These instructions provide details for unpacking and setting up the 600 Series Finger Wheel Rakes. This document should remain with the machine in the manual packet. A copy of this document should be retained by the dealer.

**GENERAL INFORMATION**

The 600 Series Finger Wheel Rakes are shipped in varying stages of assembly. The following instructions provide illustrated details of how to set up the 600 Series Finger Wheel Rakes. Recommended setup is as follows:

Unless otherwise noted, the standard fastening procedure is to secure two parts with a cap screw and lock nut. A part with a mounting slot should be secured with a plain washer against the slotted surfaces. Lock nuts are sometimes used to prevent two parts from separating but still allow one part to move or rotate next to the other. Attaching hardware, if it will require installation in the path of material flow, should always be installed with the head of the screw on the same side of the part that will be in contact with the material.

**SETUP**

1. Implement is shipped disassembled in wooden crates. Approximate assembly time is between 15 - 25 hours, depending on what options are to be installed. The majority of the fasteners are metric.

![Assembly time: 15-25 hrs. One person required.](image)

**Fig. 1**

**IMPORTANT:** Use only metric tools for metric fasteners.

2. Select an area that has adequate space for parts layout and machine assembly. Remove all parts from the crate and lay them out in assembly order according to Fig. 2.
REAR FRAME ASSEMBLY (Fig. 3)

1. Assemble the rear member (1) with the key stock facing forward to the right hand wheel support (2) and the left hand wheel support (3) using the M14 x 40 bolts (6) and the M14 nuts (7) as shown.

2. Install the two supports (4) as shown using the M14 x 40 bolts (6) and the M14 nuts (7).

3. Attach SMV brackets (11, 12) to the rear member (1) using two 3/8 x 6 bolts (13), two 3/8 flat washers (18), two 3/8 lock washers (15) and two 3/8 hex nuts (14).

4. Attach SMV emblem (16) to the SMV bracket (12) using two 1/4 x 3/4 bolts (17), two 1/4 lock washers (10) and two 1/4 hex nuts (9).
SINGLE AXLE FOR REAR FRAME (Fig. 4)

1. Apply grease to spindle (1) and slide into rear frame (2). Secure with M10 x 90 cap screw (3) and M10 locknut (4).
2. Attach ground wheel (5) to hub (1) with M16 conical lug nuts (6).
3. Repeat steps 1 and 2 on opposite side of rear frame.
TANDEM AXLE FOR REAR FRAME (Fig. 5)

1. Insert spring pin (1) through bushing (2) and pivot shaft (3).
2. Slide support hub (4) onto pivot shaft (3) with flange next to bushing (2).
3. Apply grease to pivot shaft (3) and slide into rear frame (5). Secure with M10 x 90 cap screw (6) and M10 lock nut (7).
4. Position tandem beam (8) against support hub (4). The gusset on the rear frame (5) must be centered in the cutout in the tandem beam (8). See 600 Gusset Alignment illustration below.
5. Attach tandem beam (8) to support hub (4) with M16 x 55 cap screws (9) and M16 conical lug nuts (10).
6. Attach two ground wheels (11) to tandem beam (8) with M16 conical lug nuts (10).
7. Repeat steps 1-6 on opposite side of rear frame.

[Diagram of tandem axle assembly with labels for each component]
WING FRAME ASSEMBLY (Fig. 6)

1. Using stands (19) that are 30" (762 mm) high, support the frames and connect the rear frame (1), the front frame (2) and secure using the M14 x 40 bolts (4) and the M14 lock nuts (5).

NOTE: If an optional extension frame, flex frame, center splitter wheel or extra wheel kit is to be installed, please see the options sections (Figs. 15-20) of this setup manual.

2. Insert the lift rods (6), (7) in their guides on the frame with the bushings (8, 9, 10, 11) and secure them using the M8 x 50 bolts (12) and the M8 nylon lock nuts (13). Install grease (20) in bushing (10). Bushing (10) should remain loose and slide freely on the lift tube.

3. Adjust the pivot safety pin (14) to the parking position with the lock pin (15) located in the hole closest to the front of the machine.

4. Attach the handle knob (17) for the ground pressure adjustment rod using a M12 x 90 bolt (16) and a M12 jam nut (18). Follow the same assembly procedure for the right hand side of the machine.

5. Attach the decal plate (3) to the back of the left wing frame mount using two M14 x 40 bolts (4) and two M14 lock nuts (5). The amber reflective decal plate is to face forward and this should always be mounted to the most forward end of the left wing.

NOTE: If an optional extension frame, flex frame or extra ground wheel kit is to be installed, install the decal plate (3) on the back of the left, front extension mount.
WINDROW ADJUSTMENT ASSEMBLY (Fig. 7)

1. Thread the acme screw (7) half-way into the sliding rail (1) with the hole in the acme screw (7) facing towards the outside of the machine as shown. Attach the sliding rail (1) to the wing frame as shown. Secure in place by inserting the sliding rod (8).

2. Attach washer (9), with the grooved side of the washer towards the bearing balls, and bearing (10) to the inside end (the end without the hole in it) of the acme screw (7). Attach the support adjustment device (6) on to the acme screw (7) and the sliding rod (8). Attach washer (9) and bearing (10) to the outside end (the end with the hole in it) of the acme screw (7) and slide the attachment plate (18) on to the acme screw (7) and the sliding rod (8).

NOTE: Be sure that the end of the acme screw (7) with the hole is located on the outside of the rake as shown.

3. Secure the attachment plate (18) to the support adjustment device (6) using four M10 washers (17) and four M10 x 40 bolts (16). Install one M8 x 30 bolt (15) in to the bottom of the attachment plate (18) to secure the sliding rod (8). Install the spring pin (11) half-way through the hole in the outside end of the acme screw (7). Apply grease to the acme screw (7) and the sliding rod (8).

4. Attach cover plate (12) to the support adjustment device (6) and the attachment plate (18) using twelve M8 washers (14) and M8 x 16 bolts (13). Repeat stops 10-12 for the other side of the unit.

5. Attach the support adjustment device (6) to the rear frame assembly by using pivot pin (2) and bushing (19) and secure in place using the spring pin (4). Install grease zerk (3) in to the top of the pivot pin (2).

6. Attach windrow width adjustment handle (20) to the bracket and secure using cotter pin (21).
DRAWBAR ASSEMBLY (Fig. 8)

1. Install the rear drawbar (1) to the rear member with the plate (4) using eight M14 x 160 cap screws (5) and eight M14 lock nuts (6). Assemble the nylon plates (9) on the sliding drawbar (2) using the eight M8 x 20 cap screws (10). Lightly grease all the drawbar sliding surfaces (2) and the nylon plates.

2. Insert the sliding drawbar (2) inside the rear drawbar (1) and fit the nylon plates (11, 12) as shown. Secure the nylon plates in position using the angle plates (13) and eight M8 lock nuts (14).

3. Attach the front drawbar (3) to the sliding drawbar (2) using eight M14 x 40 cap screws (7) and eight M14 lock nuts (6).

4. Install the hitchjack (15) to the front drawbar (3) using pin (16) and cotter pin (17).

5. Install the bracket (19) to the front drawbar (3) using the two pins (20) and two cotter pins (18).

Fig. 8
CASTER WHEEL ASSEMBLY (Fig. 9)

1. Assemble the wheel with hub (6) into the wheel fork (1) using the wheel fork pivot (9), short spacer (7), long spacer (8) and lock nut (10) as shown.

2. Slide the shaft of the wheel fork assembly (1) up into the wheel support and install the brake plates (5) onto the brake disk (3) and secure them in place using the spring pin (4). Repeat for the other side.

3. Install grease zerk (11) into the hole on the back side of the pivot on both sides.
OPENING ARM ASSEMBLY (Fig. 10)

1. Insert the nylon plates (14, 15) inside the slide (1) in the slots properly, long nylon plates on the top and bottom and the short plates on the sides. Mount the slide (1) on the rear drawbar and attach the cover (2) using the ten M10 x 30 cap screws (11).

2. Assemble the arm (6) on the wing frame and secure it using ten M12 x 40 (13) and ten M12 lock nuts (12).

3. Assemble the parallel arms (3) with the hinges (5), with the key stock on the hinges (5) towards the middle of the rake, and secure with the pivots (8) and nuts (9) with the nut end of the pivots (8) toward the outside of the rake as shown. Mount parallel assembly between the slide (1) the arm (6) and secure using the pivot (7) and the nut (9). Install grease zerk (16) in the bottom of pin (7). Install the opening arm (4) between the arm (6) and the front drawbar as shown and secure it using the pivot (8), spacers (10) and nut (9). Repeat the same steps for the other side.

Fig. 10
HYDRAULIC OPENING-CLOSING SYSTEM ASSEMBLY (Fig. 11)

1. Insert the hydraulic cylinder (2) on to the rear drawbar and secure it with the pin (14) and the cotter pins (15) as shown.

2. Install the fittings (8) on to the ports of the cylinder (2). Pass the 3.54" (8992 mm) hoses (1) through the brackets on the sides of the rear drawbar and then through the hose chain (3) and attach the hose chain (3) with the M8 x 25 cap screws (12) and the lock nut (13). Attach the hoses (1) to the fittings (8) and pull the extra hose forward through the hose chain (3) toward the front of the rake.

3. Attach the hoses on to the drawbar with the clamps (9), the plates (10) and the cap screws (11).

Fig. 11

Route hoses (1) through hole in the brackets on the sides of the rear drawbar

Seal Kit

After SN7400

Ref.
HYDRAULIC LIFT ARM ASSEMBLY (Fig. 12)

1. Install the fittings (3) on the cylinder (10) directing them towards the front of the rake. Mount the cylinder (10) on the wing frame as shown. Fasten the cylinder (10) to the frame using the pins (9) and “omega” circlips (16). Fasten the hoses (2) to the fittings (3) on the cylinder and then to the frame using the double hose clamp (13), plate (15) and the M8 x 25 screw (14). Repeat this step on the other side.

2. Join both hoses (2) at the center frame with tee fittings (7). Point the tee fittings (7) forward and connect the 55” (1397 mm) hoses (1) to the tee fittings (7). Route the hoses (1) and the hoses for the opening the rake forward along the drawbar with the tee fittings (7) junction between hoses (1,2) located approximately 3” (76 mm) behind the rear most hose clamp (11). Tighten the lock nut (12) on the hose clamp (11) just enough so that the hoses do not slide.

3. Attach tee fittings (7) with cap (8) to the front end of the hoses (1). Connect the 118” (2997 mm) hoses (17) to the tee fittings (7) and pull the hoses (1) as well as the two hoses for the opening wing straight before tightly securing the hose clamp (11) and lock nut (12). Tighten caps (8) on tee fittings (7). Install couplers (4), o-rings (5) and fittings (6) on the ends of hoses (17) as shown.

4. Mount the decal plate (18) above clamp (12). Hoses should extend 4-5’ (1219-1524 mm) beyond the rake hitch point.
RAKE WHEEL ASSEMBLY (Fig. 13)

1. Assemble the nylon bushings (5) onto the tubes welded on the underneath side of the wing frames. Slide in the arms carrying the rake wheels (4) through the nylon bushings and secure them with a washer (6) and a cotter pin (7). Assemble the spring (8) and the stop chain (9) between the arm and lift tube as shown. The chain must be assembled on one side of the eye link of the spring and on the other side on the arm with a “U” shackle (10) as shown.

2. Attach the rake wheels as shown and secure using M10 x 25 cap screws (2), washers (3) and M10 lock nuts (11). Install grease zerks (12) in the tubes welded to the underneath side of the frames and grease.
TRANSPORT BAR (Fig. 14)

1. Assemble the transport safety bar wing frame mounting brackets (3, 4) onto the wing frames with two M14 x 160 cap screws (5) and two M14 hex nuts (6). Attach the transport bar plate (1) to the end of the wing frames using three M14 x 50 cap screws (8). Attach the revolving mounts (2) to the transport bar plates (1) using one M20 nylon hex lock nut (7).

2. Assembly the transport safety bar center frame mounting brackets (13, 14) to the center frame using two M12 x 140 cap screws (15) and two M12 lock nuts (16). The mounting location may vary depending on selected options. Attach the mounting rings (17) to the transport safety bar center frame mounting bracket (13) using the M16 lock nuts (18).

3. Attach the transport safety bars (11, 12) to the mounts using the lock pins (9) and hair pins (10).
OPTIONAL 2-WHEEL EXTENSION (Fig. 15)

1. Install the extension frames (32, 33) on the front of the wing frames using six M14 x 40 cap screws (30) and six M14 nuts (31). Mount the decal plate on the back of the furthest forward left wing frame mount similar to Fig. 6.

2. Assemble the nylon bushings (15) onto the tubes welded on the underneath side of the extensions. Slide the arms carrying the rake wheels (9, 14) through the nylon bushings (15) and secure them with a washer (16) and cotter pin (17). Assemble the spring (11) and the stop chain (12) between the arm and the lift tube as shown. The chain must be assembled on one side of the eye link of the spring and on the other side on the arm with a “U” shackle (13) as shown.

3. Attach the rake wheels as shown and secure using M10 x 25 cap screws (2), washers (3) and M10 lock nuts (10). Install grease zerks in the tubes welded on the underneath side of the extensions.

4. Install the lift tubes (34) into the lift tube guides in the extension with the end with only one hole in it facing the rear of the machine. Install bushings (27) between the extension lift tubes and the standard lift tubes and secure in place with using two M8 x 50 cap screws (28) and two M8 lock nuts (29) on each side. Install the bushings (26) in the second hole from the front of the lift tube (34) and secure in place using one M8 x 50 cap screws (28) and one M8 lock nuts (29) in each bushing. Attach the ground pressure springs (11) to the bushings (26).
OPTIONAL 4-WHEEL EXTENSION (Fig. 16)

1. Install the extension frames (32, 33) on the front of the wing frames using six M14 x 40 cap screws (30) and six M14 nuts (31). Mount the decal plate on the back of the furthest forward left wing frame mount similar to Fig. 6.

2. Assemble the nylon bushings (15) onto the tubes welded on the underneath side of the extensions. Slide the arms carrying the rake wheels (9, 14) through the nylon bushings (15) and secure them with a washer (16) and cotter pin (17). Assemble the spring (11) and the stop chain (12) between the arm and the lift tube as shown. The chain must be assembled on one side of the eye link of the spring and on the other side on the arm with a “U” shackle (13) as shown.

3. Attach the rake wheels as shown and secure using M10 x 25 cap screws (2), washers (3) and M10 lock nuts (10). Install grease zerks in the tubes welded on the underneath side of the extensions.

4. Install the lift tubes (34) into the lift tube guides in the extension with the end with only one hole in it facing the rear of the machine. Install bushings (27) between the extension lift tubes and the standard lift tubes and secure in place with using two M8 x 50 cap screws (28) and two M8 lock nuts (29) on each side. Install the bushings (26) in the the middle hole and the second hole from the front of the lift tube (34) and secure in place using one M8 x 50 cap screws (28) and one M8 lock nuts (29) in each bushing. Attach the ground pressure springs (11) to the bushings (26).

Fig. 16
OPTIONAL FLEX FRAME (Fig. 17)

1. Install the flex frame brackets (35) on the front of the wing frames using six M14 x 40 cap screws (30) and six M14 nuts (31). Slide the flex frame beams (32, 33) into the flex frame brackets (35) and insert pins (36) through the brackets and flex frame beams as shown. Slide the braces (39, 40) onto the shoulder of the flex frame bracket (35). Secure the ends of braces (39, 40) with cap screws (41) and lock nuts (42). Install locknut (37) on to the pin (36) and tighten. Install grease zerk (3) into the end of pin (36). Mount the decal plate on the back of the furthest forward left wing frame mount similar to Fig. 6.

2. Assemble the nylon bushings (15) onto the tubes welded on the underneath side of the extensions. Slide the arms carrying the rake wheels (9, 14) through the nylon bushings (15) and secure them with a washer (16) and cotter pin (17). Assemble the spring (11) and the stop chain (12) between the arm and the lift tube as shown. The chain must be assembled on one side of the eye link of the spring and on the other side on the arm with a “U” shackle (13) as shown.

3. Attach the rake wheels as shown and secure using M10 x 25 cap screws (2), washers (3) and M10 lock nuts (10). Install grease zerks in the tubes welded on the underneath side of the extensions.

4. Install the lift tube (34) into the lift tube guides in the extension with the appropriate number of bushings (26) as shown.

5. Install brackets (27) between the extension lift tubes and the standard lift tubes and secure in place with using three M8 x 50 cap screws (28) and three M8 lock nuts (29) on each side. Install the bushings (26) in the the middle hole and the second hole from the front of the lift tube (34) and secure in place using one M8 x 50 cap screws (28) and one M8 lock nuts (29) in each bushing.

6. Attach the ground pressure springs (11) to the bushings (26).

NOTE: Before operation, the 5th and 6th ground wheel kit must be installed on the end of the flex frame beams.
OPTIONAL 5TH & 6TH GROUND WHEELS (Fig. 18)

1. Install grease zerks (2) into wheel supports (11,12). Attach the wheel supports (11,12) to the wing frames using six M14 x 40 cap screws (13) and six M14 lock nuts (14) on each side.

2. Assemble the wheel with hub (6) into the wheel fork (1) using the wheel fork pivot (9), short spacer (7), long spacer (8) and lock nut (10) as shown.

3. Slide the shaft of the wheel fork assembly (1) up into the wheel support and install the brake plates (5) onto the brake disk (3) and secure them in place using the spring pin (4). Repeat for the other side.

Fig. 18
OPTIONAL CENTER SPLITTER WHEEL ASSEMBLY (Fig. 19)

1. Install the support (1) on the front drawbar with the u-bolts (16) and the nuts (22). Mount the pivoting supports (2, 3) and secure them using the rings (14), the M10 x 100 cap screws (18) and M10 nuts (19). Connect the pivoting supports to the opening arms with the connection bars (4, 5), the M20 x 90 cap screws (17) and the M20 nuts (20).

2. Install the finger wheel arms (6) on the pivoting support (2, 3) with the bushing (21) and secure them with the washers (23) and the cotter pin (25). Insert grease zerks (26) if necessary. Insert the pin (13) in the front fork of the hydraulic cylinder (7). Install the hydraulic cylinder (7) under the drawbar and secure it with the pin (11) and cotter pins (12).

3. Attach the cables (9, 10) with the u-shackle (15) to the finger wheel arms (6). Route the cables (9, 10) through the rings in the pivoting supports (2, 3) and the rings on the support (1) as shown. Attach the cables (9, 10) to the turnbuckle (8) with the u-shackle (15). Connect the cables and the turnbuckle to the sliding pin (13) using a u-shackle (15).
OPTIONAL CENTER SPLITTER WHEEL ASSEMBLY (Fig. 20)

4. Install the straight fitting (1), copper ring (14) and the lock valve (15) to the upper port on the hydraulic cylinder. Attach one elbow (3) to lower port and one elbow (3) to lock valve (15) on the hydraulic cylinder. Remove the caps from the tee fittings on the drawbar and connect the hoses (2) to the tee fittings and to the cylinder as shown. Install the grease zerks (4) into the rake arm pivots and grease.

NOTE: Lock valve (15) should be in the closed position when transporting the machine or for whenever the center splitter wheel is not going to be used when raking.

5. Install the finger wheels (8) and (9) on the hubs using the cap screws (5), washers (6) and nuts (7). Install windshields (16).
### WARNING: Any different sized cylinders could cause serious damage to the opening system of the rake.

**Table:**

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**Fig. 21**