

HAWK406 Reverse/Forward Facing HawkEye with Camera Option



Introduction

The HAWK406 Reverse Assistance System is an ultrasonic distance monitoring system with a reverse camera or LED display panel option. When the vehicle is in reverse or drive (if using front mounted sensors), the HAWK406 electronically detects the area behind (or in front of) the vehicle and alerts the driver with an audible tone and a digital display if any objects are detected. HAWK406 is designed to detect objects which can reflect ultrasonic sound waves such as walls, vehicles, and poles.

Installation Instructions

Disconnect vehicle battery before proceeding with installation.



WARNING

Disconnect the battery to prevent setting a check engine light.

IMPORTANT—READ BEFORE INSTALLATION

It is the installer's responsibility to route and secure all wiring harnesses where they cannot be damaged by sharp objects, mechanical moving parts and high heat sources. Failure to do so could result in damage to the system or vehicle and create possible safety concerns for the operator and passengers.

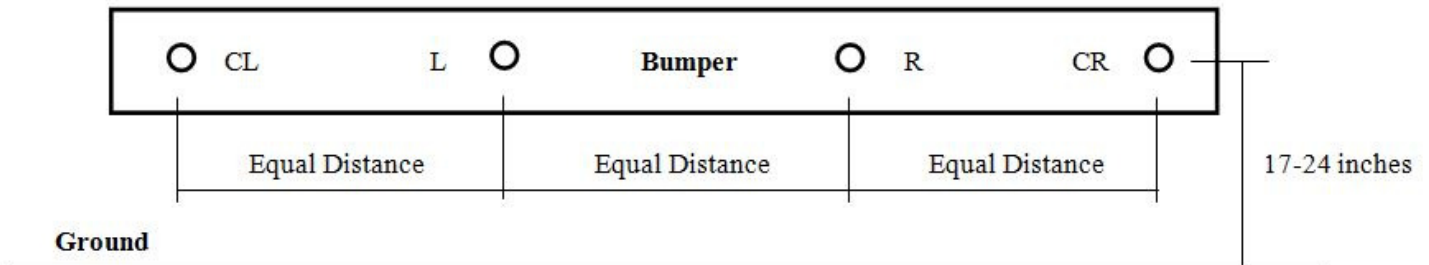
Avoid placing the module where it could encounter strong magnetic fields from high current cabling connected to motors, solenoids, etc. Avoid radio frequency energy from antennas or inverters next to the module. Avoid high voltage spikes in vehicle wiring by always using diode clamped relays when installing upfitter circuits.

Note: Excess cabling for the HAWK406 system should be rolled up and located away from other vehicle electronics. Split this roll into roughly two equal coils and overlay them one on top of the other, such that the current flow changes direction from one coil to the next. This will minimize the inductive effects of coiling the wire, and will minimize possible interference with other vehicle electronics.

To aid in installation, first gain access to the connection points. Remove any interior panels covering the left (driver) side of the rear cap and along the upper left side of the vehicle all the way to the front of the vehicle. It is not necessary to cut any OEM wires during the installation of the HAWK406 wire harness.

Sensors

The procedure for positioning and mounting the sensors depends on the shape and curver of the rear and/or front bumper or mounting surface. The sensors must be mounted on a flat surface of the bumper (curved surfaces must not exceed 5°). Sensor height must be at least 17 inches from the ground or the sensors will not work properly.



NOTE: The preset of the sensitivity for the sensor heights is 17 inches above the ground. To avoid false alarm, sensor height must be at least 17 inches.

1. Measure horizontally from each corner of the bumper and mark a distance of 6 - 8 inches for both corner sensors.
2. Divide the remaining distance by 3 and mark the two center sensor locations such that the distance between each sensor is equal.
3. Drill four 1-inch holes (use a 1-inch hole saw) in the bumper through the previous marks.
4. Install the four sensors through the holes in their proper location.

THE SENSORS MUST BE INSTALLED WITH THE DOT POINTING DOWN.



MAIN HARNESS – The Main Harness connects the Bumper/Sensor Harness(es) to the Control Unit in the vehicle.

1. Connect the Gray 8-pin connector on the Main Harness to the connector located on the bumper.
2. Drill a 5/8" hole in the bottom of the rear of the vehicle.
3. Route the harness through the hole and seat the harness grommet securely in the hole.
4. Connect the 8 pin connector from the rear sensors to the mating cavity on the module labeled "Sensor1".
5. Connect the 8 pin connector from the front sensors (if equipped) to the mating cavity on the module labeled "Sensor2".
6. Secure the harness(es) as needed.

Control Module

The control module must be located inside of the vehicle on the left-hand (driver) side. Attach the control module inside of the vehicle within 4 feet of the rear tail-lamp assembly. The control module should be attached in a vertical position to prevent water from getting into the module.

Control Module DIP Switches

- Open the control module right cover using a screwdriver.
- The default setting is switches 1-3 are Off.



	Sensor 1	Sensor 2	Sensor 3	Sensor 4	DIP Switch Setting		
					1	2	3
Type A	9.9 Feet	9.9 Feet	9.9 Feet	9.9 Feet	OFF	OFF	OFF
Type B	7.0 Feet	7.0 Feet	7.0 Feet	7.0 Feet	OFF	OFF	ON
Type C	7.0 Feet	9.9 Feet	9.9 Feet	7.0 Feet	OFF	ON	OFF
Type D	5.5 Feet	7.0 Feet	7.0 Feet	5.5 Feet	OFF	ON	ON
Type E	9.9 Feet	9.9 Feet	9.9 Feet	9.9 Feet	ON	OFF	OFF
Type F	7.0 Feet	7.0 Feet	7.0 Feet	7.0 Feet	ON	OFF	ON
Type G	7.0 Feet	9.9 Feet	9.9 Feet	7.0 Feet	ON	ON	OFF
Type H	5.5 Feet	7.0 Feet	7.0 Feet	5.5 Feet	ON	ON	ON

Reverse Camera Installation (Optional)

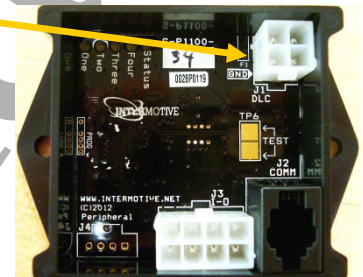
- Mount the camera, using the supplied screws and grommet, ensuring moisture cannot leak into the interior of the vehicle.
- A typical location to mount the camera is on the top of the vehicle, as close to the center as possible, and facing down at an angle.
- Plug the camera connector into the mating connector on the end of the extension harness. Secure the connectors by screwing in the retention nut.
- Slide the protective boot over both of the connectors.
- Route the extension harness to the front of the vehicle, near where the display monitor will be mounted.



Extension Harness

Data Link Harness Installation (only used if installing a forward/reverse system)

1. Locate the vehicle OBDII Data Link Connector, mounted below the lower left dash panel.
2. Remove the mounting screws for the OBDII connector. Plug the red connector from the HAWK406 Data Link Harness into the vehicle's OBDII connector. Ensure the connection is fully seated and secure with the supplied wire tie.
3. Mount the Black pass through connector from the HAWK406 Data Link Harness in the former location of the vehicle's OBDII connector.
4. Secure the HAWK406 Data Link harness so that it does not hang below the lower dash panel.
5. Plug the free end of the Data Link harness into the mating 4-pin connector on the HAWK8-401 module.
6. Plug the 8-pin connector into the mating connector on the HAWK8-401 module.



HAWK8-401 Module

PWR Harness (forward/reverse installation)

1. Connect the Red wire to a "hot in run" circuit.
2. Connect the ground eyelet to a known good ground point.
3. Connect the Blue wire to the Blue wire from the 8 pin-connector plugged into the HAWK8-401 using solder and heat shrink.
4. Connect the Yellow wire to the Yellow wire from the 8-pin connector plugged into the HAWK8-401 using solder and heat shrink.
5. Connect the Black 4-pin connector to the mating cavity on the module labeled "PWR". Make sure the connector is fully seated.
6. Secure the harness as needed.



PWR Harness

PWR Harness (reverse only installation)

The PWR harness provides power to the Control Module when the transmission is placed in reverse.

1. Verify that chassis ignition power is Off.
2. Locate the OEM circuit that provides power to the reverse lamp in the rear tail-lamp assembly. Connect the Blue wire from the HAWK406 PWR Harness to this circuit.
3. Connect the Red wire
4. Connect the ground eyelet to a known good ground point near the tail-lamp assembly.
5. Connect the Black 4-pin connector to the mating cavity on the module labeled "PWR". Make sure the connector is fully seated.
6. Secure the harness as needed.

Note: if using an external rear backup alarm, do not attach the HAWK406 Blue wire to the same side tail-lamp wire as the backup alarm or it may interfere with the HAWK406 operation. Example: if the external backup alarm gets power from the right tail-lamp wire, the HAWK406 Blue wire must be attached to the left side tail-lamp wire.



PWR Harness

Output Harness

Route the Output harness to the front of the vehicle, near where the monitor or LED display will be mounted.

1. Plug the 6 pin connector into the mating connector on the Control Module labeled "Output".
2. Plug the connector on the opposite end of the harness into the Auxiliary module labeled "DISP In".



Output Harness

Auxiliary Module

1. Mount the Auxiliary module near where the display monitor or the LED display panel will be mounted.
2. Plug the 2 pin, White connector from the DISP OUT harness into the mating connector on the Auxiliary module labeled "DISP OUT". This harness will be connected to the monitor in the upcoming steps.



Auxiliary Module



DISP OUT Harness

Display Monitor (Optional)

1. Secure the display bracket in the desired location.

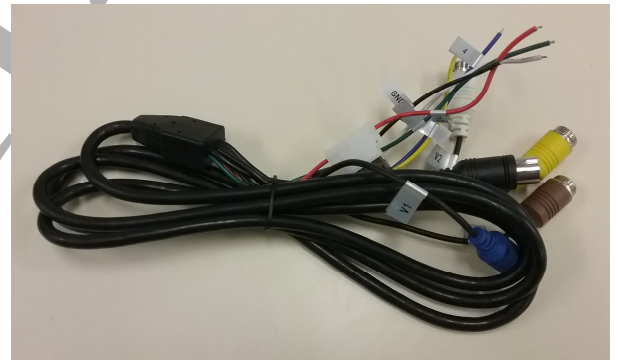


2. Attach the display to the bracket using the included screws. If desired, drill a hole through the dash to route the two harnesses.



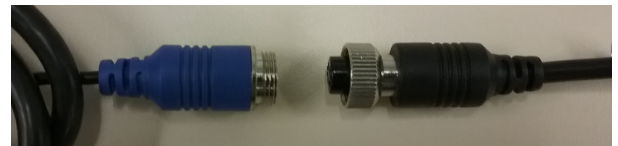
3. Plug the two pin, Black connector into the mating connector from the harness leading to the Auxiliary Module.

Camera Harness (Optional)



Camera Harness

1. Plug the Blue connector on the Camera Harness into the mating connector from the extension harness.



2. Plug the Black connector on the Camera Harness into the mating connector from the Display Monitor.



Camera Harness - Continued

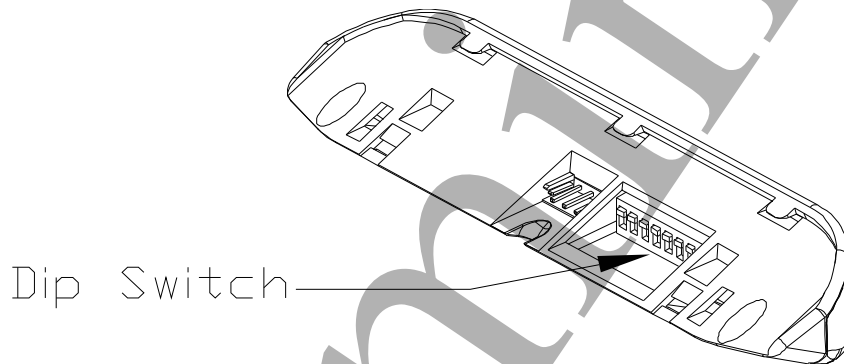
3. Attach the Red wire labeled "12V - 24V" with the 7.5A inline fuse to a +12V Ignition source.
4. Attach the Black wire labeled "GND" to a known good ground point.
5. Attach the Green wire labeled "1" to a circuit that supplies +12V whenever the vehicle is in Reverse. If necessary, connect this wire to the Blue wire from the HAWK406 PWR harness at the rear of the vehicle.

LED Display Panel (Optional)

The LED display panel provides system feedback to the driver. Prior to installing the panel, determine if any changes to the default settings are desired (see figure 1).

LED Display Panel DIP Switch

The default setting is switches 1-6 are 'On' and switches 7-8 are 'Off'.

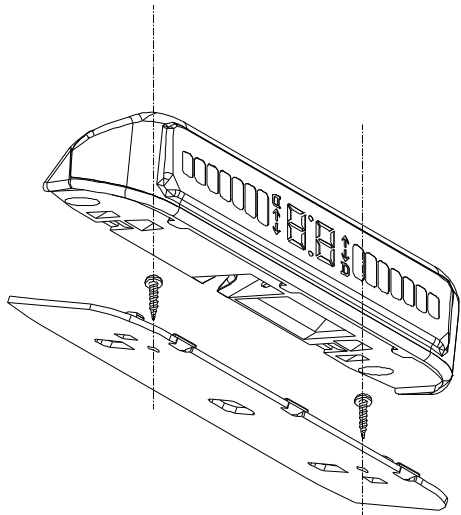


(Figure 4)

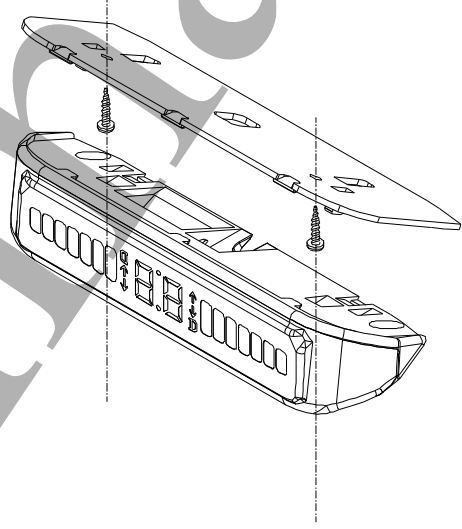
Dip Switch	Function	Note
1	Power	Must be ON
2	Data	Must be ON
3	Buzzer	ON = activate buzzer OFF = no buzzer sound
4	Buzzer Volume 1	ON = louder OFF = does not affect the loudness of buzzer volume
5	Buzzer Volume 2	ON and Dip Switch 4 ON = loudest OFF = does not affect the loudness of buzzer volume
6	Feet/Meter	ON = Feet OFF = Meter
7	LED Bar Display Swap	ON = to swap the LED bar display for LEFT/RIGHT sensor indicator when the display is installed upside down
8	Number Display Rotation	ON = to invert the displayed number when the display is installed upside down

LED Display Panel - Continued

1. Using 2 of the supplied screws (different types are provided, but only 2 are needed), secure the display bracket (figure 2a or 2b), then attach the display to the bracket. If desired, drill a hole through the dash to route the display wire harness.
2. Run the display wire harness along the left (driver) side to the back of the vehicle.
3. Connect the White 3-pin connector to the proper opening on the display panel. Make sure the connector is fully seated.
4. Secure the harness along the left side of the coach.
5. Connect the Black connector to the mating cavity on the Auxiliary module labeled "Disp Out".



(Figure 2a - Normal Position)



(Figure 2b - Inverted Position)

Reconnect Vehicle Battery

Post Installation

The following checks must be made after installation of the system. If any of the checks do not pass, do not deliver the vehicle. Recheck all connections as per the installation instructions.

Important: Ensure no objects are present within 10 feet of the bumper while testing.

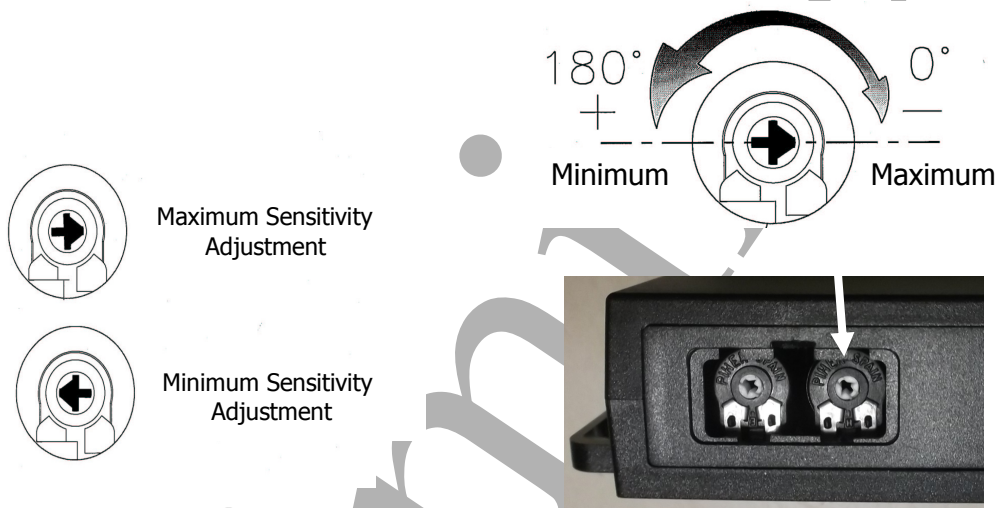
1. **Verify that the Park Brake is firmly set with the Engine Off and wheels blocked.** Turn the ignition key to "ACC" position and place the transmission in reverse. The display indicator should activate and produce a single audible beep.
2. With the aid of an assistant, verify that the sensors are connected into the proper openings on the bumper:
 - 2.1 Use a cloth to cover the two middle sensors. Holding a flat dense object (5" x 20"), approach the passenger side corner sensor from approximately 10 feet away. Verify that the LED Display shows proper distance and orientation. Repeat procedure for the driver side corner sensor.
 - 2.2 Remove covers from the middle sensors and block the corner sensors. Repeat procedure as in 2.1. Verify that the display shows proper distance and orientation.
3. If the system gives a warning without an object in the proper zone (false alarm):
 - 3.1 Check for proper sensor installation and orientation (dot on sensor must be facing down).
 - 3.2 The sensors may be detecting the ground. Note: The preset of the sensitivity for the sensor height is 17 inches above the ground. To avoid false alarm, sensor height must be at least 17 inches. If sensor height is correct, adjust sensitivity (see next page).

Guide to Adjust System Sensitivity

1. Open the control module left cover using a screwdriver.
2. Use a cart or other mobile object with a piece of 3/4" plywood (18" x 24") on the side facing the sensors (figure 3). A dense material is required to reflect the ultrasonic waves.
3. Position the cart in the direct path of a sensor at the distance of 5 feet.
4. Insert a small screwdriver into the right potentiometer and gently turn the potentiometer counter-clockwise to the stopping point.



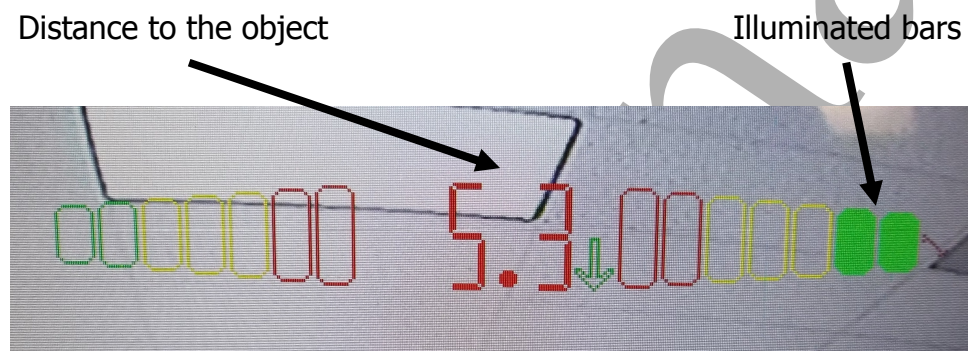
(figure 3)



5. With the **Engine Off, set the Park Brake, block the wheels**, and place the transmission in reverse. The display panel should now have a blank reading.
6. Slowly turn the right potentiometer clockwise until the display gives a numerical reading of the distance of the cart and has a consistent audible sound.
7. Reset the module by placing the vehicle in Park or by unplugging the module power connector. Removing the power from the module allows the module to recognize the new sensitivity adjustment.
8. Place vehicle in reverse or reinstall the module power connector. Move the cart away from the bus and note the display readings. Move the cart forward, measure the cart distance and compare the distance with the display reading.
9. Adjust the sensitivity further if needed. Turning the potentiometer clockwise increases the sensitivity and turning the potentiometer counter-clockwise reduces sensitivity. Repeat Post-Installation Testing. If necessary, readjust and retest.
10. Replace cover on the back of the control module.

Reading the Optional HAWK406 Display

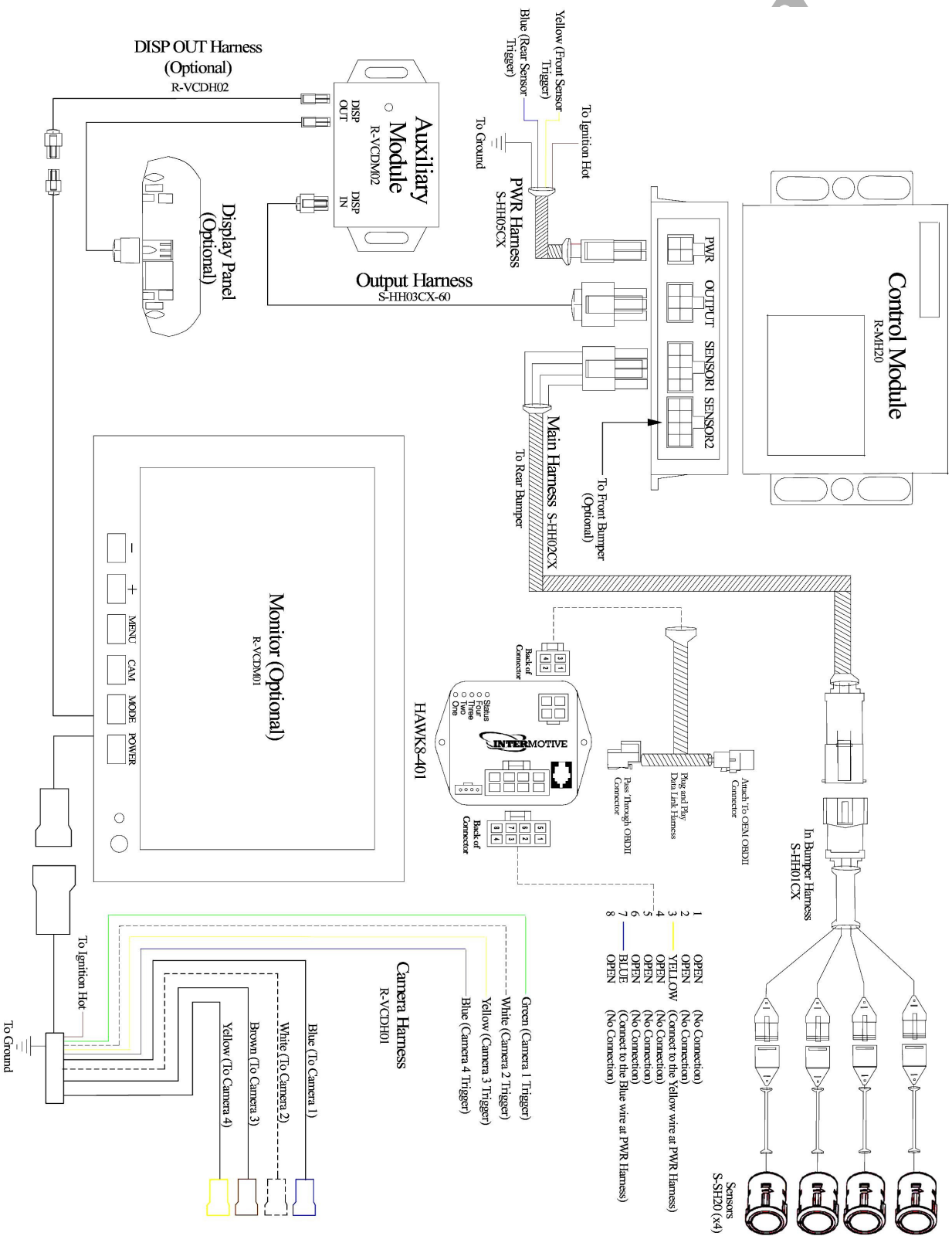
- The center of the display will show the distance of detected objects.
- Each side of the display has illuminated bars, which indicate the side and distance of the detected object. The photo below indicates there is an object approximately 5.3 feet in back of the right sensors.
- As the detected object becomes closer, more bars will illuminate and an audible beep will alert the driver.
- The audible beeps will increase in tempo as the detected object becomes closer.
- The audible sound will become a constant noise when the detected object is in range of a collision.



CAUTION!

This system is not designed to prevent contact with small or moving objects. This system is designed to provide a warning to assist the driver in detecting large stationary objects when moving in reverse at "parking speeds" of approximately 4 mph. The HAWK406 Reverse Assistance System may have reduced performance or be activated in inclement weather.

To help avoid personal injury, always use caution when in reverse and when using the HAWK406 Reverse Assistance System.



Submit product registration at www.intermotive.net

If the HAWK406 fails any step in the Post Installation Test, review the installation instructions and check all connections. If necessary, call

InterMotive Technical Support at (530) 823-1048.

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