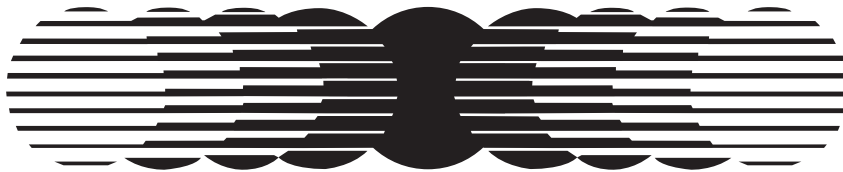


OPERATING & PARTS MANUAL

ACTIVE DEPTH
CONTROL

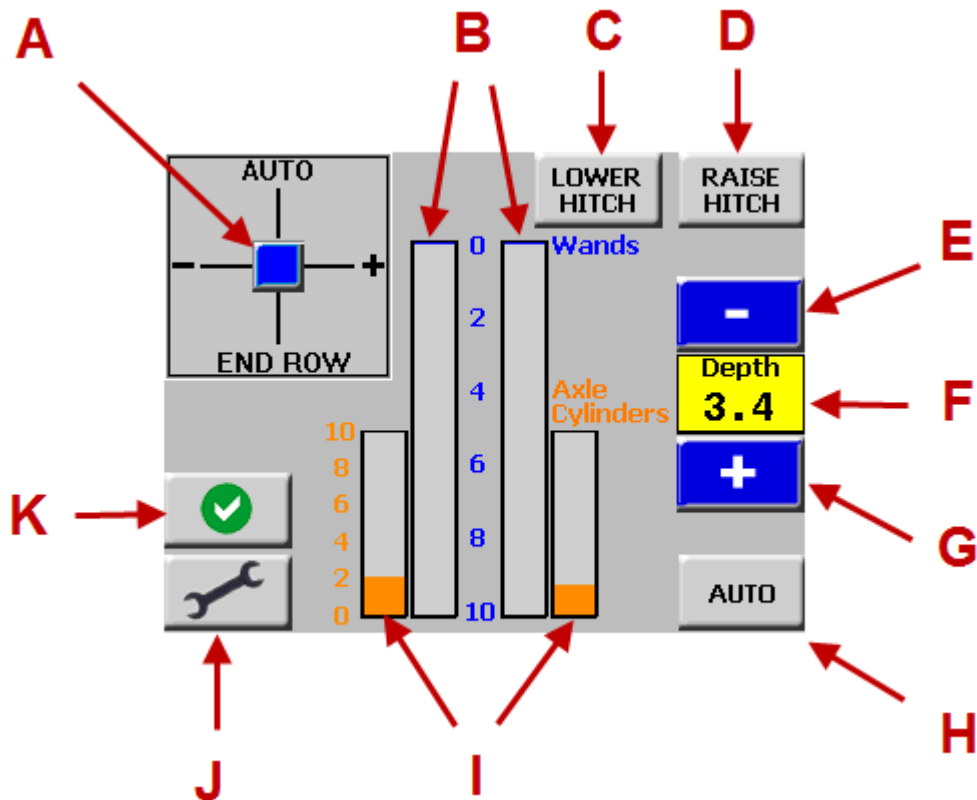
Amity
TECHNOLOGY






2800 7TH Avenue North
Fargo, ND 58102

Phone: (701) 232-4199
Fax: (701) 234-1716
www.amitytech.com

Figure 1 - HOME SCREEN



A – Joystick Selection and Activation Button

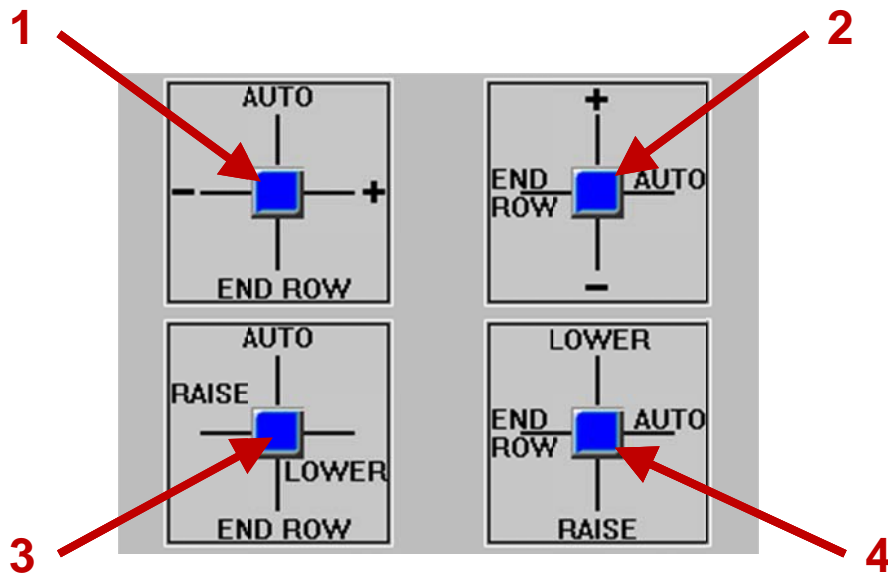
-  Signifies the PTO is not engaged and the joystick is inactive. Upon initial system power up, press once for the JOYSTICK FUNCTION SELECTION SCREEN (Figure 2) to appear.
-  Signifies the PTO is engaged, but joystick remains inactive. Press once to activate the joystick and the button turns Green.
-  PTO is engaged and joystick is activated. Press once to deactivate joystick (Back to Red).

NOTES:

- Upon each initial system power-up and PTO engagement, the button will begin as Red until the initial joystick activation (Button to Green). After the initial activation (Red to Green), the button will toggle between Blue (Inactive) and Green (Active) based on whether the PTO is engaged.
- After the initial power up & joystick activation, the button, no matter the color (Blue, Red or Green), will need to be held for 3 seconds for the JOYSTICK FUNCTION SELECTION SCREEN (Figure 2) to appear.

TROUBLESHOOTING TIP: If PTO is engaged and button remains Blue, check PTO sensor. The connections should be secure and proximity of the sensor to the collar should be within a 1/8”.

Figure 2 – JOYSTICK FUNCTION SELECTION SCREEN



Press any blue button as shown in 1, 2, 3 or 4 to select a joystick configuration. After selection, it returns to the HOME SCREEN (Figure 1). The diagram in the upper left corner of the HOME SCREEN (Figure 1) shows the current joystick configuration. The joystick configuration shown will remain the same until another selection is made.

If the PTO is engaged while making a new joystick configuration selection (1, 2, 3, 4), for safety purposes, the joystick activation and selection button (Figure 1 - A) will return to Red meaning the joystick is inactive. To re-activate the joystick, simply press the Red button once and it will turn Green.

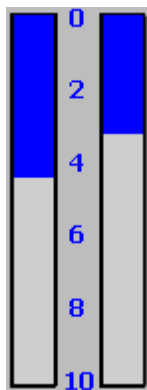
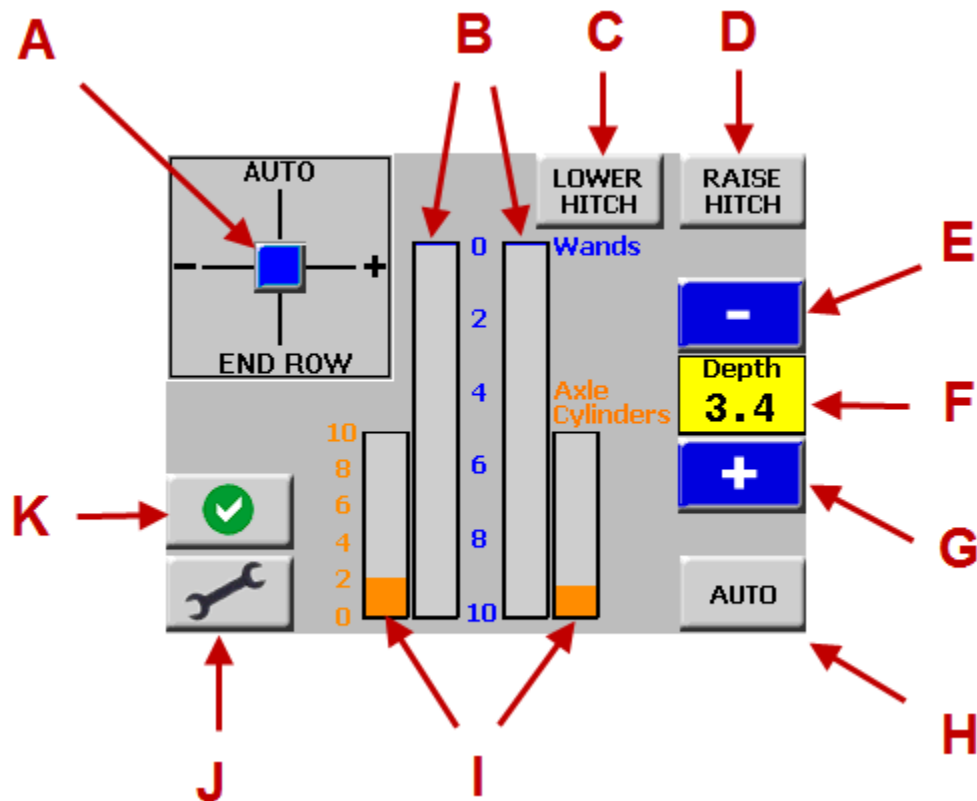
If the PTO was not engaged while making a new joystick configuration selection (1, 2, 3, 4), the joystick activation and selection button (Figure 1 – A) will remain Blue.

In reference to joystick configurations 1 and 2 Both of these selections will function similar as they use the same 4 functions (“AUTO”, “END ROW”, “+”, “-“); however, notice the orientation of the functions are opposite. Each click toward the “+” or “-“ changes the target digging depth (Figure 1 – F) by 0.2 inches.

In reference to joystick configurations 3 and 4 Both of these selections will function similar as they use the same 4 functions (“AUTO”, “END ROW”, “LOWER”, “RAISE“); however, notice the orientation of the functions are opposite. Each click toward “RAISE” or “LOWER”, temporarily changes the digging depth without altering the target digging depth (Figure 1 – F). This deactivates the “AUTO” mode, which controls depth and side to side leveling, until “AUTO” is re-engaged.

PLEASE NOTE: The functions on the joystick (“AUTO”, “END ROW”, “+”, “-“, “LOWER”, “RAISE”) work the same as touching the screen. The only difference is the “END ROW” function Button is part of a dual function on the “RAISE HITCH” Button on the screen. (See “D” – Next Page)

Figure 1 - HOME SCREEN



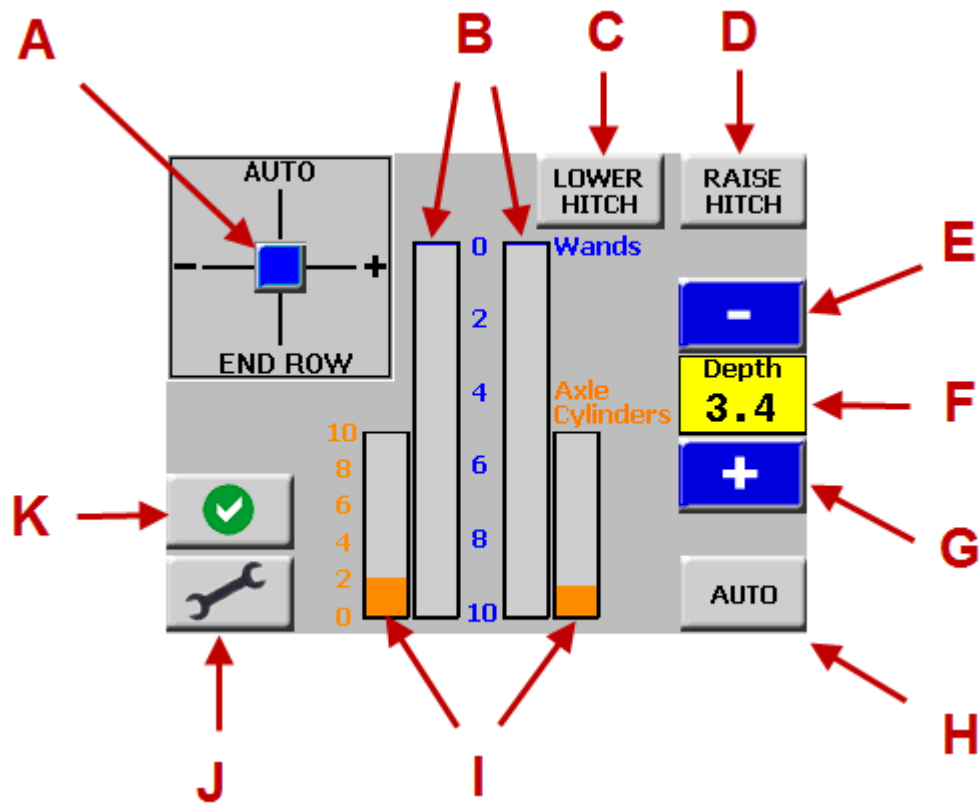
B – Wand Depth Indicators The wand depth indicators show the instantaneous values of the left and right hand wands. These values are used to achieve the target depth (Figure 1 – F).

PLEASE NOTE: If either the LH or RH indicators lose complete movement or do **NOT** appear to be tracking the target depth (Figure 1 – F), re-calibrate the wands. (See “M” – Page 7) If the problem continues after re-calibration, check rotary position sensors for damage.

C- “LOWER HITCH” Button This button lowers the hitch incrementally. It functions in two different increments, small and large, dependent on whether the PTO is engaged. If the PTO is not engaged (non-harvesting) and the button is pressed, the hitch cylinder will move smoothly in a larger increment. If the PTO is engaged (signifying harvesting) and the button is pressed, the hitch cylinder will move a small increment each time the button is pressed and will deactivate the “AUTO” mode.

D- “RAISE HITCH/END ROW” Button This button has dual functions. This button raises the hitch incrementally. And, if this button is held for 3 or more seconds, it goes to “END ROW” mode and raises harvester to its maximum height. **PLEASE NOTE:** It works on the same increment and operating premises described above for the “LOWER HITCH” Button.

Figure 1 - HOME SCREEN



E – “-” Button This button decreases the target digging depth in increments of 0.2 inches.

F – Digging “Depth” Indicator This indicator shows the target digging depth of the ADC unit when it is run in “AUTO” mode. Currently, Figure 1 – F shows a current target depth of 3.4.

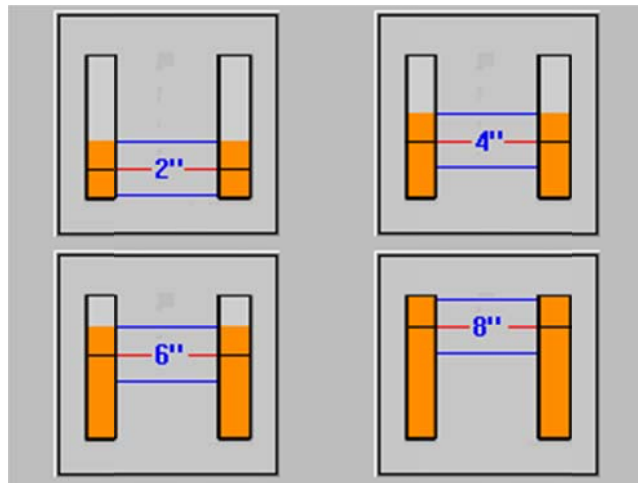
PLEASE NOTE: The target digging depth is an arbitrary number. The default Wand setting from factory will attempt to set target digging depth close to what the actual digging depth measures. By adjusting the wand height (See “Wand Adjustment” – Page 12), you can change the relationship between the target digging depth and actual digging depth to your satisfaction.

G – “+” Button This button increases the target digging depth in increments of 0.2 inches.

H – “AUTO” Button This button initiates the “AUTO” mode. It turns Green when engaged.

I – Axle Cylinder Height Indicators The Orange bars on the left and right indicate the instantaneous height of the axle cylinders. The axle cylinders will vary +/- 2 inches from the axle cylinder setpoint. The maximum differential between the cylinders equals 4 inches. Pressing either of the axle cylinder graphics (Figure 1 – I) will put you into the AXLE CYLINDER SETPOINT SCREEN (Figure 3 – Next Page)

Figure 3 – AXLE CYLINDER SETPOINT SCREEN



This screen appears after you touch either of the axle cylinder height indicators shown on the HOME SCREEN. (Figure 1 – I).

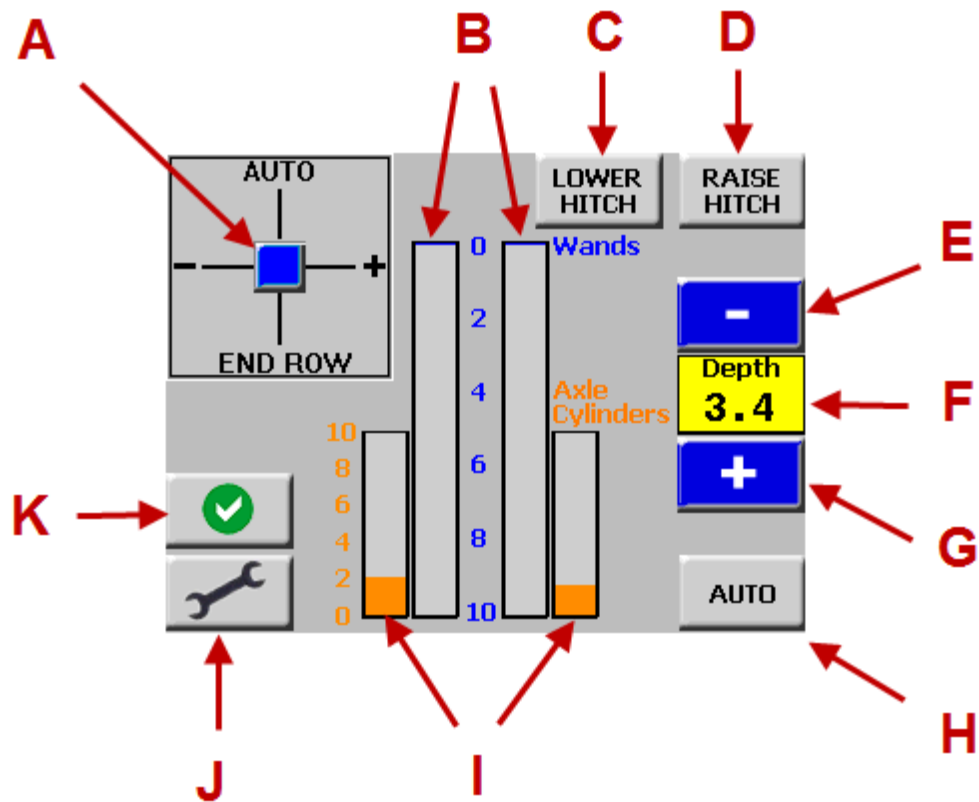
Select your desired setting by simply touching one of the four displayed boxes (2", 4", 6" or 8"). After a selection is made, it will return to the HOME SCREEN (Figure 1).

Amity Model 2700 12-Row Harvester Setting The typical (default) setting is 2" for standard cleaning of sugar beets. Selecting a higher value (4", 6", or 8") results in a higher average elevation angle, which means the beets will be subjected to a higher angle of travel over the rear jump chain/grabrolls. All selections (2", 4", 6" or 8") are available for the use on this model.

Amity Model 2500 8-Row Harvester Setting Amity recommends the default setting to be at 4".

PLEASE NOTE: Do **NOT** use settings 2" or 8" for the Model 2500 8-Row Harvester.

Figure 1 - HOME SCREEN

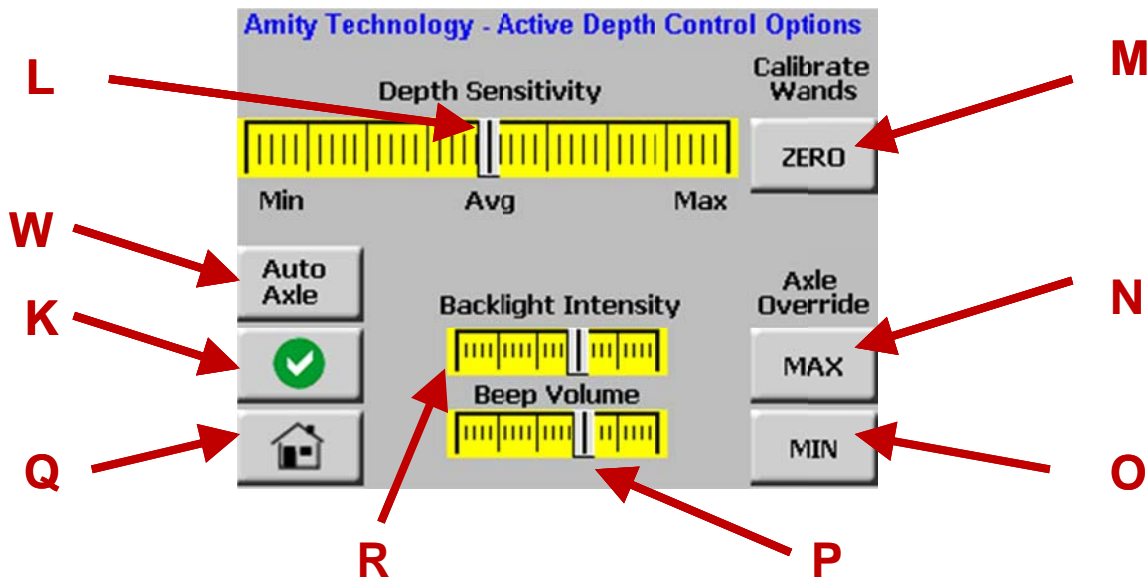


J – Options Screen Button This button displays the OPTIONS SCREEN (Figure 4-Next Page).

K – Status Screen Button This button displays the STATUS SCREEN (Figure 6). If there is a problem with any of the 6 status indicators, then the **Green checkmark** is replaced by a **Red X**.

PLEASE NOTE: If a **Red X** is displayed, the system will **NOT** be allowed to go into “AUTO” mode.

Figure 4 – OPTIONS SCREEN



In the OPTIONS SCREEN (Figure 4), you can view the current settings at any time without making any changes. After review, simply select the “HOME” button (Figure 4 – Q), which promptly returns you to the HOME SCREEN (Figure 1).

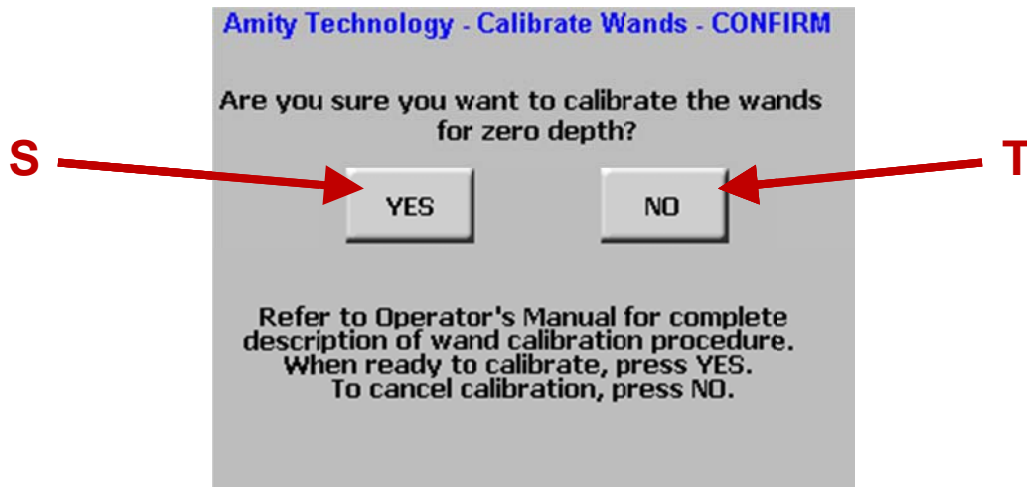
L – “Depth Sensitivity” Slider By choosing a slider position somewhere between the minimum sensitivity (on the left side of the scale) and the maximum sensitivity (on the right side of the scale), you will be able to determine the responsiveness of the harvester’s active depth control. Too high a setting will result in a fast, possibly jerky response by the hitch. Too low a setting will result in minimal, slow reaction speeds by the hitch.

The setting you choose will stay fixed even when the power is turned off to the unit. You are free to change it at any time, and your particular selection is a matter of preference and given field conditions.

M – Calibrate Wands “ZERO” Button This button makes the CALIBRATE WANDS SCREEN (Figure 5) appear. Calibrate the wands only when the harvester front hitch cylinder is fully extended (use “END ROW”) and let the wands naturally hang against the stops.

PLEASE NOTE: Amity recommends that calibration occurs upon each initial power-up.

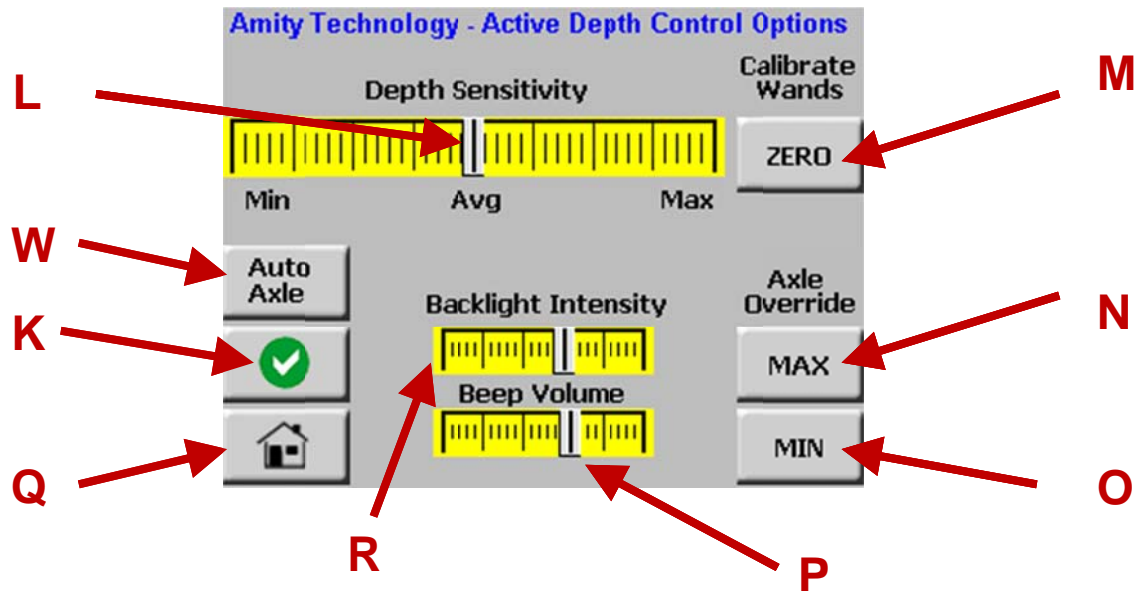
Figure 5 – WAND CALIBRATION CONFIRMATION SCREEN



S – “YES” Button Press this button to calibrate the wands.

T – “NO” Button Press this button to avoid calibrating the wands. No previous calibration settings are affected.

Figure 4 – OPTIONS SCREEN



N – Axle Override Maximum Button This button raises the rear axle cylinders to their maximum height of 10". (Deactivates "AUTO" mode) This can be done any time the operator desires to raise the axle cylinders. The change in axle cylinder height will be shown in the axle cylinder height indicators on the HOME SCREEN (See Figure 1 – I).

O – Axle Override Minimum Button This button lowers the rear axle cylinders to their minimum height of 0". This can be done any time the operator desires to lower the axle cylinders. The change in axle cylinder height will be shown in the axle cylinder height indicators on the HOME SCREEN (See Figure 1 – I).

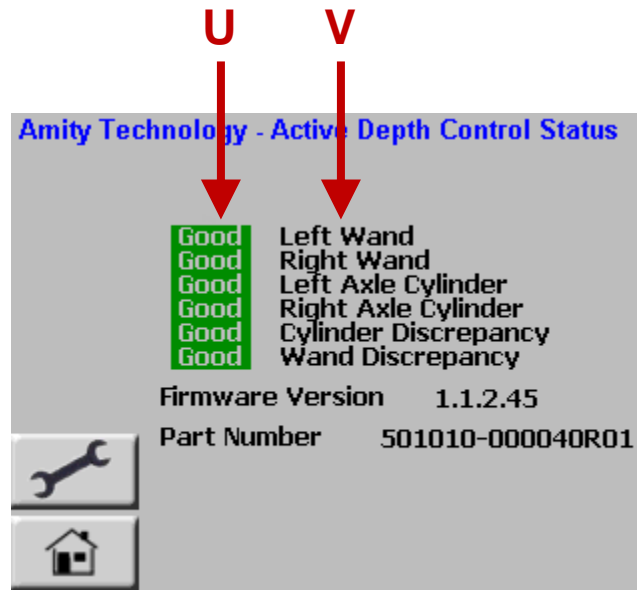
P – Beep Volume Slider This slider changes the "beep" volume of each key press.

Q – Home Button Press this button to return to the HOME SCREEN (Figure 1).

R – Backlight Intensity Slider This slider changes the "brightness" of the screen's backlight.

W – "Auto Axle" Button This button allows for the option of an additional function to the "End Row" function. When the "End Row" button is engaged, in addition to the harvester raising itself to the maximum height using the hitch cylinders, both the left and right axle cylinders will equalize to the current set-point (Figure 3) and proceed to their maximum height of 10". The "Auto Axle" button is active when the button remains Green.

Figure 6 – STATUS SCREEN (All Good)



U – Status Indicators “Good” appears in Green. “Fault” appears in Red.

V – Sensor Descriptions

Left Wand – Indicates Power is supplied to the LH Rotary Position sensor.

It does **NOT** indicate a damaged/broken Rotary Position Sensor.

Right Wand – Indicates Power is supplied to the RH Rotary Position sensor. It does **NOT** indicate a damaged/broken Rotary Position Sensor.

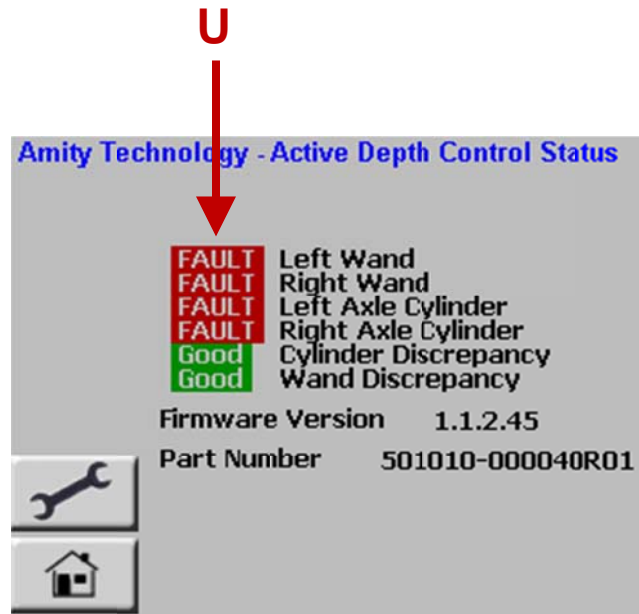
Left Axle Cylinder – Indicates Power is supplied to the LH axle cylinder sensor.

Right Axle Cylinder – Indicates Power is supplied to the RH axle cylinder sensor.

Cylinder Discrepancy – Indicates the axle cylinder differential has exceeded the maximum of 4” -- OR – The differential has exceeded 2” above or below the axle setpoint.

Wand Discrepancy – Indicates the LH and/or RH wand depth indicators are not tracking to the target digging depth.

Figure 7 – STATUS SCREEN (Fault Showing)



U – Status Indicator “Good” appears in Green. “Fault” appears in Red.

PLEASE NOTE: A fault in any of the six sensors shown will **prevent the ADC controller from functioning in Auto**. It is important to monitor the Status Screen button (Figure 1 – K) on the HOME SCREEN (Figure 1). A fault will make the **Green checkmark** appear as a **Red X**. If a **Red X** is displayed, the system will **NOT** be allowed to go into “AUTO” mode.

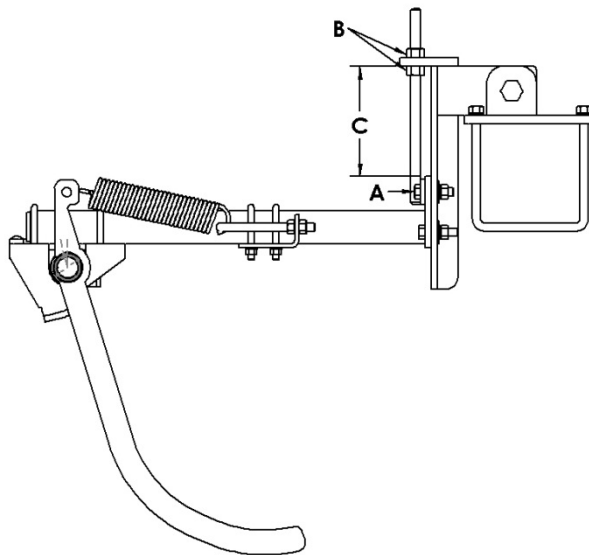
HYDRAULICS:

- The modulated valve can be run either open or closed center. The valve comes standard with a closed center plug.
- Provide the modulated valve 16-18 gallons per minute (GPM) to run the ADC system.
- The case drain line comes from the rear valve section. This line needs to be plugged into the tractor's case drain. There is a relief valve in this loop to ensure the valve will be relieved in the case that the line becomes disconnected from the tractor for any reason.

Wand Adjustment:

- Loosen bolts A and use adjustment rod (bolts B) to adjust the height of the wands. (Ref Figure 8 below).

Figure 8 – Wand Height Adjustment



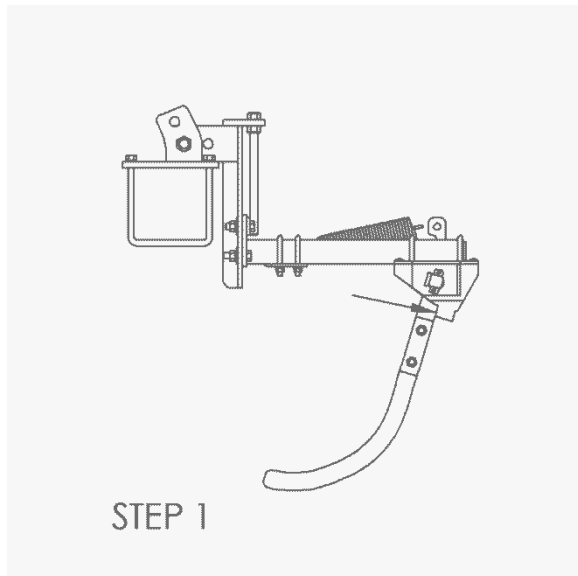
Note: From factory, dimension C is 5.25 inches.

Tractor Cab Connections:

- Use the stripped Black (Ground) and Red (Positive) wire from the tractor harness provided and connect to the tractor battery power.

Rotary Position Sensor:

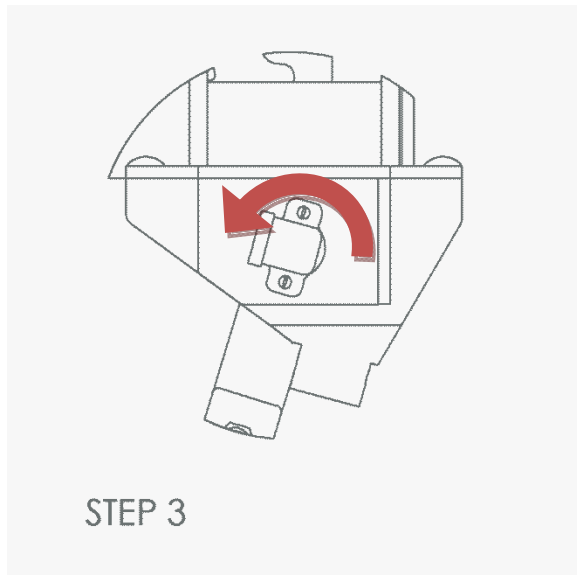
Figure 9 – Sensor Installation Steps



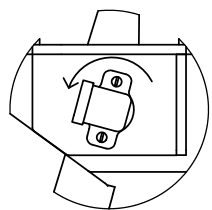
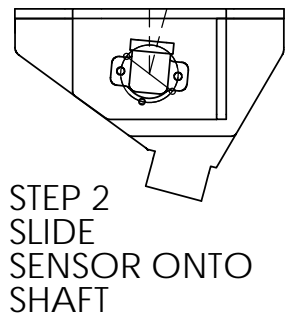
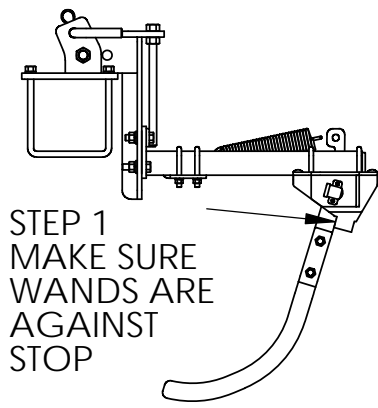
Ensure Wands are against the stops.



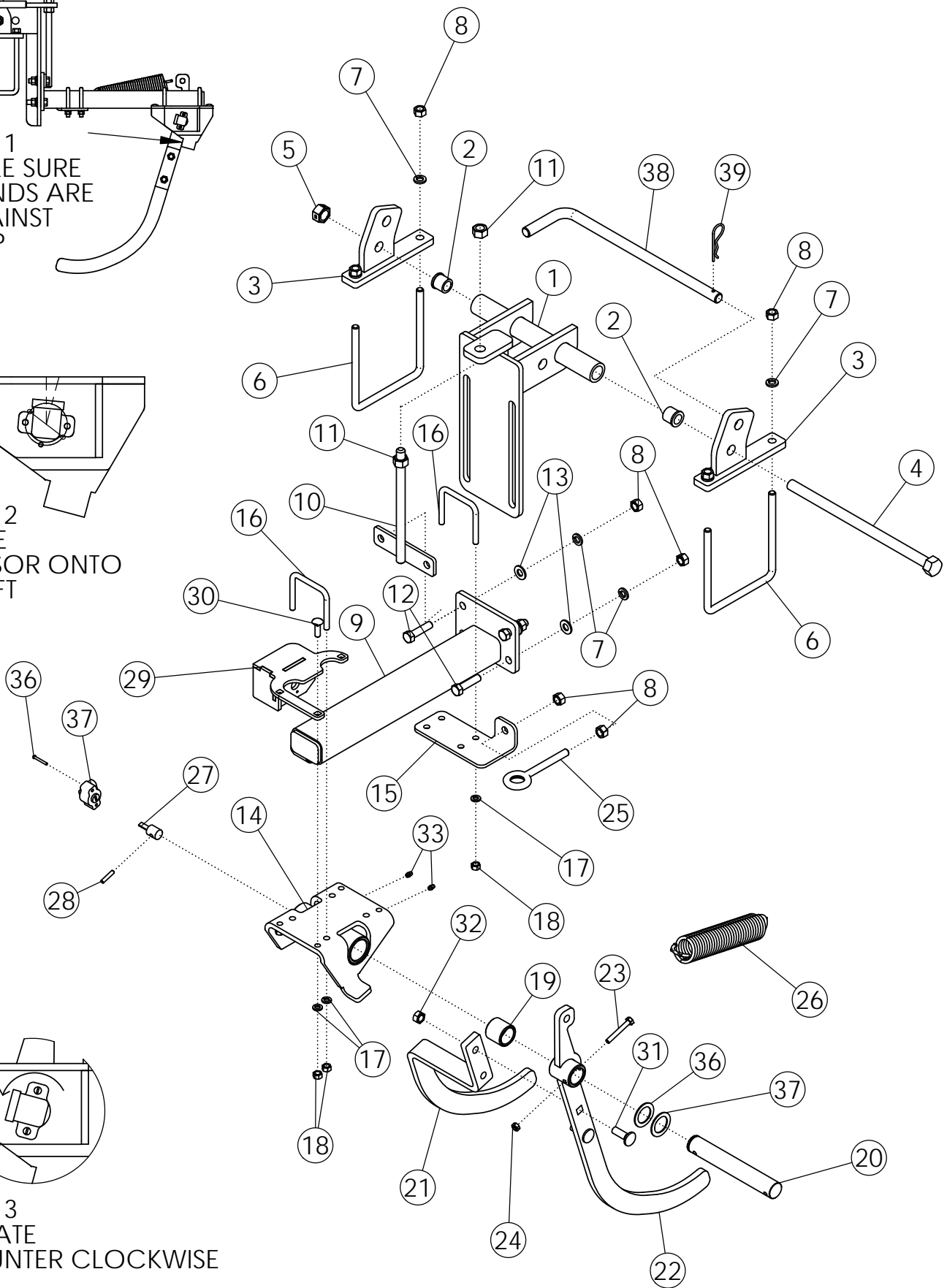
Slide sensor onto Peg in orientation shown



Rotate sensor counter clockwise (CCW)
Install screws and tighten.

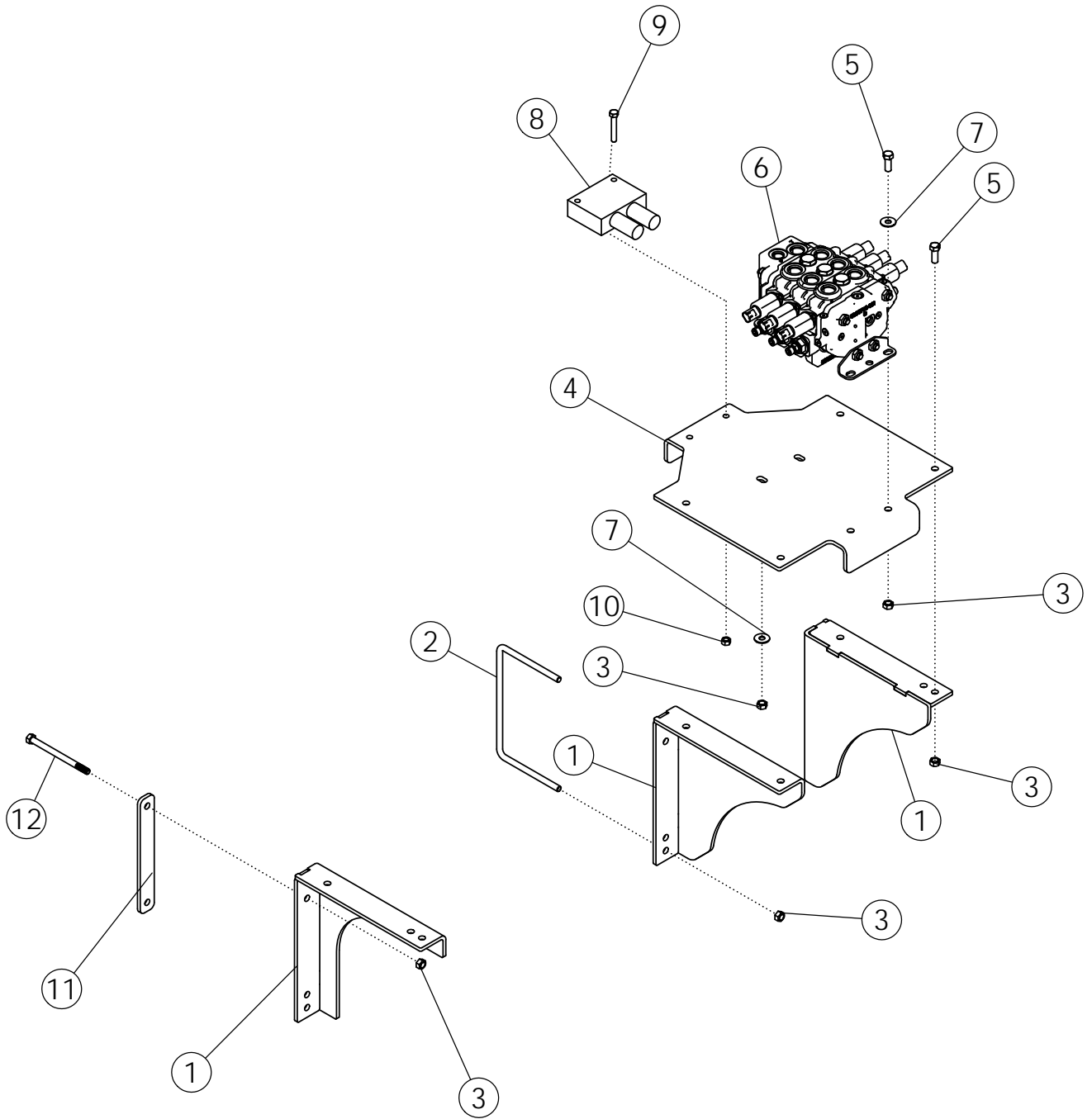


STEP 4
INSTALL SCREWS
AND TIGHTEN



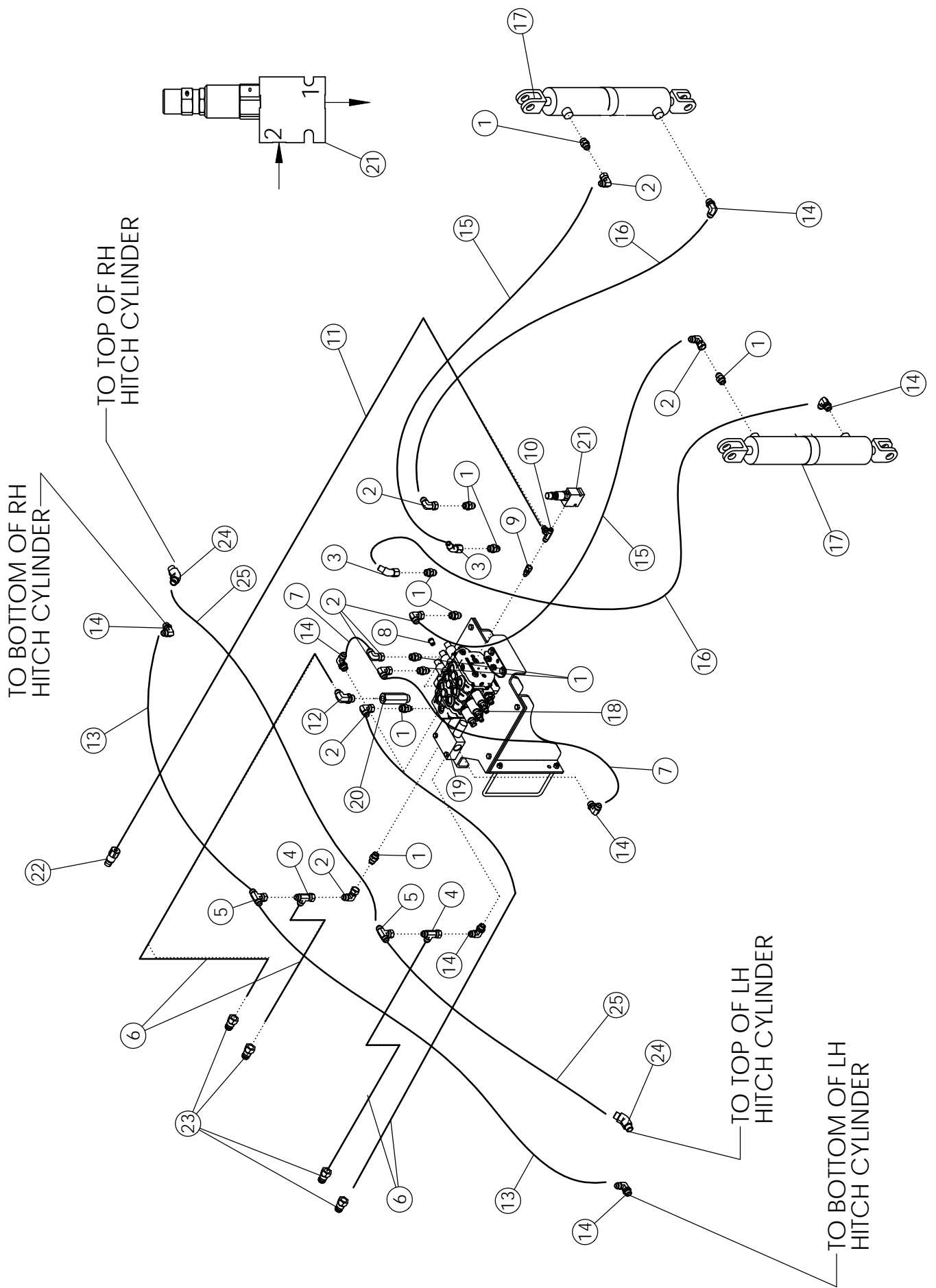
ACTIVE DEPTH CONTROL WANDS

ITEM	PART NO.	DESCRIPTION	QTY
1	63661	WLDMT-MOUNTING BRACKET	1
2	52654	BUSHING-FLANGE	2
3	300214	WLDMT-MOUNTING SUPPORT ADC NARROW	2
4	63664	BOLT-HEX: .75 X 14.00 NC GR5 ZP	1
5	1013537	NUT-CENTERLOCK: .75 NC ZP	1
6	53984	U-BOLT 1/2 X 7 X 6 X 7	2
7	1011581	WASHER-LOCK: .50 ZP	8
8	1011577	NUT-HEX: .50 NC ZP	10
9	300216	WLDMT-ADC ARM 8R	1
	73474	WLDMT-ADC ARM 12R	
10	62882	WLDMT-TIGHTENER 11.125" ZP	1
11	1011578	NUT-HEX: .63 NC GR2 ZP	2
12	1011609	BOLT-HEX: .50 X 2.00 NC GR5 ZP	4
13	1011584	WASHER-FLAT: SAE .50 ZP	4
14	300218	WLDMT-ADC MAIN 8R/12R	1
15	73490	PLATE-ADC BOLT EYELET	1
16	73491	U-BOLT .375 X 3.00 X 3.063 X 3.000	4
17	1011586	WASHER-LOCK: .38 ZP	11
18	1011576	NUT-HEX: .38 NC GR2 ZP	11
19	56939	BUSHING-BRONZE	2
20	301244	SHAFT-ADC B 8R/12R	1
21	300228	PLATE-WAND SENSOR SIDE	1
22	73475	WLDMT-WAND SPRING SIDE	1
23	301258	BOLT-HEX: .31 X 2.25 NC GR8 ZP	1
24	1030700	NUT-TOPLOCK: .31 NC GR5 ZP	1
25	52306	BOLT-EYE	1
26	53159	SPRING	1
27	73487	SHAFT-ADC A ZP	1
28	73489	BAR-ADC PIN	1
29	300224	WLDMT-ADC SENSOR HOUSING 8R/12R	1
30	1016362	BOLT-CRG: .38 X 1.25 NC GR5 ZP	3
31	1011660	BOLT-CRG: .50 X 1.50 NC GR5 ZP	2
32	1027461	NUT-TOPLOCK: .50 NC GR5 ZP	2
33	1011748	ZERK-GREASE: .25UNF STRAIGHT	2
34	73492	SENSOR-ROTARY POSITION (JD: AH233087)	1
35	1011304	SCREW-MACHINE RND SLT #10-32 X 1.25	2
36	301058	SNAP-RING 1.250"	1
37	55206	BUSHING-MACH: 1.25 NR 14GA	1 OR 2
38	301267	ROD-WAND LOCK	1
39	1029164	PIN-HAIR: .19 X 3.00 ZP	1



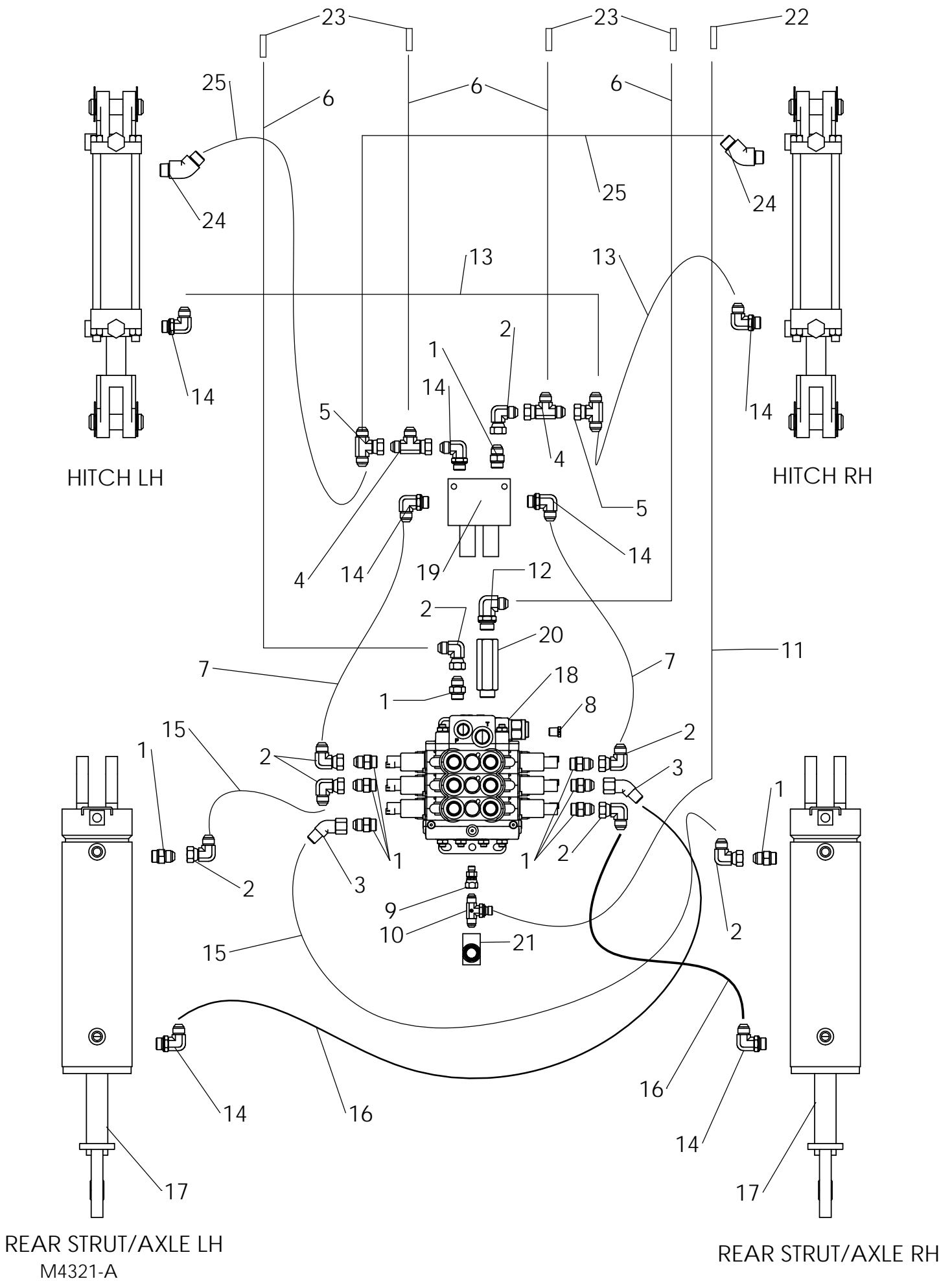
ACTIVE DEPTH CONTROL HYDRAULIC COMPONENTS

ITEM	PART NO.	DESCRIPTION	QTY
1	301029	WLDMT-SUPPORT VALVE (12R)	2
	301042	WLDMT-SUPPORT VALVE (8R)	
2	64244	U-BOLT: .375 X 5.13 X 8 X 5.13 (12R)	2
3	1016999	NUT-TOPLOCK: .38 NC GR5 ZP	12
4	301028	PLATE-MOUNT VALVES ADC	1
5	1011600	BOLT-HEX: .38 X 1.00 NC GR5 ZP	8
6	73423	VALVE-MODULATED 3-BANK	1
7	1011828	WASHER-FLAT .38 ZP	6
8	73426	VALVE-DUAL COUNTER BALANCE	1
	301854	CARTRIDGE-VALVE DUAL COUNTER BALANCE	2
9	1011285	BOLT-HEX: .31 X 2.00 NC	2
10	1030700	NUT-TOPLOCK: .31 NC GR5 ZP	2
11	301045	BAR-BOLTING (8R)	2
12	1021757	BOLT-HEX: .38 X 5.00 NC GR5 ZP (8R)	4



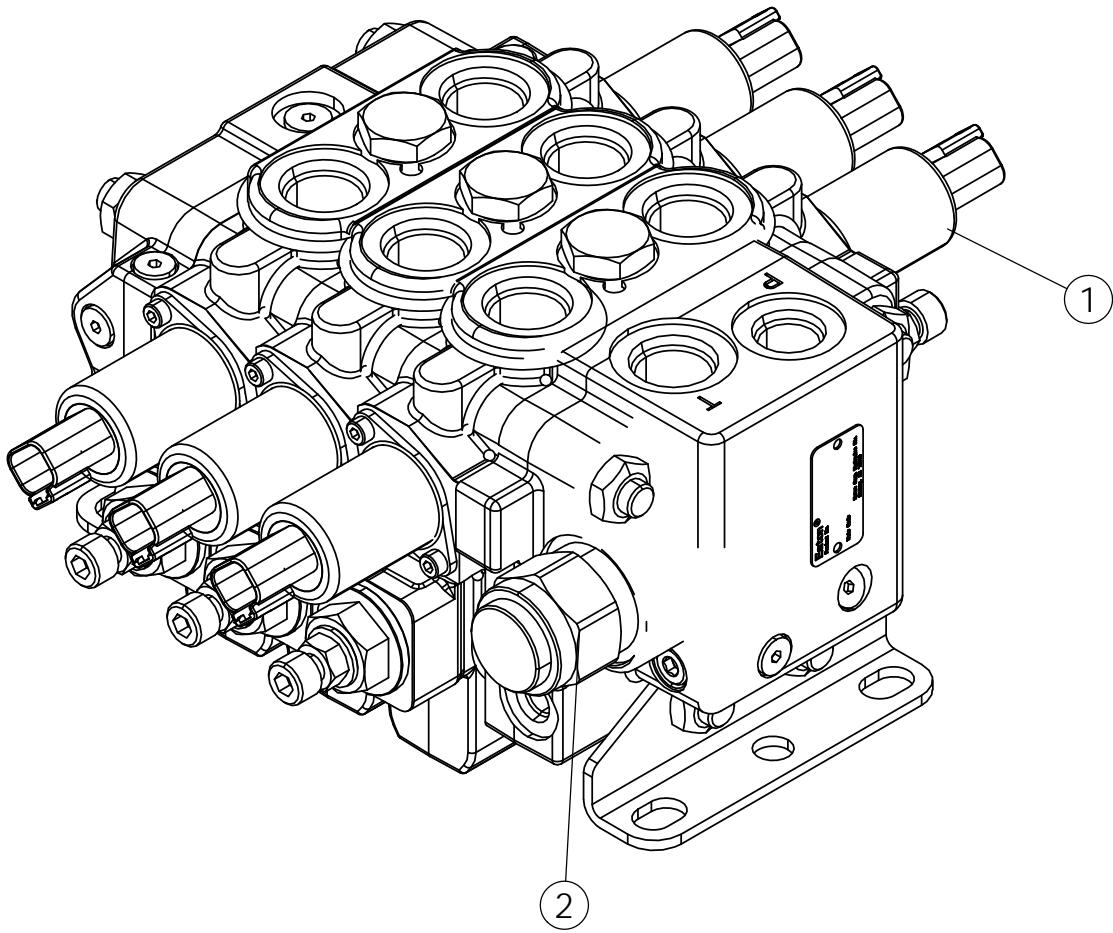
ACTIVE DEPTH CONTROL HYDRAULICS

ITEM	PART NO.	DESCRIPTION	QTY
1	56226	FTG-ADAPTER: 8MB-8MJ	10
2	57668	FTG-ELBOW: 8MJ-8FJX-90	8
3	57663	FTG-ELBOW: 8MJ-8FJX-45	2
4	63015	FTG-TEE: 8MJ-8FJX-8MJ	2
5	66603	FTG-TEE: 8MJ-8MJ-8FJX	2
6	37705	HOSE: .50 X 128 8MB-8FJX	4
7	64263	HOSE: .50 X 011 8JFX-8FJX	2
8	73593	FTG-PLUG: 4MB	1
9	301245	FTG-ADAPTER: 4MB-6MB	1
10	301246	FTG-TEE: 6FB-6MB-6MJ	1
11	73595	HOSE: .38 X 140 8MB-6FJX	1
12	65901	FTG-ELBOW: 10MB-8MJ90	1
13	35770	HOSE: .50 X 52 8FJX-8FJX	2
14	58560	FTG-ELBOW: 8MB-8MJ-90	7
15	73594	HOSE: .38 X 228 8FJX-8FJX (12R)	2
	301037	HOSE: .38 X 192 8FJX-8FJX (8R)	
16	69737	HOSE: .38 X 240 8JFX-8FJX (12R)	2
	301038	HOSE: .38 X 206 8FJX-8FJX (8R)	
17	73421	CYLINDER-HYD 4 X 10 10-3000-0° ADC	2
	73629	SEAL KIT-CYL 4 X 10 (73421)	
18	73423	VALVE-MODULATED 3-BANK	1
19	73426	VALVE-DUAL COUNTER BALANCE	1
20	301016	VALVE-CHECK: 10MB-10FB 5000 PSI	1
21	301018	VALVE-CASE DRAIN RELIEF	1
22	69119	FTG-CASE DRAIN 3/8 FLAT FACE	1
	36290	PIONEER TIP 8010-15P (#8 ORB)	
23	36290	PIONEER TIP 8010-15P (#8 ORB)	4
24	58515	FTG-ELBOW: 8MB-8MJ-45	2
25	1015221	HOSE: .50 X 040 8FJX-8FJX (12R)	2
	57676	HOSE: .50 X 31 8FJX-8FJX (8R)	



ACTIVE DEPTH CONTROL HYDRAULICS

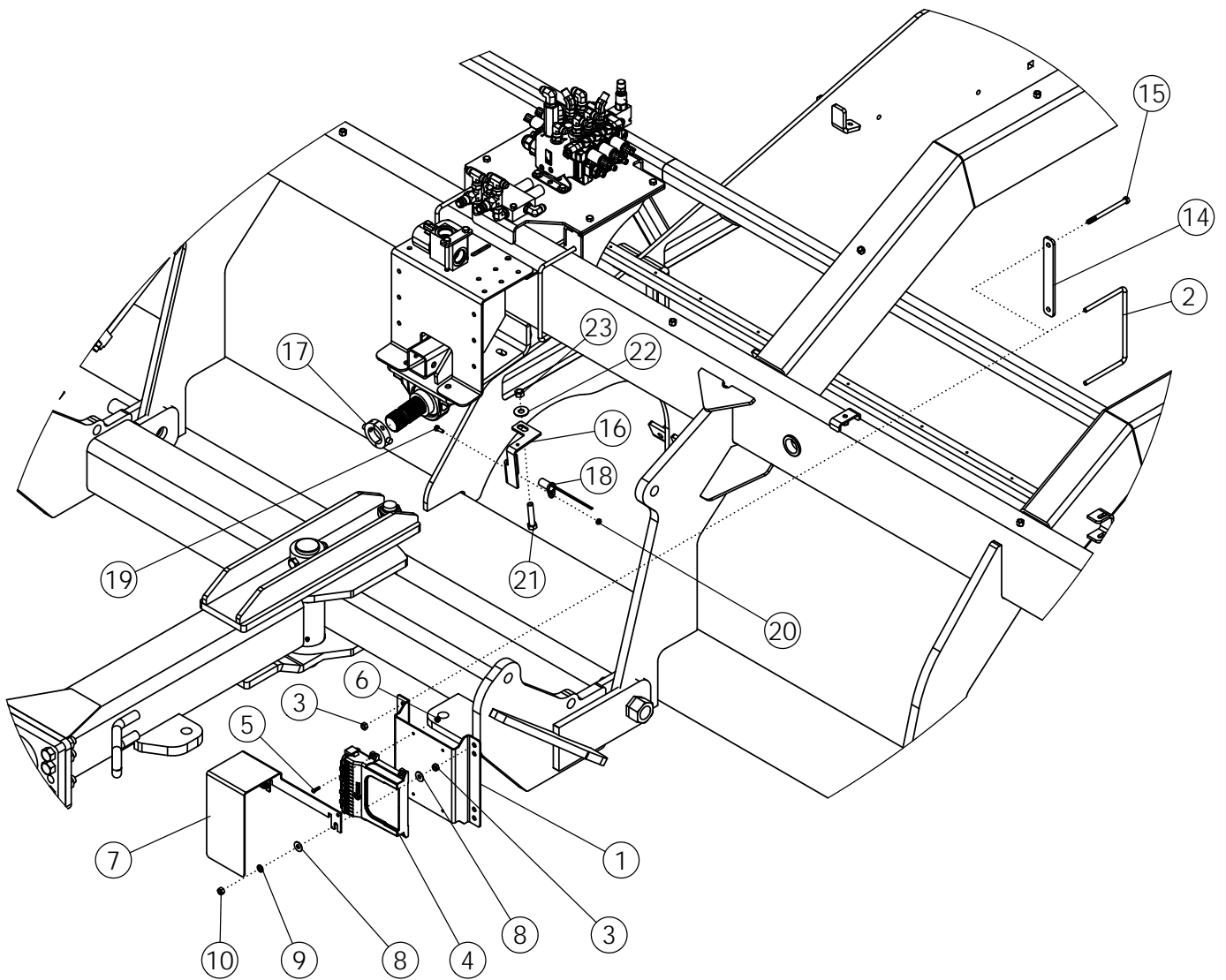
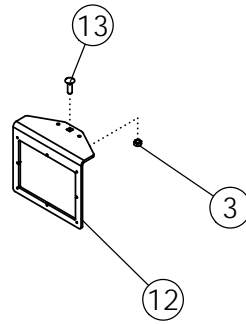
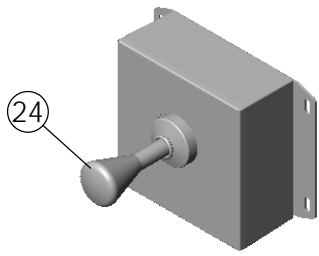
ITEM	PART NO.	DESCRIPTION	QTY
1	56226	FTG-ADAPTER: 8MB-8MJ	10
2	57668	FTG-ELBOW: 8MJ-8FJX-90	8
3	57663	FTG-ELBOW: 8MJ-8FJX-45	2
4	63015	FTG-TEE: 8MJ-8FJX-8MJ	2
5	66603	FTG-TEE: 8MJ-8MJ-8FJX	2
6	37705	HOSE: .50 X 128 8MB-8FJX	4
7	64263	HOSE: .50 X 011 8JFX-8FJX	2
8	73593	FTG-PLUG: 4MB	1
9	301245	FTG-ADAPTER: 4MB-6MB	1
10	301246	FTG-TEE: 6FB-6MB-6MJ	1
11	73595	HOSE: .38 X 140 8MB-6FJX	1
12	65901	FTG-ELBOW: 10MB-8MJ90	1
13	35770	HOSE: .50 X 52 8FJX-8FJX	2
14	58560	FTG-ELBOW: 8MB-8MJ-90	7
15	73594	HOSE: .38 X 228 8FJX-8FJX (12R)	2
	301037	HOSE: .38 X 192 8FJX-8FJX (8R)	
16	69737	HOSE: .38 X 240 8JFX-8FJX (12R)	2
	301038	HOSE: .38 X 206 8FJX-8FJX (8R)	
17	73421	CYLINDER-HYD 4 X 10 10-3000-0° ADC	2
	73629	SEAL KIT-CYL 4 X 10 (73421)	
18	73423	VALVE-MODULATED 3-BANK	1
19	73426	VALVE-DUAL COUNTER BALANCE	1
20	301016	VALVE-CHECK: 10MB-10FB 5000 PSI	1
21	301018	VALVE-CASE DRAIN RELIEF	1
22	69119	FTG-CASE DRAIN 3/8 FLAT FACE	1
	36290	PIONEER TIP 8010-15P (#8 ORB)	
23	36290	PIONEER TIP 8010-15P (#8 ORB)	4
24	58515	FTG-ELBOW: 8MB-8MJ-45	2
25	1015221	HOSE: .50 X 040 8FJX-8FJX (12R)	2
	57676	HOSE: .50 X 31 8FJX-8FJX (8R)	



MODULATED 3-BANK VALVE #73423

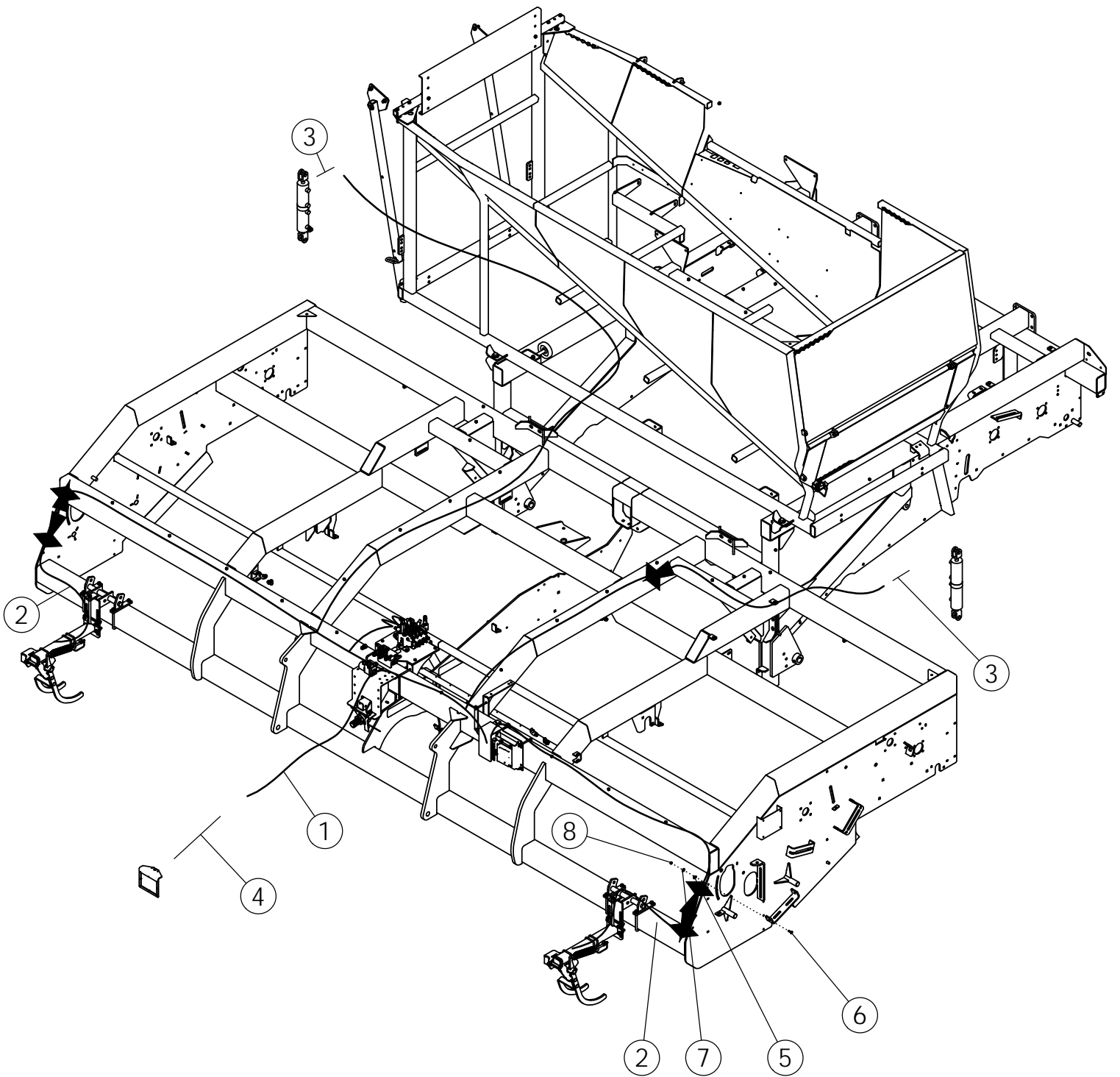
ITEM	PART NO.	DESCRIPTION	QTY
1	73627	PILOT VALVE-MODULATED VALVE	6
	301017	SEAL KIT -PILOT VALVE ADC (73627)	
2	73425	PLUG-CAVITY CLOSED CENTER #12	1
	301243	PLUG-CAVITY OPEN CENTER #12 (OPTIONAL)	

*NOTE: VALVE COMES STANDARD WITH CLOSED CENTER PLUG



ACTIVE DEPTH CONTROL ELECTRONICS

ITEM	PART NO.	DESCRIPTION	QTY
1	301046	PLATE-MNT CONTROL BOX ADC	1
2	64244	U-BOLT: .375 X 5.13 X 8. X 5.13 (12R)	2
3	1016999	NUT-TOPLOCK: .38 NC GR5 ZP	5
4	301010	ASSY-CONTROL BOX & PCB ADC	1
5	1014728	SCREW-#10-24 NC GR2 ZP	4
6	1026591	NUT-K-LOCK: #10-24 NC GR2 ZP	4
7	301036	PLATE-SHIELD ADC	1
8	1011828	WASHER-FLAT .38 ZP	4
9	1011586	WASHER-LOCK: .38 ZP	2
10	1011576	NUT-HEX: .38 NC GR2 ZP	2
11	301023	MONITOR-SCREEN ADC (NOT SHOWN)	1
12	301035	PLATE-BRACKET ADC MONITOR	1
13	1016362	BOLT-CRG: .38 X 1.25 NC GR5 ZP	1
14	301045	BAR BOLTING (8R)	2
15	1021757	BOLT-HEX: .38 X 5.00 NC GR5 ZP (8R)	4
16	301024	BRACKET-PTO SENSOR ADC	1
17	64388	WLDMT-SPLIT COLLAR 1.75"	1
18	301014	SENSOR-PTO ADC	1
19	1011595	BOLT-HEX: .25 X .75 NC GR5 ZP	1
20	1013240	NUT-NYLOCK: .25 NC ZP	1
21	1011610	BOLT-HEX: .50 X 2.50 NC GR5 ZP	1
22	1014443	WASHER-FLAT: .50 ZP	1
23	1027461	NUT-TOPLOCK: .50 NC GR5 ZP	1
24	301151	ASSY-JOYSTICK & ENCLOSURE	1



ACTIVE DEPTH CONTROL ELECTRICAL SCHEMATIC

ITEM	PART NO.	DESCRIPTION	QTY
1	301011	HARNESS-ADC HRV 12R	1
	301015	HARNESS-ADC HRV 8R	
2	301020	HARNSS-ADC POTENTIOMETER	2
3	73509	HARNESS-CYL SENSOR CONNECTOR	2
4	301152	HARNESS-ADC TRACTOR	1
5	300249	P-CLIP .38" X .313"	4
6	1016362	BOLT-CRG: .38 X 1.25 NC GR5 ZP	4
7	1011828	WASHER-FLAT: .38 ZP	4
8	1016999	NUT-TOPLOCK: .38 NC GR5 ZP	4