

SeedStar® Seed Monitor and Variable Rate Drive



D C Y

OPERATOR'S MANUAL SeedStar® Seed Monitor and Variable Rate Drive

OMA71821 Issue L1 (ENGLISH)

CALIFORNIA Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

If this product contains a gasoline engine:

WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The State of California requires the above two warnings.

John Deere Seeding Group
(This manual replaces OMA69295 F1)
North American Edition
LITHO IN U.S.A.



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Introduction

Foreword

READ THIS MANUAL carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage. This manual and safety signs on your machine may also be available in other languages. (See your John Deere dealer to order.)

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your machine and should remain with the machine when you sell it.

MEASUREMENTS in this manual are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by facing in the direction the implement will travel when going forward.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I.N.) in the Specification section. Accurately record

all the numbers to help in tracing the machine should it be stolen. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place off the machine.

WARRANTY is provided as part of John Deere's support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate which you should have received from your dealer.

This warranty provides you the assurance that John Deere will back its products where defects appear within the warranty period. In some circumstances, John Deere also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied. Setting fuel delivery above specifications or otherwise overpowering machines will result in such action.

DX,IFC2A -19-17SEP92-1/1

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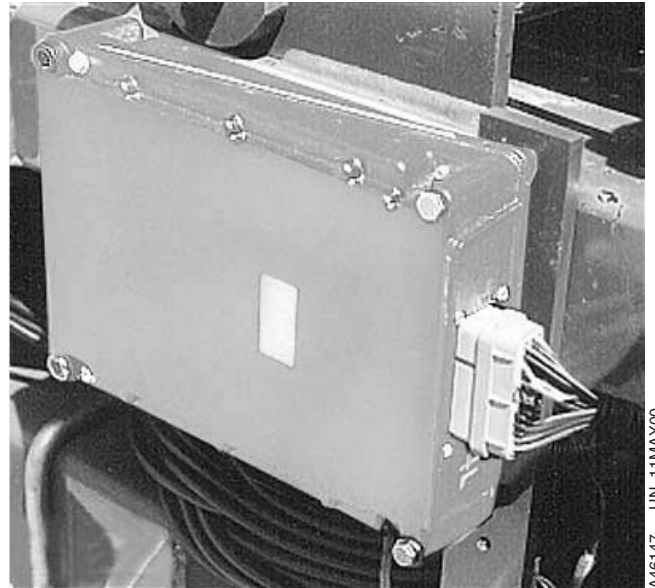
Identification Views

Identification Views



A37501 -UN-06SEP95

GREENSTAR® Monitor Display



A46147 -UN-11MAY00

SEEDSTAR® Monitor Controller



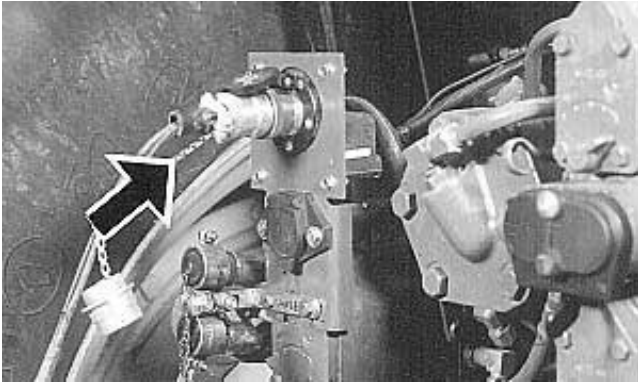
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Variable Rate Drive Controller

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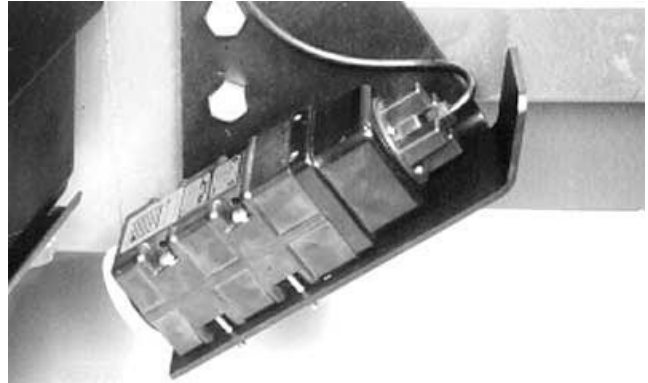
AG,OUO1074,1477 -19-24APR00-1/5

Identification Views



A38010 -UN-06SEP95

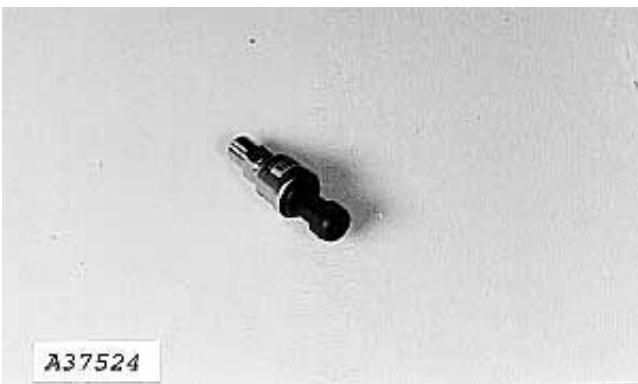
Tractor Connector



A48199 -UN-26OCT01

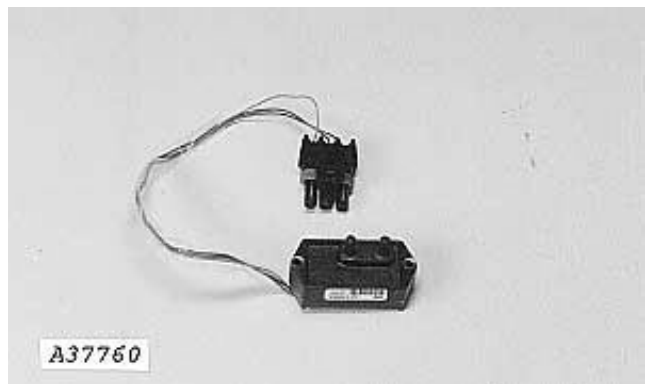
Radar

AG,OUO1074,1477 -19-24APR00-2/5



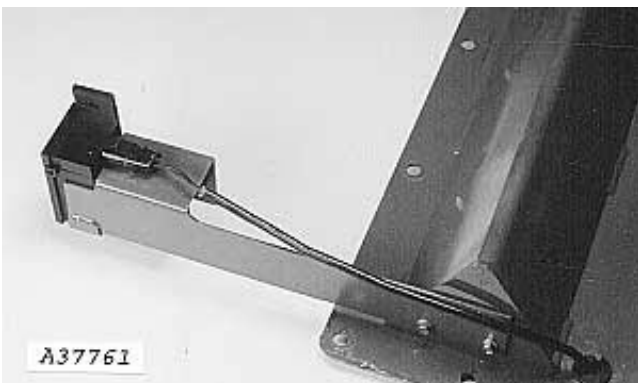
A37524 -UN-13SEP95

Liquid Fertilizer Sensors



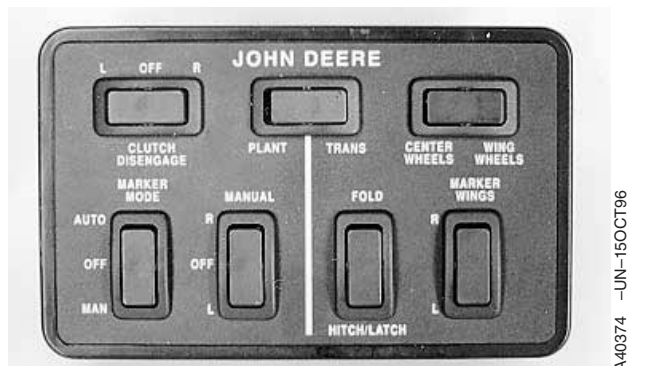
A37760 -UN-06SEP95

Vacuum Sensor



A37761 -UN-06SEP95

60 Seed Cart Hopper Level Sensor



A40374 -UN-15OCT96

Planter Frame Control Box

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AG,OUO1074,1477 -19-24APR00-3/5

Identification Views



Half-Width Disconnect

A44237 -UN-24OCT97



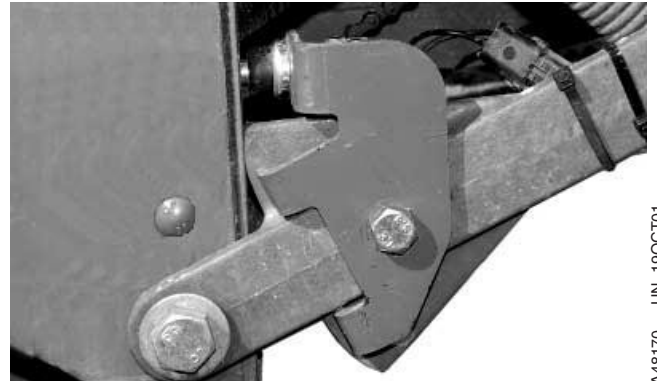
Variable Rate Drive Motor/Valve

A44950 -UN-17JUL98



Height Switch for Drawn Planters and 1720 16RN Integral Planter

A45210 -UN-27NOV98



Height Switch for Integral Planters

A48170 -UN-19OCT01

AG,OUO1074,1477 -19-24APR00-4/5



Motion Sensor and Disk

A44952 -UN-17JUL98



Motor Speed Sensor

A48171 -UN-19OCT01

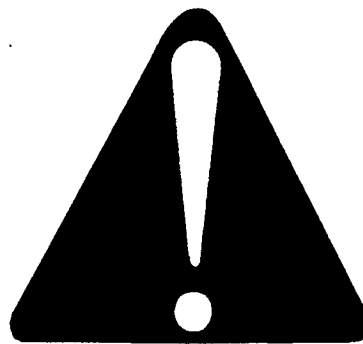
AG,OUO1074,1477 -19-24APR00-5/5

Safety

Recognize Safety Information

This is a safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



DX,ALERT -19-29SEP98-1/1

T81389 -UN-07DEC88

Understand Signal Words

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.



DX,SIGNAL -19-03MAR93-1/1

TS187 -19-30SEP88

Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.



DX,READ -19-03MAR93-1/1

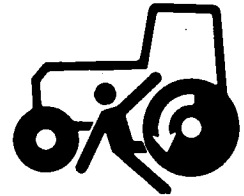
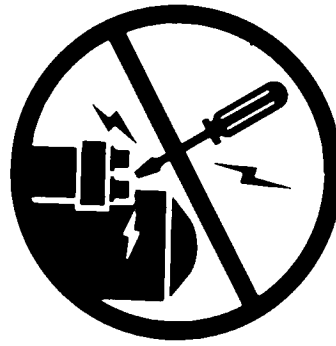
TS201 -UN-23AUG88

Prevent Machine Runaway

Avoid possible injury or death from machinery runaway.

Do not start engine by shorting across starter terminals. Machine will start in gear if normal circuitry is bypassed.

NEVER start engine while standing on ground. Start engine only from operator's seat, with transmission in neutral or park.



TS177 -UN-11JAN89

DX,BYPAS1 -19-29SEP98-1/1

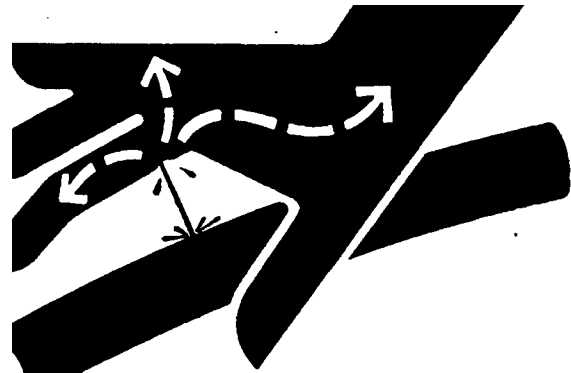
Avoid High-Pressure Fluids

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



X9811 -UN-23AUG88

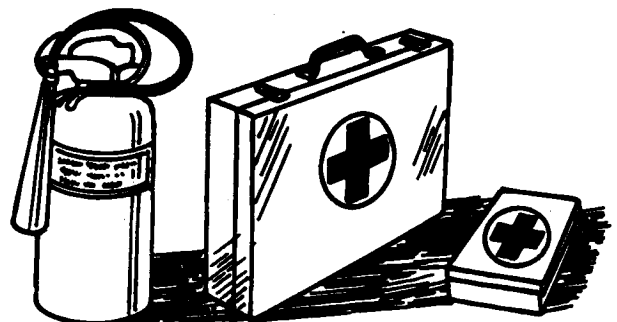
DX,FLUID -19-03MAR93-1/1

Prepare for Emergencies

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



TS291 -UN-23AUG88

DX,FIRE2 -19-03MAR93-1/1

Electrical Connections

Keep all sparks and flames away from battery, as gas given off by electrolyte is explosive. To avoid sparks, connect ground cable last and disconnect it first.

AG,OUO1074,1484 -19-24APR00-1/1

Do Not Modify the Monitor or Radar Sensor

Doing so could nullify the warranty. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

AG,OUO1074,1485 -19-24APR00-1/1

Safety Signs

Safety Signs

Warning: To avoid possible eye damage from microwave signals emitted by this radar sensor, DO NOT look directly into sensor face.



Radar Sensor

AG,OUO1074,1486 -19-24APR00-1/1

General Information

Look for Supplemental Information

Occasionally new or revised information will become available after manuals are printed. To get this up-to-date information into your hands, publication supplements are prepared and supplied to the field in the machine literature package.

Supplements can be supplied in the following forms and are usually identified with one of these titles:

- Direction(s) Sheet
- Installation Instructions
- Publications Supplement

Before your initial review of the manual, look through the machine literature package to see if any

supplemental information has been provided. If supplied, review this information to determine which procedures are impacted or modified by the revised instructions. Pay close attention to “CAUTION” and “IMPORTANT” statements. CAUTION statements address your safety, the safety of others and safe operation of the machine. IMPORTANT statements refer to machine adjustment, servicing and care.

Manuals are revised annually, at which time the supplemental information is incorporated directly into the manual, thereby eliminating the supplement.

HX,1900GI,A1A -19-21SEP98-1/1

SEEDSTAR® Monitor Overview

The operating system is comprised of two major components:

- GREENSTAR® tractor display system which displays information from seed monitor.
- SEEDSTAR® seed monitor is the microprocessor mounted on planter frame. It monitors the operations of seed, vacuum, and liquid fertilizer, and sends information to be displayed over the CAN communications lines. Optional electronic frame control is available on some front-folding frame models.

*SEEDSTAR is a trademark of Deere & Company.
GREENSTAR is a trademark of Deere & Company.*

AG,OUO1074,1496 -19-24APR00-1/1

Attaching and Detaching

Use Your Tractor and Machine Operator's Manuals

Always refer to YOUR tractor and machine Operator's Manuals for specific attaching and detaching information.



TS190 -UN-17JAN89

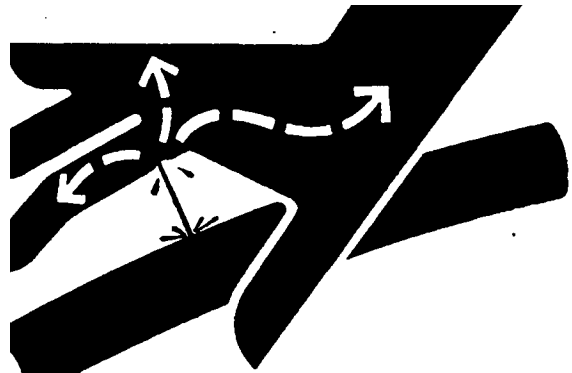
OUO1074,00013AF -19-29OCT01-1/1

Making Proper Hose Connections



CAUTION: Escaping fluid under pressure can penetrate the skin, causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours for gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



X9811 -UN-23AUG88

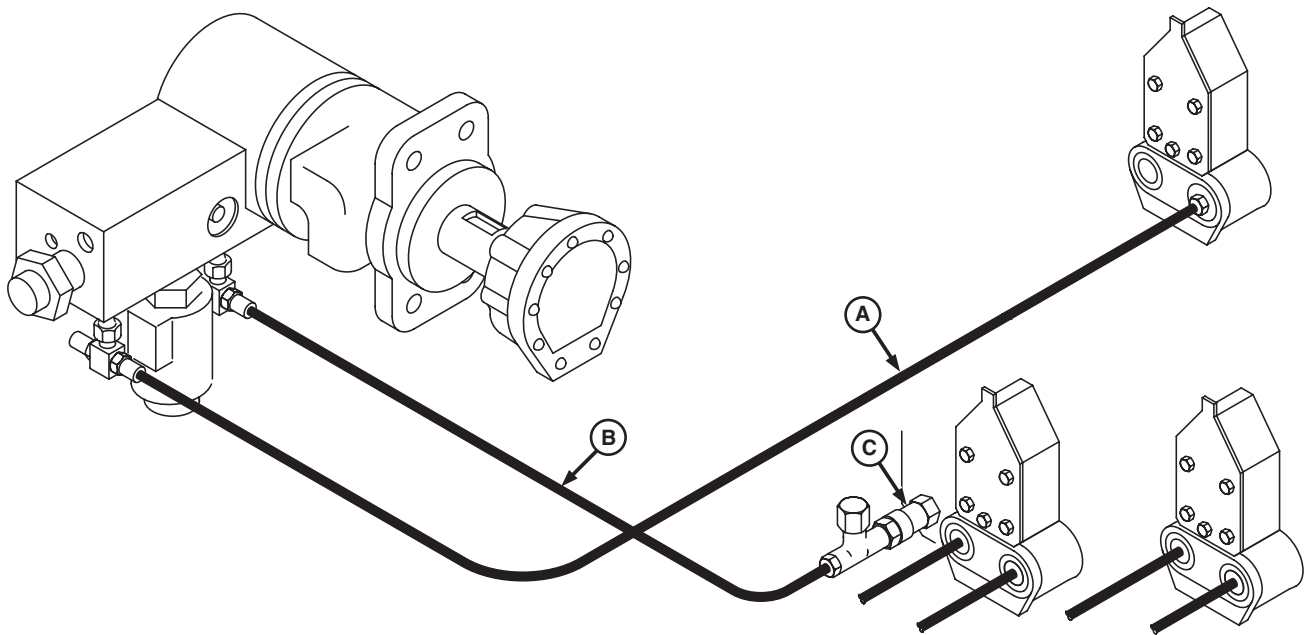


CAUTION: Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly. Replace damaged hoses.

IMPORTANT: All hydraulic couplers must be clear of debris, dust, and sand. Use protective caps on fluid openings until ready to make connection. Foreign material can damage the hydraulic system.

OUO1074,00013B1 -19-29OCT01-1/1

30—40 Series Tractors Without Power Beyond—Single Motor



A—Variable Drive Pressure
Hose

B—Variable Drive Return Hose

C—Auxiliary Return Port

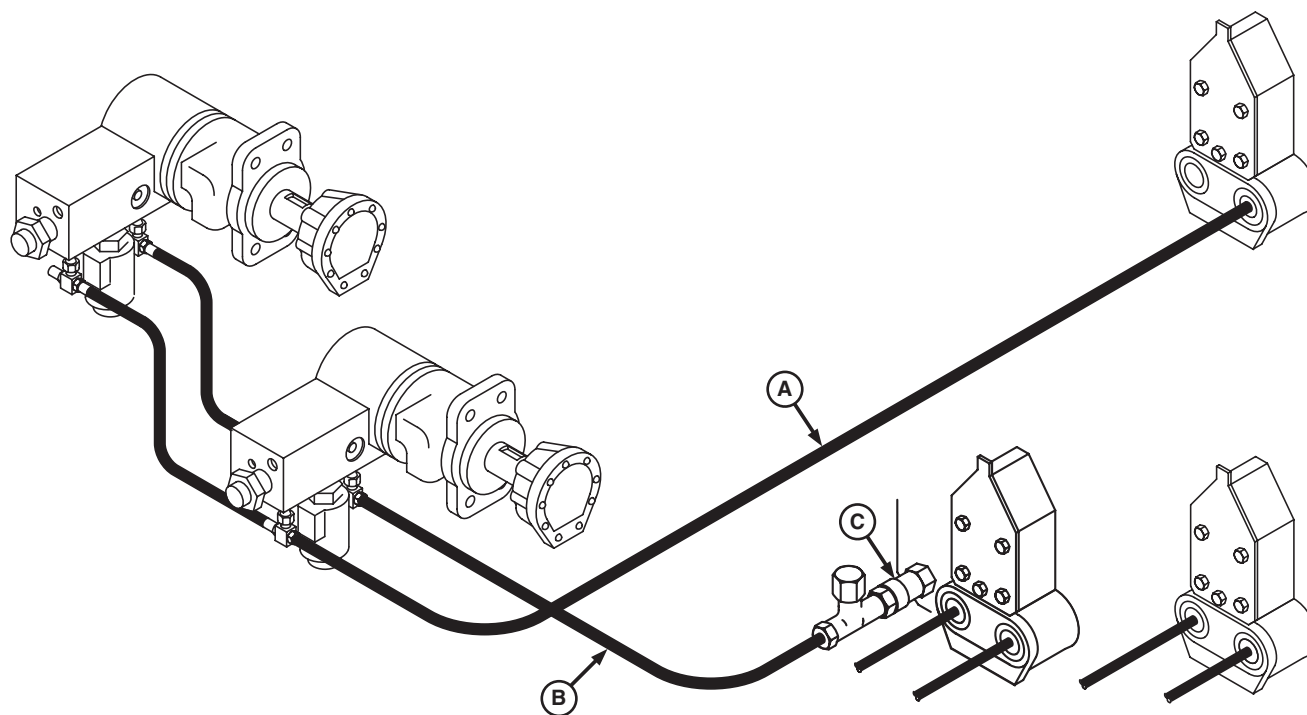
1. Attach variable drive pressure hose (A) from variable rate motor to pressure side of SCV.

2. Attach variable drive return hose (B) into auxiliary return port.

A48279 -UN-12NOV01

OUC1074,00001DC -19-02MAY01-1/1

30—40 Series Tractors Without Power Beyond—Dual Motor



A—Variable Drive Pressure
Hose

B—Variable Drive Return Hose

C—Auxiliary Return Port

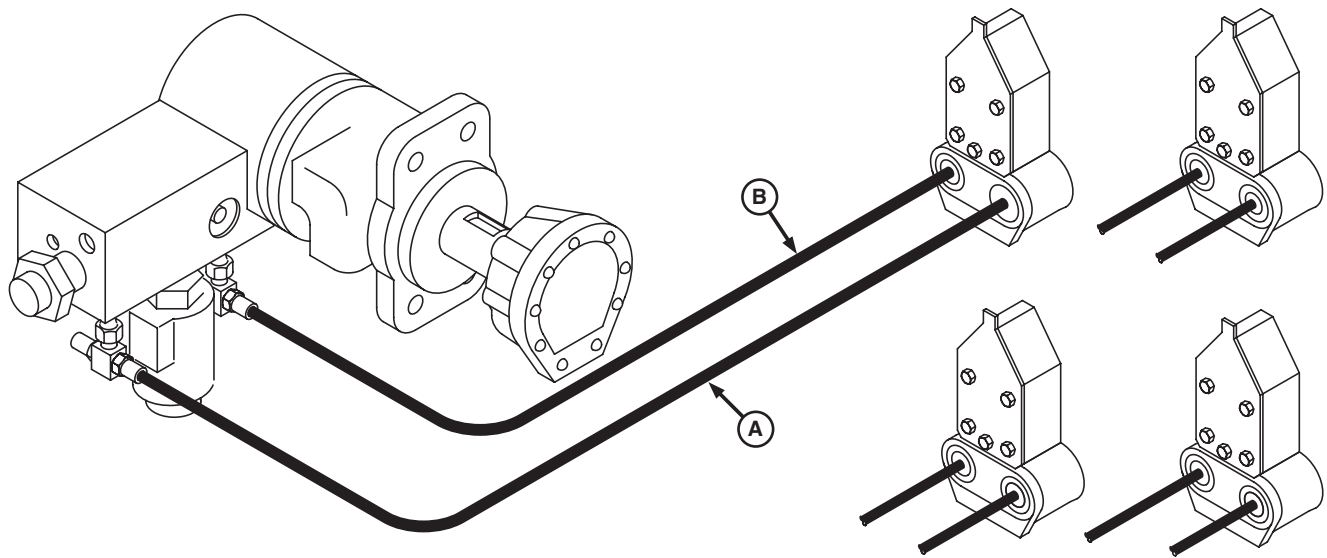
1. Attach variable drive pressure hose (A) from variable rate motor to pressure side of SCV.

2. Attach variable drive return hose (B) into auxiliary return port.

AG,OUO1074,1641 -19-24MAY00-1/1

A47217 -UN-26MAR01

50—70 Series Tractors Without Power Beyond—Single Motor



A—Variable Drive Pressure
Hose

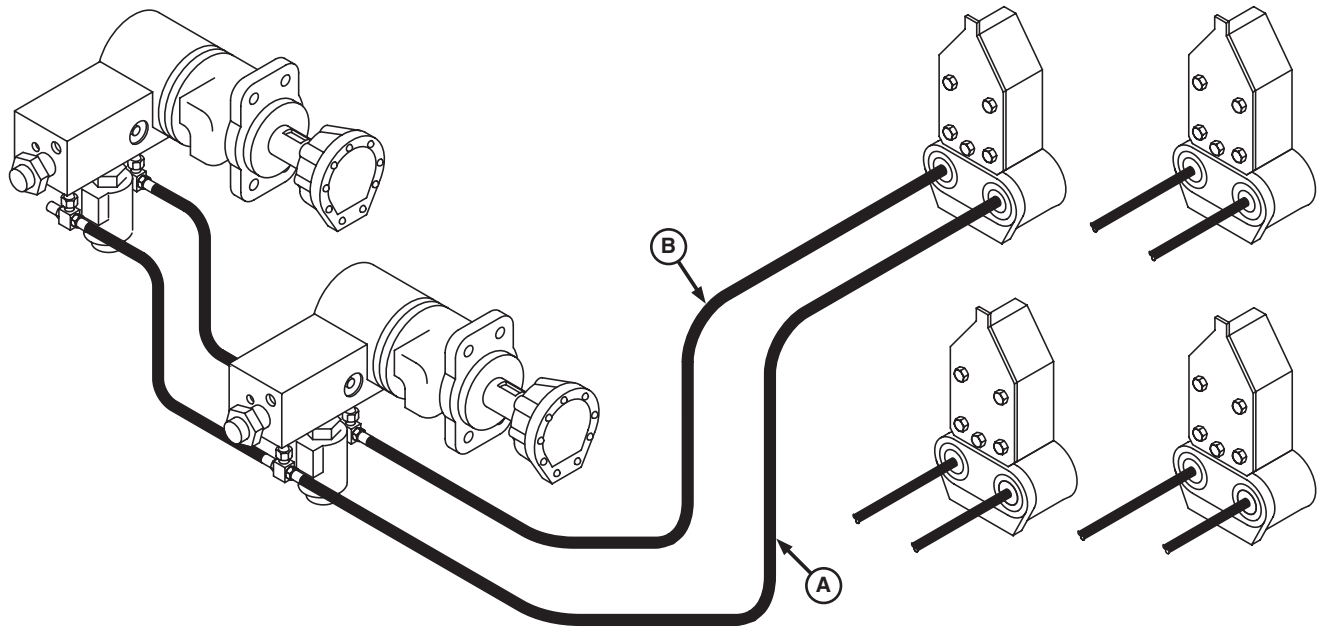
B—Variable Drive Return Hose

1. Attach variable drive pressure hose (A) from variable rate motor to pressure side of SCV.
2. Attach variable drive return hose (B) from variable rate motor to return side of SCV.

OUO1074,00001DE -19-02MAY01-1/1

A47215 -UN-26MAR01

50—70 Series Tractors Without Power Beyond—Dual Motor



A—Variable Drive Pressure
Hose

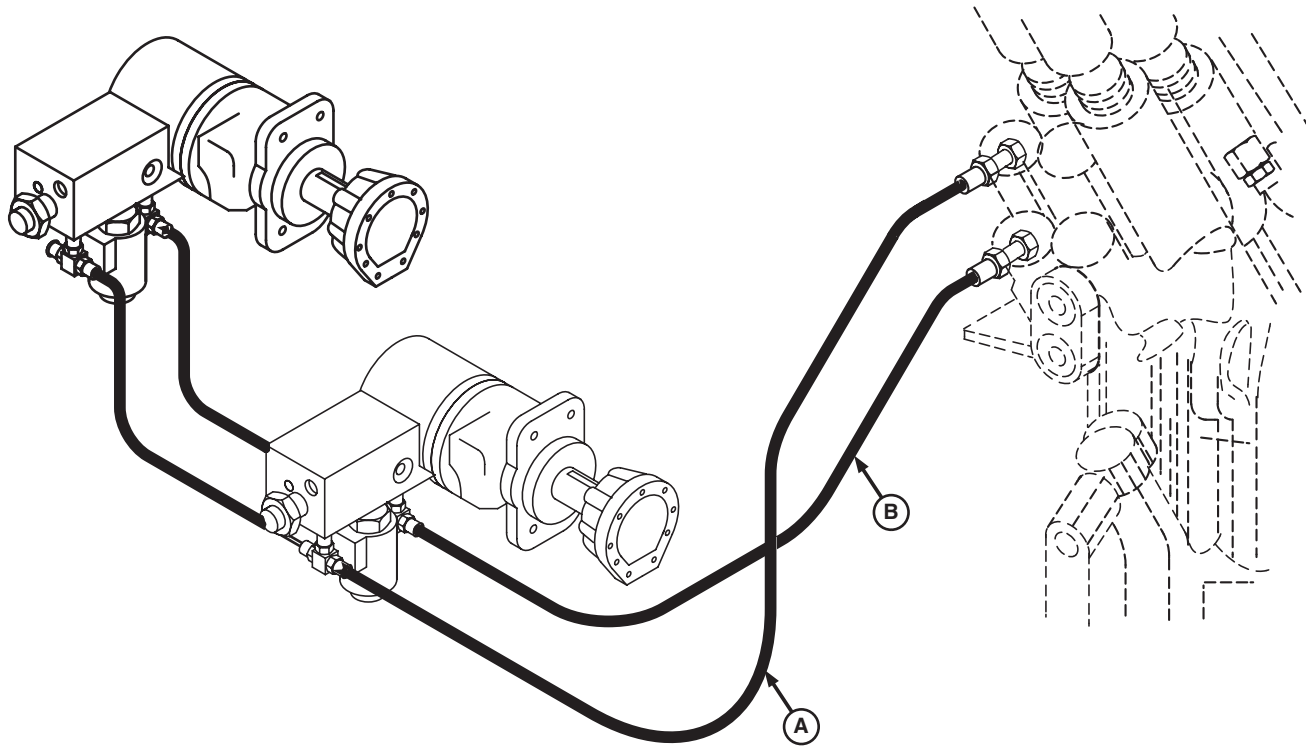
B—Variable Drive Return Hose

1. Attach variable drive pressure hose (A) from variable rate motor to pressure side of SCV.
2. Attach variable drive return hose (B) from variable rate motor to return side of SCV.

OUO1074,00001DD -19-02MAY01-1/1

A47216 -UN-26MAR01

6000 Series Tractors Without Power Beyond—Single Motor



**A—Variable Drive Pressure
Hose**

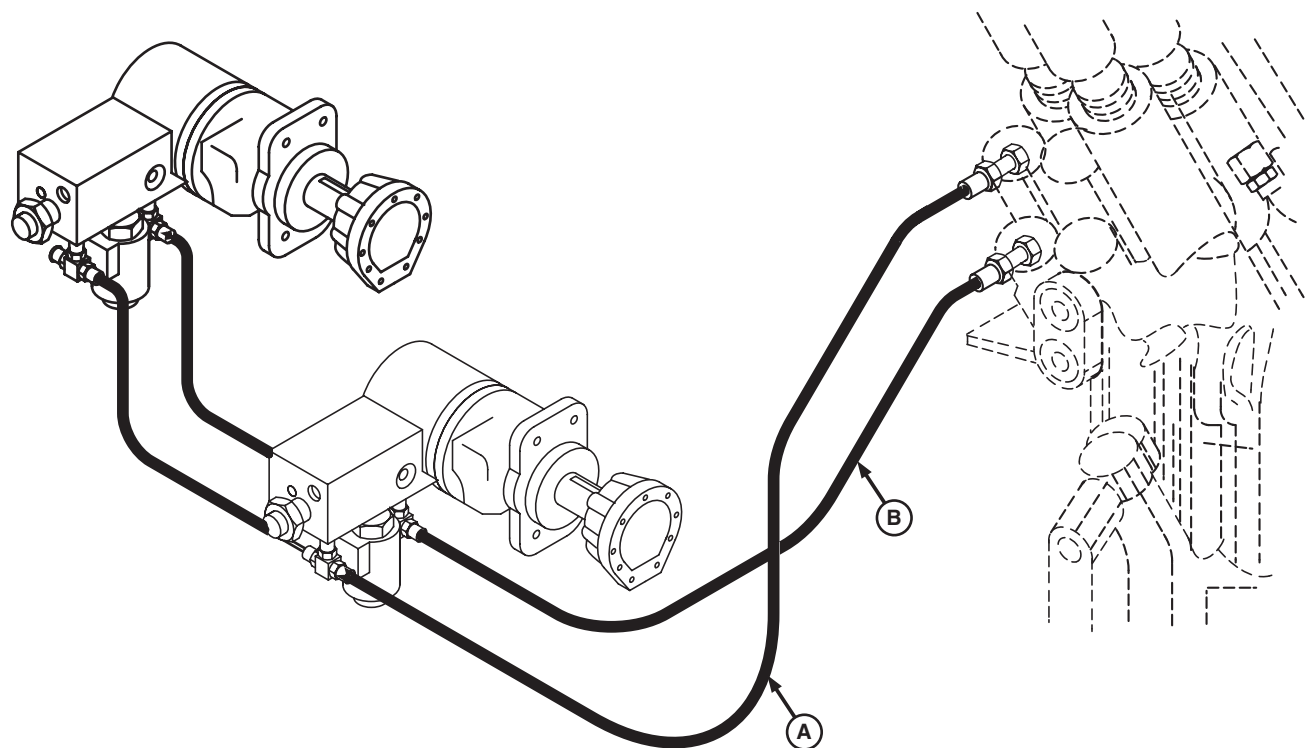
B—Variable Drive Return Hose

1. Attach variable drive pressure hose (A) from variable rate motor to pressure side of SCV.
2. Attach variable drive return hose (B) from variable rate motor to return side of SCV.

OUO1074,00001DF -19-02MAY01-1/1

A47212 -UN-26MAR01

6000 Series Tractors Without Power Beyond—Dual Motor



**A—Variable Drive Pressure
Hose**

B—Variable Drive Return Hose

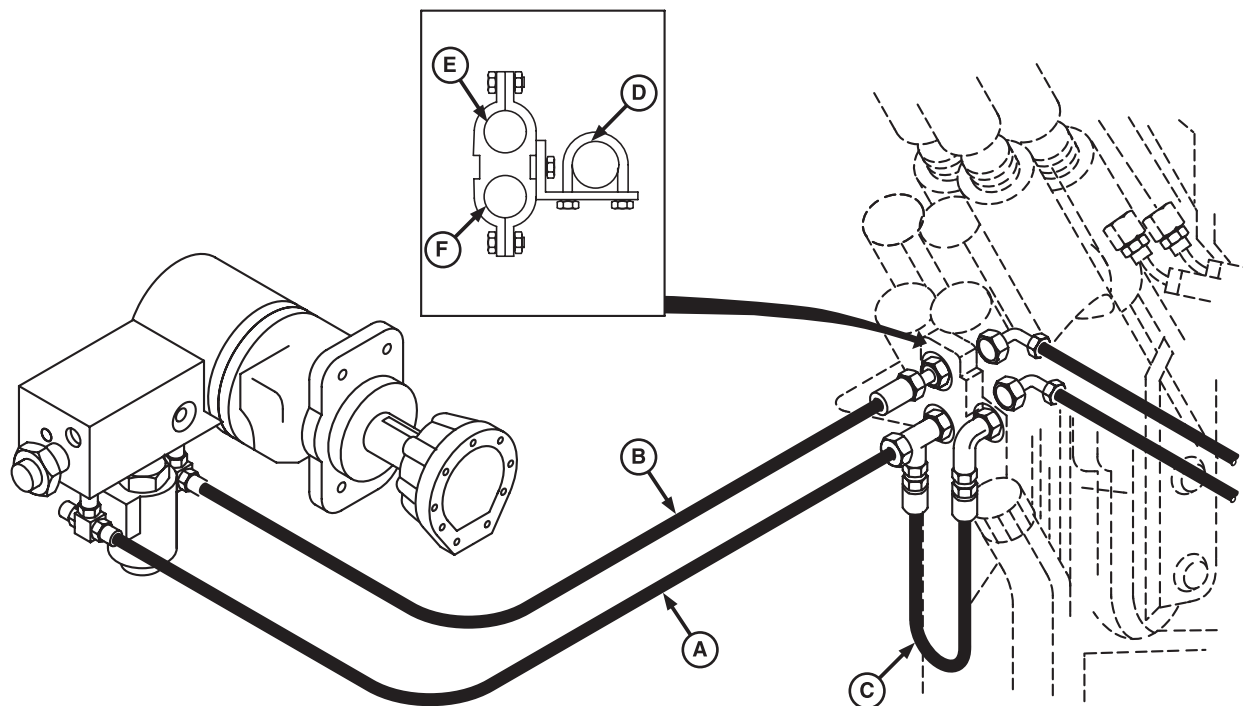
1. Attach pressure hose (A) from variable rate motor to pressure side of SCV.

2. Attach return hose (B) from variable rate motor to return side of SCV.

AG,OUO1074,1643 -19-30MAY00-1/1

A47213 -UN-26MAR01

6000 Series Tractors With Power Beyond Load Sense—Single Motor



A—Variable Drive Pressure
Hose

B—Power Beyond Pressure
Port

C—Variable Drive Return Hose
D—Return Port

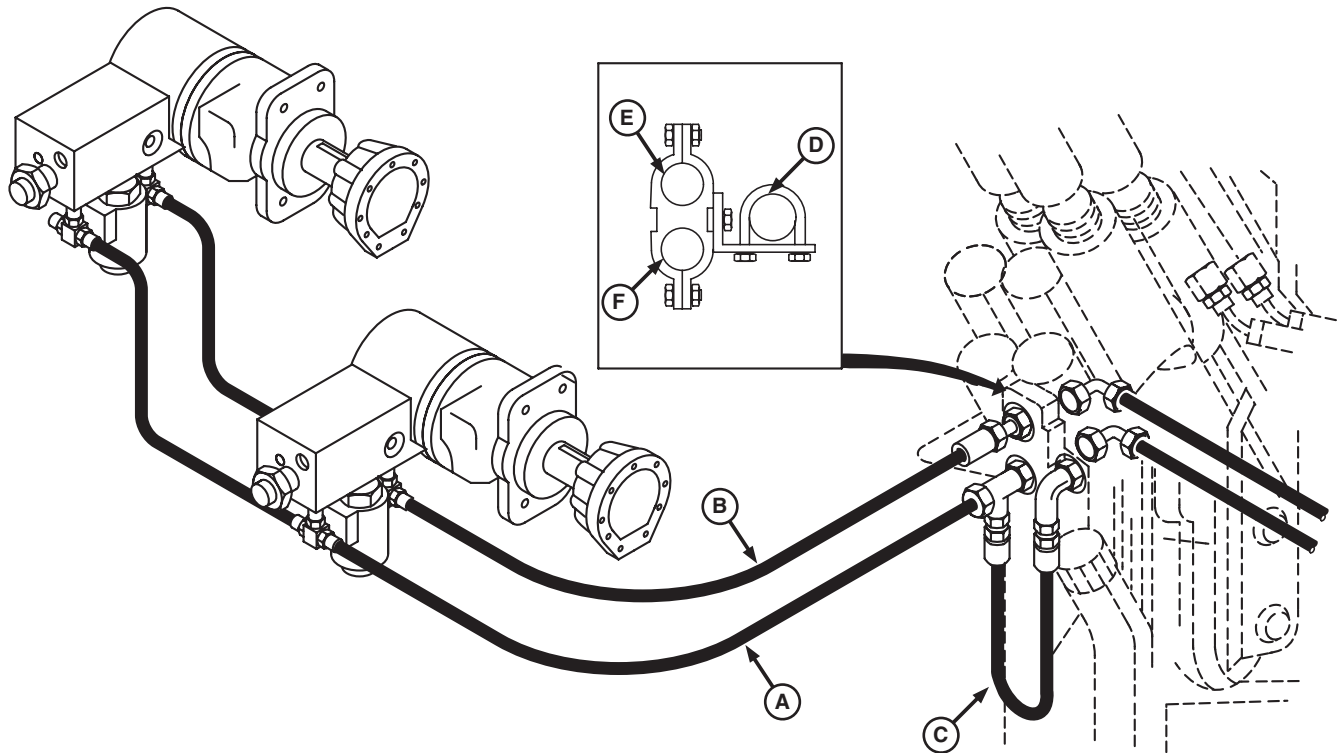
E—Adapter Hose
F—Load Sense Port

1. Attach variable drive pressure hose (A) and tee fitting to power beyond pressure port (B) on tractor SCV.
2. Attach variable drive return hose (C) to return port (D) on tractor SCV.
3. Attach adapter hose (E) to load sense port (F) and pressure hose tee fitting.

AG,OUO1074,1640 -19-18MAY00-1/1

A47210 -UN-26MAR01

6000 Series Tractors With Power Beyond Load Sense—Dual Motor



A47211 -UN-26MAR01

A—Power Beyond Pressure Port

B—Return Port

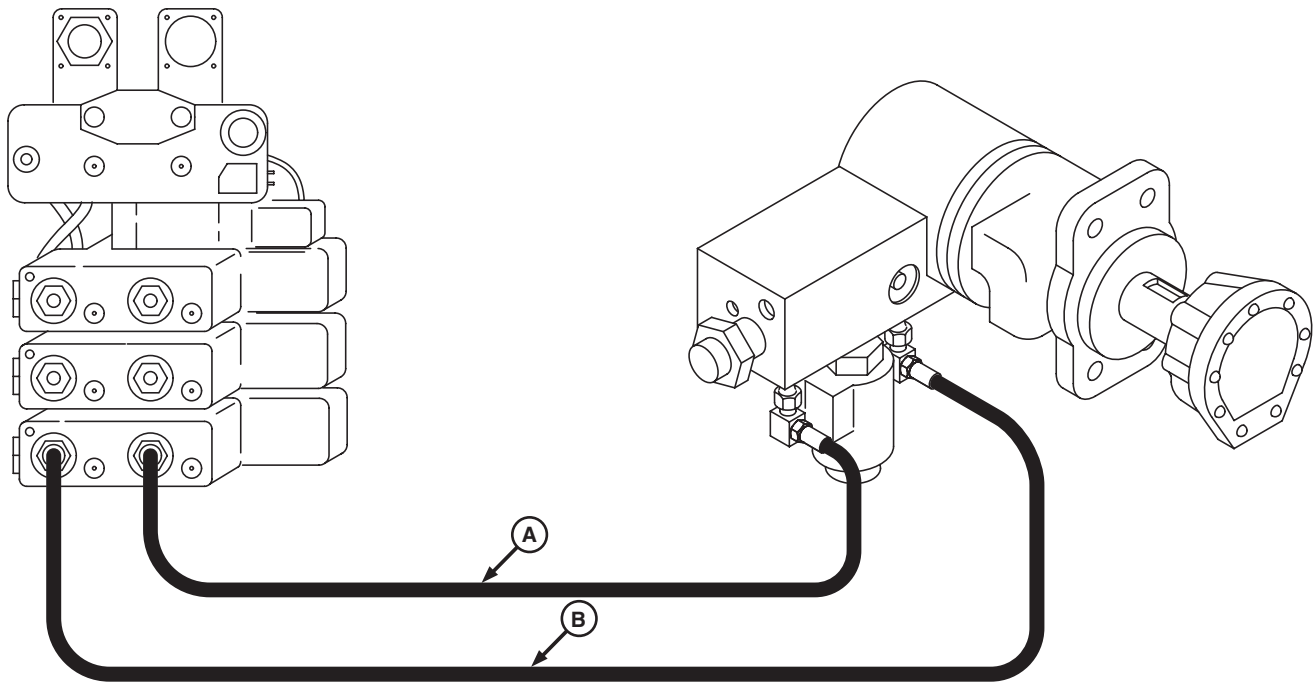
C—Adapter Hose

D—Load Sense Port

1. Attach variable drive pressure hose (A) and tee fitting to power beyond pressure port (B) on tractor SCV.
2. Attach variable drive return hose (C) to return port (D) on tractor SCV.
3. Attach adapter hose (E) to load sense port (F) and pressure hose tee fitting.

AG,OUO1074,1644 -19-30MAY00-1/1

7000, 8000, 9000 Series Tractors Without Power Beyond—Single Motor



A—Variable Drive Pressure
Hose

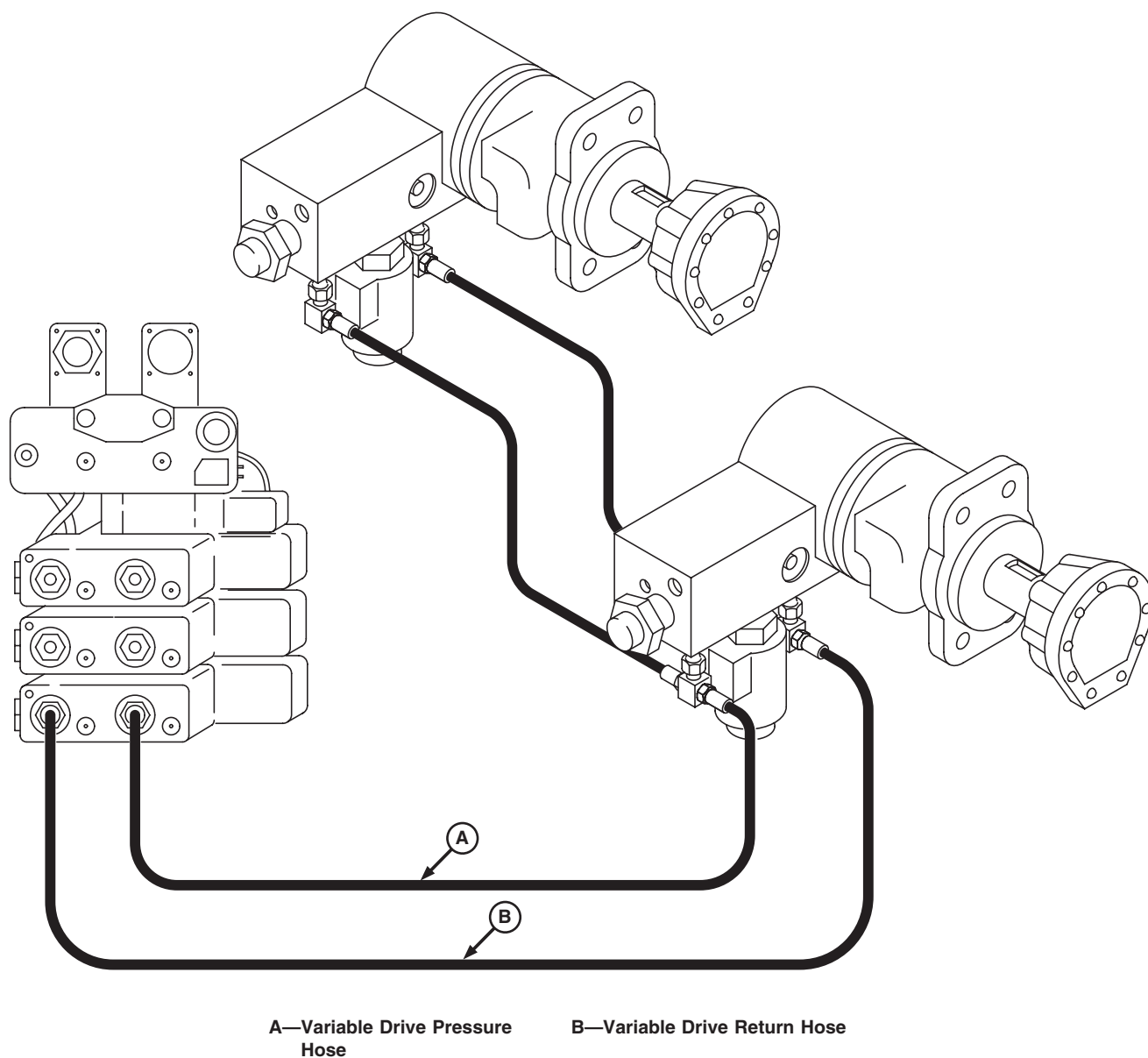
B—Variable Drive Return Hose

1. Attach variable drive pressure hose (A) from variable rate motor to pressure side of SCV.
2. Attach variable drive return hose (B) from variable rate motor to return side of SCV.

A46895 -UN-14NOV00

OUO1074,00001E0 -19-02MAY01-1/1

7000, 8000, 9000 Series Tractors Without Power Beyond—Dual Motor



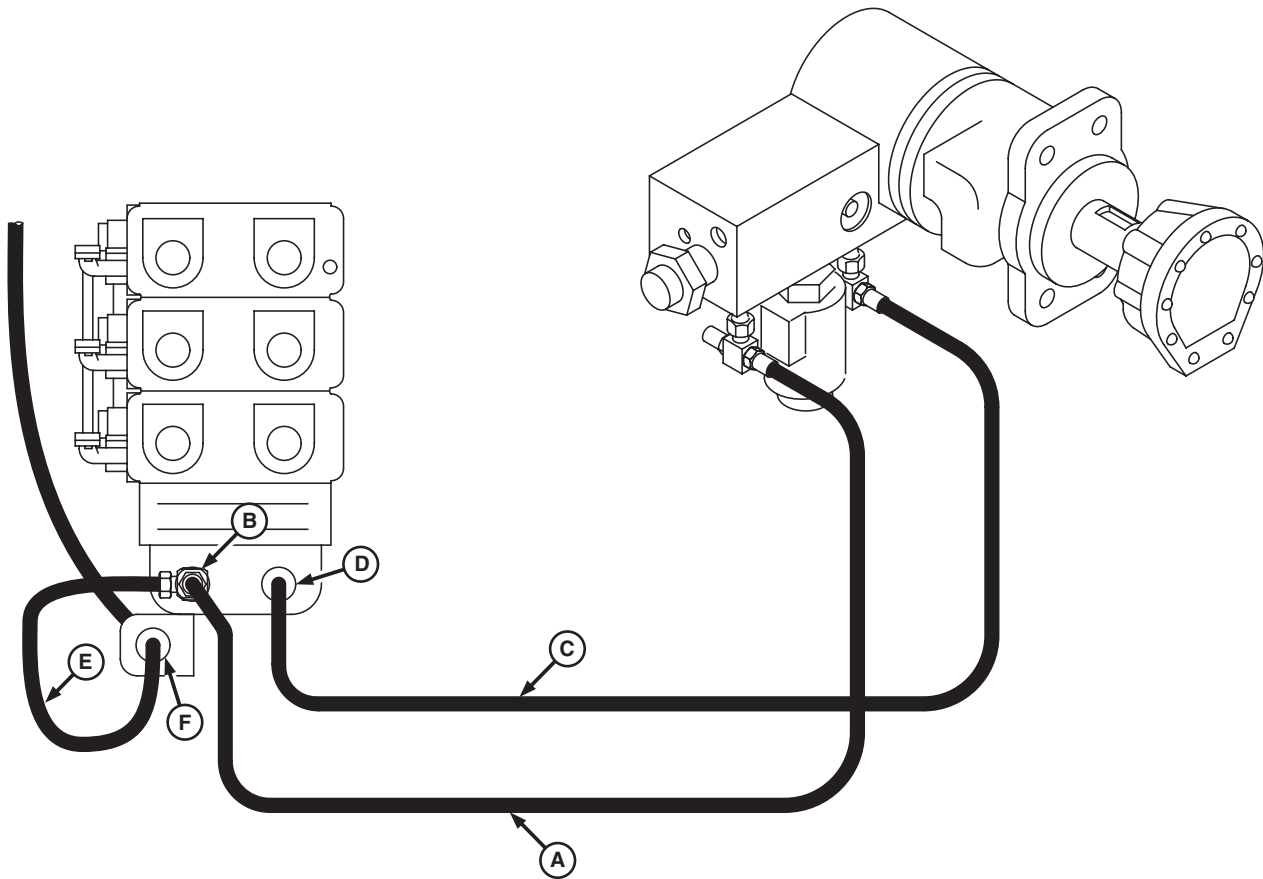
1. Attach pressure hose (A) from variable rate motor to pressure side of SCV.

2. Attach return hose (B) from variable rate motor to return side of SCV.

A46896 -UN-14NOV00

OUC1074,00001E2 -19-02MAY01-1/1

7000 Series Tractors With Power Beyond Load Sense—Single Motor



A—Variable Drive Pressure
Hose

B—Power Beyond Pressure
Port

C—Variable Drive Return Hose
D—Return Port

E—Adapter Hose
F—Load Sense Port

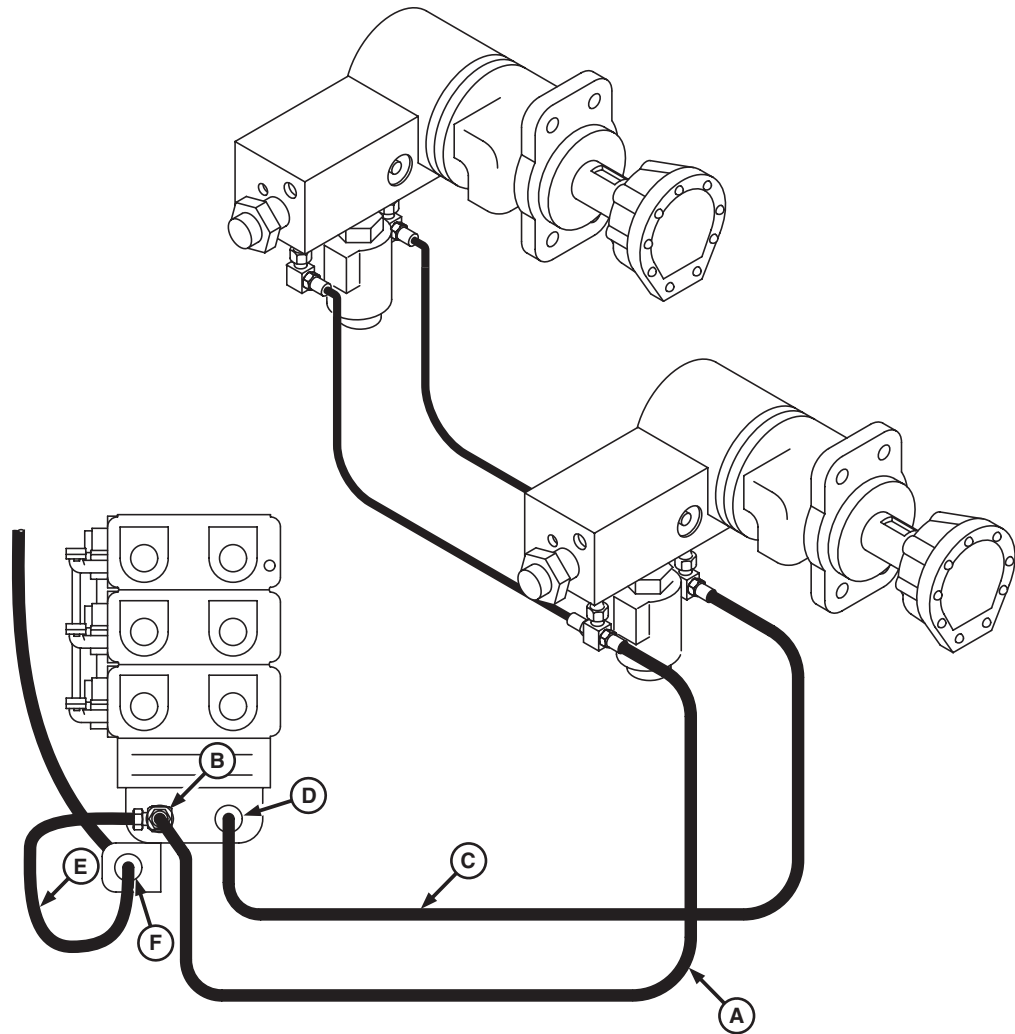
1. Attach variable drive pressure hose (A) and tee fitting to power beyond pressure port (B) on tractor SCV.
2. Attach variable drive return hose (C) to return port (D) on tractor SCV.

3. Attach adapter hose (E) to load sense port (F) and pressure hose tee fitting.

A46897 -UN-14NOV00

OOU1074,00001DB -19-02MAY01-1/1

7000 Series Tractors With Power Beyond Load Sense—Dual Motor



A—Variable Drive Pressure Hose

**B—Pressure Port
C—Return Hose**

**D—Return Port
E—Adapter Hose**

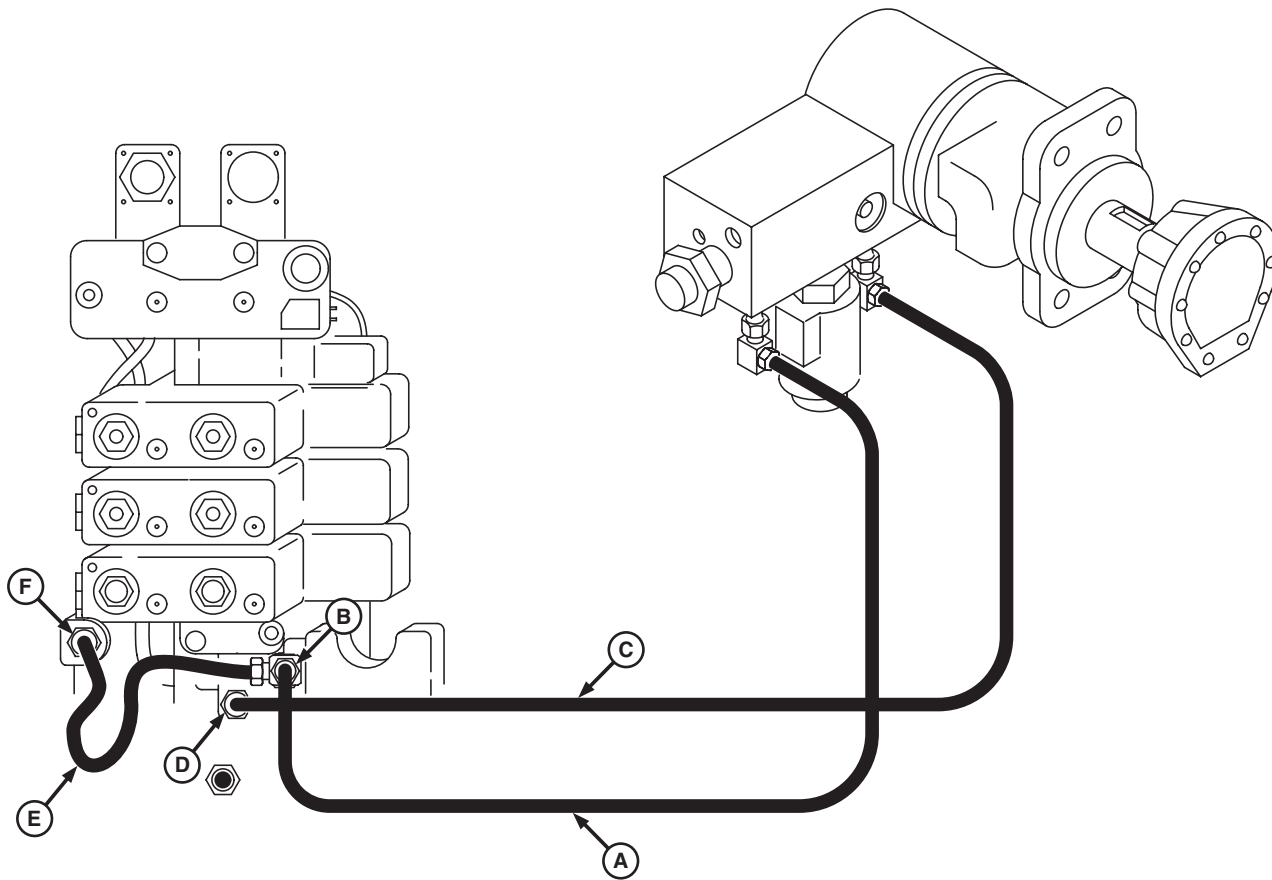
F—Load Sense Port

1. Attach variable drive pressure hose (A) and tee fitting to power beyond pressure port (B) on tractor SCV.
2. Attach variable drive return hose (C) to return port (D) on tractor SCV.
3. Attach adapter hose (E) to load sense port (F) and pressure hose tee fitting.

OUO1074,00001E3 -19-02MAY01-1/1

A46916 -UN-16NOV00

8000 Series Tractors With Power Beyond Load Sense—Single Motor



A—Variable Drive Pressure
Hose

B—Power Beyond Pressure
Port

C—Variable Drive Return Hose
D—Return Port

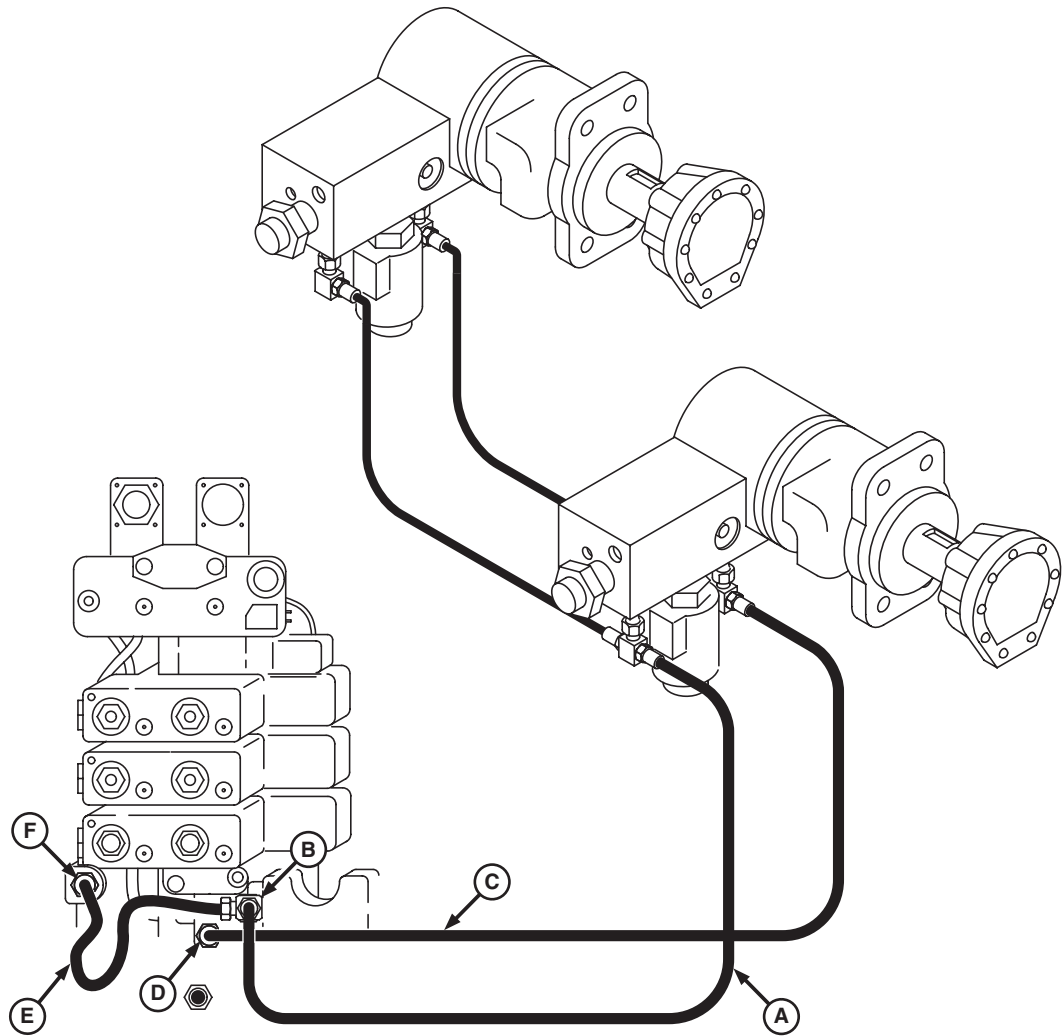
E—Adapter Hose
F—Load Sense Port

1. Attach variable drive pressure hose (A) and tee fitting to power beyond pressure port (B) on tractor SCV.
2. Attach variable drive return hose (C) to return port (D) on tractor SCV.
3. Attach adapter hose (E) to load sense port (F) and pressure hose tee fitting.

A46898 -UN-14NOV00

AG,OUO1074,1642 -19-24MAY00-1/1

8000 Series Tractors With Power Beyond Load Sense—Dual Motor



A—Variable Drive Pressure Hose

B—Power Beyond Pressure Port

C—Variable Drive Return Hose
D—Return Port

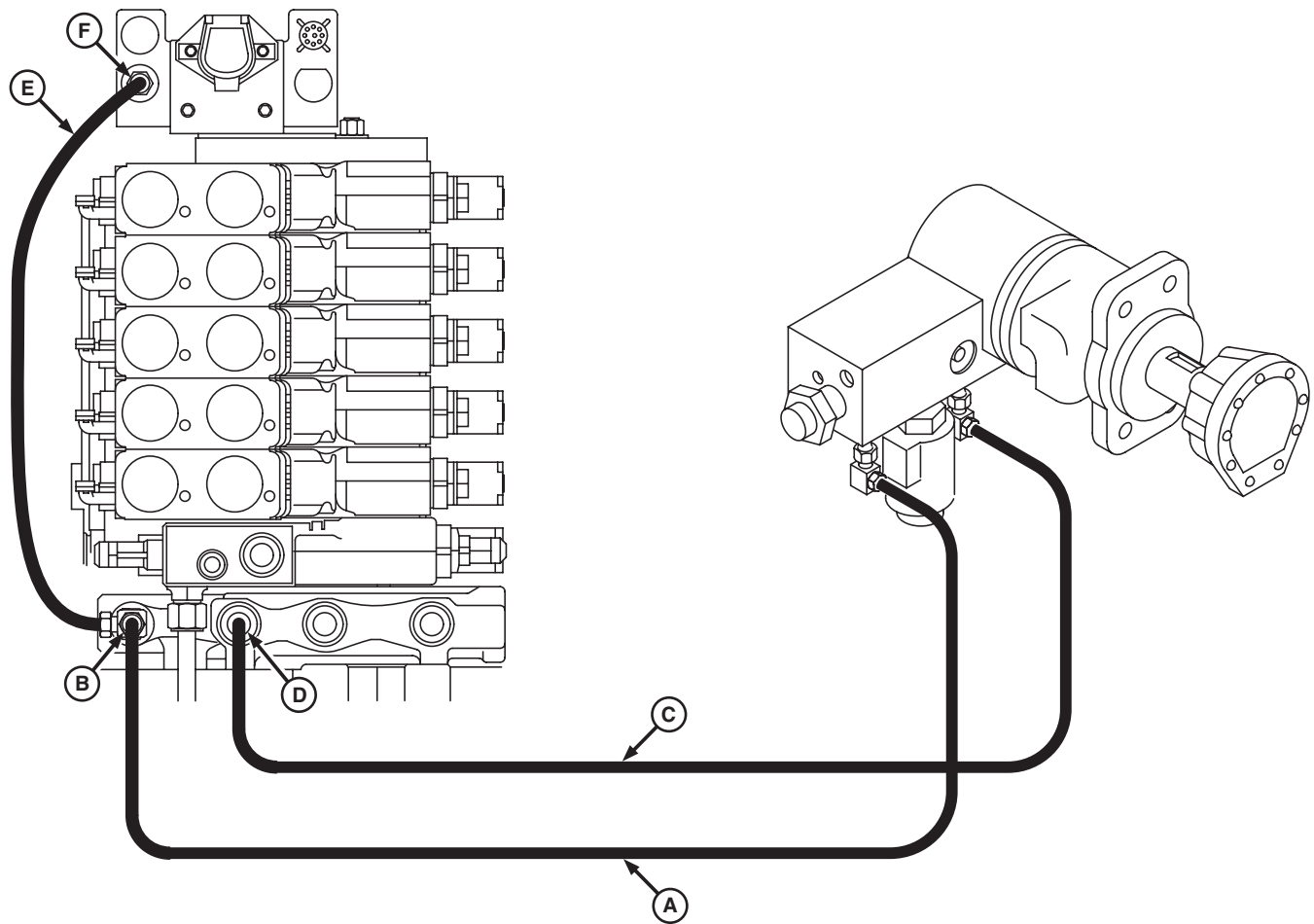
E—Adapter Hose
F—Load Sense Port

1. Attach variable drive pressure hose (A) and tee fitting to power beyond pressure port (B) on tractor SCV.
2. Attach variable drive return hose (C) to return port (D) on tractor SCV.
3. Attach adapter hose (E) to load sense port (F) and pressure hose tee fitting.

AG,OUO1074,1645 -19-30MAY00-1/1

A46917 -UN-16NOV00

9000 Series Tractors With Power Beyond Load Sense—Single Motor



A—Variable Drive Pressure Hose

B—Power Beyond Pressure Port

C—Variable Drive Return Hose
D—Return Port

E—Adapter Hose
F—Load Sense Port

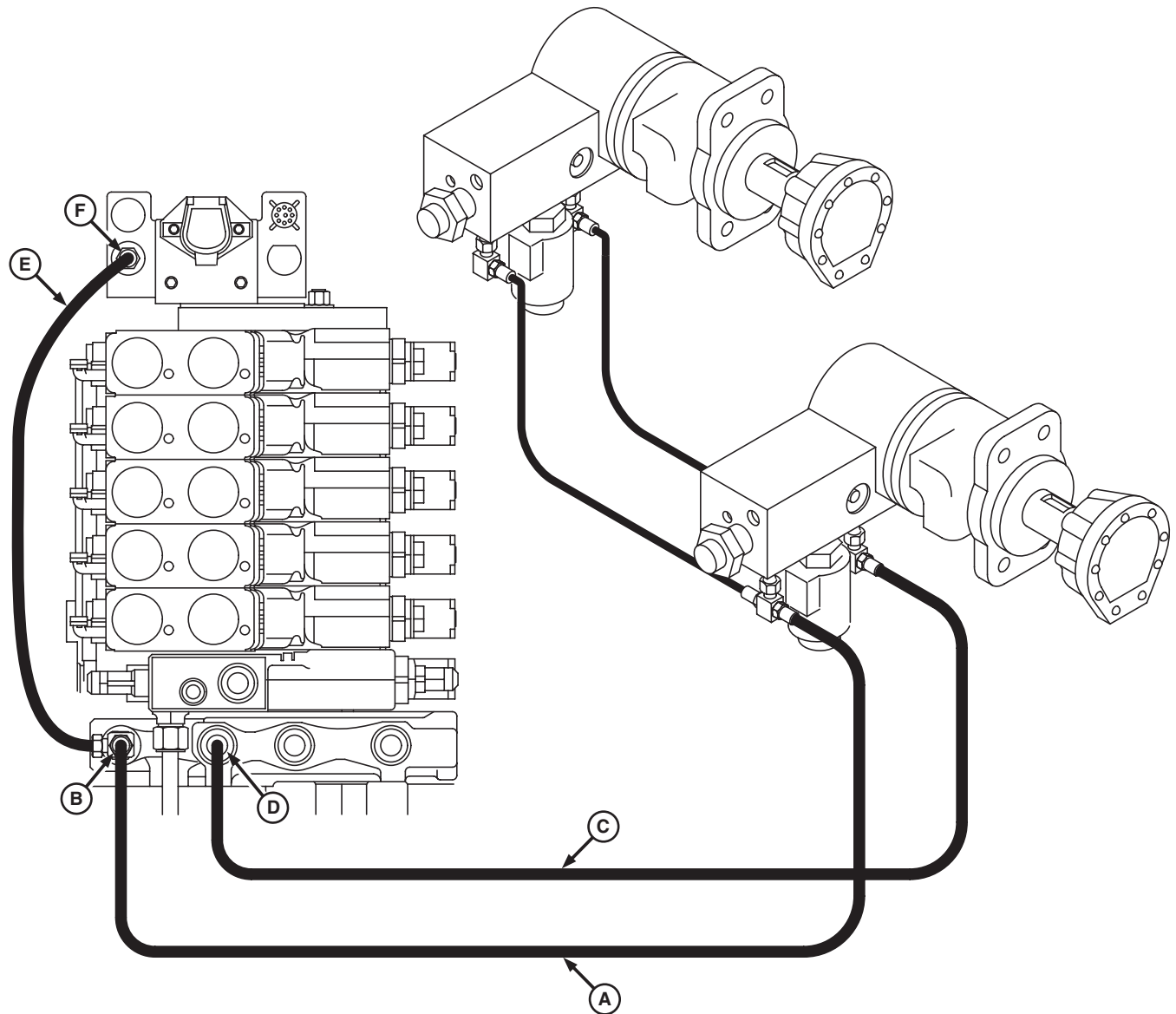
1. Attach variable drive pressure hose (A) and tee fitting to power beyond pressure port (B) on tractor SCV.
2. Attach variable drive return hose (C) to return port (D) on tractor SCV.

3. Attach adapter hose (E) to load sense port (F) and pressure hose tee fitting.

A46899 -UN-14NOV00

OUO1074,00001E1 -19-02MAY01-1/1

9000 Series Tractors With Power Beyond Load Sense—Dual Motor



A—Variable Drive Pressure
Hose

B—Power Beyond Pressure
Port

C—Variable Drive Return Hose
D—Return Port

E—Adapter Hose
F—Load Sense Port

1. Attach variable drive pressure hose (A) and tee fitting to power beyond pressure port (B) on tractor SCV.
2. Attach variable drive return hose (C) to return port (D) on tractor SCV.
3. Attach adapter hose (E) to load sense port (F) and pressure hose tee fitting.

A46900 -UN-14NOV00

Seed Monitor Connection Drawing—GREENSTAR™ Ready Harness

Seed Monitor Connection Drawing—GREENSTAR™ Ready Harness

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Continued on next page

AG,OU01074.1489 -19-24APR00-1/2

A48179 -UN-22OCT01

GREENSTAR is a trademark of Deere & Company Continued on next page AG,OUO1074,1489 -19-24APR00-1/2

25-18 120501
PN=30

120501
PN=30

Attaching and Detaching

A—GREENSTAR® Display	J—Liquid Fertilizer Pressure Sensor	O—Mapping Processor (Optional - For Use With Field Doc and Map Based Seeding)	S—Convenience Outlet (Located On Tractor)
B—Terminator	K—Vacuum Sensor	P—6-Pin Connector	T—Radar Connector (Hookup Not Required On 7000/8000/9000 Series Tractors With Factory Installed Radar)
C—Wiring Harness	L—Radar	Q—6-Pin Program Connector (Located On Tractor) (7000/8000/9000 Series Tractors Only)	U—ECU Ground and Battery Terminals
D—Implement Connector	M—Frame Control or Half-Width Disconnect	R—3-Pin Connector	
E—Controller	N—Global Position Receiver (Optional - For Use With Field Doc and Map Based Seeding)		
F—Hopper Level Sensor (60 Seed Cart)			
G—Adapter			
H—Wiring Harness			
I—Seed Tube			

NOTE: *If tractor is not equipped with a convenience outlet or 6-pin program connector, order BA28418, Voltage Suppression bundle.*

Voltage Suppression bundle is needed on John Deere 60 Series or prior row-crop tractors and 70 Series and prior four-wheel

drive tractors. Bundle can also be used to install a voltage protected convenience outlet in tractors built by other manufacturers.

Refer to instructions included with bundle for wiring details.

GREENSTAR is a trademark of Deere & Company

AG,OUO1074,1489 -19-24APR00-2/2

Standard GREENSTAR® Display

SETUP—Standard GREENSTAR® Display (Without Implement Attached)

NOTE: Display screens illustrated on the following pages are provided for reference only. Actual screens may appear differently due to connection of optional devices and/or software versions in use.

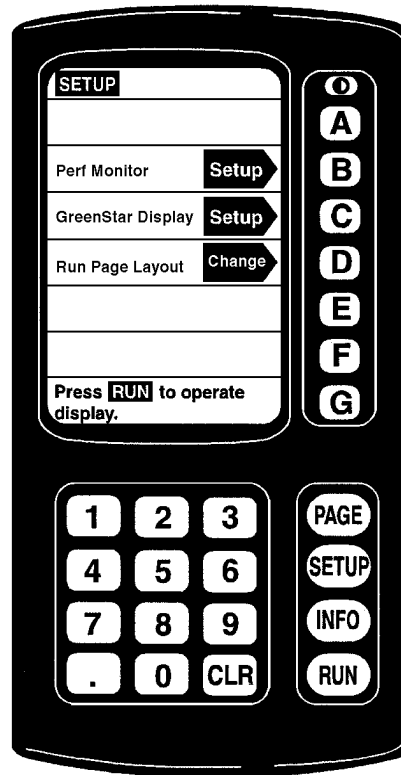
Standard GREENSTAR® Display includes Perf (Performance) Monitor that keeps its own records on implement and tractor operations.

Enter Implement Width and select controlling device (Hitch Position or Implement Switch) to activate area counters.

If equipped, radar is calibrated using the performance monitor. Refer to SETUP—CALIBRATE TRACTOR RADAR SENSOR in this section for detailed information on procedure.

Screen readability is adjusted by entering GREENSTAR® Display Setup. Refer to SETUP—ADJUST DISPLAY CONTRAST AND BACKLIGHT in this section for detailed information.

English or metric units and display language are also changed in “Adjust Display”. Refer to SETUP—CHANGING READOUT LANGUAGE AND UNITS-OF-MEASURE—GREENSTAR® DISPLAY in this section for procedure.



A45264 -19-17DEC98

GREENSTAR is a trademark of Deere & Company.

AG,OUO1074,1490 -19-24APR00-1/1

SETUP—Calibrate Tractor Radar Sensor

IMPORTANT: For best results and most accurate setting, radar calibration should be done in the field (in the type of soil to be planted) with planter attached and all tires inflated to proper pressure.

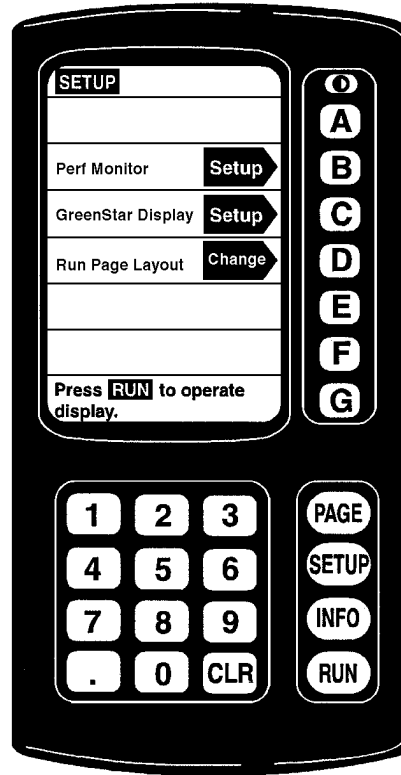
Hard, smooth surfaces are not acceptable for calibration and may produce a “Radar Sensor Calibration Error” message.

NOTE: On 7000/8000/9000 Series and newer tractors with factory installed radar, the Radar Calibration Value is not available on the display. To calibrate the radar, see your Tractor operator's manual.

Radar calibration is used to determine the true ground speed of the tractor. Radar speed value is approximately 57 Hz per mph, and should be calibrated to ensure accuracy.

If radar calibration value is already known, it can be manually placed into memory by entering setup mode, pressing Cal. Value key and making entry using numbered keys. Press Cal. Value key again to store this setting in memory.

1. Lay out a 122 m (400 ft) straight line course.
2. Enter Setup mode by pressing key B for Perf Monitor.

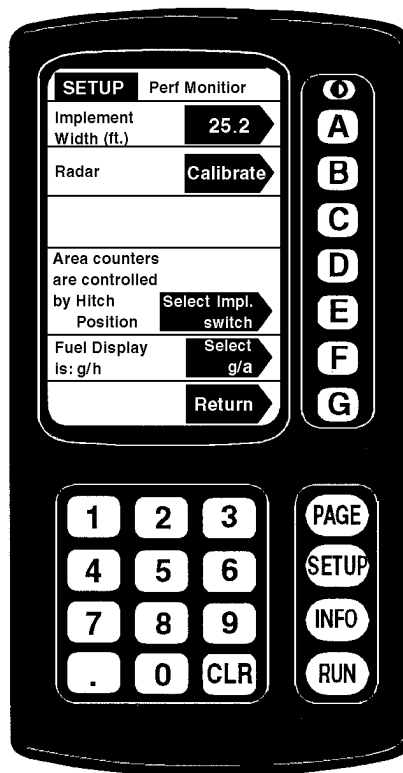


A45264 -19-17DEC08

Continued on next page

AG,OUO1074,1491 -19-24APR00-1/3

3. Press key B to enter Perf (Performance) Monitor Setup mode, Radar Calibrate function.



A45265 -19-17DEC98

Continued on next page

AG,OUO1074,1491 -19-24APR00-2/3

4. Driving at approximately 3.2 km/h (2 mph), press key C to start counter as front tractor tires pass the opening marker of the course.

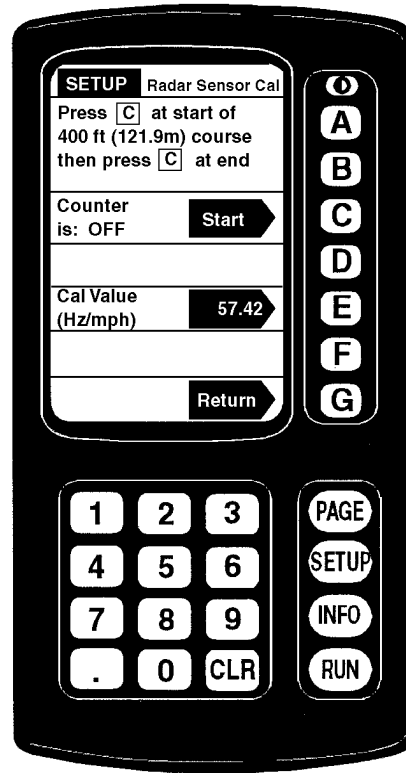
5. Press key C to stop counter as front tractor tires pass the closing marker of the course to end calibration; "Radar Sensor Calibration Finished" should be displayed along with the radar calibration value. This value is automatically entered into the monitor's memory.

Pressing the stop key before the closing marker may produce a "Radar Sensor Calibration Error" message if more feedback signals are needed for calibration.

Error message can also display when feedback signal is outside the normal range of 1 Hz to 150 Hz.

6. If "Radar Sensor Calibration Error" interrupts the active procedure, check that sensor lens is clean and cable connections are tight; then run test.

7. Press key G, then key C to setup GREENSTAR® Display.



A45266 -19-17DEC98

GREENSTAR is a trademark of Deere & Company.

AG,OUO1074,1491 -19-24APR00-3/3

SETUP—Adjust Display Contrast and Backlight

Adjust both contrast and backlight to obtain best screen readability.

Continued on next page

AG,OUO1074,1492 -19-24APR00-1/2

CONTRAST ADJUSTMENT: Depress and hold contrast button (A) to darken or lighten screen display. Release button when desired contrast is achieved.

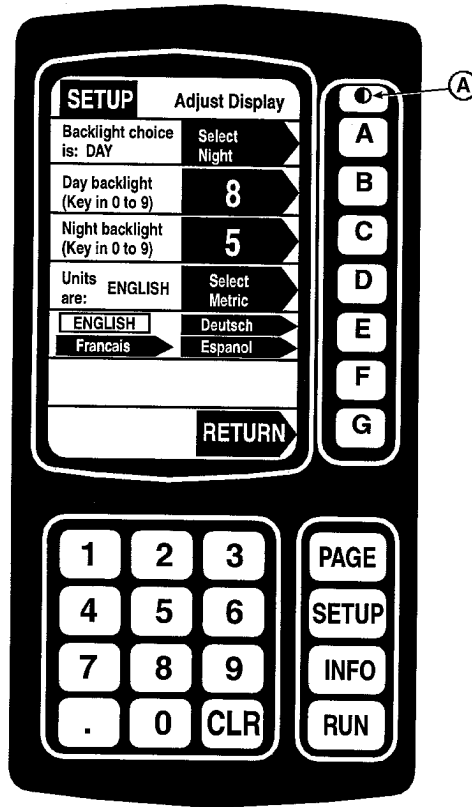
BACKLIGHT ADJUSTMENT: Press key A to toggle backlight between day and night settings.

Enter desired day and night backlight settings using numbered keys. The higher the setting, the brighter the screen.

Newer displays (RE150184 or PF80162) can be set between 0 (Darkest) and 9 (Brightest).

Older displays (RE67542) can be set between 0 and 8. Full bright setting 9 should not be used on older displays as the circuit draws too much current, resulting in light circuit shutdown.

A—Contrast Button



A45267 -19-17DEC98

AG,OUO1074,1492 -19-24APR00-2/2

SETUP—Changing Readout Language and Units-of-Measure—GREENSTAR® Display

NOTE: Operator entries must be made in the same units of measure as display readout.

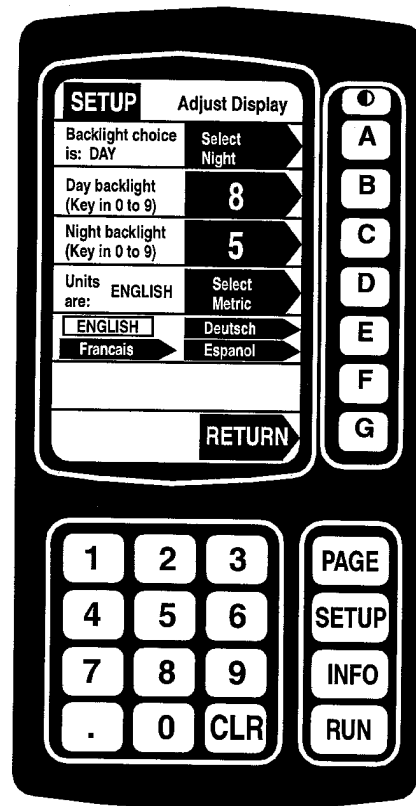
Display can be set to read out in English or Metric units-of-measure.

To view and change units-of-measure and/or language:

Review current “units” setting and select alternate units-of-measure, if desired.

Review current language selection and select alternate display language from the menu listing, if desired.

Press key G to enter selections into memory.



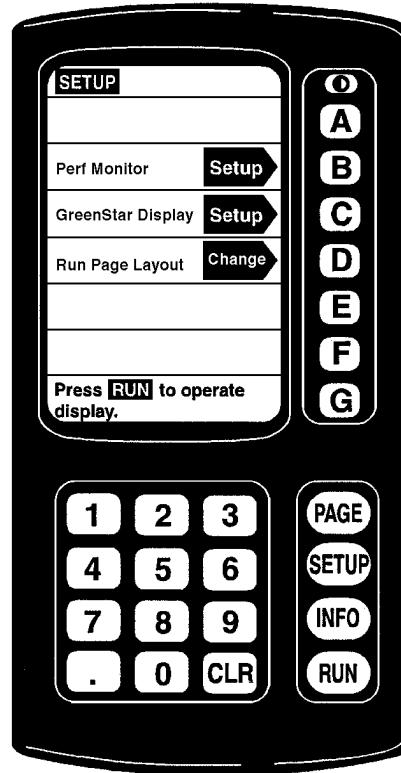
A44116 -19-21OCT97

SETUP—Run Page Layout

Run Page Layout should be done at the end of setup and when changes are made or options connected and system requests Run Page Layout.

Run Page Layout identifies standard and optional controllers connected to the system, and adds their configuration information to the RUN pages.

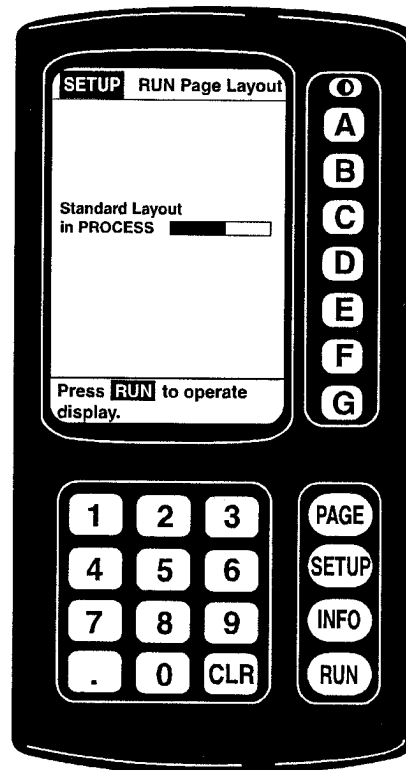
When all set-up entries have been made, depress key D to Run Page Layout which will refresh the RUN screen(s) with new (changed) settings or information. Select Standard Layout when it appears on the screen.



A45264 -19-17DEC98

AG,OUO1074,1494 -19-24APR00-1/2

Screen will show "Layout in Process" and "Complete" when done.



A40412 -19-07OCT97

AG,OUO1074,1494 -19-24APR00-2/2

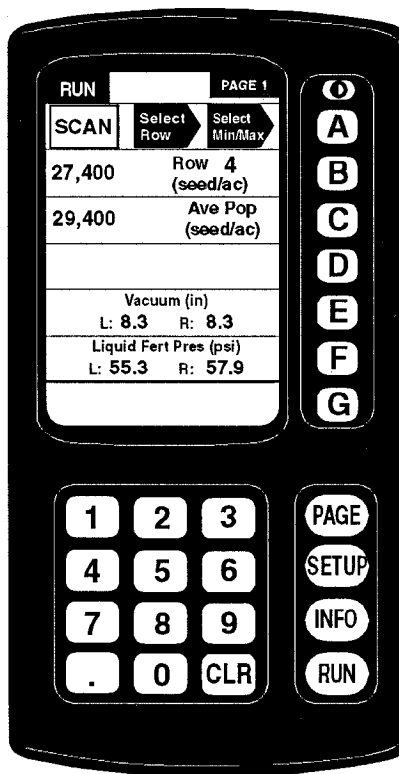
SETUP Functions— Seed Monitor

Before You Start

NOTE: First time installation may require a Run Page Layout. To perform a Run Page Layout, refer to **SETUP—RUN PAGE LAYOUT** in this section.

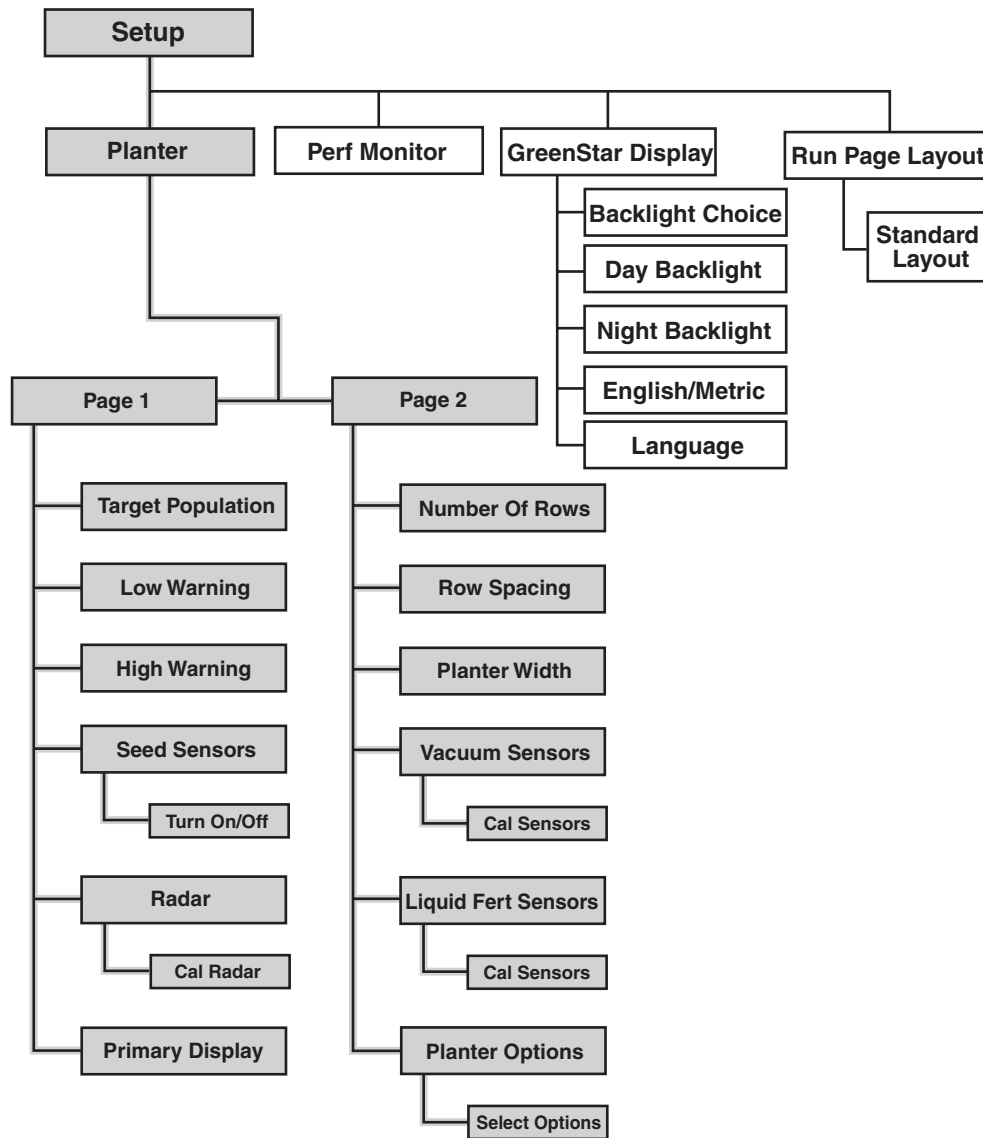
Screen at power up is RUN—Page 1.

Warning messages may be displayed if planter is not connected or there is a communication breakdown between system components.



AG,OUO1074,1497 -19-24APR00-1/1

Seed Monitor Setup Flow Chart



IMPORTANT: SETUP functions are significantly different for machines equipped with optional variable drive. If you have the variable drive option, refer to **SETUP Functions—Variable Rate Drive** section.

NOTE: PERF MONITOR is an additional SETUP selection option used for future products in conjunction with tractor performance monitors.

This flow chart shows the sequence of buttons to push to get desired function. Select the top button first; then proceed downward to desired function.

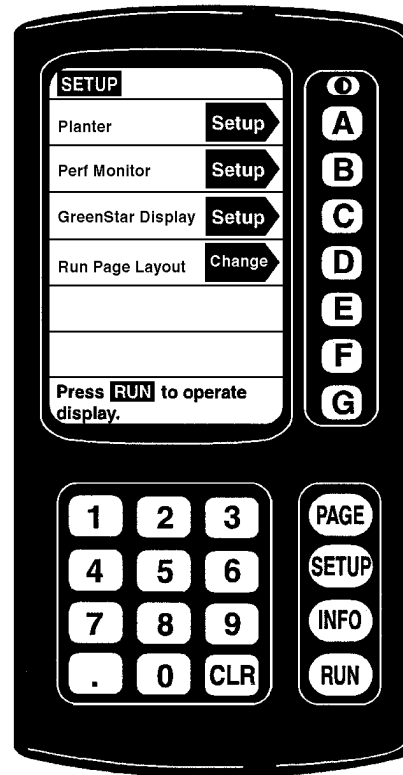
A48280 -19-12NOV01

SETUP—Menu Screen

NOTE: Performance monitor is an additional SETUP selection option used for future products in conjunction with tractor performance monitors.

Press SETUP for initial SETUP screen.

Press key A for screen to setup planter.



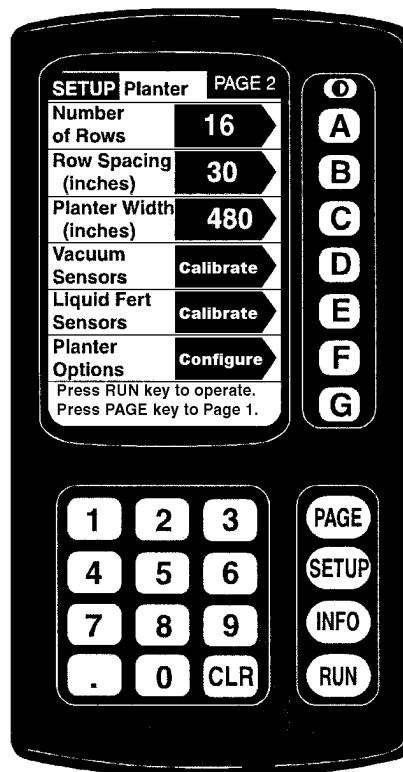
A44984 -19-01DEC98

AG.OUO1074,1499 -19-24APR00-1/1

SETUP—Planter Options

Press PAGE for Page 2.

Press key F for planter options.

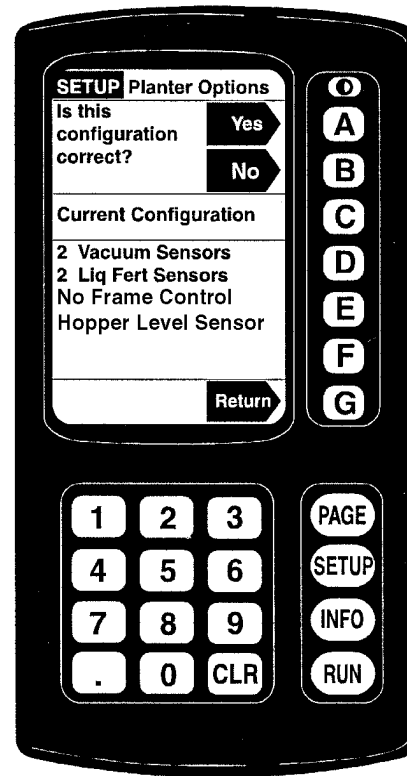


A45213 -19-01DEC98

Continued on next page

AG.OUO1074,1500 -19-24APR00-1/6

Check current configuration, if correct, press key A for YES or key G to return to SETUP—Page 2. If current configuration is not correct, press key B for NO and continue to next option.

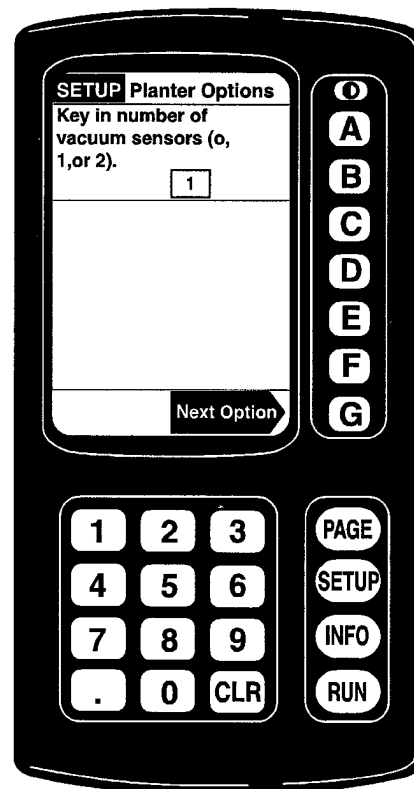


A37509 -19-24OCT97

AG,OUO1074,1500 -19-24APR00-2/6

Key in number of vacuum sensors on planter using number keyboard.

Press key G for next option.



A37747 -19-22OCT97

Vacuum Seed Sensor

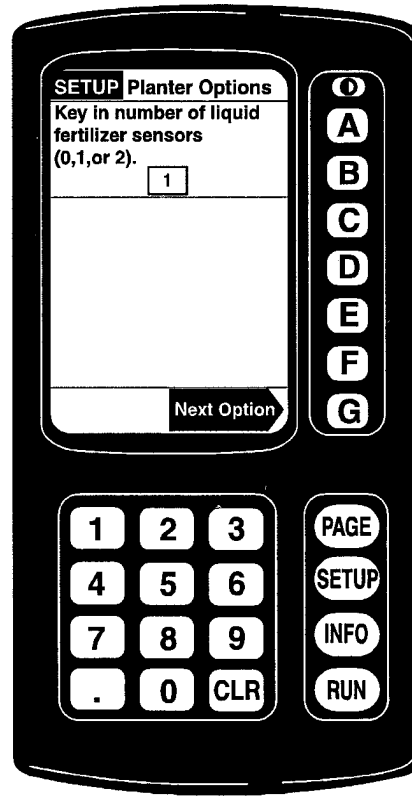
Continued on next page

AG,OUO1074,1500 -19-24APR00-3/6

NOTE: Sensor is compatible with piston pump fertilizer system only.

Key in number of liquid fertilizer sensors using number keyboard.

Press key G for next option.



Liquid Fertilizer Sensors

A37746 -19-22OCT97

Continued on next page

AG,OUO1074,1500 -19-24APR00-4/6

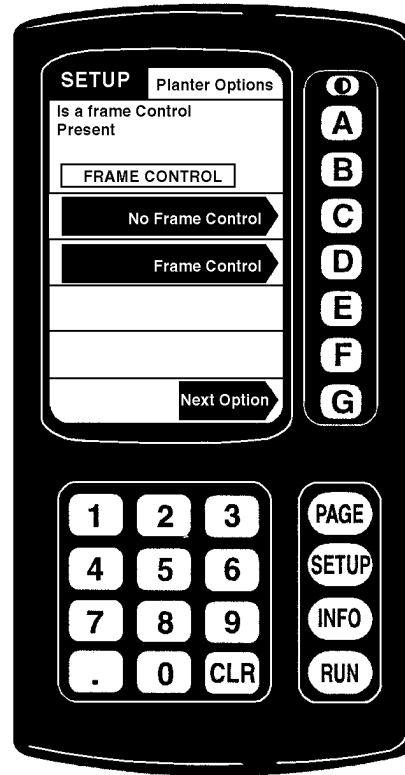
NOTE: Screen illustrated indicates planter has SEEDSTAR® frame control.

Select frame control if planter is equipped with SEEDSTAR® frame control system.

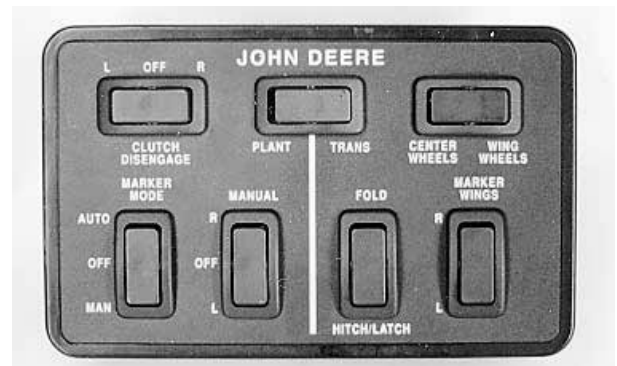
The SEEDSTAR® frame control system may be used on 16 and 24 row 1770 planters. SEEDSTAR® frame control is standard on 24/20 and 16/31-row 1780 planters.

The 1780 12/23 and 16-Row 22 DO NOT have SEEDSTAR® electronic frame control. Press key C to select No Frame Control.

Press key G for next option.



A44982 -19-02DEC98



A40374 -UN-15OCT96

SeedStar Frame Control Box

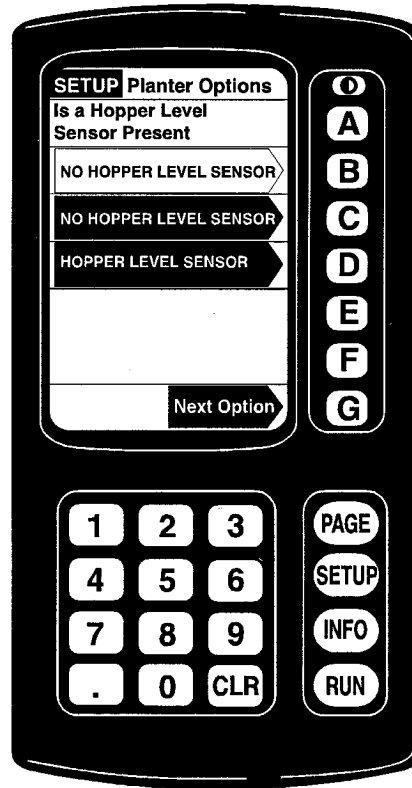


A47429 -UN-15MAY01

Non SEEDSTAR® Frame Control (1780 12/23 and 16R22)

Select hopper level sensor if planter is equipped with 60 Seed Cart low seed level sensor.

Press key G for next option.



A39826 -19-07OCT97

Hopper Level Sensor

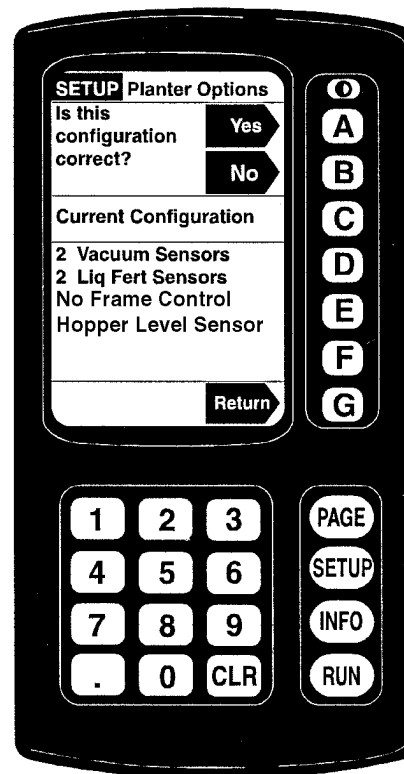
AG.OUO1074,1500 -19-24APR00-6/6

Check Current Configuration

If current configuration is correct, press key A (YES) to return to SETUP—Page 2 screen.

If current configuration is NOT correct, press key B (NO) to make corrections.

After configuration is correct, perform a Run Page Layout, refer to SETUP—RUN PAGE LAYOUT in this section.



A37509 -19-24OCT97

AG.OUO1074,1501 -19-24APR00-1/1

Planters—Setup Number of Rows, Row Spacing, Planter Width

NOTE: *Variable Drive will overwrite row spacing on this page if changes are made in SETUP—Variable Drive.*

Page 2 of planter setup must have current planter description and calibration values.

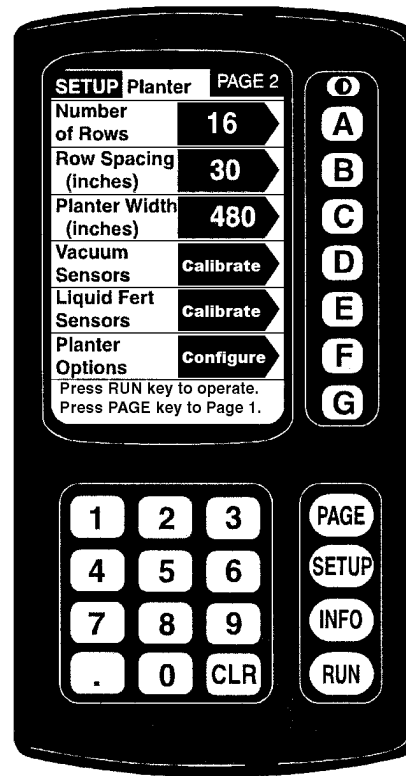
Press key A to change number of rows. With background clear, use number keyboard to enter new value. Value can be entered from 1 to 16 with one controller and 1 to 32 with two controllers.

Press key A again to enter new value in monitor.

Press key B to change row spacing value. Value can be entered from 1 mm to 508 mm (1 in. to 200 in.).

Press key C to change planter width. If machine width is NOT correct, enter correct width. Value can be entered from 1 mm to 24,384 mm (1 in. to 9600 in.). See following pages for example.

Press key D to set-up vacuum sensors.



Box Drills—Setup Number of Rows, Row Spacing, Drill Width

Page 2 of planter setup must have current drill description and calibration values.

Press key A to change number of rows (sensors on drill). With background clear, use number keyboard to enter number of sensors on drill. DO NOT enter the total number of rows on drill. Value can be entered from 1 to 16 with one controller and 1 to 32 with two controllers.

Press key A again to enter the new value in monitor.

Press key B to enter row spacing value on drill. Press key B to enter new value in monitor. Value can be entered from 1 mm to 508 mm (1 in. to 200 in.).

Press key C to change overall width (number of rows on drill x row spacing = overall width). Value can be entered from 1 mm to 24,384 mm (1 in. to 9600 in.). See following page for example.

Use number keyboard to enter overall width.

Press key C again to enter value in monitor.

Summary

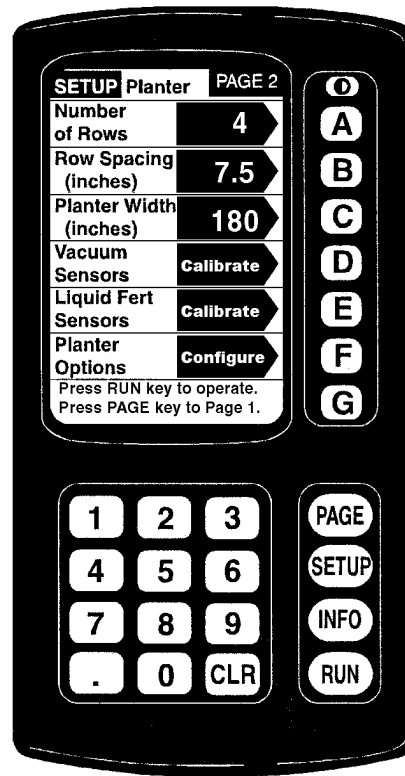
EXAMPLE:

The monitor always counts the number of sensors from the left-hand side, INCLUDING rows that are locked up. If 12 is the number of rows entered on a 12/23 row planter set to plant 12 rows, the monitor will only read the first 12 rows (six planting and six locked up). The TOTAL number of sensors (23) must be entered with the locked up row sensors turned off.

The correct planter width must be entered in the monitor.

EXAMPLE:

If planting 23 rows with a 12/23 row planter, planter width is calculated in the following way. 23 rows x 15 in. row spacing = planter width. If planting 12 rows with a 12/23 row planter, planter width is calculated in the following way. 12 rows x 30 inch row spacing = planter width.



A45268 -19-17DEC98

EXAMPLE OF MONITOR SETUP

SEEDING EQUIPMENT	DRILL 24 ROW 7.5 INCH	PLANTER 6 ROWS 30 INCH	PLANTER 12/23 ROW 30/15 INCH	PLANTER 12/23 ROW 30/15 INCH	PLANTER 16/31 ROW 30/15 INCH	PLANTER 16/31 ROW 30/15 INCH
USAGE	24 ROWS 7.5 INCH	6 ROWS 30 INCH	23 ROWS 15 INCH	12 ROWS 30 INCH	31 ROWS 15 INCH	16 ROWS 30 INCH
MONITOR SETUP DATA						
NUMBER OF ROWS (Sensors)	4	6	23	23	31	31
ROW SPACING	7.5 IN	30 IN	15 IN	30 IN	15 IN	30 IN
PLANTER WIDTH	180 IN (7.5 X 24)	180 IN (6 X 30)	345 IN (23 X 15)	360 IN (12 X 30)	465 IN (31 X 15)	480 IN (16 X 30)
SEED SENSORS ON	ALL ON	ALL ON	ALL ON	1-3-5-7-9-11- 13-15-17-19- 21-23	ALL ON	1-3-5-7-9-11-13- 15-17-19-21-23- 25-27-29-31
SEED SENSORS OFF				2-4-6-8-10- 12-14-16- 18-20-22		2-4-6-8-10-12- 14-16-18-20-22- 24-26-28-30

A45247 -19-17DEC98

Use space below to record setup information for your planter.

Number of Rows _____

Row Spacing _____

Planter Width _____

Seed Sensors On _____

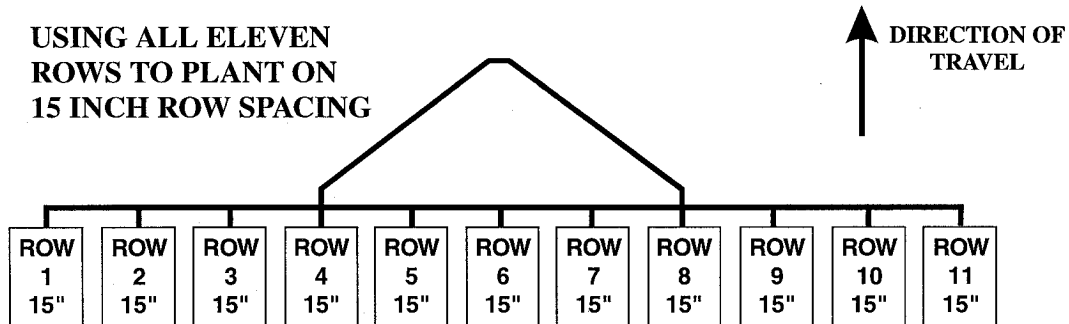
Seed Sensors Off _____

Continued on next page

AG,OUO1074,1503 -19-24APR00-2/4

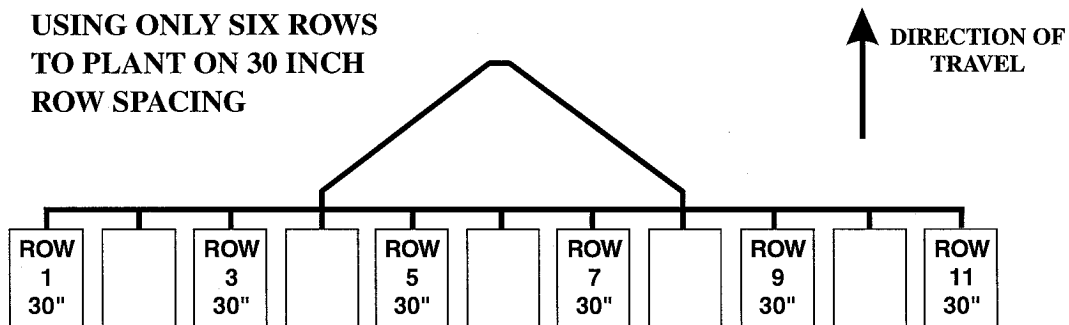
EXAMPLE SETUP FOR 6/11 ROW PLANTER

USING ALL ELEVEN
ROWS TO PLANT ON
15 INCH ROW SPACING



NUMBER OF ROWS 11 ROWS
ROW SPACING 15 INCHES
PLANTER WIDTH 165 INCHES (11 x 15)
SEED SENSORS ALL TURNED ON

USING ONLY SIX ROWS
TO PLANT ON 30 INCH
ROW SPACING



NUMBER OF ROWS 11 ROWS
ROW SPACING 30 INCHES
PLANTER WIDTH 180 INCHES (6 x 30)
SEED SENSORS 1,3,5,7,9,11 ON
2,4,6,8,10 OFF

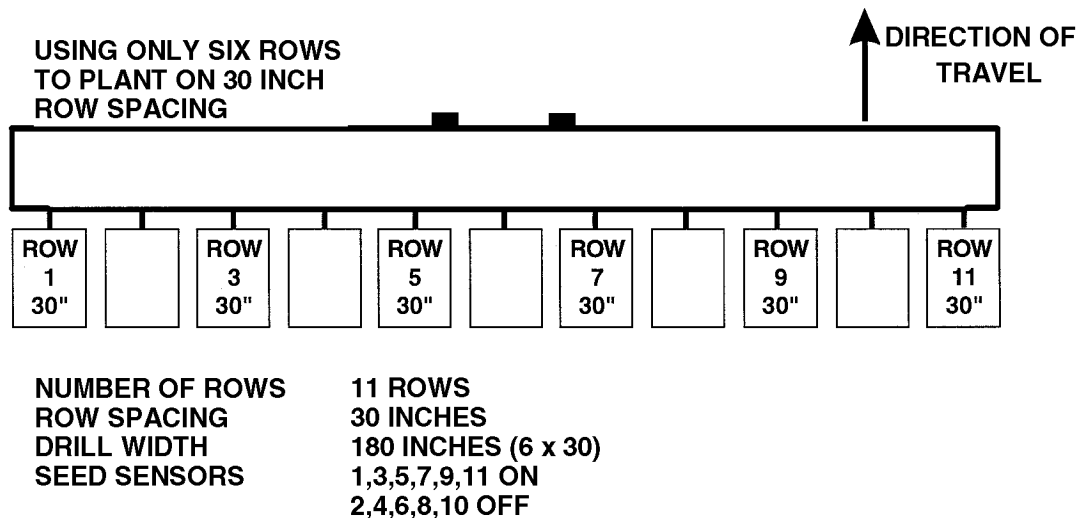
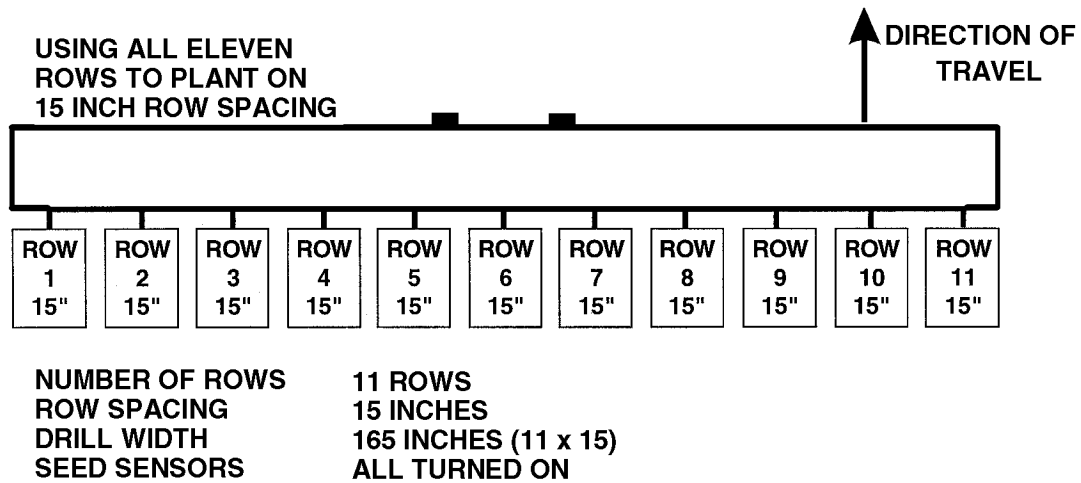
A37754

A37754 -19-17MAY96

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AG,OUO1074,1503 -19-24APR00-3/4

EXAMPLE SETUP FOR 6/11 ROW DRILL

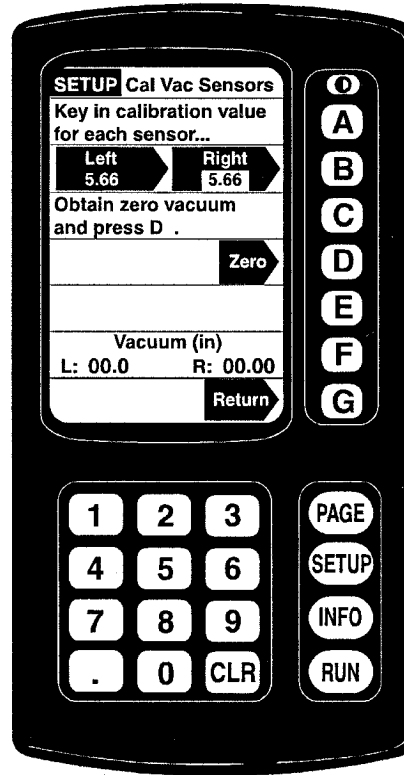


SETUP—Vacuum Sensors

This example illustrates two vacuum sensors with normal calibration values of 5.66. If NOT correct, press key B and enter the correct calibration factor using the number keyboard. For the sensors provided, the calibration value is 5.66. This is the number of inches of water vacuum that will be displayed per volt on the vacuum transducer sensor signal line.

The procedure to zero the vacuum sensor, adjusts the sensor voltage for the altitude at which the planter will be operated.

To ZERO, shut down vacuum motor and push key D to update a corrected zero value. Press RETURN when finished for SETUP—Page 2 screen.



A37511 -19-22OCT97

AG.OUO1074,1504 -19-24APR00-1/1

SETUP—Liquid Fertilizer Sensor

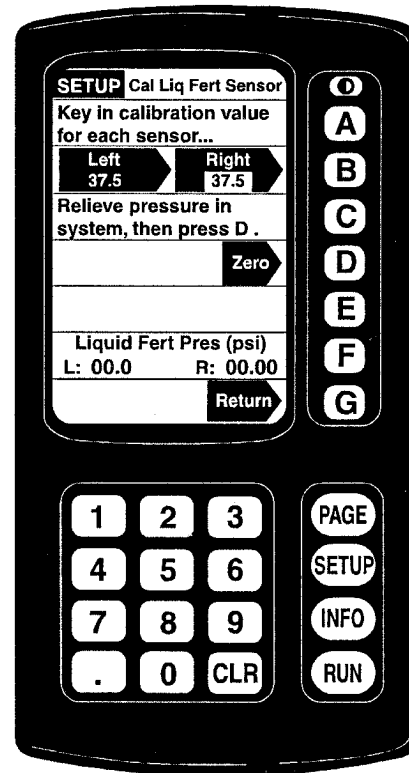
Press key E on SETUP—Page 2 screen for calibrating liquid fertilizer sensors.

This example illustrates two liquid fertilizer sensors with normal calibration values of 37.5. If NOT correct, press key B and enter the correct calibration factor using the number keyboard. For sensors provided, the calibration value is 37.5. This is the psi of the piston pump system manifold pressure per volt on the pressure sensor signal line.

The liquid fertilizer pressure sensor must be zeroed to ensure accuracy for operating altitude.

NOTE: Before performing the zero set function, make sure that no pressure is trapped in the manifold. The check valve nozzles at each row may keep up to 69 kPa (0.7 bar) (10 psi) in the system after the planter has been operated. Always relieve all pressure before performing this zero calibration.

To check ZERO, relieve pressure in system (check valve at nozzle may keep 69 kPa [0.7 bar] [10 psi] in system) and press key D to enter a NEW ZERO value. Unit is calibrated when zeros appear in “Liquid Fertilizer Pres” window. Press key G when entry is complete to return to SETUP—Planter—Page 1.



A37512 -19-22OCT97

AG,OUO1074,1505 -19-24APR00-1/1

SETUP Population Values

SETUP—Planter—Page 1:

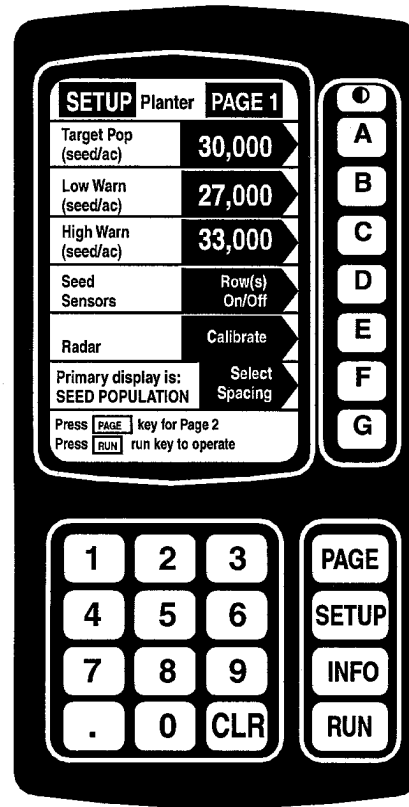
This screen shows population values, control to shut OFF rows and radar calibration.

NOTE: *Low Warn and High Warn will be displayed after target population is selected, considering accuracy of seed sensor for different seed rates.*

For planters with Variable Drive, the Target Population and High/Low Warn limits on this screen will automatically change when a new seed rate is selected in Variable Drive Setup.

Press key A and note clear background of TARGET POP (seed/ac) which illustrates monitor is ready to receive a changed value to be entered with keyboard. High and low warning limits are automatically set. However, values can be changed.

Enter target population by pressing key A and input desired population in highlighted area. Values can be entered from 0 to 999,999. Press key A again to enter data (highlighting disappears).



A44119 -19-21OCT97

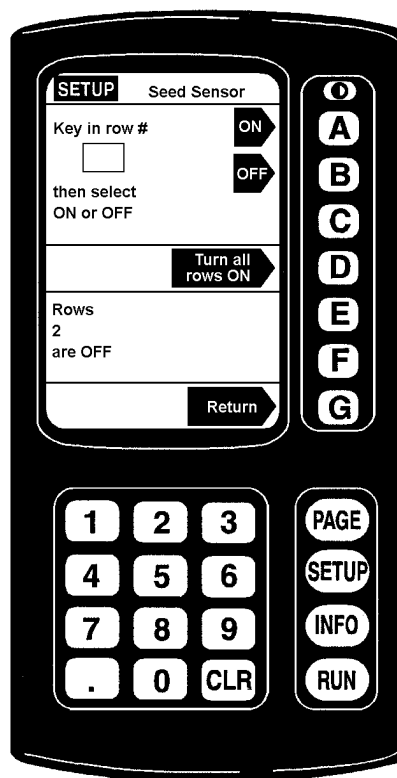
Shut Off Seed Sensors

Selected rows can be turned off, one row at a time, by keying in row number on keyboard, then pressing key B to turn OFF.

Press key C to turn on ALL rows.

Refer to Example of Monitor Setup table in this section.

Press key G to return.



A44954 -19-02DEC08

AG,OUO1074,1507 -19-24APR00-1/1

SETUP—Radar Sensor Calibration

NOTE: On 7000/8000/9000 Series and newer tractors with factory installed radar, the Radar Calibration Value is not available on the display. To calibrate the radar, see your Tractor operator's manual.

For accurate monitor readings, a 122 m (400 ft) calibration must be performed.

The most accurate radar calibration is obtained with planter attached to tractor running under actual field conditions.

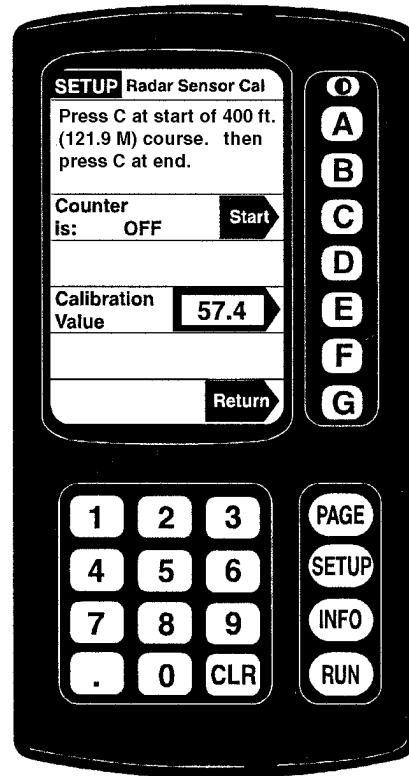
The radar calibration is stored in the memory of the GREENSTAR® display. If display is replaced then calibration value must be entered into new display unit.

Press:

- SETUP
- Planter
- Radar

NOTE: There are two locations (SETUP—Planter—Radar) and (SETUP—Performance Monitor—Calibrate) where the radar can be calibrated. Changing this in one location will automatically update the other.

To calibrate on a 122 m (400 ft) course, press key C at start of course and again at end of course. Calibration window will show number count during travel. The number shown at end of course is the NEW calibration value and will automatically be entered. Repeat calibration three times and average the results.

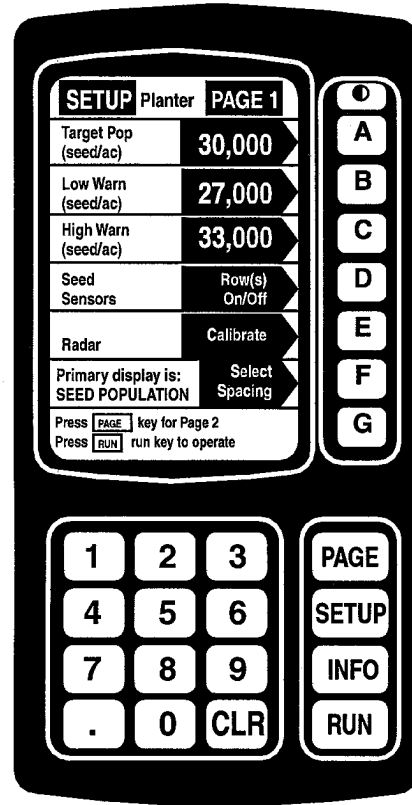


A37514 -19-24OCT97

SETUP—Primary Display

NOTE: When shipped from factory RUN—Page 1 displays seed population and RUN—Page 2 displays seed spacing. To move spacing to Page 1 perform the following:

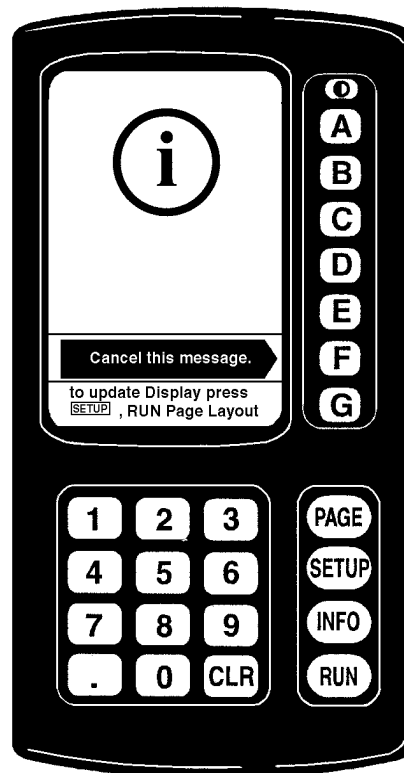
Press key F to select spacing.



A44119 -19-21OCT97

AG,OUO1074,1509 -19-24APR00-1/2

Press key F to cancel this message, then press SETUP.

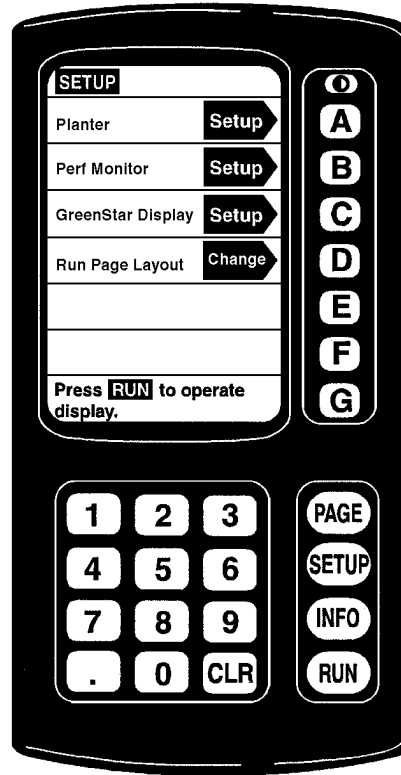


A44978 -19-01DEC98

AG,OUO1074,1509 -19-24APR00-2/2

SETUP—Run Page Layout

Press key D to Run Page Layout.



A44984 -19-01DEC98

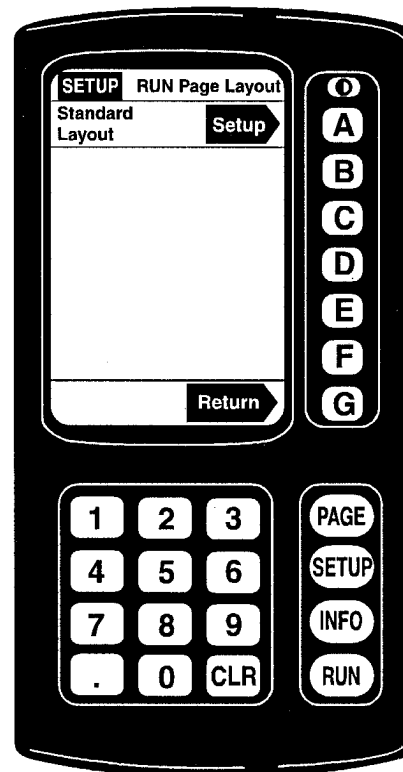
AG.OUO1074,1510 -19-24APR00-1/3

NOTE: Run Page Layout: Allows the system to load the proper data for specific configuration of the planter to which it is attached.

This should be performed when:

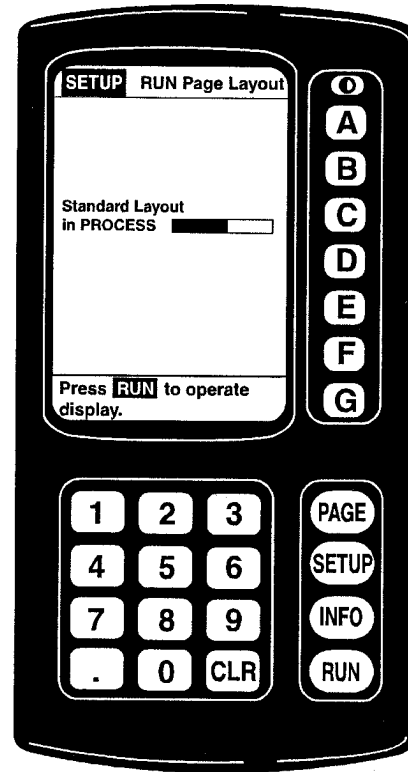
- A SEEDSTAR® monitor is installed as a field conversion on a existing planter
- A SEEDSTAR® option (vacuum sensor, fertilizer sensor, changing primary display) does not appear on the screen

Press key A to Run Page Layout.



A40411 -19-07OCT97

The screen shows system updating layout.



A40412 -19-07OCT97

AG,OUO1074,1510 -19-24APR00-3/3

SETUP—GREENSTAR® Display

Press SETUP, then key C for GREENSTAR® Display.

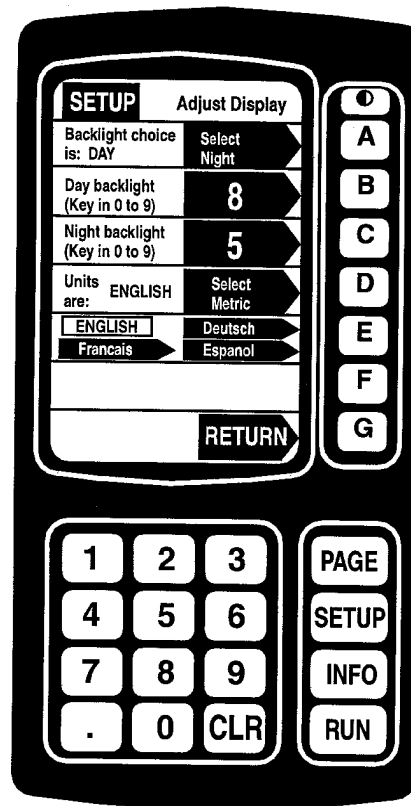
Press key A to select backlight choice of DAY or NIGHT.

Press key B to enter day backlight level 0 to 9. (0-Darkest 9-Brightest)

Press key C to enter NIGHT backlight level 0 to 9. (0-Darkest 9-Brightest)

Press key D to select UNITS. Changing units will require resetting monitor setup, and require verification of row spacing, width, and population.

Press key E to toggle for language.



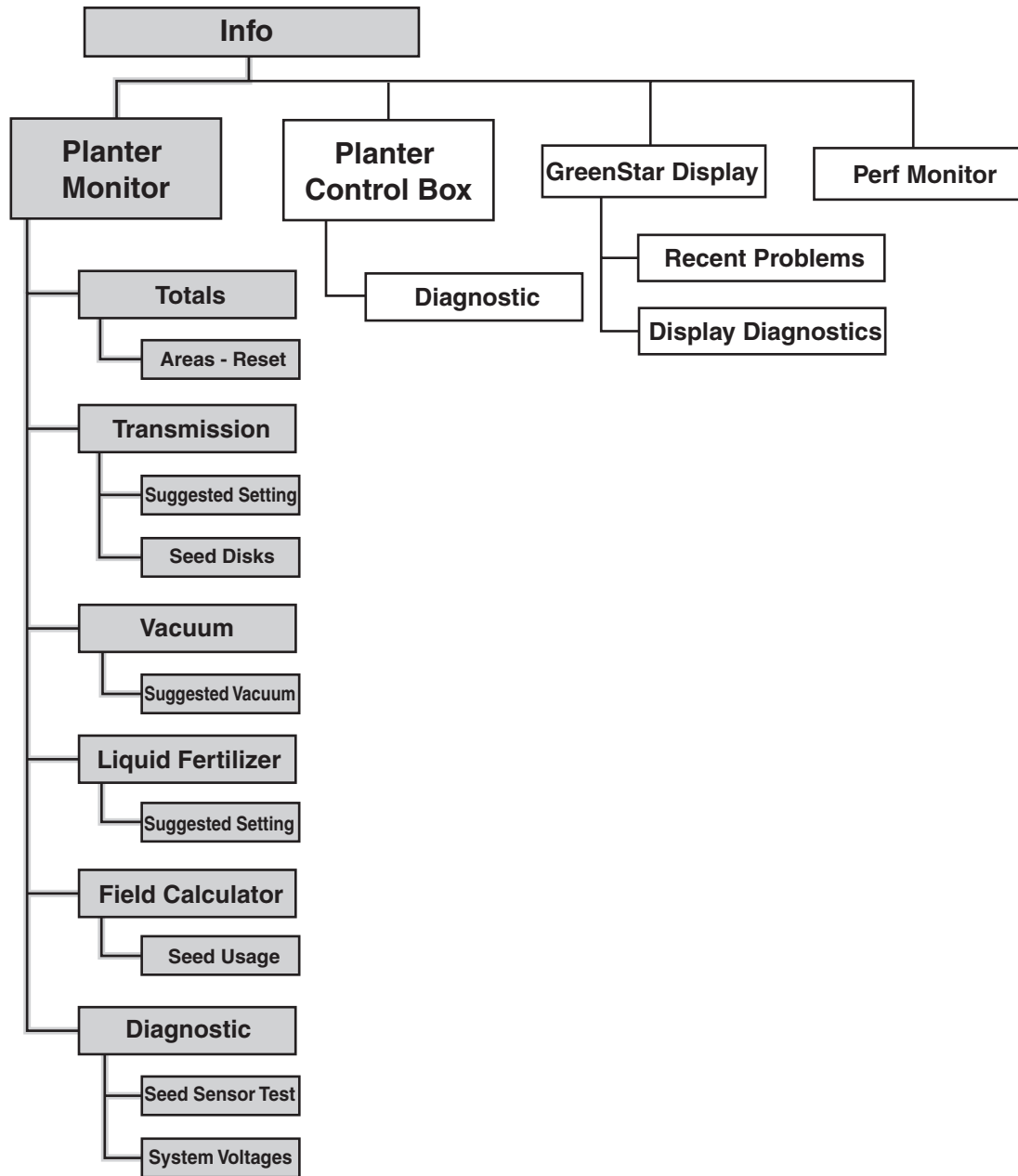
A44116 -19-21OCT97

GREENSTAR is a trademark of Deere & Company.

AG,OUO1074,1511 -19-24APR00-1/1

INFO Functions—Seed Monitor

Seed Monitor Information Flow Chart



IMPORTANT: Information functions are significantly different for planters equipped with optional variable

drive. If you have the variable drive option, see INFO Functions—Variable Rate Drive section.

A48281 -19-12NOV01

AG,OUO1074,1512 -19-24APR00-1/1

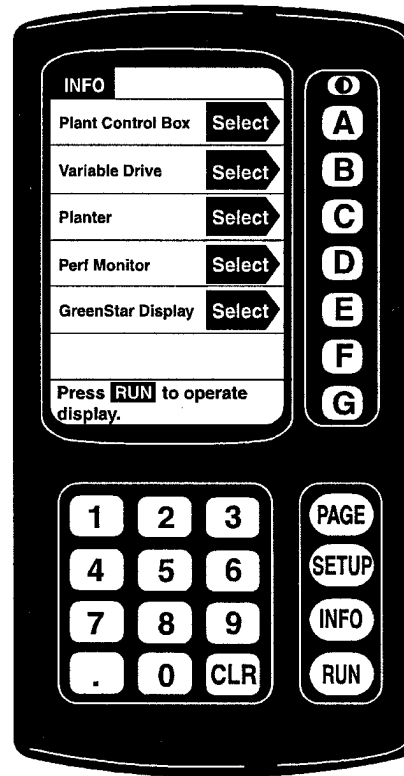
INFO—Menu

Press INFO for initial menu screen.

Press key A to select Plant Control Box information (if equipped).

Press key B to select Variable Rate Drive information (if equipped, see INFO Functions—Variable Rate Drive section).

Press key C to select Planter information.

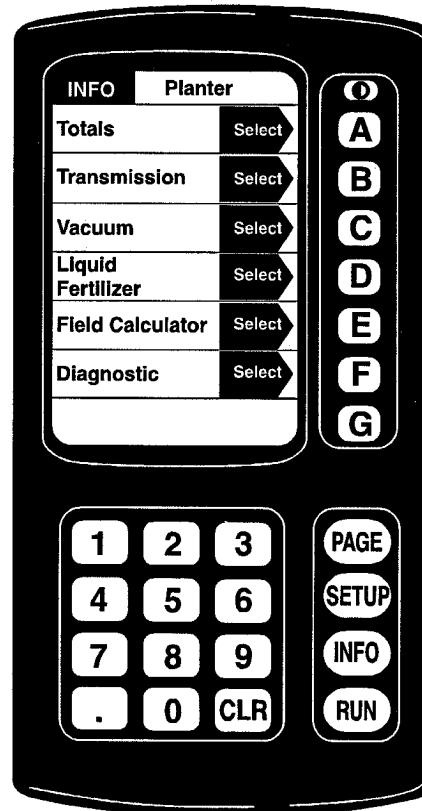


A40577 -19-07OCT97

OUO1074.00001E7 -19-17MAY01-1/1

INFO—Planter

Press INFO—Planter to display this screen. Start with Totals.



A37748 -19-24OCT97

AG,OUO1074.1513 -19-24APR00-1/1

INFO—Planter Totals

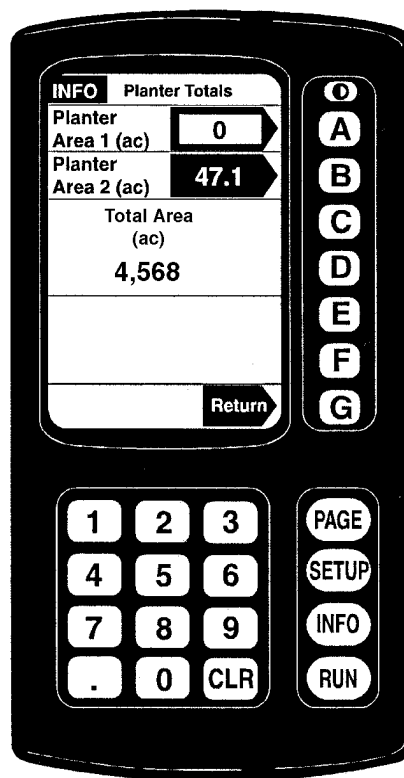
NOTE: The RUN screen area is only a readout. Areas can only be changed or set to zero using the INFO or TOTALS function.

Press INFO—Planter—Totals.

This illustration gives acres since reset and accumulated acres.

Zero by pressing key A or key B and entering “0” with the number keyboard.

Press key G to return.



A37515 -19-24OCT97

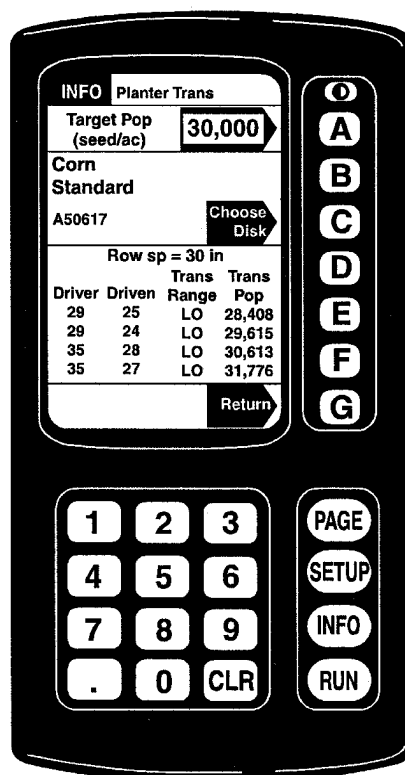
AG.OUO1074,1514 -19-24APR00-1/1

INFO—Transmission

NOTE: If using feed cup meter, see planter operators manual for suggested transmission setting.

If using finger pickup or radial bean meter, press key C and go to page two. Then press the PAGE key.

Gives information for setting seed transmission after target population and seed disk is selected.



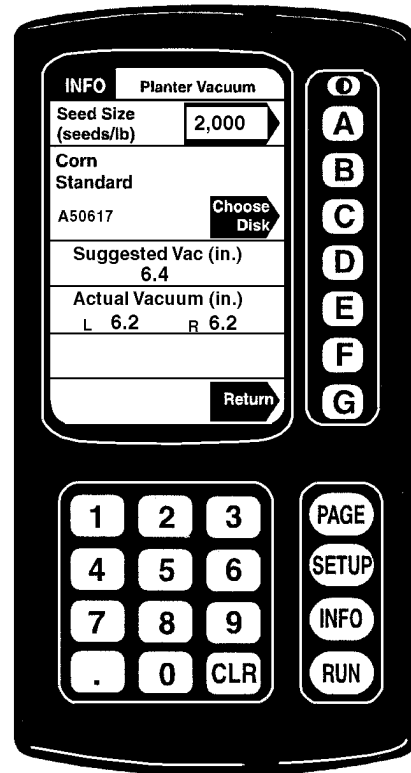
A45214 -19-01DEC98

AG.OUO1074,1515 -19-24APR00-1/1

INFO—Vacuum

NOTE: Higher operating ground speeds or irregular shaped seeds may require higher than recommended vacuum level.

Suggests vacuum after seed size and seed disk have been selected.

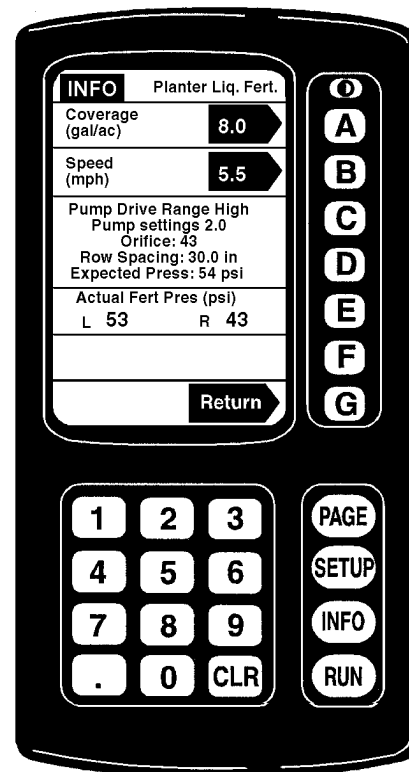


A44979 -19-01DEC98

AG,OUO1074,1516 -19-24APR00-1/1

INFO—Liquid Fertilizer

Gives suggested settings for piston pump sprocket combination, pump stroke and orifice selection based on desired application rate.



A44980 -19-27AUG98

AG,OUO1074,1517 -19-24APR00-1/1

INFO—Field Calculator

Gives information on determining required number of bags of seed or weight of seed for a given area.

Press key B to calculate by bags or weight. Input other information as desired.

INFO Field Calculator	
Field Area (ac.)	100
Calculated by BAGS:	Select Weight
Lb/bag	50
Seeds/bag	80,000
Number of BAGS:	38
Population (seed/ac)	30,000
6.9 in/seed	1.7 seed/ft
30.0 in rows	
Return	

A44981 -19-27AUG98

AG.OUO1074,1518 -19-24APR00-1/1

INFO—Planter Diagnostics

Press INFO—Planter—Diagnostics to display this screen.

The hardware version and software version cannot be changed.

Select key C to determine which seed sensors are connected.

Select key D for system voltages of all sensors and the tractor.

Select key F to enter diagnostic codes.

Please see Diagnostics section for additional information.

INFO Planter Diagnostics	
Hardware Version	
S/N 10217	
Software Version	
01 96 04 15 10	
Seed Sensor Test	Select
System Voltages	Select
Diagnostic Code	Enter
Return	

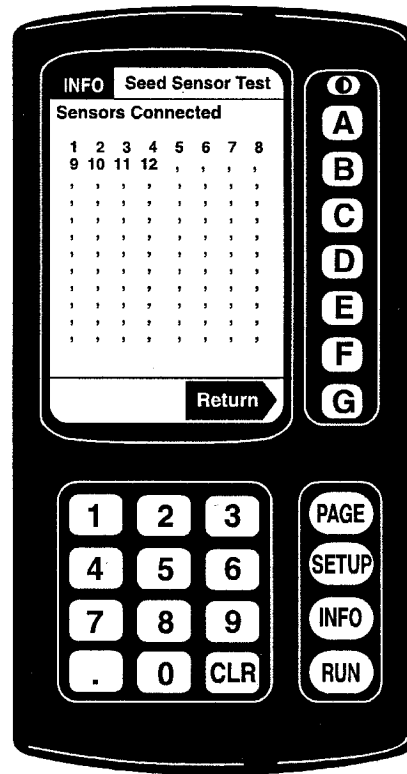
A45215 -19-01DEC98

AG.OUO1074,1519 -19-24APR00-1/1

INFO—Diagnostic—Seed Sensor Test

Seed sensor test displays row number of sensors connected to monitor.

Press key G for initial diagnostics screen, then press key D for system voltages.



A40401 -19-07OCT97

AG,OUO1074,1520 -19-24APR00-1/1

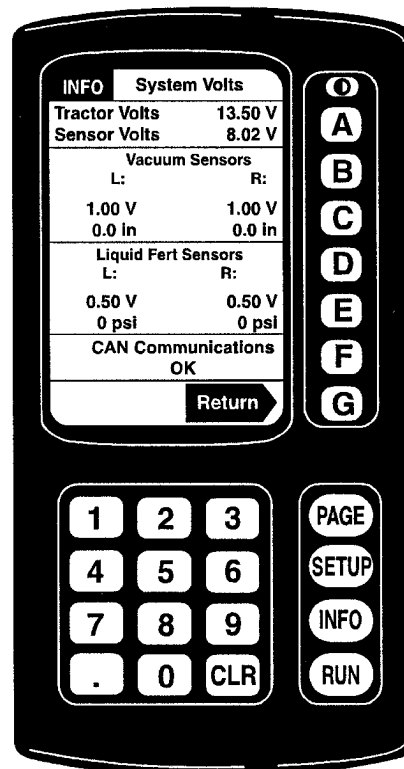
INFO—Diagnostics—System Voltages

Displays system voltages measured at the planter wedgebox.

NOTE: With tractor engine OFF, key turned to ACC, and all sensors properly zeroed, the following values are expected:

- Tractor volts—11 volts or higher
- Seed sensors—8.0 volts
- Vacuum sensors—1.0 volt Nominal (at 0 cm [0 in.])
- Liquid fertilizer sensors—0.5 volts nominal (release trapped pressure in fertilizer manifold) (at 0 kPa [0 bar] [0 psi])
- CAN communications—OK

Press key G to return.



A40396 -19-07OCT97

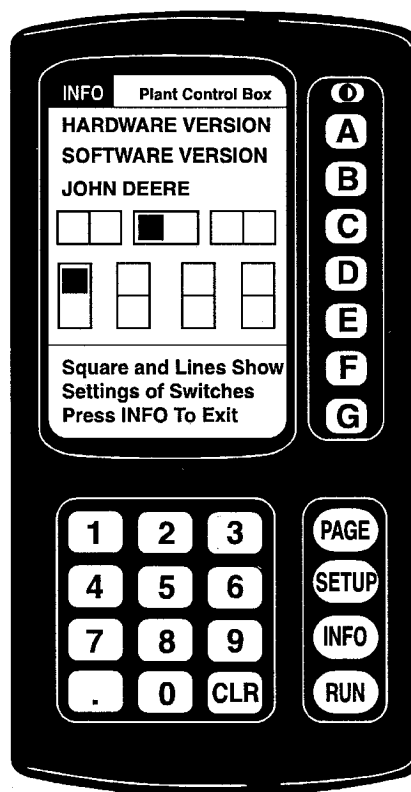
AG,OUO1074,1521 -19-24APR00-1/1

INFO—Plant Control Box

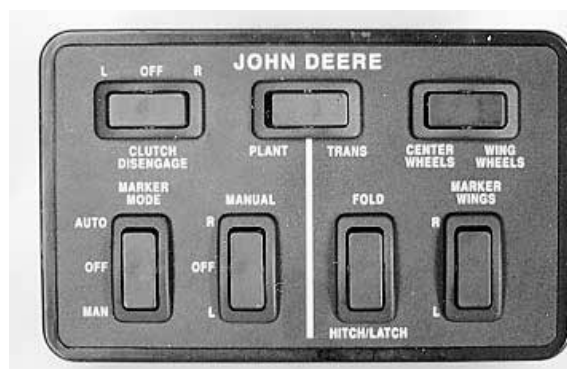
If planter is equipped with SEEDSTAR® frame control this selection is available. Tractor engine must be off and key switch in accessory position when selecting this function.

This screen displays setting of half-width disconnect or frame control box switches. This function is a diagnostic function. It only tests the function of the control box. Full page warnings will overwrite this page if used during operation of the field functions.

Press INFO—Plant Control Box to display this screen.



A39825 -19-07OCT97



A40374 -UN-15OCT96

With Frame Control

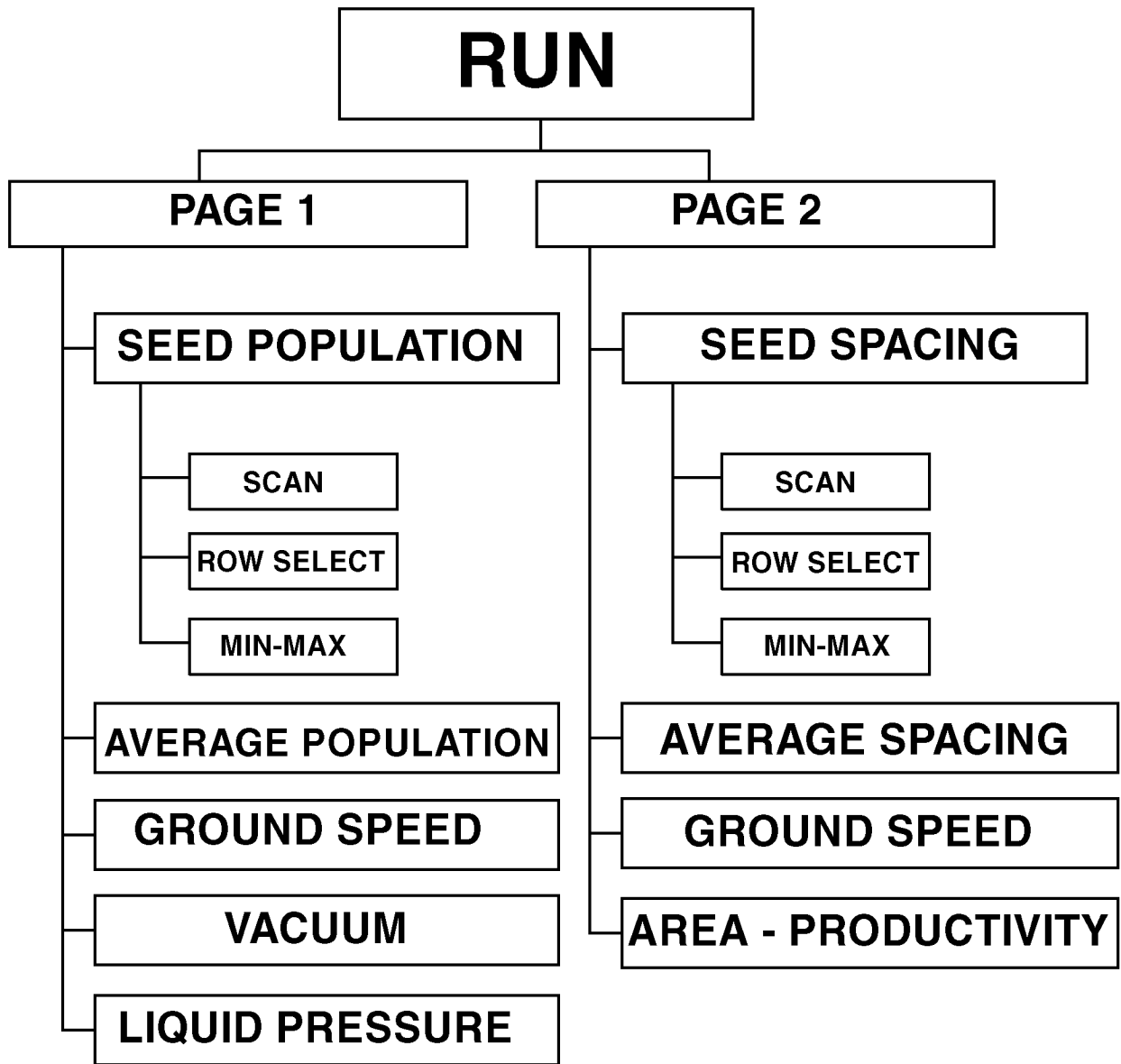


A44237 -UN-24OCT97

Without Frame Control

RUN Functions—Seed Monitor

Seed Monitor Run Function Flow Chart



NOTE: Seed spacing can be viewed on RUN Page 1 by going to SETUP—Planter—Primary Display.

A44973 -19-01DEC98

AG,OU01074,1523 -19-24APR00-1/1

RUN—Page 1

On start up, sensors are tested. If failed sensor is found, a warning will be given. The last page showing when monitor is powered down, will be the page showing on start up. Pressing RUN in the RUN mode moves screen to page 1.

AG,OUO1074,1524 -19-24APR00-1/2

With the power on and the planter operating, the monitor scans the population rate of each row in sequence.

NOTE: Update rate is 1/200th acre per row width.

NOTE: Warnings which look for a row not planting do NOT require 1/200 acre traveled.

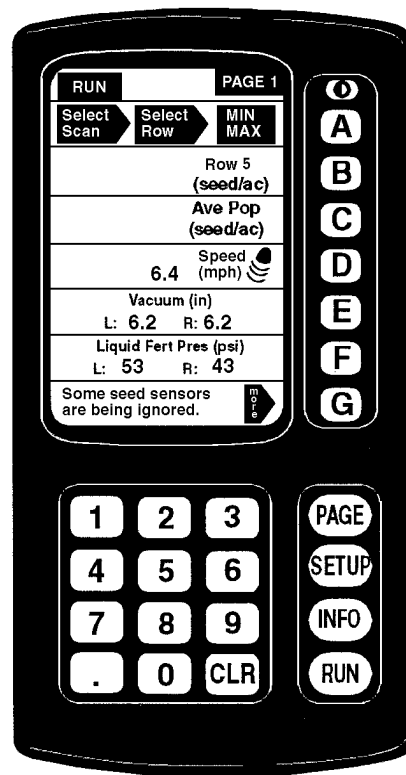
When planting above two mph, the monitor collects data for 1/200 acre per row before displaying an update to screen. The distance traveled is dependent on row spacing.

- 76 cm (30 in.) rows require 27 m (90 ft) traveled
- 38 cm (15 in.) rows require 53 m (175 ft) traveled
- 19 cm (7-1/2 in.) rows require 107 m (350 ft) traveled

Scan Selection scans each row for four seconds.

Turned off sensors can be selected from Select Row. Even though sensors are turned off, they are still being used to count area.

When ground speed drops below two mph, the monitor will not count seeds. When this occurs, the display will lock population values that were displayed just before ground speed dropped below two mph. When speed goes above two mph, the display will resume normal operation.



A44976 -19-01DEC98

AG,OUO1074,1524 -19-24APR00-2/2

RUN—Page 2

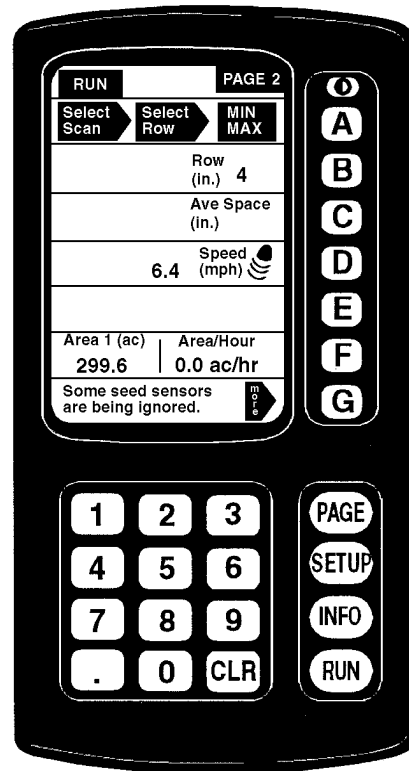
Pressing key A while monitor is scanning will cause the display to switch to the SELECT SCAN—SELECT ROW—MAX/MIN mode.

The row number with MAX population and MIN seed spacing is displayed along with the average spacing.

NOTE: When shipped from factory RUN—Page 1 displays seed population and RUN—Page 2 displays seed spacing. To move spacing to Page 1 perform the following:

Press:

- -SETUP-
- -PLANTER-
- -PRIMARY DISPLAY-
- -CANCEL WARNING MESSAGE-
- -SETUP-
- -RUN PAGE LAYOUT-
- -STANDARD LAYOUT-
- -RUN-



A44977 -19-01DEC08

AG,OUO1074,1525 -19-24APR00-1/1

Seed Tube Sensors

Seed Tube Sensors

NOTE: The seed tubes for MAXEMERGE® Plus row units are illustrated. If another type seed tube is installed, the instructions are provided with the sensors.

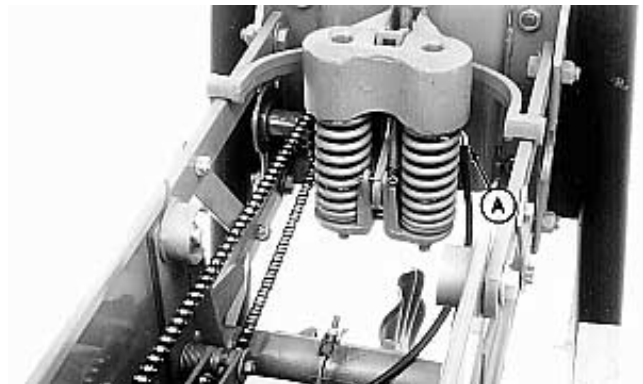
MAXEMERGE is a trademark of Deere & Company

AG,OUO1074,1621 -19-24APR00-1/1

Connect to Seed Tube Sensors (Small and Large)

1. Route harness through hole (A) on planting units.

A—Hole

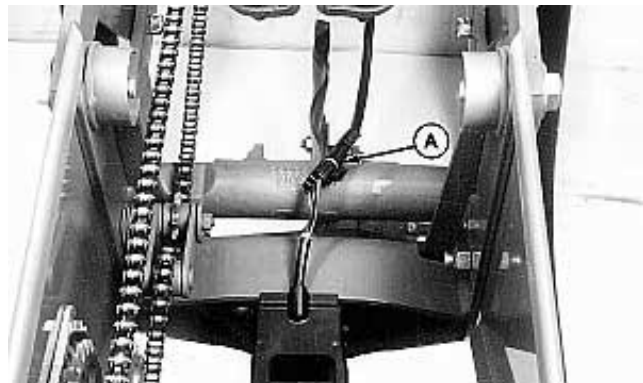


A39829 -UN-21MAY96

AG,OUO1074,1622 -19-24APR00-1/3

2. Connect harness (A) to seed sensor harness.

A—Harness



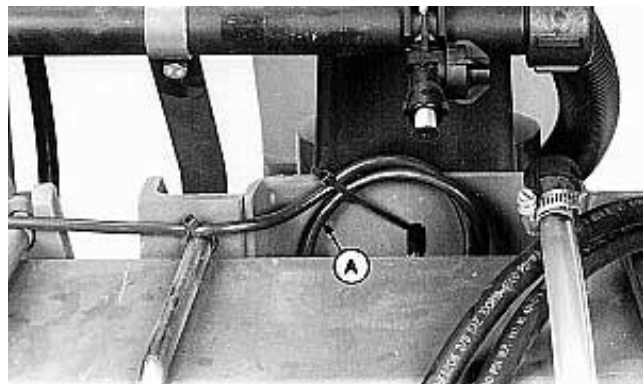
A39830 -UN-21MAY96

AG,OUO1074,1622 -19-24APR00-2/3

NOTE: Refer to the harness assembly instructions included with each harness bundle.

3. Coil excess harness (A) between frame and planting unit and fasten with tie bands.

A—Excess Harness



A39831 -UN-21MAY96

AG,OUO1074,1622 -19-24APR00-3/3

Seed Monitor Warnings

Operating Warnings

This warning appears when seed stops flowing, or when planting below two mph and then goes above two mph. If key F (Ignore these Seed Sensors) is pressed, another warning will not be issued unless one of the following things happen:

- more than 1/4 of the rows on the machine have seeds flowing in them
- operator goes below 2 mph, and then back above 2 mph

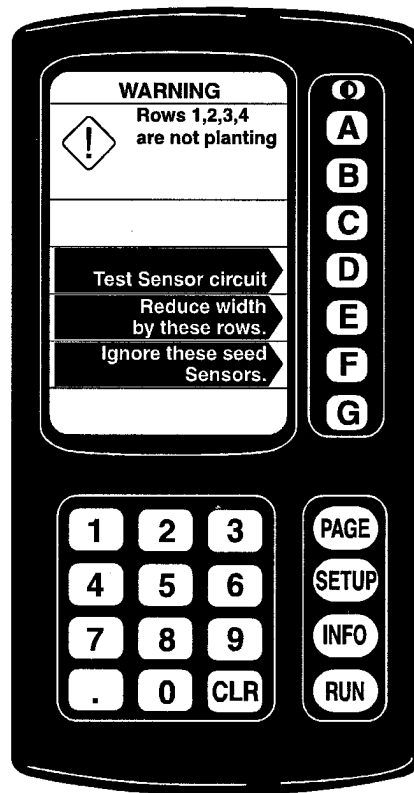
Test Sensor Circuit—Checks seed sensors.

NOTE: When using half-width disconnect, press key E (Reduce width by these rows.) so that a reminder alarm will sound every 15 seconds as long as the warning screen remains on the display.

If key F (Ignore these Seed Sensors) is pressed, the seed sensors will be ignored and no warning will be issued until system resets (ground speed drops below 2 mph).

Reduce Width by These Rows—Is used when planting point rows and when some seed meters are disconnected (or when half-width disconnect is used). This selection allows observation of rows still planting and provides proper calculation of area planted.

Ignore these Seed Sensors—This selection is used to ignore and clear. This warning message allows access to RUN, SETUP or INFO modes.

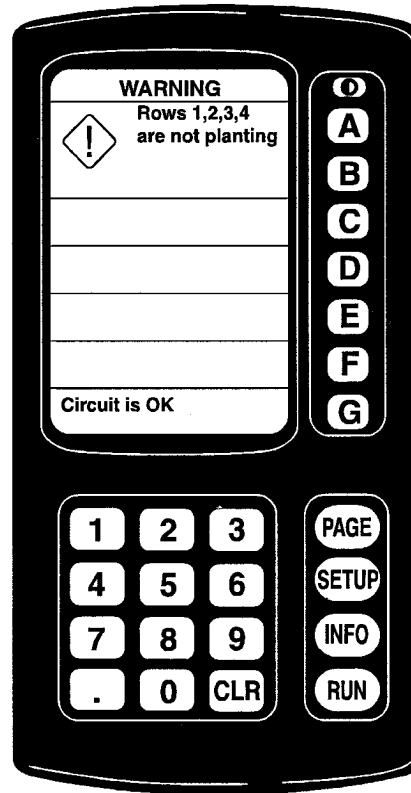


Continued on next page

AG,OUO1074,1526 -19-24APR00-1/12

Seed Monitor Warnings

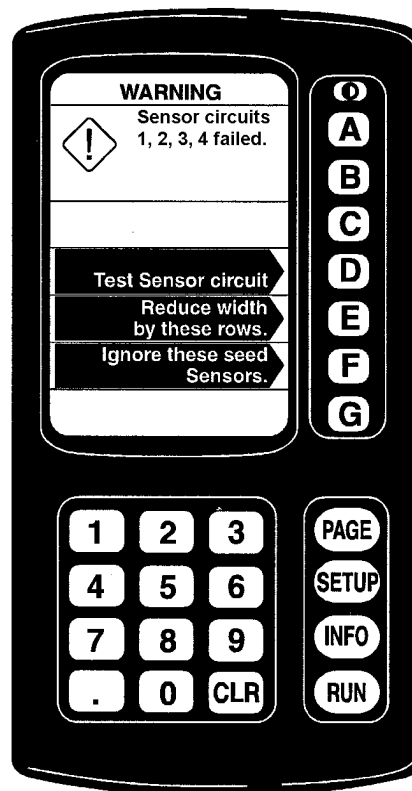
After pressing key D, the sensors are tested. If circuits test OK, screen will look as shown.



A38138 -19-22OCT97

AG,OUO1074,1526 -19-24APR00-2/12

If circuits fail the test, the screen will look as shown.

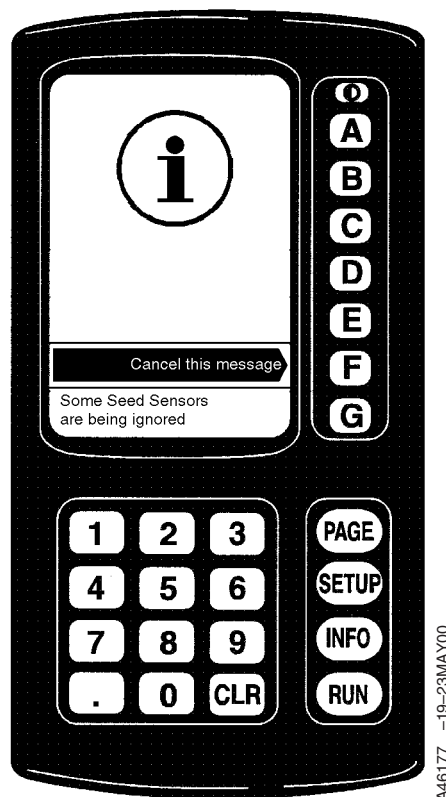


A46165 -19-23MAY00

Continued on next page

AG,OUO1074,1526 -19-24APR00-3/12

After pressing key D on the above screen, this screen appears stating that “Some seed sensors are being ignored.” Press key F to clear and access RUN, SETUP, or INFO screens.

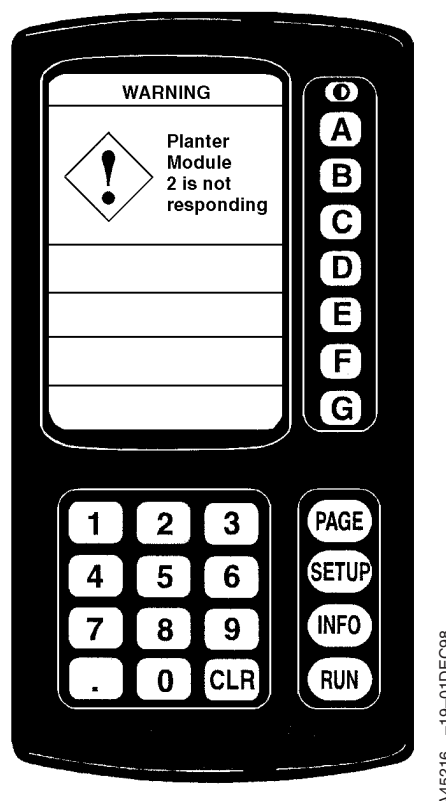


AG,OUO1074,1526 -19-24APR00-4/12

WARNING: Planter Module 2 is not responding.

This warning is generated when a message is not received by the planter monitor from the processor for a period of three seconds on planters with more than 16 rows.

Planter module 2 refers to the processor that houses the seed monitor board for planters larger than 16 rows. (Rows 17-32) This processor has one gray 30-pin connection.

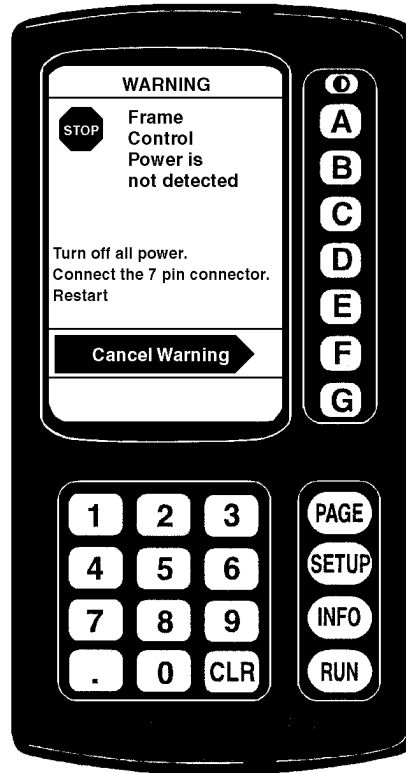


Continued on next page

AG,OUO1074,1526 -19-24APR00-5/12

WARNING: STOP. Frame Control Power is not detected. Turn off all power. Connect the 7-pin connector. Restart.

This warning is generated when the planter monitor is setup as having SEEDSTAR® frame control and no frame control is detected. This warning can happen at power-up and when frame control is selected in planter options.



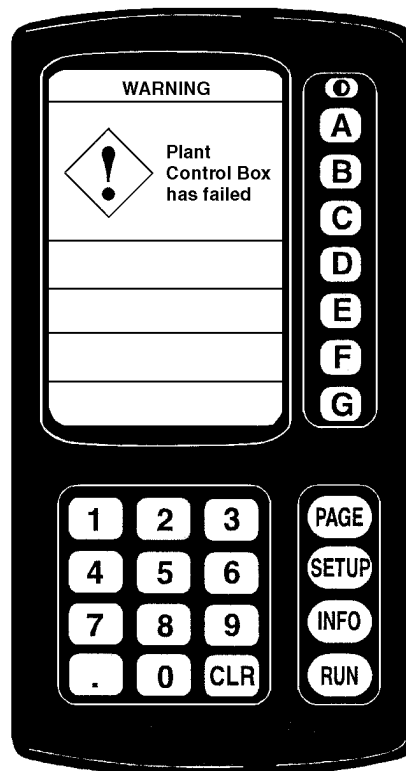
A45217 -19-01DEC98

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AG,OUO1074,1526 -19-24APR00-6/12

WARNING: Plant Control Box has failed.

This warning is generated when a message is not received by the planter monitor from the planter control box (seven switch box or single switch box) for a period of three seconds.



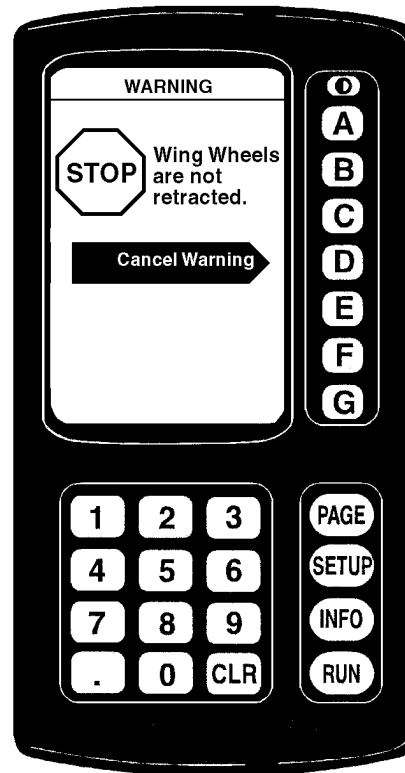
A45218 -19-01DEC98

Continued on next page

AG,OUO1074,1526 -19-24APR00-7/12

WARNING: STOP. Wing Wheels are not retracted.

This warning is generated when the planter wing wheels are down with planter in the folded position. This warning pertains to 1770 Planters only (12 row wide, 16 row narrow and 24 row).

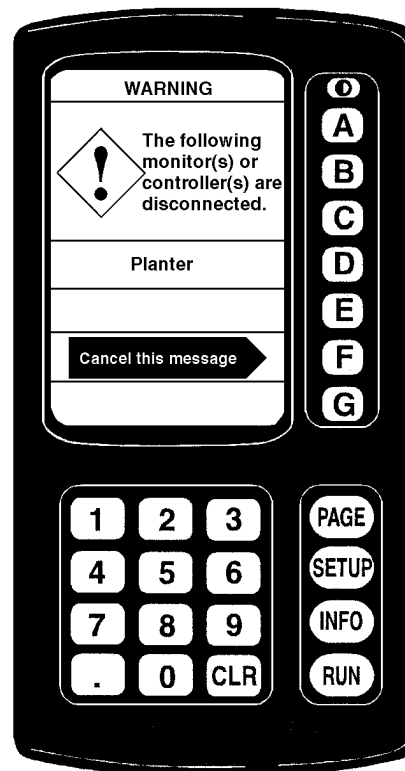


A45263 -19-17DEC98

AG,OUO1074,1526 -19-24APR00-8/12

WARNING: Monitor or controllers disconnected.

This warning is generated when no signal is detected by the GREENSTAR® display from the planter monitor controller.

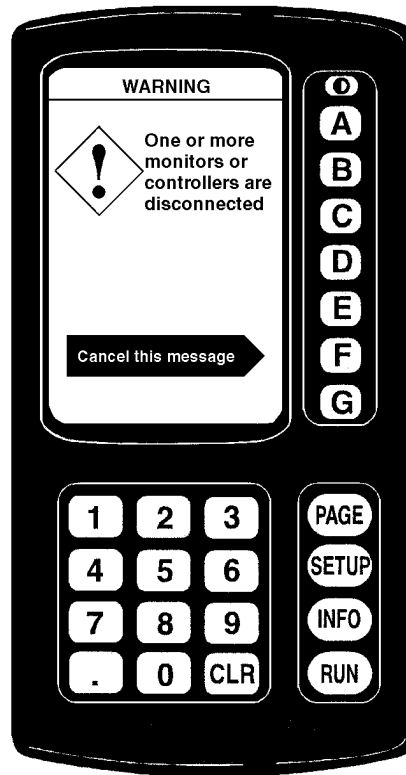


A45220 -19-17DEC98

WARNING: One or more monitors or controllers are disconnected.

This warning will appear if the “Plant Control Box has Failed” message is cancelled, and the GREENSTAR® display has not received a message from the seven switch box or single switch box.

This warning will also appear if the planter has frame control and the monitor is programmed for “No Frame Control”.



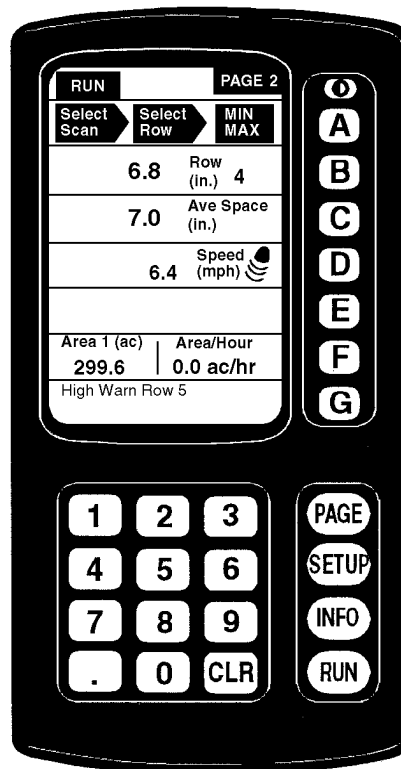
A45270 -19-17DEC98

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AG.OUO1074,1526 -19-24APR00-10/12

WARNING: High Population

This warning will appear at the bottom of screen when a row or rows are overpopulating above pre-set high population limit.



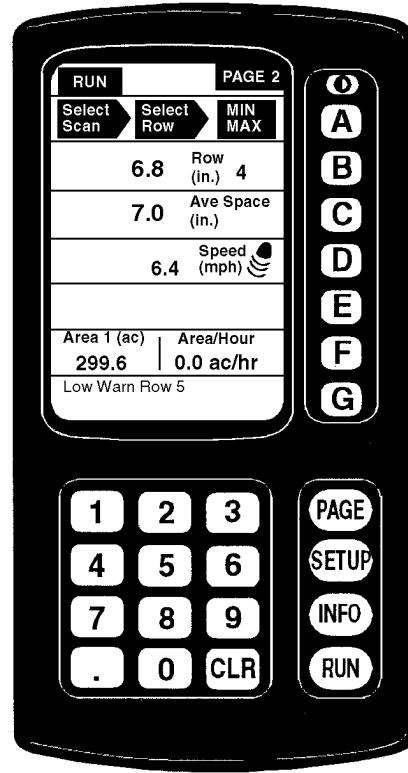
A47421 -19-14MAY01

Continued on next page

AG.OUO1074,1526 -19-24APR00-11/12

WARNING: Low Population

This warning will appear at the bottom of screen when a row or rows are underpopulating below pre-set low population limit.



A47422 -19-14MA Y01

AG.OUO1074,1526 -19-24APR00-12/12

Diagnostics

Component Identification Numbers

GREENSTAR® Display

INFO—GREENSTAR® Display

- Serial number and software version are displayed.
- Serial number is also located on back of display unit.

SEEDSTAR® Seed Monitor

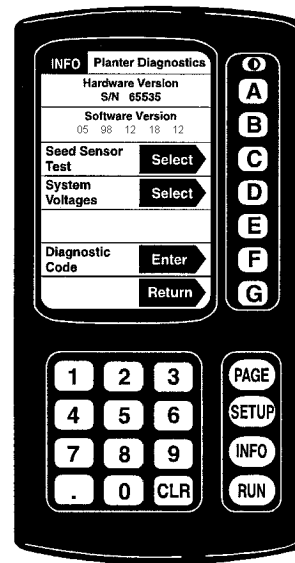
INFO—Planter—Diagnostic

- Serial number and software version are displayed.
- Serial number is also on decal attached to processor.

Electrical Frame Control Box

INFO—Plant Control Box

- Part number and software version are displayed.



A40400 -19-11FEB99

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SEEDSTAR is a trademark of Deere & Company.

AG,OUO1074,1528 -19-24APR00-1/1

Vacuum Sensor Diagnostics

1. Turn tractor OFF. Turn key to ACC.

2. Are Planter Options set correctly?

SETUP—Planter—Page—Planter Options

Correct number of vacuum sensors selected?

3. Is sensor calibration and ZERO correct?

SETUP—Planter—Page—Vacuum

- Calibration number should be 5.66
- ZERO when vacuum pump is NOT operating.

4. Are voltages correct?

INFO—Planter—Diagnostic

- Tractor voltage MUST be 11 volts or higher.
- Vacuum sensor voltage should be approximately 1 volt when vacuum pump is NOT operating.
- If voltage is ZERO, check wiring.

5. Properly connected to wiring?

If only one vacuum sensor is used, it MUST be connected to LEFT VAC wire.

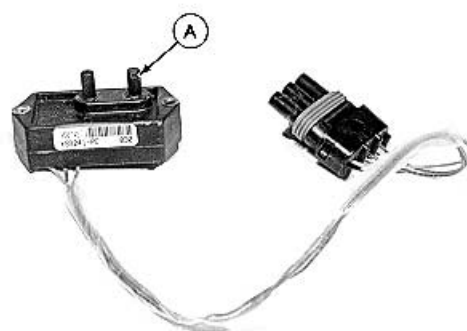
AG,OUO1074,1529 –19–24APR00–1/2

6. Is vacuum hose properly connected?

Connect hose to P2 port (A).

7. Check for air leaks in hose between sensor and vacuum meter.

A—P2 Port



A40613 –UN–30DEC96

AG,OUO1074,1529 –19–24APR00–2/2

Liquid Fertilizer Diagnostics

1. Turn tractor OFF; turn key to ACC.

2. Are planter options set correctly?

SETUP—Planter—Page—Planter Options

Are the correct number of sensors selected?

3. Is sensor calibration and ZERO correct?

SETUP—Planter—Page—Liq. Fert

- Calibration number should be 37.5.
- Release trapped pressure in fertilizer manifold, then ZERO.

4. Are voltages correct?

INFO—Planter—Diagnostic

- Tractor voltage **MUST** be 11 volts or higher.
- Sensor voltage should be approximately 0.5 volts. If voltage is 0, check wiring.

5. Properly connected to wiring?

If only one sensor is used, it **MUST** be connected to LEFT FERT wire.

AG,OUO1074,1530 -19-24APR00-1/1

Variable Rate Drive Overview

Variable Rate Drive Overview:

The operating system is comprised of three major components:

- GREENSTAR® tractor display system which displays information from seed monitor and variable drive system.
- SEEDSTAR® seed monitor microprocessor(s) are mounted on the planter frame. They monitor the operations of vacuum and liquid fertilizer and send information to be displayed over the CAN communications lines. Optional electronic frame control is also available.
- SEEDSTAR® Variable Drive system provides electrical/hydraulic, versus mechanical, means of driving the seed meters. The system uses radar to obtain planter speed information, and has a wheel motion sensor to verify planter motion.

With SEEDSTAR® variable drive, the operator can manually change the seeding rate, 'on-the-go', right from the tractor cab.

- Operator can match seed population to differing soil types or to irrigated vs. dry land soils.
- Operator can program up to six different seed rates in the system. Then, during the planting operation, the operator can select any of the programmed rates and change seed rates.

Hydraulic oil flow from a closed-center tractor SCV or power beyond goes to the hydraulic motor through a pressure compensated proportional flow control valve controlling the motor speed. When a programmed rate is selected, the microprocessor energizes the valve changing the oil flow rate. The hydraulic motor speed sensor provides a signal to the microprocessor of the motors speed ensuring the system is delivering the correct seed rate.

With drawn planters, there is an adjustable height sensor switch located on the planter to start and stop seeding as the planter is lowered and raised. The

switch may be adjusted with the GREENSTAR® display for planter height required to turn seeding on or off.

NOTE: The height switch cannot be adjusted on integral planters.

With integral planters, there are two switches mounted on the planter row unit parallel arms (one on the far left side of the machine, and one on the first row unit to the right of center). The switches are mounted in such a way that when the planter is raised, the row unit parallel arm will "trip" the switch. When BOTH switches are tripped, the planter will stop seeding. If only one switch is tripped, the drives will continue to turn until BOTH switches are tripped. This helps when planting in uneven ground.

Meter speed is determined by rate selected, input of radar speed, disk chosen, type of meter, row spacing and motor sprocket combination. If this is correct, the proper planting rate will be attained.

Variable drive system performance is marginal at motor speeds less than 18 rpm (usually around two miles per hour at low population rates). With motors operating at low rpm or low oil flow, drive may be erratic, resulting in inaccurate population and will stop at 11.5 rpm (usually planting speed below one mph). Planter monitor will not provide a warning when system is operated below two mph.

IMPORTANT: This is a precision hydraulic valve. Cleanliness is very important during assembly and operation.

The following components must be active for system operation:

- Hydraulic oil flow—oil must be flowing to motors.
- Radar—Ground speed input must indicate mph.

- Tire sensor—planter must be moving with sensor active.
- Height switch—planter must be in down position.

Verification of these inputs are shown on Variable Drive INFO Performance Data screen.

If planter is stopped in the down position, when planting is resumed, you WILL have a 3 m (10 ft) skip before drive system reactivates. This is due to minimum ground speed to operate variable rate drive motors above 18 rpm. To prevent a skip in the field, the operator must:

1. Raise planter.
2. Back up 3 m (10 ft)
3. Lower planter.
4. Resume planting.

-OR- use Quick Start Feature.

Quick Start Overview

NOTE: The system will overpopulate until radar overrides Quick Start.

The Quick Start feature allows the operator to reduce the skip left in the field when the planter starts from a stop. Quick Start will reduce the skip to approximately 0.3—1.2 m (1—4 ft).

When using Quick Start, begin forward travel in a low gear to take off slower. By taking off slow and then “gearing up” to speed, the skip will be smaller. For instance, with an 8000 series tractor, skips were attained between one and two feet when taking off in fourth gear. When taking off in higher gear, tractor will lunge forward and travel further before seed falls through seed tube into the ground.

Conditions necessary to activate Quick Start:

1. Planter must be in the “down” position.
2. Actual measured radar speed must be below 2 mph.
3. Prepare tractor to move.
4. The operator must press the Quick Start “start” button that is located in section D on RUN Page 2. This “start” button is also located on the Row Failure warning screen (this warning is issued at every end turn).
5. The Variable Drive system will NOT start until the wheel sensor detects motion.

Once these conditions are met the control system engages the drives at 18 rpm. The variable drive will continue at 18 rpm until the ground speed and selected planting rate take the motor speed above 18 rpm or six seconds expire.

If after six seconds the planter wheel sensor still senses motion between one to two mph, the system will give a warning alerting the operator to “Increase Tractor Speed” and the timer will be extended for another six seconds. If the wheel sensor detects motion but the machine is operating below one mph the variable drive will disable after the initial six second interval. A full page warning will alert the operator that “System Drive Disabled, Quick Start Function requirements not satisfied”.

If the wheel sensor fails to detect motion then the Quick Start will automatically disable after the initial six second interval. A full page warning will alert the operator that variable drive has been disabled.

When the measured radar speed exceeds two mph the variable drive will discontinue the Quick Start mode. The system will then be in a normal operating mode. When planter is in normal planting operation, a visual indicator is on RUN Page 1, which shows that motors are operating. This indicator is a small (*) asterisk next to seed rate on line D.

NOTE: *When the actual ground speed is below two mph while operating the planter with Quick Start engaged, the planter will assume a two mph seed rate and will be overpopulating.*

The variable drive control system engages the drives at 18 rpm. It is not recommended to operate the system at a motor speed below 18 rpm. The required ground speed to attain 18 rpm (at the selected rate) will vary with planting rate and row width. See INFO—Variable Drive—Setup Summary—Page 2 for the ground speed necessary to operate the motor at 18 rpm for the selected population rate. For example, you would have to travel at three mph to reach a motor speed of 18 rpm planting corn with a vacuum planter at 15,000 seeds/acre on 30 in. rows, so the threshold speed would be three mph. If you were using a vacuum planter to plant corn at 30,000 seeds/acre on 30 in. rows, you would have a motor speed of 24 rpm at two mph, so the threshold speed would be 1.5 mph. Motor speed will increase on wider rows and decrease on narrow rows at the same population.

Tractor Hydraulic System Requirements

Operation of the hydraulic drive requires the tractor to have either a load sensing hydraulic system or a closed center hydraulic system with flow control. These types of hydraulic systems usually have large oil reservoirs and increased oil cooling capacity and deliver only the oil flow needed for the motors to maintain a constant speed.

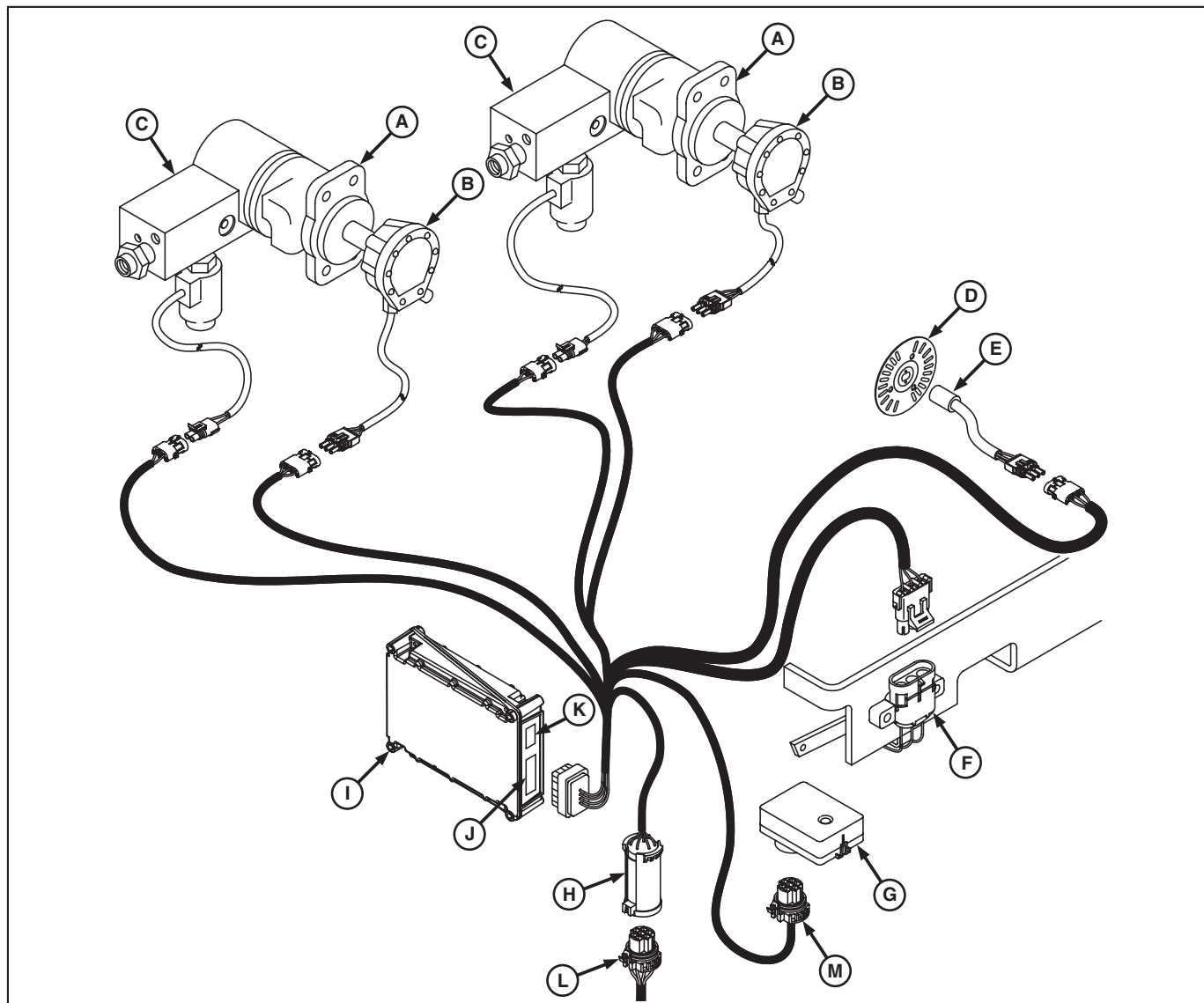
The two variable drive motors require a nominal hydraulic oil flow of 1.0 gpm to 8.0 gpm at 500 psi to 1500 psi.

Tractors with open center hydraulic systems are not recommended for the following reasons:

- No means to control volume of oil flow.
- Excessive oil temperature.
- Decreased oil flow to motor during operation of other tractor control valves.
- Reduced oil flow to tractor power steering.

AG,OUO1074,1534 -19-24APR00-3/3

Variable Rate Drive Dual Motor System—Drawn Planters (And 1720 16-RN Integral Planter)



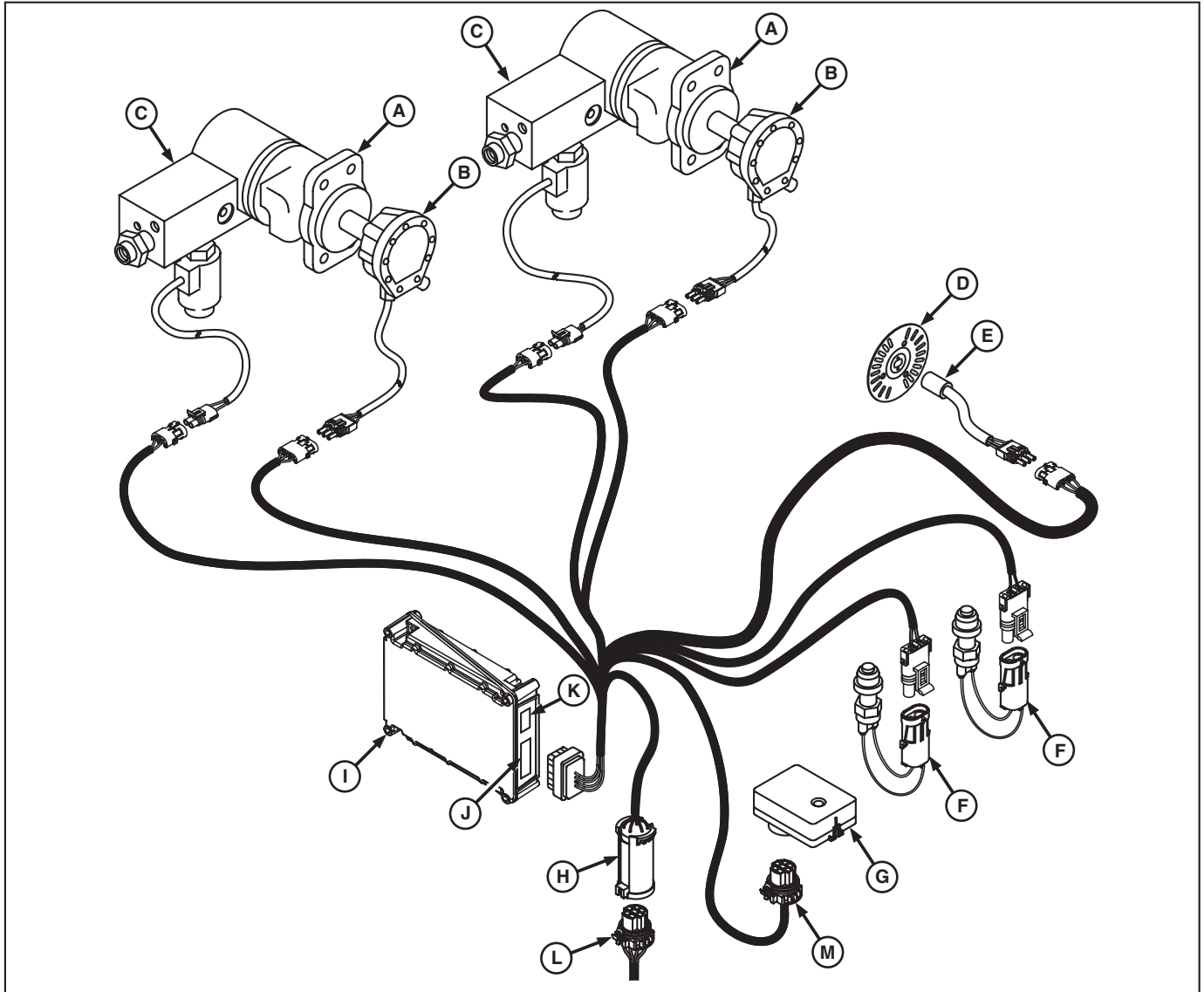
A—Motor
B—Speed Sensor

C—Speed Controller Valve
D—Sensor Disk
E—Wheel Motion Sensor
F—Height Sensor
G—Terminator
H—Variable Drive Harness Connector

I—Controller Wedgebox
J—30-Way METRAPAK™ Connector
K—18-Way METRAPAK™ Connector

L—SEEDSTAR® CAN Terminator Connector
M—Variable Rate Drive CAN Terminator Connector

Variable Rate Drive Dual Motor System—Integral Planters (Except 1720 16-RN)



A—Motor
B—Speed Sensor

C—Speed Controller Valve
D—Sensor Disk
E—Wheel Motion Sensor
F—Height Sensor
G—Terminator
H—Variable Drive Harness Connector

I—Controller Wedgebox
J—30-Way METRAPAK™ Connector
K—18-Way METRAPAK™ Connector

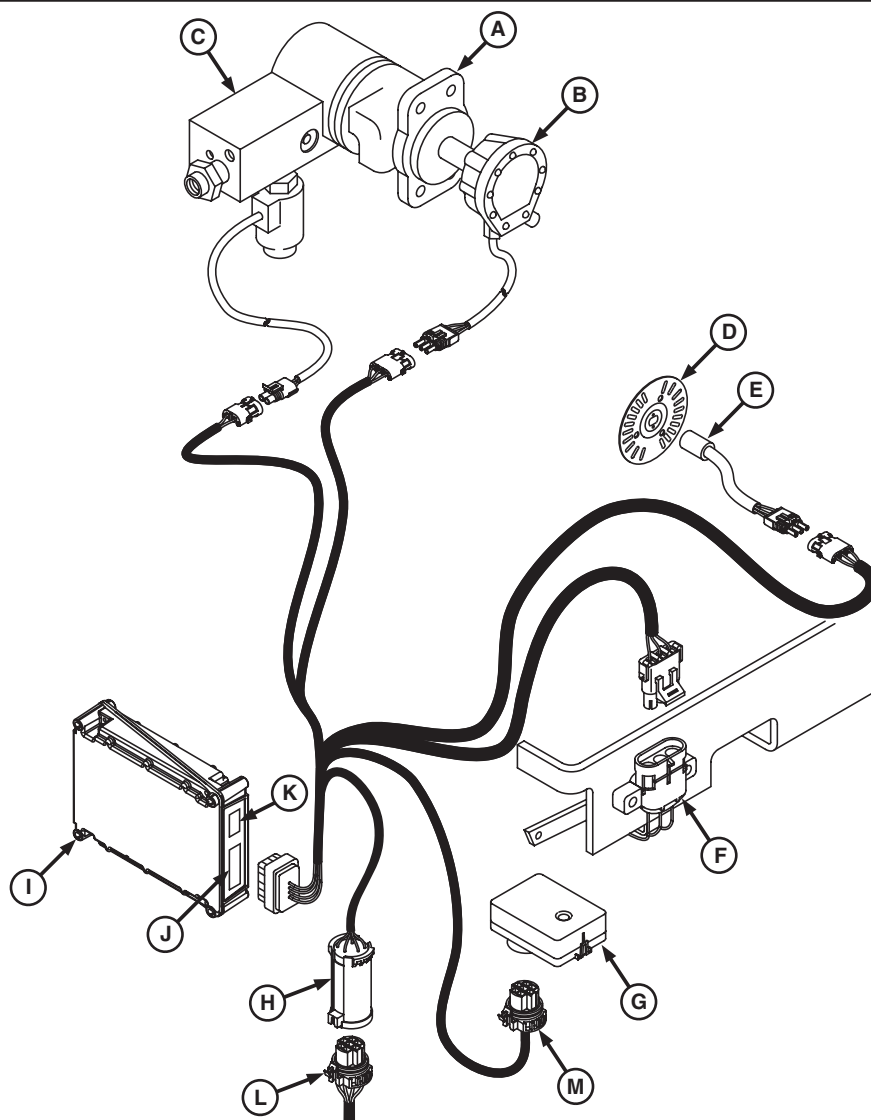
L—SEEDSTAR® CAN Terminator Connector
M—Variable Rate Drive CAN Terminator Connector

SEEDSTAR is a trademark of Deere & Company

OUC1074,00001D1 -19-30APR01-1/1

A48368 -UN-27NOV01

Variable Rate Drive Single Motor System—Drawn Planters



A—Motor
B—Speed Sensor

C—Speed Controller Valve
D—Sensor Disk
E—Wheel Motion Sensor
F—Height Sensor
G—Terminator
H—Variable Drive Harness Connector

I—Controller Wedgebox
J—30-Way METRAPAK™ Connector
K—18-Way METRAPAK™ Connector

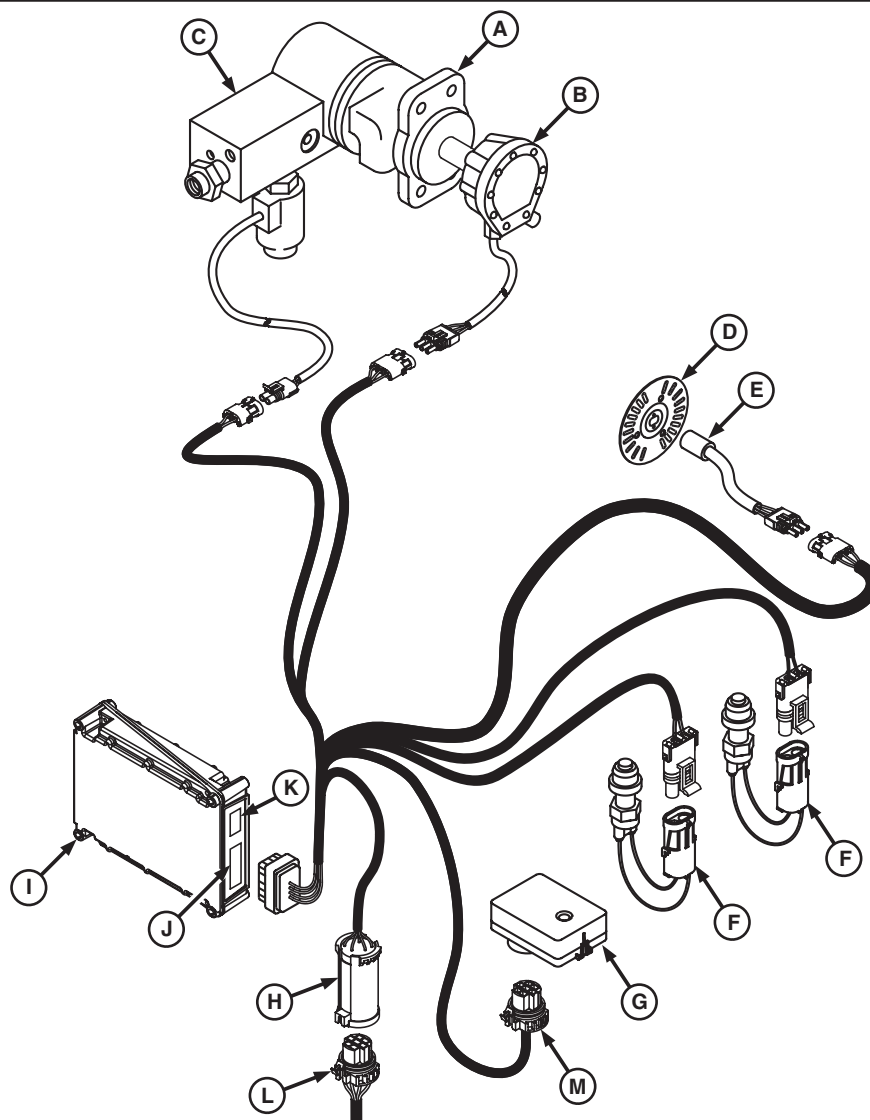
L—SEEDSTAR® CAN Terminator Connector
M—Variable Rate Drive CAN Terminator Connector

SEEDSTAR is a trademark of Deere & Company

AG,OUO1074,1536 -19-24APR00-1/1

A48370 -UN-27NOV01

Variable Rate Drive Single Motor System—Integral Planters



A—Motor
B—Speed Sensor

C—Speed Controller Valve
D—Sensor Disk
E—Wheel Motion Sensor
F—Height Sensor
G—Terminator
H—Variable Drive Harness Connector

I—Controller Wedgebox
J—30-Way METRAPAK™ Connector
K—18-Way METRAPAK™ Connector

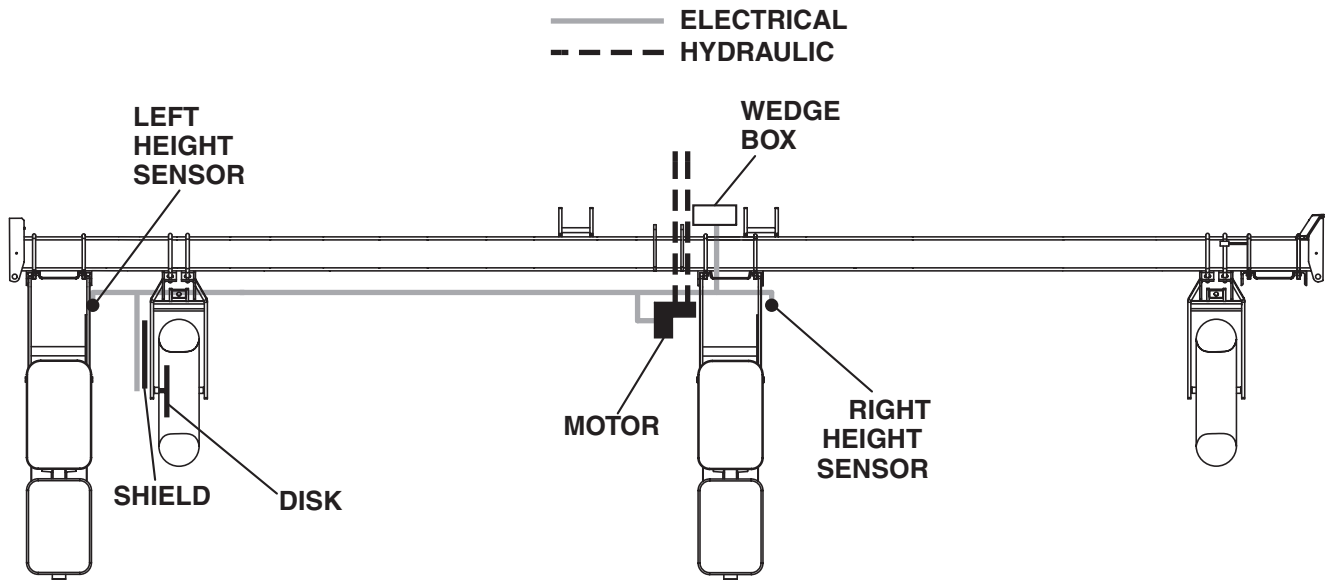
L—SEEDSTAR® CAN Terminator Connector
M—Variable Rate Drive CAN Terminator Connector

SEEDSTAR is a trademark of Deere & Company

OUC1074,00001D2 -19-30APR01-1/1

A48371 -UN-27NOV01

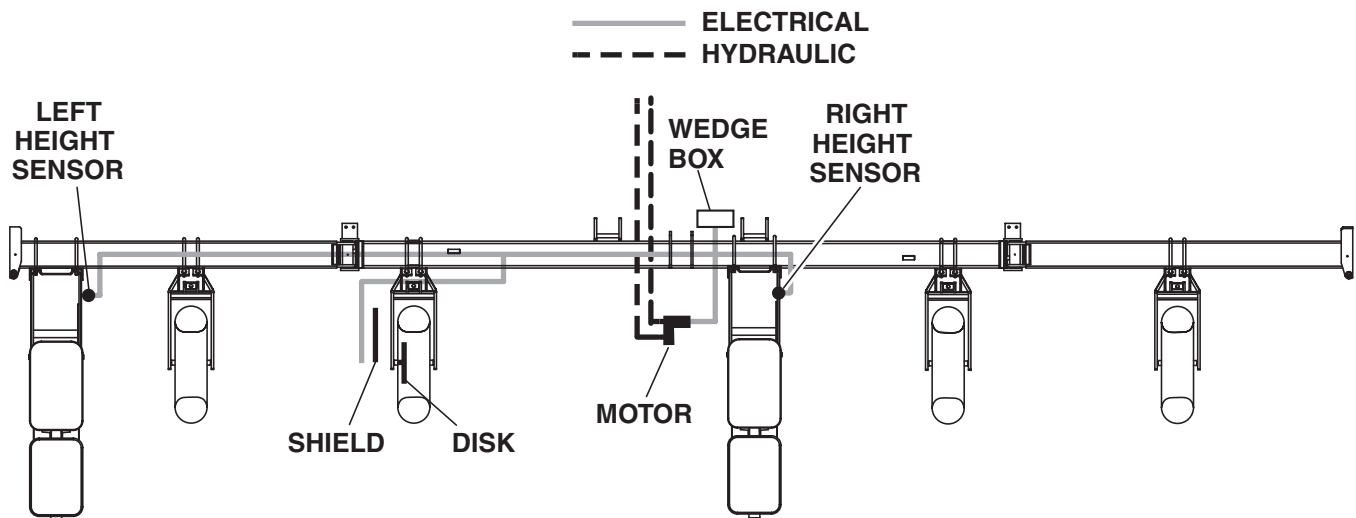
Variable Rate Drive Location Drawing—1700 Planter



A47673 -19-25OCT01

OUO1074.00001D3 -19-30APR01-1/1

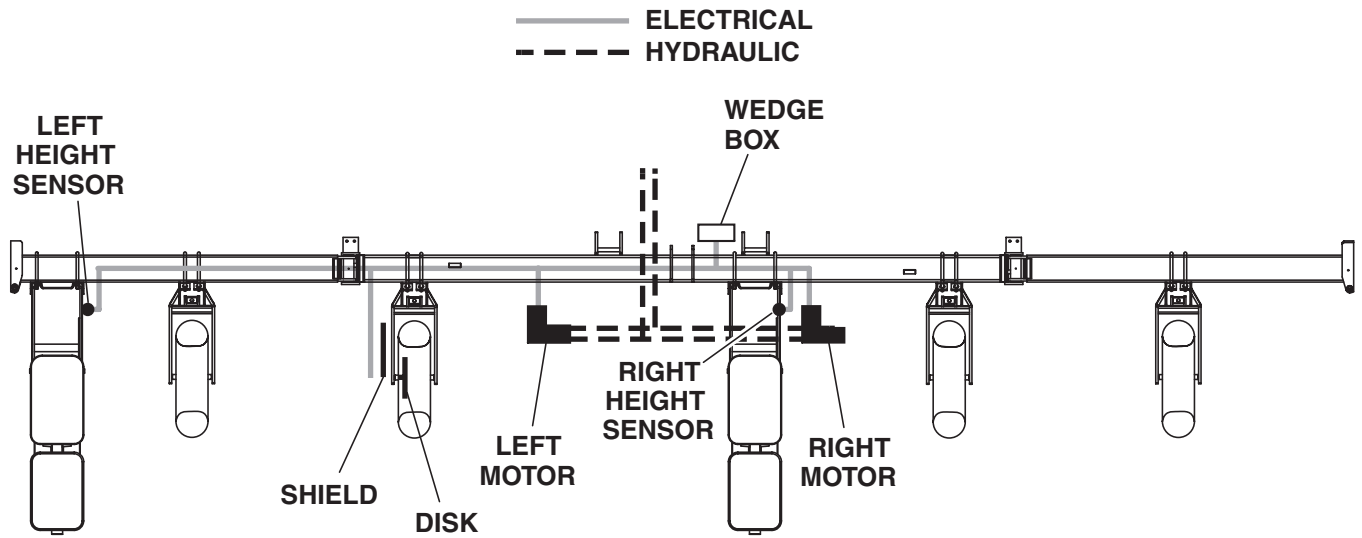
Variable Rate Drive Location Drawing—1710 Planter with Single Motor



A47675 -19-25OCT01

OUO1074.00001D4 -19-30APR01-1/1

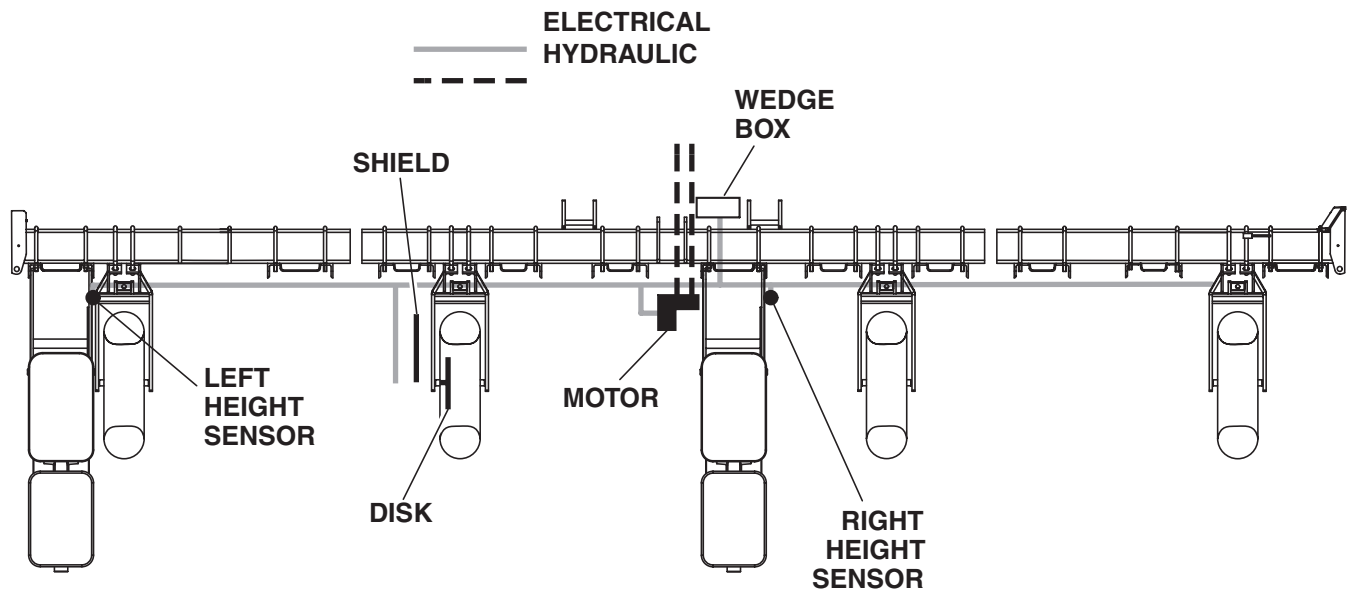
Variable Rate Drive Location Drawing—1710 Planter with Dual Motors



A47676 -19-25OCT01

OUC1074,00001D9 -19-02MAY01-1/1

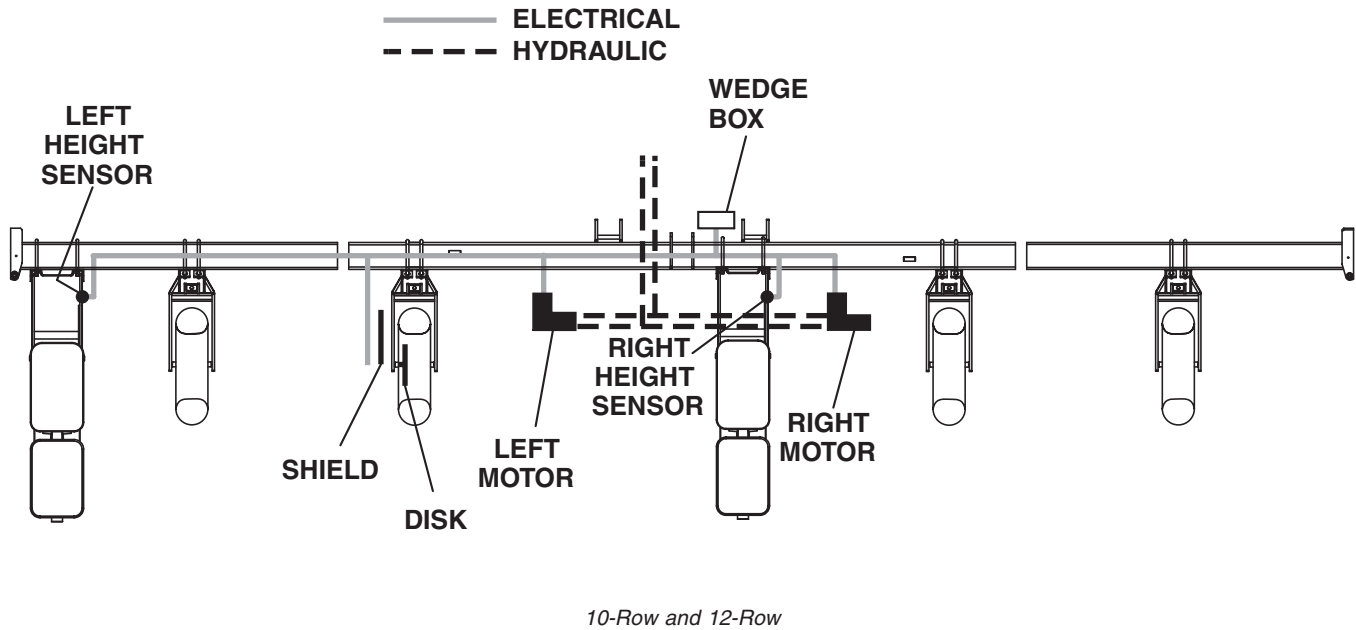
Variable Rate Drive Location Drawing—1720 Planter with Single Motor



A47674 -19-25OCT01

OUC1074,00001D5 -19-30APR01-1/1

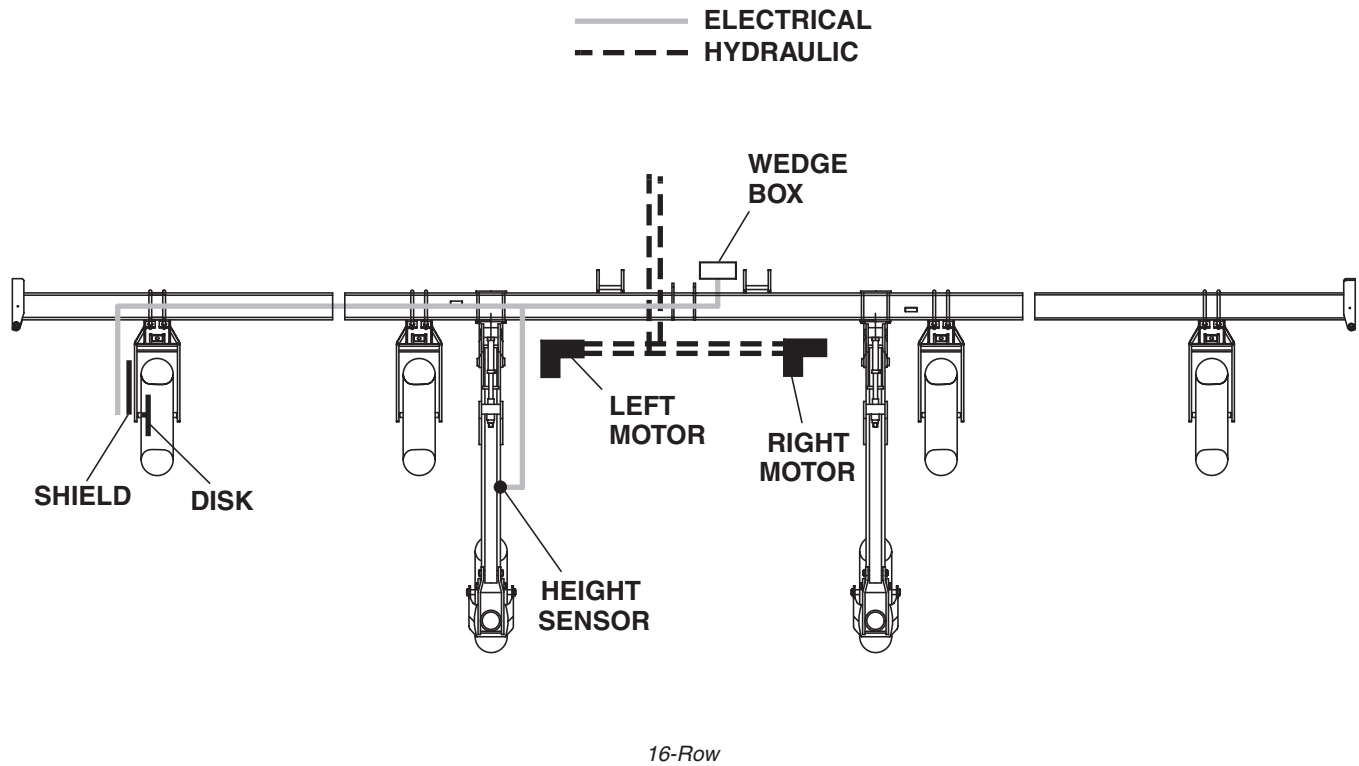
Variable Rate Drive Location Drawing—1720 10 and 12-Row Planters with Dual Motors



A47677 -19-25OCT01

OUO1074.00001E6 -19-15MAY01-1/1

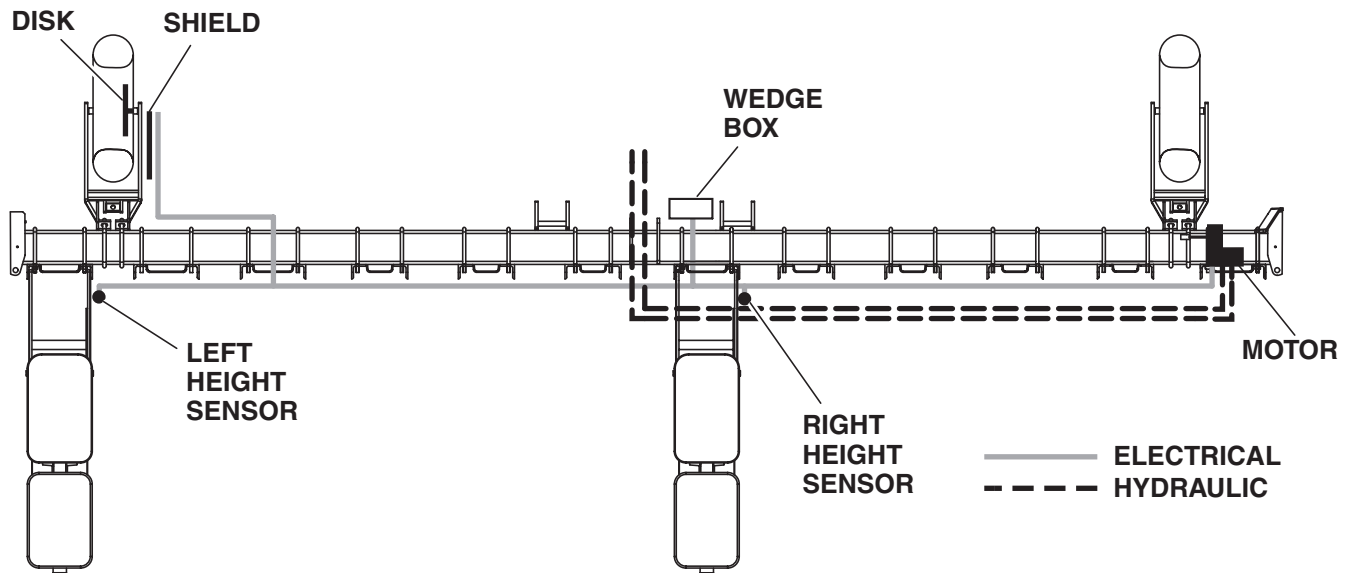
Variable Rate Drive Location Drawing—1720 16-Row Planter with Dual Motors



OUC1074,00001DA -19-02MAY01-1/1

A47383 -19-02MAY01

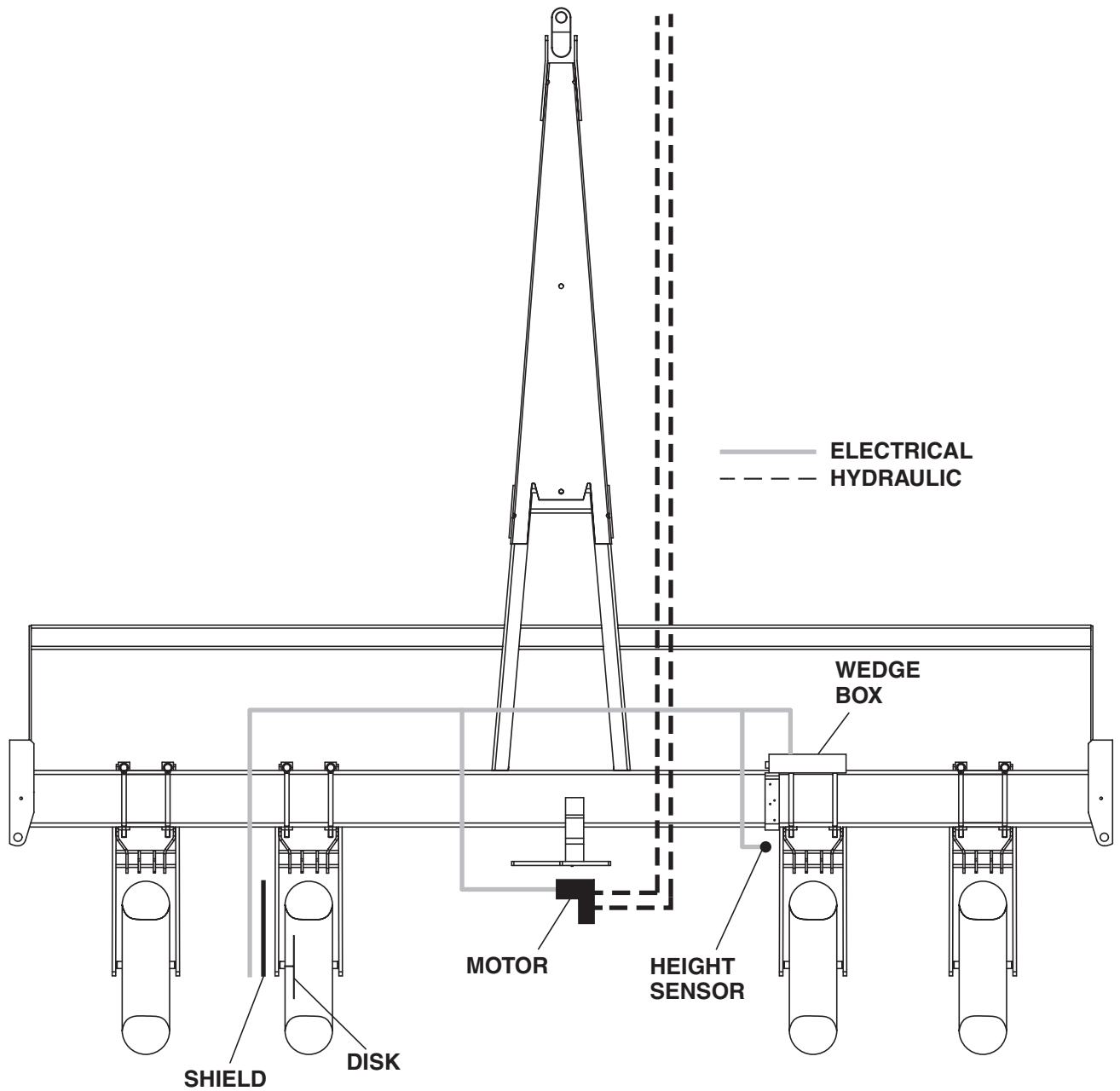
Variable Rate Drive Location Drawing—1730 Planter



A47367 -19-25OCT01

OUC1074.00001D6 -19-30APR01-1/1

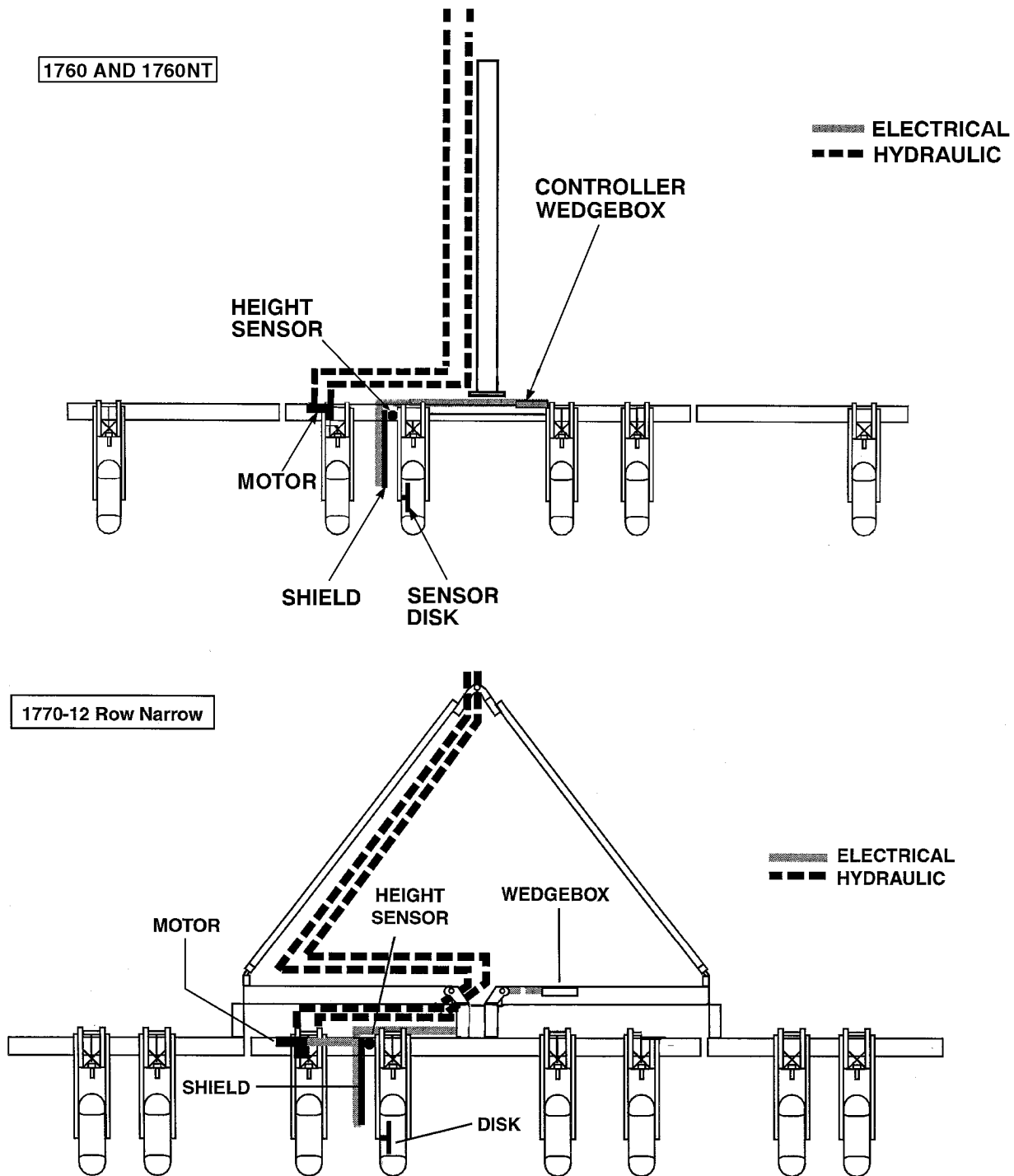
Variable Rate Drive Location Drawing—1750 Conservation Planter



A47374 -19-14MAY01

OUO1074,00001D7 -19-30APR01-1/1

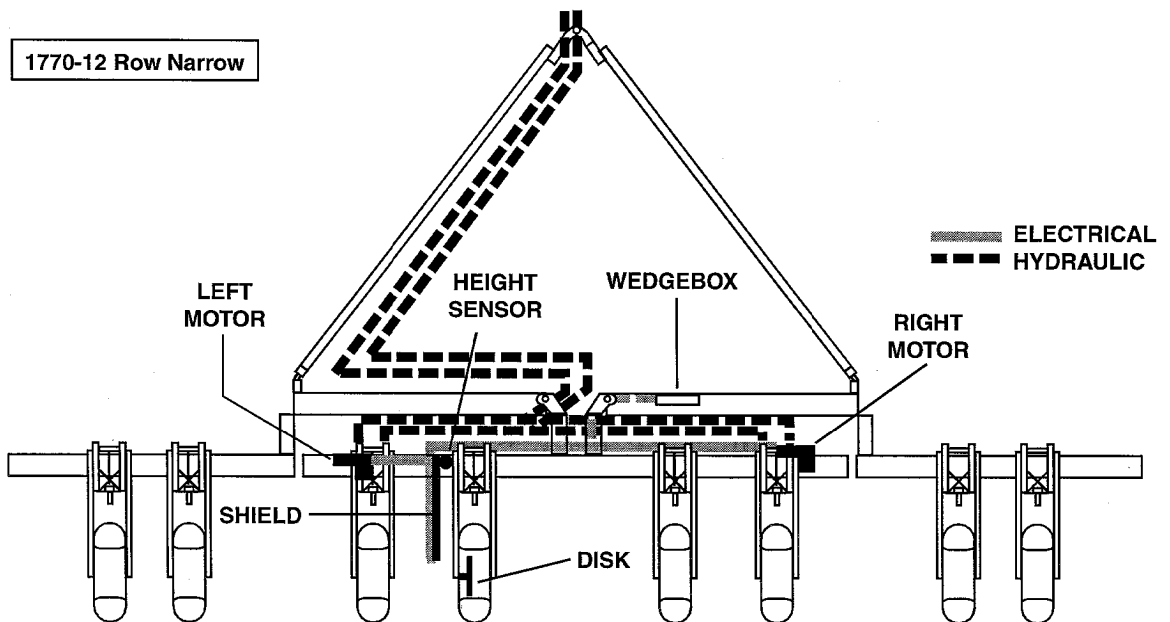
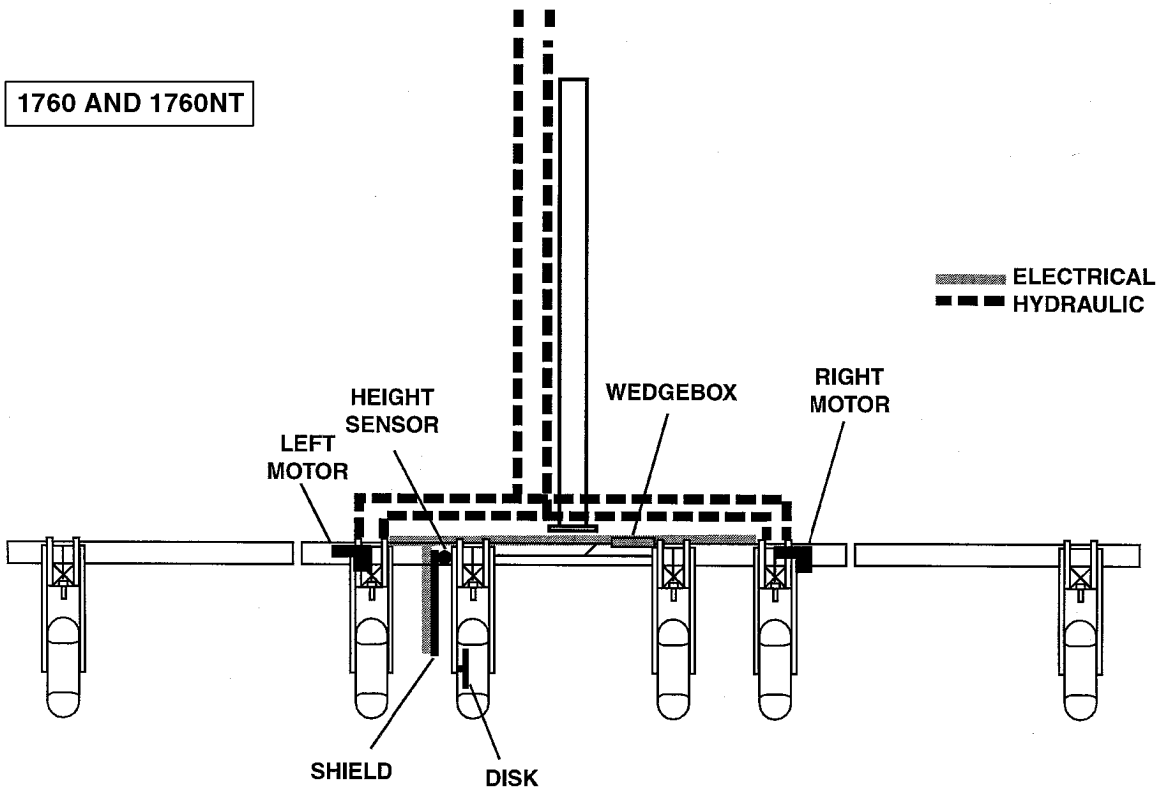
Variable Rate Drive Location Drawing—1760/1760NT/ and 1770 12-RN Planters with Single Motors



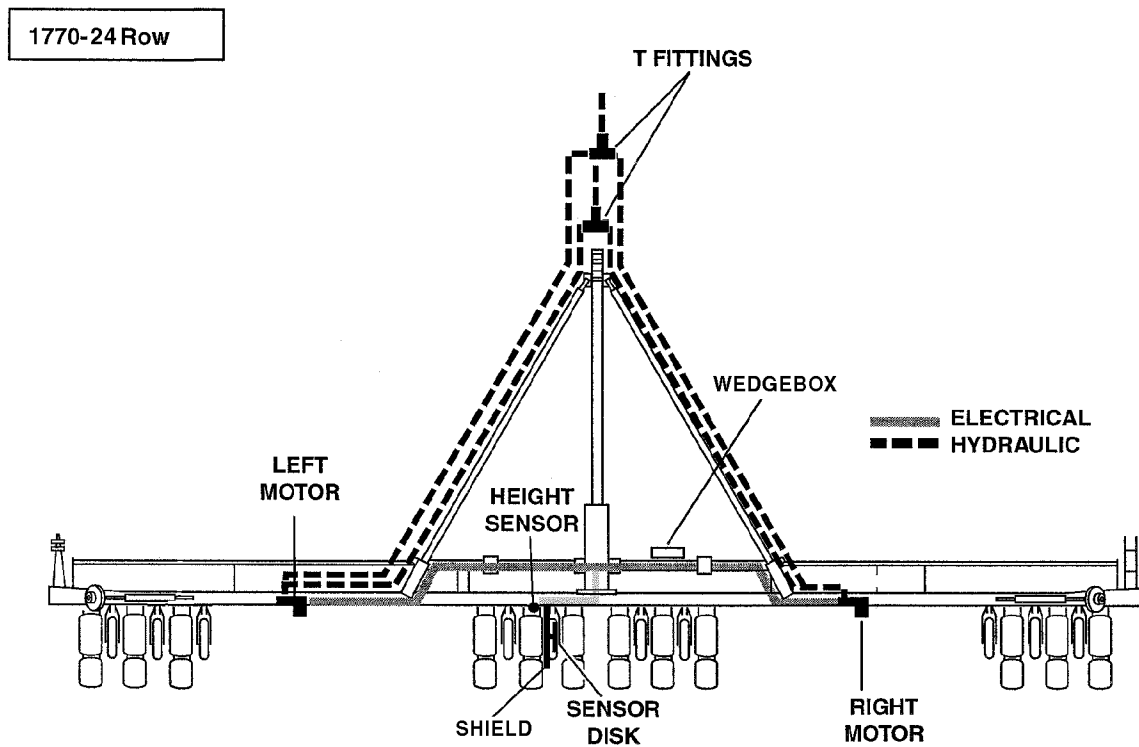
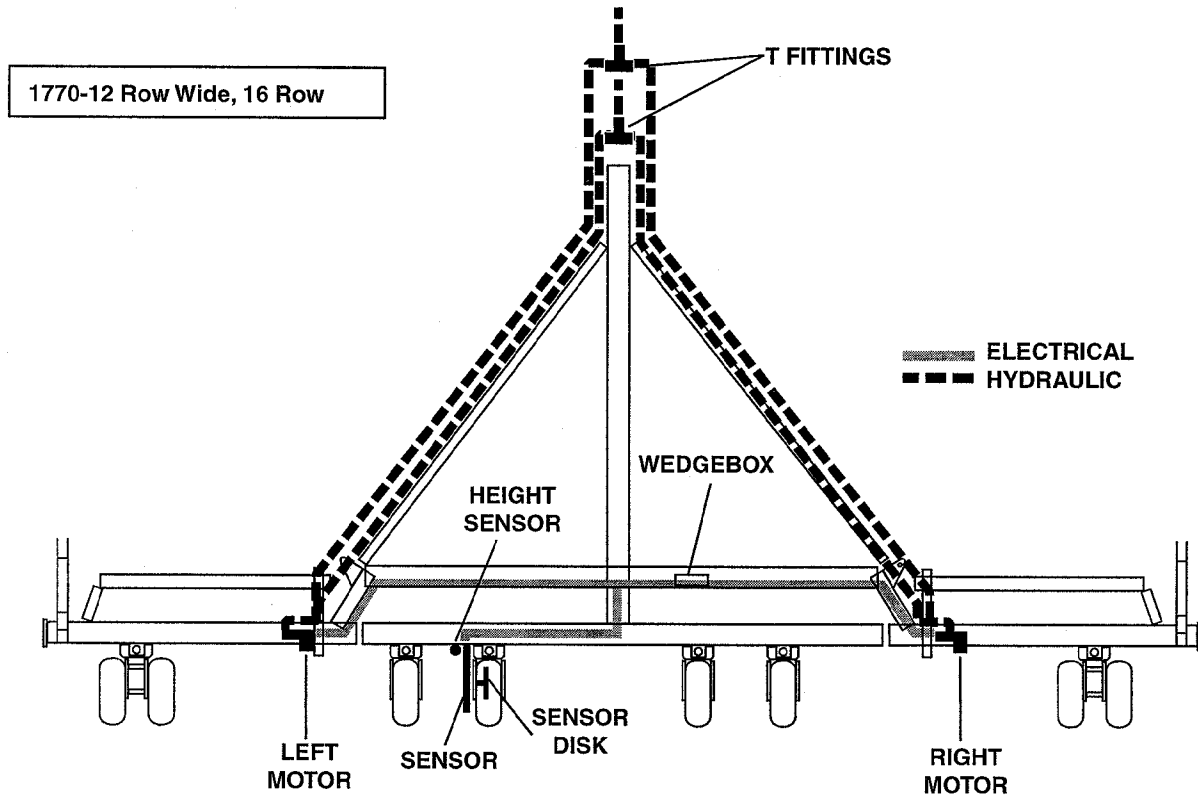
A47897 -19-12SEP01

AG,OUO1074,1537 -19-24APR00-1/1

Variable Rate Drive Location Drawing—1760 /1760NT/ and 1770 12-RN Planters with Dual Motors



Variable Rate Drive Location Drawing—1770 12-RW, 16-RN and 24-RN

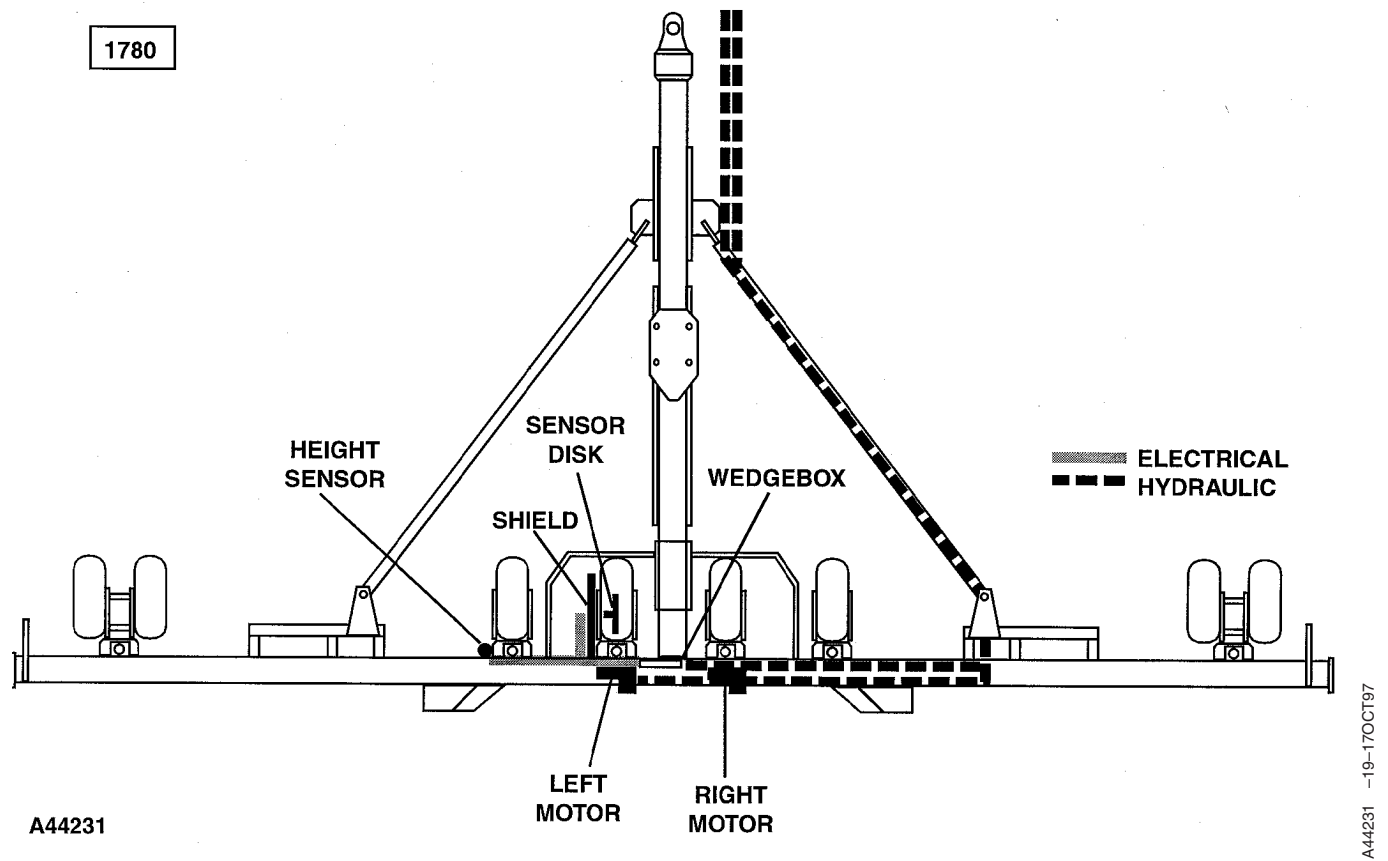


A45260

A45260 -19-02DEC98

AG,OUO1074,1540 -19-24APR00-1/1

Variable Rate Drive Location Drawing—1780 Front-Fold Planter



AG,OUO1074,1541 -19-24APR00-1/1

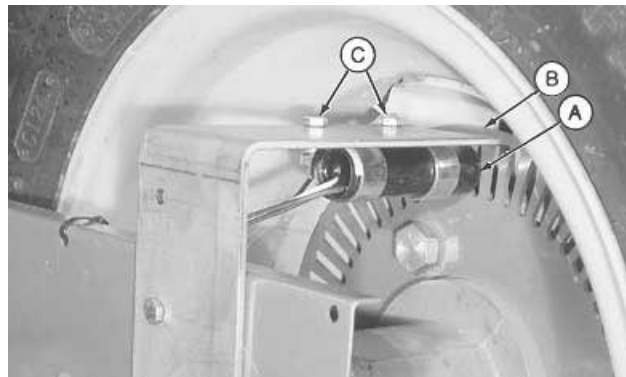
Variable Rate Drive Machine Setup

Adjusting Motion Sensor Gap

IMPORTANT: Avoid damage to sensor. Rotate wheel to ensure no contact between disk (B) and end of sensor (A).

Adjust position of wheel motion sensor (A) in clamps so space between end of sensor and disk (b) is 2—4 mm (0.08—0.16 in.). Tighten two cap screws (C) holding sensor.

A—Motion Sensor
B—Disk
C—Cap Screws



A40665 -UN-03JAN97

OUC1074,00013AA -19-19OCT01-1/1

Converting Wheel Module with Motion Sensor to Float—Integral Machines

1. Lower machine onto level surface and support frame with jack stands.

Shift tractor into “Park” or set the parking brake, stop engine and remove key.

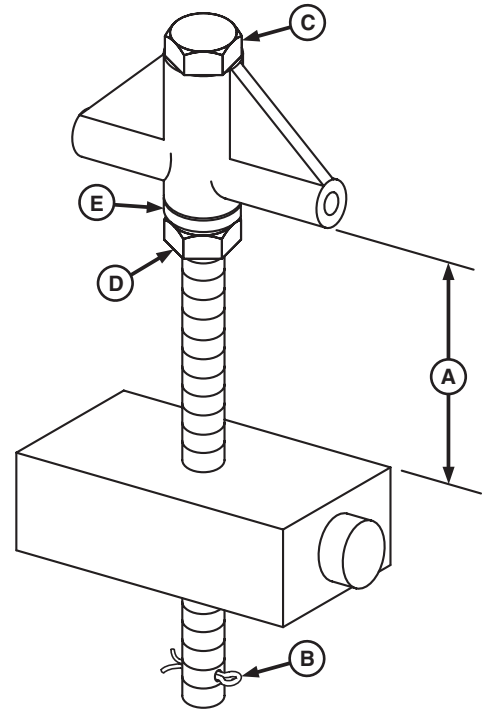
2. Locate wheel module with motion sensor.

Continued on next page

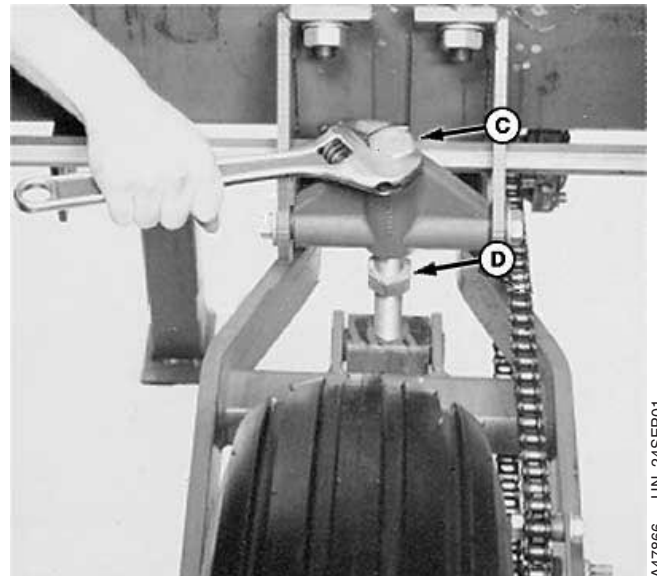
OUC1074,00013AC -19-19OCT01-1/3

3. Measure and record dimension (A).
4. Remove cotter pin (B).
5. Remove cap screw (C), nut (D) and washer (E).

A—Dimension
B—Cotter Pin
C—Cap Screw
D—Nut
E—Washer



A47864 -UN-24SEP01



A47866 -UN-24SEP01

Continued on next page

OOU01074,00013AC -19-19OCT01-2/3

NOTE: Jam nuts (E) and (F) are thinner than nut (D).

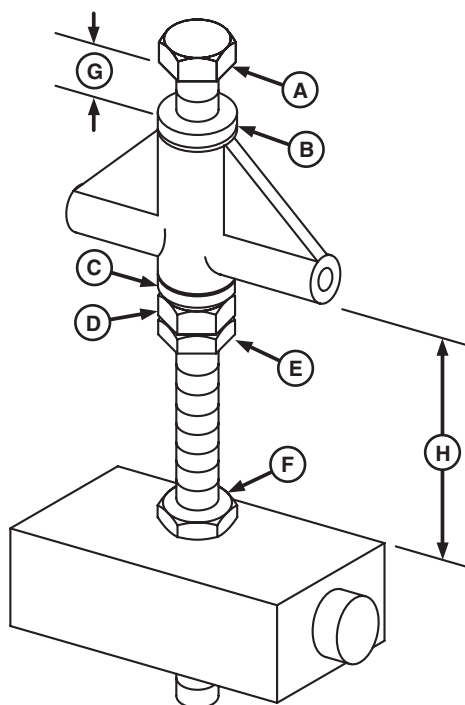
6. Install cap screw (A), washer (B), washer (C) height nut (D), jam nut (E) and jam nut (F).

NOTE: Dimension (G) is measured between bottom of cap screw head and top of washer (B).

NOTE: In extreme uneven terrain conditions, dimension (G) can be set up to 70 mm (2-3/4 in.).

7. Adjust cap screw (A) until dimension (G) is 51 mm (2 in.), for normal operating conditions.
8. Snug nut (D) against washer (C) and upper casting.
9. Tighten jam nut (E) against nut (D).
10. Turn cap screw until dimension (H) is the same as recorded earlier.
11. Tighten jam nut (F) against lower casting.

A—Cap Screw
B—Washer
C—Washer
D—Height Nut
E—Jam Nut
F—Jam Nut
G—Dimension
H—Dimension

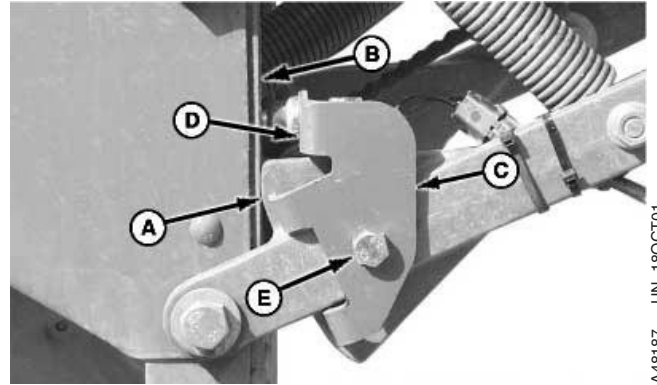


A47865 -UN-24SEP01

OUO1074,00013AC -19-19OCT01-3/3

Adjusting Dimmer Switch (Height Switch) for Integral Machines

1. Raise machine so lower parallel arm stop (A) touches planting unit frame (B).
2. Rotate sensor bracket (C) until flat surface (D) is 20 mm (3/4 in.) from planting unit frame.
3. Tighten cap screw (E).
4. Repeat for other height sensor.

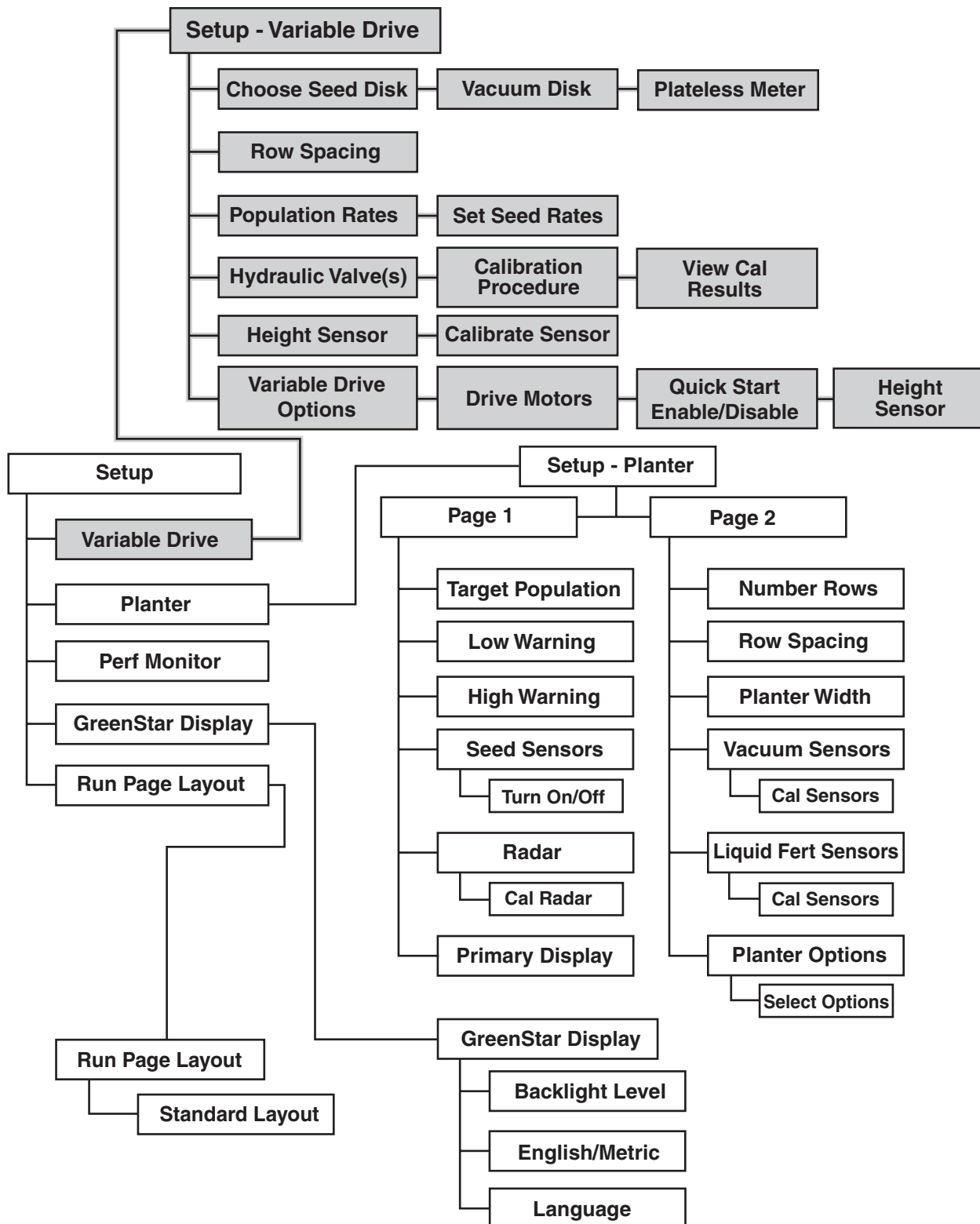


A—Stop
B—Frame
C—Bracket
D—Flat Surface
E—Cap Screw

OUC1074,00013AD -19-19OCT01-1/1

SETUP Functions—Variable Rate Drive

Setup Flow Chart—Variable Drive



A48282 -19-12NOV01

Before You Start

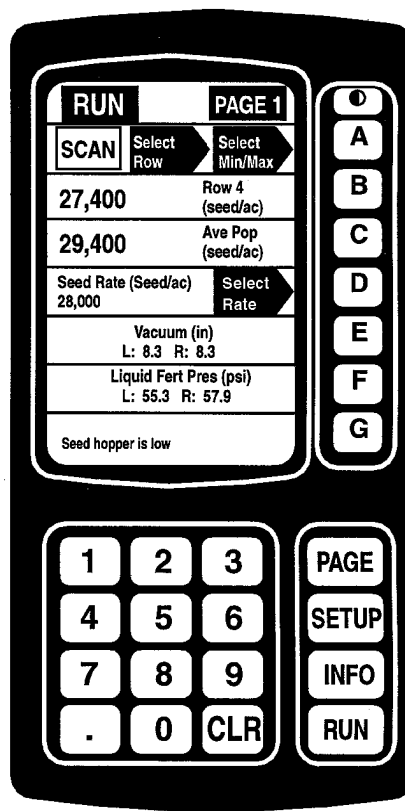
NOTE: Display screens illustrated on the following pages are provided for reference only. Actual screens may appear differently due to connection of optional devices and/or software versions in use.

NOTE: First time installation may require a Run Page Layout. Perform a Run Page Layout, refer to **SETUP—RUN PAGE LAYOUT** in **SETUP Functions—Variable Rate Drive** section.

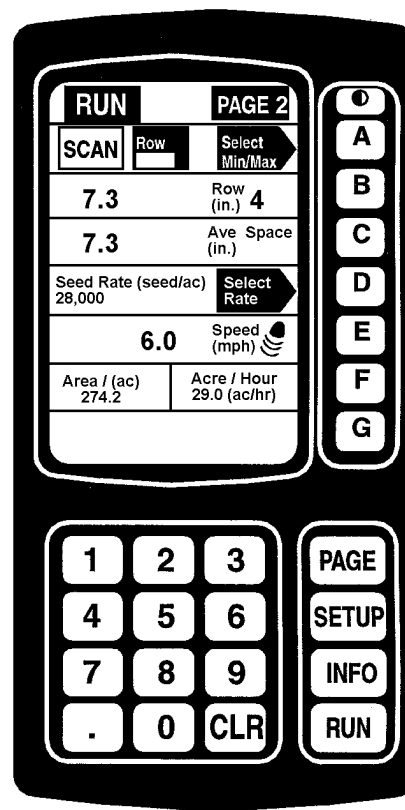
Screen at power up is RUN—Page 1.

Warning messages may be displayed if planter is not connected or there is a communication breakdown between system components.

Section D of RUN—Page 1 and 2 will vary based on the number of seeding rates that have been activated.



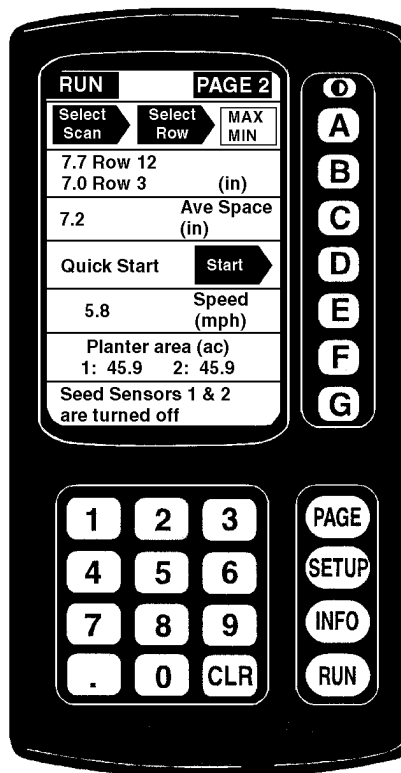
A45271 -19-17DEC98



A44957 -19-01DEC98

The screen illustrated will be visible on RUN—Page 2 when the Quick Start feature is enabled.

If the Quick Start feature does not appear in section D and the Quick Start feature has been enabled, a Run Page Layout needs to be done. Refer to SETUP—RUN PAGE LAYOUT in SETUP Functions—Variable Rate Drive section.



A45223 -19-01DEC98

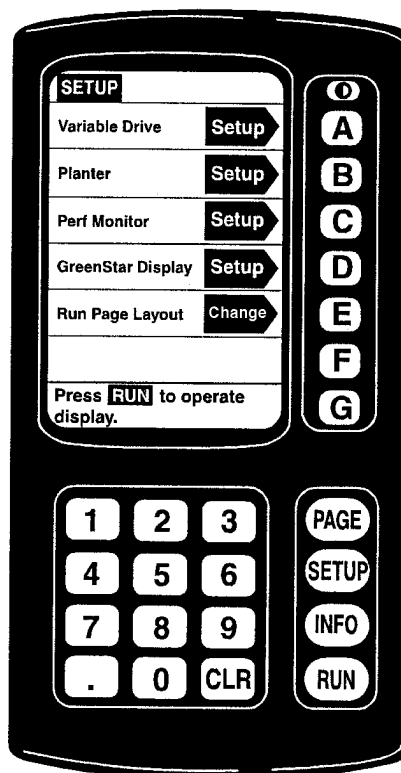
AG_OUO1074,1543 -19-24APR00-2/2

SETUP—Menu Screen

Press SETUP for initial SETUP menu.

NOTE: If Variable Drive does not appear, a Run Page Layout needs to be performed. (Refer to SETUP—RUN PAGE LAYOUT in SETUP Functions—Variable Rate Drive section.)

Press button corresponding to Variable Drive for initial screen to setup variable drive.

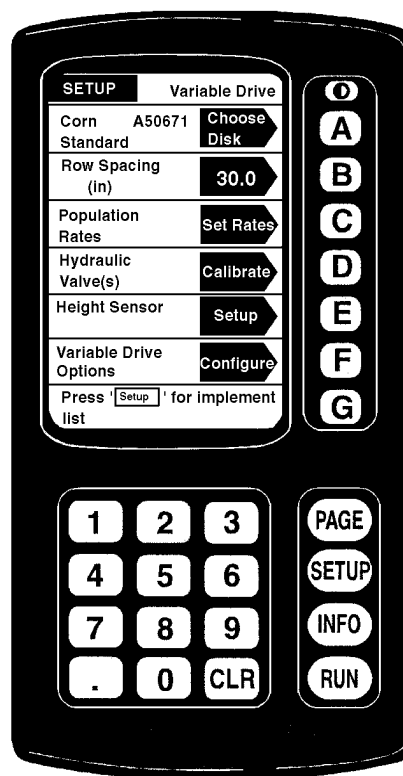


A44985 -19-01DEC98

AG_OUO1074,1544 -19-24APR00-1/1

SETUP—Variable Drive Programming

Press key A to choose a disk.



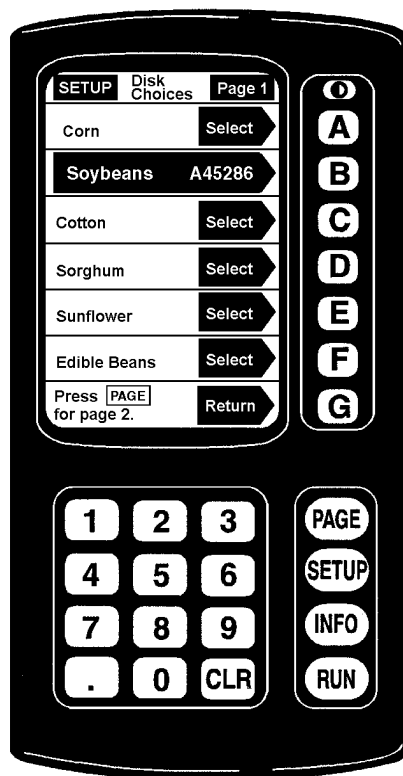
A45224 -19-01DEC98

AG,OUO1074,1545 -19-24APR00-1/1

SETUP—Variable Drive—Seed Disks

Page 1 provides disk choices for some of the more common seeds.

For additional disk choices, including “Custom Vacuum” and “Plateless Meter” press PAGE for Page 2.



A44958 -19-17DEC98

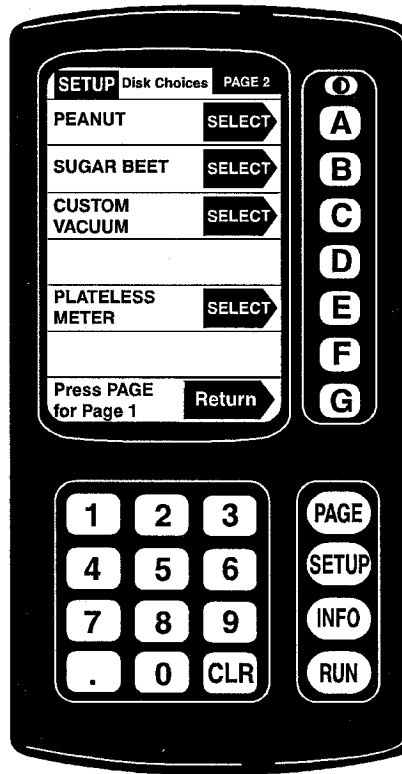
AG,OUO1074,1546 -19-24APR00-1/1

SETUP—Variable Drive—Custom Vacuum Meters

Press key C (Custom Vacuum) to select number of holes in a special seed disk.

For Plateless Meter:

Press key E (Plateless Meter) and go to SETUP—Variable Drive—Plateless Meter in this section.



A40414 -19-07OCT97

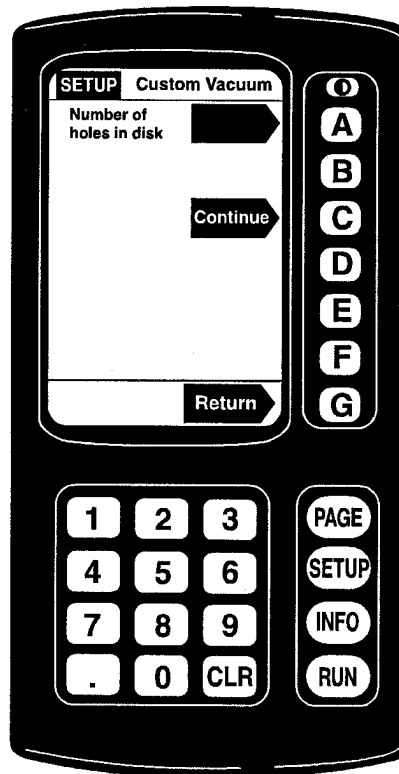
AG.OUO1074,1547 -19-24APR00-1/2

Press key A to select number of holes in Custom Vacuum seed disk.

Press key C to continue.

Press key G once for disk choices Page 1.

Press key G again for initial variable drive screen.



A40413 -19-07OCT97

AG.OUO1074,1547 -19-24APR00-2/2

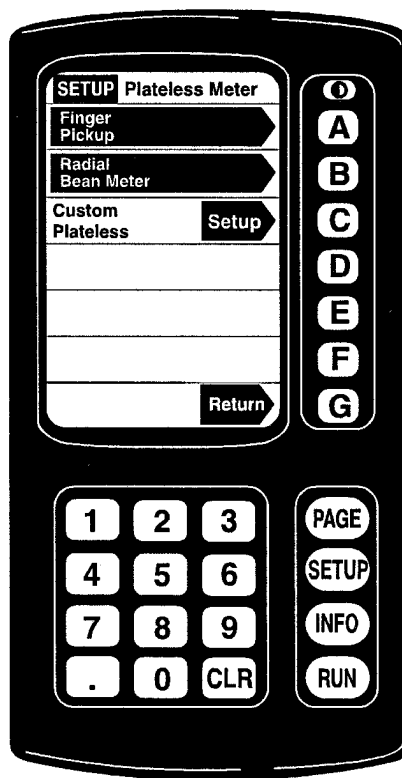
SETUP—Variable Drive—Plateless Meter

Select appropriate plateless meter.

Press key G once for disk choices Page 1.

Press key G again for initial variable drive screen.

Press key C to setup custom plateless meter.

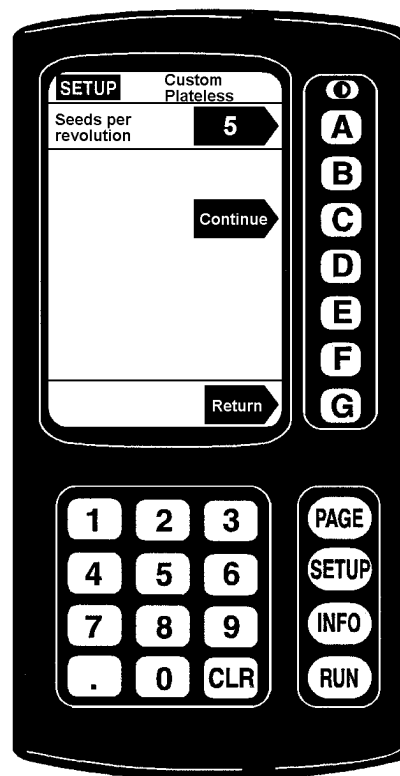


A40510 -19-24OCT97

AG,OUO1074,1548 -19-24APR00-1/2

Press key A to set number of seeds per revolution.

Press key G three times for initial variable drive screen.



A44986 -19-27AUG98

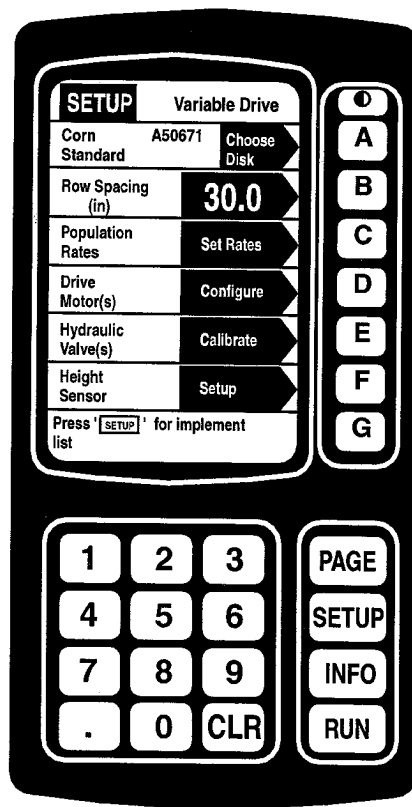
AG,OUO1074,1548 -19-24APR00-2/2

SETUP—Variable Drive—Row Spacing and Population

NOTE: Changing row spacing and population here will overwrite the values in planter monitor.

Press key B to change row spacing.

Press key C to set rates for population.



A44117 -19-21OCT97

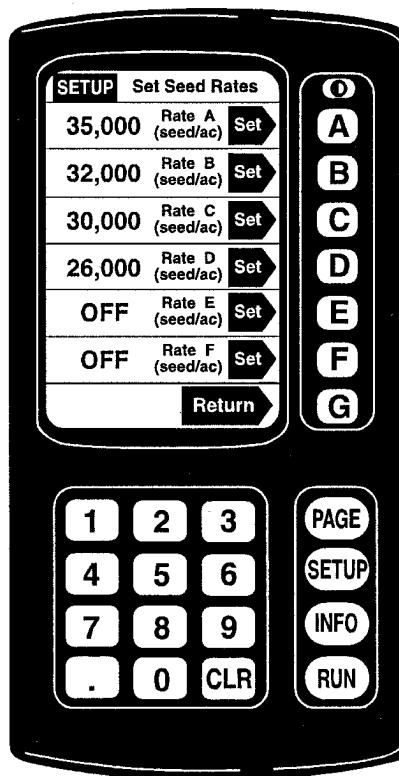
AG.OUO1074,1549 -19-24APR00-1/1

SETUP—Variable Drive—Set Seed Rates

NOTE: When only two seed rates are setup, rate change can be toggled between them on RUN Page while planting.

When setting up seed rates and changing from rate to rate, make sure the maximum decrease is no greater than 50 percent and the maximum increase is no greater than 100 percent. This may cause erratic operation of the variable drive motors.

Using this screen and the following screen, set up to six population rates (A through F). Press the appropriate letter to set seed rate.



A40407 -19-07OCT97

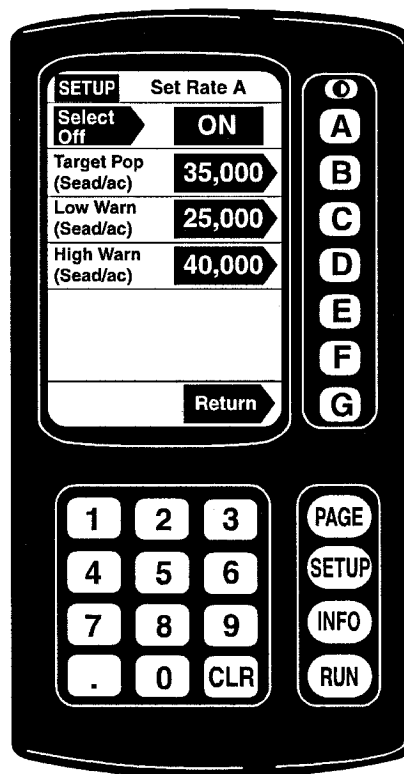
Continued on next page

AG.OUO1074,1550 -19-24APR00-1/3

Press key A to turn entered rate ON or OFF.

NOTE: “Low Warn” and “High Warn” populations are automatically adjusted based on seed type and population. Warnings can be set manually by selecting the button associated with low or high warning and typing in a value.

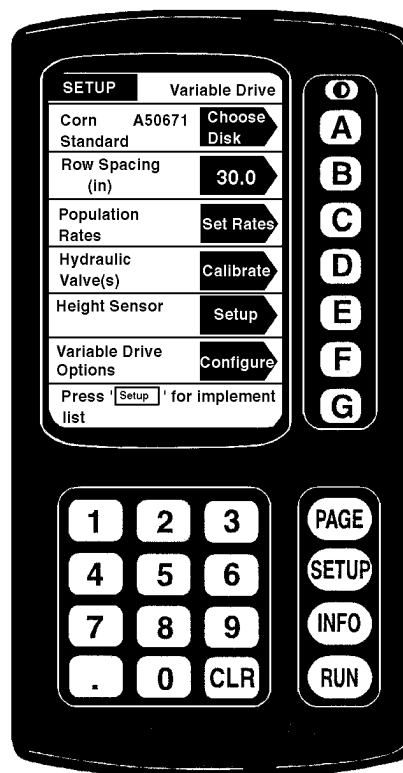
This screen is used with previous screen for setting each population rate. After rate has been entered, press key G to RETURN and identify another rate, if desired.



A40408 -19-07OCT97

AG,OUO1074,1550 -19-24APR00-2/3

When all desired rates are set, press RETURN twice for initial SETUP—Variable Drive screen.



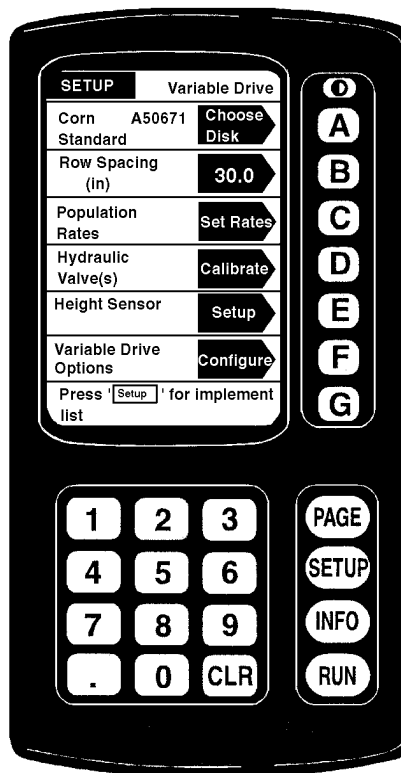
A45224 -19-01DEC98

AG,OUO1074,1550 -19-24APR00-3/3

SETUP—Configure Variable Drive Options

NOTE: It is important to configure the variable drive options prior to calibrating the hydraulic valves. This ensures that the correct number of motor(s) are loaded prior to calibration.

Press key F to configure variable drive options.



A45224 -19-01DEC98

AG,OUO1074,1551 -19-24APR00-1/2

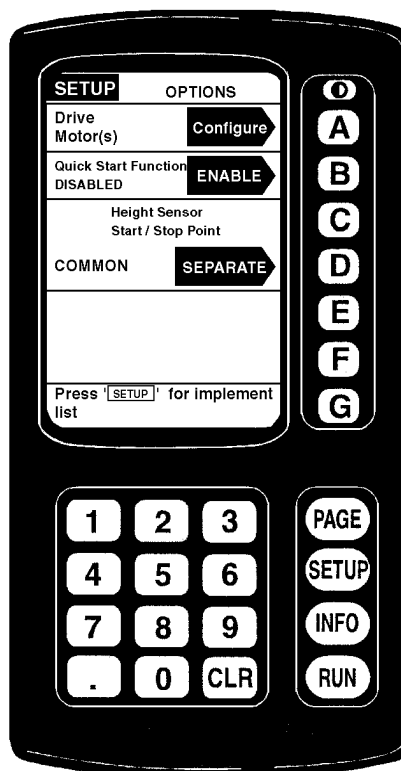
This screen is used to setup or change the system settings for:

DRIVE MOTORS: The number of drive motors and the associated gear selections. Press this button to configure drive motors.

QUICK START: The Quick Start enable/disable feature. Press this button to enable or disable Quick Start Feature.

When Quick Start is enabled or disabled a Run Page Layout is required to update RUN—Page 2. Refer to SETUP—RUN PAGE LAYOUT in this section.

HEIGHT SENSOR START/STOP POINT: The number of switching points to be used for the height sensor START and STOP thresholds. Press key D to specify a common or separate start/stop setting.



A45232 -19-01DEC98

AG,OUO1074,1551 -19-24APR00-2/2

SETUP—Options—Configure Motors

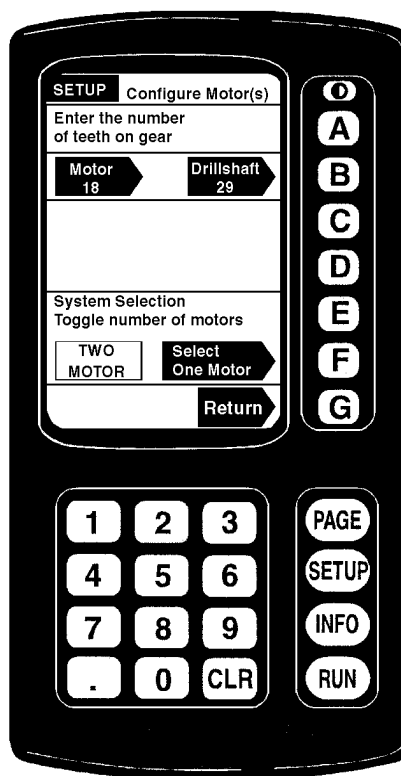
NOTE: Machines are shipped with 18-tooth sprockets on motor and 29-tooth sprockets on drill shaft.

Press key B once to enter the number of teeth on the motor gear.

Press key B twice to enter the number of teeth on the drillshaft gear.

Press key F to select between a one or two motor system.

Press key G to return to initial setup screen. Then press key D to calibrate hydraulic valves.



A45233 -19-17DEC98

AG,OUO1074,1552 -19-24APR00-1/1

SETUP—Hydraulic Valve(s)

NOTE: If the hydraulic valves are calibrated under low voltage (11 V to 12 V) and then operated under higher voltage (14 V) the valves may become oscillatory. If the valves are calibrated under higher voltage and operated at a lower voltage, response to rate changes may be sluggish. Calibrate the hydraulic valves using the same electrical load (field lights, air conditioner, etc) that will be used for normal field operation.

Press key C to start calibration.

Three conditions must be met to calibrate hydraulic valves.

IMPORTANT: Verify pressure is to “Pressure” side (marked “P”) of valve. Running motor backwards with chain installed will damage drive idlers and plateless meters.

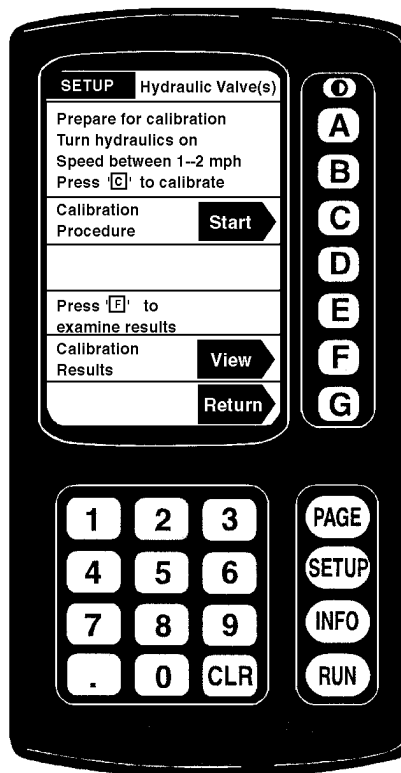
NOTE: Drawn planters do NOT need to be in the down position to calibrate valves. Integral planters with wheel motion sensor on gauge wheels need to be in down position in order for motion sensor to be active.

Press INFO—Variable Drive—Performance Data to verify that:

- Ground speed is between one and two mph. Exceeding two mph will generate a Rows Failed warning on display screen.
- Wheel sensor must indicate ACTIVE.

IMPORTANT: On new machines, field installed systems, or if hydraulic circuit has been opened, multiple calibrations may be required to purge air from lines.

- Must be hydraulic flow to valves. For 8000—9000 Series Tractors, SCV flow control setting must be 7.0 or above. Tractor operating at wide open throttle.



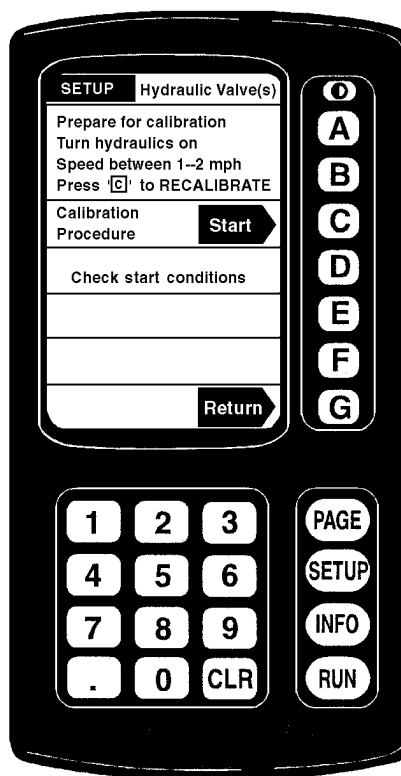
A45225 -19-01DEC98

NOTE: To check for the above mentioned conditions and access the screen on the right, touch **INFO—Variable Drive—Performance Data**.

This screen will appear if the calibration cannot be initiated. “Check Start Conditions” warning screen will be displayed. After reviewing and correcting the start conditions, the procedure may be initiated.

Check:

- That hydraulics to variable drive are on.
- Planter speed is between one and two mph.
- Wheel speed sensor is ACTIVE.



A45226 -19-01DEC08

AG,OUO1074,1553 -19-24APR00-2/2

SETUP—Calibrate Hydraulic Valves

Three conditions must be met to calibrate hydraulic valves.

IMPORTANT: Verify pressure is to “Pressure” side (marked “P”) of valve. Running motor backwards with chain installed will damage drive idlers and plateless meters.

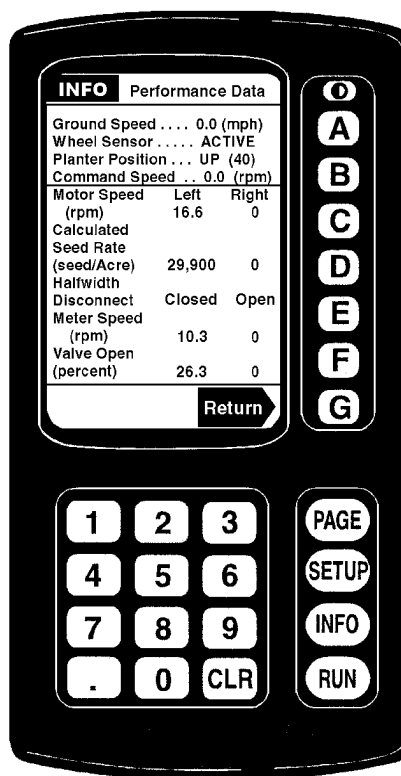
NOTE: Drawn planters do NOT need to be in the down position to calibrate valves. Integral planters with wheel motion sensor on gauge wheels need to be in down position in order for motion sensor to be active.

Press INFO—Variable Drive—Performance Data to verify that:

- Ground speed is between one and two mph. Exceeding two mph will generate warning screens on display Rows Failed.
- Wheel sensor must indicate ACTIVE.

IMPORTANT: On new machines, field installed systems, or if hydraulic circuit has been opened, multiple calibrations may be required to purge air from lines.

- Must be hydraulic flow to valves. For 8000—9000 Series Tractors, SCV flow control setting must be 7.0 or above. Tractor operating at wide open throttle.



A45236 -19-17DEC98

Continued on next page

AG,OUO1074,1554 -19-24APR00-1/3

NOTE: To check for the above mentioned conditions and access the screen on the right, touch **INFO—Variable Drive—Performance Data**.

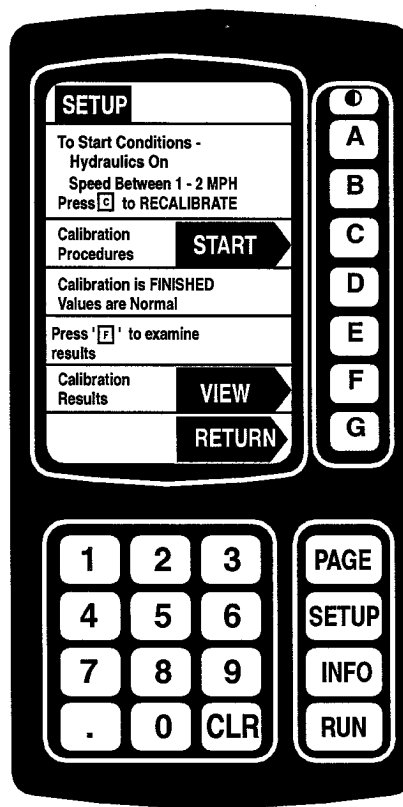
This screen will appear after calibration is complete.

Section D will read: Calibration is FINISHED Values are Normal.

IMPORTANT: On new machines, field installed systems, or if hydraulic circuit has been opened, multiple calibrations may be required to purge air from lines.

Press key C to repeat calibration.

After calibration is finished and values are normal. Press key G for initial **SETUP—Variable Drive** screen to calibrate height sensor.



A44125 -19-21OCT97

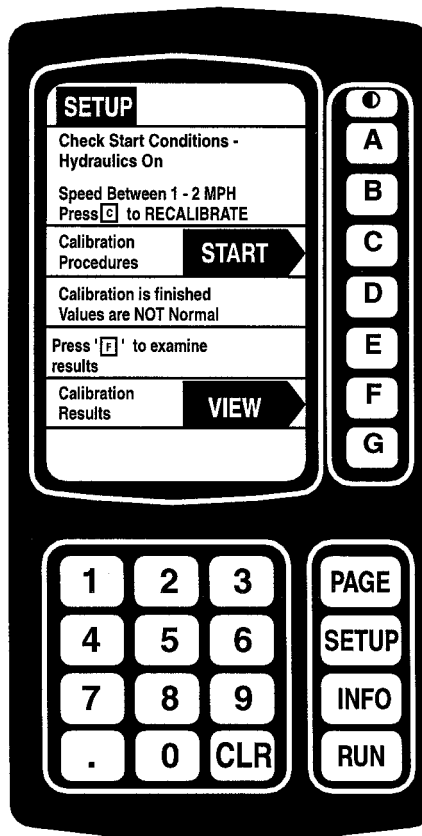
AG,OUO1074,1554 -19-24APR00-2/3

This screen will appear when valve calibration is NOT NORMAL. Calibration must be performed again.

Press key C to repeat calibration.

After calibration is finished and values are normal, press key G for initial **SETUP—Variable Drive** screen to calibrate height sensor.

After second calibration is finished and values are NOT normal, press key F to view results.



A44124 -19-21OCT97

AG,OUO1074,1554 -19-24APR00-3/3

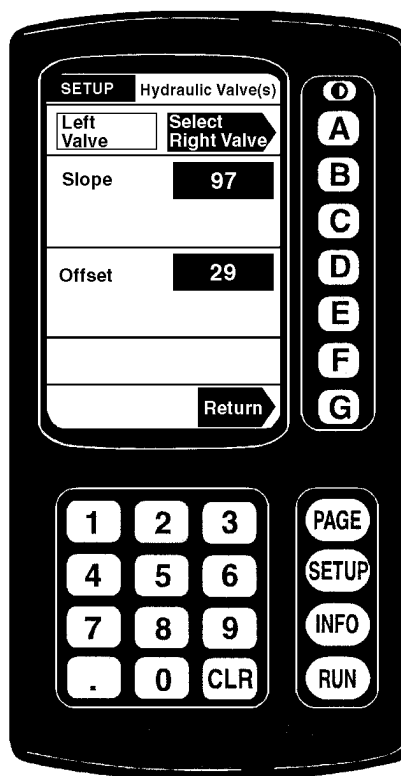
SETUP—View Calibration Results

Two values will be displayed on the hydraulic valve view screen, slope and offset. If two valves are used, separate screens for LEFT and RIGHT hydraulic valves will be provided. Use key A to toggle between the RIGHT and LEFT valves on a multiple valve system.

Offset value should be between 10 and 45. Slope value should be between 50 and 145.

Slope: The response curve (motor speed to percent valve open) determined for each valve and motor combination.

Offset: Minimum percent of valve open required to begin turning the motors.



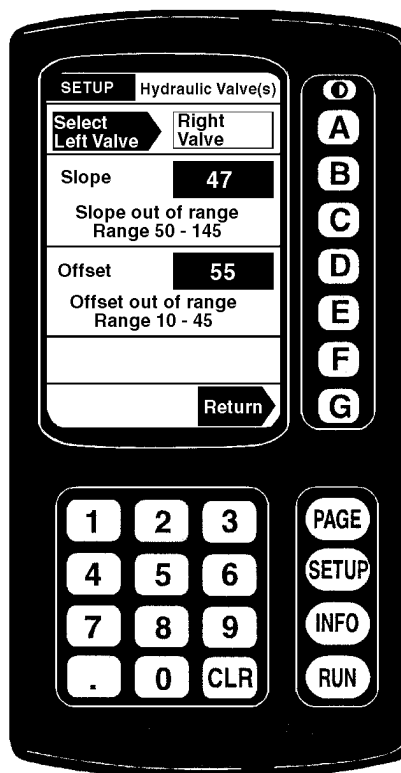
A45228 -19-17DEC98

AG,OUO1074,1555 -19-24APR00-1/3

This screen will appear and an audible alarm will sound if the calculated slope and offset values were not within an acceptable range.

If this screen appears recalibrate the system. If the problem persists contact your John Deere dealer.

Press key G two times to return to initial setup screen.

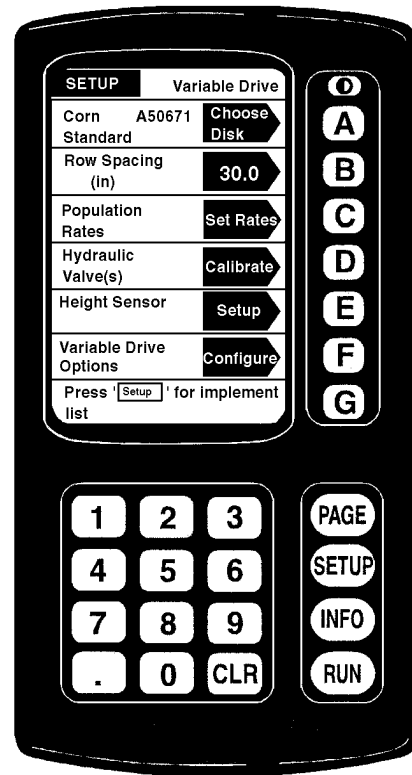


A45229 -19-17DEC98

Continued on next page

AG,OUO1074,1555 -19-24APR00-2/3

Press key E to calibrate height sensor.



A45224 -19-01DEC08

AG,OUO1074,1555 -19-24APR00-3/3

SETUP—Calibrate Height Sensor (Common)

NOTE: Changing from a common to separate height sensor programming is explained under *SETUP—Calibrate Height Sensor (Separate)*.

NOTE: For integral planters, the start/stop height must manually be set to 50.

This screen appears if the variable drive option is set for a common height sensor start/stop point.

NOTE: Calibration of the start/stop height is only available on drawn planters, however, it is still required to set full up and full down heights for both integral and drawn planters.

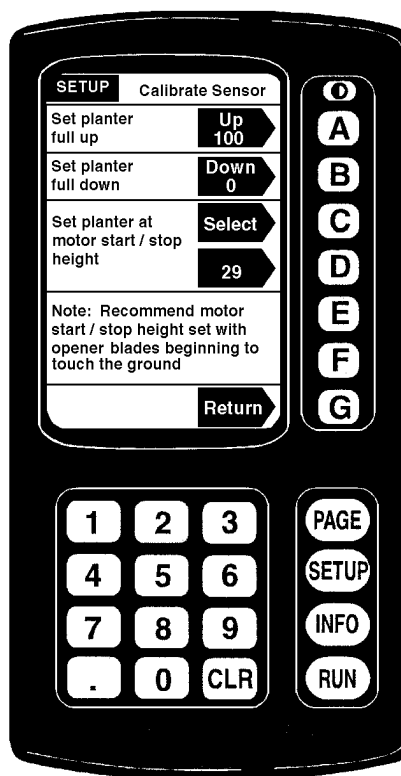
1. Fully raise planter and press key A for full up calibration at 100.

ACCEPTED will be displayed on screen when calibration is completed.

2. Fully lower planter and press key B for full down calibration at 0.

ACCEPTED will be displayed on screen when calibration is completed.

Press key G to return to initial setup screen.



A45231 -19-17DEC98

SETUP—Calibrate Height Sensor (Separate)

Drawn Planters

NOTE: The screen that appears when the operator selects **SETUP—Variable Drive—Height Sensor** depends on the configuration of variable drive options (**SETUP—Variable Drive—Configure Variable Drive Options**). The height sensor setup can be one common start and stop point or two separate points (one start point, one stop point). The common start/stop points is for simple programming to avoid operator confusion.

NOTE: Planter start and planter stop can be set to the same height. Planter start height must always have a value higher than or equal to planter stop height. Having different values for start and stop heights allow the operator to minimize skips at the beginning of a pass (start height), and minimize seed dribbling at the end of a pass (stop height), when making end of row turns without stopping.

1. Fully raise planter and press key A for full up calibration at 100.

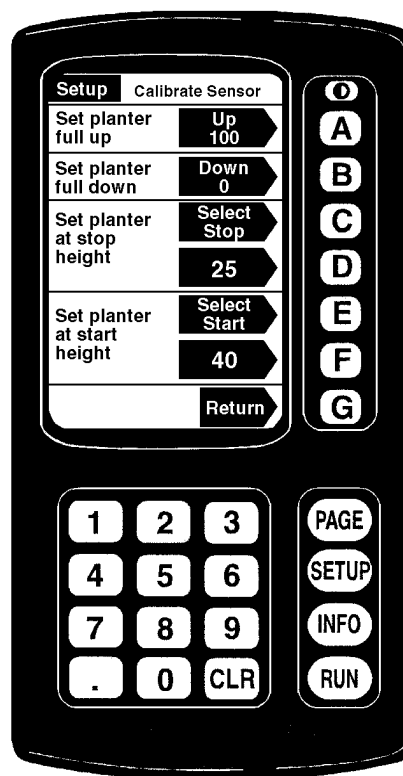
ACCEPTED will be displayed on screen when calibration is completed.

2. Fully lower planter and press key B for full down calibration at 0.

ACCEPTED will be displayed on screen when calibration is completed.

3. Raise planter to position where you desire to have drive stop and press key C. Percent of up position is indicated at D. From full up position, lower planter to position you desire to have drive start and press key E. Percent of up position is indicated at F. The percent stop and start position can also be entered manually at D and F.

ACCEPTED will be displayed on screen when calibration is completed.



A45230 -19-01DEC98

Integral Planters (Except for 1720 16-RN Planters)

NOTE: Calibration of the height switch is only possible with drawn planters (not an option on integrals). For integral planters, the planter start height and stop height must manually be set to 50.

1. Fully raise planter and press key A for full up calibration at 100.

ACCEPTED will be displayed on screen when calibration is completed.

2. Fully lower planter and press key B for full down calibration at 0.

ACCEPTED will be displayed on screen when calibration is completed.

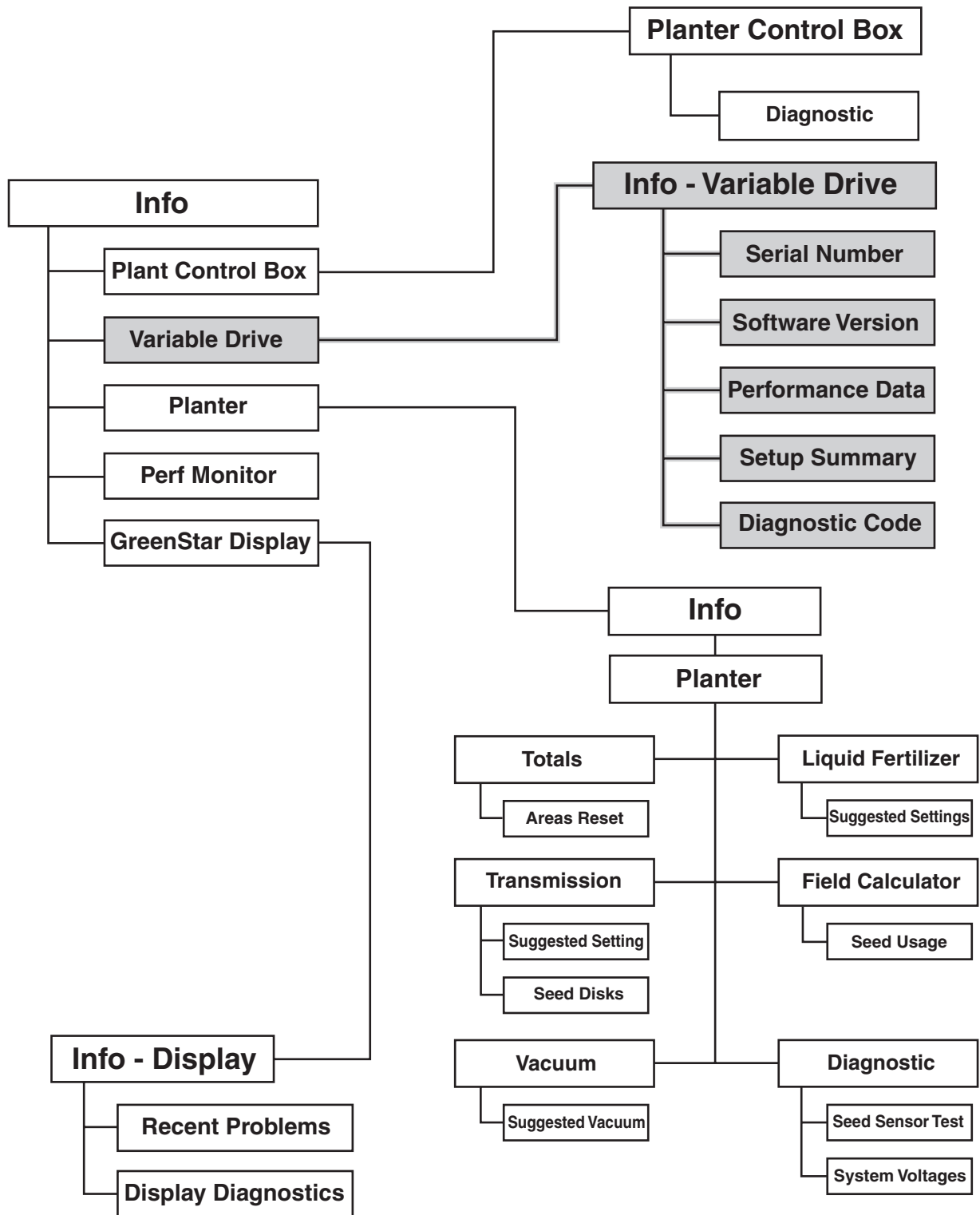
3. The planter start and stop heights must manually be set to 50 using the D and F Keys.

ACCEPTED will be displayed on screen when calibration is completed.

AG,OUO1074,1556 -19-24APR00-2/2

INFO Functions—Variable Rate Drive

INFO Flow Chart—Variable Drive

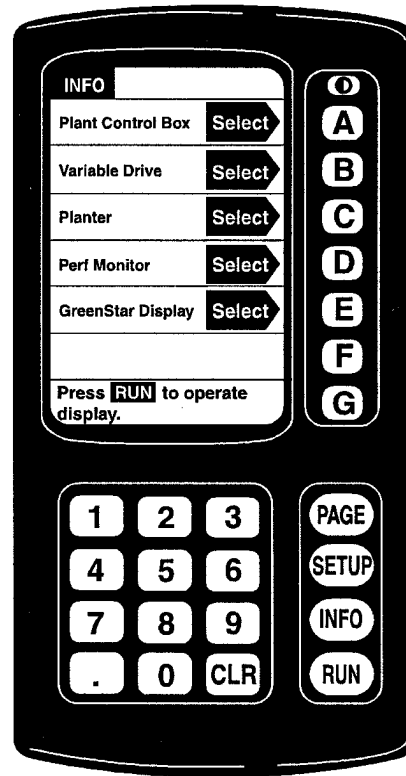


A48283 -19-12NOV01

INFO—Menu

Press INFO for initial menu screen.

Press key B to select Variable Drive information.



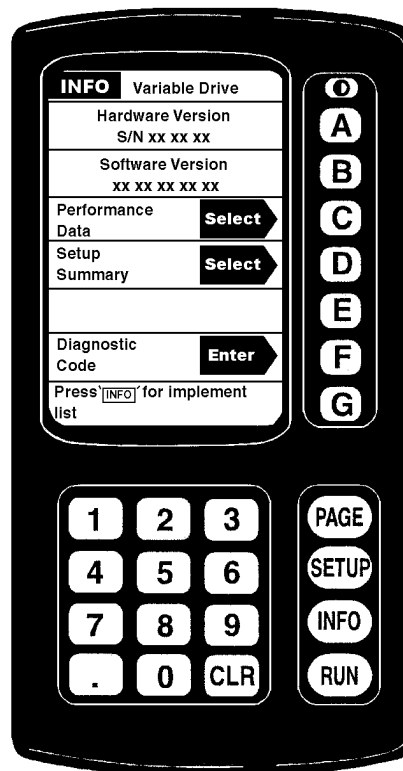
OUO1074,00001E5 -19-11MAY01-1/1

INFO—Variable Drive

This screen displays hardware version, software version and performance data, and setup summary.

Diagnostic code section is for factory service.

Select key C for Performance Data.



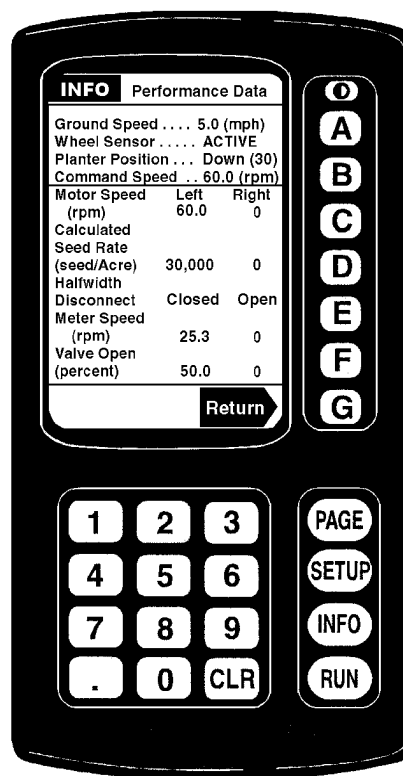
AG,OUO1074,1571 -19-24APR00-1/1

INFO—Performance Data

This screen provides status of system, and information useful in troubleshooting.

- **Ground Speed:** Signal from radar
- **Wheel Sensor:** ACTIVE indicates planter motion and a signal from the planter wheel sensor. INACTIVE indicates no motion or no signal from the planter wheel sensor. Wheel sensor should be within 2 mm of the slotted plate.
- **Planter Position:** Signal from height switch indicating planter is in raised or lowered position. It must be in down position to activate variable drive. Value in parentheses indicates current position of planter.
- **Command Speed:** This is the calculated motor speed based on all inputs. (Selected population, ground speed, row spacing, motor/drillshaft gear ratio and meter type).
- **Motor Speed:** This is the measured speed at the motor speed sensor.
- **Calculated Seed Rate:** This is the calculated seed rate based on inputs (meter type, disk, etc.) and the measured motor speed at the motor speed sensor. For actual seed population reading consult RUN pages.
- **Half-Width Disconnect:** Indicates status of each motor. Closed indicates the motor is on and open indicates the motor is turned off.
- **Meter Speed:** This is a calculated value based on sprocket teeth counts, row spacing, meter type, seed disk selected, motor speed, etc. This is useful to indicate whether a meter is operating outside its parameters.
- **Valve Open Percent:** Indicates the percentage of maximum flow through valve.

Press key G to return to INFO—Variable Drive screen.



A45272 -19-17DEC98

INFO—Setup Summary

NOTE: On INFO—Variable Drive page, press key D to select Setup Summary.

The Setup Summary pages allow the operator to view the information that was specified when the monitor/variable drive was setup.

These screens aid in spotting setup mistakes.

Offset: Minimum percent of valve position required to begin turning the motor. Should be a value between 10 and 45.

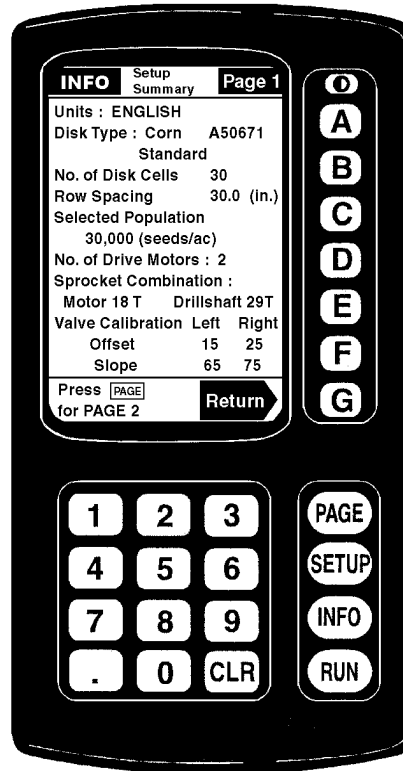
Slope: The response curve (motor speed to percent valve position) determined for each valve and motor combination. Should be a value between 50 and 145.

Press PAGE to view Page 2.

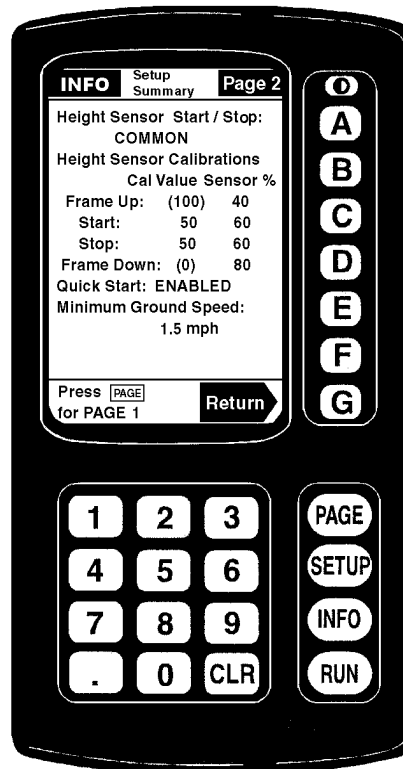
Height Sensor Cal Value: Indicates the position of the frame up, frame down, start, and stop points. Full raised position should be 100 and full down should be zero. All other points should be between these values. Height Sensor percent; the ratio between 12 volts and the height sensor output.

NOTE: Minimum ground speed will change when switching crops due to changes made in seeds dropped per revolution, which is determined by meter type or cell count on vacuum disks. The population selected will also have an effect on what minimum ground speed is.

Minimum Ground Speed: The minimum ground speed required to achieve a motor rpm of 18 (at the selected population rate). Motors may not function below 18 rpm.



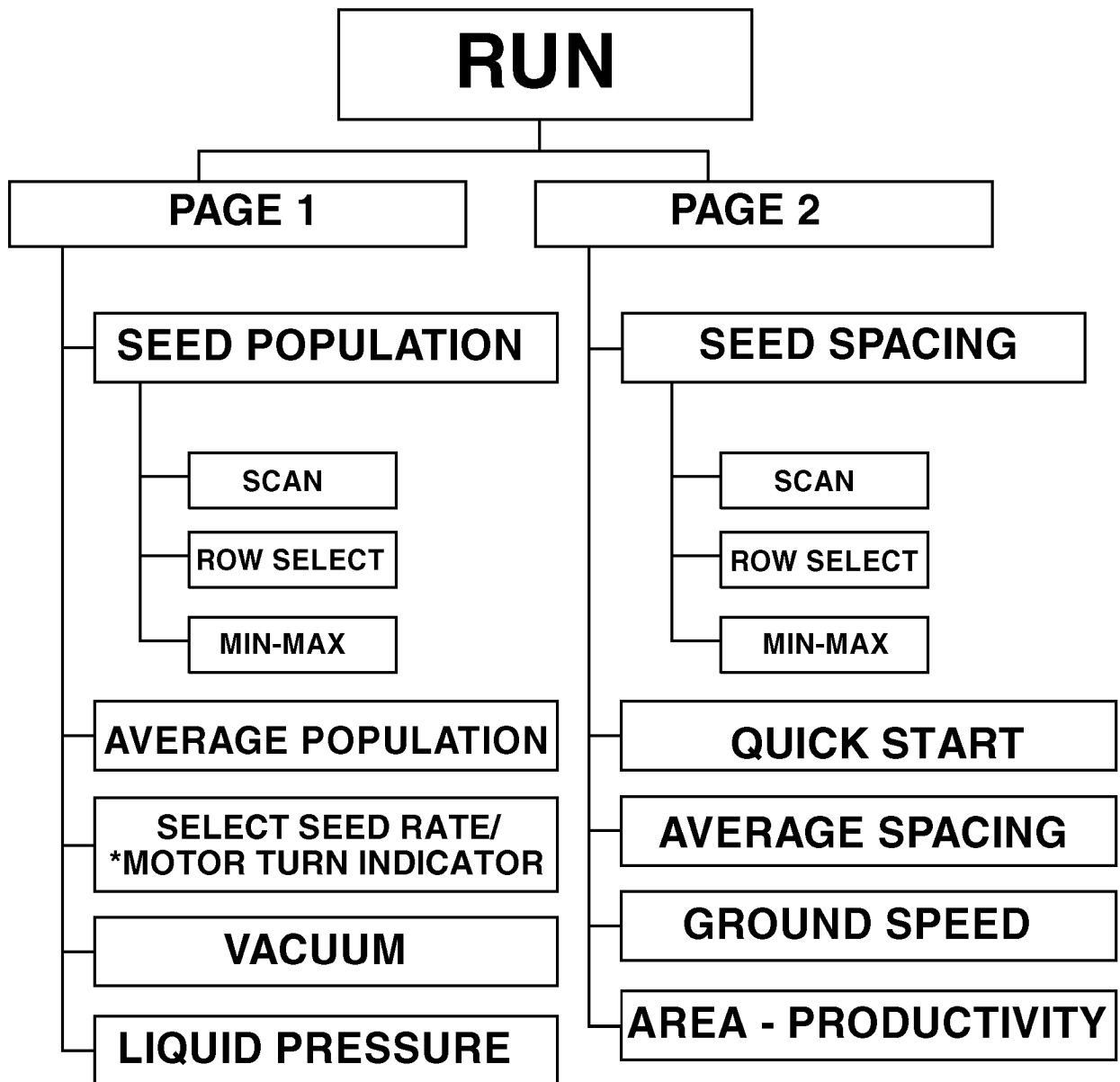
A45237 -19-01DEC98



A45238 -19-17DEC98

RUN Functions—Variable Rate Drive

Variable Drive Run Function Flow Chart



A47425 -19-14MAY01

AG,OUO1074,1583 -19-24APR00-1/1

RUN—Page 1

With power on and planter operating, the monitor scans the population rate of each row in sequence.

NOTE: Warnings which look for a row not planting do NOT require 1/200 acre traveled.

When planting above two mph, the monitor collects data for 1/200 acre per row before displaying an update to screen. The distance traveled is dependent on row spacing.

- 76 cm (30 in.) rows require 27 m (90 ft) traveled
- 38 cm (15 in.) rows require 53 m (175 ft) traveled
- 19 cm (7-1/2 in.) rows require 107 m (350 ft) traveled

Scan selection scans each row for four seconds.

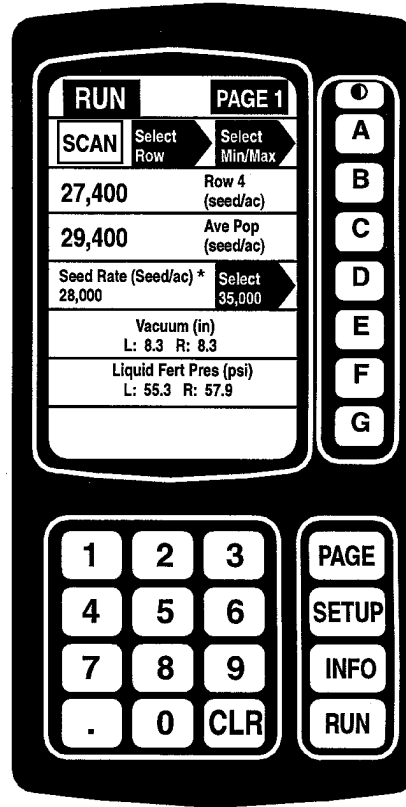
NOTE: Even though sensors are turned off, they are still used in counting area.

Turned off sensors can be selected from Row Select.

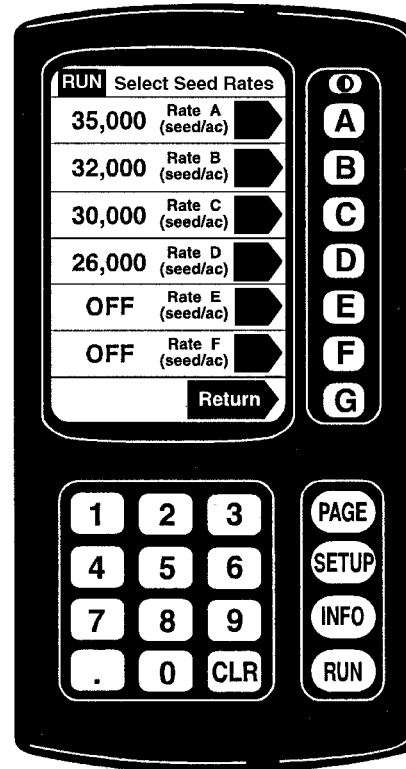
When only two seed rates are setup, rate can be changed to the second seed rate by pressing key D. When more than two rates are entered, Select Rate screen will display. From this screen, select desired population.

NOTE: The asterisk in section D alerts the operator that the variable drive motor is turning. It will disappear when the drive is turned off or disabled. This will be accompanied by an audible alarm.

When ground speed drops below two mph, the monitor will not count seeds. When this occurs, the display will lock population values that were displayed just before ground speed dropped below two mph. When speed goes above two mph, display will resume normal operation.



A44987 -19-02DEC98



A47426 -19-14MAY01

RUN—Page 2

Press key A while monitor is scanning to switch to the Select Row or Select Min/Max mode.

First, the row number with MAX population and MIN population is displayed in window B.

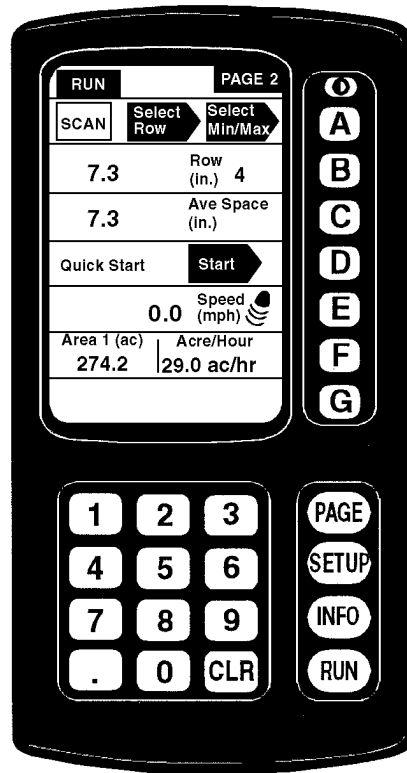
Average spacing is displayed in window C.

NOTE: When shipped from factory RUN—Page 1 displays seed population and RUN—Page 2 displays seed spacing. To move seed spacing to Page 1 perform the following:

- SETUP
- Planter
- Primary Display (Select spacing)
- CANCEL WARNING MESSAGE
- SETUP
- Run Page Layout
- Setup Standard Layout
- RUN

NOTE: When shipped from the factory, the Quick Start feature will be enabled. To disable and show seed rate selection on RUN—Page 2 perform the following:

- *SETUP*
- *Variable Drive*
- *Variable Drive Options*
- *Quick Start (Disable)*
- *SETUP*
- *Run Page Layout*
- *Select Run Page Layout*
- *RUN*



A45240 -19-17DEC98

Operate Quick Start Feature

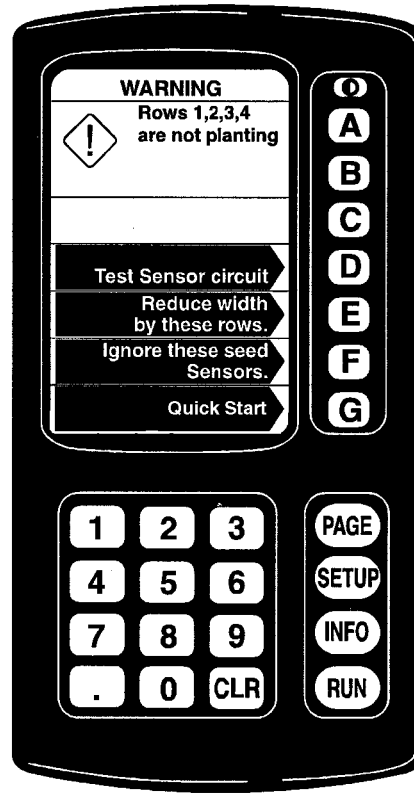
NOTE: Minimum ground speed is the speed necessary to turn motors at 18 rpm. Minimum ground speed will vary depending on what population is selected and how many seeds drop per revolution of meter.

The Quick Start feature is located on All Rows Failed page and RUN—Page 2. The Quick Start feature allows the operator to minimize the skip caused by operational delays when starting from a stop. Quick Start enables the variable drive when motion is detected at the wheel sensor and assumes a speed equal to minimum ground speed.

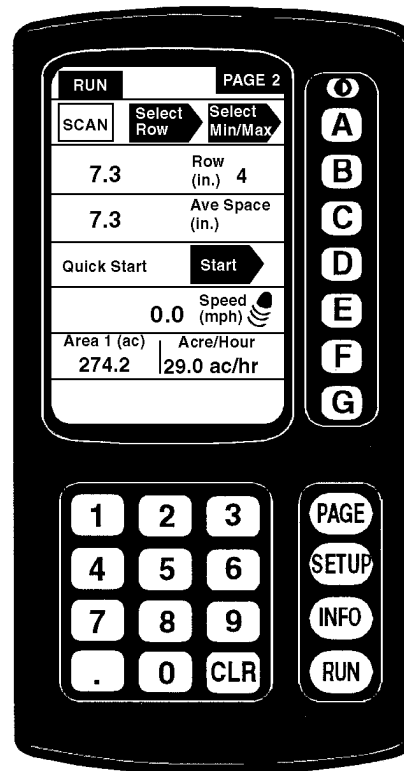
The operator has six seconds to reach a speed over the minimum ground speed before the feature times out and disables the drive.

Press key D to start Quick Start.

It is not recommended to operate the system at a motor speed below 18 rpm. The variable drive control system engages the drives at a speed equivalent to the minimum ground speed and the currently selected population rate. See INFO—Variable Drive—Setup Summary—Page 2 for the ground speed necessary to operate the motor at 18 rpm (minimum ground speed) for the selected population rate.

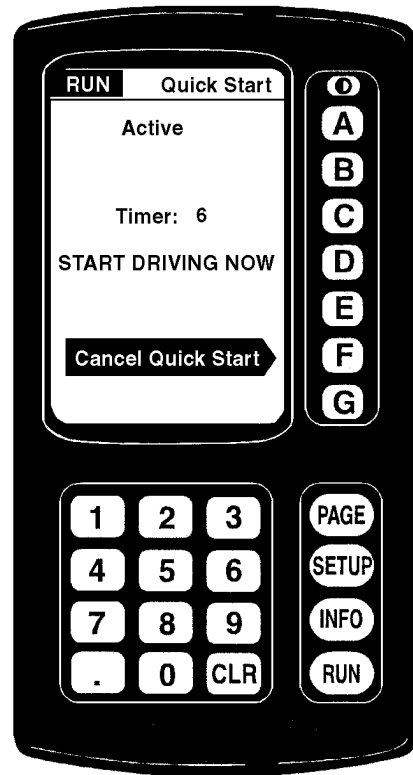


A47427 -19-14MAY01



A45240 -19-17DEC98

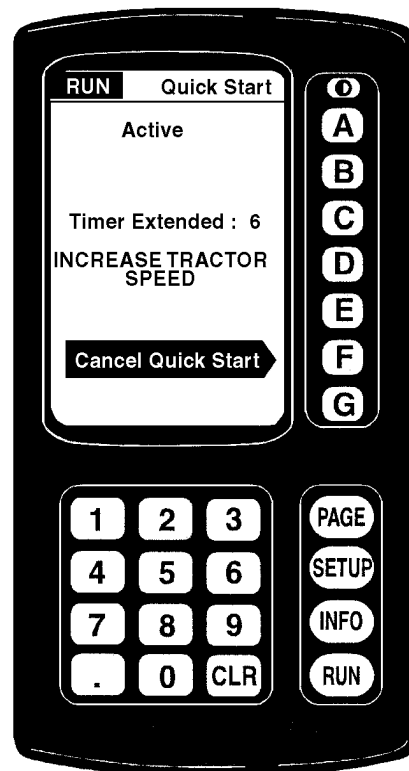
Once the “start” key is pressed, the operator has six seconds to reach minimum ground speed.



A45242 -19-17DEC98

AG,OUO1074,1586 -19-24APR00-2/4

This screen will appear if the wheel sensor detects motion and the radar speed is above one mph but below minimum ground speed. The operator will then have an additional six seconds to get the planter over minimum ground speed.

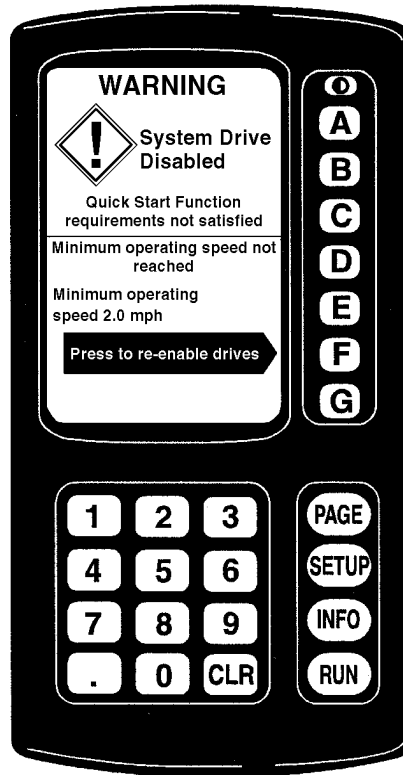


A45243 -19-17DEC98

Continued on next page

AG,OUO1074,1586 -19-24APR00-3/4

If the operator does not get the planter above minimum ground speed, the variable drive will disable and the warning screen will appear.



A45244 -19-17DEC98

AG,OUO1074,1586 -19-24APR00-4/4

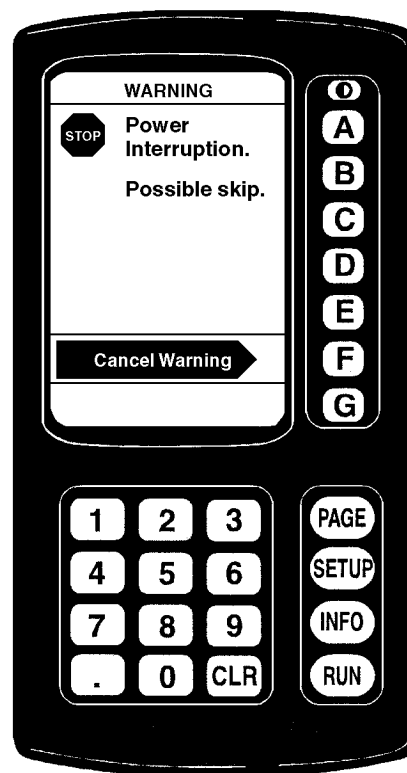
Variable Rate Drive Warnings

Operating Warnings

WARNING: STOP. Power Interruption. Possible skip.

This full page warning will occur anytime one or both of the motor speed sensors detect the motors are not turning during operation. It is normal for this warning to come up at the end of the field when lifting the machine.

This warning will be accompanied by five audible beeps when the motors stop.



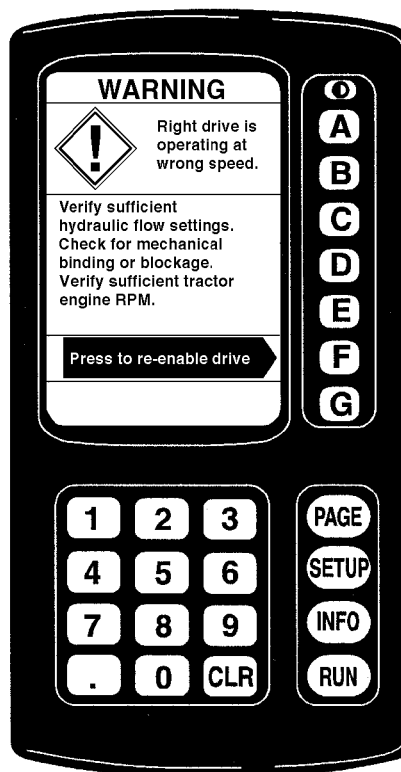
A48188 -19-25OCT01

AG,OUO1074,1587 -19-24APR00-1/8

WARNING: Right or left drive is operating at wrong speed.

NOTE: Maintain adequate tractor engine rpm at all times to provide enough oil flow for hydraulic motors to operate properly. Failure to maintain engine RPMs can cause the warning screen shown here.

This full page warning occurs when the motor speed sensor detects that the drive motor is operating at less than 70 percent or more than 125 percent of the correct speed for the selected population rate. The variable rate drive processor checks this speed every two seconds.



A47107 -19-26FEB01

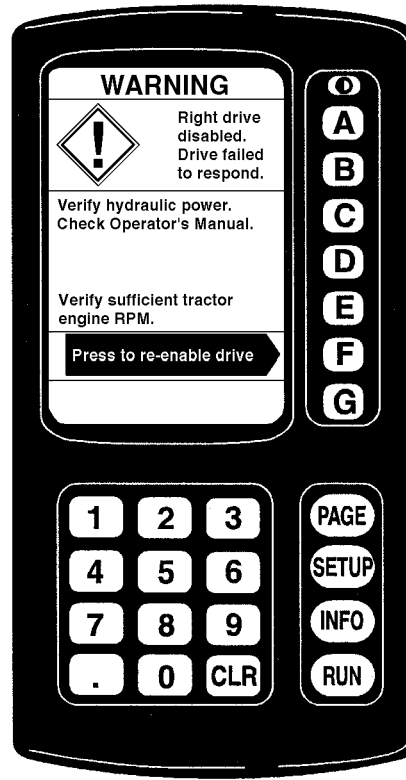
Continued on next page

AG,OUO1074,1587 -19-24APR00-2/8

WARNING: Right or left drive disabled. Drive failed to respond.

NOTE: Maintain adequate tractor engine rpm at all times to provide enough oil flow for hydraulic motors to operate properly. Failure to maintain engine RPMs can cause the warning screen shown here.

This warning occurs if the drive motor(s) are turning less than 11.5 rpm and the valves are open enough to turn the motor(s) 18 rpm or faster according to the valve calibration. The variable rate drive controller checks for this condition every two seconds.

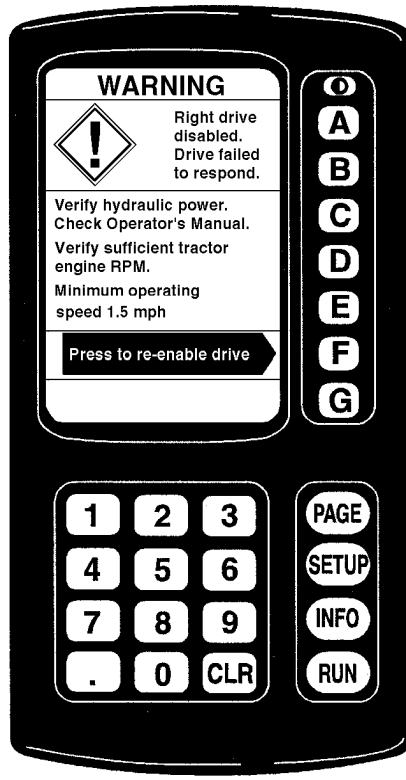


AG.OUO1074,1587 -19-24APR00-3/8

WARNING: Right or left drive disabled. Drive failed to respond.

NOTE: Maintain adequate tractor engine rpm at all times to provide enough oil flow for hydraulic motors to operate properly. Failure to maintain engine RPMs can cause the warning screen shown here.

This warning occurs when motor speed should be between 11.5 rpm and 18 rpm and the motors are currently not turning.

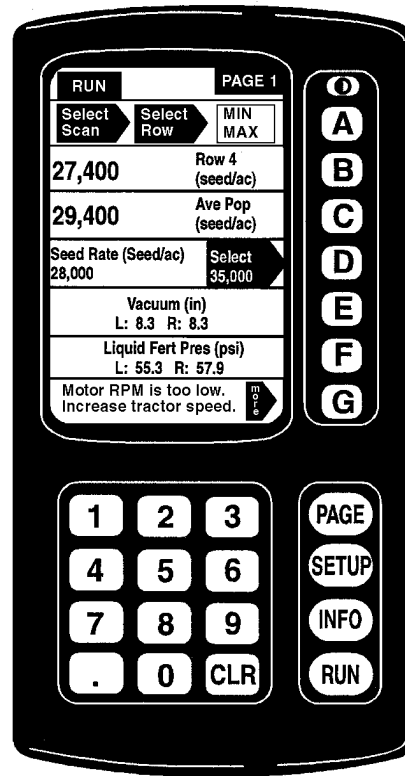


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AG.OUO1074,1587 -19-24APR00-4/8

WARNING: Motor rpm too low. Increase tractor speed.

The variable rate drive motors do not operate well at very low speeds or low hydraulic flow. A warning is displayed when motor RPM drops below 18 rpm, motors shut off when rpm drops below 11.5 rpm.

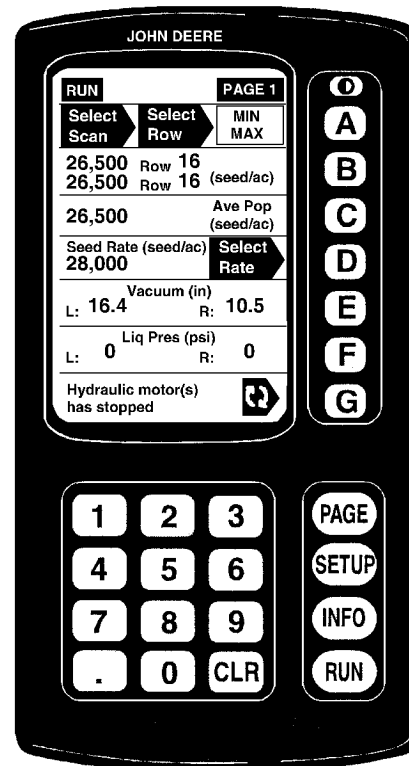


A45245 -19-02DEC08

AG,OUO1074,1587 -19-24APR00-5/8

WARNING: Hydraulic motor(s) has stopped.

If variable rate drive motor speed sensor fails or variable rate motor stops, this warning will be issued.



A48189 -19-25OCT01

Continued on next page

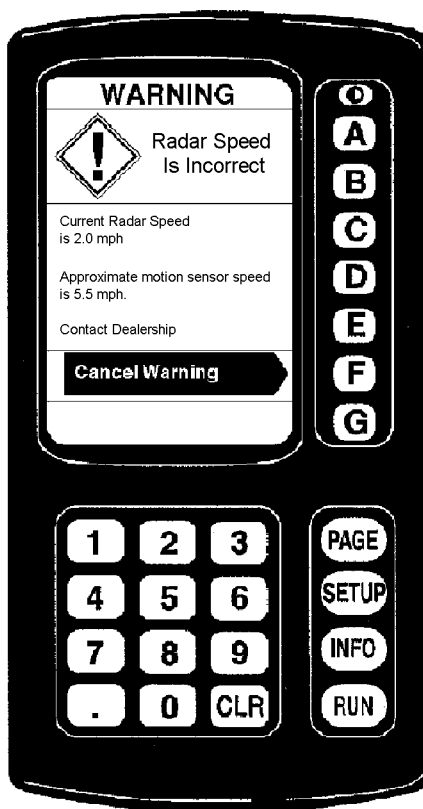
AG,OUO1074,1587 -19-24APR00-6/8

WARNING: Radar Speed Incorrect.

The electronics system on the planter is continuously comparing the radar speed coming from the tractor, to the speed calculated from the motion sensor on the planter. If the two speeds vary by 300 percent this warning will be displayed.

This situation could be caused by several things:

- If there is excessive wind/dust blowing under radar eye causing radar to be inaccurate.
- If the tire that has the motion sensor is slipping excessively (this might happen if ground is very muddy and the tire is skidding instead of turning) or has lost ground contact.
- If radar sensor is failed.
- If wheel motion sensor is failed or improperly installed.



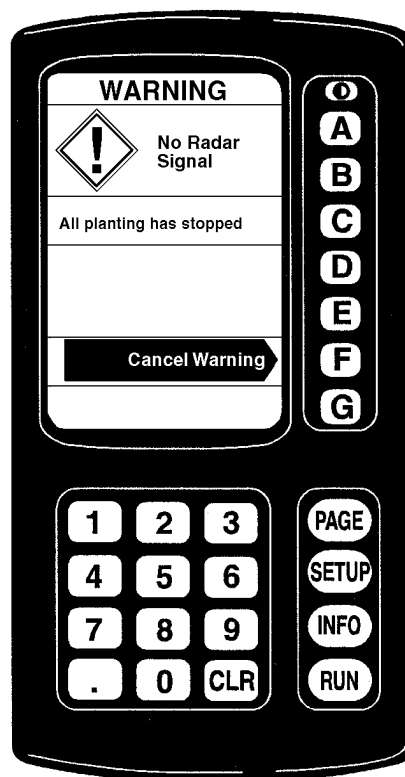
A47110 -19-25APR01

AG,OUO1074,1587 -19-24APR00-7/8

WARNING: No Radar Signal.

If the planter is in a down position and the wheel sensor detects vehicle motion, a warning screen will be displayed and an audible alarm sounded if no radar signal has been detected for three seconds.

Press key F to cancel the warning and silence the alarm.



A45246 -19-02DEC98

AG,OUO1074,1587 -19-24APR00-8/8

Troubleshooting

General Note

When trying to diagnose a problem with the variable drive system, use the following tools to help locate problems:

Reference variable drive Setup Summary page to identify setup errors. The Setup Summary page can be located by pressing INFO—Variable Drive—Setup Summary on the GREENSTAR® display. Note, there are two pages in the setup summary. To view the second page, press PAGE on the GREENSTAR® display.

Reference the variable drive Performance Data page to identify performance problems. The Performance Data page can be located by pressing INFO—Variable Drive—Performance Data on the GREENSTAR® display. If row failed warnings are interfering with diagnosing variable drive problems, turn all of the seed sensors off. To diagnose problems without metering seed/chemical, disconnect the seed/chemical meters using the disconnect. To diagnose problems without engaging the row unit in the ground, set the frame height start position to start the motors with the row units off the ground.

A warning tone will sound each time a motor starts or stops. An asterisk (*) will also appear next to the population rate selection on RUN—Page 1 whenever there is at least (ONE) motor turning.

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AG,OUO1074,1588 –19–24APR00–1/1

Error and Fault Codes

WARNING Fault Codes

- **020 Implement Disconnected**

One or more Monitor Controllers disconnected. This fault code happens when an implement fails to respond to the GREENSTAR™ Displays roll call, every eight seconds. It is often accompanied by fault code 110 due to the brief intermittent connection/transient that occurs as an implement is disconnected.

This fault code could be the expected result of an operator disconnecting an implement, or could be caused by an intermittent CAN connection. It can also occur if an implement stops communicating on the CAN bus, such as from power loss or internal faults.

- **021 Display Conflict**

This fault code occurs when a Monitor Controller asks for a display allocation that is already part of an existing allocation. The fault code indicates that some controller did not get to display information as it intended.

The proper response to this fault code is to run a Standard Layout with all CAN subsystems connected that will be used in the application. This function is found on the SETUP—Run Page Layout screen.

- **030 Too Many Devices on CAN Bus**

This fault code appears when more than eight CAN ID's (implements) attempt to log in to the GREENSTAR™ Display.

- **031 GREENSTAR® Display Overload**

This fault code can occur when an unusually high amount of CAN messages are sent to the display in a short period of time, such as from pressing the PAGE key repeatedly in very quick succession. When this fault code occurs, the display has missed receiving some messages and is, therefore out of synchronization with the implements; thus cycling of power is required to re-synchronize the entire display system.

This fault code can also occur when a CAN node is sending out messages that are properly received by the display, but the transmitting node does not see the acknowledge signal and endlessly re-sends the original message.

- **033 Memory Failure**

This fault code occurs when a stored parameter is not stored after three consecutive write attempts, and indicates a probably-permanent memory failure.

Caution Fault Codes

- **110 CAN Bus Communications Problem**

This fault code is the one most likely seen. Any type of problem with the CAN bus (wiring harness, electrical interface in each CAN node, terminators, etc.) will likely cause a Fault Code 110. Some of the potential problems include: faulty terminators, electrical wiring intermittent short or open, damaged CAN interface in a controller, loose connector, or connection.

A miswired CAN cable will also produce a 110 fault code.

In addition, this fault code can be caused by out-of-sequence or missing CAN messages, or improper commands (related to cursor positioning).

- **111 CAN to CCD Queue Overflow**

This fault code occurs when the CCD transmit queue overflows, usually as a result of a CCD bus problem.

- **112 Display Conflict**

This fault code occurs when a controller asks for a display allocation that is already part of an existing allocation. The fault code indicates that some controller did not get to display information on the RUN page as it intended.

The proper response to this fault code is to run a Standard Layout with all CAN subsystems connected that will be used in the application. This function is found on the SETUP—Run Page Layout screen.

- **113 Incompatible Monitor/Controller**

This fault code occurs when a CAN command is received that the display does not know how to

process. This could be because of a mismatch between controller and display software revisions.

OUO1074,0000034 -19-14NOV00-2/2

Troubleshooting GREENSTAR® Display

Symptom	Problem	Solution
Screen not readable.	Contrast incorrectly set.	Adjust contrast.
	Screen backlighting set too low.	Increase backlight setting.
Wrong area reading.	Tillage width incorrect.	Correct width in SETUP.
Display wrong speed.	Wrong calibration.	Enter correct calibration value in SETUP or recalibrate on 122 m (400 ft) course. Change setup to English units.
	Set for Metric units.	Go to SETUP—GREENSTAR® Display and select correct units.
	Speed reading erratic.	Radar mount loose or vibrates.
No radar speed reading.	No calibration value entered.	Calibrate radar.
No radar calibration value.	Display installed on 7000/8000/9000 Series or newer tractor with factory installed radar.	Calibrate radar per tractor operator's manual.
No vacuum reading.	Faulty wire connection.	Check wiring harness and repair.
	Blower not running.	Start blower motor.
	Vacuum line on wrong fitting on sensor.	Install vacuum line to sensor P2 fitting.
	Incorrect planter options.	See SETUP Page—Planter Options.
		Select correct number of vacuum sensors.
	Vacuum section not displayed on RUN page.	Select SETUP—GREENSTAR® Display—Run Page Layout to reformat items displayed on RUN page.
	Sensor connected to wrong wire harness lead.	If only one vacuum sensor is used, correct to wire labeled LEFT VACUUM.

Symptom	Problem	Solution
Wrong vacuum reading.	Erroneous zero value.	Stop blower motor and zero in SETUP.
	Wrong calibration value.	Enter correct calibration value in SETUP (5.66).
	Faulty vacuum sensor.	Replace sensor.
No population reading.	Faulty wire harness connection.	Correct wire harness connection. See Technical Manual TM1601.
	Incorrect voltage to sensors.	
Wrong population reading.	Row spacing incorrect.	Correct row spacing in SETUP.
	Speed reading incorrect.	Correct radar calibration.
	Set for metric units.	Go to SETUP—GREENSTAR® DISPLAY, and select correct units.
Low population reading.	Dirty seed sensor.	Clean sensor in seed tube.
	Speed reading too high.	See wrong speed reading above.
	Planting soybeans.	Seed rate exceeds sensor capability.
	Planting Hill-Drop cotton.	Multiple seeds pass seed sensor at one time.
Row failure warning.	Meter not planting.	Seed hopper empty, fill with seed.
	Planting in rocky conditions.	Seeds knocked off disk, adjust row unit down force.
Screen not readable.	Contrast incorrectly set.	Press and hold upper R/H button on display.
	Screen backlighting set too low.	SETUP—GREENSTAR® Display—backlight, enter NINE.
Seed monitor screen not readable on hook up to planter.	No communications with planter.	Must turn power off, power up to reboot the system.
Wrong area reading.	Planter width incorrect.	Correct planter width in SETUP.
	Half-width disconnect on.	

Symptom	Problem	Solution
No planter monitor reading.	Electrical connections not correct.	Check fuses in tractor. Check connections on back of rear tractor connector. C and D connections must be tight (C-red, D-black). Remove splash-shield by inserting finger and prying up on front of cover to remove. Insert wires in C and D until tight. Pin removal tool will be required if wires are in wrong position.
No liquid fertilizer reading.	Incorrect planter options.	See planter options on SETUP page and select correct number of liquid sensors.
	Fertilizer section not displayed on RUN page.	Select—GREENSTAR® Display—Run Page Layout to reformat items displayed on RUN page.
	Sensor connected to wrong wire harness lead.	If only one liquid sensor is used, it must be connected to wire labeled LEFT FERT.
	Faulty wire connection.	Check wiring harness and repair.
Wrong liquid fertilizer reading.	Wrong calibration valve.	Enter calibration value (37.5) in SETUP.
	Erroneous ZERO valve.	Relieve trapped pressure in fertilizer manifold. ZERO sensor in SETUP.
	Faulty vacuum sensor.	Replace sensor.
	Sensor plugged.	Remove sensor and flush with warm water. Do NOT insert hard object into sensor when cleaning. Sensing unit may be damaged.

Troubleshooting

Symptom	Problem	Solution
Electronic frame control not functional.	Not selected in planter options.	SETUP—Planter—Page 2—Planter Options. Select frame control.
	Control box in tractor cab not functional.	INFO—Plant Control Box. With tractor engine off, press switches and verify response on screen.
	Frame functions not operating.	Properly insert SCV hose tips into tractor. See planter tech manual to diagnose remainder of planter control system.

AG,OUO1074,1527 -19-24APR00-4/4

Troubleshooting Variable Rate Drive (Plant Mode)

Symptom	Problem	Solution
WARNING SCREEN: Right or left drive disabled. Drive failed to respond. Verify hydraulic power. Check operator's manual. <i>NOTE: This warning occurs when motor speed should be greater than 18 rpm and the motors are currently not turning.</i>	System not enabled to clear warning screen.	Press key F on the GREENSTAR® display to enable system.
	No hydraulic pressure/flow.	Make sure hoses are plugged into tractor SCV or power beyond. Verify correct location of pressure and return lines. A one way check valve is installed in the return line hose tip. Set tractor SCV to continuous detent/flow. Activate tractor SCV.
	Low hydraulic pressure/flow to variable drive motors.	Maintain full tractor engine rpm. Increase tractor SCV flow setting. Minimize flow to other hydraulic functions. Verify tractor hydraulic system performance.

Symptom	Problem	Solution
	No motor speed detected by variable drive controller.	Verify motor speed sensor electrical connections. Note: If this condition exists, the motor without any speed sensor feedback will rotate at a very high rpm for several seconds before full page warning is issued. Verify set screw in motor coupler is tightened to motor speed shaft. Verify hydraulic valve electrical connection.
	Motor proportional valve stuck from hydraulic oil contamination.	Consult Dealer or Technical Manual TM1601 for proportional valve cleaning procedure. Replace hydraulic oil and oil filter(s) in tractor. Recalibrate valves.
	Mechanical binding causing high torque.	Wing to mainframe drive shaft couplers misaligned. Align drive shaft couplers. Failed drive shaft support bearings. Replace failed bearings. Misaligned seed meter and/or chemical hopper disconnects. Inspect and adjust seed meter and/or chemical hopper disconnects. Identify and repair any other sources of mechanical binding.
	A one hydraulic motor system is setup for two hydraulic motors.	Set number of hydraulic motors to one on SETUP—Variable Drive—Variable Drive Options—Drive Motors. Verify setup on INFO—Variable Drive—Setup Summary.

Symptom	Problem	Solution
WARNING SCREEN: Right or left drive disabled. Drive failed to respond. Verify hydraulic power. Check operators manual. Minimum ground speed xx mph. <i>NOTE: This warning occurs when motor speed should be between 11.5 rpm and 18 rpm and the motors are currently not turning.</i>	System not re-enabled to clear warning screen.	Press key F on the GREENSTAR® display to enable system.
	Motors are not designed to operate less than 18 rpm. For motors to operate above 18 rpm, the ground speed must be above xx mph. The minimum ground speed varies depending on variable setup.	Operate planter above minimum ground speed. See INFO—Variable Drive—Setup Summary—Page 2 to view minimum ground speed for current setup.
	No hydraulic pressure/flow.	Make sure hoses are plugged into tractor SCV or power beyond. Verify correct location of pressure and return lines. A one way check valve is installed in the return line hose tip. Set tractor SCV to continuous detent/flow. Activate tractor SCV.
	Low hydraulic pressure/flow to variable drive motors.	Maintain full tractor engine rpm. Increase tractor SCV flow setting. Minimize flow to other hydraulic functions. Verify tractor hydraulic system performance.

Symptom	Problem	Solution
	No motor speed detected by variable drive controller.	Verify motor speed sensor electrical connection. Note: If this condition exists, the motor without any speed sensor feedback will rotate at a very high rpm for several seconds before a full page warning is issued. Verify set screw in motor coupler is tightened to motor speed shaft. Verify hydraulic valve electrical connection.
	Motor proportional valve stuck from hydraulic oil contamination.	Consult Dealer or Technical Manual TM1601 for proportional valve cleaning procedure. Replace hydraulic oil and oil filter(s) in tractor. Recalibrate valves.
	Mechanical binding causing high torque.	Wing to mainframe drive shaft couplers misaligned. Align drive shaft couplers. Failed drive shaft support bearings. Replace failed bearings. Misaligned seed meter and/or chemical hopper disconnects. Inspect and adjust seed meter and/or chemical hopper disconnects. Identify and repair any other sources of mechanical binding.
	A one hydraulic motor system is setup for two hydraulic motors.	Set number of hydraulic motors to one on SETUP—Variable Drive—Variable Drive Options—Drive Motors. Verify setup on INFO—Variable Drive—Setup Summary.

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AG,OUO1074,1589 -19-24APR00-4/14

Symptom	Problem	Solution
WARNING SCREEN: Right/left drive is operating at wrong speed. <i>NOTE: This warning occurs when the motor speed is less than 70 percent or 120 percent of the correct motor speed for the selected population rate.</i>	System not enabled to clear warning screen.	Press key F on the GREENSTAR® display to enable system.
	Proportional valve calibration not accurate.	Perform hydraulic valve calibration routine. Calibration should be performed under similar electrical load and operating temperature that planter will be operated under. Press SETUP—Variable Drive—Hydraulic Valves to locate valve calibration page.
	Motors are not designed to operate less than 18 rpm. For motors to operate above 18 rpm, the ground speed must be above mph shown in Setup Summary. The minimum ground speed varies depending on variable setup.	Operate planter above minimum ground speed. See INFO—Variable Drive—Setup Summary—Page 2 to view minimum ground speed for current setup.

Symptom	Problem	Solution
	Mechanical binding causing torque/speed fluctuations.	Loose chain on drive system causing chain to jump sprocket teeth. Tighten chain idler. Misaligned chains causing chain to jump sprocket teeth. Align drive and driven sprockets. Align chain idler. Wing to mainframe drive shaft couplers misaligned. Align drive shaft couplers. Failed drive shaft support bearings. Replace failed bearings. Misaligned seed meter and/or chemical hopper disconnects. Inspect and adjust seed meter and/or chemical hopper disconnects. Identify and repair any other sources of mechanical binding.
WARNING SCREEN: Hydraulic motor(s) has stopped.	Motor speed sensor detects no motion/motors are not turning.	Check connection to speed sensor.
	Faulty motor speed sensor.	Replace motor speed sensor.
	Seal blown in motor.	See your John Deere dealer.
	Hose clamps on motor speed sensor coupler loose.	Tighten clamps.
	Valve on hydraulic motor not getting any power.	Check connection to valve.
WARNING SCREEN: STOP. Power Interruption. Possible skip.	Power lost to controller.	Check connection on 30-way METRAPAK™ connector. Check 9-pin connector. Check 3-pin convenience outlet connector. See your John Deere dealer.

Symptom	Problem	Solution
WARNING SCREEN: No radar signal.	The radar signal has been lost for a period of three seconds.	Verify radar connection.
WARNING SCREEN: System drive disabled. Quick start functions not satisfied. Minimum operating speed not reached. Minimum operating speed xx mph.	System not enabled to clear warning screen.	Enable system by pressing key F on the GREENSTAR® display.
	Minimum ground speed not achieved.	Accelerate tractor above minimum ground speed within six seconds after activating the quick start function. See INFO—Variable Drive—Setup Summary—Page 2 to view minimum ground speed for current setup.
WARNING SCREEN: Radar speed incorrect.	Faulty radar.	Verify radar connection.
<i>NOTE: This warning occurs when radar speed is significantly different from motion sensor speed.</i> <i>Extremely windy, dusty conditions will give radar false readings and cause this warning.</i> <i>Excessive wheel slippage on tire with motion sensor mounted to it, will cause this warning.</i>		
		Consult dealer or technical manual for further diagnostics.
	Faulty motion sensor.	Verify motion sensor connection.

Symptom	Problem	Solution
		Verify motion sensor-to-disk clearance is 2—4 mm (0.08—0.16 in.) and wheel bearing is tight. Verify wheel is turning. Consult dealer or technical manual for further diagnostics.
No row failed warnings from planter monitor when drive motors stop.	Normal condition for planter monitor not to issue row failed warning below two mph.	Operate planter above two mph.
Hydraulic motor(s) will not turn or stop turning.	Normal condition when ground speed is less than one mph under all conditions/setup. Depending on variable drive setup, the minimum speed the system will function at may be higher. Note: Planter monitor will not provide row failure warning under two mph.	Operate planter at ground speeds greater than minimum ground speed listed in INFO—Variable Drive—Setup Summary—Page 2.
	System not enabled after warning screen is displayed.	Enable system by pressing key F on the GREENSTAR® display.
	A population of zero has been selected.	Population set rate must be greater than zero.
	Motor proportional valve stuck from hydraulic oil contamination.	Consult Dealer or Technical Manual TM1601 for proportional valve cleaning procedure. Replace hydraulic oil and oil filter(s) in tractor. Recalibrate valves.

Symptom	Problem	Solution
	No hydraulic pressure/flow.	Make sure hoses are plugged into tractor SCV or power beyond. Verify correct location of pressure and return lines. A one way check valve is installed in the return line hose tip. Set tractor SCV to continuous detent/flow. Activate tractor SCV.
	Low hydraulic pressure/flow to variable drive motors.	Maintain full tractor engine rpm. Increase tractor SCV flow setting. Minimize flow to other hydraulic functions. Verify tractor hydraulic system performance.
	Height sensor not calibrated (drawn machines).	Calibrate height sensor. Press SETUP—Variable Drive—Height Sensor to locate height sensor calibration page.
	Height sensor STOP position set too low (drawn machines).	Set height sensor STOP position at a frame height that allows the row unit opener blades to just touch the ground. If the stop position is set too low, the drive motors may turn on/off while planting due to wheel module float over rough ground conditions.
	Height sensor bracket not adjusted to specification (integral machines).	Adjust dimmer switches. Refer to ADJUSTING DIMMER SWITCH (HEIGHT SWITCH) FOR INTEGRAL MACHINES in Variable Rate Drive Machine Setup section.

Symptom	Problem	Solution
	Planter not in DOWN position.	Lower planter below the start position. Verify planter is in down position by pressing INFO—Variable Drive—Performance Data.
	Planter motion sensor not active when planter is moving.	Verify motion sensor is active by pressing INFO—Variable Drive—Performance Data. Verify electrical connections to motion sensor. Check 2 mm (0.08 in.) gap between motion sensor and tone wheel bolted to the wheel. Wheel bearings may be loose or failed causing an increasing/decreasing gap on wheel motion sensor.
	Mechanical binding causing high torque.	Wing to mainframe drive shaft couplers misaligned. Align drive shaft couplers. Failed drive shaft support bearings. Replace failed bearings. Misaligned seed meter and/or chemical hopper disconnects. Inspect and adjust seed meter and/or chemical hopper disconnects. Identify and repair any other sources of mechanical binding.
	Only one hydraulic motor of a two hydraulic motor system is turning.	Close half width disconnect switch.
		Set number of hydraulic motors to two on SETUP—Variable Drive—Variable Drive Options—Drive Motors. Verify setup on INFO—Variable Drive—Setup Summary.
	Variable drive setup for only one motor. This condition will only engage the right hand side of the machine.	

Continued on next page

AG,OUO1074,1589 –19–24APR00–10/14

Symptom	Problem	Solution
Motors turning backwards.	Full tractor pressure is being applied to the "T" port on the hydraulic valve manifold.	Plumb hydraulic lines so hydraulic pressure is applied to the port labeled "P".
	Motor orientation on planter backwards.	See installation instructions for correct orientation.
	Valve manifold orientation on motor backwards.	See installation instructions for correct orientation.
Hydraulic motor(s) turn at an erratic speed.	Proportional valve calibration not accurate.	Perform hydraulic valve calibration routine. Calibration should be performed under similar electrical load and operating temperature that planter will be operated under. Press SETUP—Variable Drive—Hydraulic Valves to locate valve calibration page.
	Low hydraulic pressure/flow to variable drive motors.	Maintain full tractor engine rpm.
		Increase tractor SCV flow setting.
		Minimize flow to other hydraulic functions.
		Verify tractor hydraulic system performance.

Continued on next page

AG,OUO1074,1589 -19-24APR00-11/14

Symptom	Problem	Solution
	Mechanical binding causing torque/speed fluctuations.	Loose chain on drive system causing chain to jump sprocket teeth. Tighten chain idler. Misaligned chains causing chain to jump sprocket teeth. Align drive and driven sprockets. Align chain idler. Wing to mainframe drive shaft couplers misaligned. Align drive shaft couplers. Failed drive shaft support bearings. Replace failed bearings. Misaligned seed meter and/or chemical hopper disconnects. Inspect and adjust seed meter and/or chemical hopper disconnects. Identify and repair any other sources of mechanical binding.
	Motors are not designed to operate less than 18 rpm. For motors to operate above 18 rpm, the ground speed must be above xx mph. The minimum ground speed varies depending on variable setup.	Operate planter above minimum ground speed. See INFO—Variable Drive—Setup Summary—Page 2 to view minimum ground speed for current setup.
Hydraulic motor(s) do not turn for a brief period when starting from a stop causing a “skip”.	Normal operation to have an approximate 0.9 m (3 ft) skip using Quick Start or a 9 m (10 ft) skip without Quick Start.	Start planter before seeding is required to begin. This may require backing up if planter is stopped in the middle of the field.

Continued on next page

AG,OUO1074,1589 –19–24APR00–12/14

Symptom	Problem	Solution
	<i>NOTE: These approximate distances will be longer if seed is not loaded on the seed meter disk.</i>	Use Quick Start feature to minimize skip. Load seed on the seed meter disk prior to the start of productive seeding by lowering the planter into the DOWN position and driving forward with the vacuum on if required. When using Quick Start, begin forward travel in a low gear to take off slower. By taking off slow and then “gearing up” to speed, the skip will be smaller.
Set population does not match monitored population.	Vacuum set too low/high.	Adjust vacuum to appropriate level.
	Problem with seed meter.	See planter operator manual for troubleshooting solutions.
	Wrong seed disk selected in variable drive setup.	Enter correct seed disk or planter meter in variable drive setup. Verify disk selected in INFO—Variable Drive—Setup Summary—Page 1.
	Wrong sprocket combination selected in variable drive setup.	Enter correct sprocket combination in variable drive setup. Verify sprocket combination selected on INFO—Variable Drive—Setup Summary—Page 1.
	Wrong row spacing selected in variable drive setup.	Enter correct row spacing in variable drive setup. Verify row spacing selected in INFO—Variable Drive—Setup Summary—Page 1. Verify units used to setup row spacing (English/Metric). Change units on SETUP—GREENSTAR® Display—Units and select correct units.

Symptom	Problem	Solution
	Seed sensors can not count seeds passing through sensors at high rates.	Normal operation of planter monitor.
Wrong seed population based on seed used/acre but selected rate and planter monitor agree.	Radar not calibrated.	Calibrate radar in SETUP—Perf Monitor—Radar.
Planter monitor calculated acres does not match actual acreage.	Machine width not correct in planter monitor setup.	Correct machine width in SETUP—Planter—Page 2—Planter Width.
	When row failed warning was issued, seed sensors were ignored and machine width reduced.	This is a normal planter monitor mode selected by the operator. This is a temporary condition that will be reset when ground speed is reduced below two mph and then accelerated above two mph.
	Radar not calibrated.	Calibrate radar in SETUP—Perf Monitor—Radar.
Variable drive not on GREENSTAR® display.	Electrical connections not correct.	Planter communication cable (CAN) not connected to tractor harness. Connect implement connector to tractor.
	 CAUTION: Turn off electrical power when connecting or disconnecting harnesses.	Variable drive harness not connected to planter monitor harness. Connect planter monitor CAN Out connector to variable drive CAN In connector.
	<i>NOTE: After electrical connection is corrected, Perform Run Page Layout.</i>	Variable drive wedgebox not connected to variable drive harness. Connect variable drive harness 30-pin connector to the variable drive wedgebox.
Radar speed displayed on GREENSTAR® display different than tractor performance monitor/corner post display.	Either the GREENSTAR® display or tractor performance monitor/corner post display not calibrated with radar.	Calibrate radar in GREENSTAR® by pressing SETUP—Perf Monitor—Radar. See tractor operators manual to calibrate tractor performance monitor/corner post display.

Troubleshooting Variable Rate Drive (Hydraulic Valve Calibration Mode)

Symptom	Problem	Solution
“Check Start Conditions” displayed after attempting to calibrate valves.	Ground speed must be above one mph to calibrate valves. Keep the speed below two mph to keep the planter monitor from issuing a row failed warning.	Increase tractor speed between one and two mph.
	No hydraulic pressure/flow.	Make sure hoses are plugged into tractor SCV or power beyond. Verify correct location of pressure and return lines. A one way check valve is installed in the return line hose tip. Set tractor SCV to continuous detent/flow. Activate tractor SCV.
	Planter motion sensor not active when planter is moving.	Verify motion sensor is active by pressing INFO—Variable Drive—Performance Data. Verify electrical connections to motion sensor. Check 2 mm (0.08 in.) gap between motion sensor and tone wheel bolted to the wheel. Wheel bearings may be loose or failed causing an increasing/decreasing gap on wheel motion sensor.

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AG,OUO1074,1590 -19-24APR00-1/3

Symptom	Problem	Solution
“Calibration is finished, Values are NOT Normal” is displayed.	No motor speed detected by variable drive controller.	Verify motor speed sensor electrical connection. Verify set screw in motor speed shaft. Verify hydraulic valve electrical connection.
	Mechanical binding causing high torque.	Wing to mainframe drive shaft misaligned. Align drive shaft couplers. Failed drive shaft support bearings. Replace failed bearings. Misaligned seed meter and/or chemical hopper disconnects. Inspect and adjust seed meter and/or chemical hopper disconnects. Identify and repair any other sources of mechanical binding.
	Low hydraulic pressure/flow to variable drive motors.	Maintain full tractor engine rpm. Increase tractor SCV flow setting. Minimize flow to other hydraulic functions. Verify tractor hydraulic system performance.
	Motor proportional valve stuck from hydraulic oil contamination.	Consult Dealer or Technical Manual TM1601 for proportional valve cleaning procedure. Replace hydraulic oil and oil filter(s) in tractor. Recalibrate valves.
	Air in variable drive hydraulic circuit.	Repeat calibration several times.

Troubleshooting

Symptom	Problem	Solution
	Varying speed signal due to loose set screw between motor coupler and motor speed sensor.	Tighten motor speed sensor set screw.
	Mechanical binding causing high torque.	Wing to mainframe drive shaft couplers misaligned. Align drive shaft couplers. Failed drive shaft support bearings. Replace failed bearings. Misaligned seed meter and/or chemical hopper disconnects. Inspect and adjust seed meter and/or chemical hopper disconnects. Identify and repair any other sources of mechanical binding.
	Hydraulic oil too cold.	Warm up tractor hydraulic oil before attempting to calibrate.
	Left or right valve does not meet specifications.	Repeat calibration several times. If calibration values are not normal (offset between 10-45 and slope between 50-145, Press key F to view which valve is out of the specified range) and no other cause can be found, replace proportional valve.

AG,OUO1074,1590 -19-24APR00-3/3

Storage

Beginning of the Season Service

Before using the monitor after it has been stored, inspect for cleanliness and damage.

Thoroughly inspect monitor display, controller, harnesses, radar and sensors for loose parts and adjust as necessary.

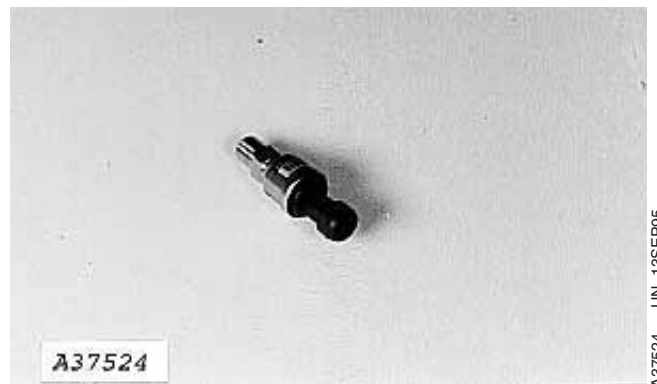
Clean any dirt or grease that may have accumulated before operating.

AG,OUO1074,1591 -19-24APR00-1/1

Liquid Fertilizer Sensor

Remove sensor and flush with clean water.

Do not insert any object or tool into fluid port.



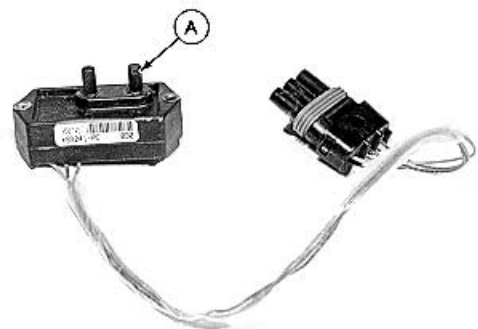
AG,OUO1074,1592 -19-24APR00-1/1

Vacuum Sensor

NOTE: P2 port (A) used for hose connection.

Protect when using water to wash planter.

A—P2 Port



AG,OUO1074,1593 -19-24APR00-1/1

Specifications

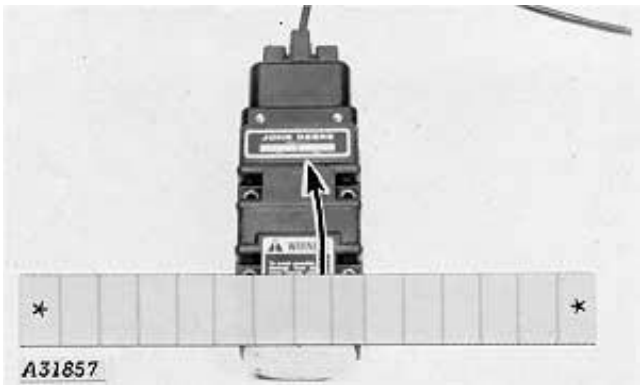
Record Serial Numbers

The serial numbers are located on the console and radar.
Record in the spaces provided.

AG,OUO1074,1630 -19-24APR00-1/3



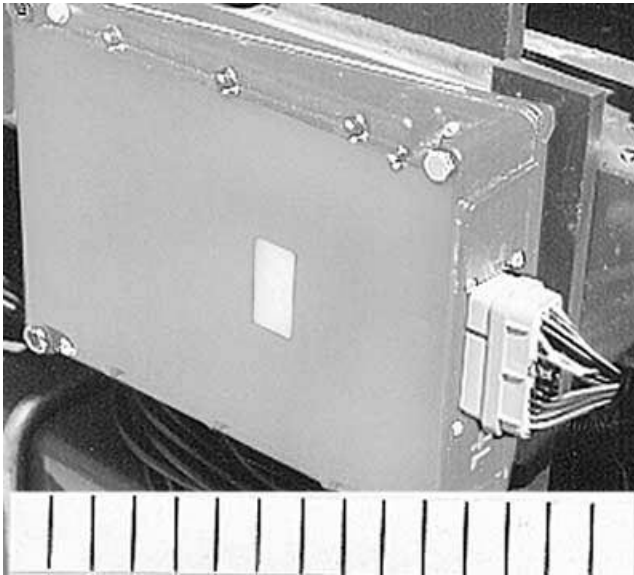
Monitor Display Serial Number



Radar Serial Number

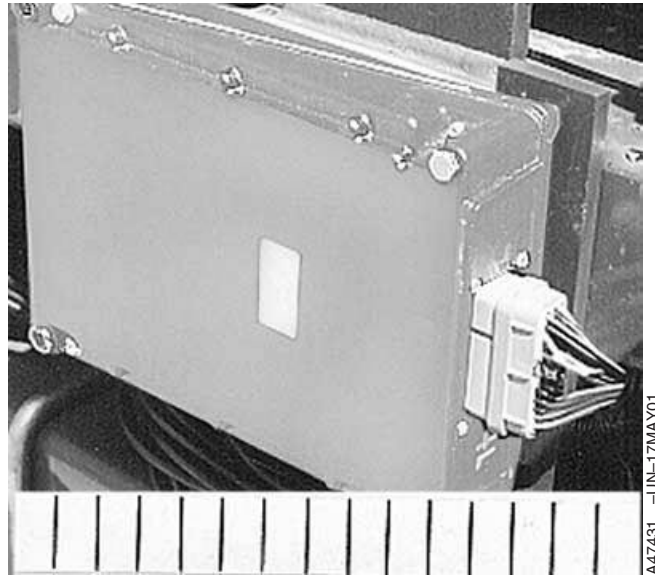
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AG,OUO1074,1630 -19-24APR00-2/3



A47431 -UN-17MAY01

Monitor Controller Serial Number



A47431 -UN-17MAY01

Frame Controller Serial Number



A48289 -UN-12NOV01

Variable Rate Drive Controller Serial Number

AG,OUO1074,1630 -19-24APR00-3/3

Record Planter Options

Number of Rows	_____
Row Spacing	_____
Planter Width	_____
Number of Vacuum Sensors	_____
Calibration Value	_____
Number of Liquid Fertilizer Sensors	_____
Calibration Value	_____
Radar Calibration Number	_____
Number of Seed Sensors Turned Off	_____
Display Software Version	_____
Planter Controller Software Version	_____

AG,OUO1074,1631 -19-24APR00-1/1

Crime Prevention Tips

Help Prevent Crime

You can help take a bite out of crime by properly documenting ownership and discouraging theft.

**TAKE A BITE OUT OF
CRIME**
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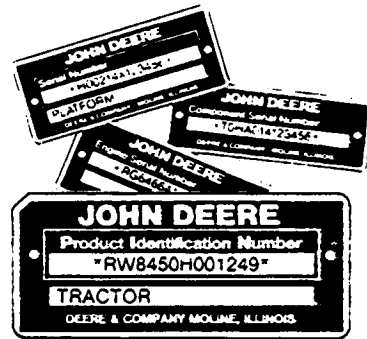


TS140 -19-07OCT88

AG,OUO1074,1623 -19-24APR00-1/1

Record AG Identification Numbers

1. Mark your machines with your own unique numbering system.
2. Record the Product Identification Number (PIN) of the unit and also individual component identification numbers for engines, axles, pumps, etc. Include the PIN numbers on all documentation, such as insurance, financial, and warranty papers.

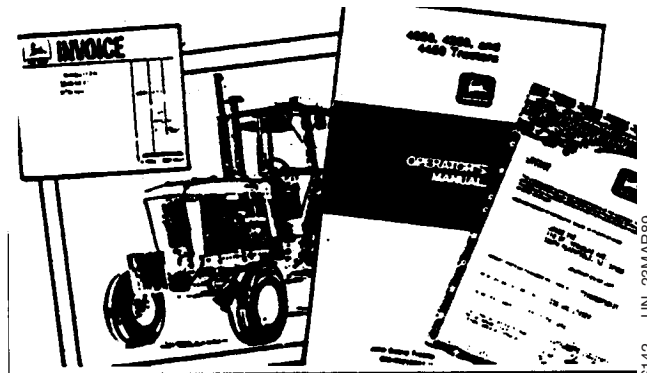


TS161 -UN-23MAR89

AG,OUO1074,1624 -19-24APR00-1/1

Keep Proof of Ownership

1. Take color photographs from several angles of each machine.
2. Maintain an up-to-date inventory of all your machines.
3. Keep your documented identification numbers, color photographs, and inventory in a safe, secure location.



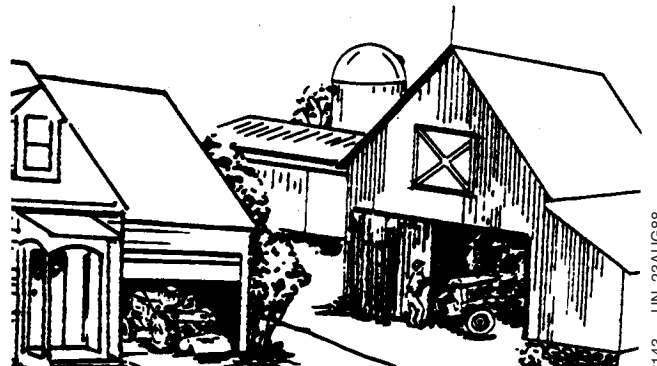
TS142 -UN-23MAR89

AG,OUO1074,1625 -19-24APR00-1/1

Park Indoors Out of Sight

Make machines hard to move:

- Park large equipment in front of exits.
- Lower equipment to the ground. Remove key.
- Remove battery when unit is in storage.
- Lock cab doors, windows, and vandal-proof devices.
- Set wheels in widest position making loading more difficult. Lock building.



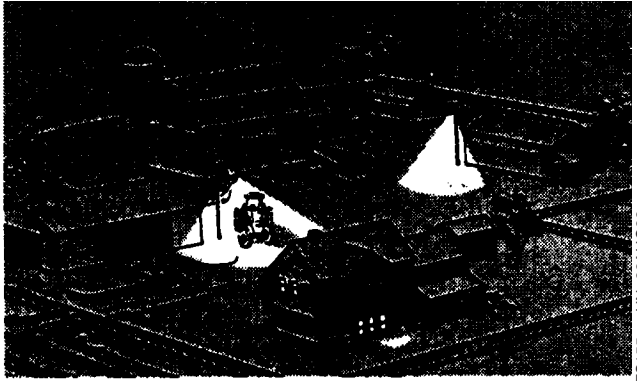
TS143 -UN-23AUG88

AG,OUO1074,1626 -19-24APR00-1/1

When Parking Outdoors

Make machines hard to move:

- Park in a well-lighted, fenced area.
- Lower all equipment to the ground.
- Remove ignition key. Remove battery when unit is in storage.
- Lock cab doors, windows, and vandal-proof devices.
- Set wheels in widest position making loading more difficult.

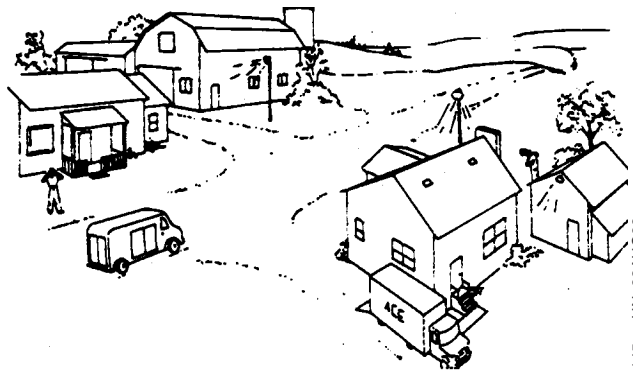


TS155 -UN-23AUG88

AG,OUO1074,1627 -19-24APR00-1/1

Reduce Vandalism

1. Install vandal-proof devices.
2. Participate in a neighborhood watch program. Take written notes of suspicious vehicles or persons and report your findings to law enforcement agency.
3. Regularly verify that identification plates have not been removed. If they have, notify law enforcement agency. Order duplicate plates from your dealer.



TS145 -UN-23AUG88

AG,OUO1074,1628 -19-24APR00-1/1

Report Thefts Immediately

1. Immediately notify your local law enforcement agency and insurance agent.
2. Provide a complete description of the machine, all of the documented identification numbers and color photographs.
3. Request verification of the identification numbers after they have been entered with any regional or national crime information center. Double check the numbers to be sure they are correct.
4. Notify your John Deere dealer of the theft and request that its loss be posted with full description and identification numbers.



AG,OUO1074,1629 -19-24APR00-1/1

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John Deere Service Literature Available

Technical Information

Technical information is available from John Deere. Some of this information is available in electronic as well as printed form. Order from your John Deere dealer or call **1-800-522-7448**. Please have available the model number, serial number, and name of the product.

Available information includes:

- **PARTS CATALOGS** list service parts available for your machine with exploded view illustrations to help you identify the correct parts. It is also useful in assembling and disassembling.
- **OPERATOR'S MANUALS** providing safety, operating, maintenance, and service information. These manuals and safety signs on your machine may also be available in other languages.
- **OPERATOR'S VIDEO TAPES** showing highlights of safety, operating, maintenance, and service information. These tapes may be available in multiple languages and formats.
- **TECHNICAL MANUALS** outlining service information for your machine. Included are specifications, illustrated assembly and disassembly procedures, hydraulic oil flow diagrams, and wiring diagrams. Some products have separate manuals for repair and diagnostic information. Some components, such as engines, are available in separate component technical manuals
- **FUNDAMENTAL MANUALS** detailing basic information regardless of manufacturer:
 - Agricultural Primer series covers technology in farming and ranching, featuring subjects like computers, the Internet, and precision farming.
 - Farm Business Management series examines "real-world" problems and offers practical solutions in the areas of marketing, financing, equipment selection, and compliance.
 - Fundamentals of Services manuals show you how to repair and maintain off-road equipment.
 - Fundamentals of Machine Operation manuals explain machine capacities and adjustments, how to improve machine performance, and how to eliminate unnecessary field operations.



TS189 -UN-17JAN89



TS191 -UN-02DEC88



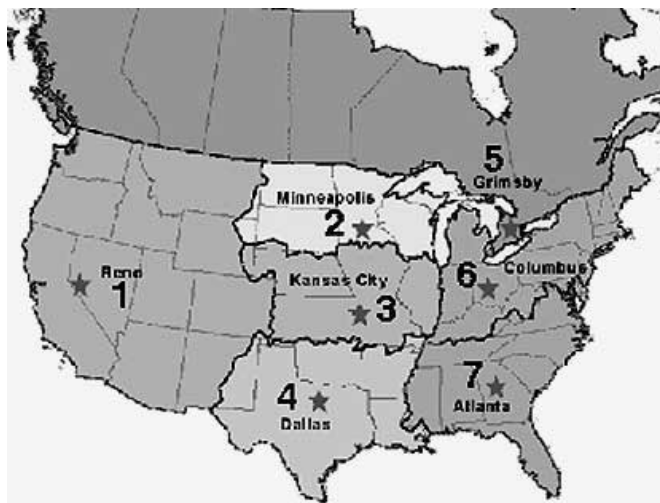
TS224 -UN-17JAN89



TS1663 -UN-10OCT97

John Deere Service Keeps You On The Job

John Deere Is At Your Service When You Need It



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Fax: 614-275-1450

CUSTOMER SATISFACTION is important to John Deere.

Our dealers strive to provide you with prompt, efficient parts and service:

- Maintenance and service parts to support your equipment.
- Trained service technicians and the necessary diagnostic and repair tools to service your equipment.

CUSTOMER SATISFACTION PROBLEM RESOLUTION PROCESS

Your John Deere dealer is dedicated to supporting your equipment and resolving any problem you may experience.

1. When contacting your dealer, be prepared with the following information:

- Machine model and product identification number
- Date of purchase
- Nature of problem

2. Discuss problem with dealer service manager.

3. If unable to resolve, explain problem to dealership manager and request assistance.

4. If you have a persistent problem your dealership is unable to resolve, ask your dealer to contact John Deere for assistance.

5. If a problem is not resolved to your satisfaction, contact the appropriate John Deere sales location for your area shown in map and ask to speak with customer service.

