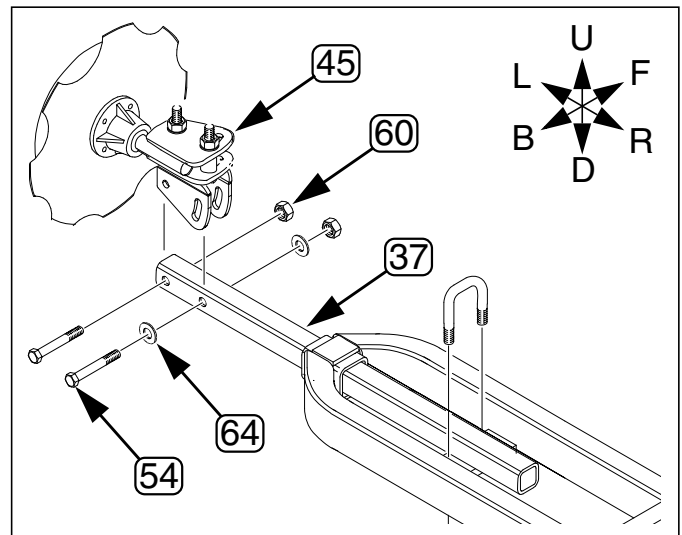


Figure 25
Marker Disc (LH, Folded)

31999

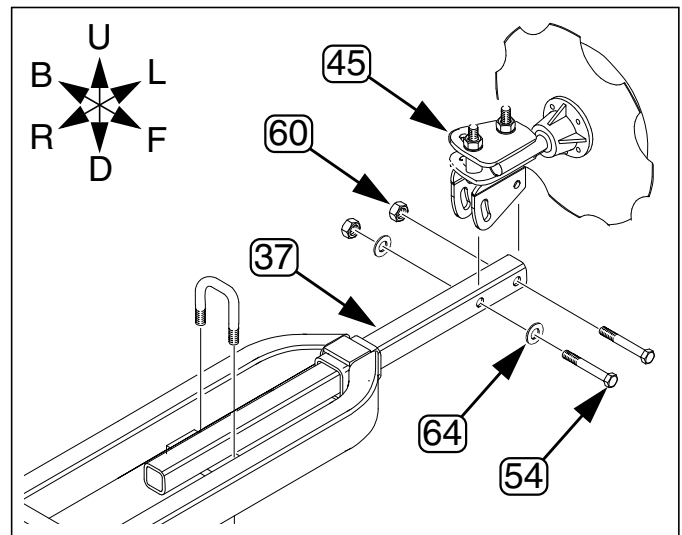


Figure 26
Marker Disc (RH, Folded)

31999

Set Initial Extension

118. Set the approximate initial marker extension per the instructions in the Operator manual. Because the implement is typically not into the ground at this time, the setting is approximate.

Close-Out

119. Lubricate markers. Pump grease at all grease zerks until grease emerges.

120. Fold the markers.

Appendix

Hydraulic Connector Identification

Refer to Figure 27 (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 PTFE^a liquid or paste pipe sealant for hydraulic applications (do not use tape sealant, which can foul filters).
- 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 JIC 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.

a PTFE: polytetrafluoroethylene, such as DUPONT® Teflon®. Great Plains recommends RectorSeal® No.5®, available in ½ pint (236 ml) cans as part number 891-231C.

Marker Operation

Marker operation is covered in the planter Operator manual.

Marker Maintenance

Marker maintenance is covered in the planter Operator manual.

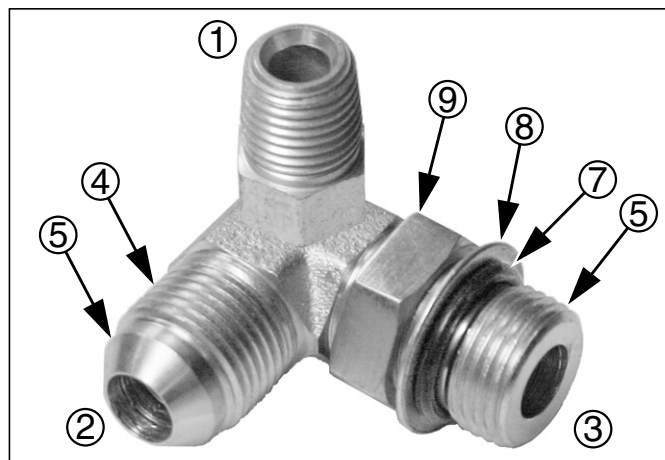








Figure 27
Hydraulic Connector Ports

31282

Fittings Torque Values		
Fitting	Ft-Lbs	N-m
1/4 NPT	1.5-3.0 turns past finger tight	
9/16 JIC	18-20	24-27
9/16 ORB w/jam nut	12-16	16-22
9/16 ORB straight	18-24	24-32
3/4 JIC	27-39	37-53
3/4 ORB w/jam nut	20-30	27-41
3/4 ORB straight	27-43	37-58

Torque Chart

Bolt Size	Bolt Head Identification						
							
	Grade 2	Grade 5	Grade 8				
in-tpi ^a	N-m ^b	ft-lb ^d	N-m	ft-lb	N-m	ft-lb	
¹ / ₄ -20	7.4	5.6	11	8	16	12	
¹ / ₄ -28	8.5	6	13	10	18	14	
⁵ / ₁₆ -18	15	11	24	17	33	25	
⁵ / ₁₆ -24	17	13	26	19	37	27	
³ / ₈ -16	27	20	42	31	59	44	
³ / ₈ -24	31	22	47	35	67	49	
⁷ / ₁₆ -14	43	32	67	49	95	70	
⁷ / ₁₆ -20	49	36	75	55	105	78	
¹ / ₂ -13	66	49	105	76	145	105	
¹ / ₂ -20	75	55	115	85	165	120	
⁹ / ₁₆ -12	95	70	150	110	210	155	
⁹ / ₁₆ -18	105	79	165	120	235	170	
⁵ / ₈ -11	130	97	205	150	285	210	
⁵ / ₈ -18	150	110	230	170	325	240	
³ / ₄ -10	235	170	360	265	510	375	
³ / ₄ -16	260	190	405	295	570	420	
⁷ / ₈ -9	225	165	585	430	820	605	
⁷ / ₈ -14	250	185	640	475	905	670	
1-8	340	250	875	645	1230	910	
1-12	370	275	955	705	1350	995	
1 ¹ / ₈ -7	480	355	1080	795	1750	1290	
1 ¹ / ₈ -12	540	395	1210	890	1960	1440	
1 ¹ / ₄ -7	680	500	1520	1120	2460	1820	
1 ¹ / ₄ -12	750	555	1680	1240	2730	2010	
1 ³ / ₈ -6	890	655	1990	1470	3230	2380	
1 ³ / ₈ -12	1010	745	2270	1670	3680	2710	
1 ¹ / ₂ -6	1180	870	2640	1950	4290	3160	
1 ¹ / ₂ -12	1330	980	2970	2190	4820	3560	

Bolt Size	Bolt Head Identification					
						
	Class 5.8		Class 8.8		Class 10.9	
mm x pitch ^c	N-m	ft-lb	N-m	ft-lb	N-m	ft-lb
M 5 X 0.8	4	3	6	5	9	7
M 6 X 1	7	5	11	8	15	11
M 8 X 1.25	17	12	26	19	36	27
M 8 X 1	18	13	28	21	39	29
M10 X 1.5	33	24	52	39	72	53
M10 X 0.75	39	29	61	45	85	62
M12 X 1.75	58	42	91	67	125	93
M12 X 1.5	60	44	95	70	130	97
M12 X 1	90	66	105	77	145	105
M14 X 2	92	68	145	105	200	150
M14 X 1.5	99	73	155	115	215	160
M16 X 2	145	105	225	165	315	230
M16 X 1.5	155	115	240	180	335	245
M18 X 2.5	195	145	310	230	405	300
M18 X 1.5	220	165	350	260	485	355
M20 X 2.5	280	205	440	325	610	450
M20 X 1.5	310	230	650	480	900	665
M24 X 3	480	355	760	560	1050	780
M24 X 2	525	390	830	610	1150	845
M30 X 3.5	960	705	1510	1120	2100	1550
M30 X 2	1060	785	1680	1240	2320	1710
M36 X 3.5	1730	1270	2650	1950	3660	2700
M36 X 2	1880	1380	2960	2190	4100	3220

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.

25199

Abbreviations

3P	Three Point (hitch)
AD	Adaptor
ASSY	Assembly
ASY	Assembly
CR	Cross
CYL	Cylinder
DIA	Diameter
FF	Flat Fold
EL	Elbow
FJIC	Female JIC
FORB	Female ORB
GR2	Grade 2
GR5	Grade 5
HEX	Hexagonal
HH	Hydraulic Hose
HHCS	Hex Head Cap Screw
HYD	Hydraulic
ID	Inside Diameter
LG	Long or Length
LH	Left hand
JIC	Joint Industry Conference (standard)
MIN	Minimum
MJIC	Male JIC
MKR	Marker

MNPT	Male NPT
MORB	male ORB
NPT	National Pipe Thread
PD	Pull-Type, Dry Fertilizer
PLT	Plated
PLTR	Planter
PT	Pull-Type
PTFE	Polytetrafluoroethylene
OD	Outside Diameter
ORB	O-Ring Boss
ORG	Orange
QD	Quick Disconnect
R1	(in HH) SAE 100R1 Hose Specification
R2	(in HH) SAE 100R2 Hose Specification
RH	Right Hand
RHSNB	Round Head Shank Neck Bolt
SAE	Society of Automotive Engineers (standard)
TD	Three-Point, Dry Fertilizer
TE	Tee
USS	United States Standard (heavy duty)
W/	With
WMNT	Weldment
X	by
YP	Yield-Pro

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