

M-213-1-95

For Units with Serial Number K-5427 and up  
*Supplement to M-213-94*

# MANUAL SUPPLEMENT



## **CHIPSPREADER**

**OPERATION, MAINTENANCE and  
SAFETY MANUAL for**

*Computerized 2WD and 4WD Hydrostatic  
Drive Units*

*with Standard Spread Hopper*

Contents

Computer Operator Screens .....PAGE 3

Supersedes pages 12 thru 15 of M-213-94

Computer Set Up Screens .....PAGE 7

Supersedes pages 36 thru 39 of M-213-94

**This manual covers standard features and options. If your unit incorporates custom features, some of the information contained in this manual may not apply. If you have any questions regarding this manual or your unit, contact your dealer or the E. D. Etnyre Service Department at 1-800-995-2116**

 **CAUTION**

Unusually strong electromagnetic interference could cause the electronic controls on this equipment to temporarily mis-function. Test the effect of two way radios and similar equipment while operating in a safe area.

### Reporting Safety Defects

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying E. D. ETNYRE & CO.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or E. D. ETNYRE & CO.

To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-800-424-9393 (or 366-0123 in Washington, D. C. area) or write to: NHTSA, U. S. Department of Transportation, Washington, D. C. 20696. You can also obtain other information about motor vehicle safety from the hotline.

### 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.

Please note this warning and remember -

Always start and operate the engine in a well-ventilated area;

If in an enclosed area, vent the exhaust to the outside;

Do not modify or tamper with the exhaust system.

 **WARNING**

Shut machine off and wait for all movement to stop before leaving operator's seat or servicing. Failure to do so could result in unexpected movement and cause serious injury or death.

3101759

 **WARNING**

Use manual travel mode when in confined spaces or loading on trailer. Failure to do so could result in unexpected movement and cause serious injury or death.

3101756

 **WARNING**

Do not operate on steep grades in auto travel mode. Auto may cause engine to stall. Engine stall could result in loss of control which may cause serious injury or death.

 **WARNING**

Parking brake meets SAE J1472.

Parking brake may not hold on grades steeper than 15%.

# OPERATOR SCREENS

## FPM 300 SET MEM 4 3/8 CHIP 20.0lb/yd

This screen shows the aggregate preset and the speed and application rate set points when standing still. The number to the right on the top line is the aggregate preset that is selected. The second line shows the size and type of aggregate and the aggregate application rate. If the application rate has been changed from that which was stored in the preset, a "+" or "-" will appear after the memory number. This indicates that the shown application rate is above or below the stored rate in that memory preset. The application rate will remain at this setting when the ignition is turned off.

The chipspreader uses a ground speed radar (Figure 8) to generate pulses which are then fed to the computer which then feeds the speed signal to the display.

The speed display changes to actual speed when the chipspreader starts moving. If manual gate operation is selected, the "App Rate" will display the gate set point in hundredths of an inch. (i.e. 147 = 1.47 inches)

This is the screen that will come up when the ignition is turned on and the engine is started. To move to the next screen, depress the scroll button just below the center of the digital display. Pressing it once will move the display to the next screen, while pressing it again will move to the third screen and so on until you return to the above screen.

<b>TEMP</b>	<b>OIL</b>	<b>FUEL</b>
<b>195 F</b>	<b>60 PSI</b>	<b>35 %</b>

This screen shows the engine coolant temperature on the left, the engine oil pressure in the center, and the fuel remaining in the fuel tank on the right.

If two tanks are selected the next screen will look like this.

<b>L TEMP</b>	<b>RPM</b>	<b>R TEMP</b>
<b>100 F</b>	<b>2340</b>	<b>100 F</b>

This screen shows the hydraulic oil temperature in the left hydraulic tank on the left, the engine rpm in the center, and the hydraulic oil temperature in the right hydraulic tank on the right side.

If one tank is selected the next screen will look like this.

<b>RPM</b>	<b>R TEMP</b>
<b>2340</b>	<b>100 F</b>

This screen shows the engine rpm on the left and the hydraulic oil temperature in the right hydraulic tank on the right side.

<b>HOURS</b>	<b>VOLTS</b>
<b>5.7</b>	<b>14.1</b>

This screen shows the hours on the machine on the left side, and the voltage coming into the control box on the right side. When the ignition key is turned on but the engine is not running, the hours will not accumulate since the hourmeter is started and stopped by an oil pressure switch. If the engine is shut down after running less than 6 minutes, the hourmeter will not increase, as it counts up only in 6 minute increments. The right side will display battery voltage when the ignition is on but the engine is not running. Once the engine is started, the hours will start to accumulate, and the voltage will increase to 13.5 to 15.0 volts as the output of the alternator supplies voltage to the system.

<b>2 3/8 CHIP 22.1lb</b>
<b>101.4% 2650lb/yd3</b>

This screen shows the information contained in the current aggregate preset memory. If you do not want to change the aggregate preset or set up a new one, depressing the scroll button will bring you back to the first screen.

This method of selecting an aggregate is used primarily to set up a new aggregate and select it. The normal way to select an aggregate while operating is described under "Scroll Button".

The choices to be moved through by using the aggregate incr/decr switch would be "1, 2, 3, 4, 5, 6, Set up Memory Preset". Picking 1, 2, 3, 4, 5, or 6 will select the aggregate with all of its stored associated parameters. When the correct aggregate setting number has been selected, depress the scroll button to move to the "Speed/App Rate" screen. Selecting "Set up Memory Preset" will bring up the "Select Aggregate # to View or Change" screen. Use the Aggregate incr/decr switch to select the desired number to change. When the correct number has been selected, push the Scroll button to move to the "Application Rate" screen.

### **APPLICATION RATE** **20 lb/yd<sup>2</sup>**

Set the application rate to the desired number using the Aggregate incr/decr switch. When the correct application rate has been set, push the scroll button to move to the "Aggregate Size" screen.

**1      Aggregate Size**  
**3/8"**

The selected aggregate number appears on the screen to the left of "Aggregate Size"

To change the aggregate size, use the App Rate Incr/Decr switch to select the aggregate size (1/8 to 2 size in 1/8 increments). When the aggregate size has been selected, depress the scroll button to move to the next screen.

If you do not want to change the aggregate size from the one that comes up, depressing the scroll button will bypass this subroutine and take you directly to the "Aggregate Type" screen.

**1      Aggregate Type**  
**Chips**

The selected aggregate number appears on the screen to the left of "Aggregate Type"

To change the aggregate type, use the App Rate Incr/Decr switch to select the aggregate type (sand, chips, gravel). When the aggregate type has been

selected, depress the scroll button to move to the next screen.

If you do not want to change the aggregate type from the one that comes up, depressing the scroll button will bypass this subroutine and take you directly to the "Aggregate Flow Factor" screen.

**1      Aggregate      Flow Factor**  
**2460**

The selected aggregate number appears on the screen to the left of "Aggregate Flow Factor"

The aggregate should be weighed to determine the approximate number to be entered here. Utilizing a box of dimensions of 1 ft wide by 1 ft long by 1 ft deep inside dimensions, fill it to level full - DO NOT PACK THE AGGREGATE IN - but merely strike it off flush with the top of the box. Weigh the full box and then empty the box and weigh the empty box. Subtract the empty box weight from the full box weight to determine the weight of one ft<sup>3</sup> of the aggregate. Multiply this number by 27 to calculate the Aggregate Flow Factor and enter this number using the App Rate incr/decr switch. When this number has been set depress the scroll button to move to the next screen.

If you do not want to change the Aggregate Flow Factor from the one that comes up, depressing the scroll button will bypass this subroutine and take you directly to the "CAL App Rate" screen.

**1 CAL. App Rate**  
**100.0% 25.0 aj 25.0 sp**

The chipsreader should be set at the speed and application rate which it is intended to be used at in order to obtain the best accuracy for this calibration. Utilize the 1 sq. yd canvas supplied with the chipsreader. Place the canvas on the ground and operate the chipsreader in the auto speed/auto gate modes. Leave enough room to accelerate to the set speed before getting to the canvas. Push the control stick full forward to engage the auto speed mode and run across the canvas dropping the aggregate. Depress the gate thumb switch about 10 ft before the canvas to



insure that the gate has opened to the proper setting before arriving at the canvas. Weigh the material and the canvas using the supplied digital scale. Empty the canvas and weigh the empty canvas. Subtract the empty canvas weight from the combined canvas and material weight to determine the weight of material dropped per square yard. Repeat this process a minimum of three times. Average the weight and enter the averaged number using the App Rate incr/decr switch. When this calibration is complete, depress the scroll button to move to the "Save as aggregate #" screen.

If this results in a calibration of over 115% or under 85% you must go back and adjust the Aggregate Flow Factor to compensate for the particular flow characteristics of this material and then retest. If the calibration is over 115% set the Aggregate Flow Factor lower by about the percentage you are over and then set the calibration to 100% and retest the material.

As an example, say the Aggregate Flow Factor is set at 2700 and in order to weigh out correctly, the gate calibration required is 120%. 20% of 2700 is 540. Subtract 540 from 2700 and set the Aggregate Flow Factor to 2160 and rest the calibration to 100%. Save these settings as described below. Repeat the 3 drops and reset the App Rate calibration as necessary and then save it as described below.

As another example, say the aggregate Flow Factor is set at 2400 and in order to weigh out correctly, the gate calibration required is 75%. 25% of 2400 is 600. Add 600 to 2400 and set the aggregate Flow Factor to 3000 and rest the calibration to 100%. Save these settings as described below. Repeat the 3 drops and reset the App Rate calibration as necessary and then save it as described below

If you do not want to change the Gate Calibration from the one that comes up, depressing the scroll button will bypass this subroutine and take you directly to the "Save as Aggregate #" screen.

#### SAVE AS AGGREGATE #

1

Use the App Rate incr/decr switch to select the memory location for this aggregate. If there is an

aggregate in the selected memory number, it will automatically be replaced by the new settings and the old one will be lost, so it is important to keep a written copy of all of the aggregates so that if one is inadvertently overwritten it can be reset. Once the address has been selected, depress the scroll button to move to the next screen.

**EXIT = PUSH APP INCR  
SAVE = PUSH APP DECR**

To exit without saving the data and thereby leave it as it was before you got into the routine, depress the App Incr switch. To save all of the settings, depress the App Decr switch. **If only one item was changed, you must "Save" as you exit or the change that was just made will be ignored.** This will bring up the original screen.

#### FPM 300 SET MEM 4 3/8 CHIP 20.0lb/yd

When the computer is shut off, the current selected aggregate and application rate will be retained to be used upon restart.

A series of alarm functions are built into the computer. If an item sensed by the computer reaches its programmed alarm condition, the appropriate item will appear and flash on the screen, regardless of what screen is currently displayed. In addition, an output is sent to the beeper and also to the warning light mounted in the upper part of the control box. For instance, the normal use will be to have the first screen displayed (FPM & LBS/SQ. YD) - this will automatically be displayed on starting the engine. If the fuel level gets down to the alarm level (approximately 10% or 7 gallons), the word "fuel" will flash, the beeper will sound and the warning light below the steering wheel will come on. The same is true for any of the items monitored which have alarm points. The alarm points are as follows:

low oil pressure	5 PSI
high water temperature	240 F
low fuel	10%-7 Gal.
high hydraulic oil temp.	180 F.
low voltage	11 volts
high voltage	15 volts

## 8. Screen Scroll Button

This push-button is used to scroll the screen from its current display to the next screen in the series. It will always change the screen to its next screen in a predetermined order.

An aggregate preset may be selected to run from any screen by the following method. Depress and hold down the scroll button for more than 3 seconds. At first, the screen will move to the next screen, but after 3 seconds the screen will change to the currently selected aggregate and will appear as:

**2 3/8 CHIP 22.1lb  
101.4% 2650lb/yd3**

Momentarily depressing the scroll button will scroll through all 6 memory presets. When the desired preset has been selected, say number 4, the computer screen will look like:

**4 1/2 CHIP 18.0lb  
97.6% 2700lb/yd3**

When this has been left up on the screen for more than 10 seconds, the computer will switch to the new preset and the screen will change back to:

**FPM 300 SET MEM 4  
1/2 GRAV 18.0lb/yd**

When the computer is shut off, the current selected aggregate will be retained as the one to be used upon restart and application rate will be retained if it had been adjusted.

## COMPUTER SET UP

The computer must be set up and the various sensors calibrated for the particular chipping machine that the computer is installed in. This is normally done at the factory, and the settings are retained in the computer's non volatile memory. Normally an entire set up does not have to be done in the field, but if a radar were remounted or a gate transducer changed, etc. that particular item would have to be re calibrated. In the case of a gate transducer, it should be mechanically set using the procedure described under "Hopper Gate Transducer Adjustment" before recalibrating the computer. In order to do that, you must enter the set up screens and follow through the various screens as described below. If an item is already properly set you can just scroll by it to the next item, until you get to the one that needs to be re calibrated. If any one item is changed, you must save it using the procedure described at the end of the various screens.

## SET UP SCREENS

The following screens are entered by depressing and holding down the scroll button while turning the ignition key on.

**IMPORTANT:** The setup of the computer should be performed with the ignition key on, but the engine not running, except for calibrating the gates and the radar.

### CAUTION

**Always place the mode selector switch in the "park" position when the chipping machine is stopped to avoid accidental movement of the machine.**

These screens are used to configure the computer to the particular chipping machine and to calibrate the radar, control stick, gates, and application rate. The speed set point and the Application Rate set point can be adjusted while in these screens, when on the "Speed-App Rate" screen. The interlocks are turned off when in these screens and the gates may be opened to a setting in the "Manual" mode while standing still. Be sure the hopper is empty before opening the gates.

**Setup Mode  
Press Scroll**

Depress the scroll button to move to the next screen

### **TO CAL SPEED PRESS APP INC**

If you do not want to calibrate the radar, depressing the scroll button will bypass this subroutine and take you directly to the "Units" screen.

If radar calibration is required, pressing the Application increment (right) side of the Application Rate switch will bring up the next screen.

### **MEASURE OFF 300 FT THEN PRESS APP DECR**

Layout a 300 ft straight measured strip on the ground with enough space in front of it to accelerate to 300 fpm and enough space after the measured strip to stop the chipping machine. Press App Decr to move to the next screen.

### **TIME IN SEC 300 FT THEN PRESS SPEED INC**

With the chipping machine set at 300 fpm, run the chipping machine in Auto travel Mode through the course and measure the time in seconds that it takes to cover the 300 ft. Press Speed Inc to move to the next screen.

### **ENTER XX.X SEC USING SPEED INC/DEC**

When you touch either the speed incr or speed decr, the initial setting of 60.0 sec will appear, displayed as 600. If you measured a time of 58.4 sec, to enter this time, press speed decr until the 600 becomes 584. When this is set to the number that you measured, depress the scroll button to move to the next screen.

### **ENGLISH UNITS DECREASE TO CHANGE**

Pressing the App Decr switch will change the display to metric units and then pressing App Incr will change the display back to English units. When the units are on the desired setting, depress the scroll button to move to the next screen.

### **STANDARD HOPPER INCREASE TO CHANGE**

Pressing the App Incr switch will change the display and machine configuration to a variable hopper and then pressing App Decr will change it back to a standard or fixed hopper. When the hopper is set to

Standard Hopper, depress the scroll button to move to the next screen.

**CUMMINS ENGINE  
DECREASE TO CHANGE**

Pressing the App Decr switch will change the display and tachometer calibration to a Caterpillar engine and then pressing App Incr will change the display and tachometer calibration back to a Cummins engine. When the engine is set to the type on the chipsreader, depress the scroll button to move to the next screen.

**EDC THRESHOLD I  
8**

Pressing the Speed Decr/Incr switch will change the threshold current to the EDC (electronic displacement control) on the pump. A setting above 10 or 11 may not allow the pump to come to neutral and may cause a jerk in the start of the machine and should not be used. A setting much lower than 6 may not allow enough pump current to allow the computer to lock onto the set speed. Unless some special conditions apply, do not use a setting other than 8 here. When the EDC threshold is set to 8, depress the scroll button to move to the next screen.

**⚠ CAUTION**

**Always place the mode selector switch in the "park" position when the chipsreader is stopped to avoid accidental movement of the machine.**

**TO CALIBRATE FNR  
PRESS APP INCREMENT**

If you do not want to calibrate the control stick (Forward, Neutral, Reverse, (FNR for short)), depressing the scroll button will bypass this subroutine and take you directly to the "Cal Gates" screen.

If the control stick requires calibration, pressing the Application increment (right) side of the Application Rate switch will bring up the next screen.

**⚠ WARNING**

**Do not perform the control stick calibration with the engine running**

**PUSH FNR FULL AHEAD  
THEN PRESS APP DECR**

Push the control stick to the full forward position and then press the Aggregate decrement switch.

**PULL FNR FULL BACK  
THEN PRESS SPEED INC**

Pull the control stick to the full reverse position and then press the Speed increase switch.

**PUT FNR IN NEUTRAL  
THEN PRESS SPEED DEC**

Push the stick forward into the neutral detent. When the control stick is in neutral, the computer will automatically move to the next screen.

**TO CALIBRATE GATES  
PRESS APP INCREMENT**

If you do not want to calibrate the gates (Closed, Full open), depressing the scroll button will bypass this subroutine and take you directly to the "Speed Set" screen.

If you want to calibrate the gates you must start the engine at this time. To calibrate the gates on a standard hopper machine the engine must be run at high idle. (full rpm)

**⚠ WARNING**

**Never put hands in between gate and spread roll or gate and rear of hopper to clear obstruction. The gate could move at any time and cause severe injury.**

Pressing the Application increment (right) side of the Application Rate switch will start the computerized gate calibration routine. The computer will find the fully closed position of the gates and then it will find the fully open position of the gates and then it will wait there for you to take an actual measurement of the gates and it will bring up the next screen.



## GATE OPENING CALIBRATION TABLE

OPENING	CALIBRATION NUMBER
3 5/8	362
3 11/16	369
3 3/4	375
3 13/16	381
3 7/8	388
3 15/16	394
4	400
4 1/16	406
4 1/8	412
4 3/16	419
4 1/4	425
4 5/16	431

**Enter Gate Opening**  
**Next = Scroll 388**

Using the App Rate decr/incr switch, adjust the right hand number to the value that you measured for the gates. If you measured 3 7/8 for instance adjust the right hand number to 388. (see calibration table) When the number is adjusted correctly depress the Scroll button to move to the next screen.

When you press the "Scroll" button, you will return to the following screen with the words "Setup Mode" flashing to remind you that you are still in the setup mode and the interlocks are not enabled.

**FPM 300 SET MEM 4**  
**3/8 CHIP 20.0lb/yd**

This screen will flash to

**SETUP MEM 4**  
**MODE 20.0lb/yd**

and back to the other screen.

Depressing the scroll button will bring up the next screen

**Two Hydraulic Tanks**  
**Decrease to Change**

Push the app rate decrease switch to change to one tank and the App rate increase switch to change back to two tanks. When the setting has been placed on the correct number of tanks, depress the scroll button to move to the "Gate Oper" screen.

**GATE OPER FWD ONLY**  
**DECREASE TO CHANGE**

Push the App rate decrease switch to change to gate operation to both forward and reverse and the App rate increase switch to change back to forward only gate operation. When the setting has been placed for the desired mode of operation, depress the scroll button to move to the "Exit/Save" screen.

**EXIT = PUSH APP INCR**  
**SAVE = PUSH APP DECR**

To save all of the settings, depress the App Decr switch. To exit without saving the data and thereby leave it as it was before you got into the routine, depress the App Incr switch.

**If only one item was changed, you must "Save" as you exit or the change that was just made will be ignored.** When you "Exit" or "Save" you will return to the following screen.

**FPM 300 SET MEM 4**  
**3/8 CHIP 20.0lb/yd**