Dakota Digital

DHC-2000
Digital Height Control System

Introduction

This control system can be connected to a display module and height sensors or pressure senders to allow monitoring and control of all four corners and optional monitoring of the tank pressure. The functions include three different height presets for automatic up/down control, manual up/down control, and a controlled bag dump. The bag pressure senders are 150 psi units and the tank sender is a 400 psi unit.

This control system can also be connected to an ARR-2000 remote transmitter system to allow remote control of the air bag system when the key is off.

IMPORTANT: Make sure to always disconnect the negative cable from the battery if you are going to be working on or under the vehicle. Failure to do so can result in serious injury if the system is accidentally activated.

Wiring

Main Power connector

RED	constant 12V power
BLACK	ground
YELLOW	12V accessory power
BLUE	night dimming (connect to tail light or head light circuit, +12V active)
GRAY	tank pressure sender
WHITE/BLUE	Park/Neutral input

Air Solenoid connector

WHITE/GREEN	right rear down solenoid
GREEN	right rear up solenoid
WHITE/PURPLE	left rear down solenoid
PURPLE	left rear up solenoid
WHTE/ORANGE	right front down solenoid
ORANGE	right front up solenoid
WHITE/BROWN	left front down solenoid
BROWN	left front up solenoid

Pressure Sender connector

GREEN	right rear pressure sender
PURPLE	left rear pressure sender
ORANGE	right front pressure sender
BROWN	left front pressure sender

Display connector

Mates to display

Height Sensor terminal

Green wire goes to matching sensor terminal.
Red wire to red terminal label.
Black wire to black terminal label.

Remote receiver connector

Mates to ARR-2000 module harness connector

INITIAL SETUP

The first step is to determine how you want the air control system set up. Is it going to be height based or pressure based? Pressure based systems are simpler, but do not provide as accurate control. When using the bag pressure senders, make sure to thread them into a grounded fitting or else attach a ground wire to the body of the sender.

If height sensors are used, they will need to be mounted on each corner and brackets will need to be welded onto the vehicle. The sensors have a long arm with a connecting rod that moves up and down as the bag is raised or lowered. One side mounts to the frame and the other mounts to the suspension arm. The sensor arm should rotate 30 – 90 degrees from fully dropped to fully raised. The controller will learn the sensor travel so it can rotate either clockwise or counter-clockwise.

Once the height sensors are mounted, the cables will need to be routed up to the controller and attached to the labeled terminals. To insert the wires into the terminals, strip about ¼" of insulation from the end of the wire, push the button down on the top of the terminal, insert the wire, and release the button. Pull on the wire gently to make sure it is seated tightly.

After the wires are attached, the next step is to program the sensor travel into the controller. Once that is done, the system is ready to operate.

POSSIBLE AUTO CONTROL SETUPS:

Height based only:
> 4 height sensors used and optionally one tank pressure sender.

Height based with pressure monitoring:
> 4 height sensors used, 4 bag sensors used, and one tank pressure sender.

Pressure based only, 4 bag:
> 4 pressure sensors used and optionally one tank pressure sender.

Pressure based only, 3 bag (2 front and 1 rear):
> 3 pressure sensors used and optionally one tank pressure sender.
> The right rear sensor input and relay outputs should not be used.

Pressure based only, 2 bag (1 front and 1 rear):
> 2 pressure sensors used and optionally one tank pressure sender.
> The right front and right rear sensor input and relay outputs should not be used.

Pressure based only, 2 bag (1 left and 1 right):
> 2 pressure sensors used and optionally one tank pressure sender.
> The left rear and right rear sensor input relay outputs should not be used.

The controller will automatically determine which mode to operate with depending on which sensors are connected to it. The display will show "EE" for a sensor that is disconnected and "- -" for a sensor that is shorted to ground.

OPERATION AS AUTO HEIGHT CONTROL SYSTEM

The auto height control system is active when both the large red power wire and the yellow accessory power wire are on. When the accessory power is off the display and height control will shut down to prevent draining the battery down.

The display unit has a 2 line, full character display with three switches on the left side and four switches on the right side. The left side switches select the three presets. The right side switches allow manual control, change the display, and are used for setup.
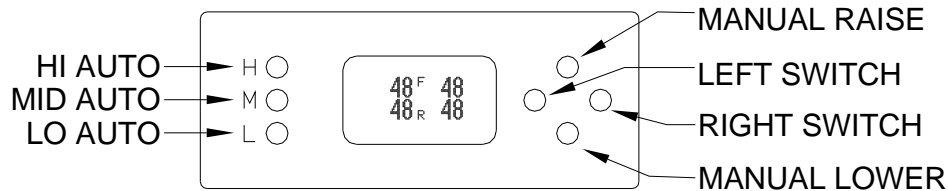
Changing the display:
Pressing the left and right switches on the right side at the same time will toggle the display between the height values, the tank pressure, and the corner pressures.

Manual control:
The four switches on the right hand side of the display are used for manual control. When manual control is active these switches will be lit brightly. Pressing the left or right switch will change which readings on the display are highlighted (all four, front two, rear two, or individual). Pressing the top switch will raise the corners that are highlighted. Pressing the bottom switch will lower the corners that are highlighted.

The Park/Neutral input (white/blue wire) is used to disable manual down when the vehicle is in gear. This should be connected to a vehicle wire that is grounded when the vehicle is in park or neutral (or to a Dakota Digital GSS-1000 output) where required by law. To disable this feature connect the white/blue wire directly to ground.

If the down switch is pressed and the white/blue wire is not grounded the display will show "LOCK".
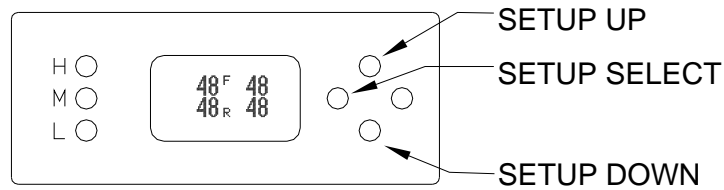
Auto control:
The three switches on the left select the three preset heights: H, M, and L. When one of the auto presets are active, that switch will be lit brightly. To select one of the presets, press that button.

To change any of the 3 presets, manually adjust the height and then press and hold the button for that preset (H, M, or L) for about 4 seconds. The display will display "SET" and store the new setting.

A fourth preset is a bag dump that is activated by pressing the H and L switches at the same time for about 4 seconds. This will do a controlled dump to about 3-5% height.

Tank Warning:
The tank pressure has a user adjustable low warning point. If the tank pressure drops below the warning point the display will automatically switch to displaying the tank pressure and the number will flash.

```
          H ○   ┌──────────┐      ○  ╲     SETUP UP
                │ 48ꜰ  48  │   ○    ╲───── SETUP SELECT
          M ○   │ 48ʀ  48  │      ○
          L ○   └──────────┘      ○  ╱───── SETUP DOWN
```

Setup Menus:
To enter the setup mode, press and hold the left switch on the right hand side (the one closest to the display) while turning the key on. Use the top and bottom switches on the right side to scroll up and down through the menus. Use the left switch to select a menu item.
The menus are:
DONE   -   exit the setup routine
REM   -   Remote system setup (operation mode and transmitter programming)
SENSR   -   Sensor programming (adjusting for mechanical arm travel)
SPEED   -   Solenoid control speed (to slow down fast air systems)
WARN   -   Tank warning point setup
KEYON   -   Select operation mode when key is turned on.
ADVNC   -   Advanced control setup options.

Programming sensor travel:
1. Begin with the key off and then hold the left switch in while turning the key on. The display will show "CODE" "AC41".
2. Release the switch. The display will show "SETUP" "DONE".
3. Press the up or down switch until "SENSR" is displayed.
4. Press and release the left switch. The display will toggle between "DUMP" "ALL" and "DONE" "PRS M".
5. Use the down switch to dump the air from all of the bags and then press the M switch.
6. The display will now toggle between showing a number for each of the four corners, "RAISE" "ALL", and "DONE" "PRS M". Use the up switch to raise all bags to their full height. The numbers will begin increasing until they reach 100 and then it will stay at 100. If any bag does not get to 100 then that sensor may need adjustment to increase the arm travel.
7. Press the left switch to control front only, right switch to control rear only, or both left and right together to control all 4 corners.
8. When all four corners are fully raised, press the M switch.
9. The display will show "SETUP" "DONE". Press the left switch or turn the key off to exit.

Changing the key on mode:
When the key is turned on, the system can be set up to go to back to the last mode it was in before the key was turned off last or it can always start up in the "M" auto mode.
1. Begin with the key off and then hold the left switch in while turning the key on. The display will show "CODE" "AC41".
2. Release the switch. The display will show "SETUP" "DONE".
3. Press the up or down switch until "KEYON" is displayed.
4. Press and release the switch. The display will show "KEYON" and the current setting ("LAST" or "M").
5. Press the up or down switch to change the setting. When the desired setting is shown, press and release the left switch.
6. The display will show "SETUP" "DONE". Press the left switch or turn the key off to exit.

Changing the output speed:

The output speed can be used to slow down systems with large air lines or high pressure tanks so that the system will operate more reliably and stop at the desired height with minimal overshoot.

1. Begin with the key off and then hold the left switch in while turning the key on. The display will show "CODE" "AC41".
2. Release the switch. The display will show "SETUP" "DONE".
3. Press the up or down switch until "SPEED" is displayed.
4. Press and release the left switch. The display will show "FRONT" "SPEED" and the current speed setting.
5. Use the up or down switch to change the speed number from 1 to 15 with 15 being the slowest. When the desired value is shown press and release the left switch.
6. The display will now show "REAR" "SPEED" along the current setting for the rear bags.
7. Use the up or down switch to change the value and press and release the left switch when done.
8. The display will show "SETUP" "DONE". Press the left switch or turn the key off to exit.

Changing the tank warning point:

The tank warning point can be adjusted from 0 to 248 psi. When the tank pressure drops below this point the tank reading will flash and the display will automatically switch to the tank pressure display. If the tank pressure sender is disconnected this is disabled.

1. Begin with the key off and then hold the left switch in while turning the key on. The display will show "CODE" "AC41".
2. Release the switch. The display will show "SETUP" "DONE".
3. Press the up or down switch until "WARN" is displayed.
4. Press and release the switch. The display will show "TANK" "WARN" and the current set point.
5. Press the up or down switch to change the value. When the desired value is shown, press and release the left switch.
6. The display will show "SETUP" "DONE". Press the left switch or turn the key off to exit.

The advanced control options:

No changes will normally be made to these settings. There are two options under the advanced menu, "ADV" "TIME" and "ADV" "ERR". The time setting is the minimum time the controller must see a corner out of adjustment before it will try to make a correction. This time delay avoids nuisance corrections during acceleration, deceleration, and cornering. The error setting is the minimum error that a corner must have before it is seen as too low or too high.

The remote setup options:

The remote system setup requires the ARR-2000 remote system. This system plugs into a connector on the back side of the controller. The remote system is only operational when the key is turned off. The remote system has two modes of operation, one for individual corner control and another that controls the front bags together and the rear bags together.

The REM selection has another set of menus underneath it. They are:

MODE	-	select remote operation mode.
PRGM	-	program the key-chain transmitters into the system.
TEST	-	test the operation of the key-chain transmitters.

Troubleshooting guide.

IMPORTANT: *Make sure to always disconnect the negative cable from the battery if you are going to be working on or under the vehicle. Failure to do so can result in serious injury if the system is accidentally activated.*

Problem	Possible cause	Solution
Gauge will not light up (red light is off)	RED wire does not have power.	Connect to a location that has power.
	BLACK wire is not getting a good ground.	Connect ground to a different location.
Gauge will not light up (red light is flashing slowly)	YELLOW wire does not have power.	Connect to a location that has power with the key on.
	The key is not on.	The ignition key must be turned on.
Gauge will not light up (red light is flashing rapidly)	Display harness is unplugged.	Seat connectors in tightly at both ends.
	Gauge is damaged.	Return gauge for repair. (see instructions)
Gauge will not light up (red light is on steady)	The harness to the display is damaged.	Inspect harness, contact factory for additional checks or instructions.
Gauge lights up, but displays "EE".	Sender is not connected to gauge.	Connect wires from gauge to sender terminals.
	Wire between controller and sender is broken.	Test and replace wire.
	Sender is not grounding properly.	PSI senders ground through it's mounting threads. Make sure the threads are clean. **Do Not Use Tape or Sealant on Sender Threads.**
	Controller is damaged.	Return gauge for repair. (contact factory)
	Sender is damaged.	Return for replacement. (see instructions)
Gauge lights up, but displays "--".	Sender wire is shorted to ground.	Check wire for damaged insulation, replace if necessary.
	Sender is damaged.	Return sender for repair. (contact factory)
Gauge lights up, but does not read correctly.	Loose connection on power wire.	Reconnect wire going to PWR terminal.
	Poor sender ground.	Make sure sender case is getting a solid ground.
	Poor ground connection.	Move ground to different location
	Incorrect sender type.	Make sure sender has been replaced with the correct type.
Display will not dim.	Blue wire is not connected correctly.	Check wiring connections.
	Gauge is damaged.	Return gauge for repair. (contact factory)
Display remains dim at all times.	Blue wire is getting power all of the time.	Connect blue wire to a location that only has power when the headlights are on.
	Battery is very low.	Recharge or replace vehicle battery.
	Gauge is damaged.	Return gauge for repair. (contact factory)
Switches will not operate any of the solenoids.	10A fuse is blown.	Replace fuse.

Dakota Digital

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