Air Drill Variable Rate Kit

Air Drill Carts and 6 & 9m Air Drills

Used with:

- ADC2350, ADC2350B
- NTA907HD, NTA3007HD
- NTA607HD, NTA2007HD

General Information

These instructions explain how to install a variable rate controller on a compatible air cart or integrated air drill that presently has only manual (crank-operated) rate control. With Variable Rate installed, the seed monitor directly controls material rate, independently, at each updated meter.

These instructions apply to an installation of:

Kit	Kit Description
166-193A	ADC2350 VARIABLE RATE KIT (dual)
166-328A	VARIABLE RATE ACTR KIT SGL BIN
166-339A	VAR RATE ACTR KIT DUAL BIN

These kits apply to:

Cart or Drill	Kit Compatibility
ADC2350[a]	166-193A
ADC2350B[a]	166-193A
NTA607HD	166-328A or[b] 166-339A
NTA907HD	166-193A
NTA2007HD	166-328A or[b] 166-339A
NTA3007HD	166-193A

a Drills with software version prior to 4.21 require the software update included in this kit. See page 4.

b A single hopper drill uses the 166-328A kit. A dual hopper drill may use either 166-328A or 166-339A, depending on whether variable rate is desired for just one or both meters.

One “dual” kit includes two actuators, and updates one air cart or one integrated air drill. One “sgl” (single) kit includes one actuator and updates one meter.

The 166-193A kit includes new WSMT software for older ADC2350/B air carts that have a Software Version that lacks qualified variable rate support.

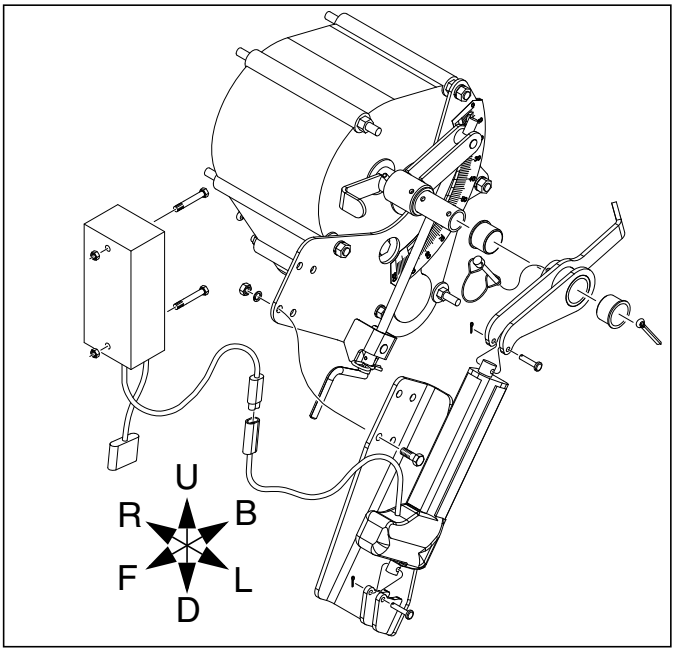


Figure 1
166-193A Kit Installation

Related Documents

110011512	ACC User Manual, Levels 2 and 3
110011513	ACC User Manual, Level 1
11001-1507	Version 4 Software Update Guide
167-085B	Seed Rate Manual (ADC & NTA models)

Have the Operator Manual at hand for drill movements.

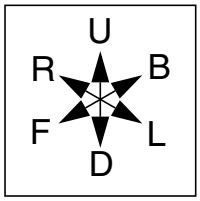
167-085M	Operator, ADC2350/2350B
166-207M	Operator, NTA907/3007HD
166-283M	Operator, NTA607/2007HD

Have the current Parts Manual at hand for parts ID.

167-085P	Parts, ADC2350/2350B
166-207P	Parts, NTA907/3007HD
166-283P	Parts, NTA607/2007HD

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	Single-digit callouts identify components in the currently referenced Figure or Figures. These numbers may be reused for different items from page to page.
⑪ to ㊵	Two-digit callouts in the range 11 to 40 reference new parts (see list on page 20).
㊶ to ㊷	Two-digit callouts in the range 51 to 52 reference affected existing parts (see page 21).

Before You Start

Compatibility

Refer to Figure 2

1. Check that linear actuators are not already installed on the cart or integrated air drill. Variable Rate is a feature that can be factory-installed.
2. Check the model number of the air cart or air drill to ensure it is a compatible model. For example, this kit is not compatible with the gearboxes used on ADC1150, ADC2220 or ADC2250 air carts, nor NTA1000, NTA1300 or NTA2000 integrated air drills.

Inventory

3. Make sure all parts are present.

Comprehension

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

Note: Illustrations in this manual, based on implement Parts manual, may show exploded views that are fully disassembled. Rely on the instructions for required disassembly and reassembly steps.

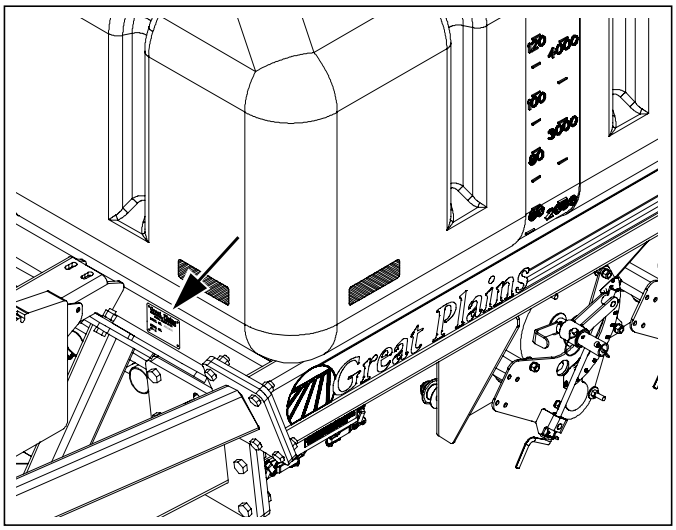


Figure 2 26428
ADC Model/Serial Number Plate

Pre-Assembly Preparation

Tools Required

- suitable tractor for positioning and operating the air drill or cart
- the seed monitor console to be used with this implement (or a 2008 or later DICKEY-john® IntelliAG® 10in LCD console)
- basic hand tools, including (for older ADC2350/B only), a drill with bit size: 1/4in (0.250in), letter size E, or 6.3mm

Prepare Drill

The mechanical installation may be performed on a disconnected air cart, but software update (if required), and testing/configuration of the system require the complete air drill, and an IntelliAG® virtual terminal.

Work Location

5. Move the air cart or air drill to a location with:
   - room to fold it (NTA607/2007HD and NTA907/3007HD only);
   - access to tractor or hydraulic power;
   - access to DICKEY-john® IntelliAG® console and 12Vdc 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.
6. NTA607/2007HD and NTA907/3007HD only: Fold drill. Lower openers. This eases access to the meters.
7. Shut off tractor or hydraulic source.

Update Monitor Software

For models NTA607HD, NTA907HD, NTA2007HD or NTA3007HD, continue at step 18 on page 5.

This step is performed first in the unlikely event that there is any incompatibility between your IntelliAG® virtual terminal, and the latest version of the Air Cart Control software supplied in the kit.

If you are unable to update the seed monitor system, do not continue the update. Have your Great Plains dealer contact the factory for assistance.

Refer to Figure 3

8. Check the seed monitor Software Version ① per the 11001-1507 guide. If the Software Version[a] is:
   4.21 or higher,
   you do not need to update the seed monitor software. If no update is required, continue at step 18 on page 5.
9. If you require a software update, and the SD card is missing from the kit, contact Great Plains to obtain the update.
10. Select from the kit one new:
    [38] 11001-1507 ACC V4 SOFTWARE REPROGRAMMING
    This is a DICKEY-john® manual describing the process of updating the software for the virtual terminal (if needed) and the WSMT (if needed).
11. Follow the instructions in the reprogramming manual [38] to check the VT part number (on back of terminal) and the software version of your seed monitor (icon ②).
12. Record Current Configuration
    Monitor configuration may reset to defaults during update. If either VT or WSMT will be updated, record the current air drill configuration, particularly the Material Library. Although newer virtual terminals support exporting the configuration to a blank SD card, Great Plains recommends making a paper record, as an imported SD configuration may be altered during Auto Config at step 79.
13. Select from the kit one new:
    [37] INTELLI-AG SOFTWARE UPDATE SDC
    This is a small Secure Digital (SD) flash memory card. When instructed, the card [37] is inserted in a slot at the lower right corner of the VT bezel, behind a flip-up door ③.

Figure 3 29504
10in Virtual Terminal and SD Card

14. Select one each new from the kit:
    [12] 110011512 ACC USR MANUAL VER 4.2 LVL 2&3
    [13] 110011513 ACC USER MANUAL VER 4.2 LVL 1
    The new software introduces user access levels, and requires a password, described in the Password Access manual [13].
15. Follow the instructions in the reprogramming manual [38]. Software is already provided on a formatted SD card, so perform no steps calling for:
    - media formatting or
    - extranet downloading.
16. The new variable rate controller is not yet installed, and will not be detected by the new software. After installing the new hardware, a complete Setup/Configuration is performed starting on page 15 of these instructions.
17. Shut down the monitor. Shut off the tractor ignition (to assure that monitor circuits are powered off).

a. This is displayed as "**Software Version**" and is not the "O.S. Version" nor the "Bootloader Version".

Prepare Meters

Refer to Figure 4

18. At a variable rate gearbox, remove the:
    (52) 805-032C PIN HAIR COTTER .148 WIRE
    then use the existing control crank ③ actuator to set the indicator to 0 on the 0-100 scale. This prevents the jackscrew from obscuring the scale.

    Adjust the final crank handle position to fully down, and re-insert the cotter pin (52).
19. Remove and save the:
    (51) 805-065C PIN WIRE RETAINING 1/4 X 1 3/4

    This pin is re-used at step 41 to couple the new control arm to the gearbox control shaft.

Note: Removing this pin de-couples the gearbox control shaft from the manual adjustment system. If it is ever necessary to revert to manual control, move the pin back to the manual arm.

20. Repeat step 18 and step 19 for the other meter.

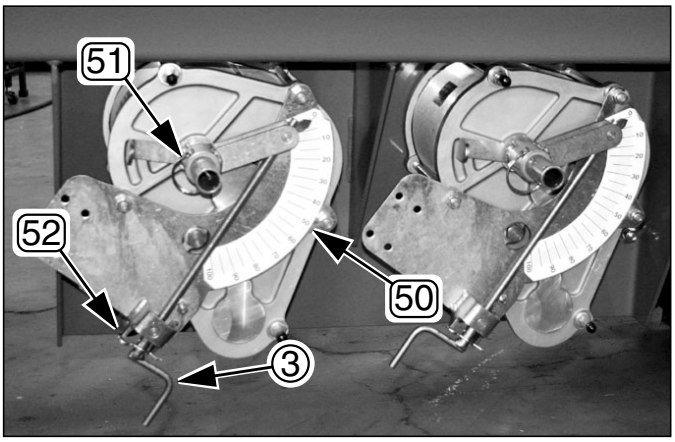


Figure 4 26306
Existing (Manual) Meters

NOTICE

Equipment Damage Risk:
Never operate the meters with pins in ***both*** *the manual/crank arm and the linear actuator arm.*

Prepare ADC Driver Mounts

If your implement is an NTA607HD, NTA907HD, NTA2007HD or NTA3007HD, continue at step 24 on page 7.

On older ADC2350/B carts, the mounting holes for the actuator driver modules may not be present, and must be drilled. Newer ADC2350 carts, all NTA607/2007HD and all NTA3007/907HD drills have holes present.

Refer to Figure 5

21. Locate the mounting holes on the ADC2350/B air cart. These are 0.28x0.38in (7.1x95mm) slotted holes 5.84in (14.8cm) apart.

    One pair ④ is located on the forward break of the gearbox mount plate.

    The second pair ⑤ are located on the brace plate at the center of the gearbox mount plate.

    If these holes are present, continue at to step 24 on page 7.

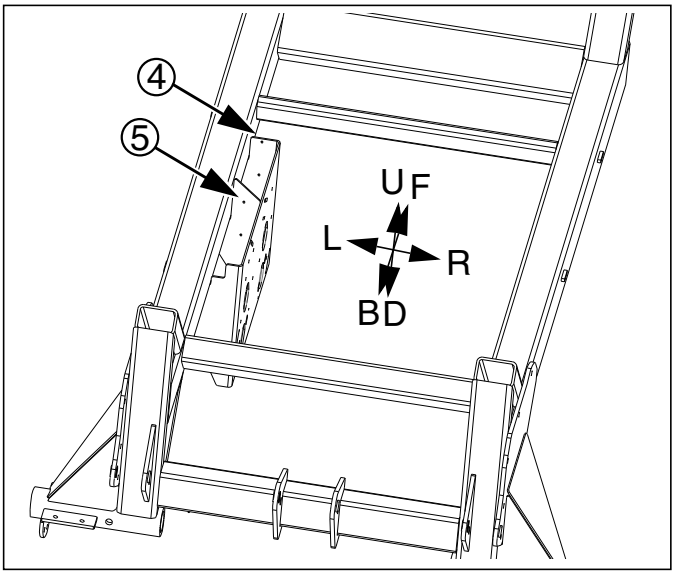


Figure 5 29508
ADC Driver Mounting Holes

Create ADC Driver Mounts

ADC Front Break Holes

Refer to Figure 6

22. Drill and size two slotted holes in the front break of the gearbox mount plate as follows:

a	$1\frac{23}{32}$in (1.72in) (4.37cm)	Frame tool bar to vertical slot center-lines
b	$\frac{9}{16}$in (0.55in) (1.4cm)	Top slot center from top of gearbox mount plate
c	$5\frac{27}{32}$in (5.84in) (14.8cm)	Slot to slot spacing, center to center
d	$\frac{9}{32}$ x $\frac{3}{8}$in (0.28 x 0.38in) (7.1 x 95mm)	Two slots, dimensions are horizontal x vertical

If you are unable to make slotted holes, make two circular holes 5.75 inches (14.6cm) apart.

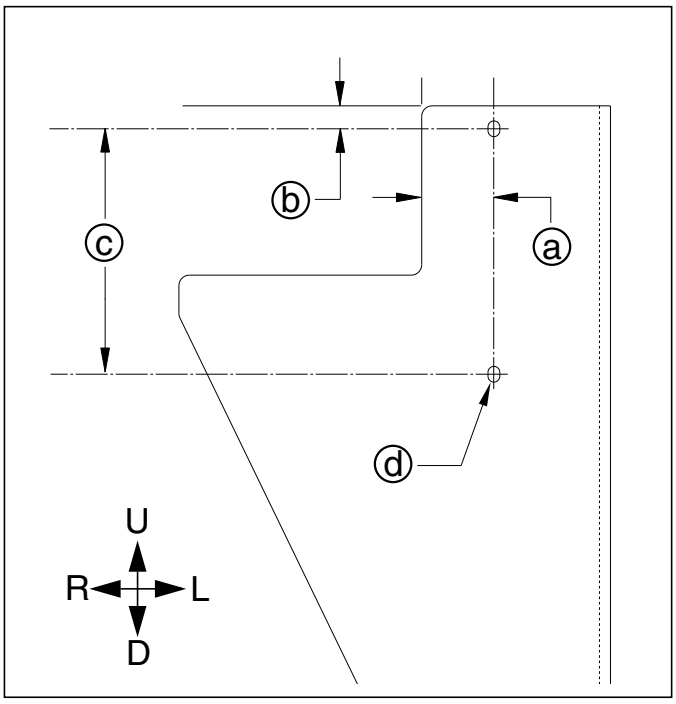


Figure 6 29511
ADC Front Break Holes

DC Brace Plate Holes

Refer to Figure 7

23. Drill and size two slotted holes in the front break of the gearbox mount plate as follows:

d	$\frac{9}{32}$ x $\frac{3}{8}$in (0.28 x 0.38in) (7.1 x 95mm)	Two slots, dimensions are horizontal x vertical
e	$1\frac{3}{4}$in (1.75in) (4.4cm)	Frame tool bar to vertical slot center-lines
r	$2\frac{25}{64}$in (2.39in) (6.1cm)	Bottom of frame tool bar to upper slot center
v	$3\frac{29}{64}$in (3.45in) (8.8cm)	Bottom of frame tool bar to lower center to center
r+v	$5\frac{27}{64}$in (5.84in) (14.8cm)	Slot to slot spacing, center to center

If you are unable to make slotted holes, make two circular holes 5.75 inches (14.6cm) apart.

If you are unable to make two holes without performing major disassembly of the gearbox structures, make only the top hole.

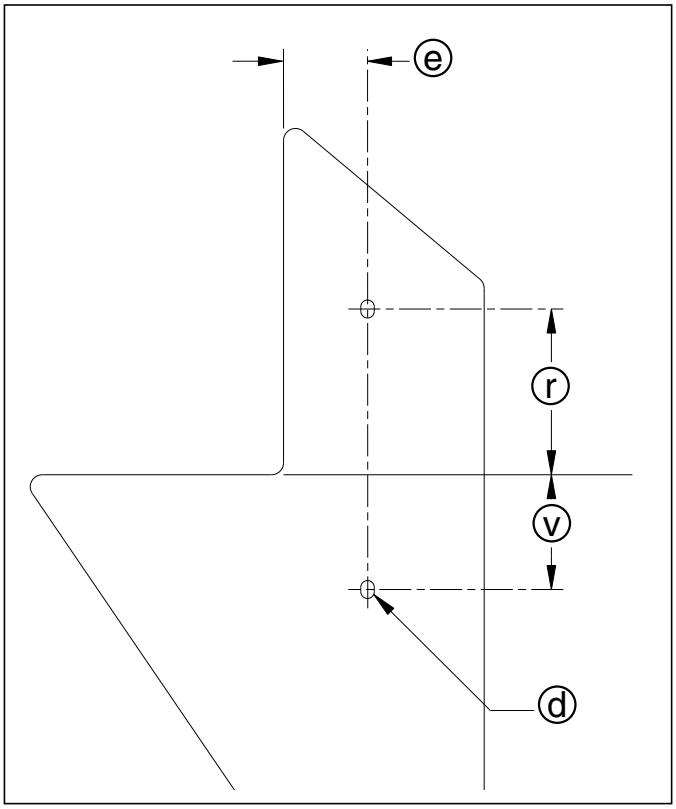


Figure 7 29512
ADC Brace Plate Holes

Install Linear Actuators

Install Linear Actuator Mounts

Install ADC or NTA907/3007HD Mounts

For models NTA607HD or NTA2007HD, continue at step 27.

Refer to Figure 8

24. Select one new:
    17 168-371H LINEAR ACTUATOR MOUNT WELDMENT
    and four sets new:
    22 802-017C HHCS 3/8-16X1 GR5
    32 804-013C WASHER LOCK SPRING 3/8 PLT
    29 803-014C NUT HEX 3/8-16 PLT

    With the lug ⑥ end down, and the lugs facing forward, install the actuator mount weldment 17 on the existing anchor weldment ⑦. Secure with bolts 22, lock washers 32 and nuts 29.
25. Repeat step 24 for the other meter.
26. Continue at step 37 on page 9.

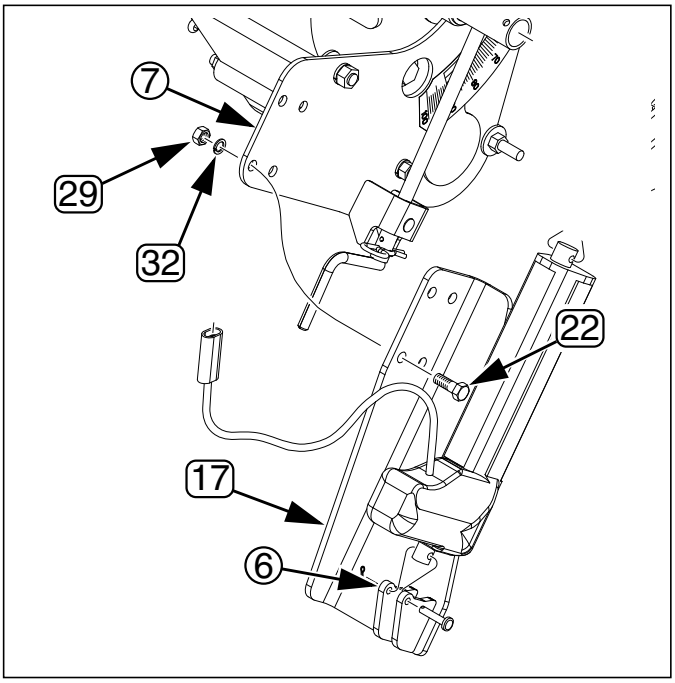


Figure 8 29498
ADC/NTA907/3007 Actuator Mount

Install NTA607/2007HD Mounts

For models ADC2350/B or NTA907/3007HD, install mounts per step 24 through step 25 above, then continue at step 37 on page 9.

Refer to Figure 9

27. Select one each new:
    14 166-318H ACTUATOR MOUNT WELDMENT
    21 800-238C .375 WIRING AND TUBE CLIP
    and four sets new:
    22 802-017C HHCS 3/8-16X1 GR5
    32 804-013C WASHER LOCK SPRING 3/8 PLT
    29 803-014C NUT HEX 3/8-16 PLT

    With the lug end ⑧ facing up and away from the gearbox, install the actuator mount weldment on the existing anchor weldment ⑨. Loosely secure with bolts 22, lock washers 32 and nuts 29.

    Place the wiring clip 21 under the left lower bolt. Tighten the other three bolts to Grade 5 torque spec. Leave the bolt with the clip finger-tight until step 59 on page 12.
28. If two meters are being upgraded, repeat step 27 for the other meter.

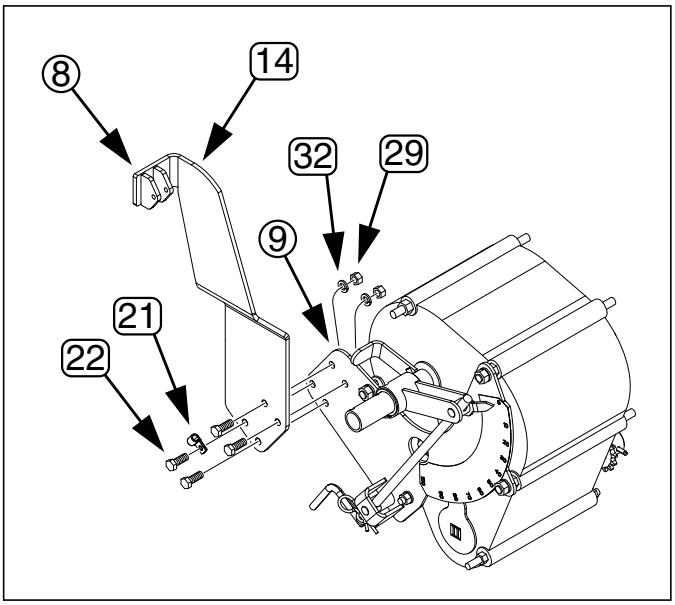


Figure 9 31357
NTA607/2007 Actuator Mount

Install Control Arm Weldments

Install ADC/NTA907/3007HD Arms

For NTA607/2007HD, continue at step 37.

Refer to Figure 10

29. Select one new:
    16 168-370H ELECTRONIC CONTROL ARM WLDMNT
    and two new:
    40 890-202C GAUGE WHEEL SFT PIVOT BUSHING
30. Press one bushing 40 into the inside end ⑧ of the control arm tube (the side with the longer arm with indicator point).

    Using the existing 1/4in holes in the tube as a guide, drill a 1/4in hole through both sides of the bushing.
31. Press the other bushing 40 into the outside end of the control arm tube.
32. With indicator tip to rear, and toward gearbox, place arm weldment 16 assembly on control shaft ⑨.
33. Select one saved:
    51 805-065C PIN WIRE RETAINING 1/4 X 1 3/4

    Align the arm tube ⑧ and inside bushing 40 with the hole ⑨ in the gearbox control shaft. The arm indicator tip should be pointing near “0” on the scale.

    Secure the arm with the wire retaining pin 51.
34. Select one each new:
    33 805-021C PIN COTTER 1/4 X 2 PLT

    Insert the cotter pin 33 through the end holes of the gearbox control shaft. Spread tips to secure cotter.
35. Repeat step 29 through step 34 for the other meter.
36. Continue at step 45 on page 10.

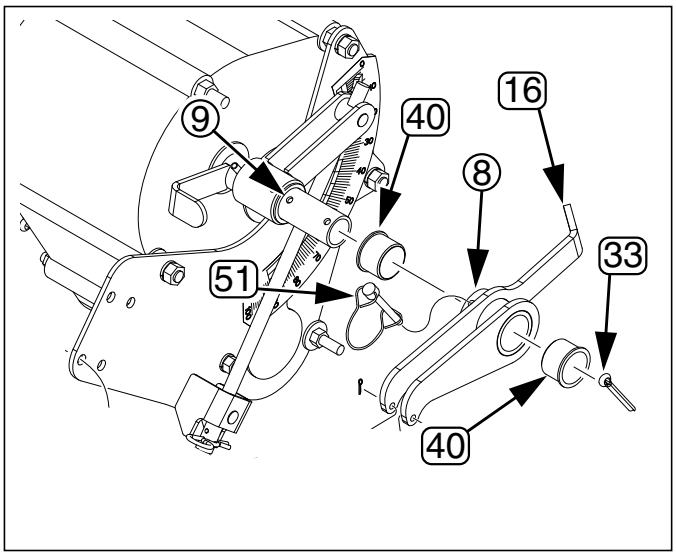


Figure 10
ADC/NTA907/3007 Control Arm
29498

Install NTA607/2007HD Arm(s)

For ADC/NTA907/3007HD, install arms per step 29 through step 35 on page 8, then continue at step 45 on page 10.

Refer to Figure 11
(which depicts an ADC installation - the NTA installations have a different appearance but use the same instructions)

37. Select one new:
    (16) 168-370H ELECTRONIC CONTROL ARM WLDMNT
    and two new:
    (40) 890-202C GAUGE WHEEL SFT PIVOT BUSHING
38. Press one bushing (40) into the inside end (8) of the control arm tube (the side with the longer arm with indicator point).

    Using the existing $^1/_4$in holes in the tube as a guide, drill a $^1/_4$in hole through both sides of the bushing.
39. Press the other bushing (40) into the outside end of the control arm tube.
40. With indicator tip to rear, and toward gearbox, place arm weldment (16) assembly on control shaft (9).
41. Select one saved:
    (51) 805-065C PIN WIRE RETAINING 1/4 X 1 3/4

    Align the arm tube (8) and inside bushing (40) with the hole (9) in the gearbox control shaft. The arm indicator tip should be pointing near “0” on the scale.

    Secure the arm with the wire retaining pin (51).
42. Select one each new:
    (33) 805-021C PIN COTTER 1/4 X 2 PLT

    Insert the cotter pin (33) through the end holes of the gearbox control shaft. Spread tips to secure cotter.
43. If two meters are being upgraded, repeat step 37 through step 42 for the other meter.
44. Continue at step 50 on page 10.

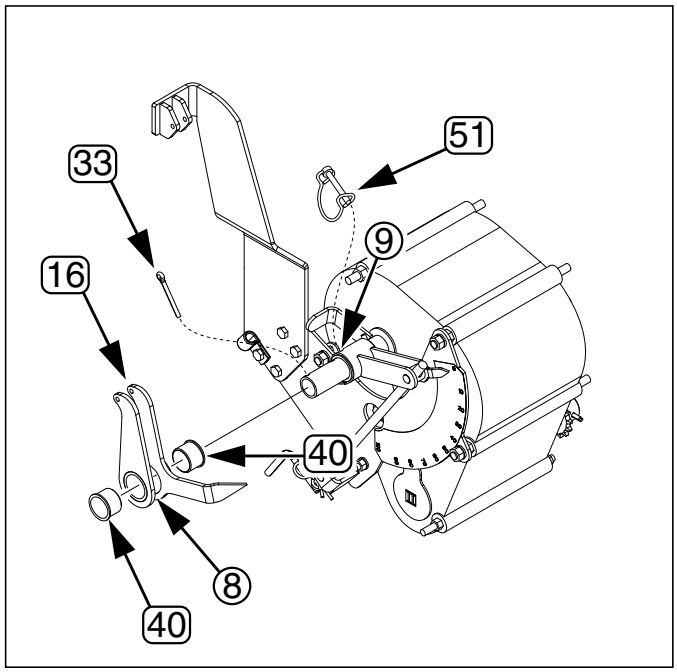


Figure 11 31358
Install Control Arm

Install Linear Actuators

Install ADC/NTA907/3007HD Actuator

For NTA607/2007HD, continue at step 50.

Refer to Figure 12

45. Select one new:
    [39] 833-456C LINEAR ACTUATOR 12V 8 IN 112LB
    and two sets new:
    [35] 805-397C PIN CLEVIS 1/4 X 1 23/64 USABL
    [34] 805-307C PIN COTTER 3/32 X 1/2
46. With the cable end of the actuator [39] down, and cable exiting up, align the lower operating rod of the actuator with the lugs [17] in the mount weldment. Secure with clevis pin [35] and cotter pin [34].
47. Rotate the control arm weldment [16] as needed to align the hole of the linear actuator rod with lugs [16] in new control arm. Secure with clevis pin [35] and cotter pin [34].
48. Repeat step 45 through step 47 for the other meter
49. Continue at step 52 on page 11.

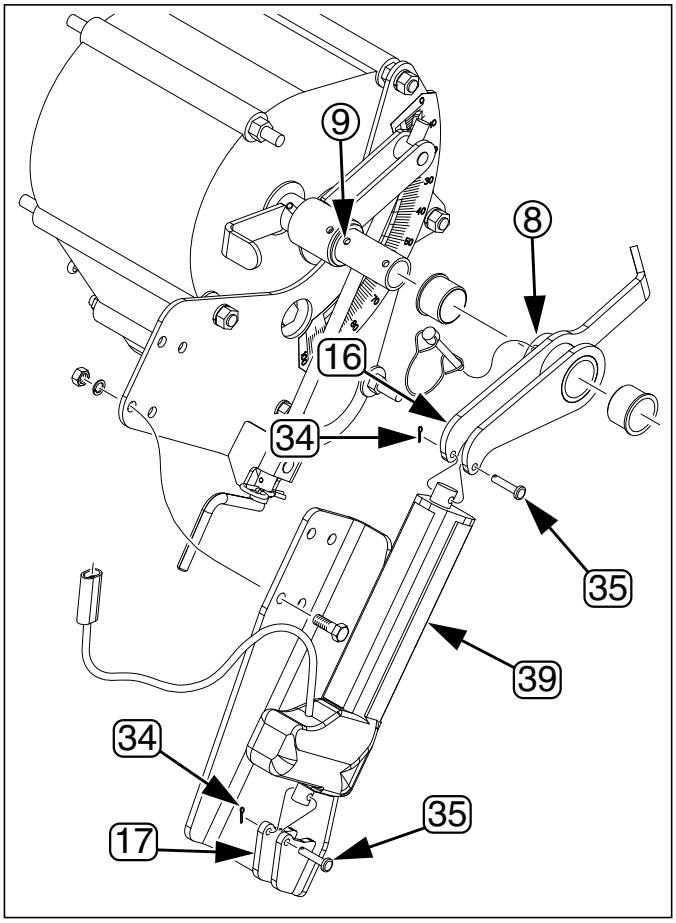


Figure 12
ADC & NTA907/3007HD Actuator
29498

Install NTA607/2007HD Actuator

For ADC2350/B or NTA907/3007HD, install actuators per step 45 through step 48 above, then continue at page 11.

Refer to Figure 13

50. Select one each new:
    [39] 833-456C LINEAR ACTUATOR 12V 8 IN 112LB
    [23] 802-167C HHCS 1/4-20X1 1/2 GR5
    [28] 803-007C NUT-LOCK 1/4-20 PLT

    With cable exiting down, secure the base end of the actuator [39] between the ears [14] of the mount weldment. Thread the lock nut [28] onto the bolt [23] until it contacts an ear, then back off one full turn.
51. Select one each new:
    [25] 802-370C HHCS 1/4-20X1 3/4 GR5
    [28] 803-007C NUT-LOCK 1/4-20 PLT

    Secure the rod end of the actuator between the arms [16] of the arm weldment. Thread the lock nut [28] onto the bolt [25] until it contacts an arm, then back off one full turn.

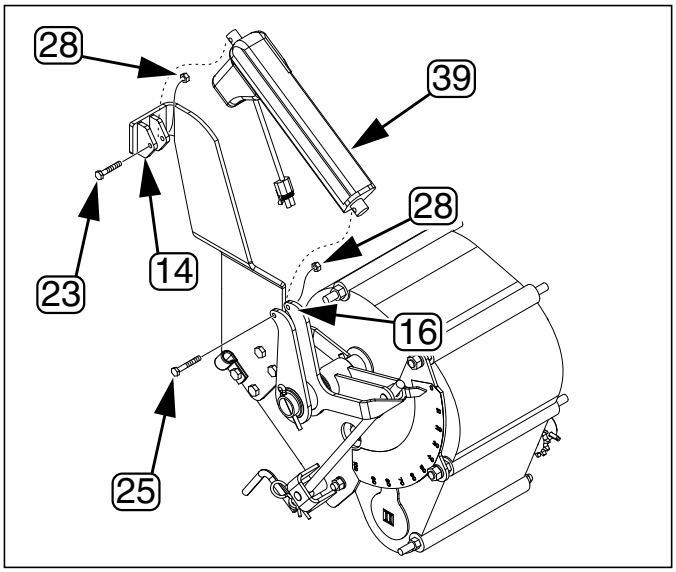


Figure 13
NTA607/2007HD Actuator
31359

Install Actuator Driver

About the Driver Module

Refer to Figure 14

The actuator driver [18] is an electronic module that adapts the linear actuator to the IntelliAG® WSMT.

It has two cable leads:
① 2-pin lead to the linear actuator, and;
② 6-pin lead to the existing WSMT harness.

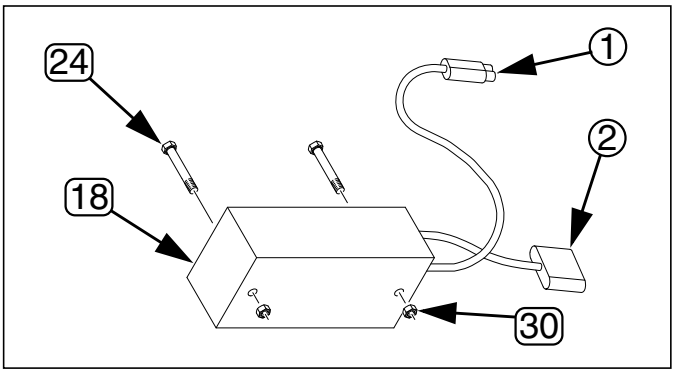


Figure 14 29498
Actuator Driver Module

Install ADC or NTA907/3007HD Driver

For NTA607/2007HD, continue at step 59 on page 12.
For NTA907/3007HD, continue at step 56.

52. Select two new:
    [18] 464360033S1 G P ZEROMAX VALVE DRIVER
    and four sets new:
    [24] 802-274C HHCS 1/4-20X3 GR5
    [30] 803-255C NUT HEX NYLOCK 1/4-20

ADC 2350/2350B Driver Installation

For NTA907/3007HD, continue at step 56.

Refer to Figure 15

On ADC2350/B, the driver modules mount vertically, with the cable lead exiting from the bottom of the module.

53. Mount one driver [18] on the back side of the forward gearbox mounting plate break, at the holes ④ identified or prepared at step 21.
54. Mount the other driver [18] on the back side of the gearbox brace plate, at the holes ⑤ identified or prepared at step 21.
55. Continue at step 62 on page 13.

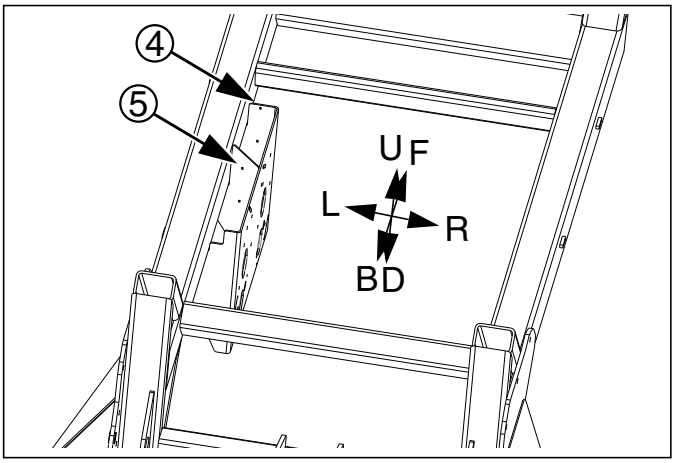


Figure 15 29508
ADC Driver Mounting

NTA907/3007HD Driver Installation

Refer to Figure 16

On NTA907/3007HD, the driver modules mount horizontally, with the cable lead exiting from the rear of the module. The mount point is pairs of $^{1}/_{4}$in (6.4mm) holes (⑥,⑦), spaced 5.75in (14.6mm) apart, at the outside (right) top edge of the gearbox mount plate.

56. Mount one driver [18] at the forward hole pair ⑥).
57. Mount the other driver [18] at the back hole pair ⑦.
58. Continue at step 62 on page 13.

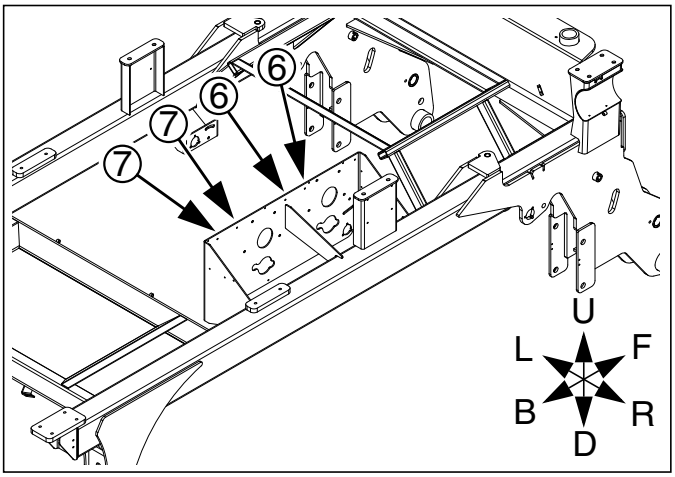


Figure 16 29509
NTA907/3007 Driver Mounting

Install NTA607/2007HD Driver

For ADC or NTA907/3007, install driver per page 11, then continue at step 62 on page 13.

Refer to Figure 17 (a cut-away view)

On NTA607/2007HD, the driver modules mount vertically, with the cable lead exiting from the bottom of the module. The module mounts to the rear face of the brace plate ① (as shown). The module side with four visible studs ② and nuts faces to cart right (away from cart).

59. Select one new:
    [18] 464360033S1 G P ZEROMAX VALVE DRIVER
    and two sets new:
    [26] 802-804C HHCS 1/4-20X2 3/4 GR8 PLT
    [31] 804-006C WASHER LOCK SPRING 1/4 PLT
    [27] 803-006C NUT-HEX 1/4-20 PLT

    Mount the driver module to the rear side of the brace plate under the base end of an actuator (or the actuator, if only one meter is being converted to variable rate). Tighten the nuts and bolts only to Grade 2 specification, to prevent deforming the module housing.

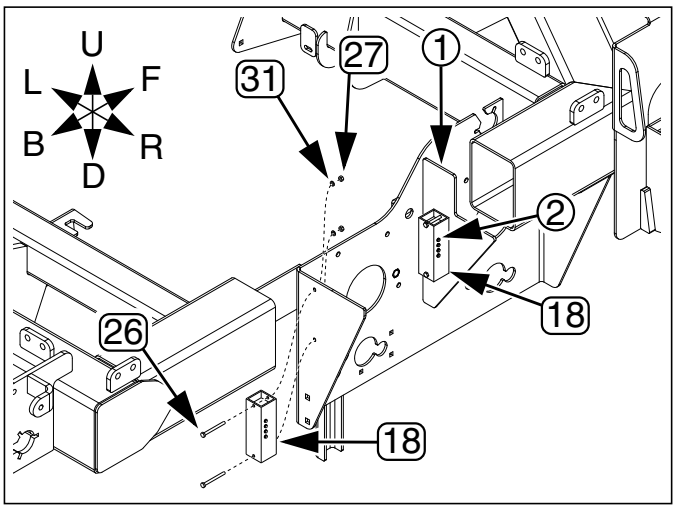


Figure 17 31364
NTA607/2007 Driver Mounting

Refer to Figure 18

60. Remove the bolt, clip [21], washer and nut securing the clip to the mount (installed at step 27 on page 7).

    Route the two-pin lead ③ through the clip [21]. Resecure the clip to the weldment. Tighten fasteners to no more than Grade 2 torque spec.

61. If two meters are being converted to variable rate, repeat step 59 and step 60 for the other meter.

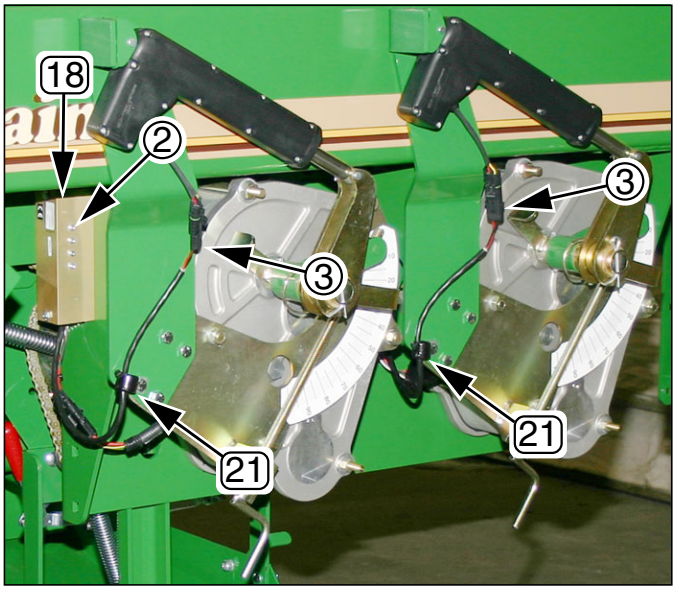


Figure 18 31363
NTA607/2007 Cable Clip

Connect Driver Leads

Refer to Figure 19

62. Connect the 2-pin lead ① of the forward actuator driver [18] to the 2-pin lead ② of the forward linear actuator [39].
63. If two meters are being converted to variable rate, connect the 2-pin lead ① of the rear actuator driver [18] to the 2-pin lead ② of the rear linear actuator [39]

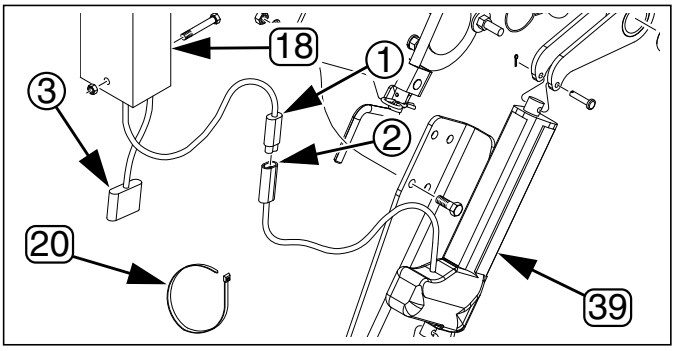


Figure 19
Actuator Driver Leads

29498

Refer to Figure 19 and Figure 20

64. Locate the harness connection points already present on the air cart or air drill. The cables have labels near the 6-pin connectors, and have labels identifying the connectors as:
ZEROMAX 1 and ZEROMAX 2, or
FRONT and REAR
65. Remove dust caps from the connectors. The caps are not re-used. If the harness connector leads are coiled up and tied, and need to be uncoiled to reach the driver module leads, cut the cable tie.
66. Connect the 6-pin lead ③ of the forward actuator driver [18] to the 6-pin FRONT or #1 harness lead ④.
67. If two meters are being converted to variable rate, connect the 6-pin lead ③ of the rear actuator driver [18] to the 6-pin REAR or #2 harness lead ⑤.
68. Select all new:
[20] 800-060C CABLE TIE .19X14.25 3DIA 50LB

    Use four ties to secure the leads for each actuator and driver. The NTA gearbox mount plate provides 6 0.21in (5.3mm) holes for this purpose.

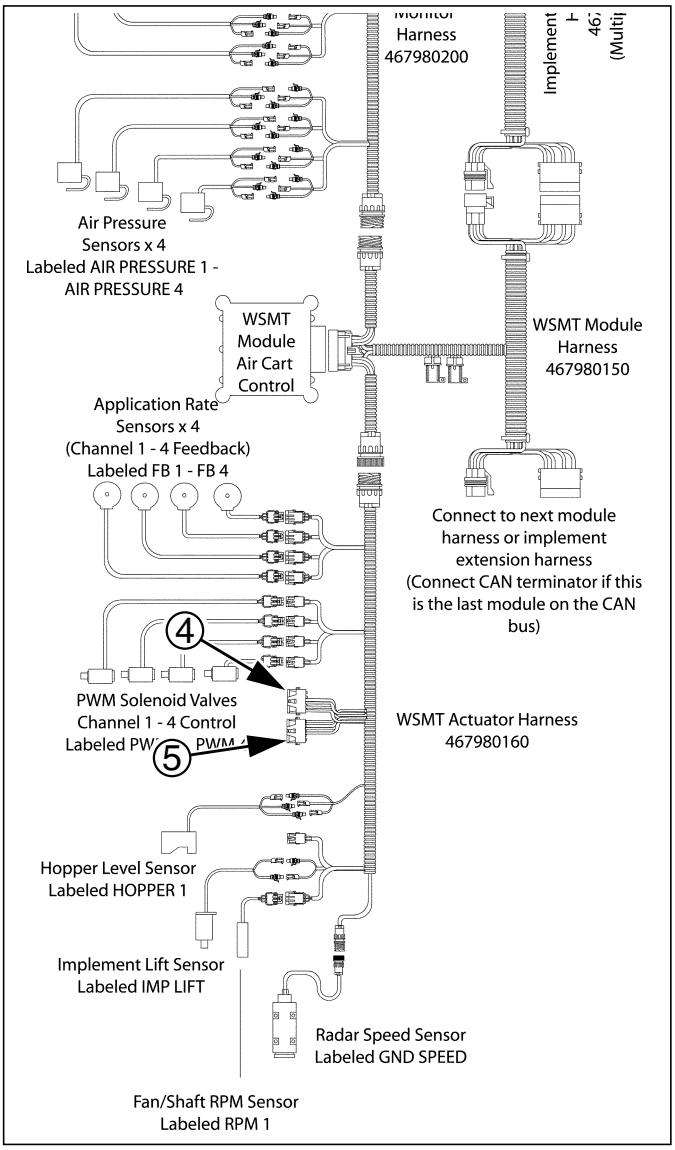


Figure 20
Harness Connection

29513

Install Master Switch

Refer to Figure 21 and Figure 22

69. In the tractor cab, locate the master switch connection lead ⑥. On newer air carts and all air drills, this is an un-terminated 2-pin weatherpak connector.

    On older air carts, this lead may already have a master switch connected to it. If so, continue at "**ACC Re-Configuration**" on page 15.

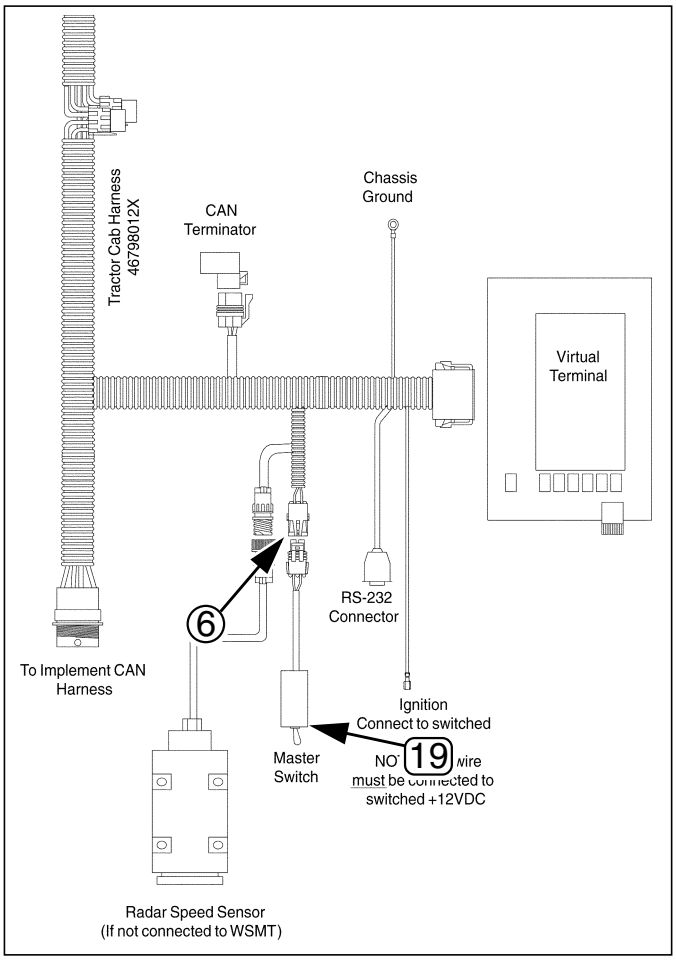


Figure 21
Cab Harness Connection

29514

Refer to Figure 21 and Figure 22

70. Select one new:
    ⑲ 467980124 ISO MASTER SWITCH

    Set the switch to OFF.

71. Mount the switch near the monitor virtual terminal, allowing enough cable length to reach the harness connection located at step 69. Mount the switch where it will be convenient for operations, but not obstruct your view of the road.

72. Connect the 2-pin lead ⑦ of the switch to harness lead ⑥.

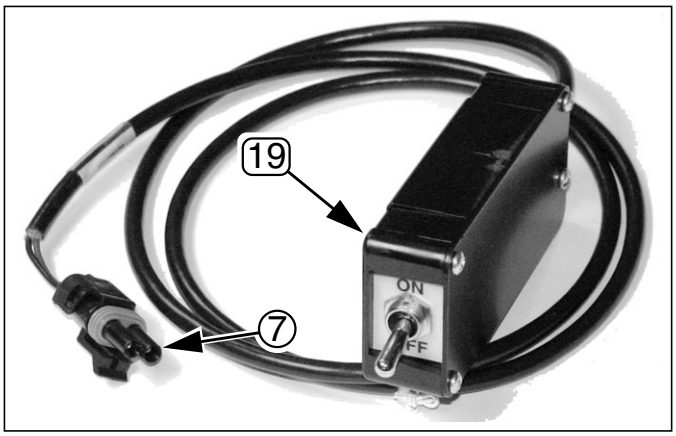


Figure 22
Master Switch

29505

ACC Re-Configuration

Before first use, the new master switch and actuator outputs must be configured into the seed monitor system. Depending on VT part number and previous software revision, it may also be necessary to re-load basic air drill parameters, and your local Materials Library.

Follow the instructions in the new IntelliAG® Aircart Control Operator's Manual. The instructions below in this manual are an overview of the sequence, and provide cross-reference to information sources if you do not have a complete record of the previous drill configuration.

29515

Initial Power-Up Steps

73. Check language and units preference.
74. Check/set date and time.
75. Perform an
    Auxiliary Input/Function Assignment
    This detects and assigns the new master switch.
76. If ON, set the new master switch to
    OFF
    (necessary to enter Configuration mode).

Load Drill Parameters

77. Enter System Mode:
    Setup/Configuration
78. If the setup was lost during software update (or has never been loaded), perform a
    Module Configuration.
79. If you run an "Auto Config", check the module assignments against any record from step 12.

The new actuators are automatically detected by the WSMT, and are not separately enumerated. When present and connected, they enable the "GRAN SEED/FERT CONTROL" modes hidden for crank-adjusted drills.

Update Material Library

In order to correlate actuator output with desired seed rate (meter shaft rate), the system requires a Calibration Constant for each material to be used.

If you already had a material library, re-load it from an SD card or via the menus. Otherwise revise a default material name as the first Control setup.

- The example at right shows sample materials:
  Wheat HRW, renamed from SEED 1
  and
  11-52-0 renamed from FERT 1
  to be used for the first Control setup.

Example Material Library:

CH1	Wheat HRW
CH2	11-52-0
CH3	DISABLED
CH4	DISABLED
Wheat HRW	11-52-0
SEED 2	FERT 2
SEED 3	FERT 3
…	…

Create a Controlled Material

Re-define at least one material. Otherwise, create at least one material. Some key steps:

80. **Type** must be set to GRAN SEED CONTROL or GRAN FERT CONTROL.
81. Select or Disable: **Preset Method**

    If using preset method, select initial rate increments that are only a few percent, so as to have fine control of the meter scale indicator. These can be changed to coarser increments after calibration.
82. **Density** must be accurately entered.
83. Enter the **Cal Const** if one is available for your seed type. This value does not affect the calibration process, and is replaced during calibration, but is useful for comparison. The calibration constant developed during calibration should be similar to the chart number.
84. Set **Variable Cal Const** if one is available for your seed. This is from a list of names pre-programmed into the monitor software. It is usually not the same name as the material name setup on page 15. In this example, “Wheat 2S”, the “2S” refers to the (factory standard) “2 star” meter flute configuration.

    Pick a seed constant closest to yours in terms of physical seed characteristics and meter flute configuration.

    If a suitable Variable Cal Const is available, the system can more accurately compensate for manual calibration cranking speeds that differ from field rate.

    If no suitable Variable Cal Const is available, crank at an rpm near field speed at step 92.

Example Non-Preset Material Setup:

1-16	CH Wheat HRW	Comment
CHANNEL	1 or 2	Per meter being configured
Type	GRAN SEED CONTROL or GRAN FERT CONTROL	Must be one of these
Units	Lb/ac with Rev/ac	Example
Preset Method	Disabled	Example
Target Rate	60.0 LB/AC	Example
Max Rate	78.0 LB/AC	Upper + limit
Min Rate	48.0 LB/AC	Lower - limit
Inc/Dec %	1.0 %	Example
Density	60.00 LBS/BU	Example
#Towers	5	Per Implement
Cal Const	77591	Optional: Use nearest chart value
Variable Cal Const	Wheat 2S	Optional
Shaft RPM	Low 10 High 50 RPM	
Prod Level Alarm	0 LBS	
Seeds per Pound	3000 S/LB	Example
High Pop Alarm	20.0 %	Example
Low Pop Alarm	20.0 %	Example
ROW WIDTH	— IN	Or use Auto-Update Width
ON(-)/ OFF(X) PATTERN	---------- (unless tramline in use)	
Row Fail Rate	2 / 1 S/SEC	See ACC manual

Actuator Channel Setup

85. Assign material.
86. **Type** must be set to GRAN SEED CONTROL or GRAN FERT CONTROL.
87. Check that other setting are as Required, and reflect the actual configuration of the implement.

Example Channel Setup:

Parameter	Value	Comment
CHANNEL	1 or 2	Per meter being config-ured
Type	GRAN SEED CONTROL or GRAN FERT CONTROL	One of these Required
Material Name	Wheat HRW or 11-52-0	Example user-speci-fied names
Control Mode	Auto	Required
Drive Type	Zero Max 1 or 2	Required
Drive Freq.	40 Hz	Required
Input Fliter	50 %	Required
Sensor Constant	360 PUL/REV	Required
Gear Ratio	1	Required
Meter Gear Range	LOW or HIGH	One of these Required
# Seed Rows	32, 36, 40, 48, 50, 60, 65, 66, 80	read-only, per implement or drill model
Channel Width	(set to swath of imple-ment or drill, in inches or cm)	Required
Flush Enable	Disabled	Data not used
Pre-charge(+)\Delay(-)	0.0 SEC	Data not used

Calibrate

Calibrate Speed Sensor

88. Perform a Calibrate Ground Speed.

Calibrate Material

Perform a calibration. The procedure is similar to that for crank-set operations.

89. Consult the Seed Rate manual (167-085B) for (the approximate) manually-set rate for your material.
90. Check that final Range gear pairing is the same on:
    - the chart,
    - the meter, and
    - the Meter gear Range in the Channel Setup.
91. Enter the calibration screen.

    At this time, the linear actuator becomes active. The scale indicator moves to approximately mid-scale, then stops.

    Pointing to a specific value is not required, but needs to be in the range 30° to 95°. Great Plains recommends using a scale setting that is close to your expected target rate.

    Use the Inc+/Dec- softkeys on the monitor console to adjust the indicator to the target rate, or at least to within the 30°-95° range.
92. Manually crank the meter for at least the number of turns shown in the instruction of the Seed Rate Manual for $^{1}/_{10}$ha or $^{1}/_{10}$ac.

    The exact number of revolutions, cranking rate[b], and precise starting and stopping handle angles are not critical, as the system reads meter revolutions accurately, and can compensate for shaft speed, seed size and partial turns.

    What matters is getting a large sample, to reduce errors and increase confidence in the calibration.

Note: By calibrating at the target rate, and for $^{1}/_{10}$ha, you establish a comfort level that the drill is set up correctly, in particular, that you are in the correct gear Range for the desired application rate.

93. Weigh the dispensed material and enter it in the menu. The monitor computes a Calibration Constant for this material. Save this result.

Example Calibration Screen:

Parameter	Value		Comment
CHANNEL	1		Example
material	Wheat HRW		Example
Density	60.0	LB/BU	Example
Calibration Constant	77591	PUL/FT	From chart
Target Meter rpm	20	RPM	Example
# Meter Revs	30	REV	Example
Pulse Count	0	PUL	Pre-Cal.
New Calib Const	_____	PUL/FT	
Total # Towers	5		Per Implement
Amount Dispensed	_____	LBS	From Scale

Example:
ADC2350B cart and NTA3510 drill
Wheat, 2-star meter, single seed hopper in use
High Range at gearbox
Target rate of 133 kg/ha would be a scale setting of:
50° (from Seed Rate manual charts)
A sample size of $^{1}/_{10}$ha requires crank:
77 turns (from Seed Rate manual instructions)

b. If no "**Variable Cal Const**" was selected at step 84, crank at for most accurate results:
ADC2350/B, NTA907/3007HD: 2 to $2^{1}/_{2}$ revolutions per second
NTA607/2007HD: 1 to $1^{3}/_{4}$ revolutions per second

Cart/Drill Operation

The air drill previously operated in “GRAN SEED MONITOR” and/or “GRAN FERT MONITOR” modes.

With the linear actuators now installed and operating, you will normally operate in “GRAN SEED CONTROL” and/or “GRAN FERT CONTROL” mode.

If it is necessary to revert to manual meter setting, move the pin from the linear actuator arm back to the crank-driven arm.

Cart/Drill Maintenance

This update causes no changes to drill maintenance.

Appendix

New Parts

Quantities are units (“ea”).

The part call-out numbers in this list match all Figures in these installation instructions. Part descriptions match those in your updated Parts Manual.

Kit Contents

Callout	Quantity in Kit: 166-193A	166-328A	166-339A	Part Number	Part Description
11	1	1	1	166-263M	MANUAL INSTALL ADC2350 VAR RT
12	1			110011512	ACC USR MANUAL VER 4.2 LVL 2&3
13	1			110011513	ACC USER MANUAL VER 4.2 LVL 1
14		1	2	166-318H	ACTUATOR MOUNT WELDMENT
15		1	2	166-319H	GEARBOX ACTUATOR ARM WLDMNT
16	2			168-370H	ELECTRONIC CONTROL ARM WLDMNT
17	2			168-371H	LINEAR ACTUATOR MOUNT WELDMENT
18	In 36	1	2	464360033S1	G P ZEROMAX VALVE DRIVER
19	In 36	1	1	467980124	ISO MASTER SWITCH
20	8	4	8	800-060C	CABLE TIE .19X14.25 3DIA 50LB
21		1	2	800-238C	.375 WIRING AND TUBE CLIP
22	8	4	8	802-017C	HHCS 3/8-16X1 GR5
23		1	2	802-167C	HHCS 1/4-20X1 1/2 GR5
24	4			802-274C	HHCS 1/4-20X3 GR5
25		1	2	802-370C	HHCS 1/4-20X1 3/4 GR5
26		2	4	802-804C	HHCS 1/4-20X2 3/4 GR8 PLT
27		2	4	803-006C	NUT-HEX 1/4-20 PLT
28		2	4	803-007C	NUT-LOCK 1/4-20 PLT
29	8	4	8	803-014C	NUT HEX 3/8-16 PLT
30	4			803-255C	NUT HEX NYLOCK 1/4-20
31		2	4	804-006C	WASHER LOCK SPRING 1/4 PLT
32	8	4	8	804-013C	WASHER LOCK SPRING 3/8 PLT
33	2			805-021C	PIN COTTER 1/4 X 2 PLT
34	4			805-307C	PIN COTTER 3/32 X 1/2
35	4			805-397C	PIN CLEVIS 1/4 X 1 23/64 USABL
36	1			823-273C	ADC2350 INTELLIAG VAR RATE KIT
37	1			<npn>	INTELLI-AG SOFTWARE UPDATE SDC
38	1			11001-1507	ACC V4 SOFTWARE REPROGRAMMING
18	2			464360033S1	G P ZEROMAX VALVE DRIVER
19	1			467980124	ISO MASTER SWITCH
39	2	1	2	833-456C	LINEAR ACTUATOR 12V 8 IN 112LB
40	4	2	4	890-202C	GAUGE WHEEL SFT PIVOT BUSHING

Existing Parts

The part call-out numbers in this list match all Figures in these installation instructions. Part descriptions match those in your updated Parts Manual.

The Part Disposition column indicates whether the part is re-used or discarded.

Callout	Part Number	Part Description	Part Disposition
51	805-065C	PIN WIRE RETAINING 1/4 X 1 3/4	Removed and saved.
52	805-032C	PIN HAIR COTTER .148 WIRE	Removed and re-installed

Abbreviations

ACC	Air Cart Control
ACTR	Actuator
ADC	Air Drill Cart
DIA	Diameter
G P	Great Plains
GR5	Grade 5
GR8	Grade 8
HD	Heavy Duty
HEX	Hexagonal
HHCS	Hex Head Cap Screw
IN	Inch
ISO	International Standards Organization (ISO 11783 CANbus)

LB	Pound
NTA	No-Till Air
PLT	Plated
RT	Rate
SD, SDC	Secure Digital Card
SFT	Shaft
USABL	Usable
V	Volt
VAR	Variable
WLDMNT	Weldment
WSMT	Working Set MasTer
X	by

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