

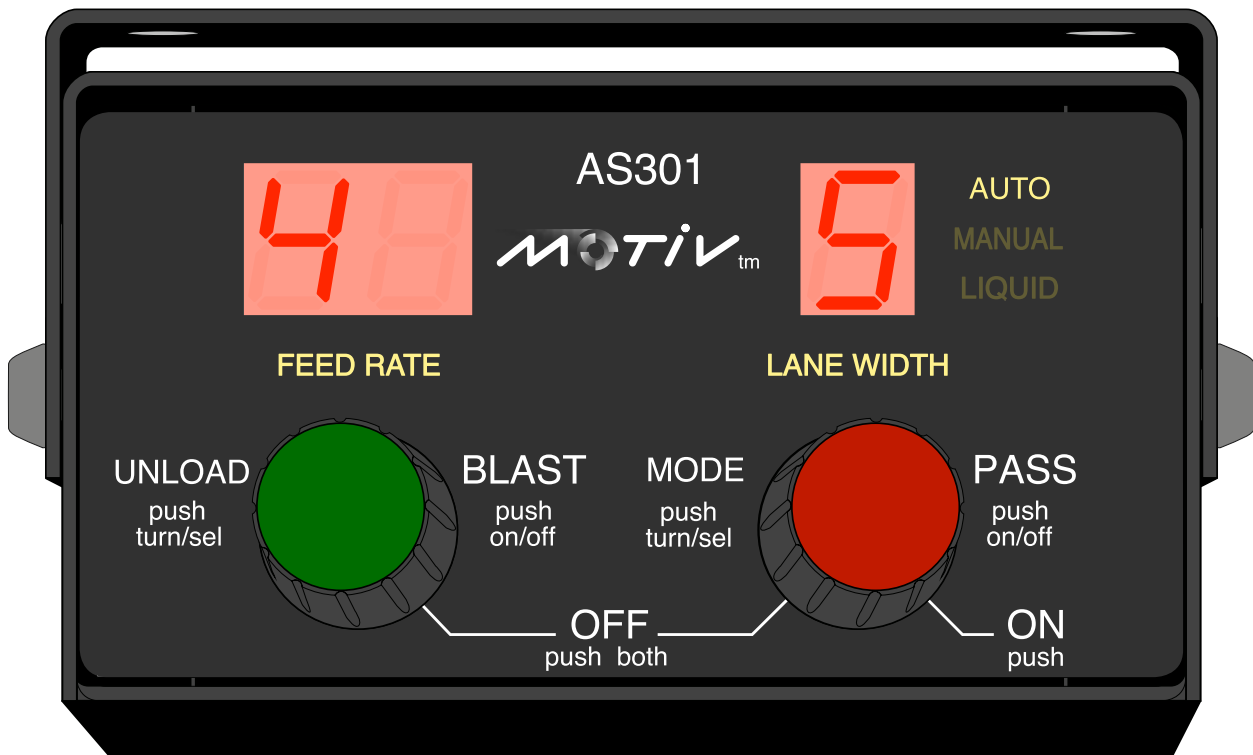


AS300

Installation and Operations Manual

Electronic Ground Speed Spreader Control

with pre-wet liquid control
Revision -A1B

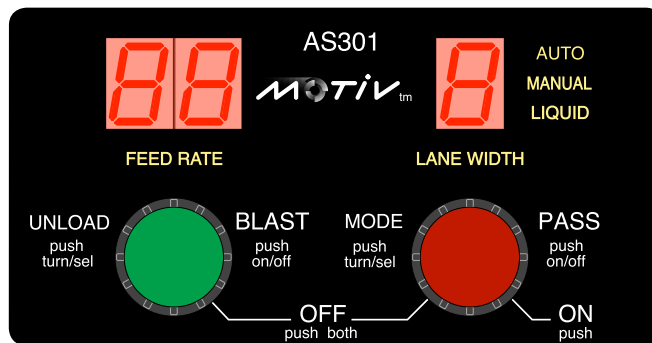


AS3 Operations and Installation Manual

Description

The AS3 spreader controller provides both automatic and manual spreader operation. In automatic spreader mode the AS3 accurately maintains a constant pounds-per-mile output as the vehicle's speed varies. The AS3 can control three electro-hydraulic proportional flow control valves for conveyor (auger), spinner (spreader), and a pre-wet liquid system. The AS3's proportional valve control is fully adjustable; both PWM frequency and minimum and maximum drive current (or voltage) settings can be adjusted. The AS3 will accommodate most electro-hydraulic proportional valves.

The AS3 front panel incorporates two knobs for the operator's Feed Rate and Lane Width adjustments. The Feed Rate and Lane Width settings are reported to the operator from a digital display located directly above each knob. Both knobs are detented with bi-directional, endless rotation, and an integral push-button. Certain selections are accomplished by push-and-turn operation of the knob. This allows the operator to change the Feed Rate, Lane Width, and other settings with fast digital precision. Pass and/or Blast functions are activated with a push of the knob. The front panel is backlit and organized using lighted indicators and a three character alpha-numeric display.



AS3 Spreader Features

- Nine programmable levels of Feed Rate for conveyor (auger) control with true lbs/mile calibration
- Nine programmable levels of Lane Width for spinner control, with zero MPH shut off
- Select number of Lanes Widths, 1 to 9 lanes
- Auto or Manual operation. Six different configurations, including manual lock out
- Blast with adjustable off-delay timer, push on/off control, remote switch option
- Pass feature with instant push on/off control, remote switch option
- Unload material (full conveyor output) with vehicle speeds up to 5 mph
- Four granular products, operator selectable
- Optional liquid pre-wet output, turns on and off with the conveyor valve
- Internal audible beeper, verifies certain functions for the operator
- MPH ratio change for two speed rear ends
- Drop in replacement for Motiv DS2's, AS2's, MS2's

Electrical Specification

- Operating voltage: 11 - 15 vdc, standard 12 volt mobile vehicle electrical system, (neg) ground
- Outputs: (3) current controlled PWM valve drivers, 2.5 amps each, overload sensing/protected
- Inputs: mph input, (4) sensor types: AC (VRM), DC sink, DC source (HALL) and coupled, (2) auxiliary inputs for current sinking devices, ie. remote switches
- Front panel: Back lighted, non-glare, encoders w/ knobs, alpha-numeric display
- Wiring interface: Keyed twist-lock CPC, 9 pin connector
- Enclosure: steel with bracket for various mounting options
- Calibration: all calibrations are set via the front panel, no tools required, pass code protected.

Installation with initial power up and check out

Always install the AS3 inside the vehicle cab. The bracket is designed to offer the installer a selection of mounting positions ([see mounting drawing](#)): above, below or panel mount (panel mount option is special order). Ensure the AS3 is mounted in a position that gives the operator easy and clear access to the control knobs. Make a secure mount to avoid vibration. Route the cable harness to the required locations and make the connections as per the wiring diagram ([see wiring drawing](#)).

The process of setting up and calibrating the AS3 spreader control is made easier by proceeding through the following steps in sequence. These steps are an operational check list for verifying the overall spreader control and operation. DO NOT proceed with the programmable calibration settings until the following operational items check out correctly:

1. Hydraulic components are to be fully plumbed and ready to run.
2. Cable harness installed with all devices and terminations completed.
(mph signal wire can remain unconnected until later in the test)
3. AS3 controller is mounted, cable connected, and 12 volt DC power is ready.
(note: the AS3 is a negative grounded device)
4. To power up the AS3 simply press-and-release the Lane Width knob. When the digital display comes on, you will also hear a short audible chirp, confirming the power-up is complete.
5. Switch the AS3 to manual mode to check out the conveyor and spinner operation. To switch to manual mode, push-and-turn the Lane Width knob clockwise 2 detents; look for the auto light to go off and the manual light to come on, then release knob. The AS3 will now directly output manual drive signals to the conveyor and spinner valves.
6. From manual mode, verify the basic hydraulic operation. To check the conveyor, rotate the Feed Rate knob to vary the conveyor speed. To check the spinner operation, rotate the Lane Width knob to vary the spinner speed. Operate both knobs throughout all of the settings 0, 1, 2, 3, ... 9 and verify proper hydraulic operation. Check for proper rotation, leaks, etc. Note: the minimum and maximum speeds may not be accurate at this point. Fine tuning individual adjustments is made later in the program setup section.
7. If liquid is used, verify liquid output (Note: liquid output is active anytime the conveyor is active)
8. MPH test. The first step is to determine the type of vehicle speed sensor being used. Most trucks manufactured today use electronic MPH signals generated from the transmission or the ECU (engine control unit). The installer must select the correct MPH signal type in the program list ([see menu 05](#)).
Factory default – DC sink
 - The AS3 offers an input circuit for the four types of sensors:
 - AC zero crossing signal generator with a 300 mV AC, peak-to-peak threshold
 - DC sink current sinking sensor, open collector NPN typ. V in low = 1vdc max, V in high = 6vdc min
 - DC source current sourcing sensor, open emitter PNP typ. V in low = 1vdc max, V in high = 6vdc min
 - Coupled edge sensing, series capacitive coupled, 1uf

General tips: Vehicles with ECU mph signals are typically DC sinking type. For trucks where the installer is going to tap into the transmission tail shaft sensor, use the AC type. Some newer small body trucks use the DC sourcing sensors. The option to use Coupled is usually done when the other types won't work.

Verify the MPH signal is correctly wired. Power up the AS3. In auto mode, the displays will blink when there is NO signal being generated (normal). Jack up the rear end of the vehicle, be safe and use wheel blocks. Put the transmission in gear and let the rear wheels rotate ~ 5mph. If the displays go from blinking, to on-steady, then you have a good MPH signal. If the displays remain blinking, you may need to change the MPH sensor type. ([see menu 05](#))

9. If the spinner and conveyor operate correctly, and the AS3 detects a MPH signal, then you are ready to proceed with the detailed programming setup (see page 7, "[How to access the program mode](#)").

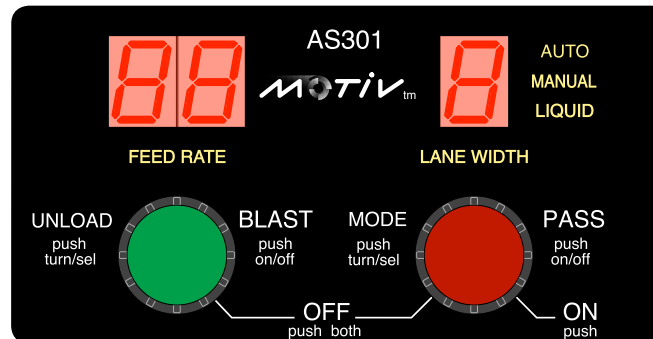
Operator Controls Power, Spinner, Conveyor, Displays

The operator has two control knobs located on the front panel. See sketch below; each knob responds to CW and CCW rotation and acts as a push-button when pressed. The combination of push and/or turn creates three different actions for each knob: turn, push-and-release, push-and-turn.

The six spreader functions in run mode, assigned to the multiple knob actions, are as follows:

- Feed Rate Turn ... selects one of nine Rate settings, power off
- Blast Push-and-release ... conveyor output = 100% w/ an off-delay timer
- Unload push-and-turn ... conveyor output = 100% to empty the hopper

- Lane Width Turn ... selects one of nine Lane settings, power on-off
- Pass Push-and-release ... instant off for the conveyor and spinner
- Product select Push-and-turn ... select 1 of 4 products



Power on/off

- To turn the **AS3 ON** **Push-and-release** only the Lane Width knob
... you will hear an audible chirp, confirming the power up
- To turn the **AS3 OFF** **Push-and-HOLD** both the Feed Rate and Lane Width knobs
... hold for 1 second and release, entire front panel goes blank

Lane Width Control with Pass, Auto/Manual and Product select

- After powering up, the AS3 pre-sets the spinner output = 0, factory default
 - ▶ to setup the number of active lanes, [see menu 31](#)
 - ▶ to set the start up Lane Width, [see menu 41](#)
 - ▶ to set the start up spreader auto/manual mode, [see menu 39](#)
 - ▶ to set the overall spinner operation, [see menu 04](#)
- To change the Lane Width, turn the Lane Width knob cw to increase and ccw to decrease the output. The display just above the Lane Width knob will show your selection; 0 – 9. 0=Off, 1 is the lowest and 9 is the highest.
- Push-and-release the Lane Width knob to enable Pass. Push-and-release again to disable Pass. The display will show **P A S**. Note: Blast will override Pass, see [Feed Rate Control](#).
- Push-and-release the Lane Width knob two detents cw to select **Manual** operation or two detents ccw to select **Automatic** operation. The Auto / Manual LED status indicator provides confirmation.
- Push-and-turn the lane width knob CW (approx. 6 detents) to select the **Product number**. The vehicle **MUST BE STOPPED** to change the product. As the knob is turned the AS3 will move through the auto/man selection, and finally the display will show # **P**. Select the desired product number (1 – 4), and release the knob. The AS3 will save your selection and return to your last operator settings. Note: A decimal point next to the number indicates the currently selected product.

Feed Rate Control with Blast and Unload

The Feed Rate knob is used by the operator to select a pounds-per-mile application rate. Associated with the Feed Rate are the Blast and Unload features

- At power up, the AS3 starts with the Feed Rate = 0, conveyor output = 0, factory default
 - ▶ to set the nine individual Feed Rates (table), [see menu 21-29](#)
 - ▶ to setup the overall conveyor spreading mode, [see menu 03](#)
 - ▶ to preset the startup Feed Rate, [see menu 40](#)

- To change the Feed Rate turn the Feed Rate knob ccw to decrease and cw to increase the rate output. The two digit display above the Feed Rate knob will display your selection. 0=Off, rates 1 - 9 corresponds to the nine programmed Feed Rates. The AS3 uses a display feature to more easily help the operator to pick the desired rate from a list of nine choices (feed rate table).

Feed Rate Table: The installer is able to program nine different Feed Rates into a table stored in the AS3, ([see menus 21-29](#)). This feature allows the operator to easily select a Feed Rate based on viewing an actual lbs./mile number. The full table of Feed Rate choices is displayed one at a time as the operator turns the Feed Rate knob. All three digits of the AS3 display immediately show the actual lbs/mile directly from the internal Feed Rate table. The nine elements of the rate table are sequentially displayed for as long as the operator is turning the Feed knob. Shortly after the operator stops turning the Feed knob, the display returns to showing the selected Feed Rate number 0 – 9.

Note: The AS3 Feed Rate table is displayed in units of lbs per mile, the range is from 100 to 1990 lbs/mile. To determine the actual Feed Rate the operator must multiply the displayed number by 10. The Feed Rate display uses a decimal point to indicate the 10 X multiplier.

[<i>displayed number</i> X 10 = actual lbs/mile]	ex.	10.0 = 100 lbs/mile
		99.0 = 990 lbs/mile
		100. = 1000 lbs/mile
		199. = 1990 lbs/mile

Refer to the section on AS3 Displays for more information.

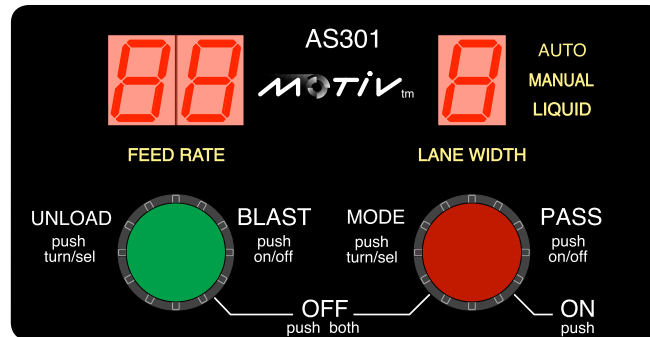
- To start **Blast**, push-and-release the Feed Rate knob; the conveyor output will = 100%. Throughout the Blast activity, the display will show **bL**. Upon releasing the knob the Blast off-delay timer begins counting down. A second push-and-release will stop the Blast and timer. The Blast stops automatically at the end of the timer period. The Blast off-delay timer is adjustable, range 0 to 30 seconds ([see menu 09](#))

- To **Unload** the hopper, the vehicle **MUST BE STOPPED**. Push-and-turn the Feed Rate knob ccw and release; the conveyor output = 100% and the display will show **UL**. To stop the unload process, push-and-release the Feed Rate knob a second time. Note: the spinner is enabled during the unload and the operator can run the spinner at any setting 0-9, 0 = Off. If the vehicle speed goes above 5 mph the unload will automatically reset both Feed and Lane to Off

Displays

The AS3 uses three, 7-segment LED displays to present a wide variety of information to the operator. Throughout the AS3 manual you will see notations to point out the individual displays and codes. Ex. **bL** means Blast and **PA S** is for Pass. The following chart that shows the common operator displays. More detailed displays are revealed later in the programming section of this manual and are not generally relevant for the operator.

In addition to the three alpha-numeric characters, there is an audible beeper, and backlit status indicators to show spreader operation; typically either **Auto** or **Manual** will be illuminated.



Common Operator Displays

- | | | |
|-------------|-----------|---|
| 8.8. | 8. | showing all character segments; first display on power-up; indicates a power reset occurred |
| 0 | 0 | initial start-up display: Shows Feed Rate (conveyor=0) and Lane Width (spinner=0) settings |
| 2 | 4 | Feed Rate = 2 and Lane Width = 4 (a typical run display) |
| bL | 3 | Blast = on/active, Lane Width = 3 |
| PA | S | Pass = on/active, both Feed Rate and Lane Width outputs are off |
| UL | 0 | Unload is on/active, Lane Width = 0 (spinner is off) |
| Pr | 2. | Product number two is selected |
| Or | 3 | (Or is blinking) conveyor has overrun its capacity, Lane Width = 3 |
| PS | i | Conveyor stall, inputs 1 or 2 active due to a high PSI condition
(aka 07 E error displays PS i) (beep) (see menus 11 and 12 for input setup) |

In the upper right corner are three backlit words: auto, manual and liquid. These indicators inform the operator of the spreading mode:

Auto: operates using ground-speed modulation.

Blinking: means the vehicle is not moving

On Steady: means the vehicle is moving, speed is > 1 mph

Manual: operates w/o vehicle speed input, follows knob selections

Liquid: option for future release

AS3 Error codes if the AS3 detects an error, the outputs will shut down and the display will repeatedly flash one of the following error codes:

- | | |
|------|---|
| 01 E | conveyor short, valve coil, circuit is < 2 ohm |
| 02 E | conveyor open, valve coil, circuit is > 40 ohm |
| 03 E | spinner short, valve coil, circuit is < 2 ohm |
| 04 E | spinner open, valve coil, circuit is > 40 ohm |
| 05 E | valve supply internal fuse blown (call for support) |
| 06 E | vehicle battery supply < 10.5 volts DC |
| 07 E | high pressure stall switch, (beeps) aka PS i (see above) |
| 08 E | liquid short, valve coil, circuit is < 2 ohm |
| 09 E | liquid open, valve coil, circuit is > 40 ohm |

How to access the program mode

Start with the unit powered off and simultaneously press-and-hold both the Feed Rate and Lane Width knobs. Continue to hold both knobs in for about 3 seconds; observe the unit power up, then the unit displays **SH O** ("show" or view only mode), then release both knobs. Note: *On newer models the displays will go blank, and then display **SH O** when the knobs are released.* Next, enter the pass code by press-and-holding the Feed Rate knob and turning the Lane Width knob until the correct three digit pass code appears on the display. Release the Feed Rate knob; the display now shows **Pr g** ("Program" or programming mode). If the pass code entered is incorrect the unit will return to displaying **SH O**.

Note: The correct pass code for the AS3 is located on the last page of this manual.

To exit the program mode, from any menu #, press both knobs and hold them for ~3 seconds. The unit will display **SH O**, and then a moment later will display **8.8. 8**. Press-and-hold both knobs for ~3 sec., returns the unit to normal run mode.

How to make changes to the internal memory settings

Once in program mode use the following two steps to make changes to any of the internal settings. Note: some menu items are view only.

- A. **To select a menu #:** Press-and-hold the Lane Width knob, then turn the Feed Rate knob until the desired menu number is displayed, **xx P**. Release knob to view setting value.
(xx = program menu number ranging from 01-99, this list may change as new features are added).
- B. **To change a setting:** Press-and-hold the Feed Rate knob, then turn the Lane Width knob until the desired setting value is displayed. The newly changed setting is automatically, and immediately, saved into the non-volatile memory (no special battery backup is required).

Program List

The AS3 uses a list of menu numbers to assign each adjustment, mode, or feature selection. The program list has been organized into logical groupings and presented in a sequence that aids the installer. Throughout this list you will see a highlighted value that denotes the factory default setting for that menu item. Throughout this list are highlighted values that denote factory settings giving the installer a basic operational system. Changes to the factory settings are expected since every vehicle, its hydraulic components, and individual spreading policies are different.

Menu #	Name	Description
01	<u>Pass code</u>	Upon entering the correct pass code the AS3 will display Pr g and allow the installer to make changes to the program settings. The incorrect pass code will display SH 0 and allow the user a view only mode.
02	<u>Program ID</u>	view only 3 digit version ID (checksum), see version log on the last page of manual for the history of dates, codes, and changes that have been made.

Operational modes, timers and options

Menu #	Name	Description	Note: (xx) denotes factory settings
03	<u>Conveyor mode</u>	1 = Manual conveyor operation only, no mph modulation; conveyor follows the operators knob selections; auto spread mode locked out 2 = Auto conveyor (w/ mph modulation in auto spread mode); spread mode can be either auto or manual 3 = Auto conveyor only (w/ mph modulation); manual spread mode locked out; unload allowed	
04	<u>Spinner mode</u>	0 = Locked out, no spinner operation; Lane Width only displays - (Off) 1 = Manual spinner; follows the operators knob selections 2 = Auto spinner; automatically starts-stops w/ mph in auto spread mode	
05	<u>MPH sensor type</u>	Defines the type of ground speed sensor. Ref. speed input, pin 8 Ac = ac sensor, VRM Ac d = ac sensor w/ differential coupling dc = dc current sinking type sensors dcn = dc current sourcing type sensors	
06	<u>Set Counts/Mile</u>	Enter counts/mile Counts/mile range is 1000 – 200,000 (Note: display X 1000 = cts/mile). Also, use menu 07 for MPH calibration.	factory 26,700
07	<u>MPH view/calib</u>	View MPH. For calibration by matching, press-and-hold Rate knob, turn Lane knob (slowly) until AS3 display matches the vehicles speedometer. Best at ~20 mph. Adjust slowly to allow MPH filter time to respond.	
08	<u>2 speed ratio</u>	Enter the ratio of the 2-speed rear-end, (range 0.2 to 5.0) Note: The AS3 creates a calculated MPH to be used for Feed Rate control. Using a 2 speed rear-end requires a switch or relay be used to pull pin 5 to ground. First, calibrate the MPH with pin 5 open, then when pin 5 is grounded by the switch the AS3 will calculate (MPH = calib MPH / ratio)	factory 1.00
09	<u>Blast timer</u>	Enter off-delay timer range (0 - 30 seconds) (Note: 0 seconds sets timer off)	factory 5
10	<u>Blast type</u>	tr i = blast outputs maximum valve trim rt E = blast outputs Feed Rate programmed in for position 9	
11	<u>Aux. Input 1</u>	(ref. pin 5) <i>Aux. Input 1 is active when pin 5 is pulled to ground.</i> 0 = input 1 is not used 1 = remote psi switch for sensing conveyor stall 2 = remote switch for Pass 3 = remote switch for Blast 4 = remote switch for two speed rear-end 5 = remote power signal	
12	<u>Aux. Input 2</u>	(ref. pin 1) <i>Aux. Input 2 is active when pin 1 is pulled to ground.</i> 0 = input 2 is not used 1 = remote psi switch for sensing conveyor stall 2 = remote switch for Pass 3 = remote switch for Blast 4 = remote switch for two speed rear end	

Valve drive setup PWM freq., current/voltage control, min and max trim

The valve drive circuits are factory calibrated and preset for current mode operation. It is recommended that current control is used, which regulates the PWM to hold the current constant thus compensating for changes in battery voltage and valve coil resistance due to thermal effects. However, if there are difficulties with a particular valve coil operating in current mode, the AS3 can be changed to voltage control mode. In either mode, the AS3 displays the valve drive settings as a percent number of full scale (range .1 – 99.9%).

Menu #	Name	Description	
13	<u>PWM freq.</u>	enter PWM frequency, range (30 to 300 hertz)	factory = 120
14	<u>Conveyor drive mode</u>	Cu r sets conveyor drive to current control OL t sets conveyor drive to voltage control	factory = Cu r
15	<u>Spinner drive mode</u>	Cu r sets spinner drive to current control OL t sets spinner drive to voltage control	factory = Cu r
16	<u>Conveyor min trim</u> *	enter min valve drive, observe conveyor shaft for min desired speed** set for a slow smooth creep speed,	factory 25%
17	<u>Conveyor max trim</u> *	enter max valve drive, observe conveyor shaft for max desired speed** set for the max shaft speed without overdriving the valve,	factory 75%
18	<u>Spinner min trim</u> *	enter min valve drive, observe spinner shaft for min desired speed*** sets the spinner speed for Lane Width no. 1,	factory 25%
19	<u>Spinner max trim</u> *	enter min valve drive, observe spinner shaft for min desired speed*** sets spinner speed for highest assigned lane, (The highest lane number is factory set at 9, see menu 31)	factory 50%

(*) To adjust a valve trim: Select the desired menu # (16-19), then press-and-hold the Feed Rate knob (the AS3 will output to the valve) and adjust the Lane Width knob for the desired shaft speed output. Repeat these steps for each of the four valve trims.

(**)Conveyor trim considerations: The conveyor min is the easiest setting to make: adjust the valve min trim for a slow, smooth creep speed as observed at the conveyor shaft.

The conveyor max is a little more difficult; the installer needs to set the valve max for the greatest shaft speed without overdriving the valve. The best approach is to adjust the max trim from a low setting, proceeding slowly to higher settings until the max conveyor RPM is just achieved. Using a hand-held RPM gauge on the conveyor shaft will create a more accurate result. Raising the max trim beyond the peak RPM will distort the conveyor calibration ([see menu 20](#))

(***)Spinner trim considerations: The spinner min is always associated with Lane Width 1 and the spinner max is associated with the highest Lane Width selected. ([see menu 31](#)). It is important to note that whenever making spinner adjustments with an empty spinner (no granular material), it will be rotating without a load and tend to spin too fast. The AS3 has a feature where the installer can have granular material dump from the conveyor while making the individual spinner adjustments. ([see menu 30](#))

(Special note) There is a built in current meter (ammeter) within the AS3 that can be useful for troubleshooting. When setting any of the valve trims (menus 16-19): turn the Feed Rate knob CW a few detents before pushing the knob. The display will now show a number corresponding to milliamps. The displayed current is only updated every .75 sec., be patient and adjust the valve trim slowly. To return to viewing the valve drive as a percentage, turn the Feed Rate knob CCW a few detents.

Conveyor Calibration and Feed Rate table

Menu # Name Description

20 Conveyor calib Perform a conveyor dump (see procedure below)
 Enter the max conveyor rate, range (50 to 1990 lbs/min) factory = **30.0**
 Note: the displayed value includes a decimal point you must use
 [digits displayed X10 = lbs/min] ex. 5.0 = 50 lbs/min
 99.0 = 990 lbs/min
 100. = 1000 lbs/min
 199. = 1990 lbs/min

Conveyor dump procedure

- The granular type (sand, salt, etc) used to calibrate the conveyor is Product no. 1.
- The conveyor's maximum trim must be correctly set for this calibration to be accurate.
- Perform the test dump using manual mode at a Feed Rate = 9.
- Use a fixed gate setting; measure and time a material dump of ~1/4 of the hopper.
- Calculation: max conveyor output, in lbs/min = total pounds dumped / total minutes dumped
- Enter the resulting number into menu 20..

Feed Rates Auto spread mode uses preset lbs/mile **Feed Rates**. Based on your spreading policy, select an individual lbs/mile set point for each of the nine Feed knob positions. If less than nine different rates are required set the all of upper knob positions to the same highest value.

example; 1=10.0, 2=25.0, 3= 30.0, 4=45.0, 5=60.0, 6=7=8=9=70.0.

The AS3's displayed Feed Rate must be multiplied by 10 to determine the actual Rate. The AS3 displays feed rate values that include a decimal point, which must be considered when interpreting the actual value.

[digits displayed X10 = lbs/mile] ex. 10.0 = 100 lbs/mile
 99.0 = 990 lbs/mile
 100. = 1000 lbs/mile
 199. = 1990 lbs/mile

Manual spreader mode arranges the Feed Rate knob positions into fixed even increments between 0% and 100%. Note: 0% = conveyor min trim, and 100% = conveyor max trim. The installer cannot change the manual settings for the conveyor output.

Feed Rate Table Starting with Feed Rate 1 (menu 21) enter the desired lbs/mile application rate which will be associated with lowest Feed Rate setting. Proceed through menus # (21-29) and enter presets for all nine Feed Rates in the table. range (100 – 1990) lbs/mile

			factory	lbs/mile	manual settings (fixed)
21	<u>Feed Rate 1</u>	enter lb/mile	10.0	100	11%
22	<u>Feed Rate 2</u>	enter lb/mile	20.0	200	22%
23	<u>Feed Rate 3</u>	enter lb/mile	30.0	300	33%
24	<u>Feed Rate 4</u>	enter lb/mile	40.0	400	44%
25	<u>Feed Rate 5</u>	enter lb/mile	50.0	500	55%
26	<u>Feed Rate 6</u>	enter lb/mile	60.0	600	66%
27	<u>Feed Rate 7</u>	enter lb/mile	70.0	700	77%
28	<u>Feed Rate 8</u>	enter lb/mile	80.0	800	88%
29	<u>Feed Rate 9</u>	enter lb/mile	90.0	900	99%

Lane Width active conveyor, set number of lanes, spinner speeds

Lane Width Menus # (30-38) allow the installer to set the spinner speed for each switch position of the Lane Width knob. The number of lanes available to the operator may also be defined. To achieve more accurate results during spinner adjustments, the conveyor can be active during the procedure.

30 Conveyor active This feature allows the installer to run the conveyor while setting the spinner speeds. This achieves a more accurate result since the granular material adds load and effects the spinner speed. Visually verifying the spinner distance (throw) also creates a better result. The number entered is a percentage (0 – 99%) to directly control the conveyor speed. This feature resets to zero (turns off) each time you enter the program mode. This feature will run the conveyor when adjusting spinner min and max trim settings ([see menus 18,19](#)) or when adjusting Lane Width settings (see menus 32-38).

Press-and-hold the Feed Rate knob, adjust Lane knob to set the percentage of conveyor drive desired for feeding material onto the spinner (range 1 – 99%). The display starts out with three dashes --- (conveyor active mode is **off**.)

31 Max Lane selection The Max Lane selection establishes how many lanes will be allowed for the operator. The AS3 is factory set with nine lanes, evenly distributed between min to max. The AS3 will automatically redistribute the individual Lane Width settings evenly across the active number of lanes. This redistribution will only occur when the Max Lane selection is changed. After the max number of lanes is selected the installer can individually change any spinner speed using the menu list below. The Lane settings for knob positions 1 and 9 are set using menu 18 and 19, and are the same as the min and max trims respectively.

Enter the number of lanes you want available to the operator into menu # 31. The range is from 2 lanes to 9 lanes. Factory = **9 lanes**

Example; Enter a setting of 5 to remove lanes 6,7,8,9.
The 5 active lanes are now: 1, 2, 3, 4, 5

Lane Width The AS3 is programmed with automatically assigned spinner speeds. It is the installers option to change these to more accurate spinner speeds. To change an individual Lane setting: select the correct menu #, press-and-hold the Feed Rate knob. Observe the spinner and conveyor (if menu 30 is active) outputs go active. With the Feed Rate knob held in, turn the Lane Width knob to change the spinner speed. Release the Feed Rate knob to store the new setting. The display shows the spinner drive as a percentage

Note: the first (lowest) lane number is always one, Lane 1 is set using [menu 18](#) and the largest lane number is always set using [menu 19](#)

Menu #	Name	Description	factory (9 lanes)
18	lane 1	min trim	----by definition is 0%
32	lane 2	enter new	12%
33	lane 3	enter new	25%
34	lane 4	enter new	37%
35	lane 5	enter new	50%
36	lane 6	enter new	62%
37	lane 7	enter new	75%
38	lane 8	enter new	87%
19	lane 9	max trim	---- by definition is 100%

Start-up presets and multiple product calibration

Start-up The AS3 allows the installer to define certain start-up settings. The factory settings have the AS3 power up in auto spreader mode, with both the Feed Rate and Lane Widths at 0 (outputs off). This is the safest arrangement since it requires the operator to turn at least one knob before spreading can occur.

Menu #	Name	Description
39	<u>Manual / Auto mode</u>	enter the spreader mode that the AS3 will start from at power up Au t (automatic mode) An U (manual mode) factory = Au t
40	<u>Start-up Feed Rate</u>	enter the startup Feed Rate that the AS3 will start from at power up [range 0 – 9] factory = 0
41	Start-up Lane Width	enter the startup Lane Width that the AS3 will start from at power up [range 0 – 9] factory = 0

Products The AS3 allows the operator to select from four granular products. The AS3 names the products 1, 2, 3 and 4. Product 1 is the granular material used for the primary conveyor calibration (weight/time dump). The other three products are defined as a ratio of the calibrated material weight and the weight of the alternate product.

An easy method for determining the ratio is to use a bathroom scale and a 5 gallon bucket. Fill the 5 gallon bucket full and flush to the top and weigh it for products 1 through 4. Then use the formula below to calculate each product ratio, and enter these ratios using menus # (42-44). To effectively turn off a product, enter a ratio of 1.00

$$\text{Product ratio} = \frac{\text{weight of Prod. (2,3,4)}}{\text{weight of Prod 1}} \quad \text{range (0.1 to 5.00)}$$

Example: Product 1 is sand, weighing 75 lbs. Product 2 is a sand/salt mix weighing 62 lbs. $62 / 75 = .826667$ (rounded = 0.83). Enter the ratio 0.83 into menu # 42 Product 2 will now be calibrated for dumping the sand / salt mixture.

42	<u>Prod 2</u>	enter ratio	factory 1.00
43	<u>Prod 3</u>	enter ratio	factory 1.00
44	<u>Prod 4</u>	enter ratio	factory 1.00
45	<u>Liquid drive mode</u>	OL t sets liquid drive voltage control Select liquid solenoid valve <i>Cu r</i> future use only, do not use; sets liquid drive to current control OFF turns liquid channel off factory = OFF	

Note: the liquid output for the AS3 currently only supports a solenoid (bang-bang) valve. If not using the liquid output its very important to select the Liquid drive mode **OFF**. If the liquid output is used to turn on a 24P ([see application note](#)) or a solenoid valve, select the **OL t** option. Do not use the **Cu r** option, this is reserved for a future PWM liquid drive option.

46-49 not assigned in this version

Test, and Serial number

50	<u>Input hardware test</u>	verify inputs	Displays status for Auxiliary inputs #1, #2 and MPH 0 = input low, 1 = input high, 0-1-0 = signal pulses left digit = aux input 1, pin 5 center digit = aux input 2, pin 1 right digit = MPH, pin 8
51	<u>Serial number</u>	factory set	view only, 3 digit number, used for warranty

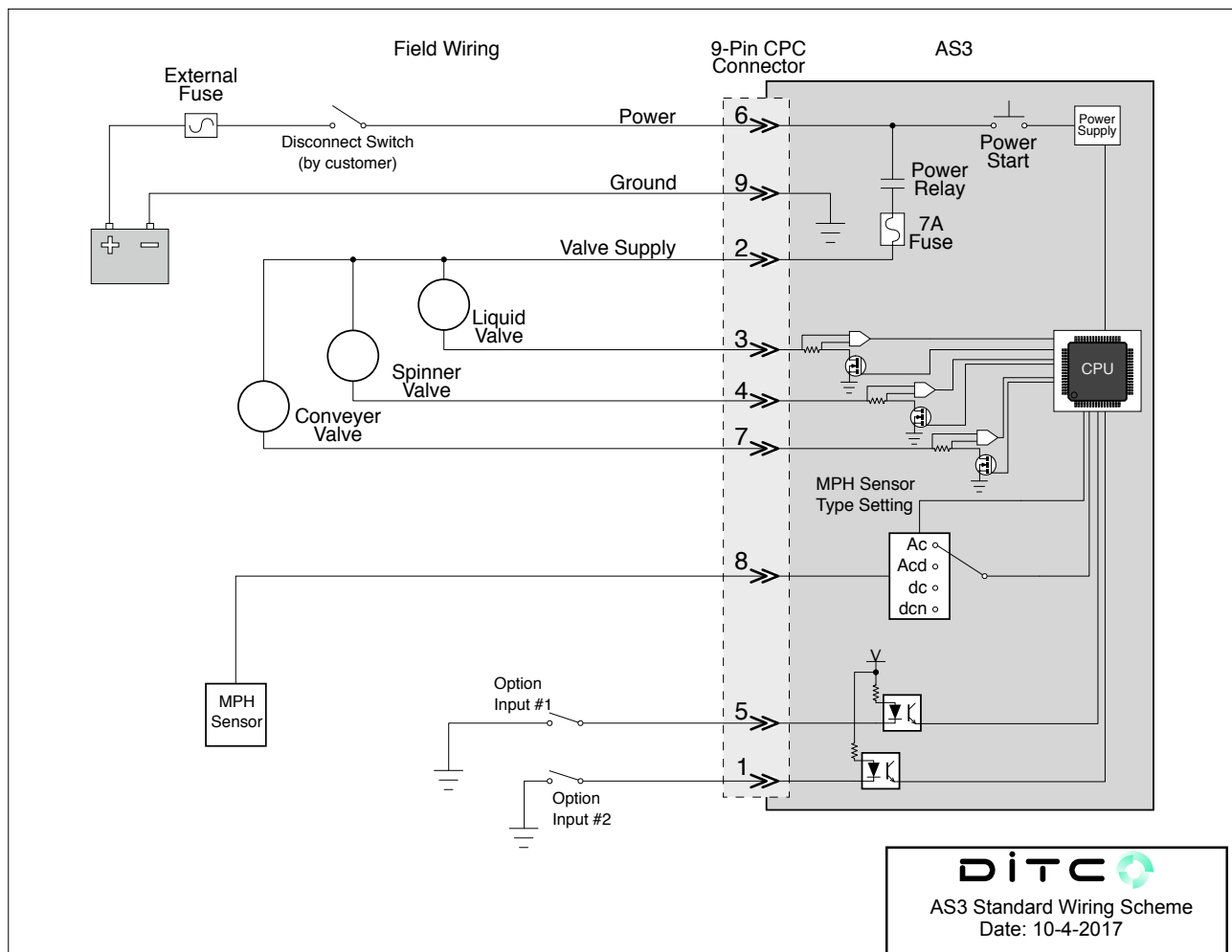
Spreader Cable Connections

The AS3 uses a 9 pin circular twist lock connector. The following table shows the connector pin out, name and description.

Pin no.	Circuit Name	Description
1	aux. input 2	Digital input, device sinking
2	valve supply (out)	12vdc valve supply, fused, common to all valve coils
3	output 3 (*)	Liquid valve solenoid drive signal
4	output 2	Spinner valve PWM drive signal
5	aux. input 1	Digital input, device sinking, (remote start option input)
6	vehicle power	+ 12vdc w/ a 5 amp feeder circuit, disconnect sw. by customer (**)
7	output 1	Conveyor valve PWM drive signal
8	mph input	vehicle speed signal, sensor types: AC, ACd, DC, DCn
9	vehicle ground	ground (neg.)

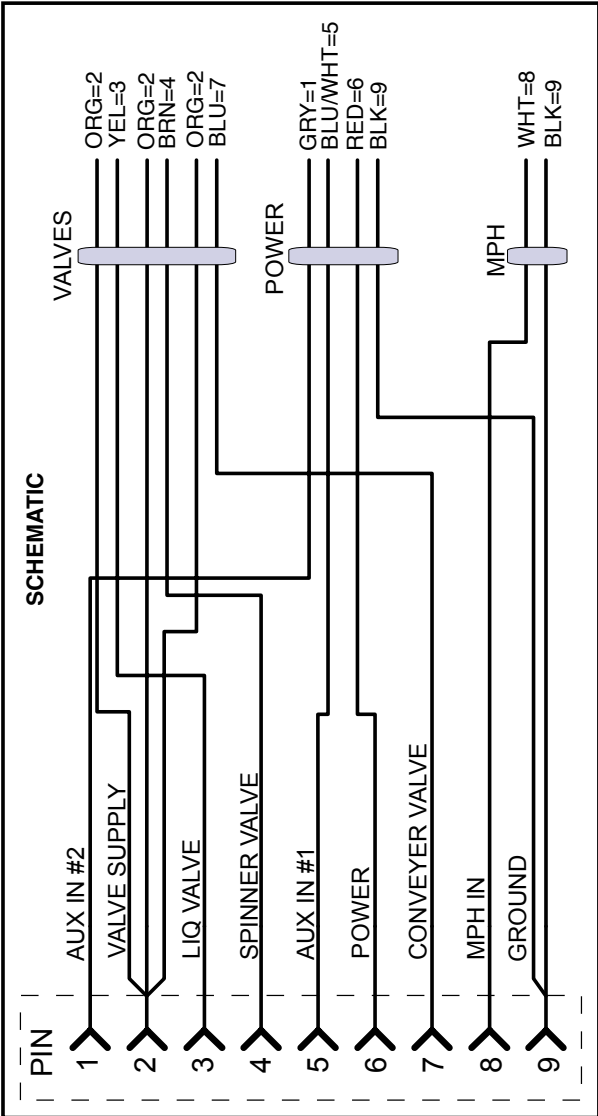
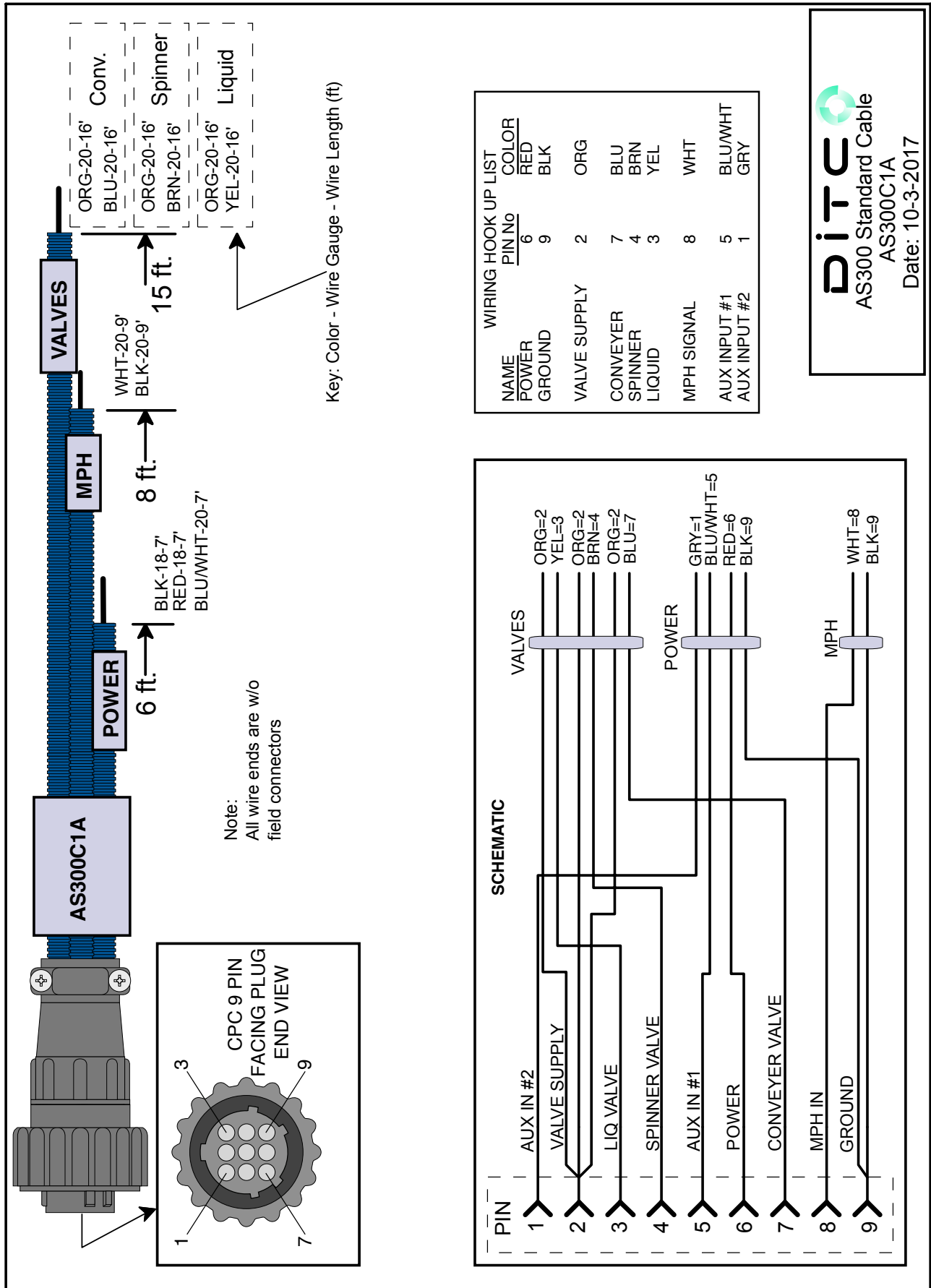
(*) The older pin out for *Motiv* spreader controls assigns pin 3 as the 12vdc supply for the mph speed sensor. However, on the AS3, pin 3 is reassigned as the liquid output. All three outputs of the AS3 are low-side switching.

(**) The customer is to supply an emergency shut-off disconnect switch to ensure the operator has a direct method to interrupt vehicle power to the AS3 and thereby immediately stop the three hydraulic functions, conveyor, spinner, liquid.



AS300C1A Vehicle Cable Assembly

The customer is to install required plug ends for the hydraulic valve coils.



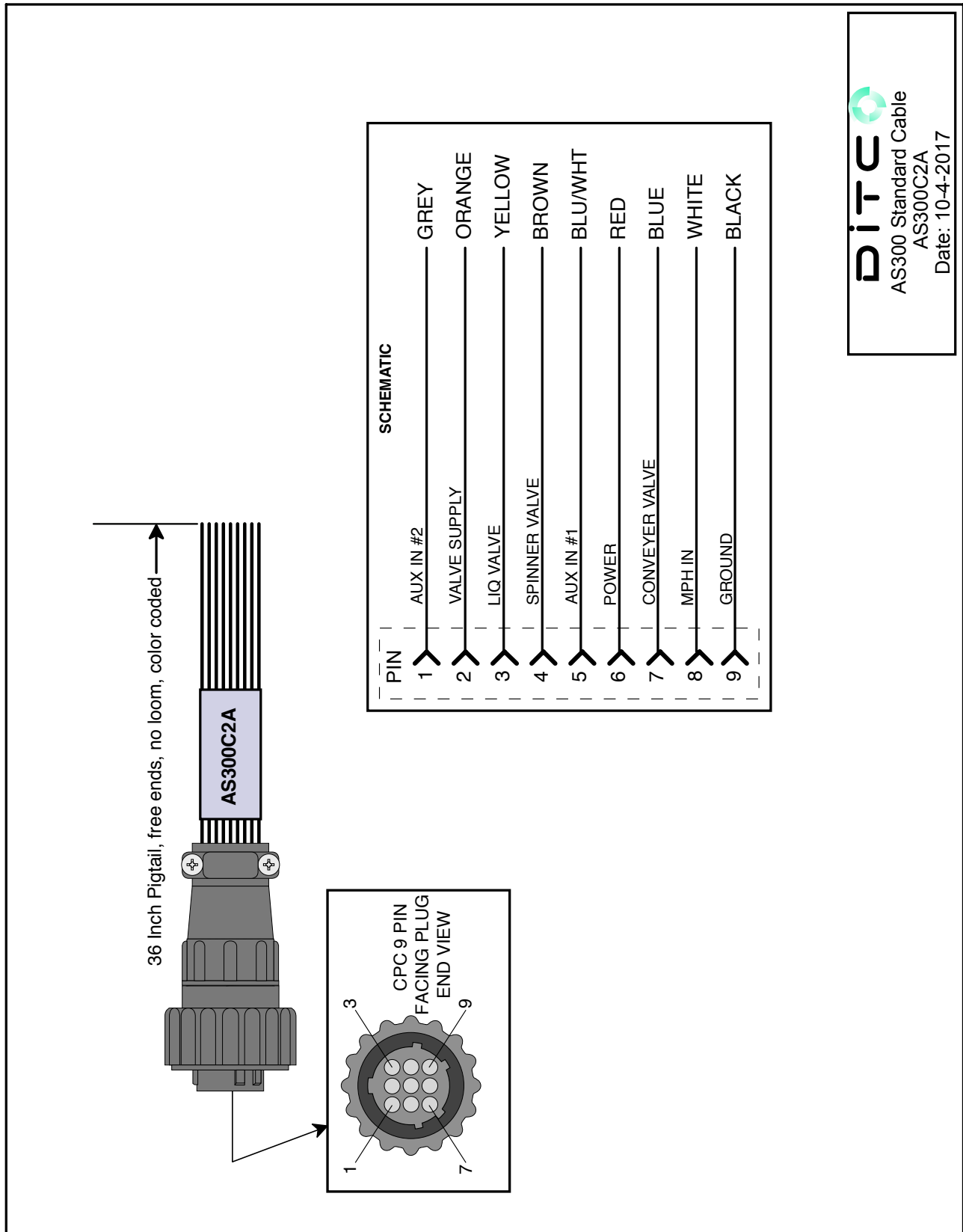
WIRING HOOK UP LIST

NAME	PIN No	COLOR
POWER	6	RED
GROUND	9	BLK
VALVE SUPPLY	2	ORG
CONVEYER	7	BLU
SPINNER	4	BRN
LIQUID	3	YEL
MPH SIGNAL	8	WHT
AUX INPUT #1	5	BLU/WHT
AUX INPUT #2	1	GRY

DITC
AS300 Standard Cable
AS300C1A
Date: 10-3-2017

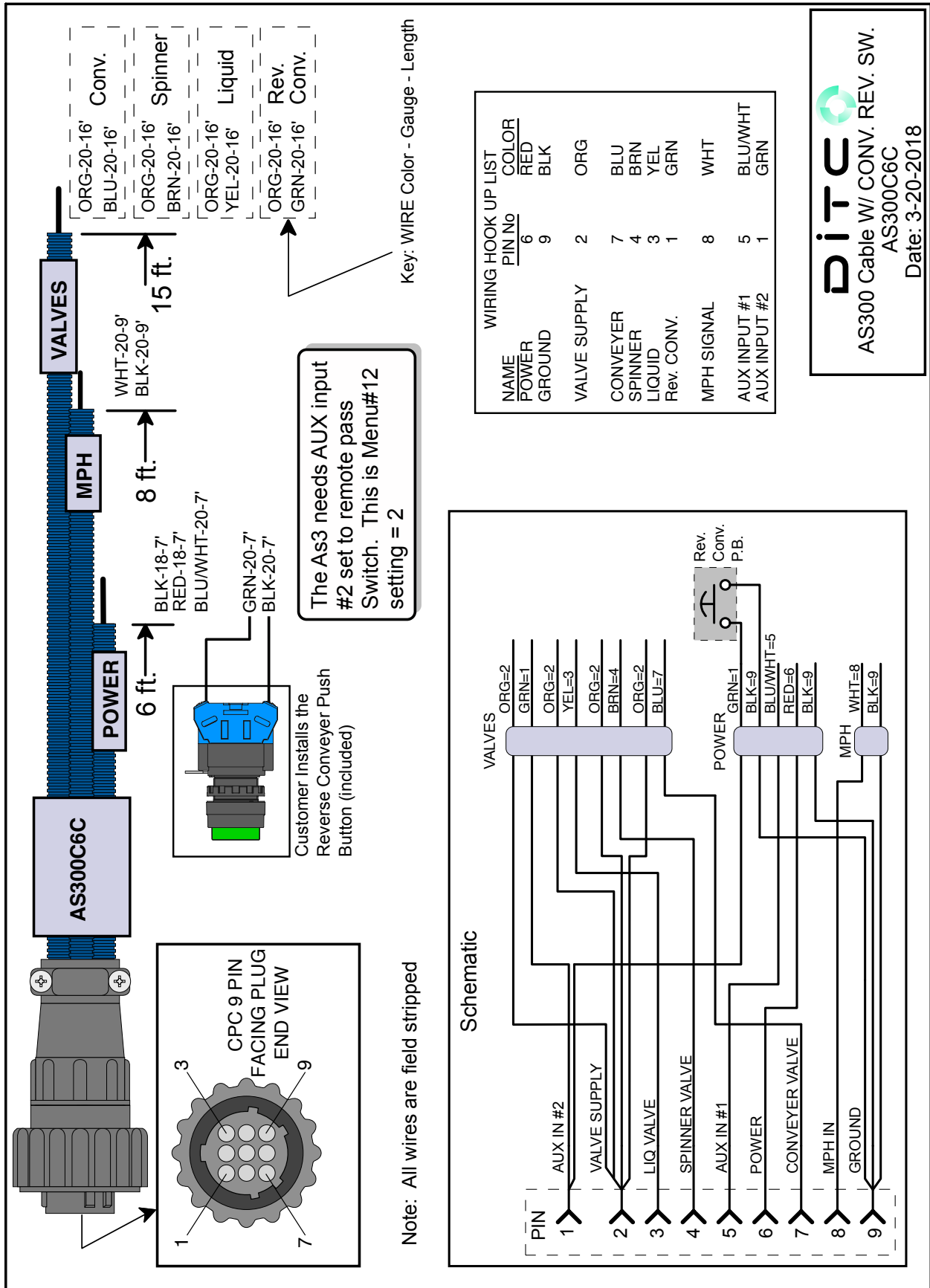
AS300C2A Pigtail Cable Assembly

The customer completes the cable assembly by adding the required wire lengths, connections and terminations to all of the required vehicle components.



AS300C6C Vehicle Cable Assembly w/ Reverse Conveyor Switch

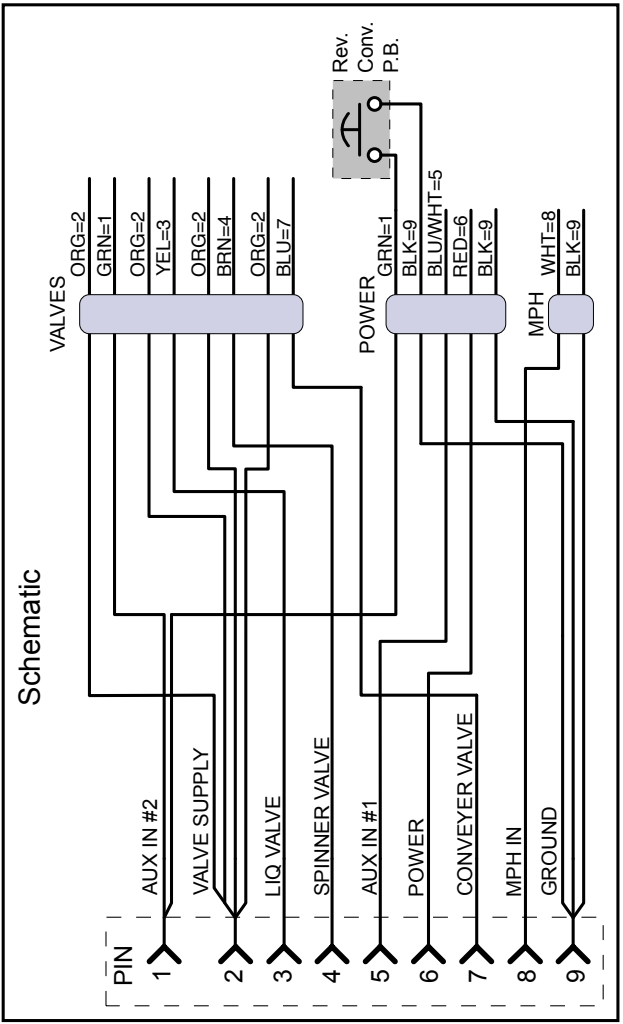
The customer is to install required plug ends for the hydraulic valve coils, and the conveyor reversing switch.



Note: All wires are field stripped

WIRING HOOK UP LIST

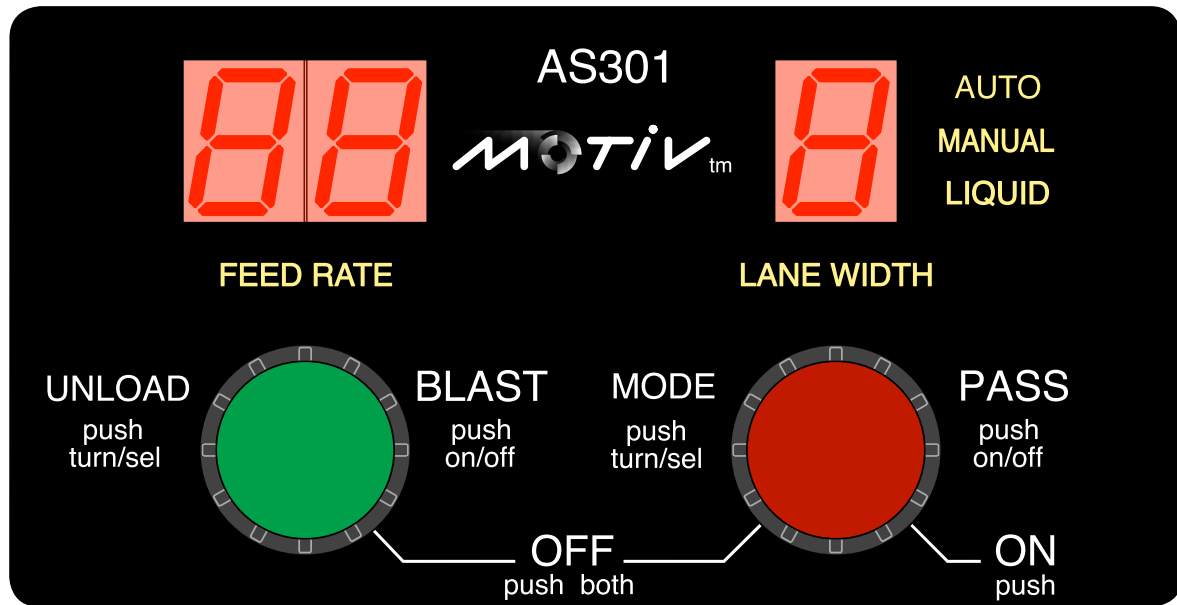
NAME	PIN No	COLOR
POWER	6	RED
GROUND	9	BLK
VALVE SUPPLY	2	ORG
CONVEYER	7	BLU
SPINNER	4	BRN
LIQUID	3	YEL
Rev. CONV.	1	GRN
MPH SIGNAL	8	WHT
AUX INPUT #1	5	BLU/WHT
AUX INPUT #2	1	GRN



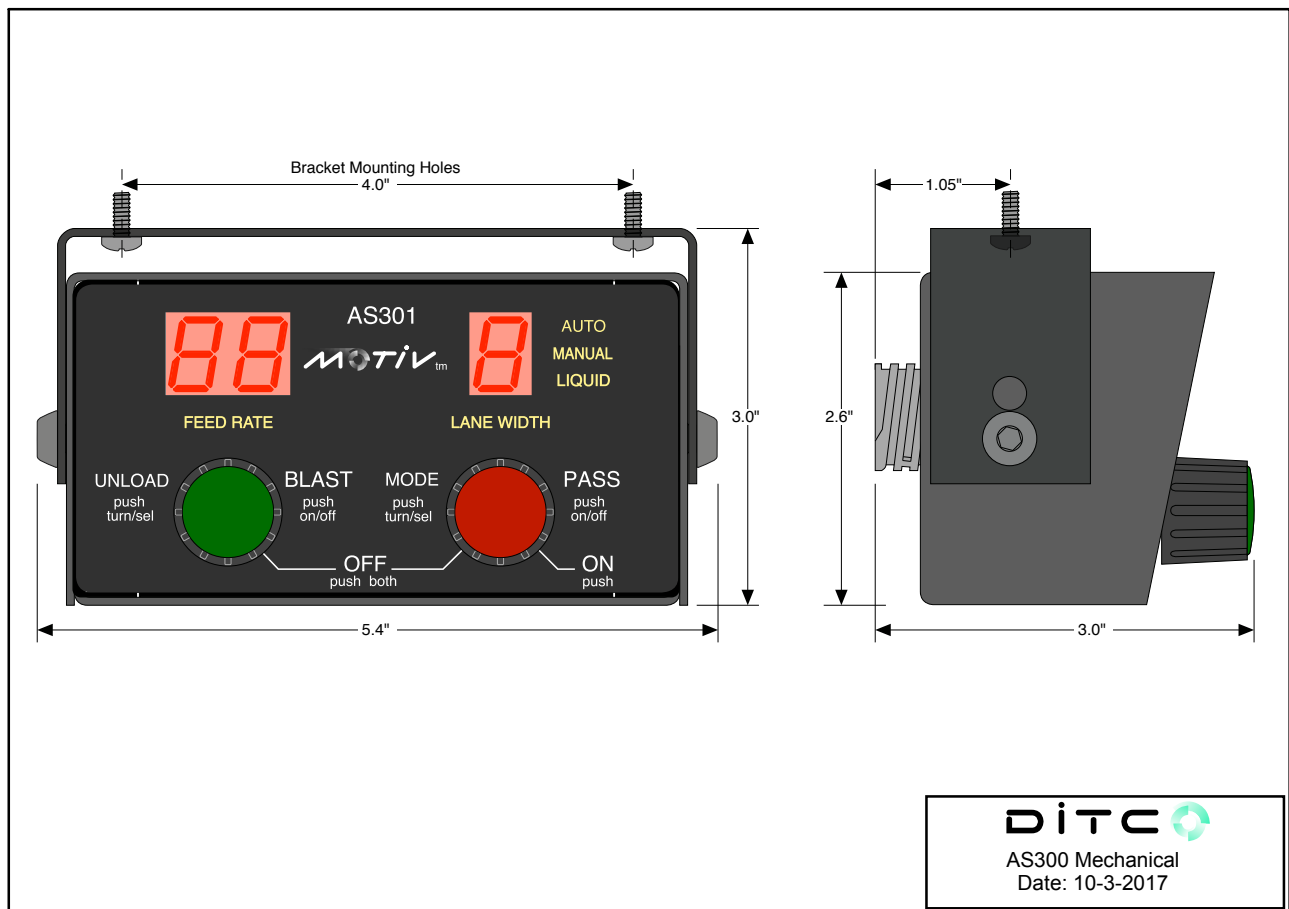
DITC

AS300 Cable W/ CONV. REV. SW.
AS300C6C
Date: 3-20-2018

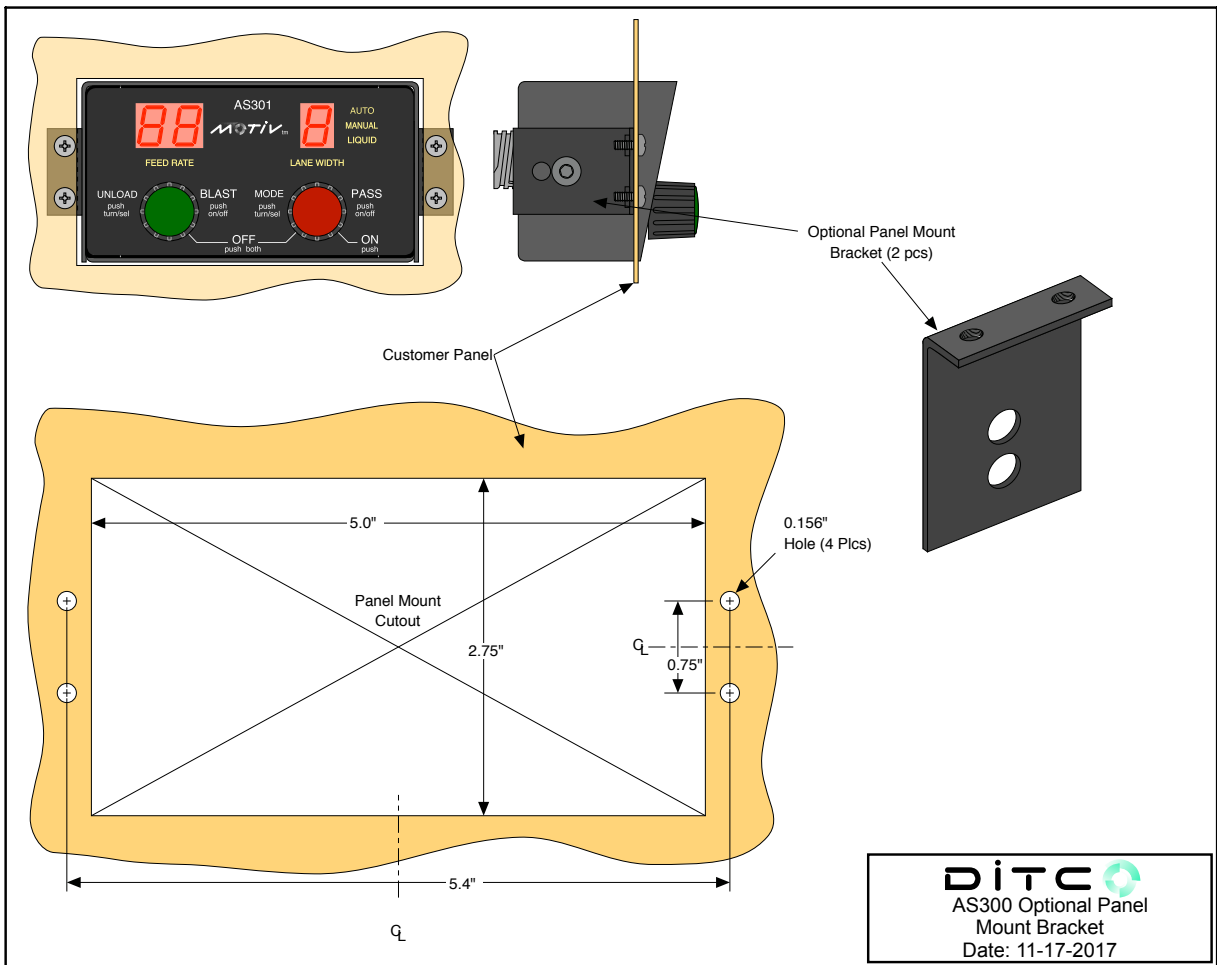
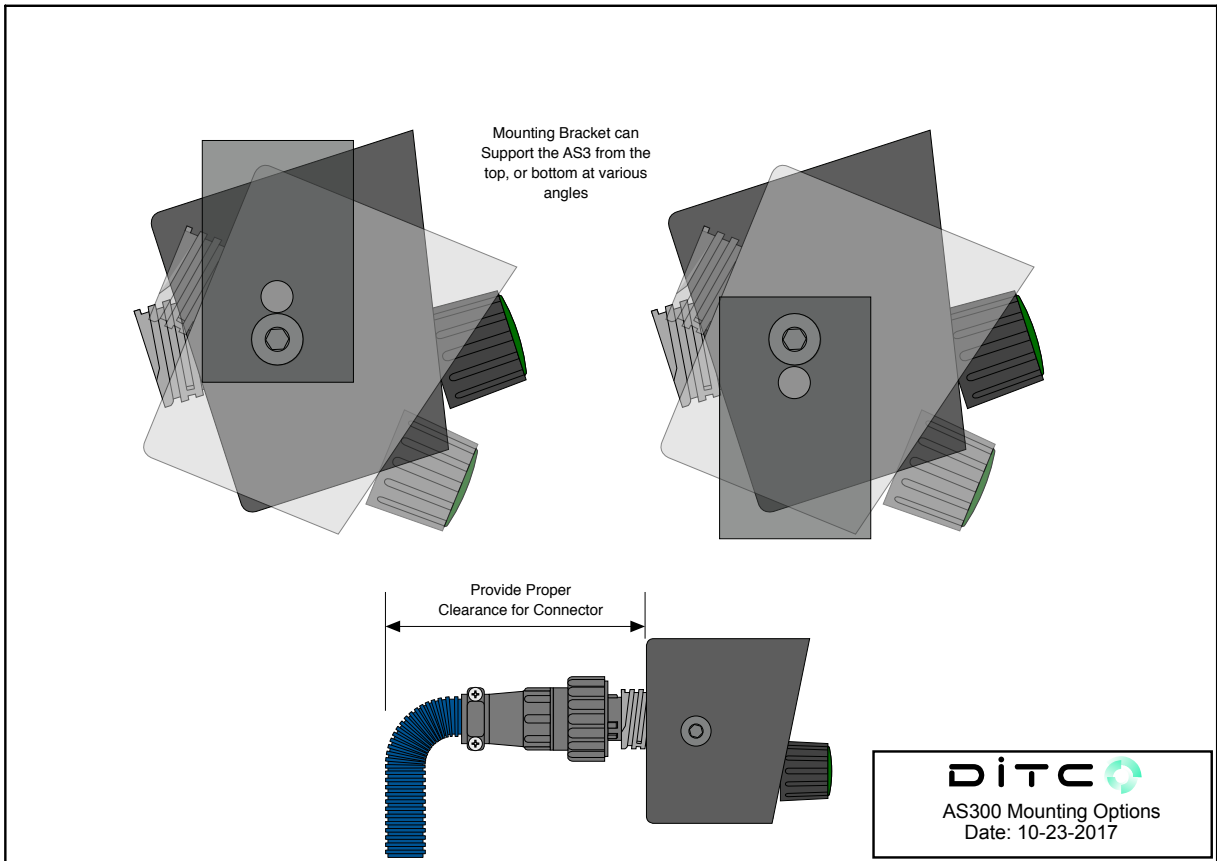
Panel Layout



Dimensional outline



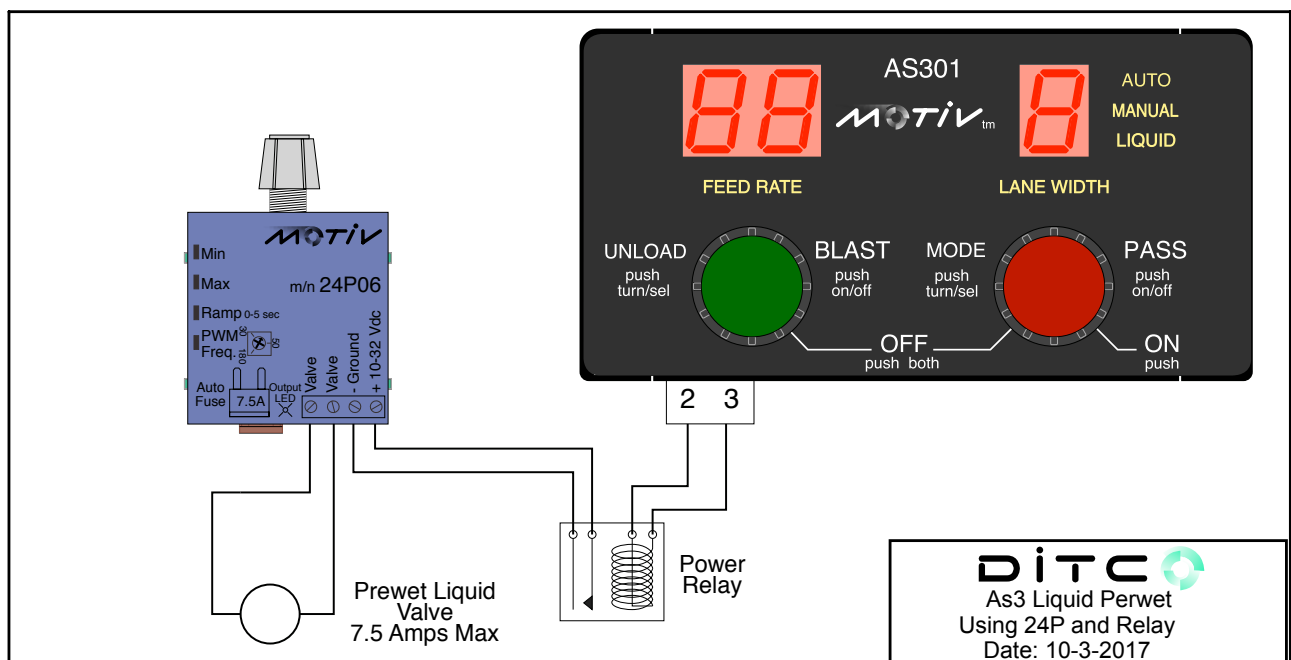
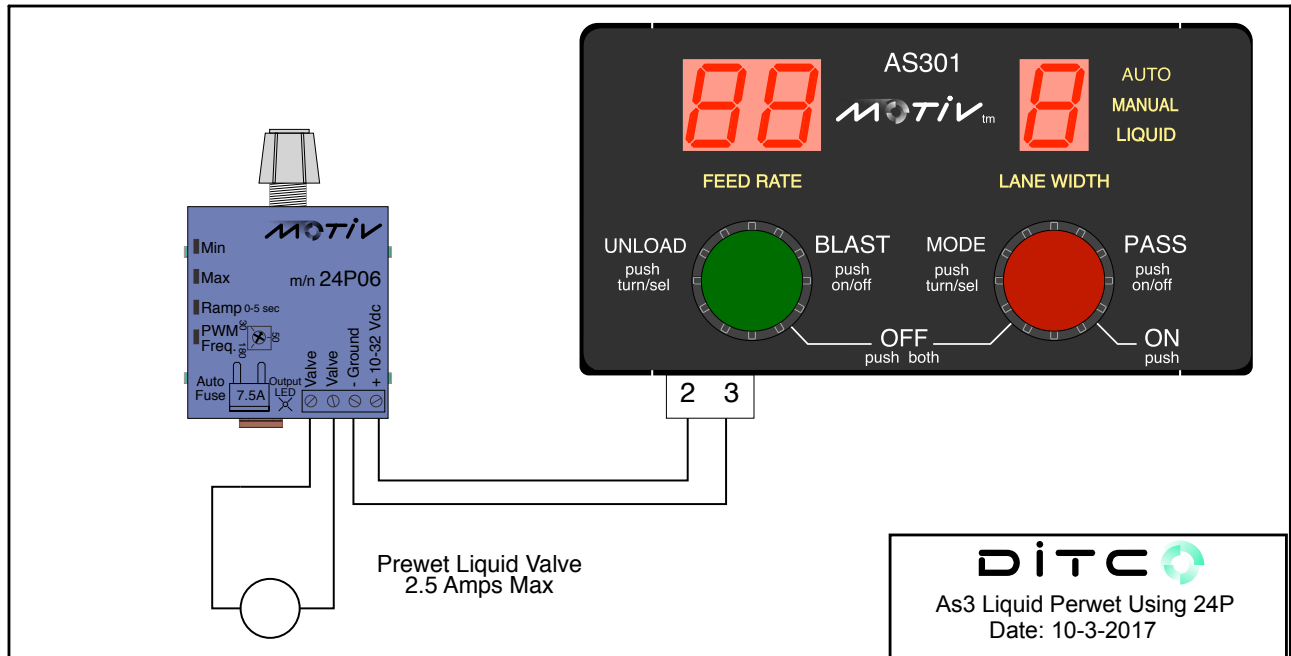
Mounting Options



Application Note:

Liquid pre-wet using 24P01

Wiring connections for using a 24P and the AS3's liquid channel output. The AS3's liquid output provides power to the 24P. The liquid output drive mode is factory set = Off. To activate the liquid output use [menu 45](#) to select the voltage drive mode. This allows the liquid output to go active (On) anytime the conveyor is active. The 24P provides the proportional drive to the liquid valve. Note, this method limits the liquid drive output current to 2.5 amps. If greater currents are required by the liquid valve use a relay.



Program version log (valid as of the date of this publication)

The software version code for an individual AS3 can be viewed at menu 02.

----- *Begin B32 design s/n 0 - 150* -----

<u>Date</u>	<u>version no.</u>	<u>description</u>
2.		D61 n/a
2.		0A9 n/a
2.		429 make spinner settings 1 & 9 = min & max
3.		2B5 add conveyor and spinner presets, s/n, test menus
4.		72E allows factory test at 9 vdc
6-9-04	80A	adjust MPH to start at ½ mph
7-27-04	1d0	fix max trim to be greater than min trim, filter display current

----- *Begin rev 9S12 design s/n (151 - up) these code versions are not backward compatible* -----

<u>Date</u>	<u>version no.</u>	<u>description</u>
6-17-05	6E9	Upgrade CPU, all previous features were maintained.
6-24-05	26F	mod to current control, ref. current inrush
8-4-05	3E7	fix Blast-manual-external mode
12-22-05	045	add startup-beep, DL2 interface, inc. cts/mi to 200K, max lane limit
4-26-06	832	add more DL2 codes, add V-batt calib, fix liquid error trap
6-19-06	bd9	fix zero current read, test mode low volt error 08
7-17-06	800	fix low supply voltage calib for zero current
10-23-06	E51	add liquid mode sel: Off , Volt, cur. factory = Off
12-6-06	C1C	correct conveyer error display E01, E02
9-22-08	354	allow new rotary switches, reverse switch logic, Aph, Bph
10-24-08	A4A	corrects the MPH menu labeling, introduce w/ CS 354
5-12-09	C13	Added a menu#17. This allows the user pass code to be set
2-17-12	Ab6	Upgrade design, all previous features were maintained

----- *Begin rev 9S12 design s/n (1125 - up) these code versions are not backward compatible* -----

8-7-17	239	Design change (LED displays = 3 red large characters)
10-11-17	192	Enabled the beeper

----- cut here -----

Program Access Pass Code

The AS3 requires the installer to enter an access pass code in order to make changes to any internal settings. If the installer or supervisor wishes to keep this code secret, remove this portion from the printed manual. The AS3 pass code is **854**